Technical Program

SPIE Optics+Photonics

Conferences + Courses: 10–14 August 2008
Exhibition: 12–14 August 2008

San Diego Convention Center
San Diego, California, USA

SPIE
Connecting minds. Advancing light.

Technical Program

Welcome to

SPIE Optics+Photonics

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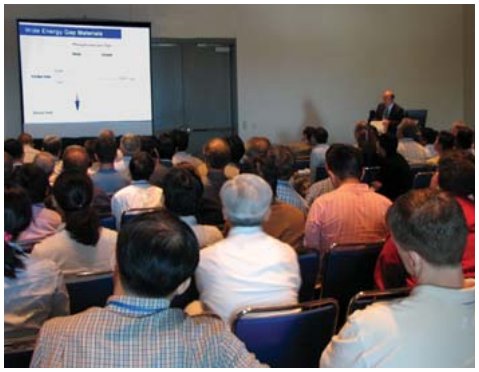
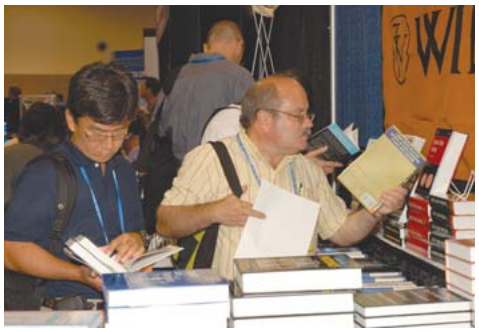
San Diego, California, USA

SPIE would like to express its deepest appreciation to the program chairs, conference chairs, cochairs, program committees, and session chairs who have so generously given of their time and advice to make this symposium possible. The symposium, like our other conferences and activities, would not be possible without the dedicated contribution of our participants and members.

This program is based on commitments received up to the time of publication and is subject to change without notice.

Left cover photo: Courtesy of SCHOTT. Receiver for solar thermal power plants. Successful test run: The receiver from SCHOTT has already proven itself as a part of a string of collectors at a parabolic trough power plant in California.





Contents

Courses

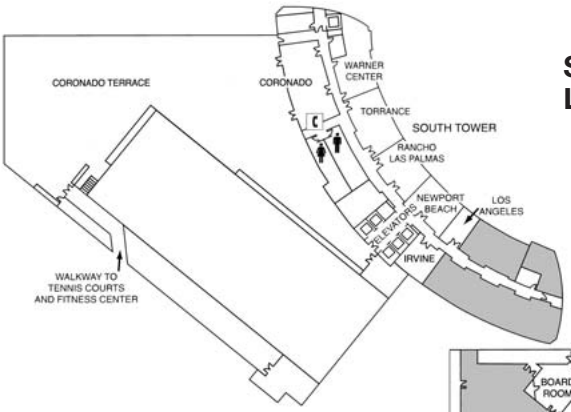
Technical Conferences

Promotional Partners

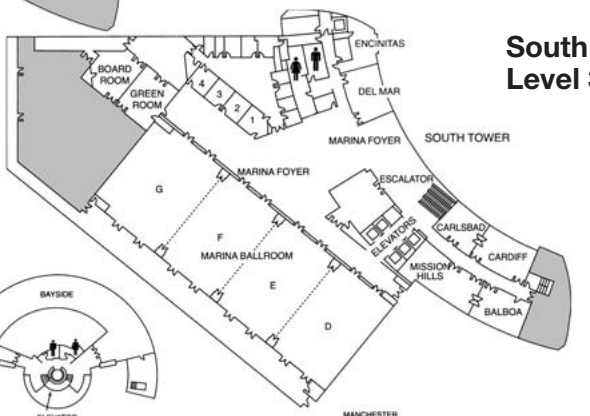
EDP Sciences
Federal Laboratory Consortium for Technology Transfer (FLC)
Laser Focus World
Materials Today
Optics & Laser Europe
Photonics Online
Photonics Spectra - Laurin Publishing
Photonics.com/Photonics Directory
Physics Today
Physics World
Small Times
Spectroscopy Magazine
Webcom Communications

Marriott Floor Plans

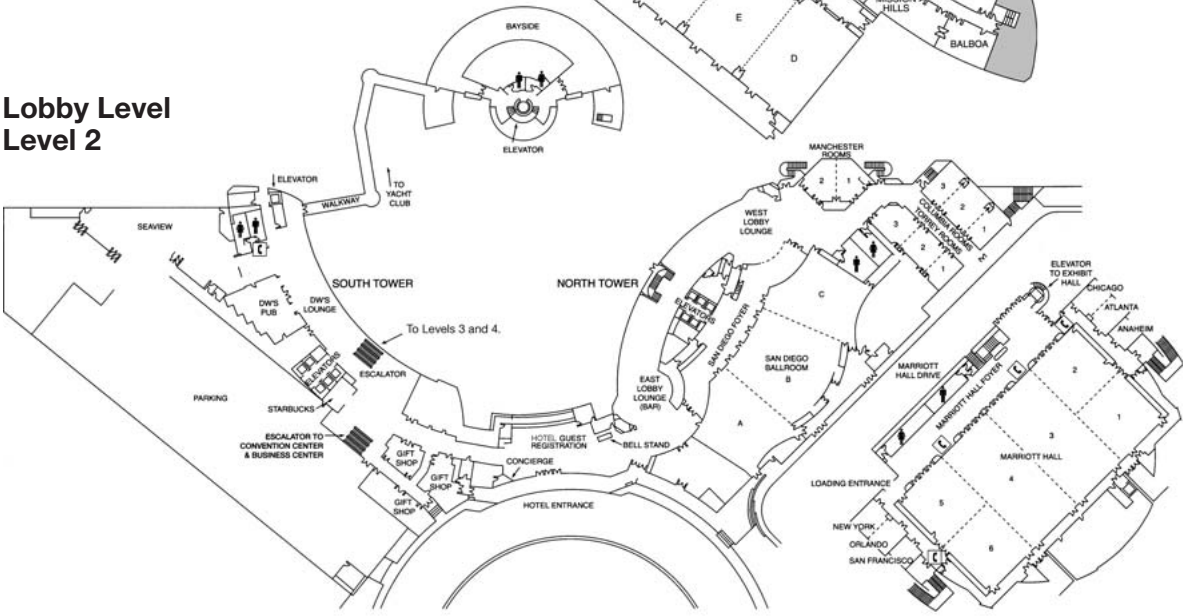
South Tower
Level 4



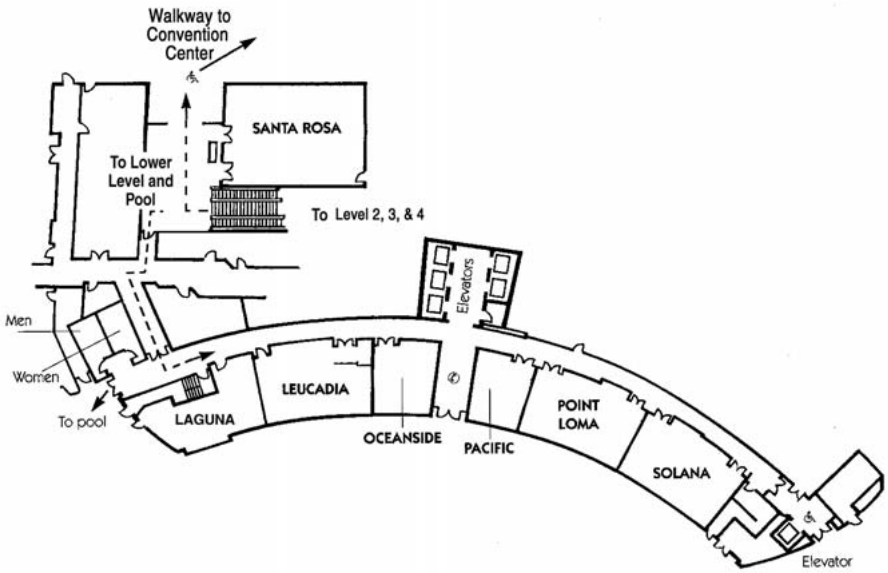
South Tower
Level 3



Lobby Level
Level 2

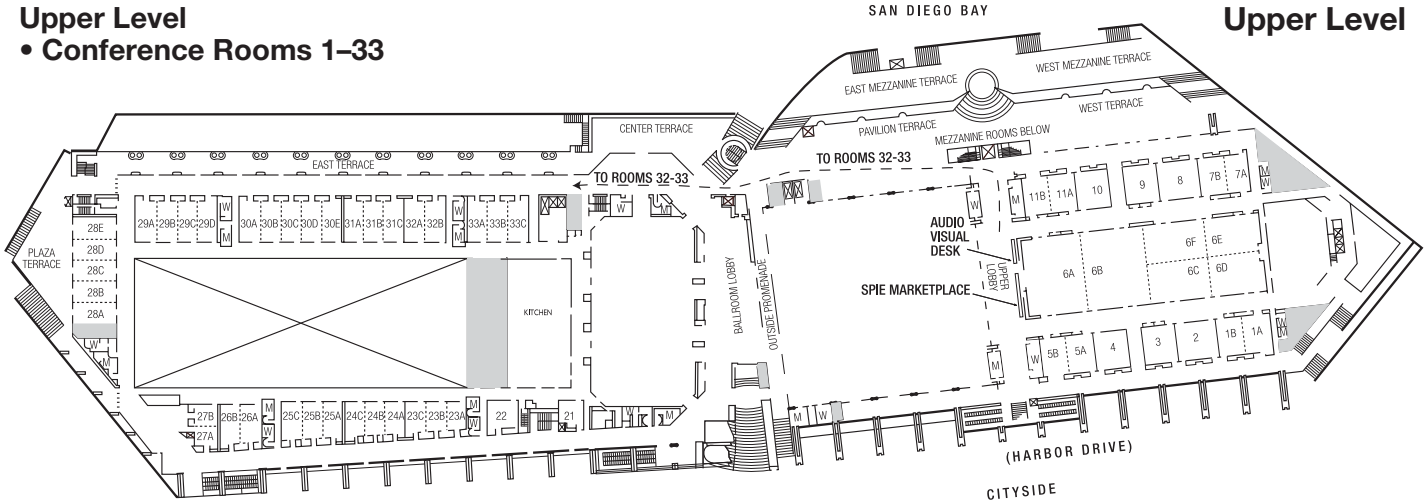


South Tower
Lower Level



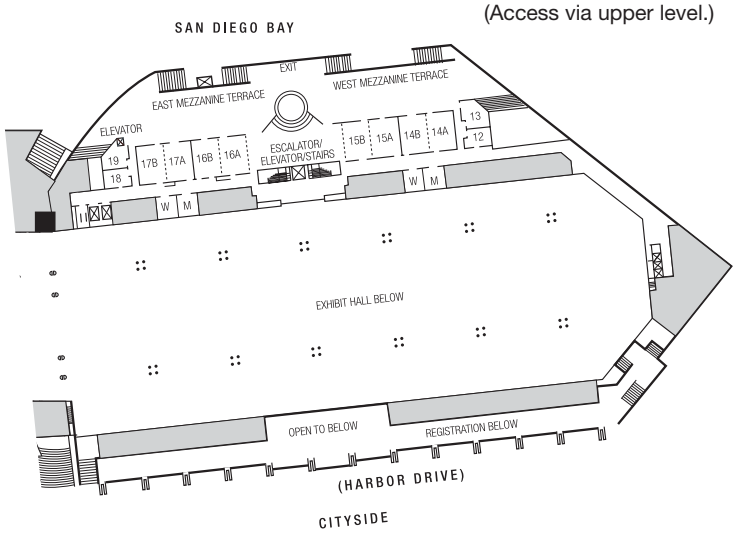
San Diego Convention Center

Upper Level
• Conference Rooms 1–33

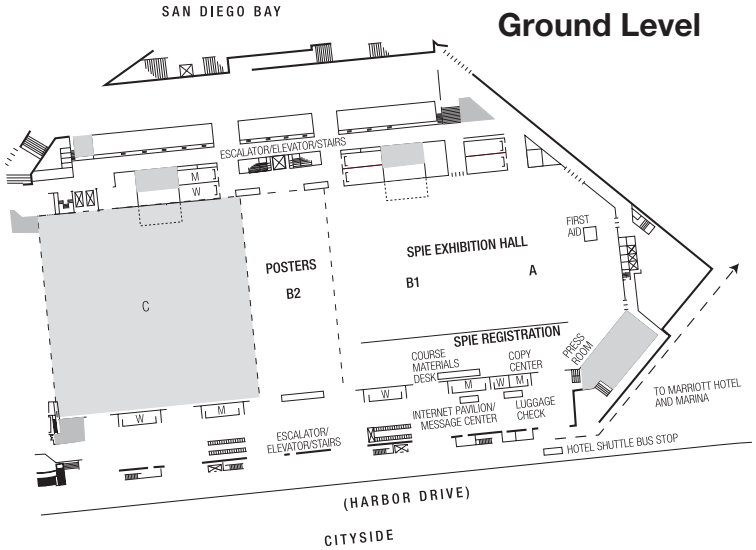


Mezzanine Level

(Access via upper level.)



Ground Level
• Registration - Lobby A
• Exhibition Halls A, B1, B2



Technical Conference Index

NanoScience +Engineering

Part of SPIE Optics+Photonics

Symposium Chairs:

David L. Andrews, Univ. of East Anglia Norwich (United Kingdom)

James G. Grote, Air Force Research Lab.

Kevin J. Liddane, Oerlikon Optics USA, Inc.

NanoScience

NanoEngineering

Special Session

Solar Energy +Applications

Part of SPIE Optics+Photonics

Symposium Chair:

Ravi Durvasula, Lightfleet Corp.

Photonic Devices +Applications

Part of SPIE Optics+Photonics

Symposium Chair:

Zakya H. Kafafi, National Science Foundation

Optical Engineering +Applications

Part of SPIE Optics+Photonics

Special Program

Illumination Engineering

Program Chair: **Ian T. Ferguson,** Georgia Institute of Technology

Optical Design

Program Chair: **R. John Koshel,** Photon Engineering LLC and College of Optical Sciences/The Univ. of Arizona

Advanced Metrology

Program Chair: **Katherine Creath,** Optineering and College of Optical Sciences/The Univ. of Arizona

Optical Systems Engineering

Program Chair: **José Sasian,** College of Optical Sciences/The Univ. of Arizona

Image and Signal Processing

Program Chair: **Khan M. Iftekharuddin,** The Univ. of Memphis

X-Ray, Gamma-Ray, and Particle Technologies

Program Chairs: **Sandra G. Biedron,** Argonne National Lab. (USA) and Sincrotrone Trieste (Italy); **Massimo Altarelli,** Deutsches Elektronen-Synchrotron (Germany)

Technical Conference Index

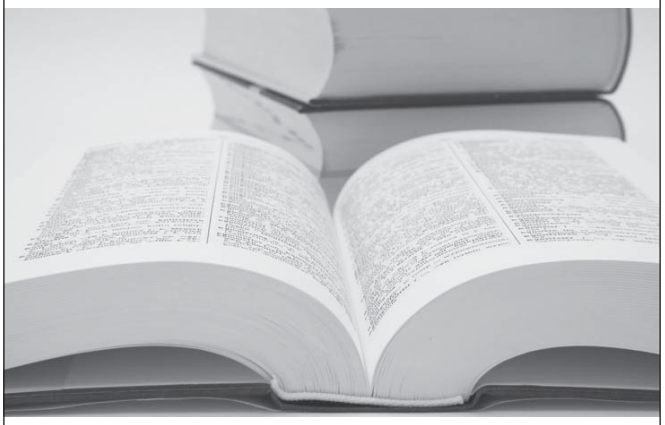
Remote Sensing

Program Chair: **Allen H.-L. Huang,** Univ. of Wisconsin/Madison

Atmospheric and Space Optical Systems


SPIE Works
SPIEWorks.com
Special 2-Day Event! SPIEWorks Career Fair
Whether you are looking for a better job, re-entering the workforce or just starting your career, this is a great place to start!
Exhibition Hall A
Tuesday 12 August · 11:00 am to 3:00 pm
Wednesday 13 August · 11:00 am to 3:00 pm
Talk to recruiters from:
Ball Aerospace &Technologies Corp.
CYMER
KLA-Tencor
L3 communications SSG-Tinsley
LINCOLN LABORATORY
MASSACHUSETTS INSTITUTE OF TECHNOLOGY
Raytheon
TESSERA

SPIE Marketplace



Make your visit complete

- **Books**
- **Souvenirs**
- **Professional Development**
- **Gifts for Kids**
- **Membership**

SPIE thanks the following Sponsors for their generous support of Optics+Photonics 2008

Coffee Break

HAMAMATSU

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Journal of Optical and Fiber Communications

Springer
the language of science

Booth #432 • www.springer.com

Lanyards

GOODRICH

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Internet Pavilion

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Spectra-Physics
A Division of Newport Corporation

Booth #153 • www.newport.com

Wi-Fi Internet Services

Newport
Experience | Solutions

Spectra-Physics
A Division of Newport Corporation

Booth #153 • www.newport.com

Meter Board

Springer
the language of science

Booth #432 • www.springer.com

General Refreshments

Agilent Technologies, Inc., Booth #631
Collimated Holes, Booth #642
Corning Inc., Booth #406
Fiberguide Industries Inc., Booth #216
Rainbow Research Optics, Booth #450

Special Events Daily Schedule

Sunday	Monday	Tuesday	Wednesday	Thursday
		10:00 am to 5:00 pm	**EXHIBITION,** p. 40-41 10:00 am to 5:00 pm	10:00 am to 2:00 pm
Professional Skills Workshop, 9:00 am to 12:30 pm, p. 30	**Guest Hospitality Suite,** 8:30 to 10:00 am, p. 11	**Essential Skills for Engineering Project Leaders,** (Hinkle), 8:30 am to 12:30 pm, p. 32	*Workshop:* **Focus on X-ray Focusing,** p. 29	
Keynote Luncheon, 12:30 to 1:30 pm, p. 30	*Plenary Presentation:* **Revivals of Molecular Nonlinear Optics in Physics, Chemistry, and Life Sciences,** (Zyss), 8:30 to 9:10 am, p. 13	*Plenary Presentation:* **Why the Developing World is the Perfect Market Place for SSL,** (Irvine-Halliday), 8:30 to 9:15 am, p. 16	**Special Session on Nonlinear Optical Polymers: In Recognition of the Contributions Made by Professor Larry Dalton,** (Dalton), 8:30 am to 3:20 pm, p. 29	
Hands-On Optics: Making an Impact with Light (HOO): Terrific Telescopes Workshop, 1:30 to 4:30 pm, p. 31	**Effective Technical Presentations,** (Doumont), 8:30 am to 12:30 pm, p. 31	**Guest Hospitality Suite,** 8:30 to 10:00 am, p. 11	**Guest Hospitality Suite** 8:30 to 10:00 am, p. 11	
Early Career Networking Social, 5:30 to 7:00 pm, p. 31	*Plenary Presentation:* **Applications of Biological Materials,** (Naik), 9:10 to 9:50 am, p. 13	*Plenary Presentation:* **The Use of Heavy Metal Complexes in Solid State Light Sources (OLEDs),** (Thompson), 9:15 to 10:00 am, p. 16	**SPIEWorks Career Fair,** 11:00 am to 3:00 pm, p. 12	
All-Conference Plenary Session: The Solar Decathlon: Building a Better Future with Solar Energy, (King), 6:00 to 6:45 pm, p. 13	*Plenary Presentation:* **Two-Photon Lithography for Precise 3D Nano/Micro-Objects,** (Lee), 10:20 to 11:00 am, p. 13	**SPIEWorks Career Fair,** 11:00 am to 3:00 pm, p. 12	**Optimizing Your Resume,** (Cain), 1:30 to 3:30 pm, p. 32	
"No Ties" Student Social, 7:30 to 9:00 pm, p. 30	*Plenary Presentation:* **Multifunctional Excimer-Laser Lithography and Photoablation Technologies for Large-Area Micro and Nanoelectronics, Displays, and Microsystems,** (Jain), 11:00 am to 11:40 pm, p. 14	*Plenary Presentation:* **The Contributions from the NASA Earth Science Decadal Survey Missions in Understanding Global Climate Change,** (Hyon), 1:15 to 2:00 pm, p. 17	**Prospects for Organics PV Panel,** p. 29	
	Plenary Presentation: **Molecules, Surfaces, and Symmetry: From Pure Geometry to Nanoscience** *(Fichou),* 11:40 am to 12:20 pm, p. 14	**Fellows Luncheon,** Noon to 1:30 pm, p. 10	**Poster Session,** 5:30 pm to 7:00 pm, p. 10	
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	Effective Scientific Papers, (Doumont), 1:30 to 5:30 pm, p. 31	**Becoming an Optical Engineering Consultant,** (Kruschwitz), 1:30 to 5:30 pm, p. 32		
	Plenary Presentation: **Nanostructures for High Efficiency Photovoltaics,** (Atwater), 1:30 to 2:00 pm, p. 15	*Plenary Presentation:* **Recovering the Atmospheric Information from the High Resolution Dynamics Limb Sounder (HIRDLS),** (Gille), 2:00 to 2:45 pm, p. 17		
	Plenary Presentation: **The Environment's Effects on Solar Radiation,** (Michalsky), 2:00 to 2:30 pm, p. 15	**Plenary Presentation: Measurement Science for Climate Remote Sensing,** (Fraser), 2:45 to 3:30 pm, p. 17		
	Plenary Presentation: **Direct Conversion of Solar Energy to Hydrogen,** (Grimes), 2:30 to 3:00 pm, p. 15	**SPIE Scholarship and Outreach Grant Winners Reception,** 3:00 to 4:00 pm, p. 12		
	Plenary Presentation: **Reliability of PV Systems,** (Wohlgemuth), 3:30 to 4:00 pm, p. 16	**Student Chapter Exhibit Mixer,** 4:00 to 5:00 pm, p. 30		
	Commercializing CPV: What Lies Ahead?, (Holland), 4:00 to 4:30 pm, p. 16	*Plenary Presentation:* **Application of MODIS Direct Broadcast System: Fire Detection, Burn Scars, Emission Air Quality Forecasting,** (Hao), 4:00 to 4:45 pm, p. 18		
	Women in Optics Presentation and Reception: Who is Science Writing For?, 5:00 to 6:30 pm, p. 11	*Plenary Presentation:* **Infrared Retina Using Nanoscale Quantum Dots and Strain Layer Superlattices,** (Krishna), 4:45 to 5:30 pm, p. 18		
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	All Symposium Welcome Reception, 7:00 to 8:30 pm, p. 10	**Annual General Meeting of the SPIE Corporation,** 6:00 to 7:00 pm, p. 10		
	Illumination Technical Event, 8:00 to 10:00 pm, p. 28	**SPIE Members Reception,** for SPIE Members Only, 7:00 to 8:30 pm, p. 10		
		Poster Session, 8:00 to 10:00 pm, p. 10		
		Lens Design Technical Event: Let's Give 'Em Something to Talk About!, (Turner, Johnston, Pfisterer), 8:00 to 10:00 pm, p. 28		
		Optical Believe It Or Not/Key Lessons Learned Technical Event and Awards Presentation, (Kahan), 8:00 to 10:00 pm, p. 28		
		Optomechanical/Instrument Technical Event: Optomechanical Challenges of the Forty-two Meter European ELT, (Hatheway), 8:00 to 10:00 pm, p. 28		
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		Penetrating Radiation, 8:00 to 10:00 pm, p. 28		

Special Events

All Symposium Welcome Reception

Convention Center Upper Level Terrace

Monday 11 August . . . . . 7:00 to 8:30 pm

All attendees are invited to relax, socialize, and enjoy refreshments and spectacular bay views.

Please remember to wear your conference registration badges (required). Dress is casual. Guest badge may be purchased during registration.

Poster Sessions

Convention Center Exhibition Hall B2

Monday 11 August . . . . . 6:00 to 7:30 pm
Tuesday 12 August . . . . . 8:00 to 10:00 pm
Wednesday 13 August . . . . . 5:30 to 7:00 pm

Conference attendees are invited to attend the poster sessions on Monday, Tuesday and Wednesday evening. Each evening will represent a different set of conferences. Come view the posters, ask questions, and enjoy the refreshments. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Authors: See setup instructions, p. 265.

Cluster Meet-up

Convention Center Exhibition Hall B1

Industry Resources Booth in the SPIE Pavilion

Tuesday 12 August. . . . . 2:00 to 3:00 pm

Network and learn about the benefits of clustering. Meet cluster leaders and members and tap into a network of potential partners.

SPIE Connecting minds. Advancing light.

Annual General Meeting of the SPIE Corporation

The Society of Photo-Optical Instrumentation Engineers (SPIE)

Marriott Hotel - Marina E

Tuesday 12 August. . . . . 6:00 to 7:00 pm

Agenda

1. 2008 Election Results

2. Report on the "State of the Society"

3. Treasurer's Report

4. Q & A with SPIE Officers

This is the general business meeting of the Society. All SPIE Members are welcome and encouraged to attend. This is your forum for expressing your ideas about the Society. Results of the 2008 election will be announced, and the President and Chief Executive Officer will report on the "State of the Society."

SPIE Members Reception

For SPIE Members Only. Membership will be checked at the entrance for admission.

Marriott Hotel - Coronado Terrace

Tuesday 12 August . . . . . 7:00 to 8:30 pm

All SPIE Members are invited to this reception in their honor. Come relax and talk with your colleagues. Refreshments will be served. Please note: this reception is limited to SPIE Members only. Membership cards or invitations will be requested at the entrance. If you join SPIE onsite, please bring your registration receipt. Dress is casual or business attire.

Fellows Luncheon

Marriott Hotel - Marina G

Tuesday 12 August . . . . . .12:00 to 1:30 pm

NREL's Past Projects in Solar Energy and Future Predictions

Speaker: **Martha Symko-Davies** is a Senior Research supervisor at the National Renewable Energy Laboratory (NREL) in Golden. She manages the subcontracted R&D group at NREL. The group works on achieving the Solar America Initiative goals. The Solar America Initiative is a U.S. Department of Energy (DOE) effort to make solar electricity from Photovoltaics (PV) cost-competitive with conventional forms of electricity from the utility grid by 2015. The strategy pursues complementary activities in research and development (R&D) and in market transformation. The goals are to reduce costs through R&D and to eliminate market barriers through deployment.

All SPIE Fellows are invited to join your colleagues for this SPIE hosted luncheon. The new Optics + Photonics Fellows will be introduced and receive their Fellow pins. Please join us for this informal gathering and a chance to interact with other Fellows.

Guest Hospitality Suite

Marriott Hotel - Suite 2540

Monday to Thursday . . . . . .8:30 to 10:00 am

Guests of attendees are invited to meet, relax, and enjoy a cup of coffee and breakfast breads in the SPIE Guest Hospitality Suite. This suite is for guests of attendees only. The hotel concierge will be available during a portion of this time to answer travel, shopping, and tourist questions.

SPIE 2008 Annual Awards Banquet

Wednesday 13 August 2008

Marriott Hotel - Marina Ballrooms

SPIE President **Kevin G. Harding** presiding

Banquet and Awards presentations. . . . . .7:30 pm

SPIE President Kevin G. Harding will preside over the 2008 Awards Banquet that will include the presentation of the 2008 Society awards, scholarship awards, and new Fellows of the Society. Join us for this gala event and enjoy a presentation by 2008 Gold Medal winner, M.J. Soileau, as well as a short presentation and special tribute to Warren J. Smith.

Tickets for the banquet are not included in the registration fee but may be ordered on the registration form, at $75 each or purchased onsite at the SPIE Registration Desk until 12 noon on Tuesday, 12 August.

Banquet Presentation

A Creole Boy Goes to CREOL:
Many hands make light work

M.J. Soileau, College of Optics and Photonics/ Univ. of Central Florida, 2008 SPIE Gold Medal Winner

This title is meant to be a play on words that will help describe the perspective of this particular "Creole boy" including what led him to a career in optics; his interpretation of the development of CREOL, the College of Optics and Photonics; his perspective on how optics is an engine for wealth creation in knowledge-based industries; and his projection for how the academic world and the business world can work together to make the 21st Century the century of the photon.

Biography: **M.J. Soileau** received his PhD in Quantum Electronics from the University of Southern California, is currently Professor of Optics, Electrical and Computer Engineering and Physics and Vice President for Research at the Univ. of Central Florida College of Optics and Photonics. His research interests include the nonlinear optical properties of materials and laser-induced damage. He is a Fellow of IEEE, SPIE, the Optical Society of America, and the American Association for the Advancement of Sciences.

Dr. Soileau previously received the SPIE Directors' Award.

SPIE Women in Optics Presentation and Reception

Convention Center - Room 13

Monday 11 August . . . . . 5:00 to 6:30 pm

Join us for an evening of networking and inspiration. Connect with others in our industry while enjoying wine and cheese refreshments.

Open to all conference attendees.

Who Is Science Writing For?

Margaret Wertheim

Polls show us that the majority of Americans do not know what causes seasons, they think humans and dinosaurs lived simultaneously, and they believe the earth came into being in much the same form it now has around 10,000 years ago. Public ignorance about scientific matters has become a cause celebre for those of us who care about science. We say we must do better in telling the people about the subject we love. But who are these "people" and what do we know about them? In this talk, noted science writer Margaret Wertheim will discuss the issue of public science communication, from the perspective of the public. Ms Wertheim - who has written about science for magazines and newspapers all over the world, including the New York Times, Los Angeles Times, The Guardian, New Scientist, Wired and Australian Vogue (for whom she wrote a regular science column), has researched the readership of science magazines. This turns out to be overwhelming well-educated, white men, over forty and in the upper socio-economic tiers of our society. In this talk Wertheim will look at how we can pursue new strategies that reach out to more diverse and wide-ranging audiences.

Biography: **Margaret Wertheim** is an internationally noted science writer and commentator whose work focuses on the relations between science and the wider cultural landscape. She is the author of Pythagoras' Trousers, a history of the relationship between physics and religion (Times Books/Norton paperback); and The Pearly Gates of Cyberspace: A History of Space from Dante to the Internet (Norton). Margaret has a BS majoring in pure and applied physics and a BA majoring in mathematics and computer science. She is a contributor to the New York Times Science Section and an Op-Ed contributor for the Los Angeles Times. From 2000-2005 she wrote the "Quark Soup" column for the LA Weekly and is a contributing editor (on science) for Cabinet, and Cosmos Magazine (Australia). Her articles have appeared in many other places, including the Los Angeles Times Magazine, The Sciences, New Scientist, Times Literary Supplement, The Guardian, Salon and Wired. Margaret has contributed essays to more than a dozen scholarly anthologies.

Wertheim has lectured widely at universities and colleges across America and abroad. She has been a keynote speaker at the International Design Conference Aspen, the Ecclesiastical Academy in Tutzing, Germany, the Royal Australian Institute of Architects, and the annual meeting of the German Women in Physics Society. In 1998 she gave a series of lectures in South Africa about relationship between science and religion. In 2006 she was Australia's official spokeswoman for Science Week and in 2007 she was a panelist at the Sundance Film Festival's science round-table. In 2008 she is curating a further series for the Los Angeles Public Library. Wertheim has written and produced interactive videos and television science programs, including the award-winning series "Catalyst," which aimed at teenage girls (for ABC Australia); and the PBS special "Faith and Reason". In 2000 she produced and directed "It's Jim's World .... we just live in it," a documentary about "outsider physicist" James Carter. Carter's work is the subject of a book she is currently writing about "outsider science" and role of imagination in theoretical physics - to be published by Walker & Co.

Special Events

SPIE Scholarship and Outreach Grant Winners Reception

Convention Center - Exhibition Hall B1 (near Registration)

Tuesday 12 August. . . . . 3:00 to 4:00 pm

This year SPIE will be awarding more than $300,000 in scholarships and grants to recipients around the world. Winners of the 2008 SPIE Scholarships and Outreach Grants will be honored at this reception. All students and scholarship and outreach grant winners are invited to attend.

Student Chapter Exhibits

Convention Center - Exhibition Hall B1

Tuesday to Thursday . . . . Exhibition Hours

Explore the possibilities in optics and photonics across the globe. Discover the research of some of the brightest student groups and the programs they have developed to increase science awareness and literacy in their regions.

Student Chapter Exhibit Mixer

Convention Center - Exhibition Hall B1

Tuesday 12 August. . . . . 4:00 to 5:00 pm

Exhibitors, join us for a late-afternoon mixer in the Student Chapter section of the exhibition hall. Meet our amazing students and learn about the innovative activities of some of the best and brightest Chapters across the globe!

SPIE Works

Special 2-Day Event!
SPIEWorks Career Fair

Convention Center - Exhibition Hall A

Tuesday 12 August. . . 11:00 am to 3:00 pm

Wednesday 13 August 11:00 am to 3:00 pm

Top employers are coming together to interview and hire engineers and scientists like you. The SPIEWorks Career Fair at Optics+Photonics is a great place to:

- **Get 'face to face' time with employers and interview on the spot**
- **Learn more about the jobs available in our industry**
- **Network!**

Whether you are looking for a better job, re-entering the workforce or just starting your career, this is a great place to start!

Talk to recruiters from:

Ball Aerospace
Cymer
GE
KLA Tencor
L-3 Tinsley
MIT Lincoln Lab.
Raytheon
Tessera

Free Admission; Registration Required.

Whether you are looking for a better job, re-entering the workforce or just starting your career, the SPIEWorks Career Fair is the place to start!

In addition to the onsite recruitment activities listed above, SPIEWorks offers you online services to help you with your search for employment before, during, and after the conference. Visit spieworks.com to post your resume, view jobs, or sign up for email alerts.

Free Services for Employers

Don't Miss This Recruiting Opportunity—hire top talent at Optics+Photonics.

- Stop by the SPIEWorks booth in the Career Fair and gain access to our proprietary resume database at no charge.
- Post jobs for free. That's right, there's no charge to post jobs to the Optics+Photonics Career Fair. Go to spieworks.com, create an employer account and sign-in to post jobs online. Your free job(s) will be live 12-13 August.

For information on future recruiting events contact Dave Baggenstos at +1 360 715 3705 or email sales@spieworks.com

All-Conference Plenary Session

Convention Center - Room 6A
Sunday 10 August . . . . . 6:00 to 6:45 pm

The Solar Decathlon: Building a Better Future with Solar Energy

Richard King, Director, Solar Decathlon, U.S. Department of Energy

Abstract: Last October, the U.S. Department of Energy hosted the third Solar Decathlon. The competition featured a "solar village" of 20 zero-energy homes built by university teams from schools of architecture and engineering across North America and Europe. For nine days, the National Mall served as a living laboratory where best practices in solar energy, energy efficiency, and home design converged. One of the driving forces behind the Solar Decathlon, Richard King, will discuss the results of the Decathlon, the lessons learned, its role in research and development, and what to look forward to in the future.

Biography: **Richard King** is the Director of the Solar Decathlon, one of the most unique, ambitious and exciting solar events in the country. The Solar Decathlon challenges teams of university architecture and engineering students to design, build and operate solar powered houses. Every two years a village of 20 solar homes is assembled on the National Mall in Washington, DC to display the homes and determine a winner.

Mr. King has been with the U.S. Department of Energy since 1986 working primarily in the Solar Energy Technology Program. From 1997 until 2007 he served as Team Leader of the Photovoltaic R&D Program. Recently he has been working in the DOE Buildings Program to work more closely with professional builders to develop cost-effective zero-net energy homes powered by solar energy.

NanoScience+Engineering

Convention Center - Room 6A
Monday 11 August . . . . . 8:30 am to 12:20 pm

8:30 to 9:10 am:

Revivals of Molecular Nonlinear Optics in Physics, Chemistry, and Life Sciences

Joseph Zyss, École Normale Supérieure de Cachan (France)

Abstract: Molecular Nonlinear Optics, an otherwise somewhat traditional domain, is currently revisiting and shaking its foundations, objectives and methods, onto spectacular conceptual as well as methodological revivals, based on correlated advances in chemistry, physics and modern microscopy for life sciences. A comprehensive multipolar template will be shown to help rationalize and generalize molecular design rules, with current emphasis on multi-functionality and the nano-scale. Moreover, nonlinear nanophotonics and new active nonlinear coupling schemes, based on interference of multi-photon absorption pathways, permit to encode nonlinear information or guide by light the displacement of molecular or nano-scale objects. Capitalizing on these advances and more, advanced bio-imaging methods such as based on phase and polarization resolved nonlinear schemes, are currently opening-up new windows onto cellular structures and mechanisms, with potential toward unprecedented spatial resolution.

Biography: **Joseph Zyss** is a professor of physics at the Ecole Normale Supérieure in Cachan (near Paris) and the founding director of the D'Alembert Institute, a cross disciplinary gathering of four CNRS Laboratories geared toward Molecular Nano Biophotonics. In the wake of mentor and friend Daniel Chemla, he has helped set over three decades the foundations of molecular nonlinear optics, from basic physical and chemical concepts onto applications, with current emphasis on nanoscale NLO, dynamical nonlinearities in microcavities and advanced nonlinear bio-imaging schemes.

9:10 to 9:50 am:

Applications of Biological Materials

Rajesh R. Naik, Air Force Research Lab.

Abstract: The emerging interface of biology, materials science and engineering has resulted in the creation of cross-disciplinary groups in creating new opportunities for development of materials, sensors and devices. Nature has evolved remarkable materials and is a source of inspiration for engineers. Naturally occurring materials are highly sophisticated, integrated and hierarchical materials that commonly exhibit multifunctionality. The mimicking or implementation of these biological materials offers considerable scope for the improvement and design of future multifunctional materials, sensors and devices. In my talk, I will cover aspects of how biological materials can be used in the fabrication of nanomaterials, for sensors and devices.

Biography: **Rajesh R. Naik** is the Technology Advisor for the Nanostructured and Biological Materials Branch (Materials and Manufacturing Directorate) and Biotechnology Research Lead at the Air Force Research Laboratory at Wright-Patterson AFB, OH. His research group focuses on biomimetic materials, sensors and bionanotechnology has authored over 90 peer-reviewed papers and has several patents. He is currently an adjunct Professor at Wright State University (Biochemistry and Molecular Biology Department) and at Georgia Tech (Department of Materials Science and Engineering).

9:50 to 10:20 am: Coffee Break

10:20 to 11:00 am:

Two-Photon Lithography for Precise 3D Nano/Micro-Objects

Kwang-Sup Lee, Hannam Univ. (South Korea)

Abstract: Considerable efforts focusing on two-photon photopolymerization (TPP) have been put forth in the area of 2D and 3D nano/microfabrication for the development of new conceptive nano/micro-devices. TPP offers numerous advantages over conventional MEMS fabrication processes which tend to be time-consuming and highly complicated. Since TPP first came out as a novel technique over a decade ago, a great number of diverse micro-objects have been fabricated using TPP employing a variety of effective two-photon absorbing chromophores as photosensitizers. In TPP, when a near-IR ultrashort-pulsed laser is closely focused into a volume of photocurable resins, real 3D microstructures can be fabricated using a layer-by-layer accumulating technique; therefore, TPP is considered to be a promising technique for 3D nano/microfabrication. Recent reports have shown TPP technique to be capable of fabricating sub

100nm structures which are below the diffraction limit of the incident light employed for the process. In this presentation, we will discuss our attempts at improving the fabrication efficiency and precision of nano/microfabrications based on TPP.

Biography: **Kwang-Sup Lee** is the Dean of the College of Life Science and Nanotechnology and Professor of the Department of Advanced Materials at the Hannam University, South Korea. He also holds a position as the Research Professor at the Institute for Lasers, Photonics and Biophotonics in the University at Buffalo, SUNY. Dr. Lee received his bachelor's degree in chemistry from Hannam University in 1976, master's degree in polymer chemistry from Korea University in 1980, and a doctorate in polymer science from the Freiburg University, Germany in 1984. He was a postdoctoral fellow at the Max-Planck-Institute for Polymer Research from 1985 to 1986 and a visiting professor at the Naval Research Laboratory, USA in 1998 and also at the University at Buffalo in 1990 and 2005. Prof. Lee's research interests lie in the field of photofunctional materials including the synthesis of conjugated organics and polymers, quantum dots, carbon nanotubes, and organic-inorganic hybrid materials and fabrication of devices involving them. He has over 150 scientific papers, 5 edited books and about 20 issued and filed patents. He is on the editorial board of several international journals including Advances in Polymer Science, Nonlinear Optics and Quantum Optics, Nature-Asia Materials and has been the organizer of several international conferences. He has over 100 plenary, keynote, and invited talks to his credit.

11:00 am to 11:40 pm:

Multifunctional Excimer-Laser Lithography and Photoablation Technologies for Large-Area Micro and Nanoelectronics, Displays, and Microsystems

Kanti Jain, Univ. of Illinois at Urbana-Champaign

Abstract: As micro and nanoscale electronic and optical devices make advances in speed, functionality and integration, demands on their fabrication processes and equipment continue to accelerate. Recently, there also has been an increasing impact of fabrication technologies in large-area microelectronics, displays, microsystems and biomolecular structures. These technologies enable the micro/nanostructuring of a variety of organic and inorganic materials, developing new synthesis techniques, and producing structures and devices previously deemed unfeasible. To facilitate these explorations, processing techniques and multifunctional systems are desired that can handle various substrate materials and geometries, including large areas, flexible sheets and nonplanar surfaces. We review advances in micro/nanolithography, photoablation and other technologies developed for these applications, distinguishing their requirements from those of established semiconductor fabrication technologies.

Biography: **Dr. Kanti Jain** is Professor of Electrical and Computer Engineering at the University of Illinois at Urbana-Champaign. He received the Ph.D. in Electrical Engineering and Solid State Physics from the University of Illinois at Urbana-Champaign in 1975, M.S. from there in 1970, and B.Tech. (Hons.) from the Indian Institute of Technology, Kharagpur, in 1969. He was a Postdoctoral Fellow at M.I.T. from 1975 to 1977. Dr. Jain joined the University of Illinois faculty in 2006, prior to which he held senior technical and managerial positions in the microelectronics industry for 30 years, including at I.B.M. (1979-88), Hewlett-Packard (1975-77), and Raychem (1989-91). In the 1980's, he invented and developed the technology of excimer laser lithography for which he received two Outstanding Innovation Awards from I.B.M. and which is now the dominant technology used in the production of semiconductor IC chips worldwide. Dr. Jain is also founder and president of Anvik Corporation, a microelectronics systems company, where in the 1990's, he developed the technologies for large-area lithography that are widely used today in the production of flat-panel displays and televisions. He holds 66 patents (53 issued, 13 pending) and is the author of the book Excimer Laser Lithography (SPIE, 1990). Professor Jain is recipient of the David Richardson Medal of the Optical Society of America, a Fellow of the Institute of Electrical & Electronics Engineers, a Fellow of the Optical Society of America, a Fellow of SPIE-The International Society for Optical Engineering, and a former member of the Board of Directors and the Executive Committee of SPIE.

11:40 am to 12:20 pm:

Molecules, Surfaces, and Symmetry: From Pure Geometry to Nanoscience

Denis Fichou, Lab. of Organic Nanostructures and Semiconductors, CEA Saclay

Abstract: Controlling the growth of highly organized molecular architectures on surfaces is a central theme of organic electronics and nanotechnology. Two-dimensional periodic lattices formed by physisorption of functional organic molecules on atomically flat surfaces can be obtained by self-assembly mechanisms, either in ambient or UHV environments. They result from a subtle interplay between various weak interactions such as Van der Waals forces, hydrogen bonding or dipolar interactions, taking place essentially between molecules themselves or in-between the substrate and the molecules. Beside physical conditions, the shape, size and chemical composition of the molecular building blocks determine the geometry of the self-organized 2D networks. Therefore, tuning these molecular parameters atom-per-atom, i.e. at the angstroem level, allows to precisely engineer functionalized surfaces having the expected properties. We report here on a variety of periodic 2D supramolecular structures that have been recently prepared and investigated by means of scanning tunneling microscopy (STM) at the liquid/solid interface.

Biography: **Prof. Dr. Denis Fichou** is a 1st class Research Director at CNRS in France. He is the current Head of the Laboratory of Organic Nanostructures and Semiconductors that he founded in CEA-Saclay, close to Paris, in 2001. His lab is a joint unit between CNRS, CEA-Saclay and Pierre et Marie Curie University. From 1987, D. Fichou has pioneered organic transistors and their applications in "plastic electronics". He is in particular the co-inventor of the 1st organic transistor on a flexible substrate in 1990 and discovered the family of semiconducting oligothiophenes. Since then, he has been developing organic semiconductors and devices and has published more than 140 articles in international journals such as Nature, Advanced Materials, J. Am. Chem. Soc., etc.

Since 2001, his new laboratory is oriented towards nanosciences and nanotechnologies of organic semiconductors and devices. A major topic is to tailor supramolecular self-assemblies on atomically flat surfaces and implement them as the active materials in field-effect transistors and photovoltaic solar cells. Another research axis is the study of single crystalline organic semiconductors at the micro and nanoscale (Nature 2000, Adv Mater 2006). Scanning tunneling microscopy (STM) and spectroscopy (STS) are the main techniques used in these programs. Therefore, the lab is equipped with various facilities for near-field microscopies (STM at the liquid-solid interface, UHV/STM, light-assisted STM, etc), device characterizations (microprobe station, lasers, etc)

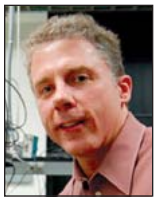
Beside, D. Fichou has been appointed as Professor of Organic Chemistry in France (1981), Morocco (1982), Japan (1986 and 1992) and is currently a Visiting Professor at the Nanyang Technological University (NTU) of Singapore since 2004. Finally, he has been acting as the coordinator or partner of several research programs in France, Europe, Japan, Singapore, etc, and is a member of various scientific committees. He is also the organizer of several international conferences worldwide such as APS, SPIE, ECME, etc.

Solar Energy

Convention Center - Room 6A
Monday 11 August . . . . . 1:30 to 4:30 pm

1:30 to 2:00 pm:

Nanostructures for High Efficiency Photovoltaics



Harry A. Atwater, California Institute of Technology

Abstract: Photovoltaics (PV) technology is currently enjoying substantial growth and investment owing to worldwide sensitivity to the long-term importance of renewable energy. There are many options, but the key performance metric is the cost per Watt of PV-generated electricity. While solar cells are semiconductor devices like integrated circuits, the processing cost/area must be several orders of magnitude less expensive than for microelectronic integrated circuit chip processing. Thus while most current solar cell manufacturing is done with crystalline silicon wafers, the future of large-scale PV is likely to bring development of inexpensive thin film and nano-structured devices and processes. I will discuss promising new approaches to ultrahigh efficiency thin film multi-junction solar cells, semiconductor nanowire-based solar cells and plasmonic structures for enhanced light absorption that open up new design approaches to very thin photovoltaic devices.

Biography: **Harry Atwater** is currently Howard Hughes Professor and Professor of Applied Physics and Materials Science at the California Institute of Technology. Atwater received his S.B. (1981), S.M. (1983), and Ph.D. (1987) in Electrical Engineering from the Massachusetts Institute of Technology.

His research interests center around photovoltaics, nanophotonics, and photoelectrochemical devices for solar fuel production. He is an early pioneer in surface plasmon photonics; he gave the name to the field of plasmonics in 2001; developments in this field were recently featured in his article about plasmonics in the May 2007 of Scientific American.

Professor Atwater is founder and chief technical advisor for Aonex Corp. He has consulted extensively for industry and government, and has actively served the materials community in various capacities, including Material Research Society Meeting Chair (1997), Materials Research Society President (2000), AVS Electronic Materials and Processing Division Chair (1999). In 2001 he served as a Gordon Conference Chair, and in 2008 he will serve as Chair for the Gordon Research Conference on Plasmonics. He currently serves as Director of Caltech's Center for Science and Engineering of Materials (an NSF MRSEC; www.csem.caltech.edu), and is also Director of the Caltech Center for Sustainable Energy Research (www.ccser.caltech.edu). He serves on the Director's Review Committee, Chemistry and Materials Science Division, Lawrence Livermore National Laboratory; and the Board of Trustees, Gordon Research Conferences. He has served on the Department of Energy, Office of Science, Division of Materials Sciences Visiting Committee; Stanford Univ. Department of Materials Science and Engineering Visiting Committee; National Science Foundation Division of Materials Research Visiting Committee. Atwater is founder and chief technical advisor for Aonex Corp. He is also an editorial board member for Surface Review and Letters.

Atwater has been honored by awards including the Joop Los Fellowship from the Dutch Society for Fundamental Research on Matter, 2005; A.T. & T. Foundation Award, 1990; NSF Presidential Young Investigator Award, 1989; IBM Faculty Development Award, 1989-1990; Member, Bohmische Physical Society, 1990; IBM Postdoctoral Fellowship, 1987.

2:00 to 2:30 pm:

The Environment's Effects on Solar Radiation

Joseph J. Michalsky, Jr., NOAA Earth System Research Lab.

Abstract: Solar radiation is perturbed by the atmosphere and by the surface before it reaches a photovoltaic array. It is well known that clouds kill concentrated sunlight. However, aerosols in an, otherwise, completely clear atmosphere can significantly reduce the output of a PV concentrator. For non-concentrating devices, there are simple, but perhaps not intuitive, procedures to enhance the output of an array by modifying the surface in front of the array. In this talk some 'environmental' factors to consider in siting PVs will be discussed. Spectral measurements and also models, which can be used in lieu of measurements, to evaluate the solar resource will be suggested.

Biography: **Joseph Michalsky** is a physical scientist at the NOAA Earth System Research Laboratory in Boulder, Colorado. He has over 30 years experience in the field of broadband solar and terrestrial infrared measurements, most of which focus on improving the accuracy of these measurements. He has considerable experience in spectral solar measurements and in the use of these to measure aerosols and their optical properties.

2:30 to 3:00 pm:

Direct Conversion of Solar Energy to Hydrogen

Craig A. Grimes, The Pennsylvania State Univ.

Abstract: Our interest is in the efficient, cost-effective conversion of sunlight to a portable chemical fuel such as hydrogen using materials still plentiful in the earth's crust. With a general overview of the field, we will consider the electrical, material and chemical design issues underlying a successful water photoelectrolysis system. Looking towards a useful commercial system, we will examine membrane-like, self-biased heterojunction photoelectrochemical pn junction diodes comprised of photocorrosion stable metal oxide semiconductors for the solar generation of hydrogen by water splitting.

Biography: **Craig A. Grimes** is currently a Professor of Electrical Engineering at the Pennsylvania State University, University Park, where he is Director of the Center for Solar Nanomaterials. His research interests include the solar production of hydrogen by water photoelectrolysis, organic as well as inorganic heterojunction solar cells, propagation and control of electromagnetic energy, and remote query environmental sensors. He has contributed over 220 archival journal publications (some of which are worth reading), a dozen book chapters, and some twenty patents. He is the founder or co-founder of four different companies. Dr. Grimes is co-author of Light, Water, Hydrogen: The Solar Generation of Hydrogen by Water Photoelectrolysis (Springer).

3:00 to 3:30 pm: Coffee Break

3:30 to 4:00 pm:

Reliability of PV Systems

John H. Wohlgemuth, BP Solar International LLC

Abstract: The reliability of PV modules and systems is critical to the commercial success of Photovoltaics. This Plenary paper will review the present status of PV system reliability using outdoor data from fielded arrays and results from accelerated testing of components.
Total system failures occurring in a short time frame are usually caused by failures of the inverter or BOS. Slow decay of output power over an extended period of time is usually caused by module degradation. Each is important and must be addressed in order to have truly reliable PV systems.

Biography: **Dr. John Wohlgemuth** earned a Ph.D. in Solid State Physics from Rensselear Polytechnic Institute. He has been working at Solarex/BP Solar for more than 30 years, where he is now a Senior Scientist responsible for development of materials used in BP Solar PV modules.

4:00 to 4:30 pm:

Commercializing CPV: What Lies Ahead?

Dave Holland, Solar Systems Pty Ltd. (Australia)

Abstract: Delivering on the great opportunity that CPV presents requires the successful navigation of the whole commercialization process. It involves coordinating the disciplines of science, engineering and commerce with courage, brute strength, patience (and impatience). After 18 years at the task Solar Systems has some views about what is involved and what the impact will be on other solar technologies if success is achieved?

Biography: **Dave Holland** was recruited by Solar Systems in 2000 with the responsibility of commercializing the company's results of 10 years of R&D in CPV systems. He was appointed CEO and a Director a year later. Previously, Dave established (and 8 years later sold) a start up in the IT industry and held sales and management roles with both Australian and international companies in the IT sector.

Solid State Lighting and OLEDs

Convention Center - Room 10
Tuesday 12 August. . . . . .8:30 to 10:00 am

8:30 to 9:15 am:

Why the Developing World is the Perfect Market Place for SSL

Dave Irvine-Halliday, Univ. of Calgary (Canada)

Abstract: Nearly 4 billion people in the developing world have the same basic need for safe, healthy and affordable electric lighting as we in the overdeveloped world.
LUTW, the pioneer and world leader with more than a decade of experience, has proven the universal applicability of Renewable Energy based SSL technology for the Base of the Pyramid.
Using Micro Credit, most families can pay for it within one to two years, and SSL contributes positively to all the UN Millennium Development Goals.
SSL is incredibly valuable for those at the BOP, as it helps to create and redistribute wealth and its benefits are immediate, profound, widespread and permanent!

Biography: **Dr. Dave Irvine-Halliday** was born/educated in Scotland, lived in Australia, settled in Canada (1982) and is "LUTW University Professor" (Calgary).
Fiber Optics and Biophotonics background, founded LUTW (1997) and brought SSL to nearly 20,000 homes, schools, clinics etc. in 42 countries.
Awards include Rolex, Tech Museum, Saatchi & Saatchi, Meritorious Service Medal, Honorary Doctorate.
Lifelong photographer, mountaineer (Everest Expedition 2000) and trail runner.

9:15 to 10:00 am:

The Use of Heavy Metal Complexes in Solid State Light Sources (OLEDs)

Mark E. Thompson, Univ. of Southern California

Abstract: There has been a great deal of interest in developing new materials for the fabrication of light emitting diodes (OLEDs). We have prepared a range of intensely luminescent Ir(III) and Pt(III) complexes, which have found application in both monochromatic and white OLEDs. A great deal of progress has been made with broadband, white emissive OLEDs. I will discuss the chemistry and design of these devices. Highlighting results from our own work and those of others in the field.

Biography: **Dr. Mark E. Thompson** received his B.S. degree in Chemistry in 1980 (U.C. Berkeley) and his Ph.D. in chemistry in 1985 (California Institute of Technology). He spent 2 years in the Inorganic Chemistry laboratory at Oxford University. He took a faculty position at Princeton University in 1987, and moved to the University of Southern California in 1995, where he is currently a Professor of Chemistry and Chair of the Chemistry Department.

Remote Sensing

Convention Center - Room 6A
Tuesday 12 August. . . . . 1:15 to 5:30 pm

1:15 to 2:00 pm:

The Contributions from the NASA Earth Science Decadal Survey Missions in Understanding Global Climate Change

Jason Hyon, Jet Propulsion Lab.

Abstract: The NRC committee has recommended 16 new missions for NASA and NOAA to implement in the next 15 years to improve understanding of Earth system science and to provide benefits to society and decision support applications. I will discuss how these missions with measurements from passive and active optical sensors will improve addressing challenges of the climate change.

Biography: **Jason Hyon** is currently Chief Technologist for JPL Earth Science and Technology Directorate

2:00 to 2:45 pm:

Recovering the Atmospheric Information from the High Resolution Dynamics Limb Sounder (HIRDLS)

John Gille, NCAR and Univ. of Colorado/Boulder

Abstract: The infrared signals emerging from the atmosphere viewed at the horizon, or limb, contain a large amount of information on the structure and composition of the atmosphere. The recovery of this information required the solution of a number of technical and scientific questions. HIRDLS, on NASA's EOS Aura satellite, is the most recent and most advanced of the instruments using this technique, providing unprecedented information on the atmosphere from 8 to 50 km altitude or higher, with finer vertical resolution than previously available. It is a 21 channel limb scanning radiometer whose design incorporates new technology not available to its predecessors, as well as refined solutions to many technical and scientific problems developed for precursor instruments. In this talk, I will review the fundamentals of the technique and outline how the requirements for novel information lead directly to many of the design features.

Perversely, HIRDLS was damaged during the Aura launch, causing a large part of the optical aperture to be obstructed. This has led to a second major effort, to recover the information from the available corrupted signal. Four major new algorithms will be described which were developed to correct the observed radiances. Among the new observations are those showing for the first time retrievals with 1 km vertical resolution at the boundary between the troposphere and the stratosphere, providing unique direct observations of the exchange of trace gases, across the boundary. These are leading to improved understanding of the fundamental underlying processes, important in discussions of Earth's climate and its changes.

Biography: **John Gille** is a Senior Scientist and EOS Program Manager at the National Center for Atmospheric Research, and Adjoint Professor at the University of Colorado, both in Boulder. He received his B.S. (Magna Cum Laude) in Physics at Yale College, his Masters (in Physics) at Cambridge University in the U.K., and Ph.D. in Geophysics at MIT. The latter was based on research done at Harvard on the role of infrared radiation in stabilizing a fluid against convective instability. While on the faculty at the Florida State University, he investigated the application of infrared signals emerging from Earth's limb to the problem of determining spacecraft attitude. This led to the realization that these signals contained important information about the stratosphere and mesosphere not easily available otherwise. He was principal investigator on the first IR limb scanner, the Limb Radiance Inversion Radiometer (LRIR) and its successor, the Limb Infrared Monitor of the Stratosphere (LIMS), which flew on the Nimbus 6 and 7 satellites and provided excellent proof of concept, as well as unique atmospheric information. He was a Collaborative PI on the Cryogenic Limb Array Etalon Spectrometer (CLAES) on the Upper Atmosphere Research Satellite, and is U.S. PI on the Measurement of Pollutants in the Troposphere (MOPITT) experiment on the EOS Terra satellite, as well as U.S. PI of the HIRDLS Experiment, and architect of the recovery algorithms. For his work with LIMS he received the NASA Exceptional Scientific Achievement Medal and the NCAR Technology Advancement Award. His work with MOPITT led to a second NCAR Achievement Award. NASA has also awarded him several Group Achievement Awards. He is a Fellow of the American Geophysical Union, the American Association for the Advancement of Science, and the American Meteorological Society. Dr. Gille has served on numerous advisory bodies, and authored or co-authored more than 170 papers in peer reviewed journals, and made frequent conference presentations.

2:45 to 3:30 pm:

Measurement Science for Climate Remote Sensing

Gerald Fraser, National Institute of Standards and Technology

Abstract: NIST role in supporting our Nation's climate-change research will be described. The assembly of climate-change data records over decadal time scales requires assimilating readings from a large number of optical sensors deployed in space and on the ground by various nations. NIST, in partnership with NASA and NOAA, develops and disseminates standards to ensure that the measurements from these sensors are comparable and tied to international standards based on the SI system of units. Such comparability and SI traceability provides confidence that the small decadal changes in environmental variable attributed to climate change are not an artifact of the measurement system. They also ensure that the measurements are physics based and thus comparable to climate models. Examples of NIST role will be chosen from various ground-based and satellite programs.

Biography: **Dr. Gerald T. Fraser** is Chief of the Optical Technology Division of the Physics Laboratory of the National Institute of Standards and Technology (NIST). He received his Ph.D. degree in Physical Chemistry from Harvard University in 1985 and then accepted a two-year National Research Council Postdoctoral Fellowship at NIST. He has remained at NIST till the present. His research interests have primarily been in molecular spectroscopy, including microwave, millimeter, and submillimeter spectroscopy with applications to atmospheric transmission, plasma diagnostics, chemical agent detection, and remote sensing. He has over 125 publications in peer-reviewed journals. He was elected a Fellow of the American Physical Society in 1998. He is additionally a member of the SPIE, the Optical Society of America, the American Geophysical Union, and the ASTM.

3:30 to 4:00 pm: Coffee Break

Remote Sensing

Continued
Convention Center - Room 6A
Tuesday 12 August. . . . . 1:15 to 5:30 pm

4:00 to 4:45 pm:

Application of MODIS Direct Broadcast System: Fire Detection, Burn Scars, Emission Air Quality Forecasting

Wei Min Hao, U.S.D.A. Forest Service

Abstract: The fire management community requires near real-time information on the spatial and temporal distribution of fire locations and burned area, and downwind pollutant levels to effectively manage wildfires and accurately assess their air quality impact. We have been operating a Direct Broadcast satellite receiving station to retrieve, process, and archive MODIS data in real-time from NASA's Terra and Aqua satellites since 2002. We have developed an automated system to produce four times every day (1) the fire locations with a 1-km x 1-km resolution for most of the North America, and (2) the burned areas with a 500 m x 500 m resolution for the continental U.S. In addition, we have developed a forecast system to predict the atmospheric pollutant concentrations downwind from large fires in the United States twice daily with a horizontal resolution of 22 km x 22 km and 37 vertical layers, using the Weather Research and Forecasting – Chemistry Model. The results are displayed on a web site. We will present the results of fire locations and burned areas in 2007 and the forecast estimates of carbon monoxide, ozone and particulate matter concentrations near major fires in 2007.

Biography: **Dr. Wei Min Hao** is a senior scientist and team leader for fire chemistry research in the Fire, Fuel and Smoke Science Program at the Forest Service's Rocky Mountain Research Station. Prior to joining the Forest Service, he was a research scientist at the Max-Planck-Institut für Chemie, Mainz, Germany. He received a BS degree in chemistry from Fu Jen Catholic University in Taiwan in 1976, two MS degrees in geochemistry and toxicology from Massachusetts Institute of Technology in 1979 and 1981, and a Ph.D. degree in atmospheric chemistry from Harvard University in 1986.

Dr. Hao leads an interdisciplinary team to study the impacts of fires on air quality, atmospheric chemistry, and climate at regional and global scales. The team has conducted extensive field experiments to quantify the emissions of atmospheric pollutants and greenhouse gases from fires in various ecosystems in the United States, Mexico, Canada, central Siberia, Brazil, Chile, Zambia, and South Africa. The group also operates a satellite receiving station to produce fire locations and map burn scars in near real-time and a high-performance Linux cluster computer to forecast air quality downwind from large fires.

He has published over 70 papers as authors or co-authors in scientific journals. He authored a chapter to one of the Intergovernmental Panel on Climate Change (IPCC) reports in 1994. The IPCC was the co-recipient of the 2007 Nobel Peace Prize. He was one of ten recipients for the "Influential Chinese Award in 2007."

4:45 to 5:30 pm:

Infrared Retina Using Nanoscale Quantum Dots and Strain Layer Superlattices

Sanjay Krishna, Univ. of New Mexico

Abstract: One of the aims of the remote sensing user is to be able to acquire a vertically-integrated, spectrally adaptive, multi-modal sensor in staring focal plane array format to accommodate the dynamic sensing requirements dictated by the target scene. Interestingly this functionality is offered in the visible spectrum by the most ubiquitous of all sensors, namely, the human eye, which uses three bands and extremely efficient signal processing to obtain spectral information from a scene. In this talk, I will discuss the concept of an "infrared retina" which consists of an active region with spectrally tailorable functionality. There are a variety of ways to encode information in the sensors using for example, bias sensitive spectrally adaptive quantum dot sensors, tunable filters, plasmonic antenna, photonic crystal etc. In our group, we are researching active regions consisting of nanoscale quantum dots and type II InAs/GaSb strain layer superlattices and this will be used as the basis for the talk. In the future, one could envision encoding polarization, phase and dynamic range in this retina.

Acknowledgements: I wish to acknowledge my collaborators (Dr. Cardimona's group at AFRL, Prof. Perera's group at Georgia State University, Prof. Painter's group at Caltech, Dr. Toni Taylor's group at Los Alamos National Laboratory, Prof. Brueck group at UNM and researchers from ARL) and co-workers (Prof. L.R. Dawson, Prof. A. Stintz, , Dr. S.J. Lee, Dr. T. Vandervelde, Dr. Y.D. Sharma, Dr.E. Plis, H.S. Kim, G.D. Bishop, A. Khoshakhlagh, J. Shao, P. Rotella, D. Ramirez, A. Barve, N.W. Bernstein and R. Shenoi). Work supported by AFRL, ARL, ARO, MDA, DARPA, and NSF.

Biography: **Sanjay Krishna** is an Associate Professor of Electrical and Computer Engineering at the Center for High Technology Materials at University of New Mexico. Sanjay received his Masters in Physics from the Indian Institute of Technology, Madras in 1996, MS in Electrical Engineering in 1999 and PhD in Applied Physics in 2001 from the University of Michigan, Ann Arbor. He joined the University of New Mexico as a tenure track faculty member in 2001. His present research interests include growth, fabrication and characterization of self-assembled quantum dots and type_II InAs/InGaSb based strain layer superlattices for mid infrared detectors. Dr. Krishna received the Gold Medal from IIT, Madras in 1996. He received the best student paper award at the 16th NAMBE Conference in Banff in 1999, the 2002 Ralph E Powe Junior Faculty Award from Oak Ridge Associated Universities, the 2003 IEEE Outstanding Engineering Award, 2004 Outstanding Researcher Award from the ECE Department, the 2005 School of Engineering Junior Faculty Teaching Excellence Award, 2007 NCMR-DIA Chief Scientist Award for Excellence, 2007 NAMBE Young Investigator Award, 2008 IEEE-Nanotechnology Council Early Career Award and the 2008 SPIE Early Career Achievement Award. Dr. Krishna has authored/co-authored more than 70 peer-reviewed journal articles, over 70 conference presentations, two book chapters and has two issued and six pending patents.

Gold Medal

M.J. Soileau is the 2008 Gold Medal of the Society recipient for his outstanding contributions to laser-induced damage research and optics education. He has also been instrumental in photonics commercialization, technology transfer, and other industry initiatives.

M.J. Soileau has led an interesting career of juxtaposition. Focusing much of his research on the damage a laser can inflict, his career has been one of establishing institutions, strengthening education, and creating collaborations.

Now his good work has been recognized with the highest honor that SPIE bestows: the Gold Medal of the Society. The Gold Medal recognizes his "extraordinary dedication and service to optics education, research, and administration, as well as his exceptional contributions in the areas of laser-induced damage to optical materials and nonlinear optical materials and concepts for sensor protecting devices."

Soileau's wide breadth of accomplishment began on one U.S. coast—at the Naval Weapons Center in China Lake, CA—continued through the University of North Texas (Denton, TX) where he was chair of the Center for Applied Quantum Electronics, and on to the University of Central Florida (UCF) in Orlando.

Soileau, a past president of SPIE, became the founding director of the Center for Research and Education in Optics and Lasers (CREOL) at UCF in 1987. He is now the vice president for research and commercialization and a professor of optics, physics, and electrical and computer engineering. CREOL was created by governor's order to develop sustainable non-agricultural, non-tourist-based industry in Florida.

For entire article, see the July 2008 issue of SPIE Professional.

SPIE Award Winners

George W. Goddard Award

John Gille

John Gille of the National Center for Atmospheric Research at the University of Colorado received the 2008 George W. Goddard Award in recognition of his outstanding research and significant accomplishments in building instruments and interpretation of results in the monitoring of the atmosphere, in particular on the High Resolution Dynamics Limb Sounder (HIRDLS). He will give a plenary talk on this subject 12 August at SPIE Optics + Photonics.

Dennis Gabor Award

Leonid Glebov

Leonid Glebov, a research scientist at the University of Central Florida's College of Optics and Photonics, is this year's winner of the SPIE Dennis Gabor Award for outstanding accomplishments in technologies relating to the bending of lightwaves. The award recognizes his discovery and practical implementation of photo-thermo-refractive glass as a new medium for recording high-efficiency volume holographic gratings. Glebov was also honored for his pioneering studies of photo-ionization physics of pure and doped glasses, which enabled the discovery and development of relevant technologies.

Technology Achievement Award

Bahram Javidi

Bahram Javidi, a distinguished professor at the University of Connecticut, received the 2008 SPIE Technology Achievement Award in recognition of his outstanding technical contributions in optical security systems, 3D image recognition, 3D display, 3D visualization, and recognition of biological microorganisms using 3D imaging systems.

A.E. Conrady Award

Adolf Lohmann

Adolf Lohmann, professor emeritus of Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany, has received the 2008 SPIE A.E. Conrady Award in recognition of his invention of the computer-generated hologram, which revolutionized the world of optical testing and design. The Conrady Award is presented to recognize exceptional contributions in design, construction, and testing of optical systems and instrumentation.

Frits Zernike Award in Microlithography

Martin van den Brink

Martin van den Brink, executive vice president of marketing and technology at ASML BV, Netherlands, is the SPIE 2008 Frits Zernike Award winner, in recognition of his pioneering contributions to the advancement of optical lithographic exposure tools. SPIE confers the Frits Zernike Award annually to honor outstanding accomplishments in microlithography, especially those furthering the development of semiconductor lithographic imaging solutions. The award is sponsored by Cymer and ASML.

G.G. Stokes Award

Shin-Tson Wu

Shin-Tson Wu, director of the Liquid Crystal Displays Lab at the University of Central Florida is the winner of this year's SPIE G.G. Stokes Award for his research in liquid crystal displays, adaptive-focus lenses, tunable photonics, and optical polarization. The award is given annually for exceptional contributions to the field of optical polarization. Wu's liquid crystal lens technology has been licensed for use in commercial, military, and medical applications. Wu, an SPIE Fellow, has also been awarded the Jan Rajchman Prize from the Society for Information Display for his contributions to LCD science and technology, especially display device physics, electro-optic effects, and materials.

Ajoy Ghatak

2008 SPIE Educator Award

Ajoy Ghatak is the 2008 SPIE Educator Award recipient in recognition of his unparalleled global contributions to the field of fiber optics research and tireless dedication to optics education worldwide and throughout the developing world.

The SPIE Educator Award is presented annually in recognition of outstanding contributions to optics education by an SPIE instructor or an educator in the field.

Ghatak repeatedly cites the success of the students he has helped as his proudest achievement during his long career in education.

"I always enjoyed teaching, and at the Indian Institute of Technology Delhi (IIT Delhi) we are very fortunate to have very bright students both at the undergraduate level as well as at the graduate level," says Ghatak. "I am very proud of my students, and working with them gave me immense satisfaction."

After receiving his own PhD from Cornell University and doing post-doctoral work at Brookhaven National Laboratory on neutron transport theory from 1963-64, Ghatak returned to India to teach at IIT Delhi. In 1969, he was asked to work in the then emerging area of fiber optics. "From 1970 onwards I got very deeply involved in the study of optics and also in carrying out research work in the general areas of fiber and integrated optics," Ghatak says.

For the next 40 years, Ghatak worked at IIT Delhi and helped mold the Optoelectronics and Fiber Optics Center at the university. He also has been a visiting scientist and professor at universities in the U.S., Brazil, Australia, Singapore, and Germany. He has written or been a co-author on 14 books and more than 170 research papers.

Now retired, Ghatak says, "I was a bit apprehensive as to what I would do after my emeritus professorship ended. In fact, I am now greatly enjoying my freedom."

Sanjay Krishna

2008 SPIE Early Career Achievement Award

Sanjay Krishna, associate professor of electrical and computer engineering at the University of New Mexico, has been given the inaugural SPIE Early Career Achievement Award in recognition of his tremendous contributions to the development of mid-infrared focal plane arrays using self-assembled quantum dots in a well (DWELL) design.

The new SPIE award was established to honor an early career professional for significant and innovative technical contributions to the photonics community.

Krishna's pioneering work with quantum dots in infrared sensing has led to many advances in space-based atmospheric sensing and remote sensing of biological agents. For example, he developed a novel class of midwave infrared detectors based on self-assembled quantum dots using a DWELL structure. This resulted in a revolutionary midwave/longwave detector with bias-dependent responsivity, leading to a new paradigm in spectral sensing.

In collaboration with NASA's Jet Propulsion Laboratory, Krishna's DWELL design led to the demonstration of the first 640 x 512 quantum-dot based camera, a device designed for the high sensitivities needed in spaceborne applications for monitoring atmospheric temperature profiles, relative humidity profiles, and cloud characteristics.

His impressive list of firsts also includes the first two-color quantum dot-based camera, the first longwave infrared quantum dot-based camera, the first quantum dot laser grown on a silicon substrate, and the first intersubband emission from quantum dots.

Krishna, who received his PhD in applied physics from the University of Michigan, Ann Arbor, in 2001, has also made influential contributions to the educational community. He spearheads internship programs at UNM, organizes public seminars, works with area high school students, and serves on several university committees. As an SPIE member, Krishna initiated the SPIE Student Chapter at UNM and serves as the group's faculty adviser.

Krishna's plenary talk at SPIE Optics+Photonics on 12 August is entitled, "Infrared Retina Using Nanoscale Quantum Dots and Strain Layer Superlattices."

For more information on SPIE annual awards, see http://spie.org/awards

72 New SPIE Fellows

SPIE has named 72 new Fellows of the Society this year for making a difference in advancing the science and application of light.

SPIE Fellows are members of distinction who have made significant scientific and technical contributions in the multidisciplinary fields of optics, photonics, and imaging. They are elected for their technical achievements and service to the optics community, and specifically to SPIE.

SPIE is honoring the new Fellows at several events over the course of 2008, inviting the honorees to choose an SPIE symposium or other event where their involvement and technologies are most relevant.

More information: http://spie.org/fellows

Armando Albertazzi Gonçalves Jr.
Universidade Federal de Santa Catarina, Brazil, for specific achievements in optical metrology

R. Rox Anderson
Wellman Center for Photomedicine at Massachusetts General Hospital and Harvard School of Medicine, USA, for specific achievements in laser applications in dermatology and medicine

Christopher P. Ausschnitt
IBM, USA, for specific achievements in metrology and process control for microlithography

Zhenan Bao
Stanford University, USA, for specific achievements in organic and polymer optoelectronics

Jennifer Barton
University of Arizona, USA, for specific achievements in optical coherence tomography and dual modality fluorescence

Michael Berns
University of California/Irvine, USA, for significant contributions in light interactions with cells and tissues

Erik P. Blasch
Air Force Research Laboratory, Wright-Patterson AFB, USA, for specific achievements in information fusion, targeting tracking, automatic target recognition, and robotics

Morley M. Blouke
Ball Aerospace & Technologies Corp., USA, for specific achievements in CCD design for space-based and ground-based astronomy

Allan Boardman
University of Salford, UK, for specific achievements in nonlinear wave propagation and metamaterials

Charles A. Bouman
Purdue University, USA, for specific achievements in electronic and biomedical imaging

Alan C. Bovik
University of Texas at Austin, USA, for specific achievements in image and video processing

Howard E. Brandt
Army Research Laboratory, Adelphi, MD, USA, for specific achievements in quantum information processing, quantum computing, and quantum cryptography

Richard Carreras
Air Force Research Laboratory, Kirtland AFB, USA, for specific achievements in large-aperture high-resolution imaging and beam control technologies

Galina Chebotareva
OpthUS, USA, for specific achievements in laser-tissue diagnostics and nanomaterials development for terahertz electronics and systems

2008 SPIE Fellows

David B. Chenault
Polaris Sensor Technologies, USA, for specific achievements in polarization and polarimetry

Liang-Chy Chien
Kent State University, USA, for specific achievements in liquid crystals for optical and electro-optical applications

Kent D. Choquette
University of Illinois at Urbana-Champaign, USA, for specific achievements in semiconductor vertical cavity surface emitting laser diodes

Larry R. Dalton
University of Washington, USA, for specific achievements in nonlinear and electro-active optical materials and nanotechnology

Peter J. de Groot
Zygo Corp., USA, for specific achievements high-precision interferometric metrology

Elizabeth A. Dobisz
Hitachi Global Storage Technologies, USA, for specific achievements in nanolithography and nanofabrication.

Mircea Dusa
ASML, USA, for specific achievements in microlithography, metrology, and mask technology

Mark A. Ealey
Xinetics Inc., USA, for specific achievements in active mirrors, adaptive optics, and actuator technologies

Pietro Ferraro
CNR-INOA, Italy, for specific achievements in 3D imaging, nanostructures, and devices

Carlos Ferreira
Universitat de València, Spain, for specific achievements in pattern recognition and morphological process

J. Michael Fitzpatrick
Vanderbilt University, USA for specific achievements in image registration in medical imaging

Alan M. Frank
Lawrence Livermore National Laboratory, USA, for specific achievements in high-speed photography and high-powered lasers

Israel Gannot
Tel Aviv University, Israel, and George Washington University, USA, for specific achievements in optical fibers and biomedical optical systems

Thomas A. Germer
National Institute of Science and Technology, USA, for specific achievements in the measurement and theory of optical scattering

Sarath Gunapala
Jet Propulsion Laboratory, USA, for specific achievements in infrared detectors and focal planes

Sen Han
Veeco, USA, for specific achievements in optical metrology and MEMS characterization

2008 SPIE Fellows

Jiang Hsieh
GE Healthcare Technologies, USA, for specific achievements in advanced computed tomography

Allen Hung-Lung Huang
University of Wisconsin-Madison, USA, for specific achievements in remote sensing

Joseph Izatt
Duke University, USA, for specific achievements in optical coherence tomography

Huabei Jiang
University of Florida, USA, for specific achievements in diffuse optical tomography and fluorescence tomography

Kristina M. Johnson
Johns Hopkins University, USA, for specific achievements in optical engineering and optics education

Winfried M. Kaiser
Carl Zeiss SMT AG, Germany, for specific achievements in optical lithography

Bernard Kippelen
Georgia Institute of Technology, USA, for specific achievements in organic optoelectronic applications

Raymond Kostuk
University of Arizona, USA, for specific achievements in holography, imaging, and fiber optics

Keith A. Krapels
Office of Naval Research, Arlington, VA, USA, for specific achievements in electro-optic and infrared imaging systems

Elizabeth A. Krupinski
University of Arizona, USA, for specific achievements in medical image perception and telemedicine

Kazuo Kuroda
University of Tokyo, Japan, for specific achievements in nonlinear optics and photorefractive materials

Gong-Ru Lin
National Taiwan University, Taiwan, for specific achievements in fiber lasers and silicon nanophotonics

Robert Loce
Xerox Corp., USA, for specific achievements in imaging and optics in electronic printing

Yongfeng Lu
University of Nebraska-Lincoln, USA, for specific achievements in nanoscale laser materials processing

Brian A. Lula
Physik Instrumente USA, for specific achievements in nanotechnology and astronomy

Jiebo Luo
Eastman Kodak Company, USA, for specific achievements in electronic imaging and visual communications

2008 SPIE Fellows

Patrick Meyrueis
Université Louis Pasteur, France, for specific achievements in interferometry, diffractive optics, and optical devices

Edward I. Moses
Lawrence Livermore National Laboratory, USA for specific achievements in high-energy lasers

Shinji Okazaki
Hitachi, Ltd, Japan, for specific achievements in optical lithography

Gregory J. Quarles
VLOC Inc., USA, for specific achievements in solid-state laser science and engineering

Sergio R. Restaino
Naval Research Laboratory, Kirtland AFB, USA, for specific achievements in novel adaptive optics for high-resolution imaging

Kathleen Richardson
Clemson University, USA, for specific achievements in optical materials and optics education

William P. Roach
Air Force Research Laboratory, Brooks City Base, TX, USA, for specific achievements in biophotonics, laser safety, and laser bioeffects education

Jannick P. Rolland
University of Central Florida, USA, for specific achievements in optical systems engineering and design

Mubarak Shah
University of Central Florida, USA, for specific achievements in video understanding in machine vision

Joseph A. Shaw
Montana State University, USA, for specific achievements in optical remote sensing technology

Peter Ta Cheng Shih
National Science Council, Taiwan, for specific achievements in promoting photonics and photonics policy in Taiwan

Richard Silver
National Institute of Standards and Technology, USA, for specific achievements in optical dimensional metrology

Narsingh B. Singh
Northrop Grumman Corp., USA, for specific achievements in crystal optics and optical devices

Richard L. Sutherland
Science Applications International Corp., USA for specific achievements in liquid crystal-polymer composites and organic nonlinear optical materials

John S. Taylor
Lawrence Livermore National Laboratory, USA, for specific achievements in optical engineering for reflective extreme ultraviolet optics and assembled systems

Meimei Tidrow
Missile Defense Agency, Washington, DC, USA for specific achievements in electro-optics and infrared sensors

2008 SPIE Fellows

J. Scott Tyo
University of Arizona, USA, for specific achievements in optical and infrared imaging polarimeters

David M. Williamson
Nikon Research Corp. of America, USA, for specific achievements in microlithographic lens design

Melville Ulmer
Northwestern University, USA, for specific achievements in x-ray mirror and space optics

Kexin Xu
Tianjin University, China, for specific achievements in optical engineering and biomedical optics

Wanjun Wang
Louisiana State University, USA, for specific achievements in microfabrication and MEMS/MOEMS

Lianxiang Yang
Oakland University, USA, for specific achievements in optical metrology and nondestructive testing

Yongtian Wang
Beijing Institute of Technology, China, for specific achievements in optical instrumentation and image processing

Paul K.L. Yu
University of California/San Diego, USA for specific achievements in semiconductor optical modulators and analog fiber optic links

Raymond V. Wick
Institute for Defense Analyses, USA, for specific achievements in lasers and optical sensors

Xiang Zhang
University of California/Berkeley, USA, for specific achievements in nanophotonics, optical lithography, and diffractionless imaging ■

Technical Special Events

Illumination Technical Event

Marriott Hotel - Coronado

Monday 11 August . . . . . 8:00 to 10:00 pm

Chair: **R. John Koshel,** Photon Engineering LLC and College of Optical Sciences/The Univ. of Arizona

We will be discussing state-of-the-art displays. Representatives from display companies, both full displays and components used in displays, will present examples of their technology and discuss some of the nuances of their operation. Examples include backlit and projection displays, LED displays, immersive environments, and novel display methods. If you would like to present display technology at this Illumination Technical Event, please contact John Koshel (john.koshel@osa.org) to be included in the schedule. At the end of the planned event, any member of the audience may present information within the broad field of illumination.

Light refreshments will be served.

Lens Design Technical Event

Marriott Hotel - Marina D

Tuesday 12 August. . . . . 8:00 to 10:00 pm

Chairs: **Mary Turner,** Breault Research Organization, Inc.; **Steve Johnston,** Photon Engineering, LLC; **Rich Pfisterer,** Photon Engineering, LLC

"Let's Give 'Em Something to Talk About!"

We are in the process of inviting a panel of experienced, "recognized" professional lens designers to come and talk about...lens design! We want to hear about what they're designing, how they're going about doing it (what materials, software, techniques, etc.), and what problems they're encountering. We want to hear about technical and commercial trends in the marketplace. We want to hear who's making the optics! We want them to give us something to talk about!

Optical Believe It Or Not/Key Lessons Learned Technical Event and Awards Presentation

Marriott Hotel - Marina G

Tuesday 12 August . . . . . 8:00 to 10:00 pm

Chair: **Mark Kahan,** Optical Research Associates

A mini-session with a judging panel evaluating selected 5-minute skits resulting from the Monday/Tuesday Optical Believe It Or Not: Key Lessons Learned conference. An award will be presented to the last presenter standing.

Penetrating Radiation Technical Event

Marriott Hotel - Ballroom

Tuesday 12 August . . . . . 8:00 to 10:00 pm

Chair: **Warrick J. Keman,** Pacific Northwest National Lab.

Special Presentation: Aspects of detector development for neutrinoless double beta decay experiments **Dr. John L. Orrell,** Pacific Northwest National Lab. The event brings together technologists and scientists with interests in neutron, x- and gamma-ray detection, spectroscopy, and imaging for all applications.

Optomechanical/Instrument Technical Event

Marriott Hotel - Mission Hills

Tuesday 12 August . . . . . 8:00 to 10:00 pm

Chair: **Alson E. Hatheway,** Alson E. Hatheway Inc.

This is the annual meeting of the premier group of optomechanical engineers that design and analyze the world's optical instruments and systems. Our feature speaker will be Dr. Jason Spyromilio, head of the European Extremely Large Telescope project office at the European Southern Observatory, who will discuss:

Optomechanical Challenges of the Forty-two Meter European ELT

The 42-m European Extremely Large Telescope is in the detailed design phase. Planned for a construction start in 2010 it will be the biggest astronomical telescope ever built and with a projected construction budget of 1.2 Billion US$ one of the most expensive scientific projects on the horizon. The 948 primary mirror segments combined with a novel optical train including a 2.5-m adaptive deformable mirror built into the telescope, it will excel in image quality and deliver unparalleled performance to its users. The presentation shall detail the current stage of the design and discuss the challenges posed by a telescope with more than 1000-m2 of collecting area and in particular areas where industrial developments are needed or would be greatly beneficial.

This gathering is open to all attendants to the Optics and Photonics Symposium. Anyone who wishes to put an item on the agenda should contact the Chair [Al Hatheway: aeh@aehinc.com]. One agenda item will certainly be the advance planning of our biennial conference on Optomechanics for next year's (2009) Optics and Photonics symposium.

Following the speakers and other agenda items the floor will be open for our traditional 'Problems and Solutions Workshop' session so bring some challenges before the group.

Panel Discussion:

Life in the Cosmos

Marriott Hotel - Marina F

Tuesday 12 August . . . . . 8:00 to 10:00 pm

Panel Moderators: **Richard Hoover,** NASA Marshall Space Flight Ctr. and **Jack Farmer,** Arizona State Univ.

Panelists: **Michael H. Engel,** Univ. of Oklahoma; **E. J. Gibson,** Jr., NASA Johnson Space Ctr.; **Alexei Yu. Rozanov,** Paleontological Institute (Russia); **Michael C. Storrie-Lombardi,** Kinohi Institute; **Nalin Chandra Wickramasinghe,** Cardiff Univ. (United Kingdom)

Liquid water is essential to all life forms known on Earth. Astrobiologists have adopted the mantra "Follow the Water" as a guide to where they should search for evidence of life in the Cosmos. The European Space Agency's Mars Express Spacecraft has found evidence for a frozen lake and sea on Mars. The Mars Advanced Radar for Subsurface and Ionospheric Sounding (MARSIS) probe has discovered a 1000 km diameter giant dome mainly composed of water ice on the South Polar region. The volume of water in this deposit was estimated to be 1.6 million cubic kilometers, enough to cover the entire planet in a global water layer 11 meters thick. The NASA/ESA/Italian Space Agency Cassini Spacecraft has provided dramatic images of water geysers erupting from regions near the South Pole of Saturn's tiny moon Enceladus. In addition to plumes of water vapor, the geysers contain methane, carbon dioxide and organics. The high temperatures observed, the water vapor and large number of ice particles expelled suggest that a liquid water lake may exist beneath the "tiger stripe" ice cracks of Enceladus.

Changes in the spin rate of Saturn's moon Titan indicate that it may also harbor a 300 km thick liquid water ocean beneath its icy crust. NASA Deep Impact probe has shown that the nucleus of comet Temple 1 is much hotter than previously thought and that geyser-like jets frequently erupt from the surface spewing water vapor, dust, and portions of the black crust into space. A spectrometer on the spacecraft detected a mixture of clay and carbonate minerals (that form in the presence of liquid water) streaming off the comet after the collision with the 370 kg impactor. These observations combined with new knowledge about the ability of microbial extremophiles to thrive in the Antarctic ice and permafrost suggest that Life may be far more widely distributed in the Cosmos than previously thought possible. This Panel will review recent discoveries and provide their own insights into these intriguing questions. The audience will be encouraged to participate in a question and answer session with the Panelists.

Special Session on

Nonlinear Optical Polymers: In Recognition of the Contributions Made by Prof. Larry Dalton

Convention Center - Room 6A

Wednesday 13 August . . . . . 8:30 am to 3:20 pm

Larry Dalton, Univ. of Washington

This special session will highlight state-of-the-art research in nonlinear optic polymer electro-optic modulator materials and devices presented by the leading researchers in the field and their collaborations with Professor Larry Dalton.

Invited speakers include:

William Steier, Univ. of Southern California

Tobin Marks, Northwestern Univ.

Nasser Peyghambarian, College of Optical Sciences/The Univ. of Arizona

Harold Fetterman, Univ. of California/Los Angeles

Seth Marder, Georgia Institute of Technology

Devanand Shenoy, DARPA

Rebecca Taylor, Lockheed Martin Corp.

Alex Jen, Univ. of Washington

Workshop: Focus on X-ray Focusing

Room: Conv. Ctr. 4

Wednesday 13 August . . . . . 8:10 am to 5:30 pm

This one-day workshop is devoted to X-ray micro- and nano-focusing techniques, optics, and applications. Various techniques are described by some of the renowned practitioners, and challenges, limitations, and prospects are discussed. The workshop should provide the audience with a comprehensive introduction and up-to-date information on various focusing techniques including theory, development, implementation, and recent applications

Workshop: Focus on X-ray Focusing

Room: Conv. Ctr. 4

Wednesday 13 August . . . . . .8:10 to 8:15 am

Opening Remarks: **Ali Khounsary,** Argonne National Lab.

Workshop Session 1

Session Chair: **Ali M. Khounsary,** Argonne National Lab. (United States)

Room: Conv. Ctr. 4

Wednesday 13 August . . . . . 8:10 to 10:15 am

8:15 am: **Introduction to x-ray focusing,** S. K. Sinha, Univ. of California, San Diego [7077-77]

8:55 am: **X-ray focusing with Kirkpatrick-Baez optics,** K. Yamauchi, Osaka Univ. (Japan) [7077-75]

9:35 am: **Hard x-ray focusing with curved reflective multilayers** *(Presentation Only),* C. Morawe, European Synchrotron Radiation Facility (France) [7077-73]

10:15 am: Refreshment Break

Workshop Session 2

Session Chair: **Christian Morawe,** European Synchrotron Radiation Facility (France)

Room: Conv. Ctr. 4

Wednesday 13 August . . . . . .10:30 to 11:50 am

10:30 am: **Refractive x-ray lenses for hard x-ray microscopy,** C. G. Schroer, Technische Univ. Dresden (Germany) [7077-70]

11:10 am: **Kinoform x-ray lens arrays,** W. H. Jark, Sincrotrone Trieste (Italy) [7077-69]

11:50 am: Lunch/Exhibition Break

Workshop Session 3

Session Chair: **Shunji Goto,** Japan Synchrotron Radiation Research Institute (Japan)

Room: Conv. Ctr. 4

Wednesday 13 August . . . . . 1:30 to 3:30 pm

1:30 pm: **Monocapillary optics,** L. Pina, Czech Technical Univ. (Czech Republic) [7077-71]

2:10 pm: **X-ray focusing with polycapillary optics,** C. A. MacDonald, SUNY, Univ. at Albany [7077-72]

2:50 pm: **Focusing of x-rays using crystal optics,** E. Förster, Friedrich-Schiller-Univ. Jena (Germany) [7077-76]

3:30 pm: Refreshment Break

Workshop Session 4

Session Chair: **Werner H. Jark,** Sincrotrone Trieste (Italy)

Room: Conv. Ctr. 4

Wednesday 13 August . . . . . 3:45 to 5:05 pm

3:45 pm: **Multilayer Laue Lens for efficient nanometer focusing of hard x-rays,** G. B. Stephenson, Argonne National Lab. [7077-68]

4:25 pm: **Diffractive focusing by zone plates,** M. Feser, Xradia, Inc. [7077-74]

Workshop Discussion and Conclusion

Room: Conv. Ctr. 4

Wednesday 13 August . . . . . 5:05 to 5:30 pm

Prospects for Organics PV Panel

Marriott Hotel - Santa Rosa

Wednesday 13 August . . . . . 5:30 to 7:00 pm

Events for Students

Student Chapter Leadership Workshop

Saturday 9 August . . . . . 8:00 am to 4:00 pm

Event by Invitation Only

Join us for engaging speakers, professional development opportunities, and a chance to connect with Student Chapter Leaders from around the world! Collaborate with your peers, find new colleagues, and learn how to get the most from your Student Chapter involvement. You'll also learn the nuts and bolts of SPIE Student Membership Benefits such as Student Chapter funding, scholarships, travel grants, and visiting lecturers.

Please e-mail students@spie.org for more information.

Professional Skills Workshop

Marriott Hotel - Multiple Rooms

Sunday 10 August . . . . . 9:00 am to 12:30 pm

Open to all Students and Early Career Professionals

Join us for an exciting keynote discussion and break-out sessions focusing on education and professional skills development. Come ready to share your thoughts and ideas!

Panel Discussion

Marriott Hotel - Marina F

Sunday 10 August . . . . . .9:00 to 10:30 am

Gain valuable insight into careers in optics and photonics at this panel discussion featuring representatives from academia industry and government.

Professional Development

Marriott Hotel - Coronado

Sunday 10 August . . . . . 10:45 am to 12:20 pm

Science Education

Marriott Hotel - Cardiff

Sunday 10 August . . . . . 10:45 am to 12:20 pm

Keynote Luncheon

Marriott Hotel – Marina G

Sunday 10 August . . . . . 12:30 to 1:30 pm

Open to all Students and Early Career Professionals

The morning's workshops conclude with lunch and a talk by Dr. Eugene Arthurs, SPIE CEO Director.

"No Ties" Student Social

Marriott Hotel - South Poolside

Sunday 10 August . . . . . 7:30 to 9:00 pm

Relax and hang out with new friends and peers while enjoying the warm weather and a west coast sunset. No ties required but please bring photo ID for bar service.

Lunch with the Experts – A Student Networking Event

Monday 11 August . . . . . 12:30 to 1:30 pm

Advance Sign-up by 10:00 am Monday in the Marketplace Required. Seating Limited.

Enjoy a casual meal with colleagues at this engaging networking opportunity. This event features experts willing to share their experience and wisdom on career paths in optics and photonics and an awards presentation for Newport Spectra-Physics travel grant winners. Lunch is complimentary to all students.

Newport and Spectra-Physics Research Excellence Travel Awards

Event co-located with Lunch with the Experts.

The Newport Spectra-Physics Research Excellence Travel Awards Program provides financial support for university students to attend the two largest SPIE meetings in order to present their research. These travel grants are open to any student who has an accepted paper for presentation at Photonics West or Optics + Photonics. Recipients will be selected based on both the quality of the original research described in the submitted paper(s) and financial need.

For application information for this and other SPIE travel grants visit Scholarships and Grants online at spie.org/scholarships.

Women in Optics Presentation and Reception: Who is Science Writing For?

Convention Center - Room 13

Monday 11 August . . . . . 5:00 to 6:00 pm

Noted science writer Margaret Wertheim will discuss the issue of public science communication, from the perspective of the public, and how to pursue new strategies to engage a more diverse and wide-ranging audience.

SPIE Scholarship and Outreach Grant Winners Reception

Convention Center - Hall B1

Tuesday 12 August. . . . . 3:00 to 4:00 pm

This year SPIE will be awarding more than $300,000 in scholarships and grants to recipients around the world. Winners of the 2008 SPIE Scholarships and Outreach Grants will be honored at this reception. All students and scholarship and outreach grant winners are invited to attend.

Student Chapter Exhibits

Convention Center - Hall B1

Tuesday to Thursday . . . . . Exhibition Hours

Explore the possibilities in optics and photonics across the globe. Discover the research of some of SPIE's brightest student groups and the programs they have developed to increase science awareness and literacy in their regions.

Student Chapter Exhibit Mixer

Convention Center - Hall B1

Tuesday 12 August. . . . . 4:00 to 5:00 pm

Exhibitors, join us for a late-afternoon mixer in the Student Chapter section of the exhibition hall. Meet our amazing students and learn about the innovative activities of some of the best and brightest Chapters across the globe!

Panel Discussion:

Getting Hired in 2008 and Beyond

Convention Center - Hall B1

Tuesday 12 August. . . . . 5:00 to 6:00 pm

Learn about the corporate hiring process directly from human resource professionals in the optics and photonics sector.

Participants include:

Mr. Bob Slusher, Manager, Optics & Detectors Engineering, Ball Aerospace and Technologies Corp.

Ms. Samhita Dasgupta, Manager, Device Integration Lab., GE Global Research

Mr. Dave Gentes, Recruiting Manager, MIT Lincoln Laboratory

Mr. Randy Heyler, Sr. Director, Strategic Marketing, Newport Corp.

SPIEWorks Career Fair

Convention Center - Hall A

Tuesday 12 August. . . . . 11:00 am to 3:00 pm
Wednesday 13 August . . . . . 11:00 am to 3:00 pm

Whether you are looking for a better job, re-entering the workforce or just starting your career, this career fair is a great place to start!

- Meeting directly with recruiters from top employers
- Learn more about employment opportunities
- Search job postings
- Interview for positions

Post your resume online today at SPIEWorks.com! Remember to sign back in before the event to indicate your plans to attend (employers have access to the resume database two weeks before the career fair and may use this information to schedule interviews in advance).

SPIE Student Lounge

Convention Center - Hall B1

Tuesday to Thursday, Exhibition Hours

Meet fellow students and members of the SPIE Lounge, our very own Facebook Group. Relax on the couches and enjoy the company of colleagues in this real-space version of our virtual community!

Early Career Networking Social

Marriott Hotel - South Poolside

Sunday 10 August . . . . . 5:30 to 7:00 pm

Open to all Early Career Professionals.

Enjoy a casual outdoor networking event while getting connected with the larger optics and photonics community. Distinguished guests include technical experts and members of the SPIE Board of Directors.

Hands-On Optics: Making an Impact with Light (HOO): Terrific Telescopes Workshop

WS852

Course Level: Introductory
CEU: .20 $20/$25 USD
Sunday 10 August . . . . . 1:30 to 4:30 pm

This workshop will train attendees on the use of Terrific Telescopes, a hands-on activity kit intended to engage and enrich the math/science learning experience for students in the middle grades. It was developed as part of HOO, a four year program funded by a $1.7 million dollar grant from the U.S. National Science Foundation (NSF) to design and implement a science enrichment program for children ages 11 to 14 years old.

Intended Audience

Optics professionals, university students, and pre-college teachers.

Instructor

Celeste Baine runs the popular website EngineerInYou.com where she promotes science and engineering learning for all ages. Before discovering her passion for teaching, she earned her Bachelors in Electrical Engineering Technology, worked in the Silicon Valley, and later became a Biomedical Engineer. In 2003, she returned to school for her Masters of Education. Celeste has given keynotes or presentations at more than 20 well known government, academic, and industry locations and received numerous awards for her work.

Effective Technical Presentations

WS897

Course level: Introductory
CEU .35 $75/$125 USD

FREE to Student Members

Monday 11 August . . . . . 8:30 am to 12:30 pm

Oral presentation skills are a key to success for researchers. This course proposes a five-step methodology that will take you from scratch to an effective technical presentation. It also offers tips on how to manage the nervousness associated with speaking in public.

Intended Audience

This material is intended for anyone who must prepare and deliver oral presentations. Both novice and experienced speakers can expect to learn much from it.

Instructor

Jean-luc Doumont runs lectures, workshops, and training programs in oral, written, and graphical communication for engineers, scientists, and managers worldwide. He is an engineer from the University of Louvain and a doctor in applied physics from Stanford University. This course is based on his lectures and workshops on scientific and technical writing at universities and research centers around the world (MIT, Shell, Johnson & Johnson, etc.).

Effective Scientific Papers

WS908

Course level: Introductory
CEU .35 $75/$125 USD

FREE to Student Members

Monday 11 August . . . . . 1:30 to 5:30 pm

Strong writing skills are a key to success for researchers. This course proposes a methodology that will take you from scratch to an effective scientific or technical document—a question of structure, not style. The approach is applicable across languages and for a wide range of document types beyond scientific papers, too.

Intended Audience

This material is intended for anyone who must write or edit technical documents in general and scientific papers in particular. Both novice and experienced writers can expect to learn much from it.

Instructor

Jean-luc Doumont runs lectures, workshops, and training programs in oral, written, and graphical communication for engineers, scientists, and managers worldwide. He is an engineer from the University of Louvain and a doctor in applied physics from Stanford University. This course is based on his lectures and workshops on scientific and technical writing at universities and research centers around the world (MIT, Shell, Johnson & Johnson, etc.).

Strategies for Professional Conference Presentations

WS666
Course Level: Introductory
CEU .20 $50/$100 USD
Tuesday 12 August. . . . . 1:30 to 3:30 pm

FREE to Student Members

The importance of communicating ideas and information in the technical community remains very high. In this workshop, a number of different facets of planning and delivery of conference presentations and posters will be discussed. Most notably, the workshop discusses strategies for conference presentation submission, goes through important facets of the delivery of the conference talk, and concludes with discussing following-through with people in the audience. The important topic of specific slide design is covered in other SPIE offerings and is only briefly mentioned in this workshop.

Intended Audience

This material is intended for both experienced and novice conference presenters who are seeking to improve the quality and impact of their technical conference presentations.

Instructor

Richard N. Youngworth Ph.D. has over a decade of experience spanning numerous facets of the optics field including optical metrology, design, manufacturing, and analysis. Since receiving his Ph.D. in Optics from the University of Rochester, he has researched and specialized in producibility and tolerance analysis of optical components and systems for Eastman Kodak, Ball Aerospace, and his current position at Light Capture, Inc. He teaches a SPIE technical course on Cost-Conscious Tolerancing of Optical Systems, is an active SPIE program committee and chair member, and has authored and delivered numerous papers, talks, and lectures on optical design and engineering while developing a reputation as an engaging and effective presenter.

Becoming an Optical Engineering Consultant

WS914
Course level: Introductory
CEU .35 $265/$315 USD
Tuesday 12 August. . . . . 1:30 to 5:30 pm

50% off for Students

This course will review all of the benefits and challenges of a consulting career in optics. Each attendee will be given the opportunity to self-evaluate based on their engineering and business strengths. Topics such as how to set up your business, sole-proprietorships vs. incorporation, determining fees, marketing, legal issues with clients, balancing family and work, invoicing, managing finances, websites, success evaluation, and taxes will be covered.

Intended Audience

Anyone from student to seasoned engineer who has been thinking about working for themselves as a consultant.

Instructor

Jennifer D. T. Kruschwitz has been an active optical coating design engineer for 20 years, 10 of which as an independent consultant for her firm, JK Consulting. She received both her Bachelors and Masters degrees in Optics from the University of Rochester. She has authored over a dozen peer-reviewed papers and presentations in the field of optical coatings, as well as several magazine articles dealing with business and consulting in optics. Concurrently she is an Adjunct Assistant Professor at the University of Rochester's Institute of Optics teaching optical coatings and professional topics in optics.

Optimizing Your Resume

WS777
Course level: Introductory
CEU .20 $50/$100 USD
Wednesday 13 August . . . . . 1:30 to 3:30 pm

FREE to Student Members

Today's job market pits you against hundreds, if not thousands, of candidates who have approximately the same credentials as you do. How do you stand out in the crowd? This workshop, which concentrates on students and recent graduates, will review a number of strategies, tips, and tools that you can use to increase the impact of your resume and cover letter. We'll examine ways to translate your educational experience into a format that is attractive to potential employers, and how to create tailored versions of your job search materials for multiple targets. The process of creating your resume will be discussed, with a focus on both layout/formatting and writing style. We'll also look at cover letters, lists of references, and other materials used in your job search.

Intended Audience

This material is intended primarily for students, recent graduates, and early-career professionals who want to improve the quality and effectiveness of their job search materials.

Instructor

John Cain is a former professional resume writer, and has written more than 500 resumes and cover letters for multiple industries and professions, focusing primarily on technical fields. He currently develops technical education programs for SPIE.

Essential Skills for Engineering Project Leaders

WS846
Course level: Introductory
CEU .35 $265/$315 USD
Wednesday 13 August . . . . . 8:30 to 12:30 pm

50% off for Students

This workshop teaches skills needed to lead technical projects, drive innovation, and influence others. Attendees learn the difference between leadership and management, and how to develop specific leadership skills that are important to technical professionals who lead projects or need assistance from others to get things done. Participants engage in exercises that assess their individual leadership abilities and provide guidance for further skill development.

Intended Audience

This material is intended for early-career technical professionals who can benefit from improving leadership skills.

Instructor

Gary C. Hinkle is President and founder of Auxilium, Inc. His experience includes a broad variety of management and staff assignments with small, medium, and large companies involved in the development and manufacturing of high-tech products. Gary led several high-profile projects including the development of a U.S. Army vehicle maintenance system, and he directed the development of 9-1-1 systems used in the majority of Public Safety Answering Points in the U.S. He also served as engineering manager for the world's best selling oscilloscope product line at Tektronix. His design and management experience spans the electronics, mechanical and software engineering disciplines.

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- Earn CEUs without additional travel

spie.org/education

Register for Courses at the SPIE Cashier!

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday
Advanced Metrology					
SC020 **Optical Scattering: Measurement and Analysis** *(Stover)* 8:30 am to 12:30 pm, $370 / $420		SC017 **Principles of Fourier Optics and Diffraction** *(Gaskill)* 8:30 am to 5:30 pm, $625 / $725	SC850 **Metrology for Modern Optical Manufacturing** *(Murphy)* 8:30 am to 12:30 pm, $315 / $365		
SC213 **Introduction to Interferometric Optical Testing** *(Wyant)* 1:30 to 5:30 pm, $315 / $365			SC211 **Practical Interferometry and Fringe Analysis** *(Creath)* 1:30 to 5:30 pm, $315 / $365		
SC492 **Predicting, Modeling, and Interpreting Light Scattered by Surfaces** *(Germer)* 1:30 to 5:30 pm, $315 / $365					
Atmospheric and Space Optical Systems					
	NEW SC916 **Digital Camera and Sensor Evaluation Using Photon Transfer** *(Janesick)* 8:30 am to 12:30 pm, $415 / $415	**NEW** SC915 **Radiometry Revealed** *(Shaw)* 8:30 am to 12:30 pm, $315 / $365	SC561 **Optomechanics for Space Applications** *(Shipley)* 8:30 am to 5:30 pm, $520 / $620		
	SC188 **Laser Beam Propagation for Applications in Laser Communications, Laser Radar, and Active Imaging** *(Phillips, Andrews)* 8:30 am to 5:30 pm, $640 / $740	SC567 **Introduction to Optical Remote Sensing Systems** *(Shaw)* 1:30 to 5:30 pm $315 / $365			
Detectors and Imaging Devices					
SC068 **Use of CCD and CMOS Sensors in Visible Imaging Applications** *(Lomheim)* 1:30 to 5:30 pm, $315 / $365	**NEW** SC916 **Digital Camera and Sensor Evaluation Using Photon Transfer** *(Janesick)* 8:30 am to 12:30 pm, $365 / $415	SC504 **Introduction to CCD and CMOS Imaging Sensors and Applications** *(Janesick)* 8:30 am to 5:30 pm, $640 / $740			
	SC194 **Multispectral and Hyperspectral Image Sensors** *(Lomheim)* 1:30 to 5:30 pm, $315 / $365	SC567 **Introduction to Optical Remote Sensing Systems** *(Shaw)* 1:30 to 5:30 pm $315 / $365			
Illumination Engineering					
SC490 **Solid State Lighting I** *(Ferguson)* 1:30 to 5:30 pm, $315 / $365	SC388 **Non-Imaging Optics** *(Winston)* 8:30 am to 12:30 pm, $315 / $365	**NEW** SC915 **Radiometry Revealed** *(Shaw)* 8:30 am to 12:30 pm, $315 / $365	SC657 **Accurate Measurement of LED Optical Properties** *(Tirpak)* 1:30 to 5:30 pm, $315 / $365		
	SC011 **Design of Efficient Illumination Systems** *(Cassarly)* 1:30 to 5:30 pm, $315 / $365				
Image and Signal Processing					
	NEW SC916 **Digital Camera and Sensor Evaluation Using Photon Transfer** *(Janesick)* 8:30 am to 12:30 pm, $365 / $415	SC661 **Advanced Image Processing and Applications** *(Iftekharuddin)* 8:30 am to 5:30 pm, $520 / $620	SC608 **Photonic Crystals: A Crash Course, from Bandgaps to Fibers** *(Johnson)* 8:30 am to 12:30 pm, $360 / $410		
	SC766 **Information Processing for Video Surveillance** *(Ebrahimi, Dufaux)* 8:30 am to 5:30 pm, $520 / $620	SC017 **Principles of Fourier Optics and Diffraction** *(Gaskill)* 8:30 am to 5:30 pm, $625 / $725			
	NEW SC913 **Multivariate Analysis of Optical and Imaging Data** *(Bajorski)* 8:30 am to 5:30 pm, $520 / $620				

Legend for Education Products:

Price = SPIE Member / Non-Member

SC000 = Course Number

WS000 = Workshop Number

Courses

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday
NanoEngineering					
	SC496 **Fabrication and Processing of Nanostructures** *(Cao)* 8:30 am to 5:30 pm, $560 / $660	SC655 **Introduction to Optical Tweezers and Optical Micromanipulation** *(Dholakia, Spalding)* 6:00 to 10:00 pm, $315 / $365	WS851 **Nanotechnology: Science & Applications** *(Brahmbhatt)* 8:30 am to 5:30 pm, $520 / $620		
NanoScience					
SC497 **Nanophotonics** *(Prasad)* 1:30 to 5:30 pm, $315 / $365			SC608 **Photonic Crystals: A Crash Course, from Bandgaps to Fibers** *(Johnson)* 8:30 am to 12:30 pm, $360 / $410	SC727 **Nanoplasmonics** *(Stockman)* 8:30 am to 5:30 pm, $520 / $620	
Optical Design					
NEW SC912 **Intermediate Lens Design** *(Bentley)* 8:30 am to 5:30 pm, $605 / $705	SC010 **Introduction to Optical Alignment Techniques** *(Ruda)* 8:30 am to 5:30 pm, $950 / $1185		SC552 **Aspheric Optics: Design, Fabrication, and Test** *(Fischer)* 8:30 am to 12:30 pm, $400 / $450		
SC020 **Optical Scattering: Measurement and Analysis** *(Stover)* 8:30 am to 12:30 pm, $370 / $420	**NEW** SC911 **Optical Layout and Analysis Using the Matrix Approach** *(Kloos)* 8:30 am to 5:30 pm, $565 / $665	SC156 **Basic Optics for Engineers** *(Ducharme)* 8:30 am to 5:30 pm, $555 / $655	SC206 **Polarized Light: A Practical Hands-on Introduction** *(Fisher)* 8:30 am to 5:30 pm, $520 / $620		
SC001 **Optical System Design: Layout Principles and Practice** *(Greivenkamp)* 8:30 am to 5:30 pm, $600 / $700	SC384 **The Design of Plastic Optical Systems** *(Schaub)* 8:30 am to 12:30 pm, $315 / $365	SC017 **Principles of Fourier Optics and Diffraction** *(Gaskill)* 8:30 am to 5:30 pm, $625 / $725	WS609 **Basic Optics for Non-Optics Personnel** *(Harding)* 1:30 to 4:00 pm, $100 / $150		
SC003 **Practical Optical System Design - EXPANDED 2-Day Format** *(Fischer)* 8:30 am to 5:30 pm, $985 / $1270					
SC792 **Polarization in Optical Design** *(Chipman)* 1:30 to 5:30 pm, $315 / $365					
SC492 **Predicting, Modeling, and Interpreting Light Scattered by Surfaces** *(Germer)* 1:30 to 5:30 pm, $315 / $365					
NEW SC921 **Physical Optics - A Hands-on Approach** *(Milster)* 1:30 to 5:30 pm, $340 / $390					
Optical Manufacturing and Testing					
SC213 **Introduction to Interferometric Optical Testing** *(Wyant)* 1:30 to 5:30 pm, $315 / $365	SC384 **The Design of Plastic Optical Systems** *(Schaub)* 8:30 am to 12:30 pm, $315 / $365	SC321 **Thin Film Optical Coatings** *(Macleod)* 8:30 am to 5:30 pm, $520 / $620	SC552 **Aspheric Optics: Design, Fabrication, and Test** *(Fischer)* 8:30 am to 12:30 pm, $400 / $450		
			SC850 **Metrology for Modern Optical Manufacturing** *(Murphy)* 8:30 am to 12:30 pm, $315 / $365		
			SC211 **Practical Interferometry and Fringe Analysis** *(Creath)* 1:30 to 5:30 pm, $315 / $365		
			SC657 **Accurate Measurement of LED Optical Properties** *(Tirpak)* 1:30 to 5:30 pm, $315 / $365		

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Sunday	Monday	Tuesday	Wednesday	Thursday	Friday

Optical Systems Engineering

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday
NEW SC912 **Intermediate Lens Design** *(Bentley)* 8:30 am to 5:30 pm, $605 / $705	SC835 **Infrared Systems - Technology & Design** *(Daniels)* 8:30 am to 5:30 pm/8:30 am to 12:30 pm, $990 / $1140		SC725 **Optical & Laser Scanning Technology: Devices, Systems & Applications** *(Marshall)* 8:30 am to 5:30 pm, $520 / $620		
SC020 **Optical Scattering: Measurement and Analysis** *(Stover)* 8:30 am to 12:30 pm, $370 / $420	SC010 **Introduction to Optical Alignment Techniques** *(Ruda)* 8:30 am to 5:30 pm, $950 / $1185				
SC001 **Optical System Design: Layout Principles and Practice** *(Greivenkamp)* 8:30 am to 5:30 pm, $600 / $700	SC384 **The Design of Plastic Optical Systems** *(Schaub)* 8:30 am to 12:30 pm, $315 / $365	SC156 **Basic Optics for Engineers** *(Ducharme)* 8:30 am to 5:30 pm, $555 / $655			
		SC017 **Principles of Fourier Optics and Diffraction** *(Gaskill)* 8:30 am to 5:30 pm, $625 / $725			
SC003 **Practical Optical System Design - EXPANDED 2-Day Format** *(Fischer)* 8:30 am to 5:30 pm, $1035 / $1270		**NEW** SC915 **Radiometry Revealed** *(Shaw)* 8:30 am to 12:30 pm, $315 / $365			
SC325 **An Introduction to Lasers** *(Fisher)* 1:30 to 5:30 pm, $315 / $365					
SC792 **Polarization in Optical Design** *(Chipman)* 1:30 to 5:30 pm, $315 / $365					
SC492 **Predicting, Modeling, and Interpreting Light Scattered by Surfaces** *(Germer)* 1:30 to 5:30 pm, $315 / $365					
NEW SC921 **Physical Optics - A Hands-on Approach** *(Milster)* 1:30 to 5:30 pm, $340 / $390					

Optomechanics

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday
	SC010 **Introduction to Optical Alignment Techniques** *(Ruda)* 8:30 am to 5:30 pm, $950 / $1185		SC561 **Optomechanics for Space Applications** *(Shipley)* 8:30 am to 5:30 pm, $520 / $620		
	SC014 **Introduction to Optomechanical Design** *(Vukobratovich)* 8:30 am to 5:30 pm, $950 / $1185		SC013 **Precision Mounting of Optical Components** *(Yoder, Jr.)* 8:30 am to 5:30 pm, $605 / $705		
		SC219 **Materials: Properties and Fabrication for Stable Optical Systems** *(Paquin)* 8:30 am to 5:30 pm, $520 / $620			
		SC015 **Structural Adhesives for Optical Bonding** *(Daly)* 8:30 am to 12:30 pm, $315 / $365			

Organic Photonics and Electronics

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday
SC490 **Solid State Lighting I** *(Ferguson)* 1:30 to 5:30 pm, $315 / $365		**NEW** SC915 **Radiometry Revealed** *(Shaw)* 8:30 am to 12:30 pm, $315 / $365	SC790 **Liquid Crystals: From Fundamentals to Applications** *(Smalyukh)* 8:30 am to 5:30 pm, $520 / $620		
		SC797 **The Science and Technology of Organic Solar Cells** *(Peumans)* 8:30 am to 12:30 pm, $315 / $375			

Photonic Devices

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday
SC490 **Solid State Lighting I** *(Ferguson)* 1:30 to 5:30 pm, $315 / $365			SC608 **Photonic Crystals: A Crash Course, from Bandgaps to Fibers** *(Johnson)* 8:30 am to 12:30 pm, $360 / $410		
			SC657 **Accurate Measurement of LED Optical Properties** *(Tirpak)* 1:30 to 5:30 pm, $315 / $365		

Courses

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday
Remote Sensing					
SC068 **Use of CCD and CMOS Sensors in Visible Imaging Applications** *(Lomheim)* 1:30 to 5:30 pm, $315 / $365	SC835 **Infrared Systems - Technology & Design** *(Daniels)* 8:30 am to 5:30 pm/8:30 am to 12:30 pm, $990 / $1140 **NEW** SC916 **Digital Camera and Sensor Evaluation Using Photon Transfer** *(Janesick)* 8:30 am to 12:30 pm, $365 / $415 SC188 **Laser Beam Propagation for Applications in Laser Communications, Laser Radar, and Active Imaging** *(Phillips, Andrews)* 8:30 am to 5:30 pm, $640 / $740 SC194 **Multispectral and Hyperspectral Image Sensors** *(Lomheim)* 1:30 to 5:30 pm, $315 / $365	SC156 **Basic Optics for Engineers** *(Ducharme)* 8:30 am to 5:30 pm, $555 / $655 SC504 **Introduction to CCD and CMOS Imaging Sensors and Applications** *(Janesick)* 8:30 am to 5:30 pm, $640 / $740 **NEW** SC915 **Radiometry Revealed** *(Shaw)* 8:30 am to 12:30 pm, $315 / $365 SC567 **Introduction to Optical Remote Sensing Systems** *(Shaw)* 1:30 to 5:30 pm $315 / $365	SC561 **Optomechanics for Space Applications** (Shipley) 8:30 am to 5:30 pm, $520 / $620 SC206 **Polarized Light: A Practical Hands-on Introduction** *(Fisher)* 8:30 am to 5:30 pm, $520 / $620		
Solar Energy+Applications					
	SC388 **Non-Imaging Optics** *(Winston)* 8:30 am to 12:30 pm, $315 / $365	**NEW** SC915 **Radiometry Revealed** *(Shaw)* 8:30 am to 12:30 pm, $315 / $365 SC797 **The Science and Technology of Organic Solar Cells** *(Peumans)* 8:30 am to 12:30 pm, $315 / $375 SC321 **Thin Film Optical Coatings** *(Macleod)* 8:30 am to 5:30 pm, $520 / $620	**NEW** SC910 **Design and Reliability of Photovoltaic Modules** *(Dhere, Wohlgemuth)* 1:30 to 5:30 pm, $315 / $365		
Thin Films					
		SC321 **Thin Film Optical Coatings** *(Macleod)* 8:30 am to 5:30 pm, $520 / $620			
X-Ray, Gamma-Ray, and Particle Technologies					
	SC794 **X-ray microCT (Micro Computed Tomography)** *(Stock)* 1:30 to 5:30 pm, $315 / $355				
The Business Side					
		NEW WS914 **Becoming an Optical Engineering Consultant** *(Kruschwitz)* 1:30 to 5:30 pm, $315 / $365	WS851 **Nanotechnology: Science & Applications** *(Brahmbhatt)* 8:30 am to 5:30 pm, $520 / $620		
Professional Development					
WS852 **Hands-On Optics (HOO) - Making an Impact with Light: Terrific Telescopes Workshop** *(Baine)* 1:30 to 3:30 pm, $60 / $70	**NEW** WS897 **Effective Technical Presentations** *(Doumont)* 8:30 am to 12:30 pm, $125 / $175 **NEW** WS908 **Effective Scientific Papers** *(Doumont)* 1:30 to 5:30 pm, $125 / $175	WS666 **Strategies for Professional Conference Presentations** *(Youngworth)* 1:30 to 3:30 pm, $100 / $150	WS846 **Essential Skills for Engineering Project Leaders** *(Hinkle)* 8:30 am to 12:30 pm, $315 / $365 WS609 **Basic Optics for Non-Optics Personnel** *(Harding)* 1:30 to 4:00 pm, $100 / $150 WS777 **Optimizing Your Resume** *(Cain)* 1:30 to 3:30 pm, $100 / $150		

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Exhibition Hours:

Tuesday . . . . . .10:00 am to 5:00 pm
Wednesday. . . . . .10:00 am to 5:00 pm
Thursday. . . . . .10:00 am to 2:00 pm

Current list of Optics+Photonics 2008 Exhibiting companies as of 14 July 2008

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AOptix Technologies Inc.
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Heraeus Quartz America
Hinds Instruments, Inc.
Hitachi High Technologies America (Pleasanton)
HOLOEYE Photonics AG
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Imagine Optic
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Labtec Sales
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LightWorks Optics, Inc.
Lincoln Laser Co.
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McGraw-Hill
MediVision Optics
MEMS Optical Inc.
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Micro Care Corp.
Micro Laser Systems, Inc.
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NiProOptics Inc.
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Norland Products Inc.
Novotech, Inc.
nPoint, Inc.
NuSil Technology
Ocean Optics, Inc.
Oerlikon Optics Inc.
Ohara Corp.
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RPC Photonics, Inc.
RSoft Design Group
Rubicon Technology, Inc.
Sandia National Laboratories
Santec USA Corp.
Sarnoff Corp.
Satisloh North America Inc.
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SCHOTT North America, Inc.
Scientific Solutions, Inc. (SSI)
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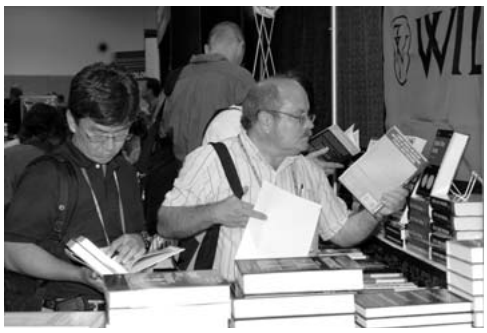
Sunday	Monday	Tuesday	Wednesday	Thursday
NanoScience				
7029 **Metamaterials: Fundamentals and Applications** *(Noginov/Zheludev/Boardman/Engheta),* p. 44				
7030 **Nanophotonic Materials V** *(Gaburro/Cabrini/Talapin)*, p. 47			7031 **Active Photonic Crystals II** *(Weiss/Subramania/García-Santamaría)*, p. 50	
7032 **Plasmonics: Metallic Nanostructures and Their Optical Properties VI** *(Stockman)*, p. 52				
7033 **Plasmonics: Nanoimaging, Nanofabrication, and Their Applications IV** *(Kawata/Shalaev/Tsai)*, p. 57				
	7034 **Physical Chemistry of Interfaces and Nanomaterials VII** *(Rumbles/Monti)*, p. 61			
		7035 **Biosensing** *(Razeghi/Mohseni)*, p. 63		
7036 **Spintronics** *(Razeghi/Drouhin/Wegrowe)*, p. 65				
7037 **Carbon Nanotubes and Associated Devices** *(Razeghi/Pribat/Lee)*, p. 68			Special Session on **Nonlinear Optical Polymers: In Recognition of the Contributions Made by Prof. Larry Dalton,** *(Dalton),* 8:30 am to 3:20 pm, p. 29	
NanoEngineering				
7038 **Optical Trapping and Optical Micromanipulation V** *(Dholakia/Spalding)*, p. 71				
7042 **Instrumentation, Metrology, and Standards for Nanomanufacturing II** *(Postek)*, p. 82			7039 **Nanoengineering: Fabrication, Properties, Optics, and Devices V** *(Dobisz/Eldada)*, p. 75	
		7040 **Nanobiosystems: Processing, Characterization, and Applications** *(Heckman/Singh/Yoshida)*, p. 78		
			7041 **Nanostructured Thin Films** *(Smith/Lakhtakia)*, p. 80	
		EXHIBITION, p. 40-41 10:00 am to 5:00 pm	10:00 am to 5:00 pm	10:00 am to 2:00 pm



Don't miss the Special Events, Plenaries Receptions, Technical Workshops, Courses, Poster Sessions—and more!

See Special Event Daily Schedule, p. 9.

Conference 7029

Sunday-Wednesday 10-13 August 2008 • Proceedings of SPIE Vol. 7029

Metamaterials: Fundamentals and Applications

Conference Chairs: **Mikhail A. Noginov,** Norfolk State Univ.; **Nikolay I. Zheludev,** Univ. of Southampton (United Kingdom); **Allan D. Boardman,** Univ. of Salford (United Kingdom); **Nader Engheta,** Univ. of Pennsylvania

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Sunday 10 August

Room: Conv. Ctr. 16A . . . . . .Sun. 8:00 to 8:10 am

Opening Remarks

Mikhail A. Noginov, Norfolk State Univ.

Room: Conv. Ctr. 16A . . . . . .Sun. 8:10 to 10:10 am

Nanoparticles-structured Metamaterials

Session Chair: **Allan D. Boardman,** Univ. of Salford (United Kingdom)

8:10 am: **Tailoring the near-field through scatterer arrays: Talbot effect, near-field antennas, and related phenomena** *(Keynote Presentation),* Javier García de Abajo, Alberto G. Curto, Alejandro Manjavacas, Consejo Superior de Investigaciones Científicas (Spain); Mark R. Dennis, Univ. of Bristol (United Kingdom); Nikolay I. Zheludev, Univ. of Southampton (United Kingdom) . . . . . [7029-01]

9:00 am: **Morphology control of metal nanoparticles and their photonic response** *(Invited Paper, Presentation Only)*, Luis M. Liz-Marzán, Univ. de Vigo (Spain) . . . . . [7029-02]

9:30 am: **Silver-polymer metamaterial with composition-tunable dielectric constant**, M. Mayy, G. Zhu, Yu. Barnakov, Mikhail A. Noginov, Norfolk State Univ. . . . . [7029-03]

9:50 am: **Plasmon-guided modes in nanoparticle metamaterials**, Rebecca Sainidou, Consejo Superior de Investigaciones Cientificas (Spain); Fransisco Javier García de Abajo, Consejo Superior de Investigaciones Científicas (Spain) . . . . . [7029-04]

Coffee Break . . . . . 10:10 to 10:40 am

SESSION 2

Room: Conv. Ctr. 16A . . . . . Sun. 10:40 am to 12:10 pm

Double-Negative, Single-Negative, and Near-Zero Metamatarials I

Session Chair: **Evgenii E. Narimanov,** Princeton Univ.

10:40 am: **Optical metamaterials: progress and challenges** *(Invited Paper)*, Vladimir M. Shalaev, Wenshan Cai, Uday Chettiar, Hsiao-Kuan Yuan, Alex Kildishev, Vladimir Drachev, Purdue Univ. . . . . [7029-05]

11:10 am: **Stacked 3D metamaterials in the optical wavelength range** *(Invited Paper)*, Harald W. Giessen, Univ. Stuttgart (Germany); Na Liu, Univ. of Stuttgart (Germany) . . . . . [7029-06]

11:40 am: **Nanoscale grooves and channels in epsilon-near-zero (ENZ) nonocircuit boards** *(Invited Paper)*, Andrea Alu, Nader Engheta, Univ. of Pennsylvania . . . . . [7029-07]

Lunch Break . . . . . 12:10 to 1:10 pm

SESSION 3

Room: Conv. Ctr. 16A . . . . . Sun. 1:10 to 3:30 pm

Metamaterials: Fundamentals and Horizons

Session Chair: **Nader Engheta,** Univ. of Pennsylvania (United States)

1:10 pm: **Mimicking quantum phenomena with classical meta-materials** *(Invited Paper)*, Nikolay I. Zheludev, Univ. of Southampton (United Kingdom) . . . . . [7029-08]

1:40 pm: **Metamaterials: from experimental realization of a generalized superlens to trapping light** *(Invited Paper)*, Bernard Didier F. Casse, Wen-Tao Lu, Ravinder K. Banyal, Yong Jian Huang, Srinivas Sridhar, Northeastern Univ. [7029-09]

2:10 pm: **Microstructured optical fibers embedded with semiconductors and metals: a potential route to fiberized metamaterials** *(Invited Paper),* P. J. A. Sazio, A. Amezcua Correa, C. E. Finlayson, J. R. Hayes, Univ. of Southampton (United Kingdom); T. J. Scheidemantel, N. F. Baril, B. R. Jackson, D. Won, F. Zhang, E. R. Margine, V. Gopalan, V. Crespi, J. V. Badding, The Pennsylvania State Univ. (United States) . . . . . [7029-57]

2:40 pm: **Configuring the cancellation of optical near-fields** *(Invited Paper)*, David L. Andrews, Univ. of East Anglia Norwich (United Kingdom) . . [7029-10]

3:10 pm: **Super-antenna**, Tomas Tyc, Masaryk Univ. (Czech Republic); Ulf Leonhardt, Univ. of St. Andrews (United Kingdom) . . . . . [7029-11]

Coffee Break . . . . . 3:30 to 4:00 pm

SESSION 4

Room: Conv. Ctr. 16A . . . . . Sun. 4:00 to 5:30 pm

Microwave and THz Metamaterials

Session Chair: Fransisco Javier García de Abajo, Consejo Superior de Investigaciones Científicas (Spain)

4:00 pm: **Towards large area THz electromagnetic metamaterials** *(Invited Paper)*, Herbert O. Moser, National Univ. of Singapore (Singapore). . [7029-12]

4:30 pm: **Microwave transmission measurements through wire array photonic crystals**, Graeme Dewar, Nathan Souther, Michael Johnson, Univ. of North Dakota . . . . . [7029-13]

4:50 pm: **Microwave frequency measurements of a negative index of refraction metamaterial, based on high permittivity inclusions and effective medium theory**, James M. L.Cramer, Andrew J. Gatesman, Robert H. Giles, Univ. of Massachusetts/Lowell. . . . . [7029-14]

5:10 pm: **Negative refractive index in metamaterial with double elements in infrared wavelength region,** Ekaterina Pshenay-Severin, Friedrich-Schiller-Univ. Jena (Germany); Uwe Hübner, IPHT Jena (Germany); Jörg Petschulat, Carsten Rockstuhl, Thomas Pertsch, Falk Lederer, Friedrich-Schiller-Univ. Jena (Germany); Andreas Tünnermann, Fraunhofer-Institut für Angewandte Optik und Feinmechanik . . . . . [7029-15]

Room: Conv. Ctr. 6A . . . . . Sun. 6:00 to 6:45 pm

All-Conference Plenary Session

View plenary presentation details p. 13..

6:00 pm: **The Solar Decathlon: building a better future with solar energy**, Richard J. King, U.S. Dept. of Energy

Monday 11 August

Room: Conv. Ctr. 6A . . . . . Mon. 8:30 am to 12:20 pm

NanoScience + Engineering Plenary Session

View plenary presentation details p. 13-14.

8:30 am: **Revivals of Molecular Nonlinear Optics in Physics, Chemistry, and Life Sciences,** Joseph Zyss, École Normale Supérieure de Cachan (France)

9:10 am: **Applications of Biological Materials**, Rajesh R. Naik, Air Force Research Lab.

Coffee Break . . . . . 9:50 to 10:20 am

10:20 am: **Two-Photon Lithography for Precise 3D Nano/Micro-Objects**, Kwang-Sup Lee, Hannam Univ. (South Korea)

11:00 am: **Multifunctional Excimer-Laser Lithography and Photoablation Technologies for Large-Area Micro and Nanoelectronics, Displays and Microsystems**, Kanti Jain, Univ. of Illinois at Urbana-Champaign

11:40 am: **Molecules, Surfaces, and Symmetry: From Pure Geometry to Nanoscience,** Denis Fichou, Commissariat à l'Energie Atomique (France)

SESSION 5

Room: Conv. Ctr. 16A . . . . . .Mon. 1:30 to 3:20 pm

General Theory of Metamaterials

Session Chair: **Jacob B. Khurgin,** Johns Hopkins Univ.

1:30 pm: **Electromagnetic circuits** *(Invited Paper)*, Graeme Milton, The Univ. of Utah; Pierre Seppecher, Univ. of Toulon (France). . . . . [7029-16]

2:00 pm: **Toward quantification of material symmetry on scales applicable to metamaterial properties**, Joseph B. Geddes III, Univ. of Illinois at Urbana-Champaign . . . . . [7029-17]

2:20 pm: **Optical localization: using fixed point placement to simplify the invariant measure**, Glen J. Kissel, Univ. of Southern Indiana . . . . . [7029-18]

2:40 pm: **Trapping light without double negative index metamaterials for all frequencies**, Wen-Tao Lu, Northeastern Univ. . . . . [7029-19]

3:00 pm: **Detection and identification of biological materials through their optical activity using the Mueller matrix**, Ezekiel Bahar, Univ. of Nebraska/Lincoln . . . . . [7029-20]

Coffee Break . . . . . 3:20 to 3:50 pm

SESSION 6

Room: Conv. Ctr. 16A . . . . . .Mon. 3:50 to 5:40 pm

Sub-wavelength Focusing and Imaging

Session Chair: **Nikolay I. Zheludev,** Univ. of Southampton (United Kingdom)

3:50 pm: **Near field plates, subwavelength focusing and radiationless interference** *(Invited Paper)*, Roberto D. Merlin, Univ. of Michigan . . [7029-21]

4:20 pm: **Terahertz plasmonic energy concentration** *(Invited Paper)*, Mark I. Stockman, Maxim Durach, Anastasia Rusina, Georgia State Univ.. [7029-22]

4:50 pm: **Metal-dielectric multilayers for controllable deep sub-wavelength focusing**, Geoffroy Lerosey, Guy Bartal, Xiang Zhang, Univ. of California/Berkeley . . . . . [7029-23]

5:10 pm: **Impedance-matched hyperlens (Invited Paper),** Zubin Jacob, Alexander Kildishev, Evgenii Narimanov, Purdue Univ. . . . . [7029-24]

Room: Conv. Ctr. Exhibit Hall B2 . . . . . Mon. 6:00 to 7:30 pm

Posters-Monday

Poster authors will begin displaying posters after 10:00 am Monday morning. A poster session, with authors present at their posters, will be held Monday evening from 6:00 to 7:30 pm. Light refreshments will be served.

Poster Setup

Poster presenters must set up their posters between 10:00 am and 5:00 pm on Monday. Poster presenters who have not set up by 5:00 pm on Monday will be considered a "no show" and their manuscript will not be published. Presenters must remove their posters immediately after the poster session. Posters not removed will be considered unwanted and will be discarded. SPIE assumes no responsibility for posters left up after the end of each poster session.

On the modification of the Fermi-Dirac distribution function in degenerate semiconductors, Subhamoy Singharoy, JIS College of Engineering (India) . . . . . [7029-50]

Metamaterials with tunable negative refractive index fabricated from nanoamorphous ferromagnetic microwires and Magnus optical effect, Andrey Ivanov, Alexander Shalygin, Anatoliy Vedyayev, Vladimir Galkin, Lomonosov Moscow State Univ. (Russia); Konstantin Rozanov, Institute for Theoretical and Applied Electromagnetics (Russia); Valery Ivanov, Lomonosov Moscow State Univ. (Russia) and N.S. Kurnakov Institute of General and Inorganic Chemistry (Russia). . . . . [7029-51]

Study of light propagation through nano-structured materials, J. C. Juarez-Morales, J. Munoz-Lopez, G. Martínez Niconoff, Instituto Nacional de Astrofísica, Óptica y Electrónica (Mexico). . . . . [7029-52]

Intelligent control of a novel IPMC-actuated manipulator using emotional learning, Azadeh Shariati, Sharif Univ. of Technology (Iran) . . . . . [7029-53]

A single-layer three-dimensional isotropic negative index material at visible wavelengths, Stanley P. Burgos, Jennifer A. Dionne, Raviv Perahia, Oskar J. Painter, California Institute of Technology; Henri J. Lezec, California Institute of Technology and National Institute of Standards and Technology; Harry A. Atwater, California Institute of Technology . . . . . [7029-54]

Non Bragg band gaps in 1D uniaxial metamaterial photonic crystals, Maria L. Martinez Ricci, Ricardo A. Depine, Univ. de Buenos Aires (Argentina) . . . . . [7029-55]

Tuesday 12 August

SESSION 7

Room: Conv. Ctr. 16A . . . . . .Tues. 8:00 to 10:00 am

Plasmonic Metamaterials

Session Chair: **Luis M. Liz-Marzan,** Univ. de Vigo (Spain)

8:00 am: **Short wavelength surface plasmons in thin films and nanorods** *(Invited Paper)*, Joachim Krenn, Karl-Franzens-Univ. Graz (Austria). . [7029-25]

8:30 am: **Role of disorder in plasmonic enhancement of optical processes** *(Invited Paper)*, Jacob B. Khurgin, Johns Hopkins Univ.. . . . . [7029-26]

9:00 am: **Nanofabrication and characterization of magneto-plasmonic materials** *(Presentation Only)*, R. A. Lukaszew, J. R. Skuza, C. Clavero, The College of William & Mary . . . . . [7029-27]

9:20 am: **Performance of opto-electronic semiconductor devices via surface plasmon excitation in metal nanoparticles**, Aswini K. Pradhan, Norfolk State Univ. . . . . [7029-28]

9:40 am: **Optical hyperspace for plasmons: Dyakonov states in metamaterials**, Zubin Jacob, Evgenii Narimanov, Purdue Univ. . . . . [7029-56]

Coffee Break . . . . . 10:00 to 10:30 am

SESSION 8

Room: Conv. Ctr. 16A . . . . . Tues. 10:30 am to 12:10 pm

Double Negative, Single Negative, and Near Zero Metamatarials II

Session Chair: **David L. Andrews,** Univ. of East Anglia Norwich (United Kingdom)

10:30 am: **Impedance matched negative index metamaterials based on plasmonic components** *(Invited Paper)*, Gennady Shvets, The Univ. of Texas at Austin; Yaroslav Urzhumov, COMSOL, Inc.; Vitaliy Lomakin, Univ. of California/San Diego; Marcelo Davanco, Stephen Forrest, Univ. of Michigan . . . . . [7029-30]

11:00 am: **Realization of planar infrared near-zero index metamaterials through genetic algorithm optimization**, Yan Tang, Jeremy A. Bossard, Douglas H. Werner, Theresa S. Mayer, The Pennsylvania State Univ. [7029-31]

11:20 am: **Negative refraction and covariance** *(Invited Paper)*, Martin W. McCall, Imperial College London (United Kingdom) . . . . . [7029-32]

11:50 am: **Miniaturization of photonic waveguides by the use of left-handed materials**, Philippe Tassin, Xavier Sahyoun, Irina Veretennicoff, Vrije Univ. Brussel (Belgium) . . . . . [7029-33]

Lunch/Exhibition Break . . . . . 12:10 to 1:30 pm

SESSION 9

Room: Conv. Ctr. 16A . . . . . .Tues. 1:30 to 3:10 pm

Fabrication of Metamaterials

Session Chair: **Vladimir M. Shalaev,** Purdue Univ.

1:30 pm: **Two-photon reduction for fabrication of three-dimensional metamaterials** *(Invited Paper)*, Satoshi Kawata, The Institute of Physical and Chemical Research (RIKEN) (Japan) and Osaka Univ. (Japan); Takuo Tanaka, Nobuyuki Takeyasu, The Institute of Physical and Chemical Research (RIKEN) (Japan) . . . . . [7029-34]

2:00 pm: **Self-organized growth of multi-phase eutectic microstructures: potential technology for metamaterials** *(Invited Paper)*, Dorota A. Pawlak, Instytut Technologii Materialów Elektronicznych (Poland) . . . . . [7029-35]

2:30 pm: **Stacked metamaterials: from simple to complex structures**, Harald W. Giessen, Na Liu, Univ. Stuttgart (Germany) . . . . . [7029-36]

2:50 pm: **Fabrication of electrically switchable photonic crystals with different structures by using a top-cut hexagon prism**, XiaoHong Sun, XiaoMing Tao, YangYong Wang, The Hong Kong Polytechnic Univ. (Hong Kong China) . . . . . [7029-37]

Coffee Break . . . . . 3:10 to 3:40 pm

SESSION 10

Room: Conv. Ctr. 16A . . . . . .Tues. 3:40 to 4:50 pm

Theory and Numerical Simulation of Metamaterials I

Session Chair: **Martin W. McCall,** Imperial College London (United Kingdom)

3:40 pm: **Homogenization of finite metallic fibers and 3D-effective permittivity tensor**, Guy Bouchitte, Univ. de Toulon et du var (France) . . . . . [7029-38]

4:00 pm: **Plane wave propagation in metamaterials in framework of macroscopic Maxwell's equations: analytical approach**, Arkadi Chipouline, Jörg Petschulat, Thomas Pertsch, Friedrich-Schiller-Univ. Jena (Germany); Andreas Tünnermann, Fraunhofer-Institut für Angewandte Optik und Feinmechanik (Germany); Carsten Rockstuhl, Christoph Menzel, Falk Lederer, Friedrich-Schiller-Univ. Jena (Germany) . . . . . [7029-39]

4:20 pm: **Electromagnetic waves propagation in inhomogeneous metamaterials** *(Invited Paper)*, Natalia M. Litchinitser, Univ. at Buffalo; Ildar R. Gabitov, The Univ. of Arizona; Andrei I. Maimistov, Moscow Engineering Physics Institute (Russia). . . . . [7029-40]

Wednesday 13 August

SESSION 11

Room: Conv. Ctr. 16A . . . . . Wed. 8:00 to 9:10 am

Theory and Numerical Simulation of Metamaterials II

Session Chair: **Natalia M. Litchinitser,** Univ. of Michigan

8:00 am: **Optical propagation through a homogeneous mixture of positive and negative index materials**, Rola Aylo, Partha P. Banerjee, Georges Nehmetallah, Univ. of Dayton . . . . . [7029-41]

8:20 am: **Numerical simulations of nanostructured optical metamaterials: challenges and trends** *(Invited Paper)*, Alexander V. Kildishev, Uday K. Chettiar, Vladimir P. Drachev, Vladimir M. Shalaev, Purdue Univ. . . . [7029-42]

8:50 am: **Cell size bounds for negative-index metamaterials: plasmonic and non-plasmonic cases,** Igor Tsukerman, The Univ. of Akron . . . [7029-43]

SESSION 12

Room: Conv. Ctr. 16A . . . . . Wed. 9:10 to 10:30 am

Loss Control and Gain in Metamaterials

Session Chair: **Graeme Milton,** The Univ. of Utah

9:10 am: **Optical magnetism and plasmonic nanolaser** *(Invited Paper)*, Andrey K. Sarychev, Andrey N. Lagarkov, Institute for Theoretical and Applied Electrodynamics (Russia) . . . . . [7029-44]

9:40 am: **Scattering-free plasmonic optics with anisotropic metamaterials** *(Invited Paper)*, Viktor A. Podolskiy, Justin Elser, Oregon State Univ. [7029-45]

10:10 am: **Effect of molecular adsorption on optical losses in metallic nanostructures**, Starre N. Williams, Alexander V. Gavrilenko, C. McKinney, Mikhail A. Noginov, Carl E. Bonner, Jr., Vladimir I. Gavrilenko, Norfolk State Univ. . . . . [7029-46]

Coffee Break . . . . . 10:30 to 11:00 am

SESSION 13

Room: Conv. Ctr. 16A . . . . . .Wed. 11:00 am to 12:40 pm

Nonlinearity and Solitons in Metamaterials

Session Chair: **Mikhail A. Noginov,** Norfolk State Univ.

11:00 am: **Nonlinear response of metamaterials based on Josephson junction arrays** *(Invited Paper)*, Ildar R. Gabitov, The Univ. of Arizona; Andrei I. Maimistov, Moscow Engineering Physics Institute (Russia) . . . . . [7029-47]

11:30 am: **Subwavelength plasmonic solitons in nonlinear metamaterials**, Yongmin Liu, Guy Bartal, Dentcho A. Genov, Xiang Zhang, Univ. of California/Berkeley. . . . . [7029-48]

11:50 am: **Weakly and strongly nonlinear waves in negative phase metamaterials** *(Keynote Presentation),* Allan D. Boardman, Rhiannon Mitchell-Thomas, Peter Egan, Yuriy Rapoport, Neil King, Univ. of Salford (United Kingdom) . . . . . [7029-49]

Room: Conv. Ctr. 16A . . . . . Wed. 12:40 pm

Closing Remarks

Nader Engheta, Univ. of Pennsylvania

Courses of Related Interest

See SPIE Cashier for information and to register.

SC496 Fabrication and Processing of Nanostructures (Cao) Monday, 8:30 am to 5:30 pm
SC497 Nanophotonics (Prasad) Sunday, 1:30 to 5:30 pm
WS851 Nanotechnology: Science & Applications (Brahmbhatt) Wednesday, 8:30 am to 5:30 pm

Conference 7030

Sunday-Tuesday 10-12 August 2008 • Proceedings of SPIE Vol. 7030

Nanophotonic Materials V

Conference Chairs: **Zeno Gaburro,** Univ. degli Studi di Trento (Italy); **Stefano Cabrini,** Lawrence Berkeley National Lab.; **Dmitri Talapin,** Univ of Chicago

Program Committee: **David L. Andrews,** Univ. of East Anglia Norwich (United Kingdom); **Angus J. Bain,** Univ. College London (United Kingdom); **Mireille H. Blanchard-Desce,** Univ. de Rennes I (France); **Robert W. Boyd,** Univ. of Rochester; **Aaron W. Harper,** Univ. of Southern California; **Ghassan E. Jabbour,** Arizona State Univ.; **Francois Kajzar,** Commissariat à l'Energie Atomique (France); **Dmitri I. Kovalev,** Univ. of Bath (United Kingdom); **Paras N. Prasad,** Univ. at Buffalo; **Younan Xia,** Univ. of Washington

Sunday 10 August

SESSION 1

Room: Conv. Ctr. 17A . . . . . Sun. 1:20 to 2:50 pm

Synthesis and Fabrication I

Session Chair: **Zeno Gaburro,** Univ. degli Studi di Trento (Italy)

1:20 pm: **Novel hybrid nanostructures for photonic and energy applications** *(Invited Paper)*, Taleb Mokari, Lawrence Berkeley National Lab. . . . . [7030-01]

1:50 pm: **Ge nanoparticles growth in Ge-doped sol-gel silica by e-beam exposure**, Norberto Chiodini, Alessandro Lauria, Roberto Lorenzi, Alberto Paleari, Giorgio Spinolo, Univ. degli Studi di Milano-Bicocca (Italy). . [7030-02]

2:10 pm: **Strong photoluminescence at 1540nm from Er-doped amorphous SiCxOyHz: a novel silicon material for photonic applications**, Spyros Gallis, SUNY/Univ. at Albany and IBM Microelectronics Div.; Vasileios Nikas, Himani Suhag, Mengbing Huang, Alain E. Kaloyeros, SUNY/Univ. at Albany . . . . . [7030-03]

2:30 pm: **Laser-aerosol heating fundamentals and the protocol for synthesis of photonic WO3 nano-wires and VO2 nano-belts by laser pyrolysis**, Bonex W. Mwakikunga, Council for Scientific and Industrial Research (South Africa), and Univ. of Witwatersrand/Johannesburg (South Africa), and Univ. of Malawi (Malaysia); Andrew Forbes, Council for Scientific and Industrial Research (South Africa); Elias Sideras-Haddad, Univ. of the Witwatersrand (South Africa); Christopher Arendse, Council for Scientific and Industrial Research (South Africa) . . . . . [7030-05]

Coffee Break . . . . . 2:50 to 3:20 pm

SESSION 2

Room: Conv. Ctr. 17A . . . . . Sun. 3:20 to 5:10 pm

Characterization I

Session Chair: **Susan Habas,** Univ. of Cal./Berkely

3:20 pm: **Engineered electronic and magnetic interactions in heterostructured nanocrystals** *(Invited Paper)*, Victor I. Klimov, Los Alamos National Lab. . . . . [7030-06]

3:50 pm: **Synthesis of Y2O3-MgO nanopowder and infrared transmission of the sintered nanocomposite**, Dongtao Jiang, Amiya K. Mukherjee, Univ. of California/Davis . . . . . [7030-07]

4:10 pm: **Wavelength dependence of free-carrier absorption in Si nanocrystals measured by microcavity photoluminescence**, Rohan D. Kekatpure, Mark L. Brongersma, Stanford Univ. . . . . [7030-08]

4:30 pm: **Single and multiple carriers in quantum dots**, Anshu Pandey, Philippe Guyot-Sionnest, The Univ. of Chicago . . . . . [7030-09]

4:50 pm: **Spectroscopic and structural characterization of nanoporous Yb3+- Er3+ codoped YAG particles prepared by glycolate assisted with PVA and UREA,** Ruben A. Rodriguez, Univ. de Guadalajara (Mexico); Haggeo Desirena, Ctr. de Investigaciones en Óptica, A.C. (Mexico); Esteban H. Tobar, Univ. de Guadalajara (Mexico); Pedro Salas, Univ. Nacional Autónoma de México (Mexico); Elder De la Rosa, Ctr. de Investigaciones en Óptica, A.C. (Mexico) . . . . . [7030-10]

Room: Conv. Ctr. 6A . . . . . Sun. 6:00 to 6:45 pm

All-Conference Plenary Session

View plenary presentation details p. 13.

6:00 pm: **The Solar Decathlon: building a better future with solar energy**, Richard J. King, U.S. Dept. of Energy

Monday 11 August

Room: Conv. Ctr. 6A . . . . . Mon. 8:30 am to 12:20 pm

NanoScience + Engineering Plenary Session

View plenary presentation details p. 13-14.

8:30 am: **Revivals of Molecular Nonlinear Optics in Physics, Chemistry, and Life Sciences,** Joseph Zyss, École Normale Supérieure de Cachan (France)

9:10 am: **Applications of Biological Materials**, Rajesh R. Naik, Air Force Research Lab.

Coffee Break . . . . . 9:50 to 10:20 am

10:20 am: **Two-Photon Lithography for Precise 3D Nano/Micro-Objects**, Kwang-Sup Lee, Hannam Univ. (South Korea)

11:00 am: **Multifunctional Excimer-Laser Lithography and Photoablation Technologies for Large-Area Micro and Nanoelectronics, Displays and Microsystems**, Kanti Jain, Univ. of Illinois at Urbana-Champaign

11:40 am: **Molecules, Surfaces, and Symmetry: From Pure Geometry to Nanoscience,** Denis Fichou, Commissariat à l'Energie Atomique (France)

SESSION 3

Room: Conv. Ctr. 17A . . . . . Mon. 1:20 to 4:10 pm

Synthesis and Fabrication II

Session Chair: **John M. Lupton,** The Univ. of Utah

1:20 pm: **Self-assembly and transport properties of nanocrystal solids** *(Invited Paper)*, Dmitri Talapin, Univ. of Chicago. . . . . [7030-11]

1:50 pm: **Patternable hybrid sol-gel materials based on silica network modified with epoxy or acrylic groups**, Giovanna Brusatin, Univ. degli Studi di Padova (Italy) . . . . . [7030-12]

2:10 pm: **Growth dynamics of CdTe quantum dot ensembles in liquid and crystalline phases**, Mark Piepenbrock, Mary O'Neill, Tom Stirner, Steve Kelly, The Univ. of Hull (United Kingdom) . . . . . [7030-13]

2:30 pm: **Frequency selective surfaces offer new possibilities as reflectance filters in the NIR/visible spectrum**, Brian R. Kimball, Richard M. Osgood III, Gary Walsh, U.S. Army Soldier Systems Ctr.; David Ziegler, U.S. Army Research, Development and Engineering Command; Joel Carlson, Lauren Belton, U.S. Army Soldier Systems Ctr. . . . . [7030-14]

Coffee Break . . . . . 2:50 to 3:20 pm

3:20 pm: **The role of nanoparticles in visible transparent polymer nanocomposites**, Thad L. Druffel, Matt Lattis, Omar Buazza, Scott Farmer, Optical Dynamics Corp. . . . . [7030-15]

3:40 pm: **Optical properties of coupled semiconductor and metal nanocrystals: exciton-plasmon interaction and nonlinear effects** *(Invited Paper),* Alexander O. Govorov, Ohio Univ. . . . . [7030-16]

SESSION 4

Room: Conv. Ctr. 17A . . . . . Mon. 4:10 to 5:40 pm

Applications I

Session Chair: **Alexander O. Govorov,** Ohio Univ.

4:10 pm: **Science and technology of semiconductor nanocrystals for device applications** *(Invited Paper)*, Moungi G. Bawendi, Massachusetts Institute of Technology . . . . . [7030-17]

4:40 pm: **Simple silanization routes of CdSe and CdTe nanocrystals for biological applications**, Diogo B. Almeida, Wagner M. Faustino, Gilberto J. Jacob, André A. de Thomaz, Luiz C. Barbosa, Oswaldo L. Alves, Univ. Estadual de Campinas (Brazil); Patricia M. A.Farias, Beate S. Santos, Adriana Fontes, Univ. Federal de Pernambuco (Brazil); Suzete A. O.Gomes, Fundacao Oswaldo Cruz (Brazil); Denise Feder, Univ. Federal Fluminense (Brazil); Italo O. Mazali, Carlos L. Cesar, Univ. Estadual de Campinas (Brazil) . . . . . [7030-19]

5:00 pm: **Temperature-independent luminescence-center-mediated excitation of erbium in Er-doped Si-rich SiO_2 films with and without nanocrystals**, Oleksandr Savchyn, College of Optics and Photonics, Univ. of Central Florida; Pieter G. Kik, College of Optics and Photonics, Univ. of Central Florida and Univ. of Central Florida; Ravi M. Todi, Kevin R. Coffey, Univ. of Central Florida . . . . . [7030-33]

5:20 pm: **Photoluminescence switching of charged quantum dots,** Praket P. Jha, Philippe Guyot-Sionnest, The Univ. of Chicago . . . . . [7030-44]

Room: Conv. Ctr. Exhibit Hall B2 . . . . . Mon. 6:00 to 7:30 pm

Posters-Monday

Poster authors will begin displaying posters after 10:00 am Monday morning. A poster session, with authors present at their posters, will be held Monday evening from 6:00 to 7:30 pm. Light refreshments will be served.

Poster Setup

Poster presenters must set up their posters between 10:00 am and 5:00 pm on Monday. Poster presenters who have not set up by 5:00 pm on Monday will be considered a "no show" and their manuscript will not be published. Presenters must remove their posters immediately after the poster session. Posters not removed will be considered unwanted and will be discarded. SPIE assumes no responsibility for posters left up after the end of each poster session.

Ion concentration effect on the spectroscopic properties of ZrO2:Yb3+, Ho3+ nanocrystals, David O. Solis, Ctr. de Investigaciones en Óptica, A.C. (Mexico); Tzarara Lopez-Luke, Univ. Michoacana de San Nicolás de Hidalgo (Mexico); Pedro Salas, Univ. Nacional Autónoma de México (Mexico); Elder De la Rosa, Ctr. de Investigaciones en Óptica, A.C. (Mexico) . . . . . [7030-31]

Spectral properties of alkaline earth composite silicate phosphors for white-LED, Yi Yang, China Jiliang Univ. (China) and Flourescent Material Co., Ltd. (China); Shang-Zhong Jin, Changyu Shen, China JiLiang Univ. (China); Yin Xuan Tang, Jiang Zhou Ming, Flourescent Material Co., Ltd. (China). [7030-32]

Photoacoustic thermal characterization of dental resins using laser induced photoacoustic technique, Paulose Thomas, Catholicate College (India); Sajan D. George, Leibniz Univ. Hannover (Germany); Achamma Kurian, Catholicate College (India) . . . . . [7030-34]

Tuning the UV-blue absorption and emission of CdSe and ZnS core-shell nanoparticles by laser radiation, Ignacio F. Gallardo, Kay Hoffmann, John W. Keto, The Univ. of Texas at Austin . . . . . [7030-36]

Ultraviolet cross-link process using spin-coating materials for advanced planarization and sublimate defect reduction, Satoshi Takei, Nissan Chemical Industries, Ltd. (Japan) . . . . . [7030-37]

Linewidth enhancement factor for InAs/GaAs quantum dot laser diodes with multiple chirped quantum dot structures, Kyoung Chan Kim, Il Ki Han, Jung Il Lee, Korea Institute of Science and Technology (South Korea) . . . . . [7030-39]

Sonoluminescent characteristics of microbubbles, Paul Prentice, Pauline Axford, Donald McLean, Paul A. Campbell, Univ. of Dundee (United Kingdom) . . . . . [7030-40]

Fabrication of solar cells based on TiO2 nanoparticles sensitized with rhodamine 6G, Ruben A. Rodríguez, Aaron Montantes, Jesus Castañeda, Hector Perez, Univ. de Guadalajara (Mexico); Pedro Salas, Univ. Nacional Autónoma de México (Mexico); Virginia Marañon, Univ. de Guadalajara (Mexico) . . . . . [7030-41]

Upconversion characterization of ZrO2:Yb3+ - Tm3+ nanocrystals, David O. Solis, Victor H. Romero, Tzarara Lopez-Luke, Ctr. de Investigaciones en Óptica, A.C. (Mexico); Pedro Salas, Univ. Nacional Autónoma de México (Mexico); Carlos Angeles-Chavez, Instituto Mexicano del Petróleo (Mexico); Elder De la Rosa, Ctr. de Investigaciones en Óptica, A.C. (Mexico). . [7030-42]

Blue, green, and red emission of Tm, Tb and Eu doped Y2O3 nanowires, Victor Romero, Elder De La Rosa, Ctr. de Investigaciones en Óptica, A.C. (Mexico); Pedro Salas, Univ. Nacional Autónoma de México (Mexico); Carlos Angeles-Chavez, Instituto Mexicano del Petróleo (Mexico) . . . . . [7030-43]

Self-assembly of 2d stepped metal-oxide nanostructure with plasmonic-photonic properties, Deeder Aurongzeb, Northeastern Univ.. . . . . [7030-45]

Study on optical nonlinearities of porphyrin covalently functionalized single-wall carbon nanotubes, Zhi-Bo Liu, Wen-Yuan Zhou, Jian-Guo Tian, Zhen Guo, Dong-Mei Ren, Jian-Yu Zheng, Nankai Univ. (China) . . . . [7030-46]

Light propagation in one-dimensional photonic finite systems (Si/a-SiO2) m with defects, Yu. K. Timoshenko, V. A. Shunina, Yu. V. Smirnov, O. V. Kazarina, Voronezh State Univ. (Russia) . . . . . [7030-47]

Tuesday 12 August

SESSION 5

Room: Conv. Ctr. 17A . . . . . Tues. 8:00 to 9:50 am

Applications II

Session Chair: **Enrico Da Como,** Ludwig-Maximilians-Univ. München (Germany)

8:00 am: **Practical implementation of exiton-plasmon resonance: from to sensors to negative refractive materials** *(Invited Paper)*, Nicholas A. Kotov, Univ. of Michigan. . . . . [7030-20]

8:30 am: **Rapid optimal design of functional nanocomposite coatings for energy harvesting applications**, Justin Trice, Washington Univ. in St. Louis; Hernando Garcia, Southern Illinois Univ.; Radhakrishna Sureshkumar, Ramki Kalyanaraman, Washington Univ. in St. Louis . . . . . [7030-21]

8:50 am: **Picosecond carrier dynamics and thermal-optical modulation in Si nanocrystals**, Jeremy A. Rowlette, Rohan D. Kekatpure, Matt A. Panzer, Kenneth E. Goodson, Mark L. Brongersma, Stanford Univ.. . . . . [7030-22]

9:10 am: **Colloidal quantum dot doped core photonic crystal fibers**, Gilberto J. Jacob V.D.M., Diogo D. Almeida, Enver F. Chillcce, Wagner M. Faustino, André A. de Thomaz, Eugenio Rodriguez, Luiz C. Barbosa, Carlos L. Cesar, Univ. Estadual de Campinas (Brazil) . . . . . [7030-23]

9:30 am: **Phase contrast imaging using PbS quantum dots film**, Pushpa A. Kurian, Vijayan Cherianath, Indian Institute of Technology Madras (India) . . . . . [7030-24]

Coffee Break . . . . . 9:50 to 10:20 am

SESSION 6

Room: Conv. Ctr. 17A . . . . . Tues. 10:20 am to 12:20 pm

Characterization II

Session Chairs: **Victor I. Klimov,** Los Alamos National Lab.; **Zeno Gaburro,** Univ. degli Studi di Trento (Italy)

10:20 am: **Probing complex optical materials using nanophotonic light sources** *(Invited Paper)*, John M. Lupton, The Univ. of Utah . . . . . [7030-25]

10:50 am: **Anisotropic light emission of single CdSe/CdS tetrapods** *(Invited Paper)*, Andrey L. Rogach, Enrico Da Como, Ludwig-Maximilians-Univ. München (Germany) . . . . . [7030-26]

11:20 am: **Stimulated emission depletion and fluorescence correlation spectroscopy of linear and branched quadrupolar chromophores**, Daven A. Armoogum, Richard J. Marsh, Nick Nicolaou, Univ. College London (United Kingdom); Olivier Mongin, Mireille Blanchard-Desce, Univ. de Rennes I (France); Angus J. Bain, Univ. College London (United Kingdom) . . . [7030-27]

11:40 am: **Adsorption of 3-mercaptopropyltrimethoxysilane on nanocrystalline and single crystal zinc oxide surfaces**, Jagdeep Singh, Univ. of Massachusetts/Lowell; Jason W. Soares, U.S. Army Research, Development and Engineering Command; JiSun Im, Univ. of Massachusetts/Lowell; Diane M. Steeves, U.S. Army Research, Development and Engineering Command; James E. Whitten, Univ. of Massachusetts/Lowell . . . . . [7030-28]

12:00 pm: **Modeling of diffractive spectral filtering applied to CMOS image sensors**, Guillaume Demésy, Institut Fresnel (France) and STMicroelectronics (France); Frédéric Zolla, André Nicolet, Mireille Commandré, Caroline Fossati, Institut Fresnel (France); Olivier Gagliano, Brendan Dunne, STMicroelectronics (France) . . . . . [7030-29]

Courses of Related Interest

See SPIE Cashier for information and to register.

SC496 Fabrication and Processing of Nanostructures (Cao) Monday, 8:30 am to 5:30 pm
SC497 Nanophotonics (Prasad) Sunday, 1:30 to 5:30 pm
WS851 Nanotechnology: Science & Applications (Brahmbhatt) Wednesday, 8:30 am to 5:30 pm

Conference 7031

Wednesday-Thursday 13-14 August 2008 • Proceedings of SPIE Vol. 7031

Active Photonic Crystals II

Conference Chairs: **Sharon M. Weiss,** Vanderbilt Univ.; **Ganapathi S. Subramania,** Sandia National Labs.; **Florencio García-Santamaría,** Los Alamos National Lab.

Program Committee: **Paul V. Braun,** Univ. of Illinois at Urbana-Champaign; **Shanhui Fan,** Stanford Univ.; **Stephen H. Foulger,** Clemson Univ.; **Rachel Jakubiak,** Air Force Research Lab.; **Michal F. Lipson,** Cornell Univ.; **Ceferino López,** Instituto de Ciencia de Materiales de Madrid (Spain); **Michael J. Sailor,** Univ. of California/San Diego; **Ralf B. Wehrspohn,** Martin-Luther-Univ. Halle-Wittenberg (Germany); **Pierre Wiltzius,** Univ. of Illinois at Urbana-Champaign

Monday 11 August

Room: Conv. Ctr. 6A . . . . . .Mon. 8:30 am to 12:20 pm

NanoScience + Engineering Plenary Session

View plenary presentation details p. 13-14.

8:30 am: **Revivals of Molecular Nonlinear Optics in Physics, Chemistry, and Life Sciences,** Joseph Zyss, École Normale Supérieure de Cachan (France)

9:10 am: **Applications of Biological Materials**, Rajesh R. Naik, Air Force Research Lab.

Coffee Break . . . . . 9:50 to 10:20 am

10:20 am: **Two-Photon Lithography for Precise 3D Nano/Micro-Objects**, Kwang-Sup Lee, Hannam Univ. (South Korea)

11:00 am: **Multifunctional Excimer-Laser Lithography and Photoablation Technologies for Large-Area Micro and Nanoelectronics, Displays and Microsystems**, Kanti Jain, Univ. of Illinois at Urbana-Champaign

11:40 am: **Molecules, Surfaces, and Symmetry: From Pure Geometry to Nanoscience,** Denis Fichou, Commissariat à l'Energie Atomique (France)

Wednesday 13 August

SESSION 1

Room: Conv. Ctr. 16A . . . . . Wed. 1:30 to 3:15 pm

Emission Properties of Active Photonic Crystals I

Session Chair: **Florencio García-Santamaría,** Los Alamos National Lab.

1:30 pm: **Tailoring thermal emission with metallic photonic crystals** *(Invited Paper)*, David J. Norris, Sang Eon Han, Prashant Nagpal, Nicholas R. Denny, Andreas Stein, Univ. of Minnesota . . . . . [7031-01]

2:05 pm: **Laser applications of self-organized organic photonic crystals** *(Invited Paper)*, Seiichi Furumi, National Institute for Materials Science (Japan). . . . . [7031-02]

2:40 pm: **Emission from nano-scale light sources in two and three-dimensional photonic crystals** *(Invited Paper)*, Ganapathi S. Subramania, Sandia National Labs. . . . . [7031-03]

Coffee Break . . . . . 3:15 to 3:45 pm

SESSION 2

Room: Conv. Ctr. 16A . . . . . Wed. 3:45 to 5:20 pm

Fabrication of Active Photonic Crystals

Session Chair: **David J. Norris,** Univ. of Minnesota

3:45 pm: **Reconfigurable photonic crystal circuits** *(Invited Paper)*, Benjamin J. Eggleton, The Univ. of Sydney (Australia) . . . . . [7031-04]

4:20 pm: **Multibeam Interference Lithography: Three Dimensional Patterning of Inorganic Chalcogenide Glass and Ceramic Photoresists** *(Invited Paper)*, Paul V. Braun, Matthew C. George, Univ. of Illinois/Urbana-Champaign . . . . . [7031-05]

4:55 pm: **Integration of photonic crystals in dye sensitized solar cells,** Silvia Colodrero, Agustin Mihi, Mauricio Calvo, Manuel Ocaña, Hernán Míguez, Instituto de Ciencia de Materiales de Sevilla (Spain) . . . . . [7031-06]

Room: Conv. Ctr. Exhibit Hall B2 . . . . . Wed. 5:30 to 7:00 pm

Posters-Wednesday

Poster authors will begin displaying posters after 10:00 am Wednesday morning. A poster session, with authors present at their posters, will be held Wednesday evening from 5:30 to 7:00 pm. Light refreshments will be served.

Poster Setup

Poster presenters must set up their posters between 10:00 am and 5:00 pm on Wednesday. Poster presenters who have not set up by 5:00 pm on Wednesday will be considered a "no show" and their manuscript will not be published. Presenters must remove their posters immediately after the poster session. Posters not removed will be considered unwanted and will be discarded. SPIE assumes no responsibility for posters left up after the end of each poster session.

Effect of interface on the far-field focusing in a two-dimensional honeycomb photonic crystal, Yong-Ping Li, Guo-Jun Li, Xue-Liang Kang, Univ. of Science and Technology of China (China) . . . . . [7031-21]

Thursday 14 August

SESSION 3

Room: Conv. Ctr. 16A . . . . . Thurs. 8:30 to 9:55 am

Propagation of Light in Active Photonic Crystals

Session Chair: **Wei Jiang,** Rutgers Univ.

8:30 am: **Ultra-compact wavelength demultiplexers and spectrometers using mode engineering in photonic crystal super-dispersive structures** *(Invited Paper)*, Ali Adibi, Georgia Institute of Technology . . . . . [7031-07]

9:05 am: **Fano filter modal analysis based on transferred silicon nanomembranes on flexible substrates**, Zexuan Qiang, Li Chen, Hongjun Yang, The Univ. of Texas at Arlington; Huiqing Pang, Zhenqiang Ma, Univ. of Wisconsin/Madison; Weidong Zhou, The Univ. of Texas at Arlington [7031-08]

9:30 am: **Towards an electrically-pumped photonic crystal-based semiconductor optical amplifier (SOA) in InP/InGaAsP**, Peter Kaspar, Roman Kappeler, ETH Zürich (Switzerland); Fouad Karouta, Technische Univ. Eindhoven (Netherlands); Franck Robin, Patric Strasser, Heinz Jaeckel, ETH Zürich (Switzerland). . . . . [7031-09]

Coffee Break . . . . . 9:55 to 10:25 am

SESSION 4

Room: Conv. Ctr. 16A . . . . . .Thurs. 10:25 am to 12:10 pm

Emission Properties of Active Photonic Crystals II

Session Chair: **Ganapathi S. Subramania,** Sandia National Labs.

10:25 am: **Optics of photonic band gap crystals: Spontaneous emission control and ultrafast switching** *(Invited Paper)*, Willem Vos, Univ. Twente (Netherlands) and FOM Institute for Atomic and Molecular Physics (Netherlands) . . . . . [7031-10]

11:00 am: **Photonic crystal chips for optical communications and quantum information processing** *(Invited Paper)*, Dirk R. Englund, Jelena Vuckovic, Ilya Fushman, Andrei Faraon, Bryan Ellis, Stanford Univ. . [7031-11]

11:35 am: **Three-dimensional photonic crystals in quantum-dot-doped polymers** *(Invited Paper)*, Min Gu, Swinburne Univ. of Technology (Australia). . . . . [7031-12]

Lunch/Exhibition Break . . . . . 12:10 to 1:30 pm

SESSION 5

Room: Conv. Ctr. 16A . . . . . Thurs. 1:30 to 3:05 pm

Modeling and Simulation of Active Photonic Crystals

Session Chair: **Ali Adibi,** Georgia Institute of Technology

1:30 pm: **Design of infrared photodetectors enhanced by surface plasmons on periodic porous structures** *(Invited Paper)*, Wai Y. Leung, Xinhua Hu, Ming Li, Kai-Ming Ho, Iowa State Univ.; Shawn-Yu Lin, Rensselaer Polytechnic Institute . . . . . [7031-13]

2:05 pm: **Tuning the longitudinal and angular dispersion of photonic crystals for optical modulation, beam steering and sensing** *(Invited Paper)*, Wei Jiang, Rutgers Univ. . . . . [7031-14]

2:40 pm: **Photonic crystal defect tuning for optimized light-matter interaction**, Christopher Kang, Sharon M. Weiss, Vanderbilt Univ. . . . [7031-15]

Coffee Break . . . . . 3:05 to 3:30 pm

SESSION 6

Room: Conv. Ctr. 16A . . . . . Thurs. 3:30 to 5:40 pm

Tuning Active Photonic Crystals

Session Chair: **Sharon M. Weiss,** Vanderbilt Univ.

3:30 pm: **Engineering and tuning photonic crystal properties by atomic layer deposition and liquid crystal infiltration** *(Invited Paper)*, Elton Graugnard, Christopher J. Summers, D. P. Gaillot, J. Blair, Georgia Institute of Technology . . . . . [7031-16]

4:05 pm: **Nanofluidically active photonic crystals** *(Invited Paper)*, David Erickson, Cornell Univ. . . . . [7031-17]

4:40 pm: **Self-assembly of superparamagnetic colloids to tunable photonic crystals** *(Invited Paper)*, Yadong Yin, Univ. of California/ Riverside . . . . . [7031-18]

5:15 pm: **Functional periodically-poled crystals for powerful intracavity CW difference-frequency generation of widely tunable, high spectral purity IR radiation**, Paolo De Natale, Istituto Nazionale di Ottica Applicata (Italy) and European Lab. for Nonlinear Spectroscopy (Italy); Iacopo Galli, Univ. of Firenze (Italy) and Istituto Nazionale di Ottica Applicata (Italy); Giovanni Giusfredi, Davide Mazzotti, Pablo Cancio, Istituto Nazionale di Ottica Applicata (Italy) and European Lab. for Nonlinear Spectroscopy (Italy) . . . . . [7031-19]

Courses of Related Interest

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SC496 Fabrication and Processing of Nanostructures (Cao) Monday, 8:30 am to 5:30 pm
SC497 Nanophotonics (Prasad) Sunday, 1:30 to 5:30 pm
SC608 Photonic Crystals: A Crash Course, from Bandgaps to Fibers (Johnson) Wednesday, 8:30 am to 12:30 pm
WS851 Nanotechnology: Science & Applications (Brahmbhatt) Wednesday, 8:30 am to 5:30 pm

Conference 7032

Sunday-Wednesday 10-13 August 2008 • Proceedings of SPIE Vol. 7032

Plasmonics: Metallic Nanostructures and Their Optical Properties VI

Conference Chair: **Mark I. Stockman,** Georgia State Univ.

Program Committee: **Martin Aeschlimann,** Univ. Kaiserslautern (Germany); **David J. Bergman,** Tel Aviv Univ. (Israel); **Jochen Feldmann,** Ludwig-Maximilians-Univ. München (Germany); **Harald W. Giessen,** Univ. Stuttgart (Germany); **Naomi J. Halas,** Rice Univ.; **Martti Kauranen,** Tampere Univ. of Technology (Finland); **Satoshi Kawata,** Osaka Univ. (Japan); **Fritz Keilmann,** Max-Planck-Institut für Biochemie (Germany); **Victor I. Klimov,** Los Alamos National Lab.; **Aaron Lewis,** The Hebrew Univ. of Jerusalem (Israel); **Olivier J. F. Martin,** École Polytechnique Fédérale de Lausanne (Switzerland); **Martin Moskovits,** Univ. of California/Santa Barbara; **Peter J. Nordlander,** Rice Univ.; **Lukas Novotny,** Univ. of Rochester; **Motoichi Ohtsu,** The Univ. of Tokyo (Japan); **John B. Pendry,** Imperial College London (United Kingdom); **Lewis J. Rothberg,** Univ. of Rochester; **Vahid Sandoghdar,** ETH Zürich (Switzerland); **George C. Schatz,** Northwestern Univ.; **Tigran V. Shahbazyan,** Jackson State Univ.; **Vladimir M. Shalaev,** Purdue Univ.; **Gennady Shvets,** The Univ. of Texas at Austin; **Din Ping Tsai,** National Taiwan Univ. (Taiwan); **Nikolay I. Zheludev,** Univ. of Southampton (United Kingdom); **Joseph Zyss,** Ecole Normale Supérieure de Cachan (France)

Sunday 10 August

SESSION 1

Room: Conv. Ctr. 15A . . . . . Sun. 8:30 to 10:30 am

Special SESSION: Novel Trends in Nanoplasmonics I

Session Chair: **Mark I. Stockman,** Georgia State Univ.

8:30 am: **Plasmonic photovoltaics** *(Keynote Presentation),* Harry A. Atwater, Jr., California Institute of Technology . . . . . [7032-01]

9:15 am: **Plasmonics for SERS, SEIRA, and SERS-SEIRA: substrate design and applications** *(Keynote Presentation),* Naomi J. Halas, Rice Univ. . . . . [7032-02]

10:00 am: **Lasing spaser** *(Invited Paper)*, Nikolay I. Zheludev, Univ. of Southampton (United Kingdom); Sergey Prosvirnin, Institute of Radio Astronomy (Ukraine); Nikitas Papasimakis, Vassili Fedotov, Univ. of Southampton (United Kingdom) . . . . . [7032-03]

Coffee Break . . . . . 10:30 to 11:00 am

SESSION 2

Room: Conv. Ctr. 15A . . . . . Sun. 11:00 am to 1:00 pm

Plasmonic Nanoantennas I

Session Chair: **Harry A. Atwater, Jr.,** California Institute of Technology

11:00 am: **Comparison between loading and tuning of nanodipoles and nanodimers as optical nanoantennas** *(Invited Paper)*, Andrea Alu, Nader Engheta, Univ. of Pennsylvania. . . . . [7032-04]

11:30 am: **Short-wavelength field enhancement from nanoantennas**, Richard M. Osgood III, Brian R. Kimball, Gary Walsh, David Ziegler, Joel Carlson, Lauren Belton, U.S. Army Soldier Systems Ctr. . . . . [7032-05]

11:50 am: **Tuning the optical properties by engineering the topologic shape of Ag nanostructures**, Zhongyue Zhang, Univ. of Georgia . . [7032-06]

12:10 pm: **Coupled nanoscale resonances for subwavelength waveguides and antennas** *(Invited Paper)*, A. Femius Koenderink, Rene de Waele, Albert Polman, FOM Institute for Atomic and Molecular Physics (Netherlands) . . . . . [7032-07]

12:40 pm: **Resonant properties of metallic nanowire and stripe antennas**, Edward S. Barnard, Mark L. Brongersma, Stanford Univ. . . . . [7032-08]

Lunch Break . . . . . 1:00 to 2:00 pm

SESSION 3

Room: Conv. Ctr. 15A . . . . . Sun. 2:00 to 3:20 pm

Plasmonic Nanoantennas II

Session Chair: **A. Femius Koenderink,** FOM Institute for Atomic and Molecular Physics (Netherlands)

2:00 pm: **Optical nanoantennas control single molecule excitation and emission** *(Invited Paper)*, Tim H. Taminiau, Fernando F. Stefani, Niek F. van Hulst, Institut de Ciències Fotòniques (Spain) . . . . . [7032-09]

2:30 pm: **Nanostructured metallic electrodes for plasmonic optimized light-emitting diodes**, Ulf Geyer, Jurana Hetterich, Dongzhi Hu, Daniel M. Schaadt, Uli Lemmer, Univ. Karlsruhe (Germany). . . . . [7032-10]

2:50 pm: **Optical antennae** *(Invited Paper)*, Vladimir M. Shalaev, Reuben Bakker, Purdue Univ.; Alexandra Boltasseva, Rasmus Pedersen, Danmarks Tekniske Univ. (Denmark); Hsiao-Kuan Yuan, Zhengtong Liu, Alexander V. Kildishev, Vladimir P. Drachev, Purdue Univ. . . . . [7032-11]

Coffee Break . . . . . 3:20 to 3:50 pm

SESSION 4

Room: Conv. Ctr. 15A . . . . . Sun. 3:50 to 5:50 pm

Ultrafast Nanoplasmonics

Session Chair: **Nikolay I. Zheludev,** Univ. of Southampton (United Kingdom)

3:50 pm: **A nanometer-sized few femtosecond electron source at high-repetition rates** *(Invited Paper)*, Christoph Lienau, Carl von Ossietzky Univ. Oldenburg (Germany) . . . . . [7032-12]

4:20 pm: **Femtosecond coherent control of surface plasmon propagating direction**, SooBong Choi, Doo-Jae Park, YeoChan Yoon, Seoul National Univ. (South Korea); JiHoon Kang, Q-Han Park, Korea Univ. (South Korea); D. S. Kim, Seoul National Univ. (South Korea). . . . . [7032-13]

4:40 pm: **Femtosecond modulation of surface plasmon-polariton propagation**, Kevin F. MacDonald, Zsolt Samson, Nikolay I. Zheludev, Univ. of Southampton (United Kingdom); Mark I. Stockman, Georgia State Univ. . . . . [7032-14]

5:00 pm: **Control of surface plasmons with phase-correlated femtosecond light fields** *(Invited Paper)*, Atsushi Kubo, Univ. of Tsukuba (Japan); Hrvoje Petek, Univ. of Pittsburgh . . . . . [7032-15]

5:30 pm: **Time-resolved optical microscopy of single gold nanoparticles,** Anna L. Tchebotareva, Leiden Univ. (Netherlands); Peter Zijlstra, Swinburne Univ. of Technology (Australia); Markus Lippitz, Univ. Stuttgart (Germany); James W. M.Chon, Swinburne Univ. of Technology (Australia); Michel Orrit, Leiden Univ. (Netherlands) . . . . . [7032-16]

Room: Conv. Ctr. 6A . . . . . Sun. 6:00 to 6:45 pm

All-Conference Plenary Session

View plenary presentation details p. 13.

6:00 pm: **The Solar Decathlon: building a better future with solar energy**, Richard J. King, U.S. Dept. of Energy

Monday 11 August

Room: Conv. Ctr. 6A . . . . . Mon. 8:30 am to 12:20 pm

NanoScience + Engineering Plenary Session

View plenary presentation details p. 13-14.

8:30 am: **Revivals of Molecular Nonlinear Optics in Physics, Chemistry, and Life Sciences,** Joseph Zyss, École Normale Supérieure de Cachan (France)

9:10 am: **Applications of Biological Materials**, Rajesh R. Naik, Air Force Research Lab.

Coffee Break . . . . . 9:50 to 10:20 am

10:20 am: **Two-Photon Lithography for Precise 3D Nano/Micro-Objects**, Kwang-Sup Lee, Hannam Univ. (South Korea)

11:00 am: **Multifunctional Excimer-Laser Lithography and Photoablation Technologies for Large-Area Micro and Nanoelectronics, Displays and Microsystems**, Kanti Jain, Univ. of Illinois at Urbana-Champaign

11:40 am: **Molecules, Surfaces, and Symmetry: From Pure Geometry to Nanoscience,** Denis Fichou, Commissariat à l'Energie Atomique (France)

SESSION 5

Room: Conv. Ctr. 15A . . . . . Mon. 1:20 to 3:20 pm

Quantum Nanoplasmonics and Related Phenomena I

Session Chair: **Naomi J. Halas,** Rice Univ.

1:20 pm: **Non-local effects in the plasmons of strongly interacting nanoparticles, dimers, and waveguides** *(Invited Paper)*, Javier García de Abajo, Consejo Superior de Investigaciones Científicas (Spain). . . . . [7032-17]

1:50 pm: **Nanoplasmonic renormalization and enhancement of Coulomb interactions**, Maxim Durach, Anastasia Rusina, Georgia State Univ.; Victor I. Klimov, Los Alamos National Lab.; Mark I. Stockman, Georgia State Univ. . . . . [7032-18]

2:10 pm: **Coupling behaviors of surface plasmon on a one-dimension Ag grating with an InGaN/GaN dual-quantum-well structure**, Cheng-Yen Chen, Kun-Ching Shen, Zen-Da Mu, Chi-Feng Huang, Jhy-Yang Wang, Yen-Cheng Lu, Yean-Woei Kiang, Chih-Chung Yang, National Taiwan Univ. (Taiwan) . . . . . [7032-19]

2:30 pm: **Surface plasmon lifetime in metal nanostructures** *(Invited Paper)*, Tigran V. Shahbazyan, Jackson State Univ. . . . . [7032-20]

3:00 pm: **Surface plasmon-enhanced CdSe/ZnS nanocrystal wavelength conversion on a blue/green two-color light-emitting diode**, Dong-Ming Yeh, Chi-Feng Huang, Yen-Cheng Lu, Chih-Chung Yang, National Taiwan Univ. (Taiwan) . . . . . [7032-21]

Coffee Break . . . . . 3:20 to 3:40 pm

SESSION 6

Room: Conv. Ctr. 15A . . . . . Mon. 3:40 to 6:00 pm

Quantum Nanoplasmonics and Related Phenomena II

Session Chair: **Fransisco Javier García de Abajo,** Consejo Superior de Investigaciones Científicas (Spain)

3:40 pm: **Quantum optics and atomic physics using plasmonics** *(Invited Paper)*, Darrick E. Chang, Mikhail Lukin, Harvard Univ. . . . . [7032-22]

4:10 pm: **Imaging of plasmonic modes of nanostructures using high-resolution cathodoluminescence spectroscopy**, Pratik Chaturvedi, Keng H. Hsu, Anil Kumar, Univ. of Illinois at Urbana-Champaign; James C. Mabon, Frederick Seitz Materials Research Lab.; Nicholas X. Fang, Univ. of Illinois at Urbana-Champaign. . . . . [7032-23]

4:30 pm: **Compensation of loss and stimulated emission of surface plasmon polaritons** *(Invited Paper)*, M. A. Noginov, G. Zhu, M. Mayy, M. Bahoura, N. Noginova, Norfolk State Univ.; V. Podolskiy, Oregon State Univ. . . . . [7032-24]

5:00 pm: **Thermal emission from phonon-polariton resonant structures**, Jon A. Schuller, Thomas Taubner, Mark L. Brongersma, Stanford Univ. . . . . [7032-26]

5:20 pm: **Enhanced performance of high-power GaN LED by mediating surface plasmon polaritons**, Ki-young Choi, Jaewong Yoon, Seok-Ho Song, Hanyang Univ. (South Korea) . . . . . [7032-27]

5:40 pm: **Electroluminescence measurement from green LEDs mediated by surface plasmons**, Seok-Ho Song, Jaewoong Yoon, Ki-young Choi, Hanyang Univ. (South Korea); Jin-Hua Kim, SAMSUNG Electro-Mechanics Co., Ltd. (South Korea) . . . . . [7032-28]

Tuesday 12 August

SESSION 7

Room: Conv. Ctr. 15A . . . . . Tues. 8:30 to 10:20 am

Nanoplasmonic Sensing, Including SERS

Session Chair: **Niek F. van Hulst,** Institut de Ciències Fotòniques (Spain)

8:30 am: **Novel plasmonic nanodevices for single molecule detection** *(Invited Paper)*, Enzo M. di Fabrizio, Francesco De Angelis, Univ. degli studi Magna Græcia di Catanzaro (Italy) . . . . . [7032-92]

9:00 am: **Distance and molecular weight dependence of surface enhanced fluorescence in conjugated polymer thin films**, Michael S. Griffo, Sue A. Carter, Univ. of California/Santa Cruz . . . . . [7032-30]

9:20 am: **Multilayered nanospheres with optical tunability as probes for surface-enhanced Raman spectroscopy**, Anil K. Kodali, Rohit Bhargava, Univ. of Illinois at Urbana-Champaign . . . . . [7032-31]

9:40 am: **Fabrication of biosensor arrays and detection by surface-enhanced resonance Raman scattering**, Robert J. Stokes, Univ. of Strathclyde (United Kingdom) and Nanoink, Inc. IL; Duncan Graham, Univ. of Strathclyde (United Kingdom); Jason Haaheim, Tom Levesque, NanoInk, Inc.. . . . . [7032-33]

10:00 am: **Surface-enhanced Raman spectroscopy using a smooth planar metal surface with embedded nanocavities**, Kho K. Wei, National Cancer Ctr. of Singapore (Singapore) and National Univ. of Singapore (Singapore); Binte Ahmad Iman, Zhen Yu Koh, Ze Xiang Shen, Srinivasan Madhavi, Subodh Mhaisalkar, John W. Timothy, Nanyang Technological Univ. (Singapore); Malini Olivo, National Cancer Ctr. of Singapore (Singapore) . . . . . [7032-34]

Coffee Break . . . . . 10:20 to 10:50 am

SESSION 8

Room: Conv. Ctr. 15A . . . . . Tues. 10:50 am to 12:30 pm

Optical Functionalities in Plasmonics and Related Subjects

Session Chair: **Enzo M. di Fabrizio,** Univ. degli studi Magna Græcia di Catanzaro (Italy)

10:50 am: **Optical functionalities with plasmonic nanorod arrays** *(Invited Paper)*, Wayne Dickson, Paul Evans, Queen's Univ. Belfast (United Kingdom); Gregory Wurtz, Univ. of North Florida; Robert Pollard, Anatoly V. Zayats, Queen's Univ. Belfast (United Kingdom). . . . . [7032-35]

11:20 am: **Nanoparticle aggregation and relaxation effects in ferrofluids: studied through anisotropic light scattering**, Corneliu I. Rablau, Prem P. Vaishnava, Kettering Univ.; Gavin Lawes, Ratna Naik, C. Sudakar, Ronald Tacket, Wayne State Univ. . . . . [7032-36]

11:40 am: **Optical response of highly anisotropic metal nanoparticles**, Viktor Myroshnychenko, Consejo Superior de Investigaciones Científicas (Spain); Enrique Carbó-Argibay, Isabel Pastoriza-Santos, Jorge Pérez-Juste, Luis M. Liz-Marzán, Univ. de Vigo (Spain); Javier García de Abajo, Consejo Superior de Investigaciones Científicas (Spain) . . . . . [7032-37]

12:00 pm: **Plasmon resonances and field enhancement at light scattering by spherical particles with radial anisotropy** *(Invited Paper)*, Boris Luk'yanchuk, Data Storage Institute (Singapore); Chengwei Qiu, National Univ. of Singapore (Singapore). . . . . [7032-38]

Lunch/Exhibition Break . . . . . 12:30 to 2:00 pm

SESSION 9

Room: Conv. Ctr. 15A . . . . . Tues. 2:00 to 3:10 pm

Transfer and Concentration of Optical Energy on Nanoscale I

Session Chair: **Nader Engheta,** Univ. of Pennsylvania

2:00 pm: **Ultrasmall plasmonic nanocavities: using slow waves, slow light, and localized fields** *(Invited Paper)*, Meir Orenstein, Technion-Israel Institute of Technology (Israel) . . . . . [7032-39]

2:30 pm: **Application of a coherent supercontinuum light source to spectroscopy of plasmonic nanostructures**, Nathaniel K. Grady, Naomi J. Halas, Rice Univ. . . . . [7032-40]

2:50 pm: **Robust plasmon waveguides in nanowire arrays**, Alejandro Manjavacas, Consejo Superior de Investigaciones Cientificas (Spain); Javier García de Abajo, Consejo Superior de Investigaciones Científicas (Spain) . . . . . [7032-42]

Coffee Break . . . . . 3:10 to 3:40 pm

SESSION 10

Room: Conv. Ctr. 15A . . . . . Tues. 3:40 to 5:40 pm

Transfer and Concentration of Optical Energy on Nanoscale II

Session Chair: **Anatoly V. Zayats,** Queen's Univ. Belfast (United Kingdom)

3:40 pm: **Unidirectional signal transfer in quantum-dot systems via optical near-field interactions** *(Invited Paper)*, Wataru Nomura, Takashi Yatsui, Tadashi Kawazoe, The Univ. of Tokyo (Japan); Makoto Naruse, The Univ. of Tokyo (Japan) and National Insitute of Information and Communication Technology (Japan); Naoya Tate, Motoichi Ohtsu, The Univ. of Tokyo (Japan). . . . . [7032-43]

4:10 pm: **Properties of three-dimensional plasmonic slot waveguides**, Georgios Veronis, Louisiana State Univ.; Shanhui Fan, Stanford Univ.[7032-44]

4:30 pm: **Experimental verification of free space coupling to a novel leaky mode of a finite planar metal-insulator-metal plasmonic waveguide**, Jing Chen, Zahyun Ku, Gennady Smolyakov, Kevin Malloy, Univ. of New Mexico. . . . . [7032-45]

4:50 pm: **Nanofocusing of surface plasmons in metallic nanostructures: new developments and results** *(Invited Paper)*, Dmitri K. Gramotnev, Queensland Univ. of Technology (Australia); David F. P. Pile, Univ. of California/Berkeley; Michael W. Vogel, Queensland Univ. of Technology (Australia). . . . . [7032-46]

5:20 pm: **Plasmon resonances in finite length MIM cavities**, Anu Chandran, Justin White, Edward Barnard, Mark Brongersma, Geballe Lab. for Advanced Materials . . . . . [7032-47]

Wednesday 13 August

SESSION 11

Room: Conv. Ctr. 15A . . . . . Wed. 8:00 to 10:10 am

Plasmonic Properties of Complex Nanostructures

Session Chair: **Meir Orenstein,** Technion-Israel Institute of Technology (Israel)

8:00 am: **Electromagnetic eigenstates of finite cylinders and cylinder-clusters: application to macroscopic response of metamaterials** *(Invited Paper)*, David J. Bergman, Tel Aviv Univ. (Israel) . . . . . [7032-48]

8:30 am: **Plasmonic nanostructures: artificial molecules** *(Invited Paper)*, Peter J. Nordlander, Rice Univ.. . . . . [7032-49]

9:00 am: **Resonant modes of plasmonic core-shell nanowires**, Carrie E. Hofmann, California Institute of Technology; Rene de Waele, California Institute of Technology and FOM Institute for Atomic and Molecular Physics (Netherlands); Anna M. Hiszpanski, Stanley Burgos, Michael A. Filler, Brendan M. Kayes, California Institute of Technology; F. Javier Garcia de Abajo, Consejo Superior de Investigaciones Cientificas (Spain); Harry A. Atwater, Jr., California Institute of Technology . . . . . [7032-50]

9:20 am: **Exploiting field-enhancement in gold nanoparticle aggregates** *(Invited Paper)*, Jochen Feldmann, Ludwig-Maximilians-Univ. München (Germany) . . . . . [7032-51]

9:50 am: **Differential scattering cross-section and electromagnetic local density of states of nanoantennas**, Alexandre Bouhelier, Caijin Huang, Gérard Colas des Francs, Alain Dereux, Univ. de Bourgogne (France)[7032-52]

Coffee Break . . . . . 10:10 to 10:40 am

SESSION 12

Room: Conv. Ctr. 15A . . . . . Wed. 10:40 am to 12:20 pm

NanoMeta

Session Chair: **Vladimir M. Shalaev,** Purdue Univ.

10:40 am: **Multidimensional metallic metamaterials and their coupling properties** *(Invited Paper)*, Harald W. Giessen, Na Liu, Hongcang Guo, Univ. Stuttgart (Germany). . . . . [7032-53]

11:10 am: **Computational methods for plasmonic and tunable photonic crystals**, Igor Tsukerman, Frantisek Cajko, The Univ. of Akron . . . . . [7032-54]

11:30 am: **From nano to meta: plasmonic waveguides and their characterization in different parts of the spectrum** *(Invited Paper)*, Stefan A. Maier, Imperial College (United Kingdom). . . . . [7032-55]

12:00 pm: **Omnidirectional absorption in nanostructured metal surfaces**, Javier García de Abajo, Tatiana V. Teperik, Consejo Superior de Investigaciones Científicas (Spain); Andrei G. Borisov, Univ. Paris-Sud-XI (France); Y. Sugawara, Jeremy J. Baumberg, M. Abdelsalam, P. N. Bartlett, Univ. of Southampton (United Kingdom) . . . . . [7032-56]

Lunch/Exhibition Break . . . . . 12:20 to 1:30 pm

SESSION 13

Room: Conv. Ctr. 15A . . . . . Wed. 1:30 to 3:00 pm

Special SESSION: Nonlinear and Ultrafast Nanoplasmonics

Session Chair: **Peter J. Nordlander,** Rice Univ.

1:30 pm: **Role of local fields and defects in the nonlinear response of metal nanostructures** *(Invited Paper)*, Martti Kauranen, Hannu Husu, Sami Kujala, Brian K. Canfield, Tampere Univ. of Technology (Finland); Janne Laukkanen, Benfeng Bai, Markku Kuittinen, Jari Turunen, Joensuun Yliopisto (Finland); Juha Kontio, Jukka Viheriälä, Tapio Niemi, Tampere Univ. of Technology (Finland); Eric Chandler, Jeff A. Squier, Colorado School of Mines . . . . . [7032-57]

2:00 pm: **Ultrafast adaptive optical near-field control in nanoplasmonic** *(Invited Paper)*, Martin Aeschlimann, Univ. Kaiserslautern (Germany) [7032-58]

2:30 pm: **Ultrafast local investigations of plasmonic structures** *(Invited Paper)*, Laurens Kuipers, FOM Institute for Atomic and Molecular Physics (Netherlands) . . . . . [7032-59]

Coffee Break . . . . . 3:00 to 3:30 pm

SESSION 14

Room: Conv. Ctr. 15A . . . . . Wed. 3:30 to 5:30 pm

Special Session: Novel Trends in Nanoplasmonics II

Session Chair: **Harald W. Giessen,** Univ. Stuttgart (Germany)

3:30 pm: **Mid-infrared semiconductor metamaterials** *(Invited Paper)*, Claire F. Gmachl, Princeton Univ. . . . . [7032-60]

4:00 pm: **Efficient interaction of single emitters with free photons using optical antennas** *(Invited Paper)*, Mario Agio, Nassiredin Mojarad, Gert H. Zumofen, Vahid H. Sandoghdar, ETH Zürich (Switzerland) . . . . . [7032-61]

4:30 pm: **Non-reciprocal nanoplasmonics and high-index metamaterials** *(Invited Paper)*, Shanhui Fan, Stanford Univ. . . . . [7032-62]

5:00 pm: **Near-field studies of surface plasmon generation: optical and terahertz studies** *(Invited Paper),* Dai-sik Kim, Hyun Woo Kihm, Kwang-Geol Lee, Min Ah Seo, Seoul National Univ. (South Korea); A. J. L. Adam, Technische Univ. Delft (Netherlands); JiHoon Kang, Korea Univ. (South Korea); Kwang Jun Ahn, Seoul National Univ. (South Korea); Q-Han Park, Korea Univ. (South Korea); P.C.M. Planken, Technische Univ. Delft (Netherlands) [7032-63]

Room: Conv. Ctr. Exhibit Hall B2 . . . . . Wed. 5:30 to 7:00 pm

Posters-Wednesday

Poster authors will begin displaying posters after 10:00 am Wednesday morning. A poster session, with authors present at their posters, will be held Wednesday evening from 5:30 to 7:00 pm. Light refreshments will be served.

Poster Setup

Poster presenters must set up their posters between 10:00 am and 5:00 pm on Wednesday. Poster presenters who have not set up by 5:00 pm on Wednesday will be considered a "no show" and their manuscript will not be published. Presenters must remove their posters immediately after the poster session. Posters not removed will be considered unwanted and will be discarded. SPIE assumes no responsibility for posters left up after the end of each poster session.

Dipolar description for the interaction between metal nanoparticles, Armando P. Leija, Javier Muñoz-López, Gabriel Martínez-Nicononoff, Instituto Nacional de Astrofísica, Óptica y Electrónica (Mexico). . . . . [7032-86]

Scattering of electromagnetic waves by small magnetic ellipsoidal particles, Gautam Mukhopadhyay, Shruti R. Puri, Indian Institute of Technology Bombay (India). . . . . [7032-87]

Study of surface plasmon statistics by optical methods, Daniel Oszetzky, Norbert Kroo, Attila Nagy, Aladár Czitrovszky, Magyar Tudományos Akadémia Szilárdtestfizikai és Optikai (Hungary) . . . . . [7032-88]

Fabry-Perot resonance in slit and grooves in the enhanced transmission through a single subwavelength slit, Zu-Bin Li, Yi-Hong Yang, Wen-Yuan Zhou, Jian-Guo Tian, Nankai Univ. (China) . . . . . [7032-89]

Nanoscale melting and ablation using near-field plasmonic effects of gold nanorods on silicon, Rick K. Harrison, Nick Durr, Adela Ben-Yakar, The Univ. of Texas at Austin . . . . . [7032-90]

A sensitivity study of the localised surface plasmon resonance of high definition structured silver nanoparticles in solution, Denise Charles, Trinity College Dublin (Ireland); Patrick Fournet, Stephen Cunningham, National Univ. of Ireland, Galway (Ireland); Deirdre Ledwith, John Kelly, Werner J. Blau, Trinity College Dublin (Ireland); Margaret B. Fournet, National Univ. of Ireland Galway (Ireland) . . . . . [7032-91]

Thursday 14 August

SESSION 15

Room: Conv. Ctr. 15A . . . . . Thurs. 8:00 to 10:30 am

Plasmonic Sensing and Enhancement

Session Chair: **Dai-sik Kim,** Seoul National Univ. (South Korea)

8:00 am: **Nanophotonics bio-sensor using gold nanostructure** *(Invited Paper)*, Masayuki Naya, Takeharu Tani, Yuichi Tomaru, Jingbo Li, Naoki Murakami, Fuji Photo Film Co., Ltd. (Japan) . . . . . [7032-64]

8:30 am: **Development of a sensitive pH Sensor based on metal enhanced fluorescence**, Ravi K. Kannadorai, Anand K. Asundi, Nanyang Technological Univ. (Singapore) . . . . . [7032-65]

8:50 am: **Surface-plasmon-enhanced electric fields in two-dimensionally periodic gold-nanodisk arrays**, Ward L. Johnson, Sudook A. Kim, National Institute of Standards and Technology; Zhandos N. Utegulov, Univ. of Nebraska/Lincoln; Bruce T. Draine, Princeton Univ.. . . . . [7032-66]

9:10 am: **Dependence of the multiphoton luminescence spectrum of single gold nanoparticles on the refractive index of the surrounding medium**, Michael Ruosch, Dominik Marti, Patrick Stoller, Jaroslav Ricka, Martin Frenz, Univ. Bern (Switzerland) . . . . . [7032-67]

9:30 am: **The effect of breaking spherical symmetry on metallodielectric nanoparticles**, Mark W. Knight, Peter Nordlander, Naomi J. Halas, Rice Univ. . . . . [7032-68]

9:50 am: **Plasmonic properties of hybrid metallic ring disk systems**, Feng Hao, Rice Univ.; Stefan A. Maier, Imperial College (United Kingdom); Peter J. Nordlander, Rice Univ. . . . . [7032-69]

10:10 am: **Groove and wedge plasmonic waveguides: analysis and comparison**, Dmitri K. Gramotnev, Queensland Univ. of Technology (Australia); David F. P. Pile, Univ. of California/Berkeley. . . . . [7032-70]

Coffee Break . . . . . 10:30 to 11:00 am

SESSION 16

Room: Conv. Ctr. 15A . . . . . Thurs. 11:00 am to 12:30 pm

Laser-Induced Processes and Nonlinear Nanoplasmonics

Session Chair: **Martti Kauranen,** Tampere Univ. of Technology (Finland)

11:00 am: **Laser-induced growth of monodisperse silver nanoparticles with tunable SPR properties and wavelength self-limiting effect** *(Invited Paper)*, John R. Lombardi, Xianliang Zheng, City College/CUNY. . . . [7032-71]

11:30 am: **Multipolar tensor analysis of second-harmonic radiation from gold nanoparticles**, Sami Kujala, Brian K. Canfield, Martti Kauranen, Tampere Univ. of Technology (Finland); Yuri Svirko, Jari Turunen, Joensuun Yliopisto (Finland). . . . . [7032-72]

11:50 am: **Enhanced optical trapping of nanoshells near resonance**, Brooke C. Hester, Rani B. Kishore, Kristian Helmerson, National Institute of Standards and Technology; Carly Levin, Naomi J. Halas, Rice Univ.. [7032-73]

12:10 pm: **Nonlinear optical properties of thin gold films and individual nanoholes**, Serge Grabtchak, Joe Cole, Nikolay Mirin, Naomi Halas, Rice Univ. . . . . [7032-74]

Lunch Break . . . . . 12:30 to 1:30 pm

SESSION 17

Room: Conv. Ctr. 15A . . . . . Thurs. 1:30 to 3:00 pm

Phenomena in Nanoplasmonics I

Session Chair: **John R. Lombardi,** City College/CUNY

1:30 pm: **Plasmon scanner and multiplexer** *(Invited Paper)*, Vitalii Vlasko-Vlasov, Alexandra Imre, John Pearson, Jon Hiller, Ulrich Welp, Argonne National Lab. . . . . [7032-75]

2:00 pm: **Design considerations of selective polariton generators for multi-state plasmonic devices**, Nemanya Sedoglavich, Rainer Künnemeyer, The Univ. of Waikato (New Zealand); John C. Sharpe, The Horticulture and Food Research Institute of New Zealand Ltd. (New Zealand). . . . . [7032-76]

2:20 pm: **Fabrication and magneto-optical response of Au-Bi:YIG films**, Ritnaro Fujikawa, Alexander Baryshev, Alexander Khanikaev, Jooyoung Kim, Hironaga Uchida, Mitsuteru Inoue, Toyohashi Univ. of Technology (Japan). . . . . [7032-77]

2:40 pm: **Fluorescence enhancement in tris(8-quinolinolato)-aluminum (Alq_3)**, Wenming Li, Intematix Corp.; Shanlin Pan, Univ. of Texas at Austin; Lewis J. Rothberg, Univ. of Rochester . . . . . [7032-78]

Coffee Break . . . . . 3:00 to 3:30 pm

SESSION 18

Room: Conv. Ctr. 15A . . . . . Thurs. 3:30 to 5:30 pm

Phenomena in Nanoplasmonics II

Session Chair: **Masayuki Naya,** FUJIFILM Corp. (Japan)

3:30 pm: **Femtosecond shape transformation dynamics of silver nanoparticles in glass**, Ahmet A. Unal, Andrei Stalmashonak, Gerhard Seifert, Heinrich Graener, Martin-Luther Univ. Halle-Wittenberg (Germany). . [7032-80]

3:50 pm: **Optical and magnetic properties of hexagonal arrays of sub-wavelength holes in thin metal films**, Georgios Ctistis, Piotr Patoka, Jaroslaw Gutek, Stiftung Caesar (Germany); Evangelos Papaioannou, Paul Fumagalli, Freie Univ. Berlin (Germany); Michael Giersig, Stiftung Caesar (Germany) . . . . . [7032-81]

4:10 pm: **Engineering surface plasmon-polaritons with hetero-dielectric nanolayers**, Junpeng Guo, Ronen Adato, The Univ. of Alabama in Huntsville. . . . . [7032-82]

4:30 pm: **A universal mechanism of absorption anomalies induced by leaky surface-plasmon resonances**, Jaewoong Yoon, Seok-Ho Song, Ki-young Choi, Kang-hee Seol, Yang Hyun Joo, Hanyang Univ. (South Korea) . . . . . [7032-83]

4:50 pm: **Magnetoplasmonic enhancement of magnetooptical Kerr effect in 2D and 3D metallic magnetophotonic crystals**, Alexander G. Zhdanov, Alexander A. Ezhov, Kirill Napolsky, Andrey A. Fedyanin, Lomonosov Moscow State Univ. (Russia); Alexander Baryshev, H. Uchida, Mitsuteru Inoue, Toyohashi Univ. of Technology (Japan) . . . . . [7032-84]

5:10 pm: **Demonstration of multilayer titanium photonic crystals with the 100nm feature size**, Shih-Chiun Wu, Chuan-Ding Lin, National Nano Device Labs. (Taiwan); Yu-Lin Yang, National Chiao Tung Univ. (Taiwan); Jing-Shian Chen, National Nano Device Labs. (Taiwan); Yang-Tung Huang, National Chiao Tung Univ. (Taiwan). . . . . [7032-85]

Courses of Related Interest

See SPIE Cashier for information and to register.

SC496 Fabrication and Processing of Nanostructures (Cao) Monday, 8:30 am to 5:30 pm
SC497 Nanophotonics (Prasad) Sunday, 1:30 to 5:30 pm
SC727 Nanoplasmonics (Stockman) Thursday, 8:30 am to 5:30 pm
WS851 Nanotechnology: Science & Applications (Brahmbhatt) Wednesday, 8:30 am to 5:30 pm

Conference 7033

Sunday-Thursday 10-14 August 2008 • Proceedings of SPIE Vol. 7033

Plasmonics: Nanoimaging, Nanofabrication, and Their Applications IV

Conference Chairs: **Satoshi Kawata,** Osaka Univ. (Japan); **Vladimir M. Shalaev,** Purdue Univ.; **Din Ping Tsai,** National Taiwan Univ. (Taiwan)

Program Committee: **Harry A. Atwater, Jr.,** California Institute of Technology; **David J. Bergman,** Tel Aviv Univ. (Israel); **Sergey I. Bozhevolnyi,** Aalborg Univ. (Denmark); **Nader Engheta,** Univ. of Pennsylvania; **Jochen Feldmann,** Ludwig-Maximilians-Univ. München (Germany); **Naomi J. Halas,** Rice Univ.; **Teruya Ishihara,** RIKEN (Japan); **Fritz Keilmann,** Max-Planck-Institut für Biochemie (Germany); **Pieter G. Kik,** College of Optics & Photonics/Univ. of Central Florida; **Victor I. Klimov,** Los Alamos National Lab.; **Joachim R Krenn,** Karl-Franzens-Univ. Graz (Austria); **Aaron Lewis,** The Hebrew Univ of Jerusalem (Israel); **Olivier J. F. Martin,** École Polytechnique Fédérale de Lausanne (Switzerland); **Martin Moskovits,** Univ. of California/Santa Barbara; **Peter J. Nordlander,** Rice Univ.; **Masaya Notomi,** NTT Basic Research Labs. (Japan); **Lukas Novotny,** Univ. of Rochester; **Motoichi Ohtsu,** The Univ. of Tokyo (Japan); **Joseph W. Perry,** Georgia Institute of Technology; **Lewis J. Rothberg,** Univ. of Rochester; **Vahid Sandoghdar,** ETH Zürich (Switzerland); **George C. Schatz,** Northwestern Univ.; **Tigran V. Shahbazyan,** Jackson State Univ.; **Mark I. Stockman,** Georgia State Univ.; **Xiang Zhang,** Univ. of California/Berkeley; **Nikolay I. Zheludev,** Univ. of Southampton (United Kingdom)

Sunday 10 August

SESSION 1

Room: Conv. Ctr. 15B . . . . . Sun. 8:00 to 11:10 am

Nanofabrication and Lithography

Session Chair: **Thomas A. Klar,** Ludwig-Maximilians-Univ. München (Germany)

8:00 am: **Designing hierarchical plasmonic materials** *(Invited Paper)*, Teri W. Odom, Northwestern Univ. . . . . [7033-01]

8:30 am: **Fabrication of metallic nanostructures with combination of laser nanolithography and selected surface metallization** *(Invited Paper)*, Xuan-Ming Duan, Technical Institute of Physics and Chemistry (China); Wei-Kang Wang, Yao-Yu Cao, Xian-Zi Dong, Technical Institute of Physics and Chemistry (China) and Graduate School of Chinese Academy of Sciences (China); Wei-Qiang Chen, Zhen-Sheng Zhao, Technical Institute of Physics and Chemistry (China) . . . . . [7033-02]

9:00 am: **Fabricating plasmonic components for nanophotonics** *(Invited Paper)*, Alexandra Boltasseva, Rasmus B. Nielsen, Anders Kristensen, Danmarks Tekniske Univ. (Denmark) . . . . . [7033-03]

9:30 am: **Parallel architecture based on optical near-field interaction** *(Invited Paper)*, Naoya Tate, Wataru Nomura, The Univ. of Tokyo (Japan); Takashi Yatsui, Japan Science and Technology Agency (Japan); Makoto Naruse, National Institute of Information and Communications Technology (Japan); Motoichi Ohtsu, The Univ. of Tokyo (Japan) . . . . . [7033-04]

Coffee Break . . . . . 10:00 to 10:30 am

10:30 am: **Photochemical nanoscale patterning with Rhodamine 6G dye from aqueous phase**, Aschalew S. Kassu, Jean Michel Taguenang, Fernando Calzzani, Jr., Redahegn Sileshi, Anup Sharma, Alabama A&M Univ. . [7033-05]

10:50 am: **Nanoparticle growth on self-assembled monolayers of ferrocene-substituted terpyridine,** Frank Hubenthal, Frank Träger, Univ. Kassel (Germany) . . . . . [7033-06]

SESSION 2

Room: Conv. Ctr. 15B . . . . . Sun. 11:10 am to 12:10 pm

Plasmonic Spectroscopy I

Session Chair: **Yuh-Lin Wang,** Academia Sinica (Taiwan)

11:10 am: **Surface-enhanced Raman spectroscopy on nanolithography-prepared substrates** *(Invited Paper)*, Eric C. Le Ru, Pablo G. Etchegoin, Victoria Univ. of Wellington (New Zealand); Johan Grand, Nordin Félidj, Jean Aubard, Georges Lévi, Univ. Paris 7-Denis Diderot (France); Andrea Hohenau, Joachim R. Krenn, Karl-Franzens-Univ. Graz (Austria) . . . . . [7033-07]

11:40 am: **Plasmonic interactions in surface-enhanced spectroscopy and microscopy** *(Invited Paper)*, Javier Aizpurua, Consejo Superior de Investigaciones Científicas (Spain) . . . . . [7033-08]

Lunch Break . . . . . 12:10 to 1:40 pm

SESSION 3

Room: Conv. Ctr. 15B . . . . . .Sun. 1:40 to 3:00 pm

Plasmonic Spectroscopy II

Session Chair: **Yuh-Lin Wang,** Academia Sinica (Taiwan)

1:40 pm: **Nanoscale characterization and spectroscopy of strained silicon** *(Invited Paper)*, Norihiko Hayazawa, Masashi Motohashi, Alvarado Tarun, Satoshi Kawata, The Institute of Physical and Chemical Research (RIKEN) (Japan). . . . . [7033-09]

2:10 pm: **Probing the plasmonic local density of states with electron energy loss spectroscopy** *(Invited Paper)*, Javier García de Abajo, Consejo Superior de Investigaciones Científicas (Spain); Mathieu Kociak, CNRS (France) . . . . . [7033-10]

2:40 pm: **Highly efficient tip-enhanced Raman spectroscopy in depolarized configuration**, Alvarado Tarun, The Institute of Physical and Chemical Research (RIKEN) (Japan); Masashi Motohashi, The Institute of Physical and Chemical Research (RIKEN) (Japan) and Osaka Univ. (Japan); Norihiko Hayazawa, The Institute of Physical and Chemical Research (RIKEN) (Japan); Satoshi Kawata, The Institute of Physical and Chemical Research (RIKEN) (Japan) and Osaka Univ. (Japan). . . . . [7033-11]

Coffee Break . . . . . 3:00 to 3:30 pm

SESSION 4

Room: Conv. Ctr. 15B . . . . . .Sun. 3:30 to 5:40 pm

Nano-imaging I

Session Chair: **Satoshi Kawata,** Osaka Univ. (Japan)

3:30 pm: **Attosecond nanoplasmonic field microscope** *(Invited Paper)*, Mark I. Stockman, Georgia State Univ.; Matthias F. Kling, Max-Planck-Institut für Quantenoptik (Germany); Ulf Kleineberg, Ludwig-Maximilians-Univ. München (Germany); Ferenc Krausz, Max-Planck-Institut für Quantenoptik (Germany) . . . . . [7033-12]

4:00 pm: **Ultrahigh resolution Raman imaging by optically trapped dielectric microsphere** *(Invited Paper)*, Ze Xiang Shen, Nanyang Technological Univ. (Singapore). . . . . [7033-13]

4:30 pm: **UHV-based TERS toward single molecule detection**, Bruno Pettinger, Jens Steidtner, Fritz-Haber-Institut der Max-Planck-Gesellschaft (Germany) . . . . . [7033-14]

4:50 pm: **Advanced resonant nanoantenna probes for single molecule imaging**, Lars Neumann, Tim Taminiau, Niek F. van Hulst, Institut de Ciències Fotòniques (Spain). . . . . [7033-15]

5:10 pm: **Nanofocusing and dispersion control in plasmonic waveguides** *(Invited Paper),* Ewold Verhagen, FOM Institute AMOLF (Netherlands); Jennifer A. Dionne, Harry A. Atwater, California Institute of Technology; L. (Kobus) Kuipers, Albert Polman, FOM Institute AMOLF (Netherlands) . . . . . [7033-16]

Room: Conv. Ctr. 6A . . . . . Sun. 6:00 to 6:45 pm

All-Conference Plenary Session

View plenary presentation details p. 13.

6:00 pm: **The Solar Decathlon: building a better future with solar energy**, Richard J. King, U.S. Dept. of Energy

Monday 11 August

Room: Conv. Ctr. 6A . . . . . .Mon. 8:30 am to 12:20 pm

NanoScience + Engineering Plenary Session

View plenary presentation details p. 13-14.

8:30 am: **Revivals of Molecular Nonlinear Optics in Physics, Chemistry, and Life Sciences,** Joseph Zyss, École Normale Supérieure de Cachan (France)

9:10 am: **Applications of Biological Materials**, Rajesh R. Naik, Air Force Research Lab.

Coffee Break . . . . . 9:50 to 10:20 am

10:20 am: **Two-Photon Lithography for Precise 3D Nano/Micro-Objects**, Kwang-Sup Lee, Hannam Univ. (South Korea)

11:00 am: **Multifunctional Excimer-Laser Lithography and Photoablation Technologies for Large-Area Micro and Nanoelectronics, Displays and Microsystems**, Kanti Jain, Univ. of Illinois at Urbana-Champaign

11:40 am: **Molecules, Surfaces, and Symmetry: From Pure Geometry to Nanoscience,** Denis Fichou, Commissariat à l'Energie Atomique (France)

SESSION 5

Room: Conv. Ctr. 15B . . . . . Mon. 1:30 to 3:10 pm

Nano-imaging II

Session Chair: **Ze Xiang Shen,** Nanyang Technological Univ. (Singapore)

1:30 pm: **Nanoscale coupling effects on single particle microscopy** *(Invited Paper)*, Kevin L. Shuford, Kent A. Meyer, William B. Whitten, Robert W. Shaw, Oak Ridge National Lab. . . . . [7033-17]

2:00 pm: **Imaging with a nanohole array** *(Invited Paper)*, Fu Min Huang, Tsung Sheng Kao, Vassili Fedotov, Nikolay I. Zheludev, Univ. of Southampton (United Kingdom) . . . . . [7033-18]

2:30 pm: **Surface-enhanced Raman imaging of living cells with gold nanoparticles**, Katsumasa Fujita, Sawako Ishitobi, Taro Ichimura, Keisaku Hamada, Yasushi Inouye, Satoshi Kawata, Osaka Univ. (Japan) . . . . [7033-19]

2:50 pm: **Image living cell membranes via surface plasmon phase microscopy and surface plasmon-enhanced total-internal-reflection fluorescent microscopy**, Y.-D. Su, Shean-Jen Chen, National Cheng Kung Univ. (Taiwan) . . . . . [7033-20]

Coffee Break . . . . . 3:10 to 3:40 pm

SESSION 6

Room: Conv. Ctr. 15B . . . . . Mon. 3:40 to 5:10 pm

Nanosensing

Session Chair: **Teri W. Odom,** Northwestern Univ.

3:40 pm: **Plasmon hybridisation at metal nanostructures as a route to sensitive optical detection** *(Invited Paper)*, Duncan S. Sutherland, Åarhus Univ. (Denmark) . . . . . [7033-21]

4:10 pm: **An effective core-shell nanostructure for SERS biosensing application**, Li-Lin Tay, National Research Council Canada (Canada); Ping-Ji Huang, Lai-Kwan Chau, National Chung Cheng Univ. (Taiwan) . . . . . [7033-22]

4:30 pm: **Self-assembled monolayers on gold nanospheres studied by optical second-harmonic generation**, Tatsuya Yamaguchi, Kotaro Kajikawa, Tokyo Institute of Technology (Japan) . . . . . [7033-23]

4:50 pm: **Coupled waveguide-surface plasmon resonance biosensor with dual-duty-cycle subwavelength grating**, C.-Y. Lin, Shean-Jen Chen, National Cheng Kung Univ. (Taiwan) . . . . . [7033-24]

Tuesday 12 August

SESSION 7

Room: Conv. Ctr. 15B . . . . . .Tues. 8:00 to 10:00 am

Manipulation of Plasmonic Effects I

Session Chair: **Vladimir M. Shalaev,** Purdue Univ.

8:00 am: **Spectral and spatial mode engineering of plasmonic cavities and waveguides** *(Invited Paper)*, Stefan A. Maier, Imperial College London (United Kingdom) . . . . . [7033-25]

8:30 am: **Nanoplasmonics in near-field optics and active coupling** *(Invited Paper)*, Abdulhakem Y. Elezzabi, Michael C. Quong, Univ. of Alberta (Canada) . . . . . [7033-26]

9:00 am: **Integrated surface plasmon routing** *(Invited Paper)*, Alexandre Bouhelier, Sébastien Massenot, Jonathan Grandidier, Gérard Colas des Francs, Laurent Markey, Jean-Claude Weeber, Alain Dereux, Univ. de Bourgogne (France) . . . . . [7033-27]

9:30 am: **Nanophotonic components utilizing channel plasmon polaritons** *(Invited Paper)*, Valentyn S. Volkov, Aalborg Univ. (Denmark) . . . . . [7033-28]

Coffee Break . . . . . 10:00 to 10:30 am

SESSION 8

Room: Conv. Ctr. 15B . . . . . .Tues. 10:30 am to 12:00 pm

Manipulation of Plasmonic Effects II

Session Chair: **Stefan A. Maier,** Univ. of Bath (United Kingdom)

10:30 am: **Surface plasmon generation and detection with integrated organic semiconductor devices** *(Invited Paper)*, Joachim R. Krenn, Karl-Franzens-Univ. Graz (Austria) . . . . . [7033-29]

11:00 am: **Plasmonic waveguides with wavelength selective function** *(Invited Paper)*, Masanobu Haraguchi, Yosuke Matsuzaki, Tatsuro Tsuzura, Toshihiro Okamoto, Masuo Fukui, The Univ. of Tokushima (Japan); Kazumasa Okamoto, Shu Seki, Seiichi Tagawa, Osaka Univ. (Japan) . . . . . [7033-30]

11:30 am: **Terahertz wave propagation in structured metals** *(Invited Paper)*, Masanori Hangyo, Keisuke Takano, Kyoji Shibuya, Osaka Univ. (Japan); Fumiaki Miyamaru, Shinshu Univ. (Japan); Hiroshi Miyazaki, Tohoku Univ. (Japan) . . . . . [7033-31]

Lunch/Exhibition Break . . . . . 12:00 to 1:30 pm

SESSION 9

Room: Conv. Ctr. 15B . . . . . .Tues. 1:30 to 3:00 pm

Manipulation of Plasmonic Effects III

Session Chair: **George C. Schatz,** Northwestern Univ.

1:30 pm: **Near-field optical phase antennas for long-range plasmon coupling** *(Invited Paper)*, Alberto G. Curto, Javier García de Abajo, Consejo Superior de Investigaciones Científicas (Spain) . . . . . [7033-32]

2:00 pm: **Efficient transmission through a plasmonic T-branch with a dip structure in metal gap optical waveguides**, Junichi Takahara, Masato Nishimori, Tadao Nagatsuma, Osaka Univ. (Japan) . . . . . [7033-33]

2:20 pm: **Tuning the polarization state of enhanced transmission and phase resonances in compound gratings and other plasmonic crystal structures**, David T. Crouse, City College/CUNY . . . . . [7033-34]

2:40 pm: **Focusing of light beyond the diffraction limit and application for photolithography**, Kuan-Ren Chen, National Cheng Kung Univ. (Taiwan) . . . . . [7033-35]

Coffee Break . . . . . 3:00 to 3:30 pm

SESSION 10

Room: Conv. Ctr. 15B . . . . . Tues. 3:30 to 5:30 pm

Plasmonics I

Session Chair: **Che Ting Chan,** Hong Kong Univ. of Science and Technology (Hong Kong China)

3:30 pm: **Nanoparticle optical property modeling** *(Invited Paper)*, George C. Schatz, Jeffrey McMahon, Ariel Atkinson, Shuzhou Li, Northwestern Univ. . . . . [7033-36]

4:00 pm: **Metallic nanoparticle arrays: a common substrate for both SERS and SEIRA** *(Invited Paper)*, Peter J. Nordlander, Rice Univ. . . [7033-37]

4:30 pm: **Plasmonic coupling of silver nanoparticle arrays with sub-10nm gaps** *(Invited Paper)*, Juen-Kai Wang, National Taiwan Univ. (Taiwan) . . . . . [7033-38]

5:00 pm: **Beyond gold nanospheres for plasmonic applications** *(Invited Paper)*, Michael J. Ford, Mike Cortie, Nadine Harris, Annette Dowd, Abbas Maaroof, Univ. of Technology/Sydney (Australia) . . . . . [7033-39]

Wednesday 13 August

SESSION 11

Room: Conv. Ctr. 15B . . . . . .Wed. 8:00 to 11:30 am

Plasmonics II

Session Chair: **Hirokazu Hori,** Univ. of Yamanashi (Japan)

8:00 am: **Light-induced forces in plasmonic spheres** *(Invited Paper)*, Che Ting Chan, Tse-Fai J. Ng, Hong Kong Univ. of Science and Technology (Hong Kong China). . . . . [7033-40]

8:30 am: **Cooperative plasmon-mediated fluorescence near a metal nanoparticle** *(Invited Paper)*, Tigran V. Shahbazyan, Vitaliy N. Pustovit, Jackson State Univ. . . . . [7033-41]

9:00 am: **Surface plasmons, absorption and emission in gold-silica-dye hybrid nanoparticles** *(Invited Paper)*, A. M. Belgrave, Norfolk State Univ.; Erik Herz, Ulrich Wiesner, Cornell Univ.; G. Zhu, M. A. Noginov, Norfolk State Univ. . . . . [7033-42]

9:30 am: **Noble metal nanoparticles: a nano lab to investigate and control light-matter interaction**, Mario Agio, Hadi Eghlidi, Nassiredin H. Mojarad, Vahid H. Sandoghdar, Eidgenossische Technische Hochschule (Switzerland) . . . . . [7033-43]

9:50 am: **Surface plasmon resonance linear and nonlinear response in a single metal nanoparticle** *(Invited Paper)*, Hatim Baida, Aurelien Crut, Paolo Maioli, Univ. Claude Bernard Lyon 1 (France); Natalia Del Fatti, Univ Claude Bernard Lyon 1 (France); Fabrice Vallee, Univ. Claude Bernard Lyon 1 (France) . . . . . [7033-44]

Coffee Break . . . . . 10:20 to 10:50 am

10:50 am: **Optical properties of metallic nanorings**, Tamer A. Ali, Chizuko Dutta, Feng Hao, Rice Univ.; Elin M. Larsson, Chalmers Tekniska Högskola (Sweden); Duncan S. Sutherland, Åarhus Univ. (Denmark); Peter J. Nordlander, Rice Univ. . . . . [7033-45]

11:10 am: **Surface plasmon polariton detection discriminating polarization-dependent image dipole effects,** K. G. Lee, K. J. Ahn, H. W. Kihm, J. S. Ahn, D. S. Kim, Seoul National Univ. (South Korea) . . . . . [7033-46]

SESSION 12

Room: Conv. Ctr. 15B . . . . . Wed. 11:30 am to 12:00 pm

Plasmonic Materials I

Session Chair: **Pieter G. Kik,** College of Optics & Photonics/Univ of Central Florida

11:30 am: **Color imaging through plasmonic nanolens** *(Invited Paper)*, Prabhat Verma, Osaka Univ. (Japan); Atsushi Ono, The Institute of Physical and Chemical Research (RIKEN) (Japan); Satoshi Kawata, Osaka Univ. (Japan). . . . . [7033-47]

Lunch/Exhibition Break . . . . . 12:00 to 1:20 pm

SESSION 13

Room: Conv. Ctr. 15B . . . . . .Wed. 1:20 to 2:50 pm

Plasmonic Materials II

Session Chair: **Pieter G. Kik,** College of Optics & Photonics/Univ of Central Florida

1:20 pm: **Controlling of the optical transparency of meta-materials with a strong DC magnetic field** *(Invited Paper)*, Yakov M. Strelniker, Bar-Ilan Univ. (Israel); David J. Bergman, Tel Aviv Univ. (Israel) . . . . . [7033-48]

1:50 pm: **Optical studies of plasmonic metamaterials** *(Invited Paper)*, Valy Z. Vardeny, The Univ. of Utah . . . . . [7033-49]

2:20 pm: **Between the looking-glasses: negative refraction, superlensing, and field-effect modulation in metal-insulator-metal waveguides** *(Invited Paper)*, Jennifer A. Dionne, Kenneth Diest, Luke A. Sweatlock, California Institute of Technology; Ewold Verhagen, Albert Polman, FOM Institute for Atomic and Molecular Physics (Netherlands); Henri J. Lezec, NIST; Harry A. Atwater, California Institute of Technology . . . . . [7033-50]

Coffee Break . . . . . 2:50 to 3:20 pm

SESSION 14

Room: Conv. Ctr. 15B . . . . . .Wed. 3:20 to 4:50 pm

Plasmonic Materials III

Session Chair: **Nader Engheta,** Univ. of Pennsylvania

3:20 pm: **Squeezing optical signals through epsilon-near-zero plasmonic channels** *(Invited Paper)*, Andrea Alu, Mario Silveirinha, Nader Engheta, Univ. of Pennsylvania . . . . . [7033-51]

3:50 pm: **Plasmonic metamaterials and their applications in novel terahertz devices** *(Invited Paper)*, Taiichi Otsuji, Tohoku Univ. (Japan). . . . . [7033-52]

4:20 pm: **Plasmonic metamaterials and their applications** *(Invited Paper),* Igor I. Smolyaninov, BAE Systems . . . . . [7033-53]

Room: Conv. Ctr. Exhibit Hall B2 . . . . . .Wed. 5:30 to 7:00 pm

Posters-Wednesday

Poster authors will begin displaying posters after 10:00 am Wednesday morning. A poster session, with authors present at their posters, will be held Wednesday evening from 5:30 to 7:00 pm. Light refreshments will be served.

Poster Setup

Poster presenters must set up their posters between 10:00 am and 5:00 pm on Wednesday. Poster presenters who have not set up by 5:00 pm on Wednesday will be considered a "no show" and their manuscript will not be published. Presenters must remove their posters immediately after the poster session. Posters not removed will be considered unwanted and will be discarded. SPIE assumes no responsibility for posters left up after the end of each poster session.

Controlled integration of gold nanocrystals on the surface of group III-nitride light-emitting epitaxial heterostructures, Sergio M. S.Pereira, Univ. de Aveiro (Portugal). . . . . [7033-72]

High-resolution multispectral Raman imaging and spectroscopy system for nanoparticles substrate and photonic crystal fiber characterizations, Maung K. Khaing Oo, Henry H. Du, Stevens Institute of Technology. [7033-73]

Variable-focusing surface plasmon dielectric lens using air-gap modulation, Junghyun Park, Hwi Kim, Joonku Hahn, Byoungho Lee, Seoul National Univ. (South Korea) and National Creative Research Ctr. for Active Plasmonics Application Systems (South Korea) . . . . . [7033-74]

Linear and nonlinear optical properties of aggregated spherical gold nanoparticles, Akihiro Sato, Kazuma Tsuboi, Tatsuya Yamaguchi, Kotaro Kajikawa, Tokyo Institute of Technology (Japan) . . . . . [7033-76]

Manipulate nonlocal plasmonic hotspots by silver nanowires, Sheng-Chung Chen, Far East College (Taiwan); Din Ping Tsai, National Taiwan Univ. (Taiwan) . . . . . [7033-78]

Far-field spectroscopy and near-field microscopy of chiral plasmonic metamaterials, Maxim R. Shcherbakov, Boris B. Tsema, Polina P. Vabishchevich, Lomonosov Moscow State Univ. (Russia); Yuan Hsing Fu, Chih Ming Wang, Din Ping Tsai, National Taiwan Univ. (Taiwan); Andrey A. Fedyanin, Lomonosov Moscow State Univ. (Russia) . . . . . [7033-80]

New plasmonic metamaterials beyond noble metals, Hanwei Gao, Joel Henzie, Teri W. Odom, Northwestern Univ. . . . . [7033-81]

Thursday 14 August

SESSION 15

Room: Conv. Ctr. 15B . . . . . Thurs. 8:00 to 11:00 am

Nanoplasmonic Applications I

Session Chair: **Xiang Zhang,** Univ. of California/Berkeley

8:00 am: **Engineered surface plasmon resonances for biodetection, integrated photonics, and nonlinear optics** *(Invited Paper)*, Pieter G. Kik, College of Optics & Photonics/Univ. of Central Florida . . . . . [7033-54]

8:30 am: **Design and fabrication of micro/nanoscale plasmonic waveguide devices aimed for VLSI photonic circuit application** *(Invited Paper)*, El-Hang Lee, Inha Univ. (South Korea); Seok-Ho Song, Hanyang Univ. (South Korea) . . . . . [7033-55]

9:00 am: **Configuration and evaluation of nanophotonics devices and systems** *(Invited Paper)*, Hirokazu Hori, Univ. of Yamanashi (Japan). [7033-56]

9:30 am: **Gold nano-stoves** *(Invited Paper)*, Thomas A. Klar, Technical Univ. of Ilmenau (Germany) and Ludwig-Maximilians-Univ. München (Germany) . . . . . [7033-57]

Coffee Break . . . . . 10:00 to 10:30 am

10:30 am: **Controlled thermal emission of two-color polarized infrared light from arrayed plasmon nanocavities** *(Invited Paper),* Katsumoto Ikeda, Nalux Co., Ltd. (Japan); Hideki T. Miyazaki, Takeshi Kasaya, National Institute for Materials Science (Japan); Kazuya Yamamoto, Yasuaki Inoue, Kayoko Fujimura, Tomohiro Kanakugi, Nalux Co., Ltd. (Japan). . . . . [7033-58]

SESSION 16

Room: Conv. Ctr. 15B . . . . . Thurs. 11:00 am to 12:30 pm

Nanoplasmonic Applications II

Session Chair: **Naomi J. Halas,** Rice Univ.

11:00 am: **Light and liquid with micro-optical-fluidic-system (MOFS) for biophysical applications** *(Invited Paper)*, Ai-Qun Liu, Nanyang Technological Univ. (Singapore). . . . . [7033-59]

11:30 am: **Nanoscale surface-emitting semiconductor plasmon lasers** *(Invited Paper)*, Farhan Rana, Christina Manolatou, Cornell Univ. . . . [7033-60]

12:00 pm: **The strength of surface plasmons** *(Invited Paper)*, Romain Quidant, Maurizio Righini, Institut de Ciències Fotòniques (Spain) . . [7033-61]

Lunch/Exhibition Break . . . . . 12:30 to 1:30 pm

SESSION 17

Room: Conv. Ctr. 15B . . . . . Thurs. 1:30 to 3:10 pm

Nanoplasmonic Applications III

Session Chair: **Prabhat Verma,** Osaka Univ. (Japan)

1:30 pm: **Harnessing the photothermal response of plasmonic nanostructures for actuation applications: expanding options in cancer therapy** *(Invited Paper)*, Naomi J. Halas, Rice Univ.. . . . . [7033-62]

2:00 pm: **Reduced scattering of a nanostructured particle or film** *(Invited Paper)*, Shengli Zou, Haining Wang, Feng Yu, Univ. of Central Florida[7033-63]

2:30 pm: **Light emission from metal-polymer nanowire heterostructures**, Deirdre O'Carroll, Keisuke Nakayama, Carrie E. Hofmann, Harry A. Atwater, Jr., California Institute of Technology . . . . . [7033-64]

2:50 pm: **Light localization with surface plasmon resonators for sub-wavelength photodetectors**, Justin White, Shanhui Fan, Mark Brongersma, Stanford Univ. . . . . [7033-65]

Coffee Break . . . . . 3:10 to 3:40 pm

SESSION 18

Room: Conv. Ctr. 15B . . . . . Thurs. 3:40 to 5:50 pm

Nanoplasmonic Applications IV

Session Chair: **Din Ping Tsai,** National Taiwan Univ. (Taiwan)

3:40 pm: **Plasmonic nanoparticle scattering for enhanced performance of photovoltaic and photodetector devices** *(Invited Paper)*, Edward T. Yu, Univ. of California/San Diego . . . . . [7033-66]

4:10 pm: **Plasmostor: a Si field effect plasmonic modulator** *(Presentation Only)*, Kenneth Diest, Jennifer A. Dionne, Luke A. Sweatlock, Harry A. Atwater, California Institute of Technology . . . . . [7033-67]

4:30 pm: **Experimental measurement of surface plasmon resonance of conical metal nanoparticle tips**, Yanshu Zou, Harvard Univ.. . . . . [7033-68]

4:50 pm: **Surface plamsons modulate the spatial coherence of light in Young's interference experiment**, Choon How Gan, Greg Gbur, The Univ. of North Carolina at Charlotte; Taco Visser, Vrije Univ. Amsterdam (Netherlands) . . . . . [7033-69]

5:10 pm: **Optimization of dichroism in laser-induced transformation of silver nanoparticles in glass**, Andrei Stalmashonak, Ahmet A. Unal, Gerhard Seifert, Heinrich Graener, Martin-Luther Univ. Halle-Wittenberg (Germany) . . . . . [7033-70]

5:30 pm: **Optical-controllable plasmonics from gold nanodisk arrays in photoresponsive liquid crystals**, Vincent K. S.Hsiao, National Chi Nan Univ. (Taiwan); Yuebing Zheng, Tony Jun Huang, The Pennsylvania State Univ. . . . . [7033-71]

Courses of Related Interest

See SPIE Cashier for information and to register.

SC496 Fabrication and Processing of Nanostructures (Cao) Monday, 8:30 am to 5:30 pm
SC497 Nanophotonics (Prasad) Sunday, 1:30 to 5:30 pm
SC727 Nanoplasmonics (Stockman) Thursday, 8:30 am to 5:30 pm
WS851 Nanotechnology: Science & Applications (Brahmbhatt) Wednesday, 8:30 am to 5:30 pm

Conference 7034

Monday-Tuesday 11-12 August 2008 • Proceedings of SPIE Vol. 7034

Physical Chemistry of Interfaces and Nanomaterials VII

Conference Chairs: **Garry Rumbles,** National Renewable Energy Lab.; **Oliver L. A. Monti,** The Univ. of Arizona

Conference Co-Chairs: **Oleg V. Prezhdo,** Univ. of Washington; **Sergei Tretiak,** Los Alamos National Lab.

Conference Cosponsor: NREL

Monday 11 August

Room: Conv. Ctr. 6A . . . . . .Mon. 8:30 am to 12:20 pm

NanoScience + Engineering Plenary Session

View plenary presentation details p. 13-14.

8:30 am: **Revivals of Molecular Nonlinear Optics in Physics, Chemistry, and Life Sciences,** Joseph Zyss, École Normale Supérieure de Cachan (France)

9:10 am: **Applications of Biological Materials**, Rajesh R. Naik, Air Force Research Lab.

Coffee Break . . . . . 9:50 to 10:20 am

10:20 am: **Two-Photon Lithography for Precise 3D Nano/Micro-Objects**, Kwang-Sup Lee, Hannam Univ. (South Korea)

11:00 am: **Multifunctional Excimer-Laser Lithography and Photoablation Technologies for Large-Area Micro and Nanoelectronics, Displays and Microsystems**, Kanti Jain, Univ. of Illinois at Urbana-Champaign

11:40 am: **Molecules, Surfaces, and Symmetry: From Pure Geometry to Nanoscience,** Denis Fichou, Commissariat à l'Energie Atomique (France)

SESSION 1

Room: Conv. Ctr. 12 . . . . . Mon. 1:20 to 3:20 pm

Conjugated Polymer Interfaces

Session Chair: **Garry Rumbles,** National Renewable Energy Lab.

1:20 pm: **Critical interfaces in new solar cell materials: organic heterojunctions and semiconductor nanoparticle/polymer heterojunctions** *(Invited Paper)*, Neal R. Armstrong, The Univ. of Arizona . . . . . [7034-01]

1:50 pm: **An investigation of the ultrafast electron transfer between oligothiophenes and thieno[3,4-b]thiophene units**, Jodi M. Szarko, Northwestern Univ. and Argonne National Lab.; Jianchang Guo, Argonne National Lab. and University of Chicago; Yongye Liang, Luping Yu, The Univ. of Chicago; Lin X. Chen, Northwestern Univ. and Argonne National Lab.[7034-02]

2:10 pm: **Interfacial charge carrier dynamics and excitation transport in a photovoltaic polymer blend observed with ultrafast vibrational spectroscopy**, John B. Asbury, Ryan D. Pensack, Larry W. Barbour, Maureen Hegadorn, The Pennsylvania State Univ. . . . . [7034-03]

2:30 pm: **Electronic properties of amorphous conjugated polymers and bio-molecular adsorbates** *(Invited Paper)*, Sergei Tretiak, Los Alamos National Lab. . . . . [7034-04]

3:00 pm: **Bulk heterojunction morphology control by electro-deposition of polythiophene**, Michael A. Hickner, The Pennsylvania State Univ. . . [7034-05]

Coffee Break . . . . . 3:20 to 3:40 pm

SESSION 2

Room: Conv. Ctr. 12 . . . . . Mon. 3:40 to 6:00 pm

Photophysics at Semi-conductor Interfaces

Session Chair: **Sergei Tretiak,** Los Alamos National Lab.

3:40 pm: **Tuning Nanoparticle Interfaces for Enhanced Photovoltaic Response** *(Invited Paper)*, Nada M. Dimitrijevic, Argonne National Lab.; Sanja Tepavcevic, The Univ. of Chicago; Oleg Poluektov, Seth B. Darling, Argonne National Lab.; Steven J. Sibener, Univ. of Chicago; Tijana Rajh, Argonne National Lab. . . . . [7034-06]

4:10 pm: **London force and energy transportation between interfacial surfaces**, David S. Bradshaw, Jamie M. Leeder, David L. Andrews, Univ. of East Anglia Norwich (United Kingdom) . . . . . [7034-07]

4:30 pm: **Single molecule interfacial charge transfer dynamics in a dye-sensitized solar cell model**, Brandon S. Tackett, Michael L. Blumenfeld, Laura K. Schirra, Jason M. Tyler, Oliver L. A.Monti, The Univ. of Arizona. . . . . [7034-08]

4:50 pm: **Photoinduced electron dynamics at molecule-semiconductor interfaces: a time-domain ab initio description** *(Invited Paper)*, Oleg V. Prezhdo, Univ. of Washington. . . . . [7034-09]

5:20 pm: **Local interfacial electronic structure of thin pentacene films on Si(111)**, Michael L. Blumenfeld, Mary P. Steele, Brandon S. Tackett, Oliver L. A.Monti, The Univ. of Arizona . . . . . [7034-10]

5:40 pm: **Modeling photoinduced reaction dynamics and coherent control in sensitized semiconductor surfaces,** Victor S. Batista, Yale Univ.[7034-11]

Room: Conv. Ctr. Exhibit Hall B2 . . . . . Mon. 6:00 to 7:30 pm

Posters-Monday

Poster authors will begin displaying posters after 10:00 am Monday morning. A poster session, with authors present at their posters, will be held Monday evening from 6:00 to 7:30 pm. Light refreshments will be served.

Poster Setup

Poster presenters must set up their posters between 10:00 am and 5:00 pm on Monday. Poster presenters who have not set up by 5:00 pm on Monday will be considered a "no show" and their manuscript will not be published. Presenters must remove their posters immediately after the poster session. Posters not removed will be considered unwanted and will be discarded. SPIE assumes no responsibility for posters left up after the end of each poster session.

Exciton trapping and recombination in type II CdSe/CdTe nanorod heterostructures, Marcus Jones, Sandeep Kumar, Shun S. Lo, Gregory Scholes, Univ. of Toronto (Canada) . . . . . [7034-13]

Physico chemical aspects of extreme reactivity of metallic nano-particles, Babak Shokri, Maziar S. Yaghmaee, Shahid Beheshti Univ. (Iran) . . . [7034-22]

Single carbon nanotube optoelectronics, Kathryn E. Leach, Lisa J. Carlson, Univ. of Rochester; Todd D. Krauss, Univ.of Rochester. . . . . [7034-23]

Negative magnetoresistance due to weak localization and electron-electron interactions effects in metallic n-type InP at very low temperatures with magnetic field, Abdelhamid El Kaaouachi, Rachid Abdia, Abdelhakim Nafidi, Univ. Ibn Zohr (Morocco) . . . . . [7034-25]

Field-assisted molecular manipulation in hydrocarbon/silicon interface, Dmitry E. Milovzorov, Fluens Technology Group Ltd. (Russia) . . . . . [7034-26]

Electronic structure of the AgCl nanosystems with atomically rough surfaces, edge dislocations, and isoelectronic substitutional impurities, Yu. K. Timoshenko, V. A. Shunina, Voronezh State Univ. (Russia) . . . [7034-27]

Formation of collective excitations in quasi-one-dimensional metallic nanostructures: size and density dependance, Ilya Grigorenko, Los Alamos National Lab.; Amy Cassidy, Stephen Haas, Univ. of Southern California . . . . . [7034-28]

Conference 7034

Tuesday 12 August

SESSION 3

Room: Conv. Ctr. 12 . . . . . .Tues. 8:00 to 10:20 am

Quantum-Confined Nanoscale Structures

Session Chair: **Oleg V. Prezhdo,** Univ. of Washington

8:00 am: **Nanoscale excitons and charge separation** *(Invited Paper)*, Gregory D. Scholes, Univ. of Toronto (Canada) . . . . . [7034-12]

8:30 am: **Understanding trap state dynamics in nanocrystal quantum dots**, Marcus Jones, Shun S. Lo, Greg Scholes, Univ. of Toronto (Canada)[7034-24]

8:50 am: **Generalized model for carrier multiplication in semiconductor nanocrystals**, Andrei Piryatinski, Victor I. Klimov, Los Alamos National Lab. . . . . [7034-14]

9:10 am: **Exciton dynamics in self-assembled molecular nanotubes and near dielectric nanorods** *(Invited Paper)*, Jasper Knoester, Univ. of Groningen (Netherlands) . . . . . [7034-15]

9:40 am: **Novel inorganic nanomaterials generated with highly concentrated sunlight**, Jeffrey M. Gordon, Eugene A. Katz, Daniel Feuermann, Ben-Gurion Univ. of the Negev (Israel); Ana Albu-Yaron, Moshe Levy, Reshef Tenne, Weizmann Institute of Science (Israel). . . . . [7034-16]

10:00 am: **Stability of PbSe nanocrystals**, Quanqin Dai, William W. Yu, Worcester Polytechnic Institute . . . . . [7034-17]

Coffee Break . . . . . 10:20 to 10:40 am

SESSION 4

Room: Conv. Ctr. 12 . . . . . Tues. 10:40 am to 12:20 pm

Single-species Spectroscopy

Session Chair: **Oliver L. A. Monti,** The Univ. of Arizona

10:40 am: **Plasmon resonance imaging of quenching of surface plasmons by quantum dots and other nanoscale systems** *(Invited Paper)*, Jao van de Lagemaat, Manuel J. Romero, Garry Rumbles, Mowafak M. Al-Jassim, National Renewable Energy Lab. . . . . [7034-18]

11:10 am: **Fluorescence efficiency of individual carbon nanotubes**, Lisa J. Carlson, Univ. of Rochester; Sara E. Maccagnano, Cornell Univ.; Ming Zheng, DuPont Co.; John Silcox, Cornell Univ.; Todd D. Krauss, Univ. of Rochester . . . . . [7034-19]

11:30 am: **Control of single molecule excitation by pulse shaping** *(Invited Paper)*, Daan Brinks, Fernando F. Stefani, Niek F. van Hulst, Institut de Ciències Fotòniques (Spain) . . . . . [7034-20]

12:00 pm: **Terahertz conductivity measurements in films of semiconductor and metallic single walled carbon nanotubes.**, Matthew C. Beard, Michael J. Heben, Jeffery Blackburn, National Renewable Energy Lab. . . . . [7034-21]

Courses of Related Interest

See SPIE Cashier for information and to register.

SC496 Fabrication and Processing of Nanostructures (Cao) Monday, 8:30 am to 5:30 pm
SC497 Nanophotonics (Prasad) Sunday, 1:30 to 5:30 pm
WS851 Nanotechnology: Science & Applications (Brahmbhatt) Wednesday, 8:30 am to 5:30 pm

Conference 7035

Tuesday-Thursday 12-14 August 2008 • Proceedings of SPIE Vol. 7035

Biosensing

Conference Chairs: **Manijeh Razeghi,** Northwestern Univ.; **Hooman Mohseni,** Northwestern Univ.

Program Committee: **Gert Cauwenberghs,** Univ. of California San Diego; **Philippe M. Fauchet,** Univ. of Rochester; **David H. Gracias,** Johns Hopkins Univ.; **Kimberly Hamad-Schifferli,** Massachusetts Institute of Technology; **Sean Humbert,** Univ of Maryland; **Giacomo Indiveri,** ETH Zürich (Switzerland); **Eric Lagally,** Univ. of British Columbia (Canada); **Chang Liu,** Northwestern Univ.; **Yuhwa Lo,** Univ. of California, San Diego; **Heather D. Maynard,** Univ. of California, Los Angeles; **Ryan P. McClintock,** Northwestern Univ.; **Masoud Panjehpour,** Thompson Cancer Survival Ctr.; **Tadashi Shibata,** The Univ. of Tokyo (Japan); **Donald J. Silversmith,** Air Force Office of Scientific Research; **Marija Strojnik,** Ctr. de Investigaciones en Óptica, A.C.; **Din Ping Tsai,** National Taiwan Univ. (Taiwan); **Adam T. Woolley,** Brigham Young Univ.

Monday 11 August

Room: Conv. Ctr. 6A . . . . . Mon. 8:30 am to 12:20 pm

NanoScience + Engineering Plenary Session

View plenary presentation details p. 13-14.

8:30 am: **Revivals of Molecular Nonlinear Optics in Physics, Chemistry, and Life Sciences,** Joseph Zyss, École Normale Supérieure de Cachan (France)

9:10 am: **Applications of Biological Materials**, Rajesh R. Naik, Air Force Research Lab.

Coffee Break . . . . . 9:50 to 10:20 am

10:20 am: **Two-Photon Lithography for Precise 3D Nano/Micro-Objects**, Kwang-Sup Lee, Hannam Univ. (South Korea)

11:00 am: **Multifunctional Excimer-Laser Lithography and Photoablation Technologies for Large-Area Micro and Nanoelectronics, Displays and Microsystems**, Kanti Jain, Univ. of Illinois at Urbana-Champaign

11:40 am: **Molecules, Surfaces, and Symmetry: From Pure Geometry to Nanoscience,** Denis Fichou, Commissariat à l'Energie Atomique (France)

Tuesday 12 August

SESSION 1

Room: Conv. Ctr. 12 . . . . . .Tues. 2:00 to 4:50 pm

Advances in Surface Plasmon Resonance

2:00 pm: **Utilizing surface enzymatic reactions and nanoparticles for ultrasensitive SPRI biosensing** *(Invited Paper)*, Robert M. Corn, Iuliana Sendroiu, Univ. of California/Irvine . . . . . [7035-01]

2:30 pm: **Development of plasmonic substrates for biosensing** *(Invited Paper)*, Alexandre G. Brolo, David Sinton, Reuven Gordon, Univ. of Victoria (Canada) . . . . . [7035-02]

Coffee Break . . . . . 3:00 to 3:30 pm

3:30 pm: **Multiplex plasmonic biosensing enabled by patterned nanostructures** *(Invited Paper)*, Sang-Hyun Oh, Antoine Lesuffleur, Hyungsoon Im, Nathan C. Lindquist, Kwan Seop Lim, Univ. of Minnesota/Twin Cities . . . . . [7035-03]

4:00 pm: **Parallel microfluidic arrays for SPRI detection** *(Invited Paper)*, Eric Lagally, Eric Ouellet, The Univ. of British Columbia (Canada); Chris Lausted, Leroy Hood M.D., Institute for Systems Biology . . . . . [7035-04]

4:30 pm: **Phase-polarization methods in surface plasmon resonance biosensing**, Andrei V. Kabashin, Michel Meunier, Sergiy Patskovsky, Mathieu Maisonneuve, Ecole Polytechnique de Montréal (Canada). . . . . [7035-05]

Wednesday 13 August

SESSION 2

Room: Conv. Ctr. 12 . . . . . Wed. 8:00 to 10:00 am

Biomimitation

8:00 am: **Self-assembled quantum dot-bioconjugates: characterization and coupling to dye acceptors and metal complexes** *(Invited Paper)*, Bing C. Mei, Thomas Pons, Igor L. Medintz, Hedi Mattoussi, Naval Research Lab. (United States). . . . . [7035-06]

8:30 am: **Patterning and characterization of model phospholipid membranes**, Aschalew S. Kassu, Fernando Calzzani, Jr., Jean Michel Taguenang, Redahegn Sileshi, Anup Sharma, Alabama A&M Univ.. . [7035-07]

8:50 am: **Automated formation and long-term stabilization of freestanding lipid bilayers for ion channel sensing** *(Invited Paper)*, Jacob Schmidt, Univ. of California/Los Angeles . . . . . [7035-08]

9:20 am: **Electrokinetic delivery of single fluorescent biomolecules in fluidic nanochannels**, Lloyd M. Davis, Brian K. Canfield, Xiaoxuan Li, William Hofmeister, Isaac Lescano, Bruce Bomar, Zbigniew Sikorski, William Robinson, The Univ. of Tennessee Space Institute . . . . . [7035-09]

9:40 am: **Fabrication of photoresponsive bacteriorhodopsin-containing hydrogels using simple inkjet technology**, Ishtiaq Saaem, Jingdong Tian, Duke Univ.. . . . . [7035-10]

Coffee Break . . . . . 10:00 to 10:30 am

SESSION 3

Room: Conv. Ctr. 12 . . . . . Wed. 10:30 am to 12:20 pm

Biosensors I

10:30 am: **High sensitive biosensors based on ZnO based nanowires and ion sensitive field effect transistors (IS-FETs)** *(Invited Paper)*, Hitoshi Tabata, The Univ. of Tokyo (Japan). . . . . [7035-11]

11:00 am: **Biosensing using surface enhanced spectroscopies: molecular level probes of biomolecular processes** *(Invited Paper)*, Naomi J. Halas, Rice Univ. . . . . [7035-12]

11:30 am: **Giant magnetoresistive biosensors for molecular diagnosis**, Heng Yu, Sebastian J. Osterfeld, Robert L. White, Magarray, Inc.; Liang Xu, Stanford Univ.; Nader Pourmand, Univ. of California/Santa Cruz and Stanford Univ.; Shan X. Wang, Stanford Univ.. . . . . [7035-14]

11:50 am: **Cancer monitoring with nano particles and opto-fluidics** *(Invited Paper)*, Sadik C. Esener, Univ. of California/San Diego . . . . . [7035-15]

Lunch/Exhibition Break . . . . . 12:20 to 1:40 pm

SESSION 4

Room: Conv. Ctr. 12 . . . . . Wed. 1:40 to 3:30 pm

DNA I

1:40 pm: **Massively parallel fabrication and characterization of DNA templated magnetic wires** *(Invited Paper)*, Albena Ivanisevic, Purdue Univ. . . . . [7035-16]

2:10 pm: **DNA-templated nanomaterials and nanocapillaries** *(Invited Paper)*, Adam T. Woolley, Jacob T. Stewart, Brigham Young Univ.; Hector A. Becerril, Stanford Univ. . . . . [7035-17]

2:40 pm: **Integration of molecular structures in electrode gaps by dielectrophoresis** *(Invited Paper)*, Andrea Csaki, Christian Leiterer, Andreas Wolff, Robert Kretschmer, Wolfgang Fritzsche, IPHT Jena (Germany)[7035-18]

3:10 pm: **Single and double stranded DNA detection using locked nucleic acid (LNA) functionalized nanoparticles**, Fiona McKenzie, Robert Stokes, Karen Faulds, Duncan Graham, Univ. of Strathclyde (United Kingdom) . . . . . [7035-19]

Coffee Break . . . . . 3:30 to 3:50 am

SESSION 5

Room: Conv. Ctr. 12 . . . . . Wed. 3:50 to 5:40 pm

DNA II

3:50 pm: **Designer DNA: architectures for directed self-assembly** *(Invited Paper)*, Hao Yan, Arizona State Univ. . . . . [7035-20]

4:20 pm: **DNA-programmed protein-nanoelectronic transducer array** *(Invited Paper)*, Jimmy Xu, Gary D. Withey, Jr., Jin Ho Kim, Brown Univ. . . . . [7035-21]

4:50 pm: **Dynamically configurable biomolecular nanoarrays for optical biosensing** *(Invited Paper)*, Suxian Huang, Eric Schopf, Yong Chen, Univ. of California/Los Angeles . . . . . [7035-22]

5:20 pm: **Direct concentration of circulating DNA by using a nanostructured tip,** Jae-Hyun Chung, Woon-Hong Yeo, Univ. of Washington; Yaling Liu, The Univ. of Texas at Arlington; Kyong-Hoon Lee, Nanofacture, Inc.. . . . . [7035-23]

Thursday 14 August

SESSION 6

Room: Conv. Ctr. 12 . . . . . Thurs. 8:00 to 10:30 am

Biosensors II

8:00 am: **Wireless integrated microsystems for monitoring brain chemical and electrical activity** *(Invited Paper)*, Masoud Roham, Case Western Reserve Univ.; Paul A. Garris, Illinois State Univ.; Pedram Mohseni, Case Western Reserve Univ. . . . . [7035-24]

8:30 am: **Multi-sensory fusion in the fruit fly** *(Invited Paper)*, Mark A. Frye, Univ. of California/Los Angeles . . . . . [7035-25]

9:00 am: **Simultaneous wireless electrophysiological and neurochemical monitoring** *(Invited Paper)*, Kartikeya Murari, Mohsen Mollazadeh, Nitish Thakor, Johns Hopkins Univ.; Gert Cauwenberghs, Univ. of California/San Diego . . . . . [7035-26]

9:30 am: **Schottky contacted silicon nanowire field effect transistor with T-channel structure for biosensor applications**, Kyeong-Sik Shin, Kyunghoon Lee, Tae Song Kim, Ji Yoon Kang, Korea Institute of Science and Technology (South Korea) . . . . . [7035-27]

9:50 am: **A highly sensitive plastic optical biosensors using a resonance coupling in optical waveguide**, Jeongah Yi, Min-Cheol Oh, Pusan National Univ. (South Korea) . . . . . [7035-28]

10:10 am: **Grating based nanophotonic structures configurations for biosensing**, Ibrahim Abdulhalim II, Mark Auslender, Shlomo Hava, Ben-Gurion Univ. of the Negev (Israel) . . . . . [7035-29]

Coffee Break . . . . . 10:30 to 11:00 am

SESSION 7

Room: Conv. Ctr. 12 . . . . . Thurs. 11:00 am to 2:30 pm

Bio-inspired Devices and Systems

11:00 am: **Lithographically structured 3D self-assembled biomedical devices** *(Invited Paper)*, David H. Gracias, Johns Hopkins Univ. . . . . [7035-30]

11:30 am: **A bio-inspired single photon detector with suppressed noise and low jitter** *(Invited Paper)*, Omer G. Memis, Alex Katsnelson, Hooman Mohseni, Northwestern Univ.; Minjun Yan, Shuang Zhang, Tim Hossain, Niu Jin, Ilesanmi Adesida, Univ. of Illinois at Urbana-Champaign . . . . . [7035-31]

12:00 pm: **Design and fabrication of an omnidirectional reflector as ultra-sensitive biochemical sensing platform**, Qiwen Zhan, Andrew Sarangan, Jian Gao, Mengshu Pan, Agus Widjaja, Univ. of Dayton . . . . . [7035-32]

Lunch/Exhibition Break . . . . . 12:20 to 1:30 pm

1:30 pm: **Tolerance analysis of a micro-optical detection unit for fluorescence and absorbance measurements in lab-on-a-chip micro-channels for chromatographic applications**, Sara Van Overmeire, Heidi Ottevaere, Gert Desmet, Hugo Thienpont, Vrije Univ. Brussel (Belgium) . . . . . [7035-33]

1:50 pm: **Nanostructured surfaces for highly efficient affinity sensors**, Ilaria Mannelli, Andrea Valsesia, Patricia Lisboa, Joint Research Ctr. (Italy); Stéphane Mornet, Institut de Chimie de la Matière Condensée de Bordeaux (France); Pascal Colpo, François Rossi, Joint Research Ctr. (Italy) . . . . . [7035-34]

2:10 pm: **Bio-inspired target detection in natural scenes: optimal thresholds and ego-motion,** Steven Wiederman, The Univ. of Adelaide (Australia); Russell S. A.Brinkworth, Univ. of Adelaide (Australia); David C. O'Carroll, The Univ. of Adelaide (Australia) . . . . . [7035-42]

SESSION 8

Room: Conv. Ctr. 12 . . . . . Thurs. 2:30 to 5:20 pm

Biosensors III

2:30 pm: **Modular optoelectronic probes for genetically-targeted brain circuits** *(Invited Paper)*, Edward S. Boyden, Clifton G. Fonstad, Rahul Sarpeshkar, Massachusetts Institute of Technology . . . . . [7035-35]

3:00 pm: **Functionalized, polymer-encapsulated nanoparticle clusters for SERS multiplexing** *(Invited Paper)*, Norbert Reich, Gary Braun, Univ. of California/Santa Barbara . . . . . [7035-36]

Coffee Break . . . . . 3:30 to 4:00 pm

4:00 pm: **Active structures in 3D CMOS technologies for cell and tissue monitoring** *(Invited Paper)*, Jennifer B. Christen, Arizona State Univ.; Andreas G. Andreou, Johns Hopkins Univ. and Univ. of Cyprus (Cyprus) . . . . [7035-37]

4:30 pm: **Detection of biological entities using Raman scattering enhanced by arrays of nanoparticles on anodic alumina templates** *(Invited Paper)*, Yuh-Lin Wang, Academia Sinica (Taiwan); Yu Chen, Ting-Ting Liu, Chi-Hung Lin, National Yang-Ming Univ. (Taiwan); Juen-Kai Wang, Huai-Hsien Wang, National Taiwan Univ. (Taiwan) . . . . . [7035-38]

4:50 pm: **Towards Reliable Multi-pathogen Biosensors using High-dimensional Encoding and Decoding Techniques** *(Invited Paper)*, Shantanu Chakrabartty, Yang Liu, Michigan State Univ. . . . . [7035-39]

Courses of Related Interest

See SPIE Cashier for information and to register.

SC496 Fabrication and Processing of Nanostructures (Cao) Monday, 8:30 am to 5:30 pm
SC497 Nanophotonics (Prasad) Sunday, 1:30 to 5:30 pm
WS851 Nanotechnology: Science & Applications (Brahmbhatt) Wednesday, 8:30 am to 5:30 pm

Conference 7036

Sunday-Thursday 10-14 August 2008 • Proceedings of SPIE Vol. 7036

Spintronics

Conference Chairs: **Manijeh Razeghi,** Northwestern Univ.; **Henri-Jean M. Drouhin,** École Polytechnique (France); **Jean-Eric Wegrowe,** École Polytechnique (France)

Program Committee: **Jack Bass,** Michigan State Univ.; **Michael E. Flatté,** The Univ. of Iowa; **Henri Jaffrès,** CNRS-THALES, Palaiseau (France); **Mathias Michael Kläui,** Univ. Konstanz (Germany); **Yuri A. Mamaev,** St. Petersburg State Technical Univ. (Russia); **Ryan P. McClintock,** Northwestern Univ.; **Laurens W. Molenkamp,** Univ. Würzburg (Germany); **Jean-Pierre Nozières,** Crocus Technology (France); **Yoshichika Otani,** RIKEN (Japan); **Jing Shi,** Univ. of California, Riverside; **Donald J. Silversmith,** Air Force Office of Scientific Research; **Luc Thomas,** IBM Almaden Research Ctr.; **Evgeny Tsymbal,** Univ. of Nebraska-Lincoln; **Jörg Wunderlich,** Hitachi Cavendish Lab. (United Kingdom)

Sunday 10 August

SESSION 1

Room: Conv. Ctr. 14A . . . . . .Sun. 8:00 to 10:00 am

Nanopillars Dynamics

Session Chairs: **Luc Thomas,** IBM Almaden Research Ctr.; **Mark D. Stiles,** National Institute of Standards and Technology

8:00 am: **Temperature dependence on spin transfer dynamics in magnetic nanocontacts** *(Invited Paper)*, William Rippard, NIST; Matthew Pufall, Univ. of Denver; Stephen Russek, NIST; Michael Schneider, Univ. of Montana[7036-01]

8:30 am: **Phase locking of a spin transfer oscillator to an external microwave current: a milestone for the synchronization of a large assembly of STOs** *(Invited Paper)*, Julie Grollier, Benoit Georges, Vincent Cros, Albert Fert, Thales Research and Technology (France) and Ctr. National de la Recherche Scientifique (France); Giancarlo Faini, LPN-CNRS (France) . . . . . [7036-02]

9:00 am: **Magnetic excitations and time resolved magnetization switching in sub-micron magnetic tunnel junctions** *(Invited Paper)*, Thibaut Devolder, Annerose Helmer, Univ. Paris Sud, CNRS (France); Jun Hayakawa, Kenchi Ito, Hiromasa Takahachi, Hitachi (Japan); Shoji Ikeda, RIEC-Tohoku Univ. (Japan); Paul Crozat, Joo-von Kim, Claude Chappert, Univ. Paris Sud, CNRS (France); Hideo Ohno, RIEC-Tohoku Univ. (Japan) . . . . . [7036-03]

9:30 am: **Toward antiferromagnetic metal spintronics** *(Invited Paper)*, Maxim Tsoi, The Univ. of Texas at Austin . . . . . [7036-04]

Coffee Break . . . . . 10:00 am to 3:30 pm

SESSION 2

Room: Conv. Ctr. 14A . . . . . Sun. 10:30 am to 12:00 pm

Experiments, Theory, Fundamentals of Spin Transfer Anatomy

Session Chairs: **Mathias Klaeui,** Univ. Konstanz (Germany); **William Rippard,** National Institute of Standards and Technology

10:30 am: **Morphology-induced electron-spin precession in iron films on silver(001)** *(Invited Paper)*, Logane Tati-Bismaths, Loic Joly, Abdelkader Bourzami, Fabrice Scheurer, Wolfgang Weber, Univ. Louis Pasteur (France) . . . . . [7036-05]

11:00 am: **Impedance and dc electrical response induced by microwave signal in patterned ferromagnetic wires** *(Invited Paper)*, Akinobu Yamaguchi, Keiichi Motoi, Hideki Miyajima, Keio Univ. (Japan) . . . . . [7036-06]

11:30 am: **Spin transfer torque in non-uniform magnetizations** *(Invited Paper)*, Mark D. Stiles, National Institute of Standards and Technology . . . . . [7036-07]

Lunch Break . . . . . 12:00 to 1:30 pm

SESSION 3

Room: Conv. Ctr. 14A . . . . . Sun. 1:30 to 3:00 pm

Spin Transfer Phenomena

Session Chairs: **Jack Bass,** Michigan State Univ.; **Akinobu Yamaguchi,** Keio Univ. (Japan)

1:30 pm: **Diffusive spin-transfer** *(Invited Paper)*, Jean-Eric Wegrowe, Ecole Polytechnique (France) . . . . . [7036-08]

2:00 pm: **Spin pumping of current in non-uniform conducting magnets** *(Invited Paper)*, Wayne M. Saslow, Texas A&M Univ. . . . . [7036-09]

2:30 pm: **Thermal effects in spin torque devices** *(Invited Paper)*, Pieter B. Visscher, Univ. of Alabama . . . . . [7036-10]

Coffee Break . . . . . 10:00 to 10:30 am

SESSION 4

Room: Conv. Ctr. 14A . . . . . .Sun. 3:30 to 5:00 pm

Current-induced Magnetization Reversal

Session Chairs: **Jean-Eric Wegrowe,** Ecole Polytechnique (France); **Brad N. Engel,** Freescale Semiconductor, Inc.

3:30 pm: **Current and field induced reversal of magnetic islands with perpendicular anisotropy** *(Invited Paper)*, Eric E. Fullerton, Univ. of California/ San Diego; Stephane Mangin, Univ. Henri Poincaré Nancy (France); Yves Henry, Univ. Louis Pasteur (France); Dafine Ravelosona, Univ. Paris-Sud (France); Jordan Katine, Hitachi Global Storage Technologies . . . . . [7036-11]

4:00 pm: **Stochastic domain wall motion in perpendicularly magnetized nanodevices** *(Invited Paper)*, Dafine Ravelosona, Univ. Paris-Sud (France) . . . . . [7036-12]

4:30 pm: **Static and dynamic properties of magnetic nanostructures probed by spin-polarized STM** *(Invited Paper),* Matthias Bode, Argonne National Lab. . . . . [7036-13]

Room: Conv. Ctr. 6A . . . . . Sun. 6:00 to 6:45 pm

All-Conference Plenary Session

View plenary presentation details p. 13.

6:00 pm: **The Solar Decathlon: building a better future with solar energy**, Richard J. King, U.S. Dept. of Energy

Monday 11 August

Room: Conv. Ctr. 6A . . . . . .Mon. 8:30 am to 12:20 pm

NanoScience + Engineering Plenary Session

View plenary presentation details p. 13-14.

8:30 am: **Revivals of Molecular Nonlinear Optics in Physics, Chemistry, and Life Sciences,** Joseph Zyss, École Normale Supérieure de Cachan (France)

9:10 am: **Applications of Biological Materials**, Rajesh R. Naik, Air Force Research Lab.

Coffee Break . . . . . 9:50 to 10:20 am

10:20 am: **Two-Photon Lithography for Precise 3D Nano/Micro-Objects**, Kwang-Sup Lee, Hannam Univ. (South Korea)

11:00 am: **Multifunctional Excimer-Laser Lithography and Photoablation Technologies for Large-Area Micro and Nanoelectronics, Displays and Microsystems**, Kanti Jain, Univ. of Illinois at Urbana-Champaign

11:40 am: **Molecules, Surfaces, and Symmetry: From Pure Geometry to Nanoscience,** Denis Fichou, Commissariat à l'Energie Atomique (France)

SESSION 5

Room: Conv. Ctr. 14A . . . . . Mon. 1:20 to 3:20 pm

Magnetic Semiconductor Heterostructures

Session Chairs: **Henri Jaffrès,** Ctr. National de la Recherche Scientifique (France) and Thales Research and Technology (France); **Hideo Ohno,** Tohoku Univ. (Japan)

1:20 pm: **Spin dependent transport in III-V magnetic heterostructures (Keynote Presentation)**, Masaaki Tanaka, The Univ. of Tokyo (Japan)[7036-14]

2:20 pm: **TMR-related effects in structures involving semiconductors** *(Invited Paper)*, Jean-Marie George, Henri Jaffrès, CNRS-Thales (France) . . . . . [7036-15]

2:50 pm: **Magnetic anisotropies, domain walls, and piezoelectric control in GaMnAs** *(Invited Paper)*, Bryan L. Gallagher, Univ. of Nottingham (United Kingdom) . . . . . [7036-16]

Coffee Break . . . . . 3:20 to 3:50 pm

SESSION 6

Room: Conv. Ctr. 14A . . . . . Mon. 3:50 to 5:20 pm

Spintronics with Quantum Dots

Session Chairs: **Yoshichika Otani,** The Institute of Physical and Chemical Research (Japan); **Michel I. Dyakonov,** Univ. Montpellier II (France)

3:50 pm: **Optical initialisation and control of carrier and nuclear spins in individual semiconductor quantum dots** *(Invited Paper)*, Xavier Marie, Institut National des Sciences Appliquées de Toulouse (France); Olivier Krebs, Lab. de Photonique et de Nanostructures, CNRS (France); Bernhard Urbaszek, Thomas Belhadj, Claire-Marie Simon, Institut National des Sciences Appliquées de Toulouse (France); Aristide Lemaitre, Paul Voisin, Lab. de Photonique et de Nanostructures, CNRS (France); Thierry Amand, Institut National des Sciences Appliquées de Toulouse (France) . . . . . [7036-17]

4:20 pm: **Spin and symmetry in optical studies of individual semiconductor quantum dots** *(Invited Paper)*, Jan A. Gaj, Univ. Warszawski (Poland)[7036-18]

4:50 pm: **Manipulating single magnetic spins for semiconductor spintronics** *(Invited Paper)*, Roberto C. Myers, Univ. of California/Santa Barbara . . . . . [7036-19]

Tuesday 12 August

SESSION 7

Room: Conv. Ctr. 14A . . . . . Tues. 8:30 to 10:00 am

Spin and Symmetry Filtering

Session Chairs: **Joël Cibert,** Ctr. National de la Recherche Scientifique (France); **Kai Liu,** Univ. of California/Davis

8:30 am: **Spin-dependent electron transport in a semiconductor quantum-dot spin valve** *(Invited Paper)*, Tomoki Machida, Univ. of Tokyo (Japan). . . . . [7036-20]

9:00 am: **Tunneling of a spinning electron through a crystalline barrier** *(Invited Paper)*, T. L. Hoai Nguyen, Ecole Polytechnique (France) and Univ. Paris-Sud (France); Henri-Jean Drouhin, Jean-Eric Wegrowe, Ecole Polytechnique (France); Guy Fishman, Univ. Paris-Sud (France) . . . . [7036-21]

9:30 am: **Role of interface resonance states on spin dependent transport in single crystal magnetic tunnel junctions** *(Invited Paper)*, Alain Schuhl, Pierre-Jean Zermatten, Gilles Gaudin, Commissariat à l'Energie Atomique (France); Coriolan Tiusan, Fanny Greulet, Michel Hehn, Univ. Henri Poincaré Nancy (France) . . . . . [7036-22]

Coffee Break . . . . . 10:00 to 10:30 am

SESSION 8

Room: Conv. Ctr. 14A . . . . . Tues. 10:30 am to 12:00 pm

Carbon-based Spintronics

Session Chairs: **Michael E. Flatté,** The Univ. of Iowa; **Tomas Jungwirth,** Institute of Physics v.v.i. ASCR (Czech Republic)

10:30 am: **Transformation of spin information into large electrical signals** *(Invited Paper, Presentation Only)*, Neil D. Mathur, Univ. of Cambridge (United Kingdom) . . . . . [7036-23]

11:00 am: **Graphene spintronics: injection and transport** *(Invited Paper)*, Csaba Jozsa, Mihaita Popinciuc, Nikolaos Tombros, Harry T. Jonkman, Bart J. van Wees, Univ. of Groningen (Netherlands) . . . . . [7036-24]

11:30 am: **Carbon nanorings for spintronics applications**, Mark A. Jack, Mario R. Encinosa, Florida A&M Univ. . . . . [7036-25]

Lunch/Exhibition Break . . . . . 12:00 to 1:20 pm

SESSION 9

Room: Conv. Ctr. 14A . . . . . Tues. 1:20 to 3:20 pm

Spin and Charge Currents

Session Chairs: **Manijeh Razeghi,** Northwestern Univ.; **Jan A. Gaj,** Univ. Warszawski (Poland)

1:20 pm: **Spin hall effect** *(Keynote Presentation),* Michel I. Dyakonov, Univ. Montpellier II (France) . . . . . [7036-26]

2:20 pm: **Theory of Hall effects and weak localization in strongly spin-orbit coupled systems: merging Keldysh, Kubo and Boltzmann theories** *(Invited Paper)*, Jairo Sinova, Texas A&M Univ.. . . . . [7036-27]

2:50 pm: **Atomistic modelling of spin-orbit coupling effects in semiconductor nanostructures** *(Invited Paper)*, Jean-Marc Jancu, CNRS-LPN (France); Mikhail Nestoklon, Ioffe Institut (Russia); Evgeniy Ivchenko, Ioffe Institut; Paul Voisin, CNRS-LPN (France) . . . . . [7036-28]

Coffee Break . . . . . 3:20 to 3:40 pm

SESSION 10

Room: Conv. Ctr. 14A . . . . . Tues. 3:40 to 5:10 pm

Multiferroics/Perovskites

Session Chair: **Neil D. Mathur,** Univ. of Cambridge (United Kingdom)

3:40 pm: **Novel spin devices based on complex oxide thin film materials** *(Invited Paper)*, Yuri Suzuki, Univ. of California/Berkeley and Lawrence Berkeley National Lab.; Brittany Nelson-Cheeseman, Franklin C. Wong, Rajesh Chopdekar, Univ. of California/Berkeley; Elke Arenholz, Lawrence Berkeley National Lab.; Miaofang Chi, Nigel D. Browning, Univ. of California/D avis . . . . . [7036-29]

4:10 pm: **Spintronics with multiferroics** *(Invited Paper)*, Manuel Bibes, Thales Research and Technology (France) and Ctr. National de la Recherche Scientifique (France) . . . . . [7036-30]

4:40 pm: **Emerging transport behavior in manganites wires** *(Invited Paper)*, Jian Shen, Oak Ridge National Lab. . . . . [7036-31]

Wednesday 13 August

SESSION 11

Room: Conv. Ctr. 14A . . . . . Wed. 8:30 to 10:00 am

Spin Engineering/Devices

Session Chairs: **Henri-Jean M. Drouhin,** Ecole Polytechnique (France); **Guido Meier,** Univ. Hamburg (Germany)

8:30 am: **Electrically controlled magnetism** *(Invited Paper)*, Christian Binek, Univ. of Nebraska . . . . . [7036-32]

9:00 am: **Current-driven domain wall dynamics in magnetic nanowires** *(Invited Paper)*, Luc Thomas, Masamitsu Hayashi, Rai Moriya, Xin Jiang, Bastiaan Bergman, Charles Rettner, Brian Hughes, Stuart S.Parkin, IBM Almaden Research Ctr. . . . . [7036-33]

9:30 am: **Status and outlook of MRAM technology** *(Invited Paper)*, Brad N. Engel, Freescale Semiconductor, Inc.. . . . . [7036-34]

Coffee Break . . . . . 10:00 to 10:30 am

SESSION 12

Room: Conv. Ctr. 14A . . . . . .Wed. 10:30 to 11:50 am

Vortex/Domain Walls

Session Chair: **Csaba Jozsa,** Univ. of Groningen (Netherlands); **Julie Grollier,** Ctr. National de la Recherche Scientifique (France) and Thales Research & Technology (France)

10:30 am: **Single domain to vortex state transition in multilayered cobalt/copper nanowires** *(Invited Paper)*, Jared Wong, Peter Greene, Randy K. Dumas, Kai Liu, Univ. of California/Davis . . . . . [7036-35]

11:00 am: **Real time detection of the current-induced resonant motion of the magnetic vortex core** *(Invited Paper, Presentation Only)*, Shinya Kasai, Kyoto Univ. (Japan); Peter Fischer, Mi-Young Im, Lawrence Berkeley National Lab.; Keisuke Yamada, Kyoto Univ. (Japan); Yoshinobu Nakatani, Univ. of Electro-Communications (Japan); Kensuke Kobayashi, Kyoto Univ. (Japan); Hiroshi Kohno, Osaka Univ. (Japan); Teruo Ono, Kyoto Univ. (Japan)[7036-36]

11:30 am: **Current-induced domain wall dynamics** *(Invited Paper)*, Mathias Klaeui, D. Bedau, Lutz Heyne, Stephen Krzyk, Univ. Konstanz (Germany); D. Backes, Univ. Konstanz (Germany) and LPN-CNRS (France); L. J. Heyderman, Paul Scherrer Institute, LMN (Switzerland); Giancarlo Faini, L. Vila, LPN-CNRS (France); Ulrich Ruediger, Univ. Konstanz (Germany) . . . . . [7036-37]

Lunch/Exhibition Break . . . . . 11:50 am to 1:00 pm

SESSION 13

Room: Conv. Ctr. 14A . . . . . .Wed. 1:00 to 3:00 pm

Magnetic Semiconductor Heterostructures

Session Chairs: **Jing Shi,** Univ. of California/Riverside; **Masaaki Tanaka,** The Univ. of Tokyo (Japan)

1:00 pm: **Electrically driven domain walls in (Ga,Mn)As** *(Keynote Presentation),* Hideo Ohno, RIEC Tohoku Univ. (Japan) . . . . . [7036-38]

2:00 pm: **Novel spintronic devices using local anisotropy engineering in (Ga,Mn)As** *(Invited Paper)*, Charles Gould, Jan Wenisch, Katrin Pappert, Silvia Humpfner, Manuel Schmidt, Christian Kumpf, Karl Brunner, Georg Schmidt, Laurens Molenkamp, Univ. Würzburg (Germany) . . . . . [7036-39]

2:30 pm: **Self-organized nanocolumns of GeMn in Germanium** *(Invited Paper)*, Joel Cibert, Salia Cherifi, Samuel Tardif, Ctr. National de la Recherche Scientifique (France); Andre Barski, Pascale Bayle-Guillemaud, Edith Bellet-Amalric, Thibault Devillers, Vincent Favre-Nicolin, Matthieu Jamet, Ing-Song Yu, Commissariat à l'Energie Atomique (France) . . . . . [7036-40]

Coffee Break . . . . . 3:00 to 3:30 pm

SESSION 14

Room: Conv. Ctr. 14A . . . . . .Wed. 3:30 to 5:00 pm

Domain Walls

Session Chairs: **Alain Schuhl,** Commissariat à l'Energie Atomique (France); **Matthias Bode,** Argonne National Lab.

3:30 pm: **Length and time scales in magnetic domain wall dynamics** *(Invited Paper)*, Geoffrey S. Beach, Carl Knutson, Jusang Yang, Maxim Tsoi, James Erskine, Univ. of Texas at Austin . . . . . [7036-41]

4:00 pm: **Lorentz microscopy and electron holography studies of current-excited magnetization dynamics in Permalloy nanowires** *(Invited Paper)*, Yoshihiko Togawa, The Institute of Physical and Chemical Research (RIKEN) (Japan); Takashi Kimura, The Univ. of Tokyo (Japan); Ken Harada, The Institute of Physical and Chemical Research (RIKEN) (Japan) and Hitachi, Ltd. (Japan); Tetsuya Akashi, Hitachi High-Technologies Corp. (Japan) and Hitachi, Ltd. (Japan); Tsuyoshi Matsuda, Akira Tonomura, The Institute of Physical and Chemical Research (RIKEN) (Japan) and Hitachi, Ltd. (Japan); Yoshichika Otani, The Univ. of Tokyo (Japan) and The Institute of Physical and Chemical Research (RIKEN) (Japan) . . . . . [7036-42]

4:30 pm: **Magnetic x-ray microscopy of current-driven domain-wall and vortex dynamics** *(Invited Paper),* Guido Meier, Univ. Hamburg (Germany) . . . . . [7036-43]

Thursday 14 August

SESSION 15

Room: Conv. Ctr. 14A . . . . . .Thurs. 8:30 to 10:00 am

Spin Manipulation

Session Chairs: **Julie Grollier,** Thales Research & Technology (France); **Jean-Marc Jancu,** Lab. de Photonique et de Nanostructures, CNRS (France)

8:30 am: **Anisotropic magnetoresistance phenomena in ferromagnetic semiconductors and metals** *(Invited Paper)*, Tomas Jungwirth, Institute of Physics v.v.i. ASCR (Czech Republic) . . . . . [7036-44]

9:00 am: **Manipulation of individual electronic spins in semiconductors** *(Invited Paper)*, Craig E. Pryor, The Univ. of Iowa . . . . . [7036-45]

9:30 am: **Pure-spin-current-induced magnetization switching** *(Invited Paper)*, Tao Yang, The Institute of Physical and Chemical Research (RIKEN) (Japan); Takashi Kimura, The Univ. of Tokyo (Japan) and The Institute of Physical and Chemical Research (RIKEN) (Japan); YoshiChika Otani, The Univ. of Tokyo (Japan) . . . . . [7036-46]

Coffee Break . . . . . 10:00 to 10:30 am

SESSION 16

Room: Conv. Ctr. 14A . . . . . .Thurs. 10:30 to 11:30 am

Domain Walls, Metal/Semiconductor Structures

Session Chairs: **Wolfgang Weber,** Univ. Louis Pasteur (France); **Eric E. Fullerton,** Univ. of California/San Diego

10:30 am: **Spin structures of head-to-head domain walls**, O. Boulle, Mathias Klaeui, Lutz Heyne, Thomas Moore, Friederike Junginger, Stephen Krzyk, Ulrich Ruediger, Univ. Konstanz (Germany) . . . . . [7036-47]

10:50 am: **Current flow in Fe/GaAS structures**, Vladimer Mikelashvili, Georgian Technical Univ. (Georgia); Tinatin Laperashvili, Orest Kvitsiani, Institute of Cybernetics (Georgia) . . . . . [7036-48]

11:10 am: **Analysis of nonlinear dynamics and spin-flip parameters on elliptically polarized injection-locked VCSELs**, Ali Homayounfar, Michael J. Adams, Univ. of Essex (United Kingdom) . . . . . [7036-49]

Courses of Related Interest

See SPIE Cashier for information and to register.

SC496 Fabrication and Processing of Nanostructures (Cao) Monday, 8:30 am to 5:30 pm
SC497 Nanophotonics (Prasad) Sunday, 1:30 to 5:30 pm
WS851 Nanotechnology: Science & Applications (Brahmbhatt) Wednesday, 8:30 am to 5:30 pm

Conference 7037

Sunday-Tuesday 10-12 August 2008 • Proceedings of SPIE Vol. 7037

Carbon Nanotubes and Associated Devices

Conference Chairs: **Manijeh Razeghi,** Northwestern Univ.; **Didier Pribat,** École Polytechnique (France); **Young Hee Lee,** Sungkyunkwan Univ. (South Korea)

Program Committee: **Phaedon Avouris,** IBM Thomas J. Watson Research Ctr.; **Ray Henry Baughman,** The Univ. of Texas at Dallas; **Jean-Philippe Bourgoin,** CEA Saclay; **Hongjie Dai,** Stanford Univ.; **Nicole Grobert,** Univ. of Oxford (United Kingdom); **Kenji Hata,** National Institute of Advanced Industrial Science and Technology (Japan); **Ali Javey,** Univ. of California/Berkeley; **S. H. Lee,** Chonbuk National Univ. (South Korea); **Pierre Legagneux,** Thales Research & Technology (France); **Annick Loiseau,** ONERA (France); **William I. Milne,** Univ. of Cambridge (United Kingdom); **John A. Rogers,** Univ. of Illinois at Urbana-Champaign; **Siegmar Roth,** Max-Planck-Institut für Festkörperforschung (Germany); **Jin Zhang,** Peking Univ.; **Donald J. Silversmith,** Air Force Office of Scientific Research; **Ryan P. McClintock,** Northwestern Univ.

Sunday 10 August

SESSION 1

Room: Conv. Ctr. 14B . . . . . .Sun. 8:30 to 9:50 am

Devices and Device Physics I

Session Chair: **Young Hee Lee,** Sungkyunkwan Univ. (South Korea)

8:30 am: **High frequency carbon nanotube devices** *(Invited Paper)*, Marcelo F. Goffman, Nicolas Chimot, Miguel Monteverde, Ervin Mile, Vincent Derycke, Jean-Philippe Bourgoin, Commissariat à l'Energie Atomique (France)[7037-01]

9:00 am: **Electrical properties of carbon nanotube FETs** *(Invited Paper)*, Takashi Mizutani, Nagoya Univ. (Japan) . . . . . [7037-02]

9:30 am: **Magnetotransport on single-walled carbon nanotubes, metallofullerene peapods and graphene**, Dirk Obergfell, Max-Planck-Institut für Festkörperforschung (Germany); Andrei N. Khlobystov, The Univ. of Nottingham (United Kingdom); Shihe Yang, The Hong Kong Univ. of Science and Technology (China); Miroslav Haluska, Technische Univ. Eindhoven (Netherlands); Siegmar Roth, Max-Planck-Institut für Festkörperforschung (Germany) . . . . . [7037-03]

Coffee Break . . . . . 9:50 to 10:20 am

SESSION 2

Room: Conv. Ctr. 14B . . . . . Sun. 10:20 am to 12:20 pm

Synthesis and Characterization

Session Chair: **Manish Chhowalla,** Rutgers Univ.

10:20 am: **"Super growth": working to supply the world with catalyst-free SWNTs** *(Invited Paper)*, Don N. Futaba, Kenji Hata, National Institute of Advanced Industrial Science and Technology (Japan) . . . . . [7037-04]

10:50 am: **Cross-polarized spectroscopy of DNA-wrapped nanotubes: unraveling the nature of optical response** *(Invited Paper)*, Slava V. Rotkin, Lehigh Univ.. . . . . [7037-05]

11:20 am: **Resonant Raman scattering of smallest single-walled carbon nanotubes**, Zi Kang Tang, Hong Kong Univ. of Science and Technology (Hong Kong China). . . . . [7037-06]

11:40 am: **The application of dielectrophoresis on the characterization of dielectric property in multi-walled carbon nanotubes**, Chehung Wei, Cheng-Hao Liang, Tatung Univ. (Taiwan) . . . . . [7037-07]

12:00 pm: **A novel resonant Raman spectroscopy system for carbon nanotube characterization**, Sebastien Blais-Ouellette, Marc Verhaegen, Photon Etc. Inc. (Canada); François Meunier, Matthieu Paillet, Richard Martel, Univ. de Montréal (Canada). . . . . [7037-08]

Lunch Break . . . . . 12:20 to 1:30 pm

SESSION 3

Room: Conv. Ctr. 14B . . . . . Sun. 1:30 to 3:10 pm

CNT Films and Interconnects

Session Chair: **Didier Pribat,** Ecole Polytechnique (France)

1:30 pm: **Recent progresses in carbon nanotube-based flexible transparent conducting film** *(Invited Paper)*, Young Hee Lee, Sungkyunkwan Univ. (South Korea) . . . . . [7037-09]

2:00 pm: **Controlled growth of super-aligned carbon nanotube arrays and their applications** *(Invited Paper)*, Kai Liu, Xiaobo Zhang, Kaili Jiang, Tsinghua Univ. (China); Qunqing Li, Tsinguha Univ. (China); Shoushan Fan, Tsinghua Univ. (China) . . . . . [7037-10]

2:30 pm: **Electrical properties of random carbon nanotubes networks**, Viera Skakalova, Max-Planck-Institut für Festkörperforschung (Germany) . . . . . [7037-11]

2:50 pm: **An application of carbon nanotubes for integrated circuit interconnects**, Jean-Christophe Coiffic, CEA, Leti Minatec (France); Helene Le Poche, CEA, Liten (France); Murielle Fayolle, CEA, Leti Minatec (France); Luis E. Foa Torres, CEA, INAC Minatec (France) and Dresden Univ. of Technology (Germany); Stephan Roche, CEA, INAC Minatec (France); Sylvain Maitrejean, CEA, Leti Minatec (France) . . . . . [7037-12]

Coffee Break . . . . . 3:10 to 3:40 pm

SESSION 4

Room: Conv. Ctr. 14B . . . . . Sun. 3:40 to 5:10 pm

NEMS

Session Chair: **Takashi Mizutani,** Nagoya Univ. (Japan)

3:40 pm: **Electromechanical transducers based on single-walled carbon nanotubes** *(Invited Paper)*, Christoph Stampfer, Alain Jungen, Thomas Helbling, Christofer Hierold, ETH Zürich (Switzerland) . . . . . [7037-13]

4:10 pm: **Carbon nanotubes based microwave varactor: modeling, simulation and design**, Ricart Thibault, Pacchini J. Sebastien, Univ. of Toulouse (France); Costel S. Cojocaru, Didier Pribat, Ecole Polytechnique (France); David Dubuc, Katia M. Grenier, Univ. of Toulouse (France). [7037-14]

4:30 pm: **Integrated 3D microelectromechanical devices from processable carbon nanotube wafers**, Yuhei Hayamizu, Takeo Yamada, Kohei Mizuno, National Institute of Advanced Industrial Science and Technology (Japan); Robert C. Davis, Brigham Young Univ.; Don N. Futaba, Motoo Yumura, Kenji Hata, National Institute of Advanced Industrial Science and Technology (Japan). . . . . [7037-15]

4:50 pm: **Integration of carbon nanotubes on AlGaAs/GaAs-based micro-cantilever devices,** Vaibhav Mathur, Jin Li, Joel Therrien, William D. Goodhue, Univ. of Massachusetts/Lowell . . . . . [7037-16]

Room: Conv. Ctr. 6A . . . . . Sun. 6:00 to 6:45 pm

All-Conference Plenary Session

View plenary presentation details p. 13.

6:00 pm: **The Solar Decathlon: building a better future with solar energy**, Richard J. King, U.S. Dept. of Energy

Monday 11 August

Room: Conv. Ctr. 6A . . . . . Mon. 8:30 am to 12:20 pm

NanoScience + Engineering Plenary Session

View plenary presentation details p. 13-14.

8:30 am: **Revivals of Molecular Nonlinear Optics in Physics, Chemistry, and Life Sciences,** Joseph Zyss, École Normale Supérieure de Cachan (France)

9:10 am: **Applications of Biological Materials**, Rajesh R. Naik, Air Force Research Lab.

Coffee Break . . . . . 9:50 to 10:20 am

10:20 am: **Two-Photon Lithography for Precise 3D Nano/Micro-Objects**, Kwang-Sup Lee, Hannam Univ. (South Korea)

11:00 am: **Multifunctional Excimer-Laser Lithography and Photoablation Technologies for Large-Area Micro and Nanoelectronics, Displays and Microsystems**, Kanti Jain, Univ. of Illinois at Urbana-Champaign

11:40 am: **Molecules, Surfaces, and Symmetry: From Pure Geometry to Nanoscience,** Denis Fichou, Commissariat à l'Energie Atomique (France)

SESSION 5

Room: Conv. Ctr. 14B . . . . . Mon. 1:20 to 3:10 pm

CNT Interactions with Liquid Crystals

Session Chair: **Marcello F. Goffman,** Commissariat à l'Energie Atomique (France)

1:20 pm: **Electrokinetic elongation and subsequent dispersion of carbon nanotubes in liquid crystal medium** *(Invited Paper)*, Seung Hee Lee, Seok-Jin Jeong, Anoop K. Srivastava, Miyoung Kim, Eun-mi Jo, Jung Hun Choi, Chonbuk National Univ. (South Korea); Jung Jun Bae, Young Hee Lee, Sungkyunkwan Univ. (South Korea) . . . . . [7037-17]

1:50 pm: **Scientific duo of carbon nanotubes and nematic liquid crystals** *(Invited Paper)*, Wei Lee, Chung Yuan Christian Univ. (Taiwan) . . . . . [7037-18]

2:20 pm: **Tuning properties by mixing carbon nanotubes and liquid crystals** *(Invited Paper)*, Giusy Scalia, Max-Planck-Institut für Festkörperforschung (Germany); Jan P. F.Lagerwall, Martin-Luther Univ. Halle-Wittenberg (Germany); Siegmar Roth, Max-Planck-Institut für Festkörperforschung (Germany) . . . . . [7037-19]

2:50 pm: **Sparse multiwall carbon nanotube electrodes arrays for liquid crystal photonic devices**, Timothy D. Wilkinson, Xiaozhi Wang, Ken Teo, William Milne, Univ. of Cambridge (United Kingdom) . . . . . [7037-20]

Coffee . . . . . 3:10 to 3:40 pm

SESSION 6

Room: Conv. Ctr. 14B . . . . . Mon. 3:40 to 4:50 pm

CNT Organization and Separation

Session Chair: **Seung Hee Lee,** Chonbuk National Univ. (South Korea)

3:40 pm: **Patterning of single-walled carbon nanotubes using a low-fluence excimer laser photoablation process** *(Invited Paper)*, Junghun Chae, Xinning Ho, John A. Rogers, Kanti Jain, Univ. of Illinois at Urbana-Champaign . . . . . [7037-21]

4:10 pm: **Novel approach to align carbon nanotubes for planar type devices**, Gowtham Manoharan, Heejin Jeong, Bernd Marquardt, Costel S. Cojocaru, Didier Pribat, Ecole Polytechnique (France) . . . . . [7037-22]

4:30 pm: **Light-induced accumulation of single-wall carbon nanotubes dispersed in aqueous solution,** Satoru Shoji, Thomas Rodgers, Zouheir Sekkat, Satoshi Kawata, Osaka Univ. (Japan) . . . . . [7037-23]

Room: Conv. Ctr. Exhibit Hall B2 . . . . . Mon. 6:00 to 7:30 pm

Posters-Monday

Poster authors will begin displaying posters after 10:00 am Monday morning. A poster session, with authors present at their posters, will be held Monday evening from 6:00 to 7:30 pm. Light refreshments will be served.

Poster Setup

Poster presenters must set up their posters between 10:00 am and 5:00 pm on Monday. Poster presenters who have not set up by 5:00 pm on Monday will be considered a "no show" and their manuscript will not be published. Presenters must remove their posters immediately after the poster session. Posters not removed will be considered unwanted and will be discarded. SPIE assumes no responsibility for posters left up after the end of each poster session.

Carbon nanotube: polymer nanocomposites for possible pressure sensor applications, Sreekanth J. Varma, Kartha R. Jayalekshmi, Cochin Univ. of Science & Technology (India) . . . . . [7037-37]

Buckypaper from thin multiwalled carbon nanotubes, Joong Tark Han, Geong-Woong Lee, Korea Electrotechnology Research Institute (South Korea) . . . . . [7037-43]

Scale effect in free vibration of carbon nanotubes, Baolin Wang, The Univ. of Sydney (Australia) . . . . . [7037-44]

Micro-interconnection technology suitable for RF-NEMS varactors elaboration, Sebastien Pacchini, Monique Dilhan, Thibaut Ricart, David Dubuc, Univ. of Toulouse (France); Costel-Sorin Cojocaru, Didier Pribat, Ecole Polytechnique (France); Katia M. Grenier, Univ. of Toulouse (France) [7037-45]

Gigahertz resonance characteristics of nanotube linear motor, Young Gyu Choi, Gi Han Ryu, Chung Sang Won, Chungju National Univ. (South Korea) . . . . . [7037-46]

Nanometrology of graphene and graphene nanoribbons on arbitrary substrates and at variable temperature, Irene Calizo, Suchismita Ghosh, Desalegne Teweldebrhan, Alexander A. Balandin, Wenzhong Bao, Feng Miao, Chun Ning Lau, Univ. of California/Riverside . . . . . [7037-47]

Schematics and simulations for nanoscale engine based on nanotube encapsulating condensed gases, Chung Sang Won, Young Gyu Choi, Chungju National Univ. (South Korea). . . . . [7037-48]

Characterization of nanotube nonvolatile memory device, Jeong-Won Kang, Chungju National Univ. (South Korea) . . . . . [7037-49]

Embedded multi-frequency generators based on multi-walled carbon nanotube, Gi Han Ryu, Chung Sang Won, Young Gyu Choi, Chungju National Univ. (South Korea) . . . . . [7037-50]

The study of physical properties and their effect in electro-optical characteristics in nematic liquid crystal doped with carbon nano tubes, Anoop K. Srivastava, Seok-Jin Jeong, Miyoung Kim, Eun-mi Jo, Seung Hee Lee, Chonbuk National Univ. (South Korea); Seung E. Lee, Hee-Kyu Lee, Merck Advanced Technologies Ltd. (South Korea); Jung Jun Bae, Young Hee Lee, Sungkyunkwan Univ. (South Korea) . . . . . [7037-51]

Conference 7037

Tuesday 12 August

SESSION 7

Room: Conv. Ctr. 14B . . . . . Tues. 8:00 to 9:50 am

Field Emission from CNTs

Session Chair: **Manijeh Razeghi,** Northwestern Univ.

8:00 am: **The application of carbon nanotube electron sources to the electron microscope** *(Invited Paper)*, Mark Mann, William Milne, Univ. of Cambridge (United Kingdom); Torquil Wells, Mohamed El Gomati, The Univ. of York (United Kingdom); Ken B. K.Teo, Univ. of Cambridge (United Kingdom) . . . . . [7037-25]

8:30 am: **Surface plasmon localization for the optical control of field emission**, Pierrick Guiset, Sylvain Combrie, Mathieu Carras, Alfredo De Rossi, Jean-Philippe P. Schnell, Pierre Legagneux, Thales Research & Technology (France) . . . . . [7037-26]

8:50 am: **Field emission properties of multi-wall carbon nanotubes**, Zhe-Chuan Feng, Yi Zhe Huang, National Taiwan Univ. (Taiwan); J. H. Ting, National Nano Device Lab. (Taiwan); Weijie Lu, Fisk Univ. . . . . [7037-27]

9:10 am: **Electronic structure and electron-phonon interaction in strained CNTs for field emission cathodes**, Niraj Sinha, Univ. of Waterloo (Canada); Debiprosad Roy Mahapatra, Indian Institute of Science (India); Roderick V. N.Melnik, Wilfrid Laurier Univ. (Canada) . . . . . [7037-28]

9:30 am: **Equilibrium of electrostatic and van der Waals forces for carbon nanotube during field emission**, Alexander Zhbanov, Evgeny Pogorelov, Yia-Chung Chang, Academia Sinica (Taiwan) . . . . . [7037-29]

Coffee Break . . . . . 9:50 to 10:20 am

SESSION 8

Room: Conv. Ctr. 14B . . . . . Tues. 10:20 to 11:50 am

Devices and Device Physics II

Session Chair: **Mark Mann,** Univ. of Cambridge (United Kingdom)

10:20 am: **Mass transport of lithium ions intercalated in pyrene-functionalized single-walled carbon nanotubes: a facile way to Schottky diode** *(Invited Paper)*, Hee Cheul Choi, Hyunseob Lim, Pohang Univ. of Science and Technology (South Korea) . . . . . [7037-30]

10:50 am: **High-performance carbon nanotube network transistors for logic applications**, Henry M. Silva, National Tsing Hua Univ. (Taiwan); Po-Wen Chiu, National Tsing-Hua Univ. (Taiwan); Siegmar Roth, Max-Planck-Institut für Festkörperforschung (Germany) . . . . . [7037-31]

11:10 am: **Synthesis of ZnO nanowires for thin film network transistors**, S. H. Dalal, Husnu Unalan, Pritesh Hiralal, Andrew J. Flewitt, Gehan A. J.Amaratunga, William I. Milne, Univ. of Cambridge (United Kingdom)[7037-32]

11:30 am: **Electronic and fluidic transport in carbon nanotube channels**, Yongqiang Xue, SUNY/Univ. at Albany. . . . . [7037-33]

Lunch Break . . . . . 11:50 am to 1:20 pm

SESSION 9

Room: Conv. Ctr. 14B . . . . . Tues. 1:40 to 3:00 pm

Sensors

Session Chair: **Kenji Hata,** National Institute of Advanced Industrial Science and Technology (Japan)

1:40 pm: **Improving the performance of functionalized carbon nanotube thin film sensors by fluctuation-enhanced sensing** *(Invited Paper)*, Akos Kukovecz, Peter Heszler, Sr., Univ. of Szeged (Hungary); Krisztian Kordas, Univ. of Oulu (Finland); Siegmar Roth, Max-Planck-Institut für Festkörperforschung (Germany); Zoltan Konya, Univ. of Szeged (Hungary) . . [7037-34]

2:10 pm: **The use of nanotube structures in reducing the turn-on voltage in Micro-discharges and micro gas-sensors** *(Invited Paper)*, James A. D.McLaughlin, Univ. of Ulster (United Kingdom). . . . . [7037-35]

2:40 pm: **Fast fully plastic actuator based on ionic-liquid-based bucky gel**, Kinji Asaka, Ken Mukai, Ichirou Takeuchi, Kenji Hata, National Institute of Advanced Industrial Science and Technology (Japan) . . . . . [7037-36]

Coffee Break . . . . . 3:00 to 3:30 pm

SESSION 10

Room: Conv. Ctr. 14B . . . . . Tues. 3:30 to 5:40 pm

Photonic and Photovoltaic Devices

Session Chair: **Akos Kukovecz,** Univ. of Szeged (Hungary)

3:30 pm: **Transparent and conducting single-walled carbon nanotube thin films as hole-conducting electrodes in organic photovoltaics** *(Invited Paper)*, Manish Chhowalla, Rutgers Univ.. . . . . [7037-38]

4:00 pm: **Optical switching of carbon nanotube transistors functionalized with conducting polymer** *(Invited Paper)*, Julien Borghetti, LEM, CEA-Saclay SPEC (France); Vincent Derycke, Pascale Chenevier, Arianna Filoramo, Marcello F. Goffman, Jean-Philippe Bourgoin, Commissariat à l'Energie Atomique (France) . . . . . [7037-39]

4:30 pm: **Carbon nanotubes and optical confinement: controlling light emission in nanophotonic devices** *(Invited Paper)*, Mathias B. Steiner, IBM Thomas J. Watson Research Ctr. . . . . [7037-40]

5:00 pm: **Embedding of carbon nanotubes on silicon substrates for use in solar cells**, Abhishek Kumar, Stanford Univ.; Nikhil Dhawan, Punjab Engineering College (India) . . . . . [7037-41]

5:20 pm: **Nanotube-based polymer photonics**, Alex Rozhin, Vittorio Scardaci, Univ. of Cambridge (United Kingdom) . . . . . [7037-42]

Courses of Related Interest

See SPIE Cashier for information and to register.

SC496 Fabrication and Processing of Nanostructures (Cao) Monday, 8:30 am to 5:30 pm
SC497 Nanophotonics (Prasad) Sunday, 1:30 to 5:30 pm
WS851 Nanotechnology: Science & Applications (Brahmbhatt) Wednesday, 8:30 am to 5:30 pm

Conference 7038

Sunday-Wednesday 10-13 August 2008 • Proceedings of SPIE Vol. 7038

Optical Trapping and Optical Micromanipulation V

Conference Chairs: **Kishan Dholakia,** Univ. of St. Andrews (United Kingdom); **Gabriel C. Spalding,** Illinois Wesleyan Univ.

Program Committee: **Elliot L. Botvinick,** Beckman Laser Institute; **Carlos Lenz César,** Univ. Estadual de Campinas (Brazil); **Jesper Glückstad,** Risø National Lab. (Denmark); **Min Gu,** Swinburne Univ. (Australia); **Jens-Christian D. Meiners,** Univ. of Michigan; **H. Daniel Ou-Yang,** Lehigh Univ.; **Thomas T. Perkins,** Univ. of Colorado at Boulder; **Ruben Ramos-Garcia,** Instituto Nacional de Astrofísica, Óptica y Electrónica (Mexico); **Halina H. Rubinsztein-Dunlop,** The Univ. of Queensland (Australia)

Sunday 10 August

SESSION 1

Room: Conv. Ctr. 16B . . . . . .Sun. 8:00 to 10:10 am

Single Molecule Studies

Session Chair: **Jens-Christian D. Meiners,** Univ. of Michigan

8:00 am: **Observing sequential formation of structural components in a single riboswitch molecule with an optical trap** *(Invited Paper)*, Michael T. Woodside, National Research Council Canada (Canada) and Univ. of Alberta (Canada) . . . . . [7038-01]

8:30 am: **Surface-coupled optical trapping assay with 1 base pair resolution**, Thomas T. Perkins, Ashley R. Carter, Univ. of Colorado at Boulder . . . . . [7038-02]

8:50 am: **Measurements of elastic constants between probe DNA strands and a target DNA linker**, Yun-Hui Park, Sun-Uk Hwang, Daekyung Sung, Dongkyu Kim, Sangyong Jon, Yong-Gu Lee, Gwangju Institute of Science and Technology (South Korea). . . . . [7038-03]

9:10 am: **Expansion and rupture of a virus shell during DNA packaging detected by optical tweezers measurements**, Douglas E. Smith, Univ. of California/San Diego . . . . . [7038-04]

9:30 am: **Mechanism of a viral DNA packaging motor studied by characterization of biochemical mutants via optical tweezers measurements**, James M. Tsay, Univ. of California/San Diego; Jean Sippy, Michael Feiss, The Univ. of Iowa; Douglas E. Smith, Univ. of California/San Diego . . . . . [7038-05]

9:50 am: **Determining single-molecule ATP stoichiometry in a multi-subunit enzyme with a hardware-based anti-Brownian electrokinetic trap**, Yan Jiang, Adam E. Cohen, Nick Douglass, William E. Moerner, Stanford Univ. . . . . [7038-06]

Coffee Break . . . . . 10:10 to 10:40 am

SESSION 2

Room: Conv. Ctr. 16B . . . . . Sun. 10:40 am to 12:10 pm

Cellular Studies Using Optical Forces

Session Chair: **Thomas T. Perkins,** Univ. of Colorado at Boulder

10:40 am: **Feeling for Cells with Light** *(Invited Paper)*, Josef A. Käs, Univ. Leipzig (Germany) . . . . . [7038-07]

11:10 am: **Deformability of erythrocytes of gene knockout and wild type mice measured by oscillatory optical tweezers**, Yu-Shan C. Huang, Guan-Bo Liao, National Yang-Ming Univ. (Taiwan); Yunlong Sheng, Univ. Laval (Canada); Yi-Fan Chen, Ting-Fen Tsai, Arthur E. T.Chiou, National Yang-Ming Univ. (Taiwan) . . . . . [7038-08]

11:30 am: **A laser microscope for mechanotransduction studies on cells**, Samir Shreim, Jamie Evora, Univ. of California/Irvine; Halina Rubinsztein-Dunlop, The Univ. of Queensland (Australia); Elliot L. Botvinick, Univ. of California/Irvine . . . . . [7038-09]

11:50 am: **The smallest crane system in the world or how macrophages trap the prey** *(Presentation Only)*, Alexander Rohrbach, Felix Kohler, Albert-Ludwigs-Univ. Freiburg (Germany); Holger Kress, Yale Univ.. . . . . [7038-11]

Lunch Break . . . . . 12:10 to 1:30 pm

SESSION 3

Room: Conv. Ctr. 16B . . . . . .Sun. 1:30 to 4:30 pm

Wigglings and Jigglings

Session Chair: **Kishan Dholakia,** Univ. of St. Andrews (United Kingdom)

1:30 pm: **Oscillatory optical tweezers for biomedical applications** *(Invited Paper, Presentation Only)*, Arthur E. Chiou, National Yang-Ming Univ. (Taiwan) . . . . . [7038-13]

2:00 pm: **Noninvasive measurement of intracellular viscoelastic properties**, Martha B. Alvarez-Elizondo, Instituto Tecnológico y de Estudios Superiores de Monterrey (Mexico); Susan H. Roelofs, The Univ. of Queensland (Australia); Frederic Meunier, Queensland Brain Institute (Australia); Norman Heckenberg, Halina Rubinsztein-Dunlop, The Univ. of Queensland (Australia) . . . . [7038-14]

2:20 pm: **Using Laser Tweezers to Find the Bridge between Bulk and Local Mechanical Properties in Tissue Engineered Constructs**, Max A. Kotlarchyk, Andy Putnam, Elliot Botvinick, Univ. of California/Irvine. . . . . [7038-15]

2:40 pm: **Multi-point viscosity measurements using optical tweezers**, Steven Keen, Jonathan Leach, Univ. of Glasgow (United Kingdom); Monica Berry, Univ. of Bristol (United Kingdom); Miles Padgett, Univ. of Glasgow (United Kingdom). . . . . [7038-16]

Coffee Break . . . . . 3:00 to 3:30 pm

3:30 pm: **Hydrodynamic interactions in a quasi two-dimensional fluid**, Roberto Di Leonardo, Univ. degli Studi di Roma/La Sapienza (Italy); Steven Keen, Univ. of Glasgow (United Kingdom); Francesca Ianni, Univ. degli Studi di Roma/La Sapienza (Italy); Jonathan Leach, Miles Padgett, Univ. of Glasgow (United Kingdom); Giancarlo Ruocco, Univ. degli Studi di Roma/La Sapienza (Italy) . . . . . [7038-17]

3:50 pm: **Three-dimensional highspeed interferometric tracking of several diffusing particles close to interfaces**, Michael Speidel, Alexander Rohrbach, Albert-Ludwigs-Univ. Freiburg (Germany). . . . . [7038-18]

4:10 pm: **Measurements of the compressibility of colloidal suspensions by radiation pressure,** Joseph Junio, H. Daniel Ou-Yang, Lehigh Univ. [7038-19]

SESSION 4

Room: Conv. Ctr. 16B . . . . . .Sun. 4:30 to 5:40 pm

Statistical Mechanics of Small Systems

Session Chair: **H. Daniel Ou-Yang,** Lehigh Univ.

4:30 pm: **Geometric frustration in temperature sensitive colloidal suspensions** *(Invited Paper)*, Arjun G. Yodh, Univ. of Pennsylvania . [7038-20]

5:00 pm: **Fabrication of structures using holographic optical tweezers and adhesion via entropic attraction**, David M. Carberry, David C. Benito, Eleanor Edwards, Julia Hildmann, Univ. of Bristol (United Kingdom); Graham M. Gibson, Miles J. Padgett, Univ. of Glasgow (United Kingdom); Martin Kuball, Simon Hanna, Mervyn J. Miles, Univ. of Bristol (United Kingdom) . . . [7038-21]

5:20 pm: **Optical tweezers manipulation of colloids and biopolymers: non-equilibrium processes**, Edith M. Sevick, Genmiao Wang, The Australian National Univ. (Australia) . . . . . [7038-22]

Room: Conv. Ctr. 6A . . . . . Sun. 6:00 to 6:45 pm

All-Conference Plenary Session

View plenary presentation details p. 13.

6:00 pm: **The Solar Decathlon: building a better future with solar energy**, Richard J. King, U.S. Dept. of Energy

Monday 11 August

Room: Conv. Ctr. 6A . . . . . .Mon. 8:30 am to 12:20 pm

NanoScience + Engineering Plenary Session

View plenary presentation details p. 13-14.

8:30 am: **Revivals of Molecular Nonlinear Optics in Physics, Chemistry, and Life Sciences,** Joseph Zyss, École Normale Supérieure de Cachan (France)

9:10 am: **Applications of Biological Materials**, Rajesh R. Naik, Air Force Research Lab.

Coffee Break . . . . . 9:50 to 10:20 am

10:20 am: **Two-Photon Lithography for Precise 3D Nano/Micro-Objects**, Kwang-Sup Lee, Hannam Univ. (South Korea)

11:00 am: **Multifunctional Excimer-Laser Lithography and Photoablation Technologies for Large-Area Micro and Nanoelectronics, Displays and Microsystems**, Kanti Jain, Univ. of Illinois at Urbana-Champaign

11:40 am: **Molecules, Surfaces, and Symmetry: From Pure Geometry to Nanoscience,** Denis Fichou, Commissariat à l'Energie Atomique (France)

SESSION 5

Room: Conv. Ctr. 16B . . . . . Mon. 1:30 to 4:10 pm

Ensemble Behaviors in Optical Fields

Session Chair: **H. Daniel Ou-Yang,** Lehigh Univ.

1:30 pm: **Actin networks under large deformations studied with optical tweezers and HOTs**, Wolfgang Losert, Andrew Pomerance, Erin Rericha, Univ. of Maryland/College Park . . . . . [7038-10]

1:50 pm: **Theoretical study of light-induced forces and binding on small particle clusters** *(Invited Paper)*, Jack Ng, Zhihong Hang, Ross Tang, Che Ting Chan, The Hong Kong Univ. of Science and Technology (Hong Kong China) . . . . . [7038-24]

2:20 pm: **Stability and dynamics of self-arranged structures in longitudinal optical binding**, Vitezslav Karasek, Oto Brzobohaty, Tomas Cizmar, Institute of Scientific Instruments (Czech Republic); Veneranda Garces-Chavez, Kishan Dholakia, Univ. of St. Andrews (United Kingdom); Pavel Zemánek, Institute of Scientific Instruments (Czech Republic) . . . . . [7038-25]

2:40 pm: **Long distance beam propagation in colloidal suspensions: comparison between theory and experiment**, Ewan M. Wright, College of Optical Sciences/The Univ. of Arizona; Woei Ming Lee, Univ. of St. Andrews (United Kingdom); Pierre-Louis Giscard, College of Optical Sciences/The Univ. of Arizona; Kishan Dholakia, Univ. of St. Andrews (United Kingdom). [7038-26]

Coffee Break . . . . . 3:00 to 3:30 pm

3:30 pm: **Generation and control of multiple Bessel beams for optical micromanipulation**, Tomas Cizmar, Univ. of St. Andrews (United Kingdom); Vera Kollarova, Univ. Palackého V Olomouci (Czech Republic); Xanthi Tsampoula, Frank J. Gunn-Moore, Univ. of St. Andrews (United Kingdom); Zdenek Bouchal, Univ. Palackého V Olomouci (Czech Republic); Kishan Dholakia, Univ. of St. Andrews (United Kingdom). . . . . [7038-27]

3:50 pm: **Optically induced multi-particle structures: multi-dimensional energy landscapes**, Justo J. Rodriguez, David L. Andrews, Univ. of East Anglia Norwich (United Kingdom) . . . . . [7038-28]

SESSION 6

Room: Conv. Ctr. 16B . . . . . Mon. 4:10 to 5:10 pm

Itty-Bitty Bits under Optical Control

Session Chair: **Min Gu,** Swinburne Univ. of Technology (Australia)

4:10 pm: **Controlled motion of nanoparticles using molecular motors**, Jean-Pierre Abid, Ecole Normale Supérieure de Cachan (France); Michel Frigoli, Chantal Larpent, Univ. de Versailles Saint-Quentin-en Yvelines (France); Robert Pansu, Joseph Zyss, Ecole Normale Supérieure de Cachan (France); Sophie Brasselet, Institut Fresnel (France). . . . . [7038-29]

4:30 pm: **Assembly of 3D structures using holographic optical tweezers**, Leo Ikin, James A. Grieve, David M. Carberry, Univ. of Bristol (United Kingdom); Graham M. Gibson, Miles J. Padgett, Univ. of Glasgow (United Kingdom); Mervyn J. Miles, Univ. of Bristol (United Kingdom) . . . . . [7038-30]

4:50 pm: **Molecular assembling and crystallization in solution by photon pressure of a focused CW laser beam** *(Invited Paper)*, Hiroshi M. Masuhara, Teruki Sugiyama, Nara Institute of Science and Technology (Japan); Hiroyuki Yoshikawa, Yu Nabetani, Osaka Univ. (Japan); Takuji Adachi, National Chiao Tung Univ. (Japan). . . . . [7038-31]

5:20 pm: **Simulation methods to model the total force on nanoparticles in an optical trap including the effect of fluid interactions**, Arvind Balijepalli, National Institute of Standards and Technology and Univ. of Maryland/College Park; Thomas Lebrun, National Institute of Standards and Technology; Satyandra K. Gupta, Univ. of Maryland/College Park. . . . . [7038-32]

5:40 pm: **Surface-plasmon-based optical manipulation**, Romain Quidant, Maurizio Righini, Institut de Ciències Fotòniques (Spain) . . . . . [7038-33]

Tuesday 12 August

SESSION 7

Room: Conv. Ctr. 16B . . . . . .Tues. 8:00 to 10:30 am

Advanced Microscopy with Integrated Optical Traps

Session Chair: **Elliot L. Botvinick,** Beckman Laser Institute, Univ. of California/Irvine

8:00 am: **Nonlinear dynamic phase contrast microscopy for microfluidic and molecular biology applications** *(Invited Paper)*, Cornelia Denz, F. Holtmann, M. Wördemann, M. Oevermann, Westfälische Wilhelms-Univ. Münster (Germany) . . . . . [7038-34]

8:30 am: **Control of nonlinear processes in trapped particles via dispersion compensated and phase shaped ultrashort laser pulses**, Janelle C. Shane, Michael Mazilu, Kishan Dholakia, Univ. of St. Andrews (United Kingdom). . . . . [7038-35]

8:50 am: **Three-axis computer-steered optical trapping integrated with a high-speed confocal imaging system**, Jingfang Wan, The Ohio State Univ. [7038-36]

9:10 am: **Study of optically-trapped living trypanosoma cruzi-rhodnius prolixus interactions by real time confocal images using CdTe quantum dots**, André A. de Thomaz, Diogo B. Almeida, Wagner M. Faustino, Gilberto J. Jacob, Univ. Estadual de Campinas (Brazil); Adriana Fontes, Univ. Federal de Pernambuco (Brazil); Luiz C. Barbosa, Carlos L. Cesar, Univ. Estadual de Campinas (Brazil); Cecília S. Vieira, Teresa C. M.Gonçalves, Jacenir R. Santos-Mallet, Suzete A. O.Gomes, Fundacao Oswaldo Cruz (Brazil); Denise Feder, Univ. Federal Fluminense (Brazil). . . . . [7038-37]

9:30 am: **CARS microscopy and optical tweezers photonic tool for biomechanical and biochemical cell processes investigation**, Wagner M. Faustino, André A. Thomaz, Diogo B. Almeida, Gilberto G. Jacob, Univ. Estadual de Campinas (Brazil); Adriana Fontes, Univ. Federal de Pernambuco (Brazil); Luiz C. Barbosa, Carlos L. Cesar, Univ. Estadual de Campinas (Brazil) . . . . . [7038-38]

9:50 am: **Study on the floating micro-probe with multi degrees of freedom and function for cell operation: juggling probe**, Kazuhiro Gesho, Tomohiro Uraki, Ichirou Ishimaru, Kagawa Univ. (Japan) . . . . . [7038-39]

10:10 am: **Optical trapping of Janus particles**, Hyuk Wang, Yong-Gu Lee, Gwangju Institute of Science and Technology (South Korea). . . . . [7038-40]

Coffee Break . . . . . 10:30 to 11:00 am

SESSION 8

Room: Conv. Ctr. 16B . . . . . Tues. 11:00 to 11:50 am

Advanced Microscopy II

Session Chair: **Jesper Glückstad,** Riso National Lab., Danmarks Tekniske Univ. (Denmark)

11:00 am: **Compact optical tweezers based on optical storage technology** *(Invited Paper)*, Dirk Vossen, Sjoerd Stallinga, Philips Research Labs. (Netherlands) . . . . . [7038-41]

11:30 am: **Scanning sub-wavelength structured surfaces with optically trapped probes** *(Presentation Only)*, Alexander Rohrbach, Lars Friedrich, Albert-Ludwigs-Univ. Freiburg (Germany). . . . . [7038-42]

Lunch/Exhibition Break . . . . . 11:50 to 1:30 pm

SESSION 9

Room: Conv. Ctr. 16B . . . . . Tues. 1:30 to 3:20 pm

Anisotropic Media

Session Chair: **Ruben Ramos-Garcia,** Instituto Nacional de Astrofísica, Óptica y Electrónica (Mexico)

1:30 pm: **Engineering optically driven micromachines** *(Invited Paper)*, Norman R. Heckenberg, Timo A. Nieminen, Halina H. Rubinsztein-Dunlop, The Univ. of Queensland (Australia) . . . . . [7038-44]

2:00 pm: **Improved optically driven microrotors**, Theodor Asavei, Vincent L. Y.Loke, Timo A. Nieminen, Norman R. Heckenberg, Halina H. Rubinsztein-Dunlop, The Univ. of Queensland (Australia). . . . . [7038-45]

2:20 pm: **Stability and dynamics of complex dielectric shapes in a simple optical trap**, Thomas G. Mason, James N. Wilking, Univ. of California/Los Angeles . . . . . [7038-46]

2:40 pm: **Anisotropic particle motion in optical landscapes modeled via the T-matrix optical scattering approach**, Brandon L. Conover, Michael J. Escuti, North Carolina State Univ.. . . . . [7038-47]

3:00 pm: **Optical manipulation of nematic colloids: wires, superstructures and 2D crystals**, Igor Musevic, Univ. v Ljubljani (Slovenia) . . . . . [7038-48]

Coffee Break . . . . . 3:20 to 3:40 pm

SESSION 10

Room: Conv. Ctr. 16B . . . . . Tues. 3:40 to 6:00 pm

Multi-Trap Systems

Session Chair: **Gabriel Cooper Spalding,** Illinois Wesleyan Univ.

3:40 pm: **Calibration of dynamic holographic optical tweezers for force measurements on biomaterials**, Astrid van der Horst, Nancy R. Forde, Simon Fraser Univ. (Canada). . . . . [7038-49]

4:00 pm: **Quantitative characterization of potential energy landscape in holographic optical tweezers**, Serge Monneret, Federico Belloni, Institut Fresnel (France). . . . . [7038-50]

4:20 pm: **A high-accuracy algorithm for designing arbitrary holographic atom traps**, Brian DeMarco, Matthew Pasienski, Univ. of Illinois . . . [7038-51]

4:40 pm: **Computation of optically induced forces and torques arising in connection with holographic optical assembly**, Stephen H. Simpson, David C. Benito, Simon Hanna, Univ. of Bristol (United Kingdom) . . . . . [7038-52]

5:00 pm: **Information capacity in optical systems for generating dynamic optical landscapes**, Darwin Palima, Jeppe S. Dam, Ivan Perch-Nielsen, Jesper Glückstad, Danmarks Tekniske Univ. (Denmark) . . . . . [7038-53]

5:20 pm: **Comparison between various types of multiple tweezers**, Jean-Marc R. Fournier, Fabrice Merenda, Johann Rohner, Pierre Jacquot, René P. Salathé, Ecole Polytechnique Fédérale de Lausanne (Switzerland) . . [7038-54]

5:40 pm: **A multiple trap optical tweezer system based on adaptive optics technology**, Rodolphe Conan, Colin Bradley, Shaun Bowman, Univ. of Victoria (Canada) . . . . . [7038-55]

Wednesday 13 August

SESSION 11

Room: Conv. Ctr. 16B . . . . . Wed. 8:00 to 10:00 am

Droplets, Nanofluidics, Cavitation

Session Chair: **Carlos Lenz Cesar,** Univ. Estadual de Campinas (Brazil)

8:00 am: **Large spectral tuning of liquid microdroplets using the optical scattering force**, Alper Kiraz, Saime C. Yavuz, Yasin Karadag, Adnan Kurt, Alphan Sennaroglu, Huseyin Cankaya, Koç Univ. (Turkey). . . . . [7038-56]

8:20 am: **Holographic control of droplet microfluidics**, Daniel R. Burnham, Univ. of St. Andrews (United Kingdom); David McGloin, Univ. of Dundee (United Kingdom); Charles N. Baroud, Maria-Luisa Cordero Garrayar, Ecole Polytechnique (France) . . . . . [7038-57]

8:40 am: **Optoelectronic tweezer (OET) trap stiffness with HeLa cells**, Steven L. Neale, Ming C. Wu, Univ. of California/Berkeley. . . . . [7038-58]

9:00 am: **Nanoscale optofluidic transport**, David Erickson, Cornell Univ. . . . . [7038-59]

9:20 am: **Parallel optical manipulation using evanescent optical landscapes**, Carlos Lopez-Mariscal, Kristian Helmerson, National Institute of Standards and Technology . . . . . [7038-60]

9:40 am: **The application of optical trapping for cavitation studies**, Paul A. Campbell, Paul A. Prentice, Univ. of Dundee (United Kingdom). . . . . [7038-61]

Coffee Break . . . . . 10:00 to 10:30 am

SESSION 12

Room: Conv. Ctr. 16B . . . . . Wed. 10:30 am to 12:00 pm

Trapping in Air

Session Chair: **Lowell McCann,** Univ. of Wisconsin-River Falls

10:30 am: **The optical manipulation and characterisation of aerosol particles** *(Invited Paper)*, Jonathan P. Reid, Univ. of Bristol (United Kingdom) . . . . . [7038-62]

11:00 am: **Dynamics of airborne tweezing**, Daniel R. Burnham, Univ. of St. Andrews (United Kingdom); David McGloin, Univ. of Dundee (United K ingdom) . . . . . [7038-63]

11:20 am: **Aerosol tweezing with a super-continuum laser beam**, Marc Guillon, Univ. of Dundee (United Kingdom); Kishan Dholakia, Univ. of St. Andrews (United Kingdom); David McGloin, Univ. of Dundee (United Kingdom) . . . . . [7038-64]

11:40 am: **Numerical analysis of fluid resistance exerted on vibrating micro-sphere controlled by optical radiation pressure**, Shimpei Tanaka, Yasuhiro Takaya, Terutake Hayashi, Osaka Univ. (Japan) . . . . . [7038-65]

Lunch/Exhibition Break . . . . . 12:00 to 1:30 pm

SESSION 13

Room: Conv. Ctr. 16B . . . . . Wed. 1:30 to 3:00 pm

Optical Momentum

Session Chair: **Jonathan Leach,** Univ. of Glasgow (United Kingdom)

1:30 pm: **Transfer of optical momentum: reconciliations of the Abraham and Minowski formulations** *(Invited Paper)*, Tomasz M. Grzegorczyk, Brandon A. Kemp, Massachusetts Institute of Technology. . . . . [7038-66]

2:00 pm: **Electromagnetic stress tensor in ponderable media**, Masud Mansuripur, College of Optical Sciences/The Univ. of Arizona . . . . . [7038-67]

2:20 pm: **Longitudinal force and torque exerted on a circular waveguide by rotating eigenmodes**, Amit Mizrahi, Univ. of California/San Diego; Moshe Horowitz, Levi Schachter, Technion-Israel Institute of Technology (Israel) . . . . . [7038-68]

2:40 pm: **Momentum transfer in a standing optical vortex**, Vladlen G. Shvedov, The Australian National Univ. (Australia) and Vernadskiy Tavricheskiy National Univ. (Ukraine); Anton S. Desyatnikov, The Australian National Univ. (Australia); Yana Izdebskaya, The Australian National Univ. (Australia) and Vernadskiy Tavricheskiy National Univ. (Ukraine); Andrei V. Rode, Wieslaw Z. Krolikowski, Yuri S. Kivshar, The Australian National Univ. (Australia) [7038-69]

Coffee Break . . . . . 3:00 to 3:10 pm

SESSION 14

Room: Conv. Ctr. 16B . . . . . Wed. 3:10 to 5:20 pm

Alternative Strategies

Session Chair: **Halina H. Rubinsztein-Dunlop,** The Univ. of Queensland (Australia)

3:10 pm: **Micro manipulation of superparamegnetic particles using magneto-optic tweezers** *(Invited Paper)*, Igor Poberaj, Dusan Babic, Natan Osterman, Jurij Kotar, Univ. v Ljubljani (Slovenia). . . . . [7038-70]

3:40 pm: **Polarization modulation of an optical trap's spring constant**, Ethan F. Schonbrun, Univ. of Colorado at Boulder; Kenneth B. Crozier, Harvard Univ.. . . . . [7038-71]

4:00 pm: **Independent polarisation control of multiple optical traps**, Jonathan Leach, Stephen Keen, Daryl Preece, Miles Padgett, Univ. of Glasgow (United Kingdom); Elliot Botvinick, Univ. of California/Irvine. . . . . [7038-72]

4:20 pm: **Thermal tweezers for effective manipulation on surfaces with nano-scale resolution**, Dmitri K. Gramotnev, Daniel R. Mason, Galina Gramotnev, Queensland Univ. of Technology (Australia) . . . . . [7038-73]

4:40 pm: **Thermal forces driving transport and interactions in colloidal suspensions**, Francesca Ianni, Giancarlo Ruocco, Roberto Di Leonardo, Univ. degli Studi di Roma/La Sapienza (Italy). . . . . [7038-74]

5:00 pm: **High bandwidth estimation of optical traps using disturbance estimation,** Hullas Sehgal, Tanuj Aggarwal, Murti V. Salapaka, Univ. of Minnesota . . . . . [7038-75]

Room: Conv. Ctr. Exhibit Hall B2 . . . . . Wed. 5:30 to 7:00 pm

Posters-Wednesday

Poster authors will begin displaying posters after 10:00 am Wednesday morning. A poster session, with authors present at their posters, will be held Wednesday evening from 5:30 to 7:00 pm. Light refreshments will be served.

Poster Setup

Poster presenters must set up their posters between 10:00 am and 5:00 pm on Wednesday. Poster presenters who have not set up by 5:00 pm on Wednesday will be considered a "no show" and their manuscript will not be published. Presenters must remove their posters immediately after the poster session. Posters not removed will be considered unwanted and will be discarded. SPIE assumes no responsibility for posters left up after the end of each poster session.

Validation of FDT calibration method in complex media, Andrew C. Richardson, Mario Fischer, Niels Bohr Institute (Denmark); Nader Reihani, Institute for Advanced Studies in Basic Sciences (Iran) and Niels Bohr Institute (Denmark); Kirstine Berg-Sørensen, Danmarks Tekniske Univ. (Denmark) and Niels Bohr Institute (Denmark); Lene B. Oddershede, Niels Bohr Institute (Denmark) . . . . . [7038-76]

Calibration of trap stiffness and viscoelasticity in polymer solution, Susan H. Roelofs, The Univ. of Queensland (Australia); Martha B. Alvarez-Elizondo, Instituto Tecnológico y de Estudios Superiores de Monterrey (Mexico); Martin Persson, Kungliga Tekniska Högskolan (Sweden); Norman R. Heckenberg, Halina H. Rubinsztein-Dunlop, The Univ. of Queensland (Australia). . [7038-77]

Hysteretic axial motion of optically-trapped aerosol droplets, Lowell I. McCann, Shawntel Murphy, Univ. of Wisconsin-River Falls . . . . . [7038-78]

Characterization of a periodic optical potential by means of particle dynamics analysis in a deterministic regime, Alejandro Vásquez-Arzola, Karen P. Volke-Sepulveda, Jose L. Mateos, Univ. Nacional Autónoma de México (Mexico) . . . . . [7038-79]

Electrostatic force and torque description of generalized spheroidal particles in optical landscapes, Ryan W. Going, Brandon L. Conover, Michael J. Escuti, North Carolina State Univ. . . . . [7038-80]

Sorting of microparticles by optical landscapes by using a spatial light modulator, Ulises Ruiz-Corona, Victor M. Arrizon, Julio C. Ramirez-San-Juan, Ruben Ramos-Garcia, Instituto Nacional de Astrofísica, Óptica y Electrónica (Mexico) . . . . . [7038-81]

Novel dual beam fiber traps using endlessly single mode photonic crystal fiber, David M. Gherardi, Antonia E. Carruthers, Tomas Cizmar, Robert F. Marchington, Kishan Dholakia, Univ. of St. Andrews (United Kingdom) . . . . . [7038-82]

Steering accuracy of a spatial light modulator-based single beam steerer: guidelines and limitations for general free-space optics and optical tweezers setups, David Engström, Emma Eriksson, Univ. of Gothenburg (Sweden); Jorgen Bengtsson, Chalmers Univ. of Technology (Sweden); Mattias Goksör, Univ. of Gothenburg (Sweden) . . . . . [7038-84]

Vortical fields based on spiral beam optics for laser manipulation, Alexander V. Korobtsov, Kirill N. Afanasiev, Svetlana P. Kotova, Nikolay N. Losevsky, Vladimir G. Volostnikov, P.N. Lebedev Physical Institute (Russia) . . . . . [7038-85]

Coated microspheres as enhanced probes for optical trapping, Anita Jannasch, Volker Bormuth, Jonathon Howard, Max-Planck-Institut für Molekulare Zellbiologie und Genetik (Germany); Erik Schäffer, Technische Univ. Dresden (Germany) . . . . . [7038-86]

Light actuated diaphragm: high efficiency conversion from light energy to mechanical vibrational energy, Ryo Hamamura, Hideki Okamura, International Christian Univ. (Japan) . . . . . [7038-88]

Magnetic modification of optical tweezers, Alexander G. Zhdanov, Maria D. Khokhlova, Evgeniy V. Lyubin, Irina V. Soboleva, Alexander A. Ezhov, Andrey A. Fedyanin, Lomonosov Moscow State Univ. (Russia) . . . . . [7038-89]

Courses of Related Interest

See SPIE Cashier for information and to register.

SC655 Introduction to Optical Tweezers and Optical Micromanipulation (Dholakia, Spalding) Tuesday, 6:00 to 10:00 pm
SC496 Fabrication and Processing of Nanostructures (Cao) Monday, 8:30 am to 5:30 pm
SC497 Nanophotonics (Prasad) Sunday, 1:30 to 5:30 pm
WS851 Nanotechnology: Science & Applications (Brahmbhatt) Wednesday, 8:30 am to 5:30 pm

Conference 7039

Wednesday-Thursday 13-14 August 2008 • Proceedings of SPIE Vol. 7039

Nanoengineering: Fabrication, Properties, Optics, and Devices V

Conference Chairs: **Elizabeth A. Dobisz,** Hitachi Global Storage Technologies; **Louay A. Eldada,** HelioVolt Corp.

Program Committee: **André-Jean Attias,** Univ. Pierre et Marie Curie (France); **Luisa D. Bozano,** IBM Almaden Research Ctr.; **Gregory J. Exarhos,** Pacific Northwest National Lab.; **Cynthia Hanson,** Space and Naval Warfare Systems Command; **Daniel J. C. Herr,** Semiconductor Research Corp.; **Ghassan E. Jabbour,** Arizona State Univ.; **Miguel Levy,** Michigan Technological Univ.; **Robert Magnusson,** Univ. of Connecticut; **Juan R. Maldonado,** Stanford Univ.; **Jun Tanida,** Osaka Univ. (Japan); **Chee Wei Wong,** Columbia Univ.

Monday 11 August

Room: Conv. Ctr. 6A . . . . . Mon. 8:30 am to 12:20 pm

NanoScience + Engineering Plenary Session

View plenary presentation details p. 13-14.

8:30 am: **Revivals of Molecular Nonlinear Optics in Physics, Chemistry, and Life Sciences,** Joseph Zyss, École Normale Supérieure de Cachan (France)

9:10 am: **Applications of Biological Materials**, Rajesh R. Naik, Air Force Research Lab.

Coffee Break . . . . . 9:50 to 10:20 am

10:20 am: **Two-Photon Lithography for Precise 3D Nano/Micro-Objects**, Kwang-Sup Lee, Hannam Univ. (South Korea)

11:00 am: **Multifunctional Excimer-Laser Lithography and Photoablation Technologies for Large-Area Micro and Nanoelectronics, Displays and Microsystems**, Kanti Jain, Univ. of Illinois at Urbana-Champaign

11:40 am: **Molecules, Surfaces, and Symmetry: From Pure Geometry to Nanoscience,** Denis Fichou, Commissariat à l'Energie Atomique (France)

Wednesday 13 August

SESSION 1

Room: Conv. Ctr. 17A . . . . . Wed. 8:30 to 10:00 am

Photonic Crystals and Metamaterials

Session Chair: **Louay A. Eldada,** HelioVolt Corp.

8:30 am: **Observations of enhanced Raman scattering in silicon slow-light photonic crystal waveguides and nanophotonics** *(Invited Paper)*, Chee Wei Wong, James F. McMillan, Columbia Univ. . . . . [7039-01]

9:00 am: **Light emission from lithographically-patterned single silicon nanocrystals**, Rohan D. Kekatpure, Alex R. Guichard, Mark L. Brongersma, Stanford Univ. . . . . [7039-02]

9:20 am: **Quasi-zero average refractive index photonic crystals metamaterials collimating infrared light over large scale**, Stefano Cabrini, Deirdre Olynick, Lawrence Berkeley National Lab.; Vito Mocella, Istituto per la Microelettronica e Microsistemi (Italy); Allan Chang, Lawrence Berkeley National Lab.; Luigi Moretti, Principia Dardano, Istituto per la Microelettronica e Microsistemi . . . . . [7039-03]

9:40 am: **Three-dimensional metal dielectric photonic crystal based on self-assembled gold nanoshells**, Jin-Hyoung Lee, Won Park, Univ. of Colorado at Boulder . . . . . [7039-04]

Coffee Break . . . . . 10:00 to 10:30 am

SESSION 2

Room: Conv. Ctr. 17A . . . . . Wed. 10:30 am to 12:00 pm

Self-Assembled Nanostructures

Session Chair: **Elizabeth A. Dobisz,** Hitachi Global Storage Technologies

10:30 am: **Rational design of molecular self-assemblies towards applications in nanophotonics** *(Invited Paper)*, Andre-Jean Attias, David Bleger, David Kreher, Fabrice Mathevet, Univ. Pierre et Marie Curie (France); Fabrice Charra, Celine Fiorini, Ludovic Douillard, Commissariat à l'Energie Atomique (France) . . . . . [7039-05]

11:00 am: **Manipulating the characteristic length scales of self-organized nanostructures for robust nanomanufacturing**, Christopher P. Favazza, Hare Krishna, Justin Trice, Radhakrishna Sureshkumar, Ramki Kalyanaraman, Washington Univ. in St. Louis . . . . . [7039-06]

11:20 am: **All-round joining method with carbon fiber reinforced interface**, Noriyoshi Miwa, Kazunori Tanaka, Yoshiko Kamiya, Yoshitake Nishi, Tokai Univ. (Japan) . . . . . [7039-07]

11:40 am: **Unusual size-dependent magnetization in 3D-elemental nanomagnets**, Hare Krishna, C. Miller, Z. Nussinov, A. K. Gangopadhyay, Ramki Kalyanaraman, Washington Univ. in St. Louis . . . . . [7039-08]

Lunch/Exhibition Break . . . . . 12:00 to 1:30 pm

SESSION 3

Room: Conv. Ctr. 17A . . . . . Wed. 1:30 to 3:10 pm

Nanoimprint Technologies

Session Chair: **Andre-Jean Attias,** Univ. Pierre et Marie Curie (France)

1:30 pm: **Strategies for low cost imprint molds** *(Invited Paper)*, Michael P. Watts, Impattern Solutions . . . . . [7039-09]

2:00 pm: **Nanoimprinting by melt processing of polymers**, Jayan Thomas, Palash Gangopadhyay, Emre Araci, Su J. Feilen, Robert Norwood, Nasser Peyghambarian, College of Optical Sciences, The Univ. of Arizona. . [7039-10]

2:20 pm: **Self assembly for correction and quadrupling of the density of e-beam patterned chemical brush layers on substrates** *(Invited Paper)*, Elizabeth A. Dobisz, Hitachi Global Storage Technologies. . . . . [7039-11]

2:50 pm: **Large-area dual-scale metal transfer by adhesive force lithography and application**, Moon Kyu Kwak, Pilnam Kim, Jae Kwan Kim, Hye Sung Cho, Kahp Y. Suh, Seoul National Univ. (South Korea) . . . [7039-12]

Coffee Break . . . . . 3:10 to 3:40 pm

SESSION 4

Room: Conv. Ctr. 17A . . . . . Wed. 3:40 to 5:40 pm

Optofluidics

Session Chair: **Jun Tanida,** Osaka Univ. (Japan)

3:40 pm: **SiO2-based variable microfluidic lenses fabricated by femtosecond laser lithography-assisted micromachining**, Mizue Mizoshiri, Hiroaki Nishiyama, Osaka Univ. (Japan); Junji Nishii, National Institute of Advanced Industrial Science and Technology (Japan); Yoshinori Hirata, Osaka Univ. (Japan) . . . . . [7039-13]

4:00 pm: **Optofluidic evanescent sensing by polymer photonic crystal band edge lasers**, Mads B. Christiansen, Felipe B. Arango, Morten G. Hansen, Anders Kristensen, Danmarks Tekniske Univ. (Denmark) . . . . . [7039-14]

4:20 pm: **Simulation and verification of real time optofluidic microscopy**, Khaled N. Salama, Tamer A. Elkhatib, Zhaoran R. Huang, Rensselaer Polytechnic Institute . . . . . [7039-15]

4:40 pm: **Patterning the wettability of lithium niobate crystals: prospective for applications in optofluidic and microfluidic systems**, Pietro Ferraro, Simonetta Grilli, Lisa Miccio, Veronica Vespini, Istituto Nazionale di Ottica Applicata (Italy) . . . . . [7039-16]

5:00 pm: **Optical micropump: an optical fluid actuator**, Shiho Maruyama, Hideki Okamura, International Christian Univ. (Japan) . . . . . [7039-17]

5:20 pm: **Femtosecond micro- and nano-machining of materials for microfluidic applications,** Yelena V. White, Matthew Parrish, Xiaoxuan Li, Lloyd Davis, William Hofmeister, Univ. of Tennessee Space Institute [7039-18]

Room: Conv. Ctr. Exhibit Hall B2 . . . . . Wed. 5:30 to 7:00 pm

Posters-Wednesday

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Design and test of a novel digital thruster, Dahai Ren, Gaofei Zhang, Xiaolu Wang, Tsinghua Univ. (China) . . . . . [7039-39]

Fluorescent liquid-core/air-cladding waveguides towards integrated optofluidic light sources, Jong-Min Lim, Se-Heon Kim, Jae-Hoon Choi, Seung-Man Yang, Korea Advanced Institute of Science and Technology (South Korea) . . . . . [7039-40]

Metal nanograil arrays with tunable multiple dipolar plasmon modes in integrated optofluidic devices for ultrasensitive sensing of biomolecules, Chul-Joon Heo, Se-Heon Kim, Se Gyu Jang, Su Yeon Lee, Su Kyeong Kim, Seung-Man Yang, Korea Advanced Institute of Science and Technology (South Korea) . . . . . [7039-41]

Characteristics of nanoparticles-doped liquid crystal devices, Shug J. Hwang, Chen Yu Yang, National United Univ. (Taiwan); Shie-Chang Jeng, Chia Wei Kuo, Industrial Technology Research Institute (Taiwan) . . . . . [7039-42]

Synthesis and patterning of hydrogel-nanoparticle composites, Derrick C. Mancini, Lane Martin, Ralu Divan, Argonne National Lab. . . . . [7039-43]

Morphology and optical properties of GdPO4:Eu3+ obtained by low-temperature synthesis, Nataliya V. Babayevskaya, Institute for Single Crystals (Ukraine) . . . . . [7039-44]

Higher performance of InGaAs quantum dot laser diodes than quantum well laser diodes, Kwang Woong Kim, Korea Institute of Science and Technology (South Korea) and Korea Univ. (South Korea); Nam Ki Cho, Sung Pil Ryu, Jin Dong Song, Won Jun Choi, Jung Il Lee, Korea Institute of Science and Technology (South Korea); Jung Ho Park, Korea Univ. (South Korea) . . . . . [7039-45]

Structural effect of a fullerene shuttle device, Young Jin Song, Konyang Univ. (South Korea); Oh-Keun Kwon, Semyung Univ. (South Korea) . [7039-46]

A study of nanoelectromechanical nanotube memory device, Oh-Keun Kwon, Semyung Univ. (South Korea); Jun-Ha Lee, SangMyung Univ. (South Korea) . . . . . [7039-47]

A molecular dynamics calculation of carbon nanotube motor, Young Sik Yoon, Young Jin Song, Konyang Univ. (South Korea) . . . . . [7039-48]

Study of the structural and luminescent properties of ZnO nanorod arrays with the hydrogen peroxide treatment, Wen-Yan Su M.D., Ching-Fuh Lin, National Taiwan Univ. (Taiwan) . . . . . [7039-49]

Fabrication of moth-eye structure using flexible PDMS mold for anti-reflective coating, Dae-Geun Choi, Ki-Jung Lee, Ki-Don Kim, Jun-Hyuk Choi, Jun-Ho Jeong, Eung-Sug Lee, Korea Institute of Machinery and Materials (South Korea). . . . . [7039-50]

Oxide nanoparticles produced by pulsed laser ablation, Cornelia Sima, National Institute for Laser, Plasma and Radiation Physics (Romania)[7039-51]

Widely-tunable polymeric Bragg wavelength filters operated by mechanical strain, Kyung-Jo Kim, Min-Cheol Oh, Pusan National Univ. (South Korea). . . . . [7039-52]

The optimal chamber size on accumulation efficiency and collection pattern in 3D electroosmosis chip, Chehung Wei, Tatung Univ. (Taiwan); Ching-Chieh Wang, Tatung Univ (Taiwan); You-Zong Shi, Tatung Univ. (Taiwan) . . . . . [7039-53]

Optical and material characteristics of InAs/GaAs quantum dots, Ping F. Huang, National Taiwan Univ. (Taiwan); Sa Huang, Georgia Institute of Technology; Zhe-Chuan Feng, National Taiwan Univ. (Taiwan); April S. Brown, Duke Univ.; Weijie Lu, Fisk Univ.. . . . . [7039-54]

Oscillation characteristics of boron-nitride nanotube, Junha Lee, SangMyung Univ. (South Korea); Oh-Keun Kwon, Semyung Univ. (South Korea) . . . . . [7039-55]

Effect of initial chirp on supercontinuum generation in nanofiber, Hao Yang, Guoying Feng, Lingli Li, Ruoxi Yang, Tianjiao Xia, Sichuan Univ. (China) . . . . . [7039-56]

Synthesis and characterization of colloidal CdTe nanocrystals, Fred Semendy, Army Research Lab.; Gomatam Jaganathan, Brimrose Corp.; Nibir K. Dhar, Army Research Lab.; Sudhir B. Trivedi, Brimrose Corp. of America; Ishwara B. Bhat, Rensselaer Polytechnic Institute; Yuanping Chen, Army Research Lab. . . . . [7039-57]

Thursday 14 August

SESSION 5

Room: Conv. Ctr. 17A . . . . . Thurs. 8:30 to 10:10 am

Nano-optics and Nanophotonics

Session Chair: **Chee Wei Wong,** Columbia Univ.

8:30 am: **State-transition of DNA nanomachines based on photonic control** *(Invited Paper)*, Yusuke Ogura, Takahiro Nishimura, Jun Tanida, Osaka Univ. (Japan) . . . . . [7039-19]

9:00 am: **A comparative study of a-SiCxOyHz thin films grown via chemical vapor deposition for silicon photonics**, Spyros Gallis, SUNY/Univ. at Albany and IBM Microelectronics Div.; Vasileios Nikas, Himani Suhag, Mengbing Huang, Alain E. Kaloyeros, SUNY/Univ. at Albany . . . . . [7039-20]

9:20 am: **Nanotechnologies for next generation data centers** *(Invited Paper)*, Louay A. Eldada, HelioVolt Corp. . . . . [7039-21]

9:50 am: **Scaling behavior and negative gain of NAPD**, Xia Guo, Beijing Univ. of Technology (China); Si Guang Ma, Univ. of California/Los Angeles; XinYu Zheng, Jet Propulsion Lab.; Kang L. Wang, Univ. of California/Los Angeles . . . . . [7039-22]

Coffee Break . . . . . 10:10 to 10:40 am

SESSION 6

Room: Conv. Ctr. 17A . . . . . Thurs. 10:40 to 11:40 am

Large-Area Nanostructure Engineering

Session Chair: **Louay A. Eldada,** HelioVolt Corp.

10:40 am: **Development of field stepping holographic lithography system for nano-patterning on large area substrates**, Moo Youn Park, Il Hyung Jung, Gwan Su Lee, Soo Ryong Hwang, Jong Ho Lee, Hyun Jun Kim, Jong Hoon Lim, Jin-Hua Kim, SAMSUNG Electro-Mechanics Co., Ltd. (South Korea) . . . . . [7039-23]

11:00 am: **A novel lithography technique for formation of large areas of uniform nanostructures**, Wei Wu, Dibyendu Dey, Omer G. Memis, Alex Katsnelson, Hooman Mohseni, Northwestern Univ. . . . . [7039-24]

11:20 am: **Behaviors of fracture toughness of thin transparent glass for liquid crystal display by EB irradiation**, Keisuke Iwata, Akira Tonegawa, Yoshitake Nishi, Tokai Univ. (Japan) . . . . . [7039-25]

Lunch/Exhibition Break . . . . . 11:40 am to 1:30 pm

SESSION 7

Room: Conv. Ctr. 17A . . . . . Thurs. 1:30 to 2:50 pm

Nano/Quantum-Scale Integration

Session Chair: **Louay A. Eldada**, HelioVolt Corp.

1:30 pm: **A wet chemistry approach to uniform sub-micron flip chip interconnects**, Christopher J. Orendorff, Joy M. Barker, Adam M. Rowen, Graham Yelton, Christian L. Arrington, Rusty Gillen, Sandia National Labs. . . . . [7039-27]

1:50 pm: **Photonic crystal-enhanced quantum dot infrared photodetectors**, Ian McKerracher, Haroldo T. Hattori, Lan Fu, Hark H. Tan, Chennupati Jagadish, The Australian National Univ. (Australia) . . . . . [7039-28]

2:10 pm: **Effects of non parabolic bands on nanostructure laser devices**, Majed Khodr, Hariri Canadian Univ. (Lebanon) . . . . . [7039-29]

2:30 pm: **Impurity-free vacancy disordering of quantum heterostructures with SiOxNy encapsulants deposited by magnetron sputtering**, Ian R. McKerracher, Lan Fu, Hark H. Tan, Chennupati Jagadish, The Australian National Univ. (Australia) . . . . . [7039-30]

Coffee Break . . . . . 2:50 to 3:20 pm

SESSION 8

Room: Conv. Ctr. 17A . . . . . Thurs. 3:20 to 4:20 pm

High Aspect Ratio Nanopatterning

Session Chair: **Elizabeth A. Dobisz,** Hitachi Global Storage Technologies

3:20 pm: **Nanofabrication of high-aspect-ratio hard x-ray zone plates by electroforming into HSQ molds**, Ming Lu, Leonidas Ocola, Ralu Divan, Derrick Mancini, Argonne National Lab. . . . . [7039-31]

3:40 pm: **Wide angle and broadband antireflection properties for a silicon nanotip array**, Yi-Fan Huang, Yi-Jun Jen, National Taipei Univ. of Technology (Taiwan); Kuei-Hsien Chen, Academia Sinica (Taiwan); Li-Chyong Chen, National Taiwan Univ. (Taiwan); Surojit Chattopadhyay, National Chung Hsing Univ. (Taiwan) . . . . . [7039-32]

4:00 pm: **Review of microfabrication techniques for lab prototyping and mass production in MEMS,** Peiman Mosaddegh, Nader Jalili, Clemson Univ. . . . . [7039-33]

SESSION 9

Room: Conv. Ctr. 17A . . . . . Thurs. 4:20 to 6:00 pm

Nanoparticle and Microlens Engineering

Session Chair: **Elizabeth A. Dobisz,** Hitachi Global Storage Technologies

4:20 pm: **Intensity softening in arrays of refractive micro-lenses for image sensor application**, Young-Je Yun, Seung Ryong Park, Jin-Ho Park, Hakyu Choi, Jeahee Kim, Jae-Won Han, Dongbu Electronics Co., Ltd. (South Korea) . . . . . [7039-34]

4:40 pm: **Ommatidia fabrication using microlenses**, Hao Liu, Sihai Chen, Huazhong Univ. of Science and Technology (China) . . . . . [7039-35]

5:00 pm: **Electro-magnetic wave simulation of graded-index lens array fabricated by semiconductor manufacturing process**, Seungryong Park, Jinho Park, Hakyu Choi, Young-Je Yun, Kwangseon Choi, Jeahee Kim, Jaewon Han, Dongbu Electronics Co., Ltd. (South Korea) . . . . . [7039-36]

5:20 pm: **ZnO nanoparticles obtained by hydrothermal method at low temperature**, Victor Ciupina, Anca Dumbrava, Univ. Ovidius Constanta (Romania); Ion Morjan, Institutul National pentru Fizica Laserilor, Plasmei si Radiatiei (Romania); Gabriel Prodan, Madalina Prodan, Univ. Ovidius Constanta (Romania); Florian V. Dumitrache, Institutul National pentru Fizica Laserilor, Plasmei si Radiatiei (Romania); Eugeniu Vasile, S.C.Metav-Cercetare Dezvoltare S.A. (Romania). . . . . [7039-37]

5:40 pm: **Creation and luminescent properties of core-shell heteronanoparticles on the basis of silica core and Lu2O3:Eu3+ functional shell**, Yulya V. Yermolayeva, Tatyana I. Korshykova, Roman P. Yavetskiy, Alexander V. Tolmachev, V.N. Karazin Kharkiv National Univ. (Ukraine) . . . . . [7039-38]

Courses of Related Interest

See SPIE Cashier for information and to register.

SC496 Fabrication and Processing of Nanostructures (Cao) Monday, 8:30 am to 5:30 pm
SC497 Nanophotonics (Prasad) Sunday, 1:30 to 5:30 pm
WS851 Nanotechnology: Science & Applications (Brahmbhatt) Wednesday, 8:30 am to 5:30 pm

Conference 7040

Tuesday-Thursday 12-14 August 2008 • Proceedings of SPIE Vol. 7040

Nanobiosystems: Processing, Characterization, and Applications

Conference Chairs: **Emily M. Heckman,** Air Force Research Lab.; **Thokchom Birendra Singh,** Johannes Kepler Univ. Linz (Austria); **Junichi Yoshida,** Chitose Institute of Science and Technology (Japan)

Program Committee: **Carrie M. Bartsch,** General Dynamics Information Technology; **Liming Dai,** Univ. of Dayton; **Ananth Dodabalapur,** The Univ. of Texas at Austin; **James G. Grote,** Air Force Research Lab.; **Kuniharu Ijiro,** Hokkaido Univ. (Japan); **Jung-Il Jin,** Korea Academy of Science and Technology (South Korea); **Francois Kajzar,** Univ. d'Angers (France); **Norihisa Kobayashi,** Chiba Univ. (Japan); **Oksana Krupka,** Univ. d'Angers (France); **Charles Y. C. Lee,** Air Force Office of Scientific Research; **Misoon Mah,** Asian Office of Aerospace Research and Development (Japan); **Naoya Ogata,** Chitose Institute of Science and Technology (Japan); **Ileana Rau,** Polytechnic Univ. of Bucharest (Romania); **Bruce H. Robinson,** Univ. of Washington; **Anna Samoc,** The Australian National Univ. (Australia); **Marek J. Samoc,** The Australian National Univ. (Australia); **Niyazi Serdar Sariciftci,** Johannes Kepler Univ. Linz (Austria); **Andrew J. Steckl,** Univ. of Cincinnati; **Morley O. Stone,** Air Force Research Lab.; **Perry P. Yaney,** Univ. of Dayton

Monday 11 August

Room: Conv. Ctr. 6A . . . . . Mon. 8:30 am to 12:20 pm

NanoScience + Engineering Plenary Session

View plenary presentation details p. 13-14.

8:30 am: **Revivals of Molecular Nonlinear Optics in Physics, Chemistry, and Life Sciences,** Joseph Zyss, École Normale Supérieure de Cachan (France)

9:10 am: **Applications of Biological Materials**, Rajesh R. Naik, Air Force Research Lab.

Coffee Break . . . . . 9:50 to 10:20 am

10:20 am: **Two-Photon Lithography for Precise 3D Nano/Micro-Objects**, Kwang-Sup Lee, Hannam Univ. (South Korea)

11:00 am: **Multifunctional Excimer-Laser Lithography and Photoablation Technologies for Large-Area Micro and Nanoelectronics, Displays and Microsystems**, Kanti Jain, Univ. of Illinois at Urbana-Champaign

11:40 am: **Molecules, Surfaces, and Symmetry: From Pure Geometry to Nanoscience,** Denis Fichou, Commissariat à l'Energie Atomique (France)

Tuesday 12 August

SESSION 1

Room: Conv. Ctr. 13 . . . . . Tues. 1:00 to 3:20 pm

Biological Systems and Applications

Session Chair: **Anna Samoc,** The Australian National Univ. (Australia)

1:00 pm: **Biotemplated Nanomaterials** *(Invited Paper)*, Rajesh R. Naik, Air Force Research Lab. . . . . [7040-01]

1:30 pm: **Luminescent bio-templated nanomaterials**, Melanie M. Tomczak, UES, Inc.; Lawrence F. Drummy, Rajesh R. Naik, Air Force Research Lab. . . . . [7040-02]

1:50 pm: **Rational design of 2D self-assembled molecular sieves: towards applications in biotechnology** *(Invited Paper)*, Andre-Jean Attias, David Kreher, Fabrice Mathevet, Univ. Pierre et Marie Curie (France); Guillaume Schull, Fabrice Charra, Celine Fiorini-Debuisschert, Ludovic Douillard, Commissariat à l'Energie Atomique (France) . . . . . [7040-03]

2:20 pm: **Brilliant organic nanodots: novel nano-objects for bionanophotonics** *(Invited Paper)*, Mireille H. Blanchard-Desce, Olivier M. Mongin, Univ. de Rennes I (France); Anne-Marie Caminade, Jean-Pierre Majoral, Ctr. National de la Recherche Scientifique (France) . . . . . [7040-04]

2:50 pm: **Bioengineered-inorganic nanosystems for nanophotonics and bio-nanotechnology** *(Invited Paper)*, Kirsty Leong, Melvin Zin, Hong Ma, Mehmet Sarikaya, Alex K.Jen, Univ. of Washington . . . . . [7040-05]

Coffee Break . . . . . 3:20 to 3:40 pm

SESSION 2

Room: Conv. Ctr. 13 . . . . . Tues. 3:40 to 5:20 pm

Applications of DNA-based Systems

Session Chair: **Junichi Yoshida,** Chitose Institute of Science and Technology (Japan)

3:40 pm: **Polymer and quantum dot optoelectronic devices with DNA as a hole-transporting/electron-blocking layer**, Qingjiang Sun, Dong Wook Chang, Guru Subramanyam, Liming Dai, Univ. of Dayton; James G. Grote, Rajesh R. Naik, Air Force Research Lab. . . . . [7040-06]

4:00 pm: **DNA-Conductive polymer blends for applications in Biopolymer based FET**, Fahima Ouchen, Univ. of Dayton . . . . . [7040-07]

4:20 pm: **Kinetic Monte Carlo study of diffraction grating recording/erasure in DNA-based azo-dye systems** *(Invited Paper)*, Antoni C. Mitus, Grzegorz Pawlik, Politechnika Wroclawska (Poland); Francois Kajzar, Univ. d'Angers (France); James G. Grote, Air Force Research Lab. . . . . [7040-08]

4:50 pm: **Nonlinear optical properties of neat and DNA-CTMA doped dendritic chromophores** *(Invited Paper)*, Anna Samoc, Marek J. Samoc, The Australian National Univ. (Australia); Tzu-Chau Lin, National Central Univ. (Taiwan); Barry Luther-Davies, The Australian National Univ. (Australia); James G. Grote, Air Force Research Lab. . . . . [7040-09]

Wednesday 13 August

SESSION 3

Room: Conv. Ctr. 13 . . . . . Wed. 1:30 to 3:10 pm

Biomaterials for Semiconductor and Sensing Applications

Session Chair: **Melanie M. Tomczak,** Air Force Research Lab.

1:30 pm: **Riboswitch-based sensor in low optical background**, Svetlana V. Harbaugh, Molly E. Davidson, Yaroslav G. Chushak, Nancy Kelley-Loughnane, Morley O. Stone, Air Force Research Lab. . . . . [7040-10]

1:50 pm: **Detection of biomolecules and gases by carbon nanotubes network transistors** *(Invited Paper)*, Subodh G. Mhaisalkar, L. J. Li, P. S. Lee, Nanyang Technological Univ. (Singapore) . . . . . [7040-11]

2:20 pm: **UV lithographic fabrication of micro-arrays on spin-coated DNA thin-films**, Darnell E. Diggs, James G. Grote, Carrie M. Bartsch, Air Force Research Lab.; Anup Sharma, Jean Michel Taguenang, Aschalew S. Kassu, Alabama A&M Univ.. . . . . [7040-12]

2:40 pm: **Biopolymer-based gate dielectric layer for organic field effect transistors** *(Invited Paper)*, Kalluri R. Sarma, Honeywell International, Inc.; James G. Grote, Air Force Research Lab. . . . . [7040-13]

Coffee Break . . . . . 3:10 to 3:30 pm

SESSION 4

Room: Conv. Ctr. 13 . . . . . Wed. 3:30 to 4:50 pm

Bio-polymer Photonics

Session Chair: **Ileana Rau,** Univ. Politehnica Bucuresti (Romania)

3:30 pm: **Dye molecular arrangement based on hybridization of DNA** *(Invited Paper)*, Yuichi Ohya, Kansai Univ. (Japan) . . . . . [7040-14]

4:00 pm: **Fabrication of waveguide structure of dye-doped DNA-lipid complex films** *(Invited Paper)*, Junichi Yoshida, Yamaoka Kanji, Takashi Tajima, Naoya Nakai, Makoto Fukuda, Naoya Ogata, Chitose Institute of Science and Technology (Japan) . . . . . [7040-15]

4:30 pm: **Characterization and evaluation of chromophore - DNA silica based thin films,** Maria Mihaly, Univ. Politehnica Bucuresti (Romania); Aurelia Meghea, Univ Politehnica Bucuresti (Romania); Celine Fiorini-Debuisschert, Commissariat à l'Energie Atomique (France) . . . . . [7040-16]

Room: Conv. Ctr. Exhibit Hall B2 . . . . . Wed. 5:30 to 7:00 pm

Posters-Wednesday

Poster authors will begin displaying posters after 10:00 am Wednesday morning. A poster session, with authors present at their posters, will be held Wednesday evening from 5:30 to 7:00 pm. Light refreshments will be served.

Poster Setup

Poster presenters must set up their posters between 10:00 am and 5:00 pm on Wednesday. Poster presenters who have not set up by 5:00 pm on Wednesday will be considered a "no show" and their manuscript will not be published. Presenters must remove their posters immediately after the poster session. Posters not removed will be considered unwanted and will be discarded. SPIE assumes no responsibility for posters left up after the end of each poster session.

An anthracene oligomer OTFT sensor for selective NOx gases detection, Luisa Torsi, Francesco Marinelli, Antonio Dell'aquila, Univ. degli Studi di Bari (Italy); Gian Paolo Suranna, Piero Mastrorilli, Cosimo F. Nobile, Politecnico di Bari (Italy); Subodh G. Mhaisalkar, Ju Nie Tey, Nanyang Technological Univ. (Singapore); Pynalisa Cosma, Univ. degli Studi di Bari (Italy) . . . . . [7040-31]

Thursday 14 August

SESSION 5

Room: Conv. Ctr. 13 . . . . . Thurs. 8:00 to 10:00 am

Application and Characterization of Bio/Nanomaterials

Session Chair: **Perry P. Yaney,** Univ. of Dayton

8:00 am: **2-D organic and inorganic nanofabrication through molecular recognition of DNA at the air-water interface** *(Invited Paper)*, Kuniharu Ijiro, Hokkaido Univ. (Japan) . . . . . [7040-17]

8:30 am: **Molecular structure and EL application of highly ordered DNA/Ru complex** *(Invited Paper)*, Norihisa Kobayashi, Chiba Univ. (Japan) . . [7040-18]

9:00 am: **Electrodeless measuremant of intra-molecular mobility of charge carriers in conjugated organic materials and biomacromolecules** *(Invited Paper)*, Shuhei Seki, Osaka Univ. (Japan) . . . . . [7040-19]

9:30 am: **BioElectroPhotonics** *(Invited Paper)*, James G. Grote, Air Force Research Lab. . . . . [7040-20]

Coffee Break . . . . . 10:00 to 10:30 am

SESSION 6

Room: Conv. Ctr. 13 . . . . . Thurs. 10:30 am to 12:20 pm

Investigation and Characterization of DNA Films

Session Chair: **James G. Grote,** Air Force Research Lab.

10:30 am: **Raman microprobe spectroscopic studies of solid DNA-CTMA films**, Perry P. Yaney, Faizan Ahmad, Univ. of Dayton; James G. Grote, Air Force Research Lab. . . . . [7040-21]

10:50 am: **Biopolymer thin films: processing, properties and stability** *(Invited Paper)*, Ileana Rau, Roxana Popescu, Gratiela Tihan, Ioana Demetrescu, Aurelia Meghea, Univ. Politehnica Bucuresti (Romania); James G. Grote, Air Force Research Lab.; Francois Kajzar, Univ. d'Angers (France). . . . . [7040-22]

11:20 am: **Stability improvements of DNA photonic devices** *(Invited Paper)*, Naoya Ogata, Kanji Yamaoka, Junichi Yoshida, Chitose Institute of Science and Technology (Japan) . . . . . [7040-23]

11:50 am: **Physical properties of natural DNA and metal ion inserted M-DNA** *(Invited Paper)*, Kenji Mizoguchi, Tokyo Metropolitan Univ. (Japan). . . . . [7040-24]

Lunch/Exhibition Break . . . . . 12:20 to 2:10 pm

SESSION 7

Room: Conv. Ctr. 13 . . . . . Thurs. 2:10 to 3:10 pm

Nanoprocessing Technologies and Nanosystems for Medical Applications

Session Chair: **Frederic Zenhausern,** Arizona State Univ.

2:10 pm: **In vivo blood lactic acid monitoring using microdialysis and surface-enhanced Raman spectroscopy**, Po Hsiang Hsu, Huihua K. Chiang, National Yang-Ming Univ. (Taiwan) . . . . . [7040-27]

2:30 pm: **Photodynamic activity of Au nanorods in human erythrocytes**, Poorani G. Gananathan, Sivabalan Shanmugam, Prakashrao R. Aruna, Ganesan Singaravelu, Anna Univ. (India) . . . . . [7040-28]

2:50 pm: **Role of different pH values in the control of magnetic behaviour of Ni-Zn nano system**, Mahavir Singh, Himachal Pradesh Univ. (India); Sangeeta Thakur, S. C. Katyal, Jaypee Univ. of Information Technology (India). . . . . [7040-30]

Courses of Related Interest

See SPIE Cashier for information and to register.

SC496 Fabrication and Processing of Nanostructures (Cao) Monday, 8:30 am to 5:30 pm
SC497 Nanophotonics (Prasad) Sunday, 1:30 to 5:30 pm
WS851 Nanotechnology: Science & Applications (Brahmbhatt) Wednesday, 8:30 am to 5:30 pm

Conference 7041

Wednesday-Thursday 13-14 August 2008 • Proceedings of SPIE Vol. 7041

Nanostructured Thin Films

Conference Chairs: **Geoffrey B. Smith,** Univ. of Technology/Sydney (Australia); **Akhlesh Lakhtakia,** The Pennsylvania State Univ.

Program Committee: **Ibrahim S. Abdulhalim II,** Ben-Gurion Univ. of the Negev (Israel); **Richard J. Blaikie,** Univ. of Canterbury (New Zealand); **Cuong Ton-That,** Univ. of Technology/Sydney (Australia); **Michael J. Brett,** Univ. of Alberta (Canada); **Dentcho A. Genov,** Univ. of California/Berkeley; **Andreas Gombert,** Fraunhofer-Institut für Solare Energiesysteme (Germany); **Claes-Göran Granqvist, Sr.,** Uppsala Univ. (Sweden); **Ruediger Iden,** BASF AG (Germany); **Cheng-Chung Lee,** National Central Univ. (Taiwan); **Tom G. Mackay,** Univ. of Edinburgh (United Kingdom); **Albert Polman,** FOM Institute for Atomic and Molecular Physics (Netherlands); **Katyayani Seal,** Oak Ridge National Lab.; **Motofumi Suzuki,** Kyoto Univ. (Japan); **Jian Xu,** The Pennsylvania State Univ.

Monday 11 August

Room: Conv. Ctr. 6A . . . . . .Mon. 8:30 am to 12:20 pm

NanoScience + Engineering Plenary Session

View plenary presentation details p. 13-14.

8:30 am: **Revivals of Molecular Nonlinear Optics in Physics, Chemistry, and Life Sciences,** Joseph Zyss, École Normale Supérieure de Cachan (France)

9:10 am: **Applications of Biological Materials**, Rajesh R. Naik, Air Force Research Lab.

Coffee Break . . . . . 9:50 to 10:20 am

10:20 am: **Two-Photon Lithography for Precise 3D Nano/Micro-Objects**, Kwang-Sup Lee, Hannam Univ. (South Korea)

11:00 am: **Multifunctional Excimer-Laser Lithography and Photoablation Technologies for Large-Area Micro and Nanoelectronics, Displays and Microsystems**, Kanti Jain, Univ. of Illinois at Urbana-Champaign

11:40 am: **Molecules, Surfaces, and Symmetry: From Pure Geometry to Nanoscience,** Denis Fichou, Commissariat à l'Energie Atomique (France)

Wednesday 13 August

SESSION 1

Room: Conv. Ctr. 14B . . . . . Wed. 8:20 to 10:00 am

Structure and Growth I

Session Chair: **Didier Felbacq,** Univ. Montpellier II (France)

8:20 am: **Patterns and pathways in self-organised nanoparticle assemblies** *(Invited Paper)*, Philip J. Moriarty, The Univ. of Nottingham (United Kingdom) . . . . . [7041-01]

8:50 am: **Stochastic continuum modeling self-assembled epitaxial quantum dot formation** *(Invited Paper)*, Lawrence H. Friedman, The Pennsylvania State Univ.. . . . . [7041-02]

9:20 am: **Dynamics of nanoparticle growth on ferroelectric surfaces**, Katyayani Seal, Sergei Kalinin, Ilia Ivanov, Oak Ridge National Lab. . [7041-03]

9:40 am: **Sputter deposition of metallic thin films for applications in solar cells and MEMS**, Abhishek Kumar, Stanford Univ.; Nikhil Dhawan, Punjab Engineering College (India) . . . . . [7041-04]

Coffee Break . . . . . 10:00 to 10:30 am

SESSION 2

Room: Conv. Ctr. 14B . . . . . Wed. 10:30 am to 12:10 pm

Structure and Growth II

Session Chair: **Katyayani Seal,** Oak Ridge National Lab.

10:30 am: **Hierarchical design of 2D self-assembled supramolecular architectures: from molecules to devices** *(Invited Paper)*, Denis Fichou, Commissariat à l'Energie Atomique (France) . . . . . [7041-08]

11:00 am: **Shadowing growth of biaxially oriented nanostructured films** *(Invited Paper)*, Toh-Ming Lu, Fu Tang, Gwo-Ching Wang, Rensselaer Polytechnic Institute . . . . . [7041-05]

11:30 am: **Reinforce membrane based on cross-linked water-soluble sulfonated carbon nanotube and sulfonated polystyrene**, Ying Dai, Haiping Hong, South Dakota School of Mines and Technology; Jeffry S. Welsh, Air Force Research Lab.. . . . . [7041-06]

11:50 am: **Atomic layer deposition of Al2O3-TiO2 nanocomposites**, Nemo Bilu_ Abaffy, Royal Melbourne Institute of Technology (Australia); Peter Evans, Gerry Triani, Australian Nuclear Science and Technology Organisation (Australia); Dougal McCulloch, Royal Melbourne Institute of Technology (Australia). . . . . [7041-07]

Lunch/Exhibition Break . . . . . 12:10 to 1:30 pm

SESSION 3

Room: Conv. Ctr. 14B . . . . . Wed. 1:30 to 3:10 pm

Plasmonics and Nanostructure I

Session Chair: **John Polo,** Edinboro Univ. of Pennsylvania

1:30 pm: **Sensitivity enhancement of guided wave surface plasmon resonance sensors using top nano dielectric layer** *(Invited Paper)*, Amit Lahav, Ibrahim Abdulhalim II, Ben-Gurion Univ. of the Negev (Israel) [7041-09]

2:00 pm: **Tailoring coupling of photon to local plasmon by using Ag nanorods-mirror sandwich structures** *(Invited Paper)*, Motofumi Suzuki, Yoshikatsu Imai, Hiroki Tokunaga, Kaoru Nakajima, Kenji Kimura, Kyoto Univ. (Japan). . . . . [7041-10]

2:30 pm: **Porosity effect on surface plasmon resonance from metallic sculptured thin films**, Ibrahim Abdulhalim II, Ben-Gurion Univ. of the Negev (Israel); Akhlesh Lakhtakia, The Pennsylvania State Univ.; Amit Lahav, Ben-Gurion Univ. of the Negev (Israel); Fan Zhang, Jian Xu, The Pennsylvania State Univ. . . . . [7041-11]

2:50 pm: **Applications of nanostructured porous silicon in the field of optical sensing**, Raul J. Martin-Palma, The Pennsylvania State Univ. and Univ. Autónoma de Madrid (Spain); Vicente Torres Costa, Jose M. Martínez-Duart, Univ. Autónoma de Madrid (Spain). . . . . [7041-12]

Coffee Break . . . . . 3:10 to 3:40 pm

SESSION 4

Room: Conv. Ctr. 14B . . . . . Wed. 3:40 to 5:10 pm

Plasmonics and Nanostructure II

Session Chair: **Ibrahim S. Abdulhalim II,** Ben-Gurion Univ. of the Negev (Israel)

3:40 pm: **Electromagnetic surface wave propagation at the planar interface of a columnar or Chiral sculptured thin film and an isotropic substrate** *(Invited Paper)*, John A. Polo, Jr., Edinboro Univ. of Pennsylvania; Akhlesh Lakhtakia, The Pennsylvania State Univ.. . . . . [7041-13]

4:10 pm: **Excitation of surface plasmon polaritons at the interface of a metal and a sculptured nematic thin film**, Michael A. Motyka, Akhlesh Lakhtakia, The Pennsylvania State Univ. . . . . [7041-14]

4:30 pm: **Comparative study of enhanced fluorescence from nano sculptured thin films**, Ibrahim Abdulhalim, Ben-Gurion Univ. of the Negev (Israel); Christian Patzig, Bernd Rauschenbach, Leibniz-Institut für Oberflächenmodifizierung e.V (Germany) . . . . . [7041-15]

4:50 pm: **Metal nano-whiskers synthesized by high-temperature glancing angle deposition,** Motofumi Suzuki, Kenji Hamachi, Ryo Kita, Koji Nagai, Kaoru Nakajima, Kenji Kimura, Kyoto Univ. (Japan) . . . . . [7041-16]

Room: Conv. Ctr. Exhibit Hall B2 . . . . . Wed. 5:30 to 7:00 pm

Posters-Wednesday

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Nanostructure-phase states of the nickel surface layers after electroexplosive alloying with boron and copper, Victor E. Gromov, Evgenii A. Budovskikh, Sergey V. Konovalov, Siberian State Univ. of Industry (Russia) . . . . . [7041-29]

Plume dynamics of laser-produced plasma in ambient gas, Vyacheslav S. Borisov, Michael Mond, Ben-Gurion Univ. of the Negev (Israel) and Pearlstone Ctr. for Aeronautical Engineering Studies (Israel) . . . . . [7041-30]

Blue photoluminescence of PECVD SiC-based films, Volodymyr I. Ivashchenko, Institute for Problems in Materials Science (Ukraine); Andriy V. Vasin, Institute of Semiconductor Physics (Ukraine); Liudmyla A. Ivashchenko, Mykola Ushakov, Institute for Problems in Materials Science (Ukraine)[7041-31]

A nano-structured surface plasmon resonance sensor for sensitivity enhancement, Jae-Ho Kim, Hyo-Sop Kim, Jin-Ho Kim, Ajou Univ. (South Korea); Sungho Ko, Sung-Wook Choi, Yong-Jin Cho, Korea Food Research Institute (South Korea). . . . . [7041-32]

Different sensing layers for SPR gas-sensing, Sara Zuccon, Maria Pelizzo, Piergiorgio Nicolosi, Univ. degli Studi di Padova (Italy); Dario Buso, Univ. degli Studi di Padova; Alessandro Martucci, Univ. degli Studi di Padova (Italy) . . . . . [7041-33]

Optical properties of silver nanorod arrays prepared by oblique angle deposition, Yi-Jun Jen, Wen-Lung Hsu, Ching-Wei Yu, National Taipei Univ. of Technology (Taiwan) . . . . . [7041-34]

Large area assembled periodic nanoarrays by block copolymer templating and glancing angle deposition, Jinan Chai, National Institute for Nanotechnology (Canada) and Univ. of Alberta (Canada); Michael T. Taschuk, Univ. of Alberta (Canada); Michael J. Brett, Jillian M. Buriak, National Institute for Nanotechnology (Canada) and Univ. of Alberta (Canada) . . . . . [7041-35]

Analysis of metal (Ag) sculptured thin films by atomic force microscopy, Fatima Z. Benkabou, Univ. de Moncton (Canada); Lakhtakia Akhlesh, The Pennsylvania State Univ.. . . . . [7041-37]

Growth characterization of magnesium and magnesium alloy sculptured thin films, Sean M. Pursel, Mark W. Horn, Barbara A. Shaw, The Pennsylvania State Univ.. . . . . [7041-38]

Courses of Related Interest

See SPIE Cashier for information and to register.

SC496 Fabrication and Processing of Nanostructures (Cao) Monday, 8:30 am to 5:30 pm
SC497 Nanophotonics (Prasad) Sunday, 1:30 to 5:30 pm
WS851 Nanotechnology: Science & Applications (Brahmbhatt) Wednesday, 8:30 am to 5:30 pm

Thursday 14 August

SESSION 5

Room: Conv. Ctr. 14B . . . . . Thurs. 8:20 to 9:50 am

Switchable and Active Films

Session Chair: **Jian Xu,** The Pennsylvania State Univ.

8:20 am: **Modulating the optical response of thin-film structures by a nanoscale phase transition** *(Invited Paper)*, Richard F. Haglund, Jr., Vanderbilt Univ. . . . . [7041-17]

8:50 am: **Frequency dependence of the observed phase transition in nanostructured and doped VO2 thin films**, Geoffrey B. Smith, Angus R. Gentle, Univ. of Technology/Sydney (Australia) . . . . . [7041-18]

9:10 am: **All optical switching based on optical control of energy transfer between thin film layers**, David S. Bradshaw, David L. Andrews, Univ. of East Anglia Norwich (United Kingdom) . . . . . [7041-19]

9:30 am: **Thin (un-doped) SnO2 films produced by pulsed laser deposition**, Rakhi Khandelwal, Avinashi Kapoor, Amit P. Singh, Univ. of Delhi (India); Sorin Grigorescu, Paola Miglietta, Nadya E. Stankova, Alessio Perrone, Univ. degli Studi di Lecce (Italy) . . . . . [7041-20]

Coffee Break . . . . . 9:50 to 10:20 am

SESSION 6

Room: Conv. Ctr. 14B . . . . . Thurs. 10:20 am to 12:20 pm

Oxide and Semiconductor Films

Session Chair: **Motofumi Suzuki,** Kyoto Univ. (Japan)

10:20 am: **Ultraviolet optical functions of ZnO and Ga2O3 thin films** *(Invited Paper)*, Shizuo Fujita, Kyoto Univ. (Japan) . . . . . [7041-21]

10:50 am: **Growth and characterisation of ZnO nanostructures and thin films** *(Invited Paper)*, Cuong Ton-That, Matthew Foley, Matthew Phillips, Univ. of Technology/Sydney (Australia) . . . . . [7041-22]

11:20 am: **Field effect in Raman spectra for nc-Si films**, Dmitry E. Milovzorov, Fluens Technology Group Ltd. (Russia). . . . . [7041-23]

11:40 am: **Reconfigurable photonic crystal filters for multi-band optical filtering on a monolithic substrate**, Gary Shambat, Univ. of Virginia; Ravindra Athale, Gary Euliss, The MITRE Corp.; Mark Mirotznik, The Catholic Univ. of America; Eric Johnson, Viktor Smolski, The Univ. of North Carolina at Charlotte . . . . . [7041-24]

12:00 pm: **Preparation and applications of nanoporous silicon**, Abhishek Kumar, Stanford Univ.; Nikhil Dhawan, Punjab Engineering College (India). . . . . [7041-39]

Lunch/Exhibition Break . . . . . 12:20 to 1:50 pm

SESSION 7

Room: Conv. Ctr. 14B . . . . . Thurs. 1:50 to 3:20 pm

Complex Mediums

Session Chair: **Cuong Ton-That,** Univ. of Technology/Sydney (Australia)

1:50 pm: **Effective properties of membrane photonic crystals** *(Invited Paper)*, Didier Felbacq, Univ. Montpellier II (France); Brahim Guizal, Univ. de Franche-Comte (France); Guy Bouchitte, Univ. de Toulon et du var (France) . . . . . [7041-25]

2:20 pm: **Circular polarization emission from an external cavity diode laser**, Jian Xu, Akhlesh Lakhtakia, Fan Zhang, The Pennsylvania State Univ. . . . . [7041-26]

2:40 pm: **Review of the role of dielectric anisotropy in surface wave propagation**, Sudarshan Rao Nelatury II, The Pennsylvania State Univ.; John A. Polo, Jr., Edinboro Univ. of Pennyslvania; Akhlesh Lakhtakia, The Pennsylvania State Univ.. . . . . [7041-27]

3:00 pm: **Photoconductivity on nanocrystalline ZnO-TiO2 thin films obtained by sol-gel**, Jorge A. Garcia-Macedo, Guadalupe Valverde-Aguilar, Rodolfo Juarez-Arenas, Univ. Nacional Autónoma de México (Mexico). . . . . [7041-28]

Conference 7042

Sunday 10 August 2008 • Proceedings of SPIE Vol. 7042

Instrumentation, Metrology, and Standards for Nanomanufacturing II

Conference Chair: **Michael T. Postek,** National Institute of Standards and Technology

Conference Co-Chair: **John A. Allgair,** SEMATECH, Inc. and Freescale Semiconductors, Inc.

Program Committee: **Daniel J. C. Herr,** Semiconductor Research Corp.; **Mark D. Hoover,** The National Institute for Occupational Safety and Health; **David C. Joy,** The Univ. of Tennessee; **Kevin W. Lyons,** National Institute of Standards and Technology; **George Orji,** National Institute of Standards and Technology; **Ron L. Remke,** SEMATECH, Inc.; **Richard M. Silver,** National Institute of Standards and Technology; **John Small,** National Institute of Standards and Technology; **Mark T. Tuominen,** Univ. of Massachusetts/Amherst

Conference Cosponsor: NIST

Sunday 10 August

SESSION 1

Room: Conv. Ctr. 12 . . . . . .Sun. 8:10 to 10:10 am

Instrumentation and Metrology I

Session Chairs: **Michael T. Postek,** National Institute of Standards and Technology; **John A. Allgair,** International SEMATECH Manufacturing Initiative

8:10 am: **Metrology at the Nanoscale: What Are The Grand Challenges?**, Kevin W. Lyons, Michael T. Postek, National Institute of Standards and Technology . . . . . [7042-01]

8:30 am: **Electrical probe for nanoscale devices and circuits**, Leonard Forbes, Oregon State Univ. and L. Forbes & Associates, LLC; Drake A. Miller, Michael E. Jacob, Oregon State Univ. . . . . [7042-02]

8:50 am: **A high-speed AFM probe with micromachined membrane tip**, Byungki Kim, Byunghyung Kwak, Faize Jamil, Univ. of Massachusetts/Lowell . . . . . [7042-03]

9:10 am: **Ultrastable atomic force microscopy: atomic-scale lateral stability and registration in ambient conditions**, Thomas T. Perkins, Ashley R. Carter, Gavin M. King, Univ. of Colorado at Boulder . . . . . [7042-04]

9:30 am: **Self-calibration of a dual-actuated single-axis nanopositioner using measurement transitivity with extensions to calibration of two-axis systems**, Young H. Jeong, Jingyan Dong, Placid M. Ferreira, Univ. of Illinois at Urbana-Champaign. . . . . [7042-05]

9:50 am: **High transmission nanoscale ridge aperture antenna for nanoscale materials processing and optical imaging**, Xianfan Xu, Purdue Univ. . . . . [7042-06]

Coffee Break . . . . . 10:10 to 10:30 am

SESSION 2

Room: Conv. Ctr. 12 . . . . . Sun. 10:30 am to 12:10 pm

Materials and Metrology

Session Chairs: **Kevin W. Lyons,** National Institute of Standards and Technology; **Ndubuisi George Orji,** National Institute of Standards and Technology

10:30 am: **Test objects with right-angled and trapezoidal profiles of the relief elements**, Yury A. Novikov, Ctr. for Surface and Vacuum Research (Russia); Valeriy P. Gavrilenko, Alexander Rakov, General Physics Institute (Russia); Pavel A. Todua, Ctr. for Surface and Vacuum Research (Russia) . . . . . [7042-07]

10:50 am: **Check of the quality of fabrication of test objects having a trapezoidal profile**, Pavel A. Todua, Valeriy P. Gavrilenko, Yury A. Novikov, Alexander Rakov, A.M. Prokhorov General Physics Institute (Russia) [7042-08]

11:10 am: **Accuracy considerations for critical dimension semiconductor metrology**, Ndubuisi G. Orji, Ronald G. Dixson, National Institute of Standards and Technology; Benjamin Bunday, John A. Allgair, International SEMATECH Manufacturing Initiative. . . . . [7042-09]

11:30 am: **Extraction of trench geometry and CD of nanoscale grating targets in (110)-oriented silicon using angle-resolved scatterometry**, Heather J. Patrick, Thomas A. Germer, Michael W. Cresswell, National Institute of Standards and Technology; Bin Li, Huai Huang, Paul S. Ho, The Univ. of Texas at Austin . . . . . [7042-10]

11:50 am: **Measurement of the parameters of the electron beam of a scanning electron microscope**, Valeriy P. Gavrilenko, General Physics Institute (Russia); Yury A. Novikov, Ctr. for Surface and Vacuum Research (Russia); Alexander Rakov, General Physics Institute (Russia); Pavel A. Todua, Ctr. for Surface and Vacuum Research (Russia). . . . . [7042-11]

Lunch Break . . . . . 12:10 to 1:30 pm

SESSION 3

Room: Conv. Ctr. 12 . . . . . .Sun. 1:30 to 3:10 pm

Standards and Metrology

Session Chairs: **Ndubuisi George Orji,** National Institute of Standards and Technology; **John A. Allgair,** International SEMATECH Manufacturing Initiative

1:30 pm: **Cellulose nanocrystals the next big nano-thing?**, Michael T. Postek, National Institute of Standards and Technology . . . . . [7042-12]

1:50 pm: **Measurement of oxide barrier-film thickness of Al alloy by electrochemical impedance spectroscopy at the nanometre scale**, Khaled J. Habib, Kuwait Institute for Scientific Research (Kuwait) . . . . . [7042-13]

2:10 pm: **Towards in situ x-ray diffraction imaging at the nanometer scale**, Nadia A. Zatsepin, Andrei Y. Nikulin, Ruben A. Dilanian, Brian M. Gable, Barry C. Muddle, Monash Univ. (Australia); Osami Sakata, Japan Synchrotron Radiation Research Institute (Japan). . . . . [7042-14]

2:30 pm: **Laser diagnostics for flame synthesis of nanostructured materials: instrumentation, metrology, and process control**, Xiaofei Liu, Rutgers Univ.. . . . . [7042-15]

2:50 pm: **Three-dimensional x-ray diffraction nanoscopy**, Andrei Y. Nikulin, Ruben A. Dilanian, Nadia A. Zatsepin, Barry C. Muddle, Monash Univ. (Australia). . . . . [7042-16]

Coffee Break . . . . . 3:10 to 3:30 pm

SESSION 4

Room: Conv. Ctr. 12 . . . . . Sun. 3:30 to 4:10 pm

Instrumentation and Metrology II

Session Chairs: **Michael T. Postek,** National Institute of Standards and Technology; **Kevin W. Lyons,** National Institute of Standards and Technology

3:30 pm: **Femtosecond laser processing with adaptive optics**, K.-C. Cho, Shean-Jen Chen, National Cheng Kung Univ. (Taiwan) . . . . . [7042-17]

3:50 pm: **Silica nanoparticle inline size measurement using refractive index gradient in a microfluidic cell,** Yi Qiao, David Hofeldt, Eric Choban, Brian Graebel, John Ramthun, Michael Dolezal, 3M Co. . . . . [7042-18]

Room: Conv. Ctr. 6A . . . . . Sun. 6:00 to 6:45 pm

All-Conference Plenary Session

View plenary presentation details p. 13.

6:00 pm: **The Solar Decathlon: building a better future with solar energy**, Richard J. King, U.S. Dept. of Energy

Monday 11 August

Room: Conv. Ctr. 6A . . . . . Mon. 8:30 am to 12:20 pm

NanoScience + Engineering Plenary Session

View plenary presentation details p. 13-14.

8:30 am: **Revivals of Molecular Nonlinear Optics in Physics, Chemistry, and Life Sciences,** Joseph Zyss, École Normale Supérieure de Cachan (France)

9:10 am: **Applications of Biological Materials**, Rajesh R. Naik, Air Force Research Lab.

Coffee Break . . . . . 9:50 to 10:20 am

10:20 am: **Two-Photon Lithography for Precise 3D Nano/Micro-Objects**, Kwang-Sup Lee, Hannam Univ. (South Korea)

11:00 am: **Multifunctional Excimer-Laser Lithography and Photoablation Technologies for Large-Area Micro and Nanoelectronics, Displays and Microsystems**, Kanti Jain, Univ. of Illinois at Urbana-Champaign

11:40 am: **Molecules, Surfaces, and Symmetry: From Pure Geometry to Nanoscience,** Denis Fichou, Commissariat à l'Energie Atomique (France)

Courses of Related Interest

See SPIE Cashier for information and to register.

SC496 Fabrication and Processing of Nanostructures (Cao) Monday, 8:30 am to 5:30 pm
SC497 Nanophotonics (Prasad) Sunday, 1:30 to 5:30 pm
WS851 Nanotechnology: Science & Applications (Brahmbhatt) Wednesday, 8:30 am to 5:30 pm

Solar Energy + Applications

Part of SPIE Optics+Photonics

Symposium Chair:

Ravi Durvasula, Lightfleet Corp.

Technical Organizing Committee

Alan E. Delahoy, EPV Solar, Inc.
Neelkanth G. Dhere, Florida Solar Energy Ctr./Univ. of Central Florida
Martha Symko-Davies, National Renewable Energy Lab.
Benjamin K. Tsai, National Institute of Standards and Technology
Loucas Tsakalakos, GE Global Research
Bolko von Roedern, National Renewable Energy Lab.
Gunnar Westin, Uppsala Univ. (Sweden)

Sunday	Monday	Tuesday	Wednesday	Thursday

Solar Energy

7043 **High and Low Concentration for Solar Electric Applications III** *(Symko-Davies)*, p. 85

7045 **Photovoltaic Cell and Module Technologies II** *(von Roedern/Delahoy)*, p. 89

7044 **Solar Hydrogen and Nanotechnology III** *(Westin)*, p. 87

7046 **Optical Modeling and Measurements for Solar Energy Systems II** *(Tsai)*, p. 91

7047 **Nanoscale Photonic and Cell Technologies for Photovoltaics** *(Tsakalakos)*, p. 93

7048 **Reliability of Photovoltaic Cells, Modules, Components, and Systems** *(Dhere)*, p. 95

	EXHIBITION, p. 40-41	
10:00 am to 5:00 pm	10:00 am to 5:00 pm	10:00 am to 2:00 pm

58 Courses and Workshops

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Conference 7043

Monday-Tuesday 11-12 August 2008 • Proceedings of SPIE Vol. 7043

High and Low Concentration for Solar Electric Applications III

Conference Chair: **Martha Symko-Davies,** National Renewable Energy Lab.

Program Committee: **Timothy J. Coutts,** National Renewable Energy Lab.; **Ravi Durvasula,** Lightfleet Corp.; **Vahan Garboushian,** Amonix Inc.; **Robert McConnell,** National Renewable Energy Lab.; **William E. McMahon,** National Renewable Energy Lab.; **Fannie Posey-Eddy,** National Renewable Energy Lab.; **Raed A. Sherif,** Spectrolab, Inc.

Monday 11 August

Room: Conv. Ctr. 6A . . . . . Mon. 1:30 to 4:30 pm

Solar Energy Plenary Session

Session Chair: **Ravi Durvasula,** Lightfleet Corp.

View plenary presentation details p. 15-16.

1:30 pm: **Nanostructures for High Efficiency Photovoltaics**, Harry A. Atwater, California Institute of Technology . . . . . [7047-102]

2:00 pm: **The Environment's Effects on Solar Radiation** *(Presentation Only)*, Joseph J. Michalsky, Jr., NOAA Earth System Research Lab. . . . . [7046-103]

2:30 pm: **Direct Conversion of Solar Energy to Hydrogen**, Craig A. Grimes, The Pennsylvania State Univ. . . . . [7044-105]

Coffee Break . . . . . 3:00 to 3:30 pm

3:30 pm: **Reliability of PV Systems**, John H. Wohlgemuth, BP Solar International LLC . . . . . [7048-101]

4:00 pm: **Commercializing CPV: What Lies Ahead?,** Dave Holland, Solar Systems Pty Ltd. (Australia) . . . . . [7043-104]

Posters-Monday

Room: Conv. Ctr. Exhibit Hall B2 . . . . . Mon. 6:00 to 7:30 pm

Poster authors will begin displaying posters after 10:00 am Monday morning. A poster session, with authors present at their posters, will be held Monday evening from 6:00 to 7:30 pm. Light refreshments will be served.

Poster Setup

Poster presenters must set up their posters between 10:00 am and 5:00 pm on Monday. Poster presenters who have not set up by 5:00 pm on Monday will be considered a "no show" and their manuscript will not be published. Presenters must remove their posters immediately after the poster session. Posters not removed will be considered unwanted and will be discarded. SPIE assumes no responsibility for posters left up after the end of each poster session.

Analysis and design of holographic solar concentrators, Raymond K. Kostuk, Jose E. Castillo, Juan M. Russo, The Univ. of Arizona; Glenn A. Rosenberg, Prism Solar Technologies, Inc. . . . . [7043-16]

The development of a 100KW HCPV system at INER, Shou-Yuan Ma, I-Tao Lung, Hwen-Fen Hong, Cheng-Dar Lee, Hwa-Yuh Shin, Cherng-Tsong Kuo, Institute of Nuclear Energy Research (Taiwan) . . . . . [7043-18]

Design and modeling of MEMS actuators excited by an external heat source, Margarita Tecpoyotl-Torres, Jorge Varona, Univ. Autónoma del Estado de Morelos (Mexico); Anas A. Hamoui, McGill Univ. (Canada); Jesús Escobedo-Alatorre, Univ. Autónoma del Estado de Morelos (Mexico)[7043-20]

Dspic control system of a solar follower, Jesús Escobedo-Alatorre, Margarita Tecpoyotl-Torres, Univ. Autónoma del Estado de Morelos (Mexico); Jose Campos-Alvarez, Univ. Nacional Autónoma de México (Mexico); Miguel A. Gomez-Vicario, Univ. Autónoma del Estado de Morelos (Mexico). [7043-21]

Experimental design of a fluidized-bed solar receiver with direct absorption of concentrated solar radiation, Arezki Bounaceur, Jean-Jacques Bezian, Alain de Ryck, Jean-Claude Poussin, Ecole des Mines d'Albi (France); Gabriel Olalde, Ctr. National de la Recherche Scientifique (France) . . . . . [7043-22]

Tuesday 12 August

SESSION 1

Room: Conv. Ctr. 6F . . . . . Tues. 8:00 to 10:10 am

CPV Module and System Reliability

Session Chair: **Martha Symko-Davies,** National Renewable Energy Lab.

8:00 am: **Reliable deployment of high concentration photovoltaic (HCPV) systems** *(Keynote Presentation),* Vahan Garboushian, Amonix Inc. . [7043-01]

8:30 am: **Optics reliability for concentrators** *(Keynote Presentation),* Cheryl E. Kennedy, National Renewable Energy Lab. . . . . [7043-02]

9:00 am: **Performance of 3-sun mirror modules on a sun tracking carousel on flat roof buildings**, Lewis M. Fraas, James Avery, Leonid Minkin, JX Crystals, Inc.; Curt Maxey, Anthony Gehl, Oak Ridge National Lab.; Rick Hurt, Robert Boehm, Univ. of Nevada/Las Vegas . . . . . [7043-03]

9:20 am: **Reduction of escape cone losses in luminescent concentrators with selective mirrors**, Lenneke H. Slooff, Teun R. Burgers, Energy Research Ctr. of the Netherlands (Netherlands); Michael G. DeBije, Technische Univ. Eindhoven (Netherlands) . . . . . [7043-04]

9:40 am: **CPV standard and related testing on optics** *(Keynote Presentation),* Liang Ji, Underwriters Labs. Inc.; Robert McConnell, Amonix Inc.. . . . . [7043-05]

Coffee Break . . . . . 10:10 to 10:40 am

SESSION 2

Room: Conv. Ctr. 6F . . . . . Tues. 10:40 am to 12:20 pm

CPV Cells and Receivers

Session Chair: **Timothy J. Coutts,** National Renewable Energy Lab.

10:40 am: **Thermal modeling for rooftop CPV system**, Erwang Mao, Jason Zhao, Rex Chang, Jason Lu, Enfocus Engineering Corp.. . . . . [7043-06]

11:00 am: **High concentration (2500 suns), high throughput, automated flash tester with calibrated color balance and intensity control**, Michael J. Ludowise, Sean S. Taylor, Hing W. Chan, SolFocus, Inc. . . . . [7043-07]

11:20 am: **GaInP/GaAs dual junction solar cells on Ge/Si epitaxial templates**, Melissa J. Archer, California Institute of Technology; Daniel C. Law, Shoghig Mesropian, Andreea Boca, Moran Haddad, Richard R. King, Spectrolab, Inc.; Harry A. Atwater, California Institute of Technology [7043-08]

11:40 am: **Modeling of GaInP/GaAs/Ge and the inverted-grown metamorphic GaInP/GaAs/GaInAs triple-junction solar cells**, Yegao Xiao, Zhiqiang L. Li, Zhanming S. Li, Crosslight Software Inc. (Canada). . . [7043-09]

12:00 pm: **Luminescence coupling in direct-bandgap multi-junction solar cells**, Song-Nan Wu, Shui-Qing Yu, Ding Ding, Shane R. Johnson, Yong-Hang Zhang, Arizona State Univ. . . . . [7043-10]

Lunch/Exhibition Break . . . . . 12:20 to 1:50 pm

SESSION 3

Room: Conv. Ctr. 6F . . . . . Tues. 1:50 to 3:30 pm

CPV Module and System Design

Session Chair: **Melissa J. Archer,** California Institute of Technology

1:50 pm: **Maximum-performance solar concentration with unfolded aplanatic optics**, Jeffrey M. Gordon, Daniel Feuermann, Ben-Gurion Univ. of the Negev (Israel); Pete Young, SolFocus, Inc. . . . . [7043-11]

2:10 pm: **The free form XR photovoltaic concentrator: a high performance SMS3D design**, Aleksandra Cvetkovic, Univ. Politécnica de Madrid (Spain); Maikel M. Hernandez, Light Prescriptions Innovators Europe, S. L. (Spain); Pablo Benítez, Juan Carlos Miñano, Univ. Politécnica de Madrid (Spain); Joel A. Schwartz, Boeing Satellite Systems; Adam P. Plesniak, Russ Jones, David A. Whelan, The Boeing Co. . . . . [7043-12]

2:30 pm: **Multiband solar concentrator using transmissive dichroic beamsplitting**, Jason H. Karp, Univ. of California/San Diego . . . . . [7043-13]

2:50 pm: **Low concentrator PV optics optimization**, Ben Chang, SV Solar, Inc.. . . . . [7043-14]

3:10 pm: **A commercial 1kW CPV system that breaks the $2/W price barrier**, Dennis D. Earl, Sunlight Direct, Inc. . . . . [7043-15]

Courses of Related Interest

See SPIE Cashier for information and to register.

SC011 Design of Efficient Illumination Systems (Cassarly) Monday, 1:30 to 5:30 pm

SC388 Non-Imaging Optics (Winston) Monday, 8:30 am to 12:30 pm

Conference 7044

Wednesday-Thursday 13-14 August 2008 • Proceedings of SPIE Vol. 7044

Solar Hydrogen and Nanotechnology III

Conference Chair: **Gunnar Westin,** Uppsala Univ. (Sweden)

Program Committee: **Hironori Arakawa,** Tokyo Univ. of Science (Japan); **Jan Augustynski,** Univ. Warszawski (Poland); **Joe da Costa,** The Univ. of Queensland (Australia); **Maria L. Ghirardi,** National Renewable Energy Lab.; **Michael Graetzel,** École Polytechnique Fédérale de Lausanne (Switzerland); **Jinghua Guo,** Lawrence Berkeley National Lab.; **Ting Guo,** Univ. of California/Davis; **Claude Levy-Clement,** Ctr. National de la Recherche Scientifique (France); **Yoshihiro Nakato,** Osaka Univ. (Japan); **Janusz Nowotny,** Univ. of New South Wales (Australia); **Ian C. Plumb,** Commonwealth Scientific and Industrial Research Organisation (Australia); **Pathiyamattom Joseph Sebastian,** Univ. Nacional Autónoma de México (Mexico); **John A. Turner,** National Renewable Energy Lab.; **Lionel Vayssieres,** National Institute for Materials Science (Japan); **T. Nejat Veziroglu,** Univ. of Miami; **Upul Wijayantha,** Loughborough Univ. (United Kingdom); **Jin Z. Zhang,** Univ. of California/Santa Cruz

Monday 11 August

Room: Conv. Ctr. 6A . . . . . Mon. 1:30 to 4:30 pm

Solar Energy Plenary Session

Session Chair: **Ravi Durvasula,** Lightfleet Corp.

View plenary presentation details p. 15-16.

1:30 pm: **Nanostructures for High Efficiency Photovoltaics**, Harry A. Atwater, California Institute of Technology . . . . . [7047-102]

2:00 pm: **The Environment's Effects on Solar Radiation** *(Presentation Only)*, Joseph J. Michalsky, Jr., NOAA Earth System Research Lab. . . . . [7046-103]

2:30 pm: **Direct Conversion of Solar Energy to Hydrogen**, Craig A. Grimes, The Pennsylvania State Univ. . . . . [7044-105]

Coffee Break . . . . . 3:00 to 3:30 pm

3:30 pm: **Reliability of PV Systems**, John H. Wohlgemuth, BP Solar International LLC . . . . . [7048-101]

4:00 pm: **Commercializing CPV: What Lies Ahead?,** Dave Holland, Solar Systems Pty Ltd. (Australia) . . . . . [7043-104]

Wednesday 13 August

SESSION 1

Room: Conv. Ctr. 6F . . . . . Wed. 8:40 to 10:00 am

Solar Hydrogen Catalysts I: Water/Charge and Electrochemistry Based Processing

Session Chair: **Gunnar Westin,** Uppsala Univ. (Sweden)

8:40 am: **Nanorod-based photocatalysts for solar hydrogen generation** *(Invited Paper)*, Lionel Vayssieres, National Institute for Materials Science (Japan) . . . . . [7044-01]

9:10 am: **Semiconducting electrodes with controlled morphologies for use in solar energy conversion** *(Invited Paper)*, Kyoung-Shin Choi, Purdue Univ. . . . . [7044-02]

9:40 am: **Synthesis and characterization of nanostructured semiconductors for photovoltaic and photoelectrochemical cell application**, Sebastian J. Pathiyamattom, Univ. Nacional Autónoma de México (Mexico); Rocio V. Castañeda, Univ. de Guadalajara (Mexico); Luis C. Ixtlilco, Rogelio V. Mejia, Univ. Autónoma del Estado de Morelos (Mexico); Alfredo Soto, Centro de Investigación en materiales Avanzados (Mexico); Jose Campos, Sergio Gamboa, Univ. Nacional Autónoma de México (Mexico); Joel Pantoja, Univ. Politecnica de Chiapas (Mexico) . . . . . [7044-03]

Coffee Break . . . . . 10:00 to 10:30 am

SESSION 2

Room: Conv. Ctr. 6F . . . . . Wed. 10:30 am to 12:00 pm

Solar Hydrogen Catalysts II: Metal Organic Processing

Session Chair: **Lionel Vayssieres,** National Institute for Materials Science (Japan)

10:30 am: **Hydrogen generation using photoelectrochemical cells based on new metal oxide nanostructures** *(Invited Paper)*, Jin Z. Zhang, Jenny Hensel, Abe Wolcott, Univ. of California/Santa Cruz; Yiping Zhao, Wilson Smith, The Univ. of Georgia . . . . . [7044-04]

11:00 am: **Semiconducting oxide photo-electrodes for water splitting** *(Invited Paper)*, Jan Augustynski, Univ. Warszawski (Poland); Renata Solarska, EMPA (Switzerland) . . . . . [7044-05]

11:30 am: **Small oxide clusters as intermediate building units for nanostructures** *(Invited Paper)*, Abdelkrim Chemseddine, Hahn-Meitner-Institut Berlin GmbH (Germany) . . . . . [7044-06]

Lunch/Exhibition Break . . . . . 12:00 to 1:30 pm

SESSION 3

Room: Conv. Ctr. 6F . . . . . Wed. 1:30 to 3:00 pm

Solar Hydrogen Catalysts III: Metal Organic Processing

Session Chair: **Jinghua Guo,** Lawrence Berkeley National Lab.

1:30 pm: **Solution processing of complex oxides for photo-catalysis** *(Invited Paper)*, Gunnar Westin, Uppsala Univ. (Sweden) . . . . . [7044-07]

2:00 pm: **High-performance photosensitive oxide semiconductors based on titanium dioxide** *(Invited Paper)*, Leigh R. Sheppard, Janusz Nowotny, Univ. of New South Wales (Australia) . . . . . [7044-08]

2:30 pm: **Water splitting property of Gd1-xBixVO4 powder photocatalysts and their thin film photoelectrodes** *(Invited Paper)*, Hironori Arakawa, Hiroshi Kishida, Yuta Imagawa, Takeshi Yamaguchi, Tokyo Univ. of Science (Japan) . . . . . [7044-09]

Coffee Break . . . . . 3:00 to 3:30 pm

SESSION 4

Room: Conv. Ctr. 6F . . . . . Wed. 3:30 to 4:20 pm

Solar Hydrogen Catalysts IV: Chemical Vapor Deposition

Session Chair: **Craig A. Grimes,** The Pennsylvania State Univ.

3:30 pm: **Semiconductor metal oxide nanowires: growth, applications and devices** *(Invited Paper)*, Sanjay Mathur, Institut für Neue Materialien GmbH (Germany) and Julius-Maximilians-Univ. (Germany) . . . . . [7044-10]

4:00 pm: **Development of a corrosion-resistant amorphous silicon carbide photoelectrode for solar-to-hydrogen photovoltaic/photoelectrochemical devices,** Ilvydas Matulionis, MVSystems, Inc.; Bjorn Marsen, Univ. of Hawai'i at Manoa; Feng Zhu, MVSystems, Inc. and Colorado School of Mines; Jian Hu, MVSystems, Inc.; Josh Gallon, MVSystems, Inc. and Colorado School of Mines; Augusto Kunrath, MVSystems, Inc.; Eric L. Miller, Univ. of Hawai'i at Manoa; Arun Madan, MVSystems, Inc. and Colorado School of Mines . . . . . [7044-11]

SESSION 5

Room: Conv. Ctr. 6F . . . . . Wed. 4:20 to 5:20 pm

Modeling Surfaces, Charge, Defect, and Transport Phenomena

Session Chair: **Jin Z. Zhang,** Univ. of California/Santa Cruz

4:20 pm: **Metal oxide surfaces in depth** *(Invited Paper)*, Kersti Hermansson, Uppsala Univ. (Sweden) . . . . . [7044-12]

4:50 pm: **Dynamics on the nanoscale: time-domain ab initio studies of quantum dots and carbon nanotubes** *(Invited Paper)*, Oleg V. Prezhdo, Univ. of Washington . . . . . [7044-13]

Thursday 14 August

SESSION 6

Room: Conv. Ctr. 6F . . . . . Thurs. 8:40 to 10:00 am

Solar Hydrogen Catalysts V: Physical Vapor Deposition and Ion Implantation

Session Chair: **Sanjay Mathur,** Institut für Neue Materialien GmbH (Germany)

8:40 am: **Towards the efficient solar generation of hydrogen by water photoelectrolysis: self-biased p-type Cu-Ti-O | n-type TiO_2 nanotube array photoelectrochemical diode membranes** *(Invited Paper)*, Craig A. Grimes, The Pennsylvania State Univ. . . . . [7044-14]

9:10 am: **New benchmark to improve the photoelectrochemical properties of hematite**, Aadesh P. Singh, Dayalbagh Educational Institute (India); Ambuj Tripathi, Inter Univ. Accelerator Ctr. (India); Rohit Shrivastav, Sahab Dass, Vibha R. Satsangi, Dayalbagh Educational Institute (India) . . . . . [7044-16]

9:30 am: **TiO_2 nanomaterials: the state of the art** *(Invited Paper)*, Xianglei S. Mao, Xiaobo Chen, Univ. of California/Berkeley and Lawrence Berkeley National Lab. . . . . [7044-17]

Coffee Break . . . . . 10:00 to 10:30 am

SESSION 7

Room: Conv. Ctr. 6F . . . . . Thurs. 10:30 to 11:40 am

Complex Photocatalysts: Z-scheme and NP Sensitation Approaches

Session Chair: **Hironori Arakawa,** Tokyo Univ. of Science (Japan)

10:30 am: **Overall water splitting on (oxy)nitride photocatalysts** *(Invited Paper)*, Kazunari Domen, The Univ. of Tokyo (Japan). . . . . [7044-18]

11:00 am: **Nanoparticle-assembled catalysts for solar hydrogen generation from water**, Frank E. Osterloh, Univ. of California/Davis [7044-19]

11:20 am: **Electrochemically-wired semiconductor nanoparticles: toward vectoral electron transport in hybrid materials**, Neal R. Armstrong, R. Clayton Shallcross, Jeffry Pyun, The Univ. of Arizona . . . . . [7044-20]

Lunch/Exhibition Break . . . . . 11:40 to 2:00 pm

SESSION 8

Room: Conv. Ctr. 6F . . . . . Thurs. 2:00 to 3:00 pm

Detailed Analysis of Surface Reactions and Electronic Structure

Session Chair: **Xianglei S. Mao,** Lawrence Berkeley National Lab.

2:00 pm: **Hydrogen adsorption on the surface of HOPG and SWNTs studied by soft-x-ray spectroscopy** *(Invited Paper)*, Jinghua Guo, Per-Anders Glans, Lawrence Berkeley National Lab. . . . . [7044-22]

2:30 pm: **High-resolution scanning tunneling microscopy studies of surface reactions on rutile TiO_2(110)** *(Invited Paper)*, Flemming Besenbacher, Århus Univ. (Denmark). . . . . [7044-23]

Coffee Break . . . . . 3:00 to 3:30 pm

SESSION 9

Room: Conv. Ctr. 6F . . . . . Thurs. 3:30 to 5:20 pm

Solar Hydrogen by Thermal and Chemical Approaches

Session Chair: **Kazunari Domen,** The Univ. of Tokyo (Japan)

3:30 pm: **A novel nanostructured semiconductor photocatalyst for solar hydrogen production** *(Invited Paper)*, Jin-Ook Baeg, Korea Research Institute of Chemical Technology (South Korea). . . . . [7044-24]

4:00 pm: **Promotion of hydrogen production by resonant excitation of vibrational levels using spectrally controlled thermal radiation**, Yuriko Maegami, Takashi Sasaki, Tadafumi Iguchi, Hiroo Yugami, Tohoku Univ. (Japan). . . . . [7044-25]

4:20 pm: **Hydrogen production from methane and carbon dioxide using solar energy**, Yongquan Qu, Alexander M. Sutherland, Ting Guo, Univ. of California/Davis . . . . . [7044-26]

4:40 pm: **Metal in ceramic nano-inclusion materials for thermally assisted photo-catalysis and methane decomposition**, Annika Pohl, Gunnar Westin, Uppsala Univ. (Sweden); Kjell Jansson, Stockholm Univ. (Sweden); Åsa Ekstrand, Uppsala Univ. (Sweden) . . . . . [7044-27]

5:00 pm: **Hydrogen energy cycle system based on magnesium and solar pumped laser**, Shigeaki Uchida, Takashi Yabe, Tokyo Institute of Technology (Japan). . . . . [7044-28]

Conference 7045

Sunday-Monday 10-11 August 2008 • Proceedings of SPIE Vol. 7045

Photovoltaic Cell and Module Technologies II

Conference Chairs: **Bolko von Roedern,** National Renewable Energy Lab.; **Alan E. Delahoy,** EPV Solar, Inc.

Program Committee: **Robert W. Collins, Jr.,** Univ. of Toledo; **Ravi Durvasula,** Lightfleet Corp.; **Alan L. Fahrenbruch,** Stanford Univ.; **Sheyu Guo,** EPV Solar, Inc.; **Martha Ch. Lux-Steiner,** Hahn-Meitner-Institut Berlin GmbH (Germany); **James R. Sites,** Colorado State Univ.; **Bhushan L. Sopori,** National Renewable Energy Lab.

Sunday 10 August

SESSION 1

Room: Conv. Ctr. 8 . . . . . .Sun. 9:20 to 10:00 am

Special Solar Cells, Modules, Materials I

Session Chair: **Raik Hesse,** Hahn-Meitner-Institut Berlin GmbH (Germany)

9:20 am: **Laser machining of thin-film solar cells with ultrashort-pulse lasers**, Tino Petsch, Jens Haenel, Bernd Keiper, 3D-Micromac AG Corp. (Germany) . . . . . [7045-01]

9:40 am: **Enhanced energy production from a cool PV module**, Mark Buchanan, Gaute M. Aas, Norsk Solkraft AS (Norway). . . . . [7045-03]

Coffee Break . . . . . 10:00 to 10:30 am

SESSION 2

Room: Conv. Ctr. 8 . . . . . .Sun. 10:30 to 11:40 am

Thin-Film Solar Cells

Session Chair: **Bolko von Roedern,** National Renewable Energy Lab.

10:30 am: **Long-term performance data and analysis of CIS/CIGS modules deployed outdoors** *(Invited Paper)*, Joseph A. del Cueto, Steve Rummel, Benjamin Kroposki, Carl Osterwald, Allan Anderberg, National Renewable Energy Lab. . . . . [7045-04]

11:00 am: **In situ monitoring of rapid thermal processes (RTP) of Cu(In,Ga)(S,Se)$_2$ by optical methods**, Raik Hesse, Humberto Rodriguez Alvarez, Cornelia Streeck, Immo Koetschau, Daniel Abou-Ras, Thomas Unold, Hans-Werner Schock, Hahn-Meitner-Institut Berlin GmbH (Germany) . . . . [7045-05]

11:20 am: **Influence of TCO type on the performance of amorphous silicon solar cells**, Alan E. Delahoy, Alexander P. Stavrides II, Anamika M. Patel, Loan T. Le, John A. Cambridge, Yue Xu, Sheyu Guo, EPV Solar, Inc. . . . . [7045-06]

Lunch Break . . . . . 11:40 am to 1:30 pm

SESSION 3

Room: Conv. Ctr. 8 . . . . . Sun. 1:30 to 3:00 pm

Special Solar Cells, Modules, Materials II

Session Chair: **Alan E. Delahoy,** EPV Solar, Inc.

1:30 pm: **Advances in tin-based transparent conductive oxides for thin-film photovoltaic applications** *(Invited Paper)*, Christopher R. Cording, AGC Flat Glass North America . . . . . [7045-07]

2:00 pm: **Antireflective trilayer films fabricated using a filtered cathodic vacuum arc**, Nemo Bilu_ Abaffy, James Partridge, Ju Peng, Dougal McCulloch, Royal Melbourne Institute of Technology (Australia) . . . . [7045-08]

2:20 pm: **Design of antireflection coating for spherical silicon photovoltaic devices**, Majid Gharghi, Siva Sivoththaman, Univ. of Waterloo (Canada) . . . . . [7045-09]

2:40 pm: **Evaporated erbium oxide as an antireflective layer for c-Si solar cells,** Hossein Alizadeh, Barzin Bahardoust, Adel B. Gougam, Nazir P. Kherani, Stefan Zukotynski, Univ. of Toronto (Canada) . . . . . [7045-10]

Room: Conv. Ctr. 6A . . . . . Sun. 6:00 to 6:45 pm

All-Conference Plenary Session

View plenary presentation details p. 13.

6:00 pm: **The Solar Decathlon: building a better future with solar energy**, Richard J. King, U.S. Dept. of Energy

Monday 11 August

Room: Conv. Ctr. 6A . . . . . .Mon. 1:30 to 4:30 pm

Solar Energy Plenary Session

Session Chair: **Ravi Durvasula,** Lightfleet Corp.

View plenary presentation details p. 15-16.

1:30 pm: **Nanostructures for High Efficiency Photovoltaics**, Harry A. Atwater, California Institute of Technology . . . . . [7047-102]

2:00 pm: **The Environment's Effects on Solar Radiation** *(Presentation Only)*, Joseph J. Michalsky, Jr., NOAA Earth System Research Lab. . . . . [7046-103]

2:30 pm: **Direct Conversion of Solar Energy to Hydrogen**, Craig A. Grimes, The Pennsylvania State Univ. . . . . [7044-105]

Coffee Break . . . . . 3:00 to 3:30 pm

3:30 pm: **Reliability of PV Systems**, John H. Wohlgemuth, BP Solar International LLC . . . . . [7048-101]

4:00 pm: **Commercializing CPV: What Lies Ahead?,** Dave Holland, Solar Systems Pty Ltd. (Australia) . . . . . [7043-104]

Posters-Monday

Room: Conv. Ctr. Exhibit Hall B2 . . . . . Mon. 6:00 to 7:30 pm

Poster authors will begin displaying posters after 10:00 am Monday morning. A poster session, with authors present at their posters, will be held Monday evening from 6:00 to 7:30 pm. Light refreshments will be served.

Poster Setup

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Atmospheric plasma activation of silicon surfaces, Sara B. Habib, Joanna Kolodziejska, Robyn Woo, Robert Hicks, Univ. of California/Los Angeles . . . . . [7045-11]

Development of amorphous silicon-based thin-film solar cells with low-temperature coefficient, Kobsak Sriprapha, Sorapong Inthisang, Shinsuke Miyajima, Akira Yamada, Tokyo Institute of Technology (Japan); Porponth Sichnanugrist, National Science and Technology Development Agency (Thailand); Makoto Konagai, Tokyo Institute of Technology (Japan) . [7045-12]

Characteristics of organic solar cells with various cathodes and n-type organic semiconductors, Wei-Yang Chou, Jay Chang, Hong-Long Cheng, National Cheng Kung Univ. (Taiwan); Shyh-Jiun Liu, National Univ. of Tainan (Taiwan); Szu-Yu Lin, Fu-Ching Tang, National Cheng Kung Univ. (Taiwan); Yu-Jen Wang, Industrial Technology Research Institute (Taiwan) . . . [7045-13]

Courses of Related Interest

See SPIE Cashier for information and to register.

SC797 The Science and Technology of Organic Solar Cells (Peumans) Tuesday, 8:30 am to 12:30 pm

NEW! SC910 Design and Reliability of Photovoltaic Modules (Dhere, Wohlgemuth) Wednesday, 1:30 to 5:30 pm

Conference 7046

Wednesday-Thursday 13-14 August 2008 • Proceedings of SPIE Vol. 7046

Optical Modeling and Measurements for Solar Energy Systems II

Conference Chair: **Benjamin K. Tsai,** National Institute of Standards and Technology

Program Committee: **Jorge Gonzalez,** Santa Clara Univ.; **Christian A. Gueymard,** Solar Consulting Services; **Daryl R. Myers,** National Renewable Energy Lab.; **Govindasamy TamizhMani,** Arizona State Univ.; **Frank E. Vignola,** Univ. of Oregon

Monday 11 August

Room: Conv. Ctr. 6A . . . . . Mon. 1:30 to 4:30 pm

Solar Energy Plenary Session

Session Chair: **Ravi Durvasula,** Lightfleet Corp.

View plenary presentation details p. 15-16.

1:30 pm: **Nanostructures for High Efficiency Photovoltaics**, Harry A. Atwater, California Institute of Technology . . . . . [7047-102]

2:00 pm: **The Environment's Effects on Solar Radiation** *(Presentation Only)*, Joseph J. Michalsky, Jr., NOAA Earth System Research Lab. . . . . [7046-103]

2:30 pm: **Direct Conversion of Solar Energy to Hydrogen**, Craig A. Grimes, The Pennsylvania State Univ. . . . . [7044-105]

Coffee Break . . . . . 3:00 to 3:30 pm

3:30 pm: **Reliability of PV Systems**, John H. Wohlgemuth, BP Solar International LLC . . . . . [7048-101]

4:00 pm: **Commercializing CPV: What Lies Ahead?,** Dave Holland, Solar Systems Pty Ltd. (Australia) . . . . . [7043-104]

Wednesday 13 August

Posters-Wednesday

Room: Conv. Ctr. Exhibit Hall B2 . . . . . Wed. 5:30 to 7:00 pm

Poster authors will begin displaying posters after 10:00 am Wednesday morning. A poster session, with authors present at their posters, will be held Wednesday evening from 5:30 to 7:00 pm. Light refreshments will be served.

Poster Setup

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Pulse analysis spectroradiometer system for measuring the spectral distribution of flash solar simulators, Afshin M. Andreas, Daryl R. Myers, National Renewable Energy Lab. . . . . [7046-20]

Shape and alignment measurement of the heliostat by laser deflectometry, Wenbin Xu, Zhenwu Lu, Hua Liu, Hongxin Zhang, Changchun Institute of Optics, Fine Mechanics and Physics (China) . . . . . [7046-21]

Distributed simulation of diffuse solar radiation over complex terrains based on DEM, Shujie Yuan, Agricultural Univ. of Hebei (China); Shanshan Zhong, Yongqing Wang, Nanjing Univ. of Information Science & Technology (China); Xiaoping Gu, Guizhou Institute of Mountainous Environment and Climate (China); Xinfa Qiu, Nanjing Univ. of Information Science & Technology (China) . . . . . [7046-22]

Celestial simulation for the ground solar energy facilities optimizations, Chung-Jen Ou, Hsuiping Institute of Technology (Taiwan). . . . . [7046-23]

Indoor characterization of photovoltaic modules under various conditions, Marcus A. Zettl, Omar Stern, GE Global Research (Germany) . . . . . [7046-24]

Thursday 14 August

SESSION 1

Room: Conv. Ctr. 8 . . . . . Thurs. 8:30 to 10:30 am

Cells and Systems Modeling and Measurement I

Session Chair: **Frank E. Vignola,** Univ. of Oregon

8:30 am: **Prediction of solar global radiation on a surface tilted to the south**, Avraham I. Kudish, Efim G. Evseev, Ben-Gurion Univ. of the Negev (Israel) . . . . . [7046-18]

8:50 am: **Spectral optimization of CPV for integrated energy output**, Mark E. McDonald, Chris Barnes, SolFocus, Inc. . . . . [7046-01]

9:10 am: **High-throughput photovoltaic cell characterization system**, Vladimir Kochergin, Kelly Dobson, Zhong Shi, Luna Innovations Inc. [7046-02]

9:30 am: **Comparative performance prediction of two low-concentration line-axis photovoltaic systems**, Tapas K. Mallick, Heriot-Watt Univ. (United Kingdom); Philip C. Eames, Univ. of Warwick (United Kingdom) . . . . [7046-04]

9:50 am: **Optical modeling of nanostructured films for selective coatings**, Pietro P. Altermatt, Leibniz Univ. Hannover (Germany); Jun Wang, Yang Yang, Rolf Reineke-Koch, Rolf Brendel, The Institut für Solarenergieforschung Hameln (Germany) . . . . . [7046-05]

10:10 am: **Microstructured antireflection surface design for the omnidirectional solar cells**, Li Chen, Hongjun Yang, Meng Tao, Weidong Zhou, The Univ. of Texas at Arlington . . . . . [7046-03]

Coffee Break . . . . . 10:30 to 11:00 am

SESSION 2

Room: Conv. Ctr. 8 . . . . . Thurs. 11:00 am to 12:00 pm

Cells and Systems Modeling and Measurement II

Session Chair: **Frank E. Vignola,** Univ. of Oregon

11:00 am: **Monte Carlo simulations of quantum dot solar concentrators: ray tracing based on fluorescence mapping**, Andreas M. Schuler, André Kostro, Benjamin Huriet, Ecole Polytechnique Fédérale de Lausanne (Switzerland); Charudatta Galande, Tata Institute of Fundamental Research (India); Jean-Louis Scartezzini, Ecole Polytechnique Fédérale de Lausanne (Switzerland) . . . . . [7046-06]

11:20 am: **Synthesis and optical characterization of C-SiO_2 and C-NiO sol-gel composite films for use as selective solar absorbers**, Gibion Makiwa, Univ. of Zimbabwe (Zimbabwe); Gift Katumba, Council for Scientific and Industrial Research (South Africa); Louis Olumekor, Univ. of Zimbabwe (Zimbabwe) . . . . . [7046-07]

11:40 am: **Quantifying the efficacy of solar selective absorber materials: the case of carbon nanoparticles dispersed in SiO_2, ZnO and NiO matrices**, Gift Katumba, Council for Scientific and Industrial Research (South Africa); Louis Olumekor, Univ. of Zimbabwe (Zimbabwe); Andrew Forbes, Council for Scientific and Industrial Research (South Africa); Gibion Makiwa, Univ. of Zimbabwe (Zimbabwe). . . . . [7046-08]

Lunch/Exhibition Break . . . . . 12:00 to 1:30 pm

SESSION 3

Room: Conv. Ctr. 8 . . . . . Thurs. 1:30 to 2:30 pm

Solar Resources Modeling and Measurement I

Session Chair: **Christian A. Gueymard,** Solar Consulting Services

1:30 pm: **Modeling energy production for low concentrating PV modules**, Ben Chang, SV Solar, Inc.. . . . . [7046-10]

1:50 pm: **Fixed or tracking flat-plate solar collectors: helping the decision process with the solar resource enhancement factor**, Christian A. Gueymard, Solar Consulting Services . . . . . [7046-11]

2:10 pm: **Modeling IR loss from Eppley PSP pyranometers**, Frank E. Vignola, Univ. of Oregon; Ibrahim Reda, National Renewable Energy Lab.; Charles Long, Pacific Northwest National Lab. . . . . [7046-14]

SESSION 4

Room: Conv. Ctr. 8 . . . . . Thurs. 2:30 to 3:30 pm

Solar Resources Modeling and Measurement II

Session Chair: **Christian A. Gueymard,** Solar Consulting Services

2:30 pm: **Corrections for rotating shadowband pyranometers for solar resource assessment**, Norbert Geuder, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany); Benedikt Pulvermueller, Solar Millennium AG (Germany); Oliver Vorbrugg, FLAGSOL GmbH (Germany) . . . . . [7046-15]

2:50 pm: **Simulation of direct solar radiation over rugged terrains in ChongQing based on DEM**, Lan Shi, Qilong Miao, Xinfa Qiu, Nanjing Univ. of Information Science & Technology (China) . . . . . [7046-17]

3:10 pm: **Study of atmospheric turbidity indices for a subtropical African station**, Mathias Bashahu, Univ. of Burundi (Burundi) . . . . . [7046-19]

Courses of Related Interest

See SPIE Cashier for information and to register.

SC011 Design of Efficient Illumination Systems (Cassarly) Monday, 1:30 to 5:30 pm

SC388 Non-Imaging Optics (Winston) Monday, 8:30 am to 12:30 pm

Nanoscale Photonic and Cell Technologies for Photovoltaics

Conference Chair: **Loucas Tsakalakos,** GE Global Research

Program Committee: **Eray S. Aydil,** Univ. of Minnesota; **Keith Barnham,** Imperial College London (United Kingdom); **Naomi J. Halas,** Rice Univ.; **Alberto Salleo,** Stanford Univ.; **Joop Schoonman,** Technische Univ. Delft (Netherlands); **Raj Solanki,** Portland State Univ.; **Wilfried G. J. H. M. van Sark,** Univ. Utrecht (Netherlands); **Xianfan Xu,** Purdue Univ.

Monday 11 August

Room: Conv. Ctr. 6A . . . . . Mon. 1:30 to 4:30 pm

Solar Energy Plenary Session

Session Chair: **Ravi Durvasula,** Lightfleet Corp.

View plenary presentation details p. 15-16.

1:30 pm: **Nanostructures for High Efficiency Photovoltaics**, Harry A. Atwater, California Institute of Technology . . . . . [7047-102]

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Coffee Break . . . . . 3:00 to 3:30 pm

3:30 pm: **Reliability of PV Systems**, John H. Wohlgemuth, BP Solar International LLC . . . . . [7048-101]

4:00 pm: **Commercializing CPV: What Lies Ahead?,** Dave Holland, Solar Systems Pty Ltd. (Australia) . . . . . [7043-104]

Wednesday 13 August

SESSION 1

Room: Conv. Ctr. 8 . . . . . Wed. 8:00 to 10:00 am

Nanophotonic Structures for Photovoltaics

Session Chair: **Loucas Tsakalakos,** GE Global Research

8:00 am: **Quantum-well and plasmonic nanostructures for high-efficiency photovoltaics** *(Invited Paper)*, Edward T. Yu, Daniel Derkacs, Winnie V. Chen, Paul K. L.Yu, Univ. of California/San Diego . . . . . [7047-01]

8:25 am: **Nanophotonic approaches to low-cost and high-efficiency photovoltaics** *(Invited Paper)*, Peter Peumans, Stanford Univ. . . . . [7047-02]

8:50 am: **Doped ZnO nanowires for solution-processable transparent electrodes** *(Invited Paper)*, Alberto Salleo, Ludwig J. Goris, Rodrigo J. Noriega-Manez, Matthew M. Donovan, Stanford Univ.; Greg J. Kusinski, Clemson Univ. . . . . [7047-03]

9:15 am: **Embossing of light trapping patterns in sol-gel coatings for thin film silicon solar cells**, Maurits Heijna, Jochen Loffler, Bas Van Aken, Wim Soppe, ECN Solar Energy (Netherlands); Rob van Erven, Ronald Franken, Herman Borg, Patrick Peeters, OM&T B.V. (Netherlands) . . . . . [7047-04]

9:30 am: **Optimization of plasmon-enhanced thin film Si solar cells**, Ragip Pala, Justin S. White, Edward S. Barnard, Mark L. Brongersma, Stanford Univ. . . . . [7047-05]

9:45 am: **Surface plasmon enhanced photocurrent in thin GaAs solar cells**, Keisuke Nakayama, California Institute of Technology and Nippon Oil Corp. (Japan); Katsuaki Tanabe, Harry A. Atwater, Jr., California Institute of Technology . . . . . [7047-06]

Coffee Break . . . . . 10:00 to 10:45 am

SESSION 2

Room: Conv. Ctr. 8 . . . . . Wed. 10:45 to 11:55 am

Nanostructured Inorganic Solar Cells

Session Chair: **Eray S. Aydil,** Univ. of Minnesota

10:45 am: **Silicon nanowire solar cells** *(Invited Paper)*, Loucas Tsakalakos, Joleyn E. Balch, Jody Fronheiser, Bastiaan A. Korevaar, GE Global Research; Oleg Sulima, James A. Rand, GE Solar . . . . . [7047-07]

11:10 am: **Nano-antenna enhanced high efficient solar cell and high gain photovoltaic transistors based on AlGaAsSb/InGaAsSb**, Chunchen Lin, Nikolai Faleev, Dennis W. Prather, Univ. of Delaware. . . . . [7047-08]

11:25 am: **Computational design of the intermediate-band solar cells based on the quantum dot superlattices**, Qinghui Shao, Alexander A. Balandin, Univ. of California/Riverside; Alexandre I. Fedoseyev, Marek Turowski, CFD Research Corp.. . . . . [7047-09]

11:40 am: **Si nanowire photovoltaics and single-wire characterization**, Michael D. Kelzenberg, Michael A. Filler, Brendan M. Kayes, Morgan C. Putnam, Katherine E. Plass, Nathan S. Lewis, Harry A. Atwater, California Institute of Technology . . . . . [7047-10]

Lunch/Exhibition Break . . . . . 11:55 am to 1:30 pm

SESSION 3

Room: Conv. Ctr. 8 . . . . . Wed. 1:30 to 3:20 pm

Nanostructured Organic Solar Cells I

Session Chair: **Alberto Salleo,** Stanford Univ.

1:30 pm: **Ultrafast diagnostics of energy transfer in photovoltaic materials** *(Invited Paper)*, Xianfan Xu, Purdue Univ. . . . . [7047-11]

1:55 pm: **A nanoparticle ink printing process for thin film copper-indium-disellenide solar cells**, X. Charles Li, Renewable Energy Solutions, Inc.. . . . . [7047-12]

2:10 pm: **Transfer of aligned single-crystal silicon nanowires to transparent substrates**, Shu-Chia Shiu, Chieh-Yu Hsiao, Cha-Hsin Chao, Shih-Che Hung, Ching-Fuh Lin, National Taiwan Univ. (Taiwan) . . . . [7047-13]

2:25 pm: **Dye sensitized solar cells with TiO_2 nanowires** *(Invited Paper)*, Eray S. Aydil, Janice E. Boercker, Emil Enache-Pommer, Univ. of Minnesota . . . . . [7047-14]

2:50 pm: **Correlating charge transport and morphology of polythiophenes in organic bulk heterojunction photovoltaic cells**, Brian E. Hardin, Alex C. Mayer, Stanford Univ.; Michael F. Toney, Stanford Synchrotron Radiation Lab.; Jack Parmer, Michael D. McGehee, Stanford Univ. . . . . [7047-15]

3:05 pm: **A soft lithography route to nanopatterned photovoltaic devices**, Stuart Williams, Meredith J. Hampton, The Univ. of North Carolina at Chapel Hill; Vignesh Gowrishankar, I-Kang Ding, Michael McGehee, Stanford Univ.; Joseph L. Templeton, Joseph M. DeSimone, Edward T. Samulski, The Univ. of North Carolina at Chapel Hill. . . . . [7047-16]

Coffee Break . . . . . 3:20 to 3:50 pm

SESSION 4

Room: Conv. Ctr. 8 . . . . . Wed. 3:50 to 5:45 pm

Nanostructured Organic Solar Cells II

Session Chair: **Xianfan Xu,** Purdue Univ.

3:50 pm: **Photovoltaic devices created from electrodeposited, "nanotextured" poly(thiophene) films, semiconductor nanoparticles and/or vacuum-deposited fullerenes**, Neal R. Armstrong, Erin L. Ratcliff, Judy L. Jenkins, Jeffry L. Head, Clayton Shallcross, The Univ. of Arizona . . . [7047-17]

4:05 pm: **High-efficiency large area flexible organic solar cells**, Noëlla Lemaître, Rémi De Bettignies, Séverine Bailly, Pascal Maisse, Stéphane Cros, Stéphane Guillerez, Commissariat à l'Energie Atomique (France) . . . [7047-18]

4:20 pm: **Nanowire photovoltaic cells** *(Invited Paper)*, Gary Goncher, Raj Solanki, Portland State Univ.. . . . . [7047-19]

4:45 pm: **TiO_2 nanotube-array based double heterojunction polymeric solar cells**, Craig A. Grimes, Oomman K. Varghese, Gopal K. Mor, Karthik Shankar, Maggie Paulose, The Pennsylvania State Univ.. . . . . [7047-20]

5:00 pm: **Nanometer scale TiO_2 interface modifying layers in P3HT/ZnO donor-acceptor bilayer devices**, Matthew S. White, Joseph Berry, Nikos Kopidakis, Dana Olson, National Renewable Energy Lab.; Julia Hsu, Sandia National Labs.; David Ginley, National Renewable Energy Lab.. . . . . [7047-21]

5:15 pm: **Tandem inorganic/organic hybrid solar cell using PbSe nanocrystal photoconductor for carrier multiplication**, Sung Jin Kim, Won Jin Kim, Alexander N. Cartwright, Paras N. Prasad, Univ. at Buffalo . [7047-22]

5:30 pm: **Study on the electric properties of photovoltaic devices in nanoscale using atomic force microscopy,** Yu Ching Huang, Yun Yue Lin, Chun-Wei Chen, Wei-Fang Su, National Taiwan Univ. (Taiwan). . . . . [7047-23]

Posters-Wednesday

Room: Conv. Ctr. Exhibit Hall B2 . . . . . Wed. 5:30 to 7:00 pm

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Theoretical investigation of a p-n_1-n_2 quantum dot solar cell, Partha Goswami, Univ. of Delhi (India) . . . . . [7047-24]

Observation of near-field thermal radiation from surface gratings for micro-gap thermophotovoltaic, Hiroo Yugami, Kensuke Takahashi, Kengo Watanabe, Tohoku Univ. (Japan) . . . . . [7047-25]

Characterizing enhanced performance of nanopatterned bulk heterojunction organic photovoltaics, John Tumbleston, Doo-Hyun Ko, René Lopez, Edward T. Samulski, The Univ. of North Carolina at Chapel Hill . . . . . [7047-26]

The patterning of sub-500-nm inorganic oxide and semiconducting polymeric structures, Meredith J. Hampton, Stuart Williams, The Univ. of North Carolina at Chapel Hill; Zhilian Zhou, Liquidia Technologies, Inc.; Janine Nunes, Doo-Hyun Ko, Joseph L. Templeton, Joseph M. DeSimone, Edward T. Samulski, The Univ. of North Carolina at Chapel Hill . . . . . [7047-27]

Organic photovoltaic devices based on near-IR absorbing titanyl phthalocyanines and Au-nanoparticle-modified and related ITO substrates, Neal R. Armstrong, Diogenes Placencia, Michael Brumbach, Peter A. Veneman, The Univ. of Arizona. . . . . [7047-28]

Mn-doped ZnS quantum-dots for down-conversion solar cell applications, Dong-Kyun Seo, Elizabeth Steenbergen, Arizona State Univ.; Alan R. Kost, College of Optical Sciences/The Univ. of Arizona; Yong-Hang Zhang, Arizona State Univ.. . . . . [7047-29]

Investigation of structural and optical properties of CdSe quantum dots in glass matrices for photovoltaic application, Bahareh Sadeghimakki, Siva Sivoththaman, Univ. of Waterloo (Canada) . . . . . [7047-30]

Courses of Related Interest

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SC797 The Science and Technology of Organic Solar Cells (Peumans) Tuesday, 8:30 am to 12:30 pm

NEW! SC910 Design and Reliability of Photovoltaic Modules (Dhere, Wohlgemuth) Wednesday, 1:30 to 5:30 pm

Conference 7048

Monday-Wednesday 11-13 August 2008 • Proceedings of SPIE Vol. 7048

Reliability of Photovoltaic Cells, Modules, Components, and Systems

Conference Chair: **Neelkanth G. Dhere,** Florida Solar Energy Ctr./Univ. of Central Florida

Conference Co-Chairs: **John H. Wohlgemuth,** BP Solar International LLC; **Scott Stephens,** U.S. Dept. of Energy

Program Committee: **David Albin,** National Renewable Energy Lab.; **John Crisman,** EMCORE Corp.; **Michael DeBergalis,** DuPont Co.; **Alan E. Delahoy,** EPV Solar, Inc.; **Steve Hogan,** Spire Corp.; **Ralf Leutz,** Concentrator Optics (Germany) and Univ. Marburg (Germany); **Xavier Mathew,** Univ. Nacional Autónoma de México (Mexico); **Robert McConnell,** Amonix; **John Pern,** National Renewable Energy Lab.; **Kevin Shreve,** Blue Square Energy

Monday 11 August

SESSION 1

Room: Conv. Ctr. 8 . . . . . Mon. 8:30 to 10:28 am

Metrology and Certification

Session Chair: **David S. Albin,** National Renewable Energy Lab.

8:30 am: **PV reliability determination from I-V measurement and analysis** *(Invited Paper)*, Keith Emery, Tom Moriarty, James Kiehl, Steve Rummel, National Renewable Energy Lab. . . . . [7048-01]

8:55 am: **Integrated quantum efficiency, reflectance, topography, and stress metrology for solar cell manufacturing**, Wojtek J. Walecki, Fanny Szondy, Sunrise Optical LLC . . . . . [7048-02]

9:12 am: **PV module test/certification and some issues related to quality assurance** *(Invited Paper)*, Liang Ji, Underwriters Labs. Inc. . . . . [7048-03]

9:37 am: **Indoor and outdoor weathering of PV-modules**, Michael Köhl, Fraunhofer-Institut für Solare Energiesysteme (Germany); Claudio Ferrara, Werner Herrmann, TÜV Rheinland Group (Germany); Daniel Philipp, Karl-Anders Weiss, Fraunhofer-Institut für Solare Energiesysteme (Germany) . . . . . [7048-04]

9:54 am: **Advantages in using LEDs as the main light source in solar simulators for measuring PV device characteristics**, Martin Bliss, Thomas R. Betts, Ralph Gottschalg, Loughborough Univ. (United Kingdom) . . . [7048-05]

10:11 am: **LED reliability test driven by PWM technique**, Bin-Juine Huang, Min-Sheng Wu, Chun-Wen Tang, Chun-Wei Chen, National Taiwan Univ. (Taiwan) . . . . . [7048-06]

Coffee Break . . . . . 10:28 to 10:58 am

SESSION 2

Room: Conv. Ctr. 8 . . . . . Mon. 10:58 am to 12:05 pm

Reliability of Concentrator Optics and PV Cells

Session Chair: **Robert McConnell,** National Renewable Energy Lab.

10:58 am: **Optical tests for reliability and efficiency of photovoltaic concentrators** *(Invited Paper)*, Ralf Leutz, Ling Fu, Hans Philipp Annen, Concentrator Optics GmbH (Germany). . . . . [7048-07]

11:23 am: **Qualification and reliability of high-efficiency multijunction concentrator solar cells for terrestrial applications** *(Invited Paper)*, Peter Hebert, Spectrolab, Inc. . . . . [7048-09]

Discussion . . . . . 11:48 am to 12:05 pm

Lunch Break . . . . . 12:05 to 1:30 pm

Room: Conv. Ctr. 6A . . . . . Mon. 1:30 to 4:30 pm

Solar Energy Plenary Session

Session Chair: **Ravi Durvasula,** Lightfleet Corp.

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Photovoltaic performance models: an evaluation with actual field data, Govindasamy Tamizh-Mani, John-Paul Ishioye, Arseniy Voropayev, Yi Kang, Arizona State Univ. . . . . [7048-34]

Outdoor monitoring of a-Si:H thin film photovoltaic modules in hot and humid climate of Florida, Ashwani Kaul, Shirish A. Pethe, Neelkanth G. Dhere, Univ. of Central Florida . . . . . [7048-35]

Design and construction evaluation of a PV DC LED lighting system, Jyotsna Bhamidipati, The Pennsylvania State Univ. . . . . [7048-36]

Tuesday 12 August

SESSION 3

Room: Conv. Ctr. 8 . . . . . .Tues. 8:00 to 10:07 am

Encapsulants, Back Sheet

Session Chair: **Steve Hogan**, Spire Corp.

8:00 am: **Accelerated test for effect of moisture and temperature on glass-encapsulant interface** *(Invited Paper)*, Shaofu Wu, Josh Chen, Bert Weaver, Bill Sumner, Victor Juarez, The Dow Chemical Co. . . . . [7048-12]

8:25 am: **Bio-based backsheets**, Stanley B. Levy, BioSolar, Inc.. . . [7048-13]

8:42 am: **Low-cost single-layer replacement for the back-sheet and encapsulant layers**, Michael D. Kempe, National Renewable Energy Lab.; Prem Thapa, BRP Manufacturing Co.. . . . . [7048-14]

8:59 am: **Degradation mechanisms of encapsulation polymers: new studies and investigation methods**, Karl-Anders Weiss, Philip Huelsmann, Michael Koehl, Daniel Philipp, Jochen Wirth, Fraunhofer-Institut für Solare Energiesysteme (Germany) . . . . . [7048-15]

9:16 am: **Observation of polymer degradation processes in photovoltaic modules via luminescence detection**, Beate Röder, Eugeny Ermilov, John Exner, Humboldt-Univ. zu Berlin (Germany); Karl-Anders Weiß, Michael Köhl, Fraunhofer-Institut für Solare Energiesysteme (Germany) . . . . . [7048-16]

9:33 am: **Characterization of encapsulant materials for photovoltaic solar energy conversion**, Kamel Agroui, Kuraray Specialities Europe GmbH (Germany) and B. Koll (Germany) . . . . . [7048-17]

9:50 am: **Property considerations for use of polymers as backsheets in PV modules** *(Presentation Only)*, Tom Blong, Mark Muggli, Peter Harrison, Dennis Hull, Maria Dillon, Jost Krichel, Dyneon LLC. . . . . [7048-37]

Coffee Break . . . . . 10:07 to 10:37 am

SESSION 4

Room: Conv. Ctr. 8 . . . . . .Tues. 10:37 am to 12:01 pm

c-Si PV, Glass

Session Chair: **John H. Wohlgemuth,** BP Solar International LLC

10:37 am: **Wafer breakage in the silicon photovoltaic industry** *(Invited Paper)*, Bhushan L. Sopori, Przemyslaw Rupnowski, National Renewable Energy Lab. . . . . [7048-20]

11:02 am: **Optimizing photovoltaic module glass reliability** *(Invited Paper)*, Christopher R. Cording, AGC Flat Glass North America. . . . . [7048-21]

11:27 am: **Hot spot evaluation of photovoltaic modules**, Govindasamy Tamizh-Mani, Samir Sharma, Arizona State Univ. . . . . [7048-22]

11:44 am: **Effect of flux on performance of crystalline silicon solar module**, He Wang, Hongcai Wu, Hong Yang, Xi'an Jiaotong Univ. (China) . . . [7048-23]

Lunch/Exhibition Break . . . . . 12:01 to 1:26 pm

SESSION 5

Room: Conv. Ctr. 8 . . . . . .Tues. 1:26 to 3:07 pm

Thin Film PV

Session Chair: **Chung-hei Yeung,** The Dow Chemical Co.

1:26 pm: **Design of high-reliability low-cost amorphous silicon modules** *(Invited Paper)*, Kai W. Jansen, EPV Solar, Inc. and Univ. of Central Florida; Anthony Varvar, Edward Twesme, Troy Berens, EPV Solar, Inc.; Neelkanth G. Dhere, Univ. of Central Florida . . . . . [7048-24]

1:51 pm: **Accelerated testing and diagnostic analysis of degradation in CdTe solar cells**, David S. Albin, National Renewable Energy Lab. . [7048-25]

2:08 pm: **Approaches to encapsulation of CIGS cells**, Larry C. Olsen, Mark E. Gross, Sambhu N. Kundu, Gordon L. Graff, Pacific Northwest National Lab. . . . . [7048-26]

2:25 pm: **Degradation of ZnO window layer for CIGS by damp-heat exposure** *(Invited Paper)*, John Pern, Rommel Noufi, National Renewable Energy Lab. . . . . [7048-27]

2:50 pm: **Characterization of photovoltaic modules based on thin-film solar cells in outdoor exposure**, Kamel Agroui, Unite de Developpement de la Technologie du Silicium (Algeria). . . . . [7048-28]

Coffee Break . . . . . 3:07 to 3:30 pm

SESSION 6

Room: Conv. Ctr. 8 . . . . . .Tues. 3:30 to 5:02 pm

Reliability of Flexible Packaging

Session Chair: **John Pern,** National Renewable Energy Lab.

Joint Session with Conference 7052: Organic Photovoltaics IX

3:30 pm: **Flexible packaging for PV modules** *(Invited Paper)*, Neelkanth G. Dhere, Univ. of Central Florida . . . . . [7048-29]

3:55 pm: **Lifetime testing methods for high-performance organic photovoltaics: toward a standardized method and commercialization considerations** *(Invited Paper)*, Darin Laird, Swanand S. Vaidya, Shijun Jia, Sergey B. Li, Jan Bernkopf, Plextronics Inc.. . . . . [7052-04]

4:20 pm: **Methodology and systems to ensure reliable thin-film PV modules** *(Invited Paper)*, Jon Call, Uday Varde, Mike Walters, Alla Konson, Subhendu Guha, United Solar Ovonic, LLC . . . . . [7048-30]

4:45 pm: **Statistical data analysis of thin film PV modules deployed in hot and humid climate of Florida**, Shirish A. Pethe, Ashwani Kaul, Neelkanth G. Dhere, Univ. of Central Florida . . . . . [7048-31]

Wednesday 13 August

SESSION 7

Room: Conv. Ctr. 6E . . . . . .Wed. 10:30 am to 12:11 pm

Reliability of Organic Photovoltaics

Session Chair: **Neelkanth G. Dhere,** Univ. of Central Florida

Joint Session with Conference 7052: Organic Photovoltaics IX

10:30 am: **Report from the OPV lifetime workshop: emerging roadmap** *(Invited Paper)*, David S. Ginley, National Renewable Energy Lab.. . . [7052-08]

10:55 am: **Getting ready for industrialization, stability, and cost assessments of dye solar cells** *(Invited Paper)*, Toby B. Meyer, David Martineau, Asef Azam, Andreas F. Meyer, Solaronix SA (Switzerland)[7052-09]

11:20 am: **Relationship between encapsulation barrier performance and organic solar cell lifetime**, Stéphane Cros, Stephane Guillerez, Rémi de Bettignies, Noëlla Lemaître, Severine Bailly, Pascal Maisse, Commissariat à l'Energie Atomique (France) . . . . . [7048-32]

11:37 am: **Thin film encapsulation of organic photovotaics with ALD and PECVD processing**, Namsu Kim, Georgia Institute of Technology; Seunghyup Yoo, Korea Advanced Institute of Science and Technology (South Korea); William Potscavage, Benoit Domercq, Bernard Kippelen, Samuel Graham, Georgia Institute of Technology . . . . . [7048-33]

11:54 am: **Influence of the metal/organic interface on device performance and stability**, Matthew O. Reese, Anthony J. Morfa, Matthew S. White, Nikos Kopidakis, National Renewable Energy Lab.; Sean E. Shaheen, Univ. of Denver; Garry Rumbles, David S. Ginley, National Renewable Energy Lab. . . . . [7052-10]

Courses of Related Interest

See SPIE Cashier for information and to register.

SC797 The Science and Technology of Organic Solar Cells (Peumans) Tuesday, 8:30 am to 12:30 pm

NEW! SC910 Design and Reliability of Photovoltaic Modules (Dhere, Wohlgemuth) Wednesday, 1:30 to 5:30 pm

Photonic Devices + Applications

Part of SPIE Optics+Photonics

Symposium Chair:

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Ruth Shinar, Iowa State Univ.
Franky So, Univ. of Florida
Ashok K. Sood, Magnolia Optical Technologies, Inc.
Shizhuo Yin, The Pennsylvania State Univ.

PHOTONICS

Sunday	Monday	Tuesday	Wednesday	Thursday

Photonic Devices

7049 **Linear and Nonlinear Optics of Organic Materials VIII** *(Jakubiak)*, p. 99

7050 **Liquid Crystals XII** *(Khoo)*, p. 102

7051 **Organic Light Emitting Materials and Devices XII** *(So)*, p. 104

7052 **Organic Photovoltaics IX** *(Kafafi)*, p. 108

7053 **Organic 3D Photonics Materials and Devices II** *(Orlic)*, p. 111

7054A **Organic Field-Effect Transistors VII** *(Bao/McCulloch)*, p. 112

7054B **Organic Semiconductors in Sensors and Bioelectronics** *(Shinar)*, p. 115

7055B **Infrared and Photoelectronic Imagers and Detector Devices III** *(Longshore/Sood)*, p. 117

7055A **Infrared Detectors and Focal Plane Arrays IX** *(Dereniak/Hartke/LeVan)*, p. 116

7056 **Photonic Fiber and Crystal Devices: Advances in Materials and Innovations in Device Applications II** *(Yin/Guo)*, p. 118

	EXHIBITION, p. 40-41	
10:00 am to 5:00 pm	10:00 am to 5:00 pm	10:00 am to 2:00 pm

Don't miss the Special Events, Plenaries Receptions, Technical Workshops, Courses, Poster Sessions—and more!

See Special Event Daily Schedule, p. 9.

58 Courses and Workshops

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Conference 7049

Tuesday-Thursday 12-14 August 2008 • Proceedings of SPIE Vol. 7049

Linear and Nonlinear Optics of Organic Materials VIII

Conference Chair: **Rachel Jakubiak,** Air Force Research Lab.

Conference Co-Chairs: **Theodore G. Goodson III,** Univ. of Michigan; **Manfred Eich,** Technische Univ. Hamburg-Harburg (Germany); **Jean-Michel Nunzi,** Queens Univ. (Canada)

Program Committee: **Kevin D. Belfield,** Univ. of Central Florida; **Antao Chen,** Univ. of Washington; **Koen J. Clays,** Katholieke Univ. Leuven (Belgium); **Alain F. Fort,** Institut de Physique et Chimie des Matériaux de Strasbourg (France); **Francois Kajzar,** Univ. d'Angers (France); **Satoshi Kawata,** Osaka Univ. (Japan); **Mark G. Kuzyk,** Washington State Univ.; **Charles Y. C. Lee,** Air Force Office of Scientific Research; **Kwang-Sup Lee,** Hannam Univ. (South Korea); **Geoffrey A. Lindsay,** Naval Air Warfare Ctr.; **Aristides Marcano,** Delaware State Univ.; **Robert A. Norwood,** College of Optical Sciences/The Univ. of Arizona; **André P. Persoons,** Katholieke Univ. Leuven (Belgium); **Joy E. Rogers,** UES, Inc.; **Jayan Thomas,** College of Optical Sciences/The Univ. of Arizona; **Tatsuo Wada,** The Institute of Physical and Chemical Research (Japan); **A. Todd Yeates,** Air Force Research Lab.

Tuesday 12 August

SESSION 1

Room: Conv. Ctr. 6E . . . . . .Tues. 3:30 to 5:30 pm

Organic Lasers

Session Chair: **Joseph Shinar,** Iowa State Univ.

Joint Session with Conference 7051: Organic Light Emitting Materials and Devices XII

3:30 pm: **Toward practical polymer lasers** *(Invited Paper)*, Graham A. Turnbull, Ying Yang, Scott Richardson, Ifor D. Samuel, Univ. of St. Andrews (United Kingdom). . . . . [7051-46]

3:55 pm: **Ultrafast optical switching and laser dynamics in distributed feedback polymer lasers**, Stefano Perissinotto, Margherita Zavelani-Rossi, Marco Carvelli, Guglielmo Lanzani, Politecnico di Milano (Italy); Marco Salerno, Instituto Italiano di Tecnologia (Italy); Giuseppe Gigli, Univ. degli Studi di Lecce (Italy) . . . . . [7051-47]

4:10 pm: **Organic self-doubled laser sources**, Alain F. Fort, Alberto Barsella, Jean-Pierre Vola, Daniel Acker, Institut de Physique et Chimie des Matériaux de Strasbourg (France); David Kreher, André-Jean Attias, Univ. Pierre et Marie Curie (France) . . . . . [7049-01]

4:25 pm: **Coherent control of OLEDs** *(Invited Paper)*, John M. Lupton, The Univ. of Utah . . . . . [7051-48]

4:50 pm: **A new injection scheme for an up-conversion organic laser** *(Invited Paper)*, Jean-Michel Nunzi, Queen's Univ. (Canada) . . . . . [7051-49]

5:15 pm: **Lateral molecular orientation in organic amorphous films and its effect on cutoff emissions from edges,** Daisuke Yokoyama, Chihaya Adachi, Kyushu Univ. (Japan). . . . . [7051-50]

Poster/Demo Session-Tuesday

Room: Conv. Ctr. Exhibit Hall B2 . . . . .Tues. 8:00 to 10:00 pm

Poster authors will begin displaying posters after 10:00 am Tuesday morning. A poster session and demo session, with authors present at their posters, will be held Tuesday evening from 8:00 to 10:00 pm. Light refreshments will be served.

Poster Setup

Poster presenters must set up their posters between 10:00 am and 5:00 pm on Tuesday. Poster presenters who have not set up by 5:00 pm on Tuesday will be considered a "no show" and their manuscript will not be published. Presenters must remove their posters immediately after the poster session. Posters not removed will be considered unwanted and will be discarded. SPIE assumes no responsibility for posters left up after the end of each poster session.

Novel nonlinear optical material with poly(3-hexylthiophene) thin film prepared on quartz glass surface modified by self-assembled monolayer, Shizuyasu Ochiai, Jayaraman Ramajothi, Kenzo Kojima, Teruyoshi Mizutani, Aichi Institute of Technology (Japan) . . . . . [7049-29]

Plasma enhanced chemical vapor deposition for high index of refraction polymer films, Hao Jiang, General Dynamics Information Technology; Jesse O. Enlow, UES, Inc.; Kurt G. Eyink, Air Force Research Lab.; John T. Grant, Univ. of Dayton; Weijie Su, Walter E. Johnson, Timothy J. Bunning, Air Force Research Lab. . . . . [7049-30]

Synthesis and investigation of new porphyrins with electron-donating or electron-withdrawing groups, Weijie Su, Air Force Research Lab.; Joy Rogers-Haley, UES, Inc.; Doug Krein, Augustine M. Urbas, Air Force Research Lab. . . . . [7049-31]

Triplet excimer formation of a platinum acetylide in solution, Jonathan Slagle, Air Force Research Lab. . . . . [7049-32]

Influence of styryl dyes on blood erythrocytes, Dilorom P. Khakimova, Negmat Nizomov, Mubaro Barakaeva, Samarkand State Univ. (Uzbekistan); Gayrat Khodjaev, Samarkand Agricultural Institute (Uzbekistan); Eldar Kurtaliev, Sherzod Rahimov, Samarkand State Univ. (Uzbekistan); Valeriy Yashchuk, National Taras Shevchenko Univ. of Kyiv (Ukraine) . . . . . [7049-33]

Nonlinear model for holographic formation of inharmonic multiplexed photonic structures in absorbent photopolymer composites, Sergey N. Sharangovich, Tomsk State Univ. (Russia); Vyacheslav G. Mirgorod, Tomsk State Univ. of Control Systems and Radioelectronics (Russia) . . . . . [7049-34]

Environment-sensitive two-photon dye, Nikolay S. Makarov, Mikhail A. Drobizhev, Aleksander Rebane, Montana State Univ./Bozeman . . . . [7049-35]

Fourier transform infrared spectroscopy of deuterated proteins, Aristides Marcano, Yuri Markushin, Noureddine Melikechi, Delaware State Univ.; Denise Connolly, Fox Chase Cancer Ctr. . . . . [7049-36]

Wednesday 13 August

SESSION 2

Room: Conv. Ctr. 7B . . . . . Wed. 8:00 to 9:20 am

Structure-Property Relationships of NLO Materials

Session Chair: **Rachel Jakubiak,** Air Force Research Lab.

8:00 am: **Molecular engineering for nonlinear optics: beyond the molecular approach** *(Invited Paper)*, Mireille H. Blanchard-Desce, Claudine Katan, CNRS (France); Francesca Terenziani, Univ. degli Studi di Parma (Italy); Puspendu K. Das, Indian Institute of Science (India) . . . . . [7049-02]

8:30 am: **Quantitative description of two-photon absorption with few essential states models** *(Invited Paper)*, Mikhail A. Drobizhev, Nikolay Makarov, Aleksander Rebane, Montana State Univ./Bozeman . . . . . [7049-03]

9:00 am: **Novel cycloketo tetraphenylporphyrins: spectroscopic study of structure-properties relationships,** Eugeny Ermilov, Humboldt-Univ. zu Berlin (Germany); Stefan Jasinski, Norbert Jux, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); Beate Röder, Humboldt-Univ. zu Berlin (Germany) . . . . . [7049-04]

SESSION 3

Room: Conv. Ctr. 7B . . . . . Wed. 9:20 to 11:20 am

NLO Platinum Derivatives

Session Chair: **Theodore G. Goodson III,** Univ. of Michigan

9:20 am: **Development of novel two-photon absorbing chromophores** *(Invited Paper)*, Joy E. Rogers-Haley, UES, Inc. and Air Force Research Lab.; Jennifer L. Monahan, Air Force Research Lab.; Douglas M. Krein, General Dynamics Information Technology; Jonathan E. Slagle, AT&T Government Solutions; Daniel G. McLean, Science Applications International Corp.; Thomas M. Cooper, Augustine M. Urbas, Air Force Research Lab.. . [7049-05]

9:50 am: **Influence of an alkoxyl substituent on the photophysical and nonlinear optical properties of platinum(II) 4,6-diphenyl-2,2'-bipyridyl complexes**, Wenfang Sun, Pin Shao, Yunjing Li, Iswarya Mathew, North Dakota State Univ. . . . . [7049-06]

Coffee Break . . . . . 10:10 to 10:40 am

10:40 am: **Synthesis and characterization of novel platinum acetylide oligomers**, Thomas M. Cooper, Douglas M. Krein, Aaron R. Burke, Daniel G. McLean, Joy E. Halley, Jonathan M. Slagle, Jennifer Monahan, Augustine Urbas, Air Force Research Lab. . . . . [7049-07]

11:00 am: **Nonlinear absorption in platinum acetylides**, Kirk S. Schanze, Univ. of Florida . . . . . [7049-08]

Lunch/Exhibition Break . . . . . 11:20 am to 1:00 pm

SESSION 4

Room: Conv. Ctr. 7B . . . . . Wed. 1:00 to 2:10 pm

NLO Measurement Techniques

Session Chair: **Aleksander K. Rebane,** Montana State Univ./ Bozeman

1:00 pm: **Using hyper-Rayleigh scattering and the dipole-free sum-over states expression to predict two-photon absorption spectra of AF455** *(Invited Paper)*, Mark G. Kuzyk, Juefei Zhou, Washington State Univ.; Javier Pérez-Moreno, Katholieke Univ. Leuven (Belgium); Shiva K. Ramini, Washington State Univ.; Shen-Ting Hung, Koen J. Clays, Katholieke Univ. Leuven (Belgium). . . . . [7049-09]

1:30 pm: **Hyper-Rayleigh scattering for solution phase structure determination**, Koen J. Clays, Katholieke Univ. Leuven (Belgium) and Washington State Univ.. . . . . [7049-10]

1:50 pm: **Pump-probe photothermal lens experiment for measuring the thermal diffusivity coefficient of organic solvent,** Aristides Marcano, Aaron Zelinskas, Noureddine Melikechi, Delaware State Univ.. . . . . [7049-11]

SESSION 5

Room: Conv. Ctr. 7B . . . . . Wed. 2:10 to 3:30 pm

Polymeric Waveguides

Session Chair: **Mark G. Kuzyk,** Washington State Univ.

2:10 pm: **Poled and unpoled chromophore-containing polymers for optical communication and sensor applications** *(Invited Paper)*, Antao Chen, Univ. of Washington . . . . . [7049-12]

2:40 pm: **Optical bistability of waveguide consisting of poly (3-hexylthiophene)/ polymethylmethacrylate composite film**, Shizuyasu Ochiai, Suguru Mototani, Kenzo Kojima, Teruyoshi Mizutani, Aichi Institute of Technology (Japan) . . . . . [7049-13]

3:00 pm: **Applications of surface relief structures on azopolymer films**, Paul Rochon, Royal Military College of Canada (Canada) . . . . . [7049-14]

Coffee Break . . . . . 3:30 to 4:00 pm

SESSION 6

Room: Conv. Ctr. 7B . . . . . Wed. 4:00 to 4:40 pm

EO Modulators and Materials

Session Chair: **Antao Chen,** Univ. of Washington

4:00 pm: **UV-patternable inorganic-organic hybrid materials: tailored for use in electro-optic modulators**, Roland Himmelhuber, Christopher T. DeRose, Robert A. Norwood, Nasser N. Peyghambarian, The Univ. of Arizona. . . . . [7049-15]

4:20 pm: **Development of PMMA-AMA-based core materials for electro-optic modulator**, Diyun Huang, Lumera Corp. . . . . [7049-16]

Thursday 14 August

SESSION 7

Room: Conv. Ctr. 7B . . . . . Thurs. 8:00 to 9:10 am

Nanophotonics

Session Chair: **Alain F. Fort,** Institut de Physique et Chimie des Matériaux de Strasbourg (France)

8:00 am: **Nanophotonics with silicon polymer hybrid structures** *(Invited Paper)*, Manfred Eich, Jan-Hendrik Wülbern, Jan Hampe, Alexander Y. Petrov, Markus Schmidt, Technische Univ. Hamburg-Harburg (Germany). . . [7049-18]

8:30 am: **Photonic crystals for improved light harvesting**, Koen J. Clays, Branko Kolaric, Kasper Baert, Renaud A. L.Vallée, Katholieke Univ. Leuven (Belgium) . . . . . [7049-19]

8:50 am: **Two-photon polymer laser writing in the photonic crystal,** Shiyoshi Yokoyama, Shinichiro Inoue, Kensuke Sasaki, Kyushu Univ. (Japan) [7049-20]

SESSION 8

Room: Conv. Ctr. 7B . . . . . Thurs. 9:10 to 10:20 am

Organic and Metallic Assemblies

Session Chair: **Koen J. Clays,** Katholieke Univ. Leuven (Belgium)

9:10 am: **Nonlinear optical properties of quantum sized gold clusters** *(Invited Paper)*, Theodore G. Goodson III, Guda Ramakrishna, Univ. of Michigan; Lee Dongil, Western Michigan Univ.. . . . . [7049-21]

9:40 am: **Combining top-down and bottom-up fabrication in volume gratings**, Michael Birnkrant, Christopher Li, Drexel Univ.; Lalgudi V. Natarajan, Vincent P. Tondiglia, Richard L. Sutherland, Science Applications International Corp.; Pamela F. Lloyd, UES, Inc.; Rachel Jakubiak, Timothy J. Bunning, Air Force Research Lab. . . . . [7049-22]

10:00 am: **Highly stable photo-orientation of small molecular azobenzene-containing compounds**, Pascal Wolfer, ETH Zürich (Switzerland); Klaus Kreger, Hubert Audorff, Lothar Kador, Hans-Werner Schmidt, Univ. Bayreuth (Germany); Paul Smith, ETH Zürich (Switzerland); Natalie Stingelin, Queen Mary Univ. of London (United Kingdom) . . . [7049-23]

Coffee Break . . . . . 10:20 to 10:50 am

SESSION 9

Room: Conv. Ctr. 7B . . . . . Thurs. 10:50 to 11:40 am

Resonate Bragg Structures

Session Chair: **Manfred Eich,** Technische Univ. Hamburg-Harburg (Germany)

10:50 am: **Linear and nonlinear optical properties of highly transmissive one-dimensional metal-organic photonic bandgap structures** *(Invited Paper)*, Canek Fuentes-Hernandez, Georgia Institute of Technology; Lazaro A. Padilha, College of Optics & Photonics/Univ. of Central Florida; Daniel Owens, Shuo-Yen Tseng, Georgia Institute of Technology; Scott Webster, College of Optics & Photonics/Univ. of Central Florida; Jian-Yang Cho, Georgia Institute of Technology; David J. Hagan, Eric W. VanStryland, College of Optics & Photonics/Univ. of Central Florida; Seth R. Marder, Bernard Kippelen, Georgia Institute of Technology . . . . . [7049-24]

11:20 am: **Tunable refractive index titania nanocomposite for fabrication of distributed all-dielectric Bragg reflectors**, Manuela Russo, Thomas Cszany, Queen Mary Univ. of London (United Kingdom); Toby Ferenczi, Mariano Campoy-Quiles, Imperial College London (United Kingdom); Walter R. Caseri, ETH Zürich (Switzerland); Natalie Stingelin-Stutzmann, Queen Mary Univ. of London (United Kingdom) . . . . . [7049-25]

Lunch/Exhibition Break . . . . . 11:40 am to 1:10 pm

SESSION 10

Room: Conv. Ctr. 7B . . . . . Thurs. 1:10 to 2:00 pm

Polymeric Integrated Optics for Communication Applications

Session Chair: **Robert A. Norwood,** College of Optical Sciences/The Univ. of Arizona

1:10 pm: **Thermo-optic polymeric waveguide devices for WDM-PON applications** *(Invited Paper)*, Young-Ouk Noh, Hyung-Jong Lee, ChemOptics Inc. (South Korea); Kyung-Jo Kim, Min-Cheol Oh IV, Pusan National Univ. (South Korea). . . . . [7049-26]

1:40 pm: **PQ/PMMA holographic filters for OCDMA over CWDM applications**, Juan M. Russo, The Univ. of Arizona and Prism Solar Technologies, Inc.; Raymond K. Kostuk, The Univ. of Arizona. . . . . [7049-27]

Courses of Related Interest

See SPIE Cashier for information and to register.

SC790 Liquid Crystals: From Fundamentals to Applications (Smalyukh)
Wednesday, 8:30 am to 5:30 pm

Conference 7050

Monday-Tuesday 11-12 August 2008 • Proceedings of SPIE Vol. 7050

Liquid Crystals XII

Conference Chair: **Iam Choon Khoo,** The Pennsylvania State Univ.

Program Committee: **Timothy J. Bunning,** Air Force Research Lab.; **Shaw H. Chen,** Univ. of Rochester; **Neil Collings,** Univ. of Cambridge (United Kingdom); **Jean-Pierre Huignard,** Thales Research & Technology (France); **Tomiki Ikeda,** Tokyo Institute of Technology (Japan); **Francesco F. Simoni,** Univ. Politecnica delle Marche (Italy); **David M. Walba,** Univ. of Colorado at Boulder

Monday 11 August

SESSION 1

Room: Conv. Ctr. 7B . . . . . Mon. 8:30 to 10:00 am

Novel Liquid Crystalline Materials I

Session Chair: **Iam Choon Khoo,** The Pennsylvania State Univ.

8:30 am: **Nematic gels via self-assembly of block copolymers** *(Invited Paper)*, Julia A. Kornfield, California Institute of Technology; Rafael Verduzco, Oak Ridge National Lab.; Neal Scruggs, National Institute of Standards and Technology . . . . . [7050-01]

8:55 am: **Enhancing the electro-optical properties of liquid crystal nanodroplets for switchable Bragg gratings**, Richard L. Sutherland, Vincent P. Tondiglia, Lalgudi V. Natarajan, Science Applications International Corp.; Pamela F. Lloyd, UES, Inc.; Timothy J. Bunning, Air Force Research Lab. . . . . [7050-02]

9:10 am: **Novel columnar liquid-crystalline nanomaterials designed toward anhydrous organic proton conductors** *(Invited Paper)*, Akihiko Kanazawa, Yamagata Univ. (Japan); Katsuhiko Nakajima, Masatoshi Matsuda, Toyota Motor Co. (Japan) . . . . . [7050-03]

9:35 am: **A new generation of previously unrealizable photonic devices as enabled by a unique electro-optic waveguide architecture** *(Invited Paper)*, Scott R. Davis, George Farca, Scott D. Rommel, Michael H. Anderson, Vescent Photonics Inc. . . . . [7050-04]

Coffee Break . . . . . 10:00 to 10:30 am

SESSION 2

Room: Conv. Ctr. 7B . . . . . Mon. 10:30 am to 12:05 pm

Electro- and Nonlinear Optical Effects

Session Chair: **Shaw H. Chen,** Univ. of Rochester

10:30 am: **Polarization-dependent nonlinear phase contrast by using dye-doped nematic liquid crystals**, Ruben Ramos-Garcia, Marcelo D. Iturbe-Castillo, Julio C. Ramirez-San-Juan, Oscar Baldovino-Pantaleon, Rosario Porras-Aguilar, Instituto Nacional de Astrofísica, Óptica y Electrónica (Mexico). . . . . [7050-05]

10:45 am: **High-optical nonlinearity of azobenzene liquid crystals** *(Invited Paper)*, Nelson V. Tabiryan, Uladzimir Hrozhyk, Svetlana Serak, BEAM Engineering for Advanced Measurements Co.; Landa Hoke, Diane M. Steeves, Brian Kimball, U.S. Army Soldier Systems Ctr.; Gary Kedziora, Wright-Patterson Air Force Base . . . . . [7050-06]

11:10 am: **Light-driven soft actuator materials based on liquid-crystalline polymers** *(Invited Paper)*, Yanlei Yu, Ruoyuan Yin, Futao Cheng, Fudan Univ. (China); Mizuho Kondo, Tomiki Ikeda, Tokyo Institute of Technology (Japan). . . . . [7050-07]

11:35 am: **Liquid crystals for organizing carbon nanotubes**, Giusy Scalia, Max-Planck-Institut für Festkörperforschung (Germany); Jan P. F.Lagerwall, Martin-Luther Univ. Halle-Wittenberg (Germany); Siegmar Roth, Max-Planck-Institut für Festkörperforschung (Germany) . . . . . [7050-08]

11:50 am: **Nonlinear all-optical switching with organic liquid and liquid crystals in the visible-infrared regime**, Michael V. Stinger, Justin D. Liou, Andres Diaz, Yi Ma, Junbin Huang, Jae Hong Park, Iam Choon Khoo, The Pennsylvania State Univ.. . . . . [7050-09]

Lunch Break . . . . . 12:05 to 1:35 pm

SESSION 3

Room: Conv. Ctr. 7B . . . . . Mon. 1:35 to 3:15 pm

Novel Liquid Crystalline Materials II

Session Chair: **Andy Y. Fuh,** National Cheng Kung Univ. (Taiwan)

1:35 pm: **Diamantane: a thread stitching up photochromism and liquid crystals** *(Invited Paper)*, Yasushi Yokoyama, Yokohama National Univ. (Japan). . . . . [7050-10]

2:00 pm: **A new achiral ferroelectric smectic phase useful for fast phase modulation** *(Invited Paper)*, Eva D. Korblova, David M. Walba, Univ. of Colorado at Boulder; Amaranatha Reddy, VVI Bright, Inc.; Chenhui Zhu, Renfan Shao, Noel A. Clark, Univ. of Colorado at Boulder. . . . . [7050-11]

2:25 pm: **Photoresponsive behavior of azobenzene liquid crystals containing metal nanoparticles** *(Invited Paper)*, Osamu Tsutsumi, Ritsumeikan Univ. (Japan). . . . . [7050-12]

2:50 pm: **Semiconducting properties of nematic liquid crystals for electroluminescence and photovoltaics** *(Invited Paper)*, Mary O'Neill, Steve M. Kelly, Manea S. Al Khalifah, Miguel Carrasco-Orozco, Stefan Droege, Chunghong Lei, Alicia Liedtke, Stuart P. Kitney, Matt P. Aldred, Panos Vlachos, The Univ. of Hull (United Kingdom) . . . . . [7050-13]

Coffee Break . . . . . 3:15 to 3:45 pm

SESSION 4

Room: Conv. Ctr. 7B . . . . . Mon. 3:45 to 5:45 pm

Optical Effects and Devices

Session Chair: **Nelson V. Tabirian,** BEAM Engineering for Advanced Measurements Co.

3:45 pm: **Kerr effect of nano-structured liquid crystals** *(Invited Paper)*, Hirotsugu Kikuchi, Kyushu Univ. (Japan); Yasuhiro Haseba, Chisso Petrochemical Corp. (Japan); Suk-Won Choi, Japan Science and Technology Corp. (Japan); Shinichi Yamamoto, Chisso Petrochemical Corp. (Japan); Takashi Iwata, NOF Corp. (Japan); Dong-Uk Cho, Japan Science and Technology Corp. (Japan); Hiroki Higuchi, Kyushu Univ. (Japan). . . . [7050-14]

4:10 pm: **Enhanced confocal microscopy imaging of the in-plane switching of a cholesteric liquid crystal**, Sharon A. Jewell, John R. Sambles, The Univ. of Exeter (United Kingdom). . . . . [7050-15]

4:25 pm: **Axially symmetric polarization converters based on photo-aligned liquid crystal films** *(Invited Paper)*, Andy Y. Fuh, Ying-Yu Tzeng, Shih-Wei Ke, Chi-Lun Ting, National Cheng Kung Univ. (Taiwan); Tsung-Hsien Lin, National Sun Yat-Sen Univ. (Taiwan) . . . . . [7050-16]

4:50 pm: **A liquid crystal tunable filter for polarization imaging**, Dong-Feng Gu, Bruce K. Winker, John Mansell, Karen N. Zachery, Donald B. Taber, Tallis Y. Chang, Keith A. Sage, Teledyne Scientific Co.. . . . . [7050-17]

5:05 pm: **Reflective liquid crystal polarization gratings with high efficiency and small pitch**, Ravi K. Komanduri, Chulwoo Oh, Michael J. Escuti, North Carolina State Univ.. . . . . [7050-18]

5:20 pm: **Polysilacage moiety as a bulky mesogenic motif** *(Invited Paper)*, Masaki Shimizu, Masanori Nata, Tamejiro Hiyama, Kyoto Univ. (Japan). . . . . [7050-46]

Courses of Related Interest

See SPIE Cashier for information and to register.

SC790 Liquid Crystals: From Fundamentals to Applications (Smalyukh)
Wednesday, 8:30 am to 5:30 pm

Tuesday 12 August

SESSION 5

Room: Conv. Ctr. 7B . . . . . .Tues. 8:30 to 10:00 am

Novel Liquid Crystals

Session Chair: **Shaw H. Chen,** Univ. of Rochester

8:30 am: **Laser damage resistant photoalignment layers for high-peak-power liquid crystal device applications**, Kenneth L. Marshall, Jean Gan, Gary L. Mitchell, Semyon Papernov, Amy L. Rigatti, Ansgar W. Schmid, Stephen D. Jacobs, Univ. of Rochester . . . . . [7050-19]

8:45 am: **Discotic liquid crystals: synthesis and mesomorphic properties of polyacetylenes carrying triphenylene pendant groups** *(Invited Paper)*, Ben Z. Tang, Jacky W. Y.Lam, Changmin Xing, Hong Kong Univ. of Science and Technology (Hong Kong China); Keqing Zhao, Sichuan Normal Univ. (China) . . . . . [7050-20]

9:10 am: **Ferroelectric liquid crystals for second-order nonlinear optics** *(Invited Paper)*, David M. Walba, Malcolm Rickard, Edgardo Garcia, Jennifer Niessink-Trotter, Renfan Shao, Michi Nakata, Noel A. Clark, Univ. of Colorado at Boulder . . . . . [7050-21]

9:35 am: **Quantitative evaluation of photoalignment of liquid crystals on coumarin-containing polymer films** *(Invited Paper)*, Chun Ki Kim, Jason U. Wallace, Anita Trajkovska, Jane J. Ou, Shaw H. Chen, Univ. of Rochester . . . . . [7050-22]

Coffee Break . . . . . 10:00 to 10:30 am

SESSION 6

Room: Conv. Ctr. 7B . . . . . .Tues. 10:30 to 11:50 am

Liquid Crystal Alignment Switches and Filter

Session Chair: **Timothy J. Bunning,** Air Force Research Lab.

10:30 am: **Liquid crystal tunable filters and polarization controllers for biomedical optical imaging** *(Invited Paper)*, Ofir Aharon, Avner Safrani, Riki Moses, Ibrahim Abdulhalim, Ben-Gurion Univ. of the Negev (Israel) . [7050-23]

10:55 am: **New liquid crystal alignment technologies** *(Invited Paper)*, Hoi Sing Kwok, Vladimir G. Chigrinov, Hong Kong Univ. of Science and Technology (Hong Kong China) . . . . . [7050-24]

11:20 am: **Flexoelectric polarization effects in nematic liquid crystal phase gratings**, Carl V. Brown, Andrew A. T.Smith, Nottingham Trent Univ. (United Kingdom); Nigel J. Mottram, Univ. of Strathclyde (United Kingdom); Christophe L. Trabi, Nottingham Trent Univ. (United Kingdom) . . . . . [7050-25]

11:35 am: **Electro-optical effects in liquid crystals with dielectric dispersion**, Oleg D. Lavrentovich, Kent State Univ.. . . . . [7050-26]

Lunch/Exhibition Break . . . . . 11:50 am to 1:40 pm

SESSION 7

Room: Conv. Ctr. 7B . . . . . .Tues. 1:40 to 3:00 pm

Switches, Modulators, Lasers

Session Chair: **David M. Walba,** Univ. of Colorado at Boulder

1:40 pm: **Polarization freedom for liquid crystal devices** *(Invited Paper)*, Michael J. Escuti, North Carolina State Univ.. . . . . [7050-27]

2:05 pm: **Liquid crystal modulated optical amplifier for night vision imaging**, Alexander Parfenov, Xiaowei W. Xia, Tin Win, Jason Holmstedt, Neven Rakuljic, Tin M. Aye, Physical Optics Corp.. . . . . [7050-28]

2:20 pm: **Red-green-blue 2D tunable liquid crystal laser devices and displays** *(Invited Paper)*, Harry J. Coles, Univ. of Cambridge (United Kingdom) . . . . . [7050-29]

2:45 pm: **Liquid crystal based electro-optic Bragg gratings for laser beam attenuations**, Suning Tang, Crystal Research, Inc.; James J. Foshee, Air Force Research Lab.; Yuanji Tang, Crystal Research, Inc.. . . . . [7050-30]

Coffee Break . . . . . 3:00 to 3:30 pm

SESSION 8

Room: Conv. Ctr. 7B . . . . . Tues. 3:30 to 5:15 pm

Photoresponsive and Photorefractive Liquid Crystals

Session Chair: **Iam Choon Khoo,** The Pennsylvania State Univ.

3:30 pm: **Hybrid liquid crystal inorganic photorefractives** *(Invited Paper)*, Gary Cook, Universal Technology Corp.; Victor Y. Reshetnyak, National Taras Shevchenko Univ. of Kyiv (Ukraine); Anatoliy V. Glushchenko, Univ. of Colorado/Colorado Springs; Dean R. Evans, Air Force Research Lab.[7050-31]

3:55 pm: **Photoalignment and patterning of nanostructures in liquid crystalline thin films** *(Invited Paper),* Takahiro Seki, Mitsuo Hara, Haruhiko Fukumoto, Shusaku Nagano, Nagoya Univ. (Japan) . . . . . [7050-47]

4:20 pm: **Photoresponsive cholesteric liquid crystals** *(Invited Paper)*, Timothy J. Bunning, Timothy J. White, Rachel Jakubiak, Air Force Research Lab.; Svetlana V. Serak, Uladzimir Hrozhyk, Nelson V. Tabirian, BEAM Engineering for Advanced Measurements Co. . . . . [7050-33]

4:45 pm: **Investigation of field-induced refractive index changes in nanometer thin nematic liquid crystals**, Justin D. Liou, Andres Diaz, Yi Ma, Junbin Huang, Jae Hong Park, Iam Choon Khoo, The Pennsylvania State Univ. . . . . [7050-34]

5:00 pm: **Sparse multiwall carbon nanotube electrodes arrays for liquid crystal photonic devices,** Timothy D. Wilkinson, Xiaozhi Wang, K. B. K.Teo, William I. Milne, Univ. of Cambridge (United Kingdom) . . . . . [7050-36]

Poster/Demo Session-Tuesday

Room: Conv. Ctr. Exhibit Hall B2 . . . . Tues. 8:00 to 10:00 pm

Poster authors will begin displaying posters after 10:00 am Tuesday morning. A poster session and demo session, with authors present at their posters, will be held Tuesday evening from 8:00 to 10:00 pm. Light refreshments will be served.

Poster Setup

Poster presenters must set up their posters between 10:00 am and 5:00 pm on Tuesday. Poster presenters who have not set up by 5:00 pm on Tuesday will be considered a "no show" and their manuscript will not be published. Presenters must remove their posters immediately after the poster session. Posters not removed will be considered unwanted and will be discarded. SPIE assumes no responsibility for posters left up after the end of each poster session.

Molecular stacking of discotic liquid crystals on the surfaces treated by O_2 plasma, Wenjun Zheng, Ya-Ting Hu, Cheng-Yan Chiang, Chi-Wi Ong, National Sun Yat-Sen Univ. (Taiwan) . . . . . [7050-37]

Refractive index engineering of liquid crystals with nano-particulates, Andres Diaz, Yi Ma, Junbin Huang, Justin Liou, Jae Hong Park, Iam Choon Khoo, The Pennsylvania State Univ.. . . . . [7050-38]

Photoswitching properties of photonic band gap material containing azo-polymer liquid crystal, Masaki Moritsugu, Tomomi Shirota, Tomonari Ogata, Takamasa Nonaka, Seiji Kurihara, Kumamoto Univ. (Japan) . . . . . [7050-39]

Color shift improvement in a broadband cholesteric liquid crystal polarizer through computational simulations, Ping-Chen Chen, Hui-Lung Kuo, Industrial Technology Research Institute (Taiwan) . . . . . [7050-40]

Matrix model for a twisted medium: low twist, Diana Tentori, Ctr. de Investigación Científica y de Educación Superior de Ensenada (Mexico); Cesar Ayala-Diaz, Univ. Autónoma de Baja California (Mexico); J. Ernesto Ledezma-Sillas, Ctr. de Investigación Científica y de Educación Superior de Ensenada (Mexico). . . . . [7050-41]

Nonlinear films characterization by Z-scan technique, Roger Chiu-Zarate, Virginia Marañon Ruiz, Univ. de Guadalajara (Mexico) . . . . . [7050-42]

Polarization-independent tunable optical filters based on bilayer polarization gratings, Elena Nicolescu, Michael J. Escuti, North Carolina State Univ.. . . . . [7050-43]

Electrically switchable achromatic liquid crystal polarization gratings on reflective substrates, Chulwoo Oh, Michael J. Escuti, North Carolina State Univ. . . . . [7050-44]

Hard-core liquid crystal fibers, Antoni J. Adamczyk, Politechnika Warszawska (Poland) . . . . . [7050-45]

Conference 7051

Sunday-Tuesday 10-12 August 2008 • Proceedings of SPIE Vol. 7051

Organic Light Emitting Materials and Devices XII

Conference Chair: **Franky So,** Univ. of Florida

Conference Co-Chair: **Chihaya Adachi,** Kyushu Univ. (Japan)

Program Committee: **Alasdair J. Campbell,** Imperial College London (United Kingdom); **Brian W. D'Andrade,** Universal Display Corp.; **Andrew B. Holmes,** Bio21 Molecular Science and Biotechnology Institute (Australia); **Changhee Lee,** Seoul National Univ. (South Korea); **Chun Sing Lee,** City Univ. of Hong Kong (Hong Kong China); **Michele Muccini,** Istituto per lo Studio dei Materiali Nanostrutturati (Italy); **Hideyuki Murata,** Japan Advanced Institute of Science and Technology (Japan); **Soo Jin Park,** Samsung SDI Co. Ltd. (South Korea); **Ifor D. Samuel,** Univ. of St. Andrews (United Kingdom); **Linda S. Sapochak,** Pacific Northwest National Lab.; **Joseph Shinar,** Iowa State Univ.

Sunday 10 August

SESSION 1

Room: Conv. Ctr. 6E . . . . . Sun. 9:30 am to 12:30 pm

Materials

Session Chair: **Chihaya Adachi,** Kyushu Univ. (Japan)

9:30 am: **Advanced device architecture for highly efficient OLEDs with an orange emitting crosslinkable iridium complex**, Nina Rehmann, Univ. zu Köln (Germany); Christoph Ulbricht, Technische Univ. Eindhoven (Netherlands); Anne Köhnen, Philipp Zacharias, Malte C. Gather, Dirk Hertel, Univ. zu Köln (Germany); Elisabeth Holder, Bergische Univ. Wuppertal (Germany); Ulrich S. Schubert, Technische Univ. Eindhoven (Netherlands); Klaus Meerholz, Univ. zu Köln (Germany) . . . . . [7051-01]

9:45 am: **Novel p- and n-dopants for high-efficiency organic light-emitting diodes with low-driving voltage** *(Invited Paper),* Jang-Joo Kim, Dong-Seok Leem, Seoul National Univ. (South Korea) . . . . . [7051-02]

10:10 am: **Geometric and electronic structures of a hole-transport material, TPD, studied by DFT calculations and solid state NMR** *(Invited Paper),* Hironori Kaji, Yamada Tomonori, Kyoto Univ. (Japan) . . . . . [7051-03]

Coffee Break . . . . . 10:35 to 11:00 am

11:00 am: **Novel hole transport materials for OLED devices** *(Invited Paper)*, Jianmin Shi, Army Research Lab. . . . . [7051-04]

11:25 am: **The effect of structure on dendrimer light-emitting diodes** *(Invited Paper)*, Paul L. Burn, The Univ. of Queensland (Australia) . . . [7051-05]

11:50 am: **New developments in photochromic materials showing large change in the refractive index**, Andrea Bianco, Osservatorio Astronomico di Brera (Italy); Chiara Bertarelli, Giovanni Dassa, Politecnico di Milano (Italy); Giorgio Toso, Osservatorio Astronomico di Brera (Italy); Giuseppe Zerbi, Politecnico di Milano (Italy) . . . . . [7051-06]

12:05 pm: **Color tuning by changing the substituent of highly luminescent iridium(III) complexes** *(Invited Paper),* Ute J. Weinaug, Sven Ammermann, Matthias Hoping, Matthias Tamm, Wolfgang Kowalsky, Hans-Hermann Johannes, Technische Univ. Braunschweig (Germany) . . . . . [7051-07]

Lunch Break . . . . . 12:30 to 1:30 pm

SESSION 2

Room: Conv. Ctr. 6E . . . . . Sun. 1:30 to 3:30 pm

Processing

Session Chair: **Franky So,** Univ. of Florida

1:30 pm: **New ways to solution-processed multilayer OLEDs**, Anne Köhnen, Univ. zu Köln (Germany); Nina Riegel, Univ. zu Köln (Germany) and OSRAM Opto Semiconudctors GmbH (Germany); Jonas Kremer, Hans Lademann, Univ. zu Köln (Germany); David Müller, Univ. zu Köln (Germany) and Merck Chemicals Ltd. (United Kingdom); Klaus Meerholz, Univ. zu Köln (Germany) . . . . . [7051-08]

1:45 pm: **Thermal intake in organic layers by metal deposition/limiting factor for organic device performance and production velocity**, Steffen Mozer, Technische Univ. Braunschweig (Germany) . . . . . [7051-09]

2:00 pm: **Highly efficient green electrophosphorescent organic light-emitting diodes with hybrid device geometry**, Andreas Haldi, Benoit Domercq, Asha Sharma, Georgia Institute of Technology; Richard D. Hreha, The Univ. of Arizona; Jian-Yang Cho, Seth R. Marder, Bernard Kippelen, Georgia Institute of Technology . . . . . [7051-10]

2:15 pm: **Correlating the performance of device applicable conjugated polymer blends to their morphology using time resolved scanning near-field optical microscopy** *(Invited Paper)*, Ashley J. Cadby, David G. Lidzey, The Univ. of Sheffield (United Kingdom) . . . . . [7051-11]

2:40 pm: **Improving the performance of PHOLED by using dual doping** *(Invited Paper)*, Vadim Adamovich, Michael S. Weaver, Julie J. Brown, Universal Display Corp. . . . . [7051-12]

3:05 pm: **Development of high performance OLEDs** *(Invited Paper)*, Junji Kido, Yamagata Univ. (Japan) . . . . . [7051-69]

Coffee Break . . . . . 3:30 to 3:50 pm

SESSION 3

Room: Conv. Ctr. 6E . . . . . Sun. 3:50 to 5:55 pm

Degradation

Session Chair: **Michele Muccini,** Consiglio Nazionale delle Ricerche (Italy)

3:50 pm: **The purity of organic electroluminescent materials: synthetic by-products and their effects on device degradation mechanisms** *(Invited Paper)*, Linda S. Sapochak, James A. Campbell, Xiuyu Cai, Paul A. Vecchi, Asanga B. Padmaperuma, Paul E. Burrows, Pacific Northwest National Lab.; Bob Brunck, Chinmay Betrabet, Hewlett Packard Co. . . . . [7051-13]

4:15 pm: **Optically detected magnetic resonance (ODMR) studies of trions in organic light-emitting materials and OLEDs and their possible relation to OLED stability** *(Invited Paper)*, Ying Chen, Min Cai, Emily Beauvais, Joseph Shinar, Iowa State Univ. . . . . [7051-14]

4:40 pm: **Air-stable hybrid organic-inorganic light-emitting diodes** *(Invited Paper)*, Katsuyuki Morii, Kyushu Univ. (Japan) . . . . . [7051-15]

5:05 pm: **Chemical transformations of common hole-transport materials in operating OLED devices** *(Invited Paper)*, Denis Kondakov, Eastman Kodak Co. . . . . [7051-16]

5:30 pm: **Comprehensive simulation of light-emitting and light-harvesting organic devices** *(Invited Paper),* Beat Ruhstaller, Thomas Flatz, Daniele Rezzonico, FLUXiM, Inc. (Switzerland); Michael Moos, Nils Reinke, Evelyne Huber, Roger Haeusermann, Guido Sartoris, Zürcher Hochschule für Angewandte Wissenschaften (Switzerland) . . . . . [7051-70]

Room: Conv. Ctr. 6A . . . . . Sun. 6:00 to 6:45 pm

All-Conference Plenary Session

View plenary presentation details p. 13.

6:00 pm: **The Solar Decathlon: building a better future with solar energy**, Richard J. King, U.S. Dept. of Energy

Monday 11 August

SESSION 4

Room: Conv. Ctr. 6E . . . . . Mon. 8:00 to 10:10 am

Device Physics

Session Chair: **Linda S. Sapochak,** Pacific Northwest National Lab.

8:00 am: **Does giant surface potential modify the performance of Alq$_3$-based OLED? Voltage shift and charge traps induced by light irradiation**, Yutaka Noguchi, Naoki Sato, Yuya Tanaka, Yasuo Nakayama, Hisao Ishii, Chiba Univ. (Japan) . . . . . [7051-17]

8:15 am: **Importance of tuning charge balance in phosphorescent organic light-emitting diodes**, Neetu Chopra, Jaewon Lee, Franky So, Univ. of Florida . . . . . [7051-18]

8:30 am: **Optimization of white organic light emitting diodes based on charge carrier conduction properties of phosphorescent emitting layers** *(Invited Paper)*, Changhee Lee, Heume-Il Baek, Jeong-Hun Kwak, Joon Youp Kim, Seoul National Univ. (South Korea); Byung D. Chin, Korea Institute of Science and Technology (South Korea) . . . . . [7051-19]

8:55 am: **Exciton-charge interaction in organic light-emitting diodes**, Hideyuki Murata, Japan Advanced Institute of Science and Technology (Japan). . . . . [7051-20]

9:10 am: **High-efficiency blue fluorescent organic light-emitting devices based on double emission layers**, Wallace C. H.Choy, Tianhang Zheng, The Univ. of Hong Kong (Hong Kong China) . . . . . [7051-21]

9:25 am: **A new door for molecular-based organic light-emitting diodes**, Jwo-Huei Jou, National Tsing Hua Univ. (Taiwan) . . . . . [7051-22]

9:40 am: **Realizing white phosphorescent OLED efficiency limits**, Brian W. D'Andrade, James Esler, Universal Display Corp. . . . . [7051-23]

9:55 am: **Efficient simple structure phosphorescent organic light-emitting devices with narrow band gap fluorescent hosts**, Jang H. Kwon, Kyunghee Univ. (South Korea) . . . . . [7051-24]

Coffee Break . . . . . 10:10 to 10:40 am

SESSION 5

Room: Conv. Ctr. 6E . . . . . Mon. 10:40 am to 12:25 pm

Novel Devices and Displays

Session Chair: **Chung-Chih Wu,** National Taiwan Univ. (Taiwan)

10:40 am: **Toward self-powering active-matrix OLED displays** *(Invited Paper)*, Chih-Jen Yang, Su-Hao Liu, Hsing-Hung Hsieh, Chih-Che Liu, Kun-Cheng Tien, Ting-Yi Cho, Po-Chuan Yang, Che-Yu Yang, Si-Chen Lee, Chung-Chih Wu, National Taiwan Univ. (Taiwan) . . . . . [7051-25]

11:05 am: **Organic light-emitting transistors based on vertically engineered three-components heterojunctions** *(Invited Paper)*, Michele Muccini, Raffaella Capelli, Stefano Toffanin, Mauro Murgia, Franco Dinelli, Consiglio Nazionale delle Ricerche (Italy); Antonio Facchetti, Northwestern Univ.; Roberto Zamboni, Consiglio Nazionale delle Ricerche (Italy) . . [7051-26]

11:30 am: **Current development status and issues of AMOLED toward an invaluable display** *(Invited Paper)*, Mu-Hyun Kim, Samsung SDI (South Korea) . . . . . [7051-27]

11:55 am: **FDTD simulations of external light out-coupling efficiency of organic field-effect transistors**, Robert Gehlhaar, Tomo Sakanoue, Masayuki Yahiro, Chihaya Adachi, Kyushu Univ. (Japan) . . . . . [7051-28]

12:10 pm: **All-phosphor white light-emitting diodes based on endothermic population of the blue phosphor leading to high-power efficiency**, Sebastian Reineke, Gregor Schwartz, Karsten Walzer, Karl Leo, Technische Univ. Dresden (Germany) . . . . . [7051-30]

Lunch Break . . . . . 12:25 to 1:50 pm

SESSION 6

Room: Conv. Ctr. 6E . . . . . Mon. 1:25 to 3:30 pm

Interfaces

Session Chair: **Alasdair J. Campbell,** Imperial College London (United Kingdom)

1:25 pm: **Methods for estimation of carrier injection barrier at metal/organic interfaces** *(Invited Paper),* Chun Sing Lee, City Univ. of Hong Kong (Hong Kong China) . . . . . [7051-71]

1:50 pm: **Controlling organic-organic interfaces for efficient optoelectronic devices** *(Invited Paper)*, Ji-Seon Kim, Imperial College London (United Kingdom); Keng-Hoong Yim, AnnaMaria Petrozza, Jessica Winfield, Richard H. Friend, Univ. of Cambridge (United Kingdom); Craig Murphy, National Physical Lab. (United Kingdom); Jeremy H. Burroughes, Cambridge Display Technology Ltd. (United Kingdom) . . . . . [7051-31]

2:15 pm: **Metal/fullerene electrode structure: physics and device applications** *(Invited Paper)*, Zhenghong Lu, Univ. of Toronto (Canada) . . . . . [7051-32]

2:40 pm: **Effective anode surface area and interfacial traps as controlling factors for hole injection into polymer light-emitting diodes with and without interlayers: implications for polymer field-effect transistors and photovoltaics** *(Invited Paper)*, Alasdair J. Campbell, Imperial College London (United Kingdom). . . . . [7051-33]

3:05 pm: **Electronic structure of doping in organic semiconductor** *(Invited Paper)*, Yongli Gao, Univ. of Rochester. . . . . [7051-34]

Coffee Break . . . . . 3:30 to 4:00 pm

SESSION 7

Room: Conv. Ctr. 6E . . . . . Mon. 4:00 to 6:05 pm

Injection and Transport

Session Chair: **Chun Sing Lee,** City Univ. of Hong Kong (Hong Kong China)

4:00 pm: **Formation of ohmic contact and improvement in performance of organic light-emitting diodes by using an ultrathin hole-injection layer of molybdenum oxide** *(Invited Paper)*, Toshinori Matsushima, Murata Hideyuki, Japan Advanced Institute of Science and Technology (Japan) . . . . . [7051-35]

4:25 pm: **Hole mobility probed by advanced UPS** *(Invited Paper)*, Nobuo Ueno, Chiba Univ. (Japan). . . . . [7051-36]

4:50 pm: **Contribution of efficient hole injection to OLED performance for display and lighting applications** *(Invited Paper),* Mathew K. Mathai, Shawn Williams, Brian Woodworth, Darin Laird, Venkataramanan Seshadri, Christopher Brown, Jessica Benson-Smith, Plextronics Inc. . . . . [7051-37]

5:15 pm: **The application and influence of PEDOT:PSS in organic LEDs and photodiodes** *(Invited Paper)*, John C. de Mello, Imperial College London (United Kingdom). . . . . [7051-38]

5:40 pm: **Solution processed organic light-emitting diodes with improved cathode interfacial structure** *(Invited Paper)*, Yang Yang, Juohao Li, Univ. of California/Los Angeles . . . . . [7051-39]

Tuesday 12 August

SESSION 8

Room: Conv. Ctr. 10 . . . . . .Tues. 8:00 to 9:30 am

Solid State Lighting and OLEDs Plenary Session

Session Chair: **Franky So,** Univ. of Florida

View plenary presentation details p. 16.

8:00 am: **Why the Developing World is the Perfect Market Place for SSL**, Dave Irvine-Halliday, Univ. of Calgary (Canada) . . . . . [7058-101]

8:45 am: **The Use of Heavy Metal Complexes in Solid State Light Sources (OLEDs) (Presentation Only),** Mark E. Thompson, Univ. of Southern California

SESSION 9

Room: Conv. Ctr. 10 . . . . . Tues. 9:30 am to 12:00 pm

OLEDs and Solid State Lighting

Session Chair: **Franky So,** Univ. of Florida

Joint session with Conference 7058: Eighth International Conference on Solid State Lighting

9:30 am: **DOE solid state lighting program overview** *(Invited Paper)*, Ryan J. Egidi, National Energy Technology Lab. . . . . [7051-40]

9:55 am: **Nanostructured LEDs for lighting** *(Invited Paper)*, Norbert Linder, OSRAM Opto Semiconductors GmbH (Germany) . . . . . [7058-11]

Coffee Break . . . . . 10:20 to 10:45 am

10:45 am: **High-performance OLEDs and their application to lighting** *(Invited Paper)*, Nobuhiro Ide, Takuya Komoda, Matsushita Electric Works, Ltd. (Japan). . . . . [7051-41]

11:10 am: **Improvement of efficiency droop by resonance tunneling LED** *(Invited Paper)*, Wang N. Wang, Univ. of Bath (United Kingdom) . . . . [7058-12]

11:35 am: **OLEDs for lighting applications** *(Invited Paper)*, Volker van Elsbergen, Herbert F. Boerner, Georg Gaertner, Claudia Goldmann, Stefan Grabowski, Horst J. Greiner, Hans-Peter Loebl, Edward W. A.Young, Philips Research Labs. (Germany) . . . . . [7051-42]

Lunch/Exhibition Break . . . . . 12:00 to 1:00 pm

SESSION 10

Room: Conv. Ctr. 6E . . . . . Tues. 1:00 to 3:00 pm

Charge Injection and Transport in Organic Light-Emitting Diodes and Solar Cells

Session Chair: **Jang-Joo Kim,** Seoul National Univ. (South Korea)

Joint session with Conference 7052: Organic Photovoltaics IX

1:00 pm: **Carrier injection and transport in molecularly doped organic materials** *(Invited Paper)*, S. K. So, K. K. Tsung, Hong Kong Baptist Univ. (Hong Kong China) . . . . . [7051-43]

1:25 pm: **Multi-scale modeling of charge transport in disordered organic semiconductors** *(Invited Paper)*, Jenny Nelson, Imperial College London (United Kingdom). . . . . [7052-01]

1:50 pm: **Stacking matters in polymer heterojunctions**, Eric R. Bittner, Univ. of Houston. . . . . [7052-02]

2:05 pm: **Investigations of electron-injection mechanisms and interfacial chemical reactions of Bphen doped with rubidium carbonate in OLEDs**, Mei-Hsin Chen, National Taiwan Univ. (Taiwan); Dong-Seok Leem, Jang-Joo Kim, Seoul National Univ. (South Korea); Chih-I Wu, National Taiwan Univ. (Taiwan) . . . . . [7051-44]

2:20 pm: **Charge-injecting layer for admittance spectroscopy** *(Invited Paper)*, Matthias Hoping, Technische Univ. Braunschweig (Germany); Christian Schildknecht, BASF Aktiengesellschaft (Germany); Hassan Gargouri, Thomas Riedl, Markus Tilgner, Hans-Hermann Johannes, Wolfgang Kowalsky, Technische Univ. Braunschweig (Germany) . . . . . [7051-45]

2:45 pm: **A doping mechanism for organic semiconductors derived from SXPS measurements on coevaporated films of CuPc and TCNQ**, Thomas H. Mayer, Corinna Hein, Eric Mankel, Wolfram Jaegermann, Technische Univ. Darmstadt (Germany) . . . . . [7052-03]

Coffee Break . . . . . 3:00 to 3:30 pm

SESSION 11

Room: Conv. Ctr. 6E . . . . . Tues. 3:30 to 5:30 pm

Organic Lasers

Session Chair: **Joseph Shinar,** Iowa State Univ.

Joint session with Conference 7049: Linear and Nonlinear Optics of Organic Materials VIII

3:30 pm: **Toward practical polymer lasers** *(Invited Paper)*, Graham A. Turnbull, Ying Yang, Scott Richardson, Ifor D. Samuel, Univ. of St. Andrews (United Kingdom). . . . . [7051-46]

3:55 pm: **Ultrafast optical switching and laser dynamics in distributed feedback polymer lasers**, Stefano Perissinotto, Margherita Zavelani-Rossi, Marco Carvelli, Guglielmo Lanzani, Politecnico di Milano (Italy); Marco Salerno, Instituto Italiano di Tecnologia (Italy); Giuseppe Gigli, Univ. degli Studi di Lecce (Italy) . . . . . [7051-47]

4:10 pm: **Organic self-doubled laser sources**, Alain F. Fort, Alberto Barsella, Jean-Pierre Vola, Daniel Acker, Institut de Physique et Chimie des Matériaux de Strasbourg (France); David Kreher, André-Jean Attias, Univ. Pierre et Marie Curie (France) . . . . . [7049-01]

4:25 pm: **Coherent control of OLEDs** *(Invited Paper)*, John M. Lupton, The Univ. of Utah . . . . . [7051-48]

4:50 pm: **A new injection scheme for an up-conversion organic laser** *(Invited Paper)*, Jean-Michel Nunzi, Queen's Univ. (Canada) . . . . . [7051-49]

5:15 pm: **Lateral molecular orientation in organic amorphous films and its effect on cutoff emissions from edges,** Daisuke Yokoyama, Chihaya Adachi, Kyushu Univ. (Japan). . . . . [7051-50]

Poster/Demo Session-Tuesday

Room: Conv. Ctr. Exhibit Hall B2 . . . . . Tues. 8:00 to 10:00 pm

Poster authors will begin displaying posters after 10:00 am Tuesday morning. A poster session and demo session, with authors present at their posters, will be held Tuesday evening from 8:00 to 10:00 pm. Light refreshments will be served.

Poster Setup

Poster presenters must set up their posters between 10:00 am and 5:00 pm on Tuesday. Poster presenters who have not set up by 5:00 pm on Tuesday will be considered a "no show" and their manuscript will not be published. Presenters must remove their posters immediately after the poster session. Posters not removed will be considered unwanted and will be discarded. SPIE assumes no responsibility for posters left up after the end of each poster session.

The Purcell effect on light emission of organic light-emitting devices, Wallace C. H.Choy, Hongmei Zhang, Xue-Wen Chen, The Univ. of Hong Kong (Hong Kong China); Sailing He, Zhejiang Univ. (China). . . . . [7051-51]

Highly color-stable white fluorescent OLEDs, Anne Köhnen, Nina Rehmann, Malte C. Gather, Philipp Zacharias, Klaus Meerholz, Univ. zu Köln (Germany) [7051-52]

Au modified by vanadium pentoxide as anode for high-efficiency organic light-emitting diodes, Hongmei Zhang, Jilin Univ. (China) . . . . . [7051-53]

Determination of carrier mobility of amorphous organic electronic material by thin film transistor configuration, C. H. Cheung, K. K. Tsung, S. K. So, Hong Kong Baptist Univ. (Hong Kong China) . . . . . [7051-54]

Material and device properties of nematic glasses and polymer networks for organic electroluminescence, Mary O'Neill, Alicia Liedtke, Steve Kelly, Stuart Kitney, Matt Aldred, Panos Vlachos, The Univ. of Hull (United Kingdom). . . . . [7051-55]

High-efficiency green phosphorescent OLEDs with long lifetime by using novel host materials, Eunsun Yu, Namsoo Kim, Euisu Kang, Younghoon Kim, Miyoung Chae, Tuwon Chang, Cheil Industries, Inc. (South Korea) . . [7051-57]

Courses of Related Interest

See SPIE Cashier for information and to register.

SC657 Accurate Measurement of LED Optical Properties (Tirpak)
Wednesday, 1:30 to 5:30 pm

Conference 7052

Tuesday-Thursday 12-14 August 2008 • Proceedings of SPIE Vol. 7052

Organic Photovoltaics IX

Conference Chair: **Zakya H. Kafafi,** National Science Foundation

Conference Co-Chairs: **Christoph J. Brabec,** Konarka Austria (Austria); **Paul A. Lane,** Naval Research Lab.

Program Committee: **Katsuhiko Fujita,** Kyushu Univ. (Japan); **Rene A. J. Janssen,** Technische Univ. Eindhoven (Netherlands); **Bernard Kippelen,** Georgia Institute of Technology; **Kwanghee Lee,** Gwangju Institute of Science and Technology (South Korea); **Toby B. Meyer,** Solaronix SA (Switzerland); **Peter Peumans,** Stanford Univ.; **Sean E. Shaheen,** Univ. of Denver; **Yasuhiko Shirota,** Fukui Univ. of Technology (Japan)

Monday 11 August

Room: Conv. Ctr. 6A . . . . . .Mon. 1:30 to 4:30 pm

Solar Energy Plenary Session

Session Chair: **Ravi Durvasula,** Lightfleet Corp.

View plenary presentation details p. 15-16.

1:30 pm: **Nanostructures for High Efficiency Photovoltaics**, Harry A. Atwater, California Institute of Technology . . . . . [7047-102]

2:00 pm: **The Environment's Effects on Solar Radiation** *(Presentation Only)*, Joseph J. Michalsky, Jr., NOAA Earth System Research Lab. . . . . [7046-103]

2:30 pm: **Direct Conversion of Solar Energy to Hydrogen**, Craig A. Grimes, The Pennsylvania State Univ. . . . . [7044-105]

Coffee Break . . . . . 3:00 to 3:30 pm

3:30 pm: **Reliability of PV Systems**, John H. Wohlgemuth, BP Solar International LLC . . . . . [7048-101]

4:00 pm: **Commercializing CPV: What Lies Ahead?,** Dave Holland, Solar Systems Pty Ltd. (Australia) . . . . . [7043-104]

Tuesday 12 August

SESSION 1

Room: Conv. Ctr. 6E . . . . . .Tues. 1:00 to 3:00 pm

Charge Injection and Transport in Organic Light Emitting Diodes and Solar Cells

Session Chair: **Christoph J. Brabec,** Konarka Austria (Austria)

Joint session with Conference 7051: Organic Light Emitting Materials and Devices XII

1:00 pm: **Carrier injection and transport in molecularly doped organic materials** *(Invited Paper)*, S. K. So, K. K. Tsung, Hong Kong Baptist Univ. (Hong Kong China) . . . . . [7051-43]

1:25 pm: **Multi-scale modeling of charge transport in disordered organic semiconductors** *(Invited Paper)*, Jenny Nelson, Imperial College London (United Kingdom). . . . . [7052-01]

1:50 pm: **Stacking matters in polymer heterojunctions**, Eric R. Bittner, Univ. of Houston. . . . . [7052-02]

2:05 pm: **Investigations of electron-injection mechanisms and interfacial chemical reactions of Bphen doped with rubidium carbonate in OLEDs**, Mei-Hsin Chen, National Taiwan Univ. (Taiwan); Dong-Seok Leem, Jang-Joo Kim, Seoul National Univ. (South Korea); Chih-I Wu, National Taiwan Univ. (Taiwan) . . . . . [7051-44]

2:20 pm: **Charge-injecting layer for admittance spectroscopy** *(Invited Paper)*, Matthias Hoping, Technische Univ. Braunschweig (Germany); Christian Schildknecht, BASF Aktiengesellschaft (Germany); Hassan Gargouri, Thomas Riedl, Markus Tilgner, Hans-Hermann Johannes, Wolfgang Kowalsky, Technische Univ. Braunschweig (Germany) . . . . . [7051-45]

2:45 pm: **A doping mechanism for organic semiconductors derived from SXPS measurements on coevaporated films of CuPc and TCNQ**, Thomas H. Mayer, Corinna Hein, Eric Mankel, Wolfram Jaegermann, Technische Univ. Darmstadt (Germany) . . . . . [7052-03]

Coffee Break . . . . . 3:00 to 3:30 pm

SESSION 2

Room: Conv. Ctr. 8 . . . . . .Tues. 3:30 to 5:02 pm

Reliability of Flexible Packaging

Session Chair: **John Pern,** National Renewable Energy Lab.

Joint session with Conference 7048: Reliability of Photovoltaic Cells, Modules, Components, and Systems

3:30 pm: **Flexible packaging for PV modules** *(Invited Paper)*, Neelkanth G. Dhere, Univ. of Central Florida . . . . . [7048-29]

3:55 pm: **Lifetime testing methods for high-performance organic photovoltaics: toward a standardized method and commercialization considerations** *(Invited Paper)*, Darin Laird, Swanand S. Vaidya, Shijun Jia, Sergey B. Li, Jan Bernkopf, Plextronics Inc.. . . . . [7052-04]

4:20 pm: **Methodology and systems to ensure reliable thin-film PV modules** *(Invited Paper)*, Jon Call, Uday Varde, Mike Walters, Alla Konson, Subhendu Guha, United Solar Ovonic, LLC . . . . . [7048-30]

4:45 pm: **Statistical data analysis of thin film PV modules deployed in hot and humid climate of Florida,** Shirish A. Pethe, Ashwani Kaul, Neelkanth G. Dhere, Univ. of Central Florida . . . . . [7048-31]

Poster/Demo Session-Tuesday

Room: Conv. Ctr. Exhibit Hall B2 . . . . .Tues. 8:00 to 10:00 pm

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Poster Setup

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Molecular semiconductors incorporating a diketopyrrolopyrrole chromophore for solution processed organic field effect transistors and photovoltaic cells, Arnold Tamayo, Mananya Tantiwiwat, Thuc-Quyen T. Nguyen, Univ. of California/Santa Barbara . . . . . [7052-34]

Aromatic n-type semiconductors for organic solar cells, Ying Shu, John E. Anthony, Univ. of Kentucky. . . . . [7052-35]

Soluble pentacene derivatives as acceptors for organic photovoltaics, Yee-Fun Lim, Cornell Univ.; Ying Shu, John E. Anthony, Univ. of Kentucky; George G. Malliaras, Cornell Univ. . . . . [7052-36]

Schottky barrier formation using composite of polyaniline containing iron oxides, Hussen A. Motaweh, Alexandria Univ. (Egypt); Tharwat G. Abdel-Malik, Minia Univ. (Egypt). . . . . [7052-37]

Dye-sensitized solar cells based on ZnO nanorod arrays, Yu Xie, South Dakota State Univ.; Shaoyan Li, Ting Zhang, Beijing Jiaotong Univ. (China); Prakash Joshi, South Dakota State Univ.; Hao Fong, South Dakota School of Mines and Technology; Michael Ropp, David W. Galipeau, Qiquan Qiao, South Dakota State Univ. . . . . [7052-38]

Organic photovoltaics based on liquid crystal porous networks, Mary O'Neill, Manea S. Al Khalifah, Chunghong Lei, Wing C. Tsoi, Steve M. Kelly, Stuart P. Kitney, Matt P. Aldred, Panos Vlachos, The Univ. of Hull (United Kingdom) . . . . . [7052-39]

Fabrication of bulk heterojunction photovoltaic cells with controlled distribution of p-n components by evaporative spray deposition from ultradilute solution, Masato Shakutsui, Ryoji Maeda, Kyushu Univ. (Japan); Katsuhiko Fujita, Tetsuo Tsutsui, Institute for Materials Chemistry and Engineering, Kyushu Univ. (Japan) and Graduate School of Engineering Sciences, Kyushu Univ. (Japan) . . . . . [7052-40]

Efficacious photocurrent generation and carrier transport by quantum dot decorated carbon nanotubes, Chandan Biswas, Seung Yol Jeong, Seong Chu Lim, Dong Jae Bae, Young Hee Lee, Sungkyunkwan Univ. (South Korea) . . . . . [7052-41]

Fabrication and characterization of tandem polymer solar cells, Lenneke H. Slooff, Wilma Eerenstein, Sjoerd C. Veenstra, Wiljan J. H.Verhees, Jan M. Kroon, Energy Research Ctr. of the Netherlands (Netherlands) . . . . . [7052-42]

Model for adsorption kinetics of a ruthenium-based sensitizing dye to porous nanocrystalline TiO_2, Wouter Moons, Koen Vandewal, Abay Gadisa Dinku, Jean V. Manca, Univ. Hasselt (Belgium) . . . . . [7052-43]

Charge transport properties of P3HT/surface modified TiO_2 bulk heterojunction systems, Fang-Chi Hsu, Yulia Galagan, Jui-Hung Hsu, Yu-Ching Huang, Chun-Wei Chen, Wei-Fang Su, National Taiwan Univ. (Taiwan) . . . . . [7052-45]

Interfacial adhesion in polymer blend P3HT:PCBM solar cells, Ayse Z. Turak, Max-Planck-Institut für Metallforschung (Germany); Esther Barrena, Max-Planck-Institut für Metallforschung (Germany) and Univ. Stuttgart (Germany); Jonas Hanisch, Erik Ahlswede, Zentrum für Sonnenenergie- und Wasserstoff-Forschung (Germany); Helmut Dosch, Max-Planck-Institut für Metallforschung (Germany) and Univ. Stuttgart (Germany) . . . . . [7052-46]

Improving the conductivity of hole injection layer by heating PEDOT:PSS, Kao-Hua Tsai, Ching-Fuh Lin, National Taiwan Univ. (Taiwan). . . . . [7052-47]

Intrinsic photoconductivity of single-walled carbon nanotubes, Andrew J. Ferguson, Jeffrey L. Blackburn, Robert Tenent, Nikos Kopidakis, Michael J. Heben, Garry Rumbles, National Renewable Energy Lab. . . . . [7052-48]

Modulations of photo-induced magneto conductance for polymer photovoltaic cells, Tsung-Hsun Lee, J. C. A.Huang, Ten-Chin Wen, Tzung-Fang Guo, National Cheng Kung Univ. (Taiwan). . . . . [7052-50]

Photosynthetic RC protein as a photo-nano-electronic device, Stanislav Tsoi, Scott A. Trammell, Naval Research Lab.; Igor Griva, George Mason Univ.; Anthony Spano, Univ. of Virginia; Joel Schnur, George Mason Univ.; Nikolai Lebedev, Naval Research Lab. . . . . [7052-51]

Organic photovoltaic cells with near-infrared sensitivity, Do Young Kim, Kaushik Roy-Choudhury, Jiyon Song, Franky So, Univ. of Florida. . . [7052-52]

New deep-red-emitting polymers derived from indenoindene and benzothiadiazole for photovoltaic cells, Hongsuk Suh, Youngeup Jin, Suhee Song, Pusan National Univ. (South Korea); Sun Hee Kim, Gwangju Institute of Science and Technology (South Korea); Youngran Goo, Jin-A Park, Pusan National Univ. (South Korea); Kwanghee Lee, Gwangju Institute of Science and Technology (South Korea). . . . . [7052-53]

Colloidal crystals as nanostructured templates for organic solar cells, Sarah Berhanu, Martyn A. McLachlan, David W. McComb, Imperial College London (United Kingdom); Tim S. Jones, Univ. of Warwick (United Kingdom) . . . . . [7052-54]

Wednesday 13 August

SESSION 3

Room: Conv. Ctr. 6E . . . . . Wed. 8:30 to 10:00 am

Novel Structures and Materials for Organic Photovoltaics

Session Chair: **Zakya H. Kafafi,** National Science Foundation

8:30 am: **Small band gap and multi-junction polymer solar cells** *(Invited Paper)*, Rene A. J.Janssen, Jan Gilot, Martijn Wienk, Technische Univ. Eindhoven (Netherlands); Mathieu Turbiez, Ciba Specialty Chemicals Inc. (Switzerland) . . . . . [7052-05]

9:00 am: **Fiber-based organic photovoltaic devices** *(Invited Paper)*, Max Shtein, Univ. of Michigan . . . . . [7052-06]

9:30 am: **Bipolar charge transport in PCPDTBT-PCBM bulk-heterojunctions for photovoltaic applications** *(Invited Paper)*, Gilles Dennler, Konarka Austria (Austria). . . . . [7052-07]

Coffee Break . . . . . 10:00 to 10:30 am

SESSION 4

Room: Conv. Ctr. 6E . . . . . Wed. 10:30 am to 12:11 pm

Reliability of Organic Photovoltaics II

Session Chair: **Gilles Dennler,** Konarka Austria (Austria)

Joint session with Conference 7048: Reliability of Photovoltaic Cells, Modules, Components, and Systems

10:30 am: **Report from the OPV lifetime workshop: emerging roadmap** *(Invited Paper)*, David S. Ginley, National Renewable Energy Lab.. . . [7052-08]

10:55 am: **Getting ready for industrialization, stability, and cost assessments of dye solar cells** *(Invited Paper)*, Toby B. Meyer, David Martineau, Asef Azam, Andreas F. Meyer, Solaronix SA (Switzerland)[7052-09]

11:20 am: **Relationship between encapsulation barrier performance and organic solar cell lifetime**, Stéphane Cros, Stephane Guillerez, Rémi de Bettignies, Noëlla Lemaître, Severine Bailly, Pascal Maisse, Commissariat à l'Energie Atomique (France) . . . . . [7048-32]

11:37 am: **Thin film encapsulation of organic photovotaics with ALD and PECVD processing**, Namsu Kim, Georgia Institute of Technology; Seunghyup Yoo, Korea Advanced Institute of Science and Technology (South Korea); William Potscavage, Benoit Domercq, Bernard Kippelen, Samuel Graham, Georgia Institute of Technology . . . . . [7048-33]

11:54 am: **Influence of the metal/organic interface on device performance and stability**, Matthew O. Reese, Anthony J. Morfa, Matthew S. White, Nikos Kopidakis, National Renewable Energy Lab.; Sean E. Shaheen, Univ. of Denver; Garry Rumbles, David S. Ginley, National Renewable Energy Lab. . . . . [7052-10]

Lunch/Exhibition Break . . . . . 12:11 to 1:15 pm

SESSION 5

Room: Conv. Ctr. 6E . . . . . Wed. 1:15 to 3:35 pm

Accurate Measurement of the Efficiency of Organic Photovoltaic Devices

Session Chair: **Yang Yang,** Univ. of California/Los Angeles

1:15 pm: **Efficiency of organic photovoltaics: an overview** *(Invited Paper)*, Christoph J. Brabec, Konarka Austria (Austria). . . . . [7052-11]

1:45 pm: **Accurate measurement of solar cell efficiency** *(Invited Paper)*, Keith E. Emery, National Renewable Energy Lab.. . . . . [7052-12]

2:15 pm: **Measurement issues of organic solar cell** *(Invited Paper)*, Gang Li, Vishal Shrotriya, Solarmer Energy Inc.; Yang Yang, Univ. of California/Los Angeles . . . . . [7052-13]

2:45 pm: **Performance measurement of dye-sensitized solar cells and organic polymer solar cells** *(Invited Paper)*, Yoshihiro Hishikawa, National Institute of Advanced Industrial Science and Technology (Japan) . . . [7052-14]

3:15 pm: **Panel Discussion on Device Measurement**

Coffee Break . . . . . 3:35 to 4:00 pm

SESSION 6

Room: Conv. Ctr. 6E . . . . . .Wed. 4:00 to 5:20 pm

Multilayer Organic Photovoltaics with a p-i-n Structure

Session Chair: **Paul L. Heremans,** IMEC (Belgium)

4:00 pm: **Efficient organic p-i-n solar cells having very thick codeposited i-layer composed of highly purified organic semiconductors** *(Invited Paper)*, Masahiro Hiramoto, Osaka Univ. (Japan) . . . . . [7052-15]

4:30 pm: **Organic p-i-n solar cells** *(Invited Paper)*, Moritz K. Riede, Rico Schueppel, Christiane Falkenberg, Rudolf Lessmann, Jan Meiss, Toni Mueller, Steffen Pfuetzner, Ronny Timmreck, Wolfgang Tress, David Wynands, Hannah Ziehlke, Annette Petrich, Technische Univ. Dresden (Germany); Peter Baeuerle, Univ. Ulm; Karl Leo, Technische Univ. Dresden (Germany) [7052-16]

5:00 pm: **Organic photovoltaic cell based on benzoporphyrin with p-i-n junction,** Yoshiharu Sato, Takaaki Niinomi, Yoko Abe, Yutaka Matsuo, Japan Science & Technology Agency (Japan); Eiichi Nakamura, The Univ. of Tokyo (Japan). . . . . [7052-17]

Room: Marriott Santa Rosa . . . . . Wed. 5:30 to 7:00 pm

Panel on Prospects for Organic Photovoltaics

Panel Moderator: **Sean E. Shaheen,** Univ. of Denver

Panelists:

Christoph Brabec or **Gilles Dennler,** Konarka Technologies
Darin Laird, Plextronics Inc.
Yang Yang, Solarmer Energy, Inc.
Moritz Riede, Institute for Applied Photophysics
Toby Meyer, Solaronix
David Ginley, National Renewable Energy Lab.
Garry Rumbles, National Renewable Energy Lab.
Bolko von Roedern, National Renewable Energy Lab.
Lenneke Slooff, Energy Research Centre of the Netherlands
Paul Heremans, Institute for Microelectronics, Belgium

Thursday 14 August

SESSION 7

Room: Conv. Ctr. 6E . . . . . .Thurs. 8:00 to 9:50 am

Physics of Multi- and Bulk Heterojunction Solar Cells

Session Chair: **Rene A. J. Janssen,** Technische Univ. Eindhoven (Netherlands)

8:00 am: **Physics of planar heterojunction organic photovoltaic cells** *(Invited Paper)*, Paul L. Heremans, David Cheyns, IMEC (Belgium) and Katholieke Univ. Leuven (Belgium); Hans Gommans, IMEC (Belgium)[7052-18]

8:30 am: **Crystalline-crystalline organic photovoltaic binaries: a simple rationale for optimum compositions**, Christian Muller, ETH Zürich (Switzerland); Paul Smith, ETH Zurich (Switzerland); Natalie Stingelin-Stutzmann, Queen Mary Univ. of London (United Kingdom); Toby A. M.Ferenczi, Mariano Campoy-Quiles, Jarvis Frost, Jenny Nelson, Donal D. C.Bradley, Imperial College London (United Kingdom) . . . . . [7052-19]

8:50 am: **Lateral and vertical diffusion in polymer: fullerene solar cells**, Toby A. M.Ferenczi, Mariano Campoy-Quiles, Jenny Nelson, Donal D. C.Bradley, Imperial College London (United Kingdom) . . . . . [7052-20]

9:10 am: **Implications of a reduced bimolecular recombination on polymer: fullerene solar cells**, Carsten Deibel, Andreas Baumann, Alexander Wagenpfahl, Vladimir Dyakonov, Univ. Würzburg (Germany) . . . . . [7052-21]

9:30 am: **Interdigitated photoconductors using organic and small molecule materials**, Alyson C. Niemeyer, Los Alamos National Lab. and Univ. of Florida; Ian H. Campbell, Los Alamos National Lab.; Franky So, Univ. of Florida; Brian K. Crone, Los Alamos National Lab.. . . . . [7052-22]

Coffee Break . . . . . 9:50 to 10:20 am

SESSION 8

Room: Conv. Ctr. 6E . . . . . Thurs. 10:20 to 11:50 am

Hybrid Solar Cells with Organic and Inorganic Components

Session Chair: **Toby B. Meyer,** Solaronix SA (Switzerland)

10:20 am: **Infrared dye-sensitized solar cells** *(Invited Paper)*, Craig A. Grimes, Karthik Shankar, Oomman Varghese, Maggie Paulose, The Pennsylvania State Univ. . . . . [7052-23]

10:50 am: **Photoexcitation dynamics in zinc oxide/polythiophene composites**, Matthew T. Lloyd, Sandia National Labs.; Rohit P. Prasankumar, Los Alamos National Lab.; Michael B. Sinclair, Yun-ju Lee, Julia W.Hsu, Sandia National Labs. . . . . [7052-24]

11:10 am: **Hybrid solar cells based on liquid crystalline conjugated polymer/ZnO composites**, Dana C. Olson, National Renewable Energy Lab.; Timothy N. Lambert, Yun-Ju Lee, Sandia National Labs.; Matthew S. White, National Renewable Energy Lab.; Sean E. Shaheen, Univ. of Denver; David S. Ginley, National Renewable Energy Lab.; David R. Wheeler, James A. Voigt, Julia W.Hsu, Sandia National Labs. . . . . [7052-25]

11:30 am: **Improved performance of polymer/TiO_2 nanorod bulk heterojunction photovoltaic devices by interface modification**, Chun-Wei Chen, National Taiwan Univ. (Taiwan). . . . . [7052-26]

Lunch/Exhibition Break . . . . . 11:50 am to 1:10 pm

SESSION 9

Room: Conv. Ctr. 6E . . . . . Thurs. 1:10 to 3:30 pm

New Materials for Organic Photovoltaics

Session Chair: **Paul A. Lane,** Naval Research Lab.

1:10 pm: **Optimizing donors for organic photovoltaic devices** *(Invited Paper)*, Nikos Kopidakis, National Renewable Energy Lab. . . . . [7052-28]

1:40 pm: **Organic photovoltaic cells from self-organizing liquid crystalline phthalocyanines**, Neal R. Armstrong, Mariola R. Macech, Niranjani Kumaran, Peter A. Veneman, Britt A. Minch, The Univ. of Arizona . . . . . [7052-29]

2:00 pm: **Improved acceptor materials for organic solar cells**, Martin Drees, Claudia Cardona, Brian C. Holloway, Luna Innovations Inc.; Russel B. Ross, Edward R. Van Keuren, Georgetown Univ.; Matthew O. Reese, Nikos Kopidakis, David S. Ginley, National Renewable Energy Lab.; Dirk M. Guldi, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany) . . . . . [7052-30]

2:20 pm: **Development of novel conjugated donor polymers for high-efficiency bulk-heterojunction photovoltaic devices** *(Invited Paper)*, Yong Cao, Ergang Wang, Li Wang, Yangjun Xia, Mingliang Sun, Feng Wang, Junwu Chen, South China Univ. of Technology (China). . . . . [7052-31]

2:50 pm: **Selenophene-based polymers as potential donors in bulk heterojunction OPV cells**, Martin J. Heeney, Mo Baklar, Queen Mary Univ. of London (United Kingdom); Weimin Zhang, Warren Duffy, Merck Chemicals Ltd. (United Kingdom); David Sparrowe, Merck Chemicals Ltd. (United Kingdom) and Queen Mary Univ. of London (United Kingdom); Iain McCulloch, Rick Hamilton, James R. Durrant, Amy M. Ballantyne, Jenny Nelson, LiChun Chen, Donal D. C.Bradley, Imperial College London (United Kingdom); Peter J. Skabara, Univ. of Strathclyde (United Kingdom). . . . . [7052-32]

3:10 pm: **A low-energy gap and fully regioregular poly(3-Dodecyl-2,5-thienylenevinylene) for photovoltaics**, Sam-Sha-jing Sun, Cheng Zhang, Shahin Maaref, Norfolk State Univ. . . . . [7052-33]

Courses of Related Interest

See SPIE Cashier for information and to register.

SC797 The Science and Technology of Organic Solar Cells (Peumans) Tuesday, 8:30 am to 12:30 pm

NEW! SC910 Design and Reliability of Photovoltaic Modules (Dhere, Wohlgemuth) Wednesday, 1:30 to 5:30 pm

Conference 7053

Tuesday 12 August 2008 • Proceedings of SPIE Vol. 7053

Organic 3D Photonics Materials and Devices II

Conference Chair: **Susanna Orlic,** Technische Univ. Berlin (Germany)

Conference Co-Chair: **Robert R. McLeod,** Univ. of Colorado at Boulder

Program Committee: **Yasuo Tomita,** The Univ. of Electro-Communications (Japan); **Michael Cole,** InPhase Technologies Inc.

Tuesday 12 August

SESSION 1

Room: Conv. Ctr. 7A . . . . . .Tues. 8:30 to 10:00 am

Materials and Effects I

Session Chair: **Susanna Orlic,** Technische Univ. Berlin (Germany)

8:30 am: **Update on InPhase holographic media** *(Invited Paper)*, Michael Cole, InPhase Technologies Inc. . . . . [7053-01]

9:00 am: **Optical characterization of photopolymer and photoresist materials for storage, sensing, and security applications**, Timo Feid, Sven Frohmann, Jens Rass, Susanna Orlic, Technische Univ. Berlin (Germany) . . . . . [7053-02]

9:20 am: **3D structures using surface relief gratings of azobenzene materials**, Joachim Stumpe, L. Goldenberg, Yuri Gritsai, Olga Kulikovska, Fraunhofer-Institut für Angewandte Polymerforschung (Germany) . . [7053-03]

9:40 am: **Degenerate four-wave mixing experiments in fast green FCF dye-doped gelatin film**, Mohammad H. Majles Ara, Teacher Training Univ. (Iran); Samaneh Mehrabani, Tarbiat Modares Univ. (Iran); Rasoul Malekfar, Tarbiat Modarres Univ. (Iran). . . . . [7053-04]

Coffee Break . . . . . 10:00 to 10:30 am

SESSION 2

Room: Conv. Ctr. 7A . . . . . Tues. 10:30 am to 12:00 pm

Applications and Devices I

Session Chair: **Robert R. McLeod,** Univ. of Colorado at Boulder

10:30 am: **The tapestry 300R high-performance optical drive: holographic storage reaches product debut** *(Invited Paper)*, William L. Wilson, InPhase Technologies Inc. . . . . [7053-05]

11:00 am: **Impact of spherical aberration on the performance of microholographic data storage** *(Invited Paper)*, Jens Rass, Enrico Dietz, Alan Guenther, Sven Frohmann, Susanna Orlic, Technische Univ. Berlin (Germany) . . . . . [7053-06]

11:30 am: **Progress in two-photon 3D optical data storage** *(Invited Paper)*, Edwin P. Walker, Call/Recall, Inc.; Alexander S. Dvornikov, Peter M. Rentzepis, Univ. of California/Irvine . . . . . [7053-07]

Lunch/Exhibition Break . . . . . 12:00 to 1:50 pm

SESSION 3

Room: Conv. Ctr. 7A . . . . . .Tues. 1:50 to 3:10 pm

Applications and Devices II

Session Chair: **Michael Cole,** InPhase Technologies Inc.

1:50 pm: **Three-dimensional waveguide arrays via projection lithography into a moving photopolymer** *(Invited Paper)*, Eric D. Moore, Robert R. McLeod, Univ. of Colorado at Boulder . . . . . [7053-08]

2:20 pm: **Three-dimensional photonic gratings for optical sensing and image processing**, Alexander Schloesser, Henning Markoetter, Christian Mueller, Susanna Orlic, Technische Univ. Berlin (Germany). . . . . [7053-09]

2:40 pm: **Optoelectronic printed circuit board: 3D structures written by two-photon absorption** *(Invited Paper)*, Ruth Houbertz-Krauss, Fraunhofer-Institut für Silicatforschung (Germany) . . . . . [7053-11]

Coffee Break . . . . . 3:10 to 3:40 pm

SESSION 4

Room: Conv. Ctr. 7A . . . . . .Tues. 3:40 to 5:20 pm

Materials and Effects II

Session Chair: **Susanna Orlic,** Technische Univ. Berlin (Germany)

3:40 pm: **Photosensitive organic and hybrid materials for optical applications**, Olivier Soppera, Safi Jradi, Daniel-Joseph Lougnot, Ecole Nationale Supérieure de Chimie de Mulhouse (France) . . . . . [7053-12]

4:00 pm: **Absorption and bleaching dynamics of initiator in thick photopolymer exposed to Gaussian illumination**, Matthew W. Grabowski, Kristen M. Vogelhuber, Univ. of Colorado at Boulder; Dusan Sabol, National Univ. of Ireland/Dublin (Ireland); Robert R. McLeod, Univ. of Colorado at Boulder; John T. Sheridan, National Univ. of Ireland/Dublin (Ireland). [7053-13]

4:20 pm: **Exceeding the diffraction limit with single-photon photopolymerization and photo-induced termination**, Benjamin A. Kowalski, Timothy F. Scott, Christopher N. Bowman, Amy C. Sullivan, Robert R. McLeod, Univ. of Colorado at Boulder. . . . . [7053-14]

4:40 pm: **Methylene blue sensitized poly (vinyl alcohol): effect of monomer incorporation**, Beena M. John, Rani Joseph, Sudha Kartha Cheranellore, Krishnapillai Sreekumar, Cochin Univ. of Science & Technology (India). . . . . [7053-15]

5:00 pm: **Non-local photo-polymerization kinetics with multiple termination mechanisms and post-exposure effects,** Michael R. Gleeson, Shui Liu, John T. Sheridan, Univ. College Dublin (Ireland) and Optoelectronic Research Ctr. (Ireland) and SFI Strategic Research Ctr. in Solar Energy Conversion (Ireland). . . . . [7053-17]

Poster/Demo Session-Tuesday

Room: Conv. Ctr. Exhibit Hall B2 . . . . .Tues. 8:00 to 10:00 pm

Poster authors will begin displaying posters after 10:00 am Tuesday morning. A poster session and demo session, with authors present at their posters, will be held Tuesday evening from 8:00 to 10:00 pm. Light refreshments will be served.

Poster Setup

Poster presenters must set up their posters between 10:00 am and 5:00 pm on Tuesday. Poster presenters who have not set up by 5:00 pm on Tuesday will be considered a "no show" and their manuscript will not be published. Presenters must remove their posters immediately after the poster session. Posters not removed will be considered unwanted and will be discarded. SPIE assumes no responsibility for posters left up after the end of each poster session.

Simulation and experimental analysis of multiplexed hologram recording using photopolymer media, Naruki Yoshida, Shuhei Yoshida, Kei Kumagai, Keita Shimada, Manabu Yamamoto, Tokyo Univ. of Science (Japan) [7053-18]

Analysis of diffraction characteristics of multiplexed hologram by using the beam propagation method, Shuhei Yoshida, Manabu Yamamoto, Tokyo Univ. of Science (Japan) . . . . . [7053-19]

Novel blue sensitive polymeric materials for optical data storage, Francesco F. Simoni, Luigino Criante, Daniele E. Lucchetta, Francesco Vita, Riccardo Castagna, Univ. Politecnica delle Marche (Italy) . . . . . [7053-20]

Investigation of the spectral behavior of microholographic gratings in photopolymers, Örs Sepsi, Budapest Univ. of Technology and Economics (Hungary); Timo Feid, Sven Frohmann, Susanna Orlic, Technische Univ. Berlin (Germany); Balázs Gombkötö, Zsolt Nagy, Pál Koppa, Budapest Univ. of Technology and Economics (Hungary) . . . . . [7053-21]

Conference 7054A

Sunday-Tuesday 10-12 August 2008 • Proceedings of SPIE Vol. 7054

Organic Field-Effect Transistors VII

Conference Chairs: **Zhenan Bao,** Stanford Univ.; **Iain McCulloch,** Imperial College London (United Kingdom)

Conference Cosponsors:

Sunday 10 August

SESSION 1

Room: Conv. Ctr. 7A . . . . . .Sun. 8:40 to 10:00 am

Materials

Session Chair: **Martin J. Heeney,** Queen Mary Univ. of London (United Kingdom)

8:40 am: **Materials for organic electronics: conductors and semiconductors designed for wet processing** *(Invited Paper)*, Stephan E. Kirchmeyer, Timo Meyer-Friedrichsen, Andreas Elschner, H.C. Starck GmbH (Germany); Sergei A. Ponomarenko, Institute of Synthetic Polymeric Materials (Russia) . . . . . .[7054A-01]

9:05 am: **Engineering organic semiconductor chromophores** *(Invited Paper)*, John E. Anthony, Marsha Loth, Ying Shu, Sankar Subramanian, Sean R. Parkin, Univ. of Kentucky . . . . . .[7054A-02]

9:30 am: **Soluble pentacene precursors: strategic design, synthesis, and characterization**, Tahsin J. Chow, Hsin-Hui Huang, Ta-Hsien Chuang, Institute of Chemistry (Taiwan); Hsing-Hung Hsieh, Chung-Chih Wu, Chao-Chen Lin, Pi-Tai Chou, National Taiwan Univ. (Taiwan) . . . . . .[7054A-03]

9:45 am: **High-performance amorphous polymeric thin-film transistors**, Dae Sung Chung, Pohang Univ. of Science and Technology (South Korea); Sung Joong Lee, Soon-Ki Kwon, Gyeongsang National Univ. (South Korea); Chan-Eon Park, Pohang Univ. of Science and Technology (South Korea) . . . . . .[7054A-04]

Coffee Break . . . . . 10:00 to 10:30 am

SESSION 2

Room: Conv. Ctr. 7A . . . . . .Sun. 10:30 to 11:50 am

Materials and N-type

Session Chair: **John E. Anthony,** Univ. of Kentucky

10:30 am: **A new materials set for organic field-effect transistors** *(Invited Paper)*, Antonio F. Facchetti, Northwestern Univ. . . . . .[7054A-05]

10:55 am: **Solution processed OTFTs for OLED backplanes: optimisation of high mobility 10µm channel OTFTs** *(Invited Paper),* Jonathan J. Halls, Thomas Kugler, Christopher J. Newsome, Jeremy H. Burroughes, Cambridge Display Technology Ltd. (United Kingdom) . . . . . .[7054A-45]

11:20 am: **High-performance and stable n-channel organic thin-film transistors based on C_{60}**, Xiaohong Zhang, Benoit Domercq, Bernard Kippelen, Georgia Institute of Technology . . . . . .[7054A-07]

11:35 am: **Influence of polymer gate dielectrics and metal source-drain electrodes on n-channel conduction of pentacene-based organic field-effect transistors**, Wei-Lieh Hsu, Jer-Wei Chang, Ten-Chin Wen, Tzung-Fang Guo, National Cheng Kung Univ. (Taiwan) . . . . . .[7054A-09]

Lunch Break . . . . . 11:50 am to 1:35 pm

SESSION 3

Room: Conv. Ctr. 7A . . . . . Sun. 1:35 to 3:00 pm

N-type

Session Chair: **David J. Gundlach,** National Institute of Standards and Technology

1:35 pm: **High-mobility organic semiconductors for unifunctional and bifunctional transistor applications** *(Invited Paper)*, Thomas D. Anthopoulos, Jeremy Smith, Richard Hamilton, James Ball, Paul H. Wöbkenberg, Donal D. C.Bradley, Imperial College London (United Kingdom); Dago M. de Leeuw, Philips Research Labs. (Netherlands); Jan C. Hummelen, Rijksuniv. Groningen (Netherlands); David Kronholm, Solenne B.V. (Netherlands); Simon Ogier, Plastic Electronics Technology Ctr. (United Kingdom); John E. Anthony, Univ. of Kentucky; Martin J. Heeney, Queen Mary Univ. of London (United Kingdom); Iain McCulloch, Imperial College London (United Kingdom) . . . . . .[7054A-10]

2:00 pm: **Air stable n-channel organic semiconductors with high-charge carrier mobilities**, Zhenan Bao, Stanford Univ. . . . . .[7054A-11]

2:15 pm: **Performance of n-type organic field-effect transistor prepared with fluorinated copper phthalocyanine (F_{16}CuPc) as organic semiconductor and polycarbonate as gate insulating material**, Shizuyasu Ochiai, Kunjithapatham Sethuraman, Kenzo Kojima, Teruyoshi Mizutani, Aichi Institute of Technology (Japan) . . . . . .[7054A-12]

2:30 pm: **Ambipolar light-emitting transistor based on high-photoluminescent organic single crystal**, Taishi Takenobu, Satria Z. Bisri, Yohei Yomogida, Tohoku Univ. (Japan); Takeshi Yamao, Shu Hotta, Kyoto Institute of Technology (Japan); Yoshihiro Iwasa, Tohoku Univ. (Japan) . . . . . .[7054A-13]

2:45 pm: **Band bending and Debye screening in F_{16}CuPc/BP_2T ambipolar organic thin film transistor**, Yongli Gao, Huanjun Ding, Univ. of Rochester; Haibo Wang, Changchun Institute of Applied Chemistry (China); Donghang Yan, Changchun Institute of Applied Chemistry . . . . . .[7054A-14]

Coffee Break . . . . . 3:00 to 3:30 pm

SESSION 4

Room: Conv. Ctr. 7A . . . . . Sun. 3:30 to 5:15 pm

Thin Films

Session Chair: **Zhenan Bao,** Stanford Univ.

3:30 pm: **Structural characteristics of blend organic semiconductors for organic thin-film transistors**, Do Yeung Yoon, Jihoon Kang, Nayool Shin, Seoul National Univ. (South Korea); Vivek M. Prabhu, Dean M. DeLongchamp, Eric K. Lin, National Institute of Standards and Technology. . . . . .[7054A-15]

3:45 pm: **Correlating microstructure and charge transport in P3HT: transport mechanisms and bottlenecks** *(Invited Paper)*, Alberto Salleo, Ludwig J. Goris, Leslie H. Jimison, Stanford Univ.; Michael F. Toney, Stanford Linear Accelerator Ctr.; Martin J. Heeney, Queen Mary Univ. of London (United Kingdom); Iain McCulloch, Imperial College London (United Kingdom) . . . . . .[7054A-16]

4:10 pm: **Controllably oriented single-crystal domains of a high-performance semiconducting polymer** *(Invited Paper)*, Dean M. DeLongchamp, National Institute of Standards and Technology . . .[7054A-17]

4:35 pm: **Organic field-effect transistors: a materials scientist's view** *(Invited Paper)*, Natalie Stingelin-Stutzmann, Queen Mary Univ. of London (United Kingdom). . . . . [7054A-18]

5:00 pm: **Pentacene-based organic superlattice transistors using organic heterostructure,** Yuuki Tidiishi, Shigeki Naka, Hiroyuki Okada, Univ. of Toyama (Japan). . . . . [7054A-19]

Room: Conv. Ctr. 6A . . . . . Sun. 6:00 to 6:45 pm

All-Conference Plenary Session

View plenary presentation details p. 13.

6:00 pm: **The Solar Decathlon: building a better future with solar energy**, Richard J. King, U.S. Dept. of Energy

Monday 11 August

SESSION 5

Room: Conv. Ctr. 7A . . . . . Mon. 8:30 to 10:05 am

Applications I

Session Chair: **Jack Hou,** Industrial Technology Research Institute (Taiwan)

8:30 am: **OTFTs for large-area flexible display applications** *(Invited Paper)*, Timothy A. Von Werne, Plastic Logic Ltd. (United Kingdom) . . . . . [7054A-20]

8:55 am: **All printed thin film transistors for flexible electronics** *(Invited Paper)*, Ana C. Arias, Jurgen H. Daniel, Brent S. Krusor, Tse Nga Ng, Sanjiv Sambandan, Robert A. Street, Palo Alto Research Ctr., Inc. . . . . [7054A-21]

9:20 am: **A 5" active-matrix electrophoretic panel driven by organic TFTs**, Tarng-Shiang Hu, Yi-Kai Wang, Chi-Jen Kao, Yu-Rung Peng, Tsung-Hua Yang, Jack Hou, Industrial Technology Research Institute (Taiwan) [7054A-22]

9:35 am: **One-step fabrication of high-performance organic field-effect transistors from semiconductor/dielectric blends**, Kilwon Cho, Wi Hyoung Lee, Longzhen Qiu, Jung Ah Lim, Pohang Univ. of Science and Technology (South Korea). . . . . [7054A-23]

9:50 am: **Application of redox doping in OTFTs**, Tobias W. Canzler, Markus Burghart, Omrane Fadhel, Monique Jahn, Ansgar G. Werner, Novaled GmbH (Germany) . . . . . [7054A-24]

Coffee Break . . . . . 10:05 to 10:35 am

SESSION 6

Room: Conv. Ctr. 7A . . . . . Mon. 10:35 am to 12:20 pm

Applications II

Session Chair: **Iain McCulloch,** Imperial College London (United Kingdom)

10:35 am: **Applications and technology of organic circuits on foil** *(Invited Paper)*, Paul L. Heremans, IMEC (Belgium). . . . . [7054A-25]

11:00 am: **Field-induced polymorphous disorder and bias-stress instability of pentacene organic thin-film transistors** *(Invited Paper)*, Masahiko Ando, Hitachi, Ltd. (United Kingdom); Claudia Duffy, Jessica Winfield, Univ. of Cambridge (United Kingdom); Takashi Minakata, Asahi Kasei EMD Corp. (Japan); Henning Sirringhaus, Univ. of Cambridge (United Kingdom)[7054A-26]

11:25 am: **Stability improvement of organic TFTs by selective interface treatment for display applications** *(Invited Paper)*, Kazumasa Nomoto, Ryouichi Yasuda, Nobukazu Hirai, Iwao Yagi, Makoto Noda, Nobuhide Yoneya, Akira Yumoto, Jiro Kasahara, Sony Corp. (Japan) . . . . . [7054A-27]

11:50 am: **Organic electronics integration technology and logic circuits**, Luigi Occhipinti, STMicroelectronics (Italy) . . . . . [7054A-28]

12:05 pm: **Polymer inverters design flow and manufacturing process on plastic substrates**, Chen-Pang Kung, Hung-Chun Chen, Wen-Gain Houng, Yu-Rung Peng, Yen-Min Hsien, Chun-Cheng Chou, Chi-Jen Kao, Tsung-Hua Yang, Jack Hou, Industrial Technology Research Institute (Taiwan) [7054A-29]

Lunch Break . . . . . 12:20 to 1:50 pm

SESSION 7

Room: Conv. Ctr. 7A . . . . . Mon. 1:50 to 3:35 pm

Device Physics

Session Chair: **Alberto Salleo,** Stanford Univ.

1:50 pm: **A renewed recipe for organic electronics: just add salt** *(Invited Paper)*, C. Daniel Frisbie, Univ. of Minnesota . . . . . [7054A-30]

2:15 pm: **Non-idealities in thin-film transistors from semiconducting polymers** *(Invited Paper)*, Michael L. Chabinyc, Palo Alto Research Ctr., Inc. . . . . [7054A-31]

2:40 pm: **High performance and solution processability: no longer mutually exclusive** *(Invited Paper)*, Oana D. Jurchescu, Krystyna Dillard-Crawford, Behrang Hamadani, National Institute of Standards and Technology; Sankar Subramanian, Univ. of Kentucky; Joseph Kline, National Institute of Standards and Technology; John E. Anthony, Univ. of Kentucky; Thomas N. Jackson, The Pennsylvania State Univ.; David J. Gundlach, National Institute of Standards and Technology. . . . . [7054A-32]

3:05 pm: **Steady-state and transient photocurrents in rubrene single-crystal free-space dielectric transistors**, Denis Fichou, Commissariat à l'Energie Atomique (France); Nripan Mathews, Nanyang Technological Univ. (Singapore); Etienne Menard, Univ. of Illinois at Urbana-Champaign; Vitaly Podzorov, Rutgers Univ.; Subodh G. Mhaisalkar, Nanyang Technological Univ. (Singapore) . . . . . [7054A-33]

3:20 pm: **TOF and TFT mobilities in polycrystalline thin films of liquid crystalline material**, Hiroaki Iino, Jun-ichi Hanna, Tokyo Institute of Technology (Japan). . . . . [7054A-34]

Coffee Break . . . . . 3:35 to 4:05 pm

SESSION 8

Room: Conv. Ctr. 7A . . . . . Mon. 4:05 to 5:25 pm

Device Physics and Transport

Session Chair: **Thomas D. Anthopoulos,** Imperial College London (United Kingdom)

4:05 pm: **Studies on the hysteresis phenomena depending on the hydrophobicity and thickness of polymer gate dielectrics for pentacene field-effect transistors**, Chan-Eon Park, Pohang Univ. of Science and Technology (South Korea). . . . . [7054A-35]

4:20 pm: **Charge trapping in organic field-effect transistors** *(Invited Paper)*, Henning Sirringhaus, Univ. of Cambridge (United Kingdom) . . . . . [7054A-36]

4:45 pm: **Drift mobility and velocity in organic and polymer transistors** *(Invited Paper)*, Ananth Dodabalapur, Debarshi Basu, Brian Cobb, The Univ. of Texas at Austin . . . . . [7054A-37]

5:10 pm: **Capacitance-voltage measurements: a powerful technique for characterizing the contact and channel properties of organic FETs**, Behrang H. Hamadani, Curt A. Richter, John S. Suehle, David J. Gundlach, National Institute of Standards and Technology; Iain McCulloch, Imperial College London (United Kingdom); Martin Heeney, Queen Mary Univ. of London . . . . . [7054A-38]

Tuesday 12 August

Poster/Demo Session-Tuesday

Room: Conv. Ctr. Exhibit Hall B2 . . . . .Tues. 8:00 to 10:00 pm

Poster authors will begin displaying posters after 10:00 am Tuesday morning. A poster session and demo session, with authors present at their posters, will be held Tuesday evening from 8:00 to 10:00 pm. Light refreshments will be served.

Poster Setup

Poster presenters must set up their posters between 10:00 am and 5:00 pm on Tuesday. Poster presenters who have not set up by 5:00 pm on Tuesday will be considered a "no show" and their manuscript will not be published. Presenters must remove their posters immediately after the poster session. Posters not removed will be considered unwanted and will be discarded. SPIE assumes no responsibility for posters left up after the end of each poster session.

Effect of UV/ozone treatment on the hysteresis of pentacene organic thin-film transistor, Jae-Bon Koo, Seong Yeol Kang, In-Kyu You, Kyung-Soo Suh, Electronics and Telecommunications Research Institute (South Korea) . . . . . .[7054A-39]

Electrical properties of bio-organic-semiconductor-field-effect-transistor based on biotinylated F_8T_2, Sang Chul Lim, Seong Hyun Kim, Yong Suk Yang, Zin Sig Kim, Jae-Bon Koo, Yoon Ho Song, Electronics and Telecommunications Research Institute (South Korea) . . . . . .[7054A-40]

Preparation and characterization of OTFT-based biosensor using a biotinylated F_8T_2 polymer, Yong Suk Yang, Seong Hyun Kim, Sang Chul Lim, Zin-Sig Kim, Electronics and Telecommunications Research Institute (South Korea); Do-Hoon Hwang, Kumoh National Institute of Technology (South Korea). . . . . .[7054A-41]

N-channel fluorinated copper phthalocyanine thin-film transistors utilizing oxygen-plasma-treatment ITO source and drain electrodes, Yu-Wu Wang, National Changhua Univ. of Education (Taiwan); Chen-Hsiang Yen, Wei-Yang Chou, National Cheng Kung Univ. (Taiwan); Shyh-Jiun Liu, National Univ. of Tainan (Taiwan); Horng-Long Cheng, National Cheng Kung Univ. (Taiwan) . . . . . .[7054A-42]

Bending-stress-driven phase transition in pentacene thin films for flexible organic field-effect transistors, Chanwoo Yang, Jinhwan Yoon, Se Hyun Kim, Chan-Eon Park, Moonhor Ree, Pohang Univ. of Science and Technology (South Korea). . . . . .[7054A-43]

Electric field enhancement in polarizing beam splitter made with deep-groove grating, Weijin Kong, Maojin Yun, Qingdao Univ. (China); Jianfeng Sun, Shanghai Institute of Optics and Fine Mechanics (China) . . . .[7054A-44]

Conference 7054B

Sunday 10 August 2008 • Proceedings of SPIE Vol. 7054

Organic Semiconductors in Sensors and Bioelectronics

Conference Chair: **Ruth Shinar,** Iowa State Univ.

Conference Co-Chair: **George G. Malliaras,** Cornell Univ.

Program Committee: **Graciela B. Blanchet,** DuPont Electronic Polymers; **Magnus Berggren,** Linköpings Univ. (Sweden); **Emil J. W. List,** Technische Univ. Graz (Austria); **Roisin Owens,** Cornell Univ.; **Franky So,** Univ. of Florida; **Luisa Torsi,** Univ. degli Studi di Bari (Italy)

Sunday 10 August

SESSION 1

Room: Conv. Ctr. 7B . . . . . Sun. 8:30 to 10:10 am

Organic Semiconductors in Sensors and Bioelectronics I

Session Chair: **Uli Lemmer,** Univ. Karlsruhe (Germany)

8:30 am: **Control of spurious phenomena in organic thin-film transistors with enhanced sensing capabilities** *(Invited Paper)*, Luisa Torsi, Francesco Marinelli, Daniela Angione, Antonio Dell'Aquila, Francesco Palmisano, Pier G. Zambonin, Univ. degli Studi di Bari (Italy) . . . . . .[7054B-45]

9:00 am: **Device physics of conducting polymer transistors for sensor applications**, Fabio Cicoira, Cornell Univ. and IFN-CNR Trento (Italy); Daniel Macaya, Na Yang Shim, Sang Yoon Yang, Yuri A. Slvester, John A. DeFranco, George G. Malliaras, Cornell Univ. . . . . .[7054B-46]

9:20 am: **Organic thin film transistors for electronic detection of chemicals under aqueous conditions** *(Invited Paper)*, Zhenan Bao, Stanford Univ. . . . . .[7054B-47]

9:50 am: **Composites of carbon nanotubes and non-polymeric materials for diagnosing lung cancer via breath samples**, Gang Peng, Elena Trock, Hossam Haick, Technion, Israel Institute of Technology (Israel). . . .[7054B-48]

Coffee Break . . . . . 10:10 to 10:40 am

SESSION 2

Room: Conv. Ctr. 7B . . . . . Sun. 10:40 to 11:50 am

Organic Semiconductors in Sensors and Bioelectronics II

Session Chair: **Kirk S. Schanze,** Univ. of Florida

10:40 am: **OLED-based dissolved oxygen and biosensor platforms** *(Invited Paper)*, Joseph Shinar, Ruth Shinar, Iowa State Univ. and Integrated Sensor Technologies, Inc.; Yuankun Cai, Don W. Choi, Alan A. DiSpirito, Anthony Pometto, Iowa State Univ.. . . . . .[7054B-49]

11:10 am: **A planar "on-chip" refractometer using an organic light emitting diode light source and an organic photovoltaic detector**, Neal R. Armstrong, Peter A. Veneman, Brian Zacher, Dan Huebner, Adam Simmonds, The Univ. of Arizona . . . . . .[7054B-50]

11:30 am: **Characterization of biochemical sensors based on thin-film photodetector and OLED pixel arrays**, Robert W. Mayer, Ruth Shinar, Yuankun Cai, Vikram L. Dalal, Joseph Shinar, Iowa State Univ.. . . .[7054B-51]

Lunch Break . . . . . 11:50 am to 1:30 pm

SESSION 3

Room: Conv. Ctr. 7B . . . . . .Sun. 1:30 to 3:10 pm

Organic Semiconductors in Sensors and Bioelectronics III

Session Chair: **Luisa Torsi,** Univ. degli Studi di Bari (Italy)

1:30 pm: **Integrated sensors for point of care diagnostics** *(Invited Paper)*, John C. de Mello, Imperial College London (United Kingdom) . . . . .[7054B-52]

2:00 pm: **OLED-polypropylene bio-CD sensor**, Srikanth Vengasandra, Yuankun Cai, Ruth Shinar, Joseph Shinar, David A. Grewell, Iowa State Univ. . . . . .[7054B-53]

2:20 pm: **Smart bandage based on organic electronic devices**, Marc M. Koetse, TNO (Netherlands) . . . . . .[7054B-54]

2:40 pm: **Organic semiconductor lasers for integrated sensor systems** *(Invited Paper)*, Uli Lemmer, Univ. Karlsruhe (Germany) . . . . . .[7054B-55]

Coffee Break . . . . . 3:10 to 3:40 pm

SESSION 4

Room: Conv. Ctr. 7B . . . . . .Sun. 3:40 to 5:30 pm

Organic Semiconductors in Sensors and Bioelectronics IV

Session Chair: **John C. de Mello,** Imperial College London (United Kingdom)

3:40 pm: **Organic bioelectronics based on PEDOT to record and regulate cell signaling** *(Invited Paper)*, Magnus Berggren, Edwin Jager, Daniel Simon, Klas Tybrandt, Maria Bolin, Xiangjun Wang, Linköpings Univ. (Sweden); Agneta Richter-Dahlfors, Karin Larsson, Karl Svennersten, Sindhulakshmi Kurup, Karolinska Institutet (Sweden). . . . . .[7054B-56]

4:10 pm: **Conjugated polyelectrolytes as fluorescent biosensors** *(Invited Paper)*, Kirk S. Schanze, Univ. of Florida . . . . . .[7054B-57]

4:40 pm: **Characterization of flexible image sensors**, Tse Nga Ng, William S. Wong, Sanjiv Sambandan, Michael L. Chabinyc, Rene Lujan, Robert A. Street, Palo Alto Research Ctr., Inc. . . . . .[7054B-58]

5:00 pm: **Functionalized polythiophenes: novel platforms for bionics** *(Invited Paper),* David L. Officer, Robert Breukers, Klaudia Wagner, Kerry Gilmore, Simon E. Moulton, Gordon G. Wallace, Univ. of Wollongong (Australia); Anita Quigley, Magdalena Kita, Robert M. Kapsa, Bionic Ear Institute (Australia) . . . . . .[7054B-59]

Room: Conv. Ctr. 6A . . . . . Sun. 6:00 to 6:45 pm

All-Conference Plenary Session

View plenary presentation details p. 13.

6:00 pm: **The Solar Decathlon: building a better future with solar energy**, Richard J. King, U.S. Dept. of Energy

Conference 7055A

Sunday 10 August 2008 • Proceedings of SPIE Vol. 7055

Infrared Detectors and Focal Plane Arrays IX

Conference Chairs: **Eustace L. Dereniak,** College of Optical Sciences/The Univ. of Arizona; **John P. Hartke,** U.S. Military Academy; **Paul D. LeVan,** Air Force Research Lab.

Program Committee: **Arvind I. D'Souza,** DRS Sensors & Targeting Systems, Inc.; **Sarath D. Gunapala,** Jet Propulsion Lab.; **John Edward Hubbs,** Ball Aerospace & Technologies Corp.; **Herbert K. Pollehn,** Army Research Lab.; **Robert E. Sampson,** I-Technology Applications; **James A. Stobie,** BAE Systems, Inc.; **William B. Weissbard,** Teledyne Imaging Sensors

Sunday 10 August

SESSION 1

Room: Conv. Ctr. 10 . . . . . .Sun. 8:30 to 10:00 am

Quantum Wells

Session Chair: **Paul D. LeVan,** Air Force Research Lab.

8:30 am: **Strained layer superlattices** *(Invited Paper)*, Sarath D. Gunapala, Jet Propulsion Lab. . . . . [7055A-01]

9:00 am: **InAs quantum-dot intersubband optical amplifier**, Xuejun Lu, Univ. of Massachusetts/Lowell. . . . . [7055A-02]

9:20 am: **Megapixel infrared imaging arrays based on superlattice photodiodes**, Cory J. Hill, Alexander Soibel, Sam Keo, Jason Mumolo, Sarath Gunapala, Jet Propulsion Lab.; David Rhiger, Robert Kvaas, Sean Harris, Raytheon Vision Systems . . . . . [7055A-03]

9:40 am: **Nano-structured thin films of oriented pyroelectric triglycine-sulfate nano-rods**, Michal Nitzani, Shlomo Berger, Technion-Israel Institute of Technology (Israel) . . . . . [7055A-04]

Coffee Break . . . . . 10:00 to 10:30 am

SESSION 2

Room: Conv. Ctr. 10 . . . . . .Sun. 10:30 to 11:40 am

Multi-band Arrays

Session Chair: **Arvind I. D'Souza,** DRS Sensors & Targeting Systems, Inc.

10:30 am: **Adaptive MWIR spectral imaging sensor** *(Invited Paper)*, Freeman D. Shepherd, Jonathan M. Mooney, Toby D. Reeves, Solid State Scientific Corp.; Melanie M. Weeks, Steven DiSalvo, Air Force Research Lab.[7055A-05]

11:00 am: **Dualband infrared imaging spectrometer: observations of the Moon**, Paul D. LeVan, Air Force Research Lab.; Brian P. Beecken, Bethel Univ. . . . . [7055A-06]

11:20 am: **Design of multilayered grating couplers as key elements of a fully integrated IR absorption sensor**, Juergen Kasberger, Integrated Microsystems Austria GmbH (Austria); Bernhard Jakoby, Johannes Kepler Univ. Linz (Austria) . . . . . [7055A-08]

Lunch Break . . . . . 11:40 am to 1:30 pm

SESSION 3

Room: Conv. Ctr. 10 . . . . . Sun. 1:30 to 2:50 pm

Unique FPA

Session Chair: **John Edward Hubbs,** Ball Aerospace & Technologies Corp.

1:30 pm: **Curving monolithic silicon for nonplanar focal plane array applications**, Rostam Dinyari, Kevin Huang, Seung-Bum Rim, Peter Peumans, Stanford Univ. . . . . [7055A-09]

1:50 pm: **Barium strontium titanate (BST) pyroelectric detector for bolometric solar imaging**, Matthew Noble, Pietro Bernasconi, Harry Eaton, Bliss Carkhuff, The Johns Hopkins Univ. Applied Physics Lab.; Peter Foukal, Heliophysics, Inc . . . . . [7055A-11]

2:10 pm: **Sensor design for x-ray detection based on silicon thermistors for space astronomy missions of the new generation**, Abdelkader Aliane, Lab. d'Electronique de Technologie de l'Information (France) . . . . . [7055A-10]

2:30 pm: **Correlation between bands structure and magneto-transport properties in a far-infrared detector superlattice**, Abdelhakim Nafidi, Abderrahim El Adibi, Abdelhamid El Kaaouachi, Hassan Chaib, Univ. Ibn Zohr (Morocco); Izeddine Zorkani, Univ. Sidi Mohamed Ben Abdellah (Morocco); Jamal Hemine, Mimoun Zazoui, Univ. Hassan II Mohammedia (Morocco) . . . . . [7055A-35]

Coffee Break . . . . . 2:50 to 3:20 pm

SESSION 4

Room: Conv. Ctr. 10 . . . . . Sun. 3:20 to 5:00 pm

Mechanical Interfaces

Session Chair: **John P. Hartke,** U.S. Military Academy

3:20 pm: **Improved spectral response model for backside illuminated photovoltaic devices**, Priyalal S. Wijewarnasuriya, Army Research Lab.; Arvind I. D'Souza, DRS Sensors & Targeting Systems, Inc; Maryn G. Stapelbroek, DRS Sensors & Targeting Systems, Inc. . . . . [7055A-13]

3:40 pm: **High dynamic range adaptive $\Delta\Sigma$-based focal plane array architecture**, Khaled N. Salama, Shun Yao, Rensselaer Polytechnic Institute . . . . . [7055A-14]

4:00 pm: **The structural mechanics design of Dewar in IRFPA package**, Haiyan Zhang, Shanghai Institute of Technical Physics (China) . . . . [7055A-15]

4:20 pm: **Application of power stabilized laser to the optomechanical, uncooled infrared imaging system**, Ming Liu, Yue-jin Zhao, Xiao-hua Liu, Fei Teng, Cheng Gong, Beijing Institute of Technology (China) . . . . . [7055A-16]

4:40 pm: **Gain, spatial and temporal noise, pattern, and non-linearity in QWIP focal plane array,** Sir Don B. Rafol, Diversified Electronics Corp. . . . . [7055A-17]

Room: Conv. Ctr. 6A . . . . . Sun. 6:00 to 6:45 pm

All-Conference Plenary Session

View plenary presentation details p. 13.

6:00 pm: **The Solar Decathlon: building a better future with solar energy**, Richard J. King, U.S. Dept. of Energy

Tuesday 12 August

Poster/Demo Session-Tuesday

Room: Conv. Ctr. Exhibit Hall B2 . . . . .Tues. 8:00 to 10:00 pm

Poster authors will begin displaying posters after 10:00 am Tuesday morning. A poster session and demo session, with authors present at their posters, will be held Tuesday evening from 8:00 to 10:00 pm. Light refreshments will be served.

Poster Setup

Poster presenters must set up their posters between 10:00 am and 5:00 pm on Tuesday. Poster presenters who have not set up by 5:00 pm on Tuesday will be considered a "no show" and their manuscript will not be published. Presenters must remove their posters immediately after the poster session. Posters not removed will be considered unwanted and will be discarded. SPIE assumes no responsibility for posters left up after the end of each poster session.

Two-band IR sensing technology with improved temperature and spatial resolution, Volodymyr K. Malyutenko, Oleg Y. Malyutenko, Institute of Semiconductor Physics (Ukraine) . . . . . [7055A-07]

Conference 7055B

Monday-Tuesday 11-12 August 2008 • Proceedings of SPIE Vol. 7055

Infrared and Photoelectronic Imagers and Detector Devices III

Conference Chairs: **Randolph E. Longshore,** Raytheon Missile Systems (Retired); **Ashok K. Sood,** Magnolia Optical Technologies, Inc.

Program Committee: **Raymond S. Balcerak,** Defense Advanced Research Projects Agency; **Alexander C. Childs,** Raytheon Vision Systems; **Nibir K. Dhar,** Army Research Lab.; **Meimei Z. Tidrow,** Missile Defense Agency

Monday 11 August

SESSION 1

Room: Conv. Ctr. 6F . . . . . Mon. 1:30 to 3:10 pm

Infrared Detectors

Session Chair: **Ashok K. Sood,** Magnolia Optical Technologies, Inc.

1:30 pm: **Photonic bandgap and ultrafast lasers: IR photodetectors phenomenology and novel applications**, Michael K. Rafailov, RICHER International LLC . . . . . .[7055B-18]

1:50 pm: **Effect of growth parameters and annealing on the morphology and resistivity of IR detector materials**, Brian P. Wagner, Narsingh B. Singh, Sean McLaughlin, David Kahler, Andre Berghmans, David Knuteson, Northrop Grumman Corp.. . . . . .[7055B-19]

2:10 pm: **Near-IR enhanced position-sensitive avalanche photodiodes**, Richard A. Myers, Richard Farrell, Frank Robertson, Radiation Monitoring Devices, Inc.; James E. Carey, SiOnyx Inc.; Eric Mazur, Harvard Univ. . . . . .[7055B-20]

2:30 pm: **Frontside-illuminated quantum well photodetector for far-infrared range**, Mikhail A. Patrashin, Iwao Hosako, National Institute of Information and Communications Technology (Japan). . . . . .[7055B-21]

2:50 pm: **Potential application of antenna-pair coupled bolometers in beam synthesis**, Weidong Yang, Michael C. Roggemann, Christopher Middlebrook, Michigan Technological Univ.; Nikola Subotic, William Buller, Kyle Cooper, Michigan Tech Research Institute . . . . . .[7055B-22]

Coffee Break . . . . . 3:10 to 3:40 pm

SESSION 2

Room: Conv. Ctr. 6F . . . . . Mon. 3:40 to 5:40 pm

Detectors and Applications

Session Chair: **Randolph E. Longshore,** Raytheon Missile Systems

3:40 pm: **Development of blood vessel searching system for HMS**, Hirofumi Kandani, Osaka Institute of Technology (Japan); Toshiyuki Uenoya, Doshisha Univ. (Japan); Yasutomo Uetsuji, Osaka Institute of Technology (Japan); Eiji Nakamachi, Doshisha Univ. (Japan) . . . . . .[7055B-23]

4:00 pm: **Smart distance measurement line sensor with background light suppression and on-chip phase generation**, Gerald Zach, Alexander Nemecek, Horst Zimmermann, Technische Univ. Wien (Austria) . . .[7055B-24]

4:20 pm: **High-performance SiC avalanche photodiode for single ultraviolet photon detection**, Xiaogang Bai, Han-din Liu, Dion McIntosh, Joe Campbell, Univ. of Virginia . . . . . .[7055B-25]

4:40 pm: **Performance-based CID imaging: past, present, and future**, Suraj K. Bhaskaran, Michael Pilon, Tony Chapman, Steve VanGorden, Thermo Fisher Scientific Inc. . . . . .[7055B-26]

5:00 pm: **CMOS Geiger photodiode array with integrated signal processing for imaging of 2D objects using quantum dots**, Christopher J. Stapels, Rajan S. Gurjar, Radia Sia, Erik B. Johnson, James F. Christian, Radiation Monitoring Devices, Inc. . . . . .[7055B-27]

5:20 pm: **Performance characteristics of microbolometer based IR sensors**, Ashok K. Sood, Robert A. Richwine, Yash R. Puri, Magnolia Optical Technologies, Inc.; Glenn S. Baker, MilSys Technologies LLC; Raymond S. Balcerak, Defense Advanced Research Projects Agency. . . . . .[7055B-28]

Tuesday 12 August

Poster/Demo Session-Tuesday

Room: Conv. Ctr. Exhibit Hall B2 . . . . Tues. 8:00 to 10:00 pm

Poster authors will begin displaying posters after 10:00 am Tuesday morning. A poster session and demo session, with authors present at their posters, will be held Tuesday evening from 8:00 to 10:00 pm. Light refreshments will be served.

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Growth and characterization of short-period InAsGaSb photoconductors, Guo Jie, Luoyang Optical Electronics (China). . . . . .[7055B-29]

The development and application of single-photon detectors, Xue-Jiao Zhang, Jun-Li Wan, ChaoJun Yan, Fang-Min Dong, China Three Gorges Univ. (China) . . . . . .[7055B-30]

Thermo-drift analysis and bias compensation of the gain of APD, Yan-Qin Li, Jun-Li Wan, Binghua Jiang, Bin Wang, China Three Gorges Univ. (China); Liquan Dong, Beijing Institute of Technology (China) . . . . . .[7055B-31]

A sparse signal representation-based image denoising algorithm for uncooled MEMS IRFPA, Li-quan Dong, Xiao-hua Liu, Yue-jin Zhao, Ming Liu, Mei Hui, Xiao-xiao Zhou, Beijing Institute of Technology (China) . . .[7055B-32]

Suppressing premature edge breakdown for InP/InGaAs avalanche photodiodes by modeling analyses, Yegao Xiao, Zhiqiang L. Li, Zhanming S. Li, Crosslight Software Inc. (Canada) . . . . . .[7055B-33]

Reducing intricacy of 3D space for 3D shape reconstruction, Mannan S. Muhammad, Tae-Sun Choi, Gwangju Institute of Science and Technology (South Korea). . . . . .[7055B-34]

Courses of Related Interest

See SPIE Cashier for information and to register.

SC504 Introduction to CCD and CMOS Imaging Sensors and Applications (Janesick) Tuesday, 8:30 am to 5:30 pm

NEW! SC916 Digital Camera and Sensor Evaluation Using Photon Transfer (Janesick) Monday, 8:30 am to 12:30 pm

Conference 7056

Tuesday-Thursday 12-14 August 2008 • Proceedings of SPIE Vol. 7056

Photonic Fiber and Crystal Devices: Advances in Materials and Innovations in Device Applications II

Conference Chairs: **Shizhuo Yin,** The Pennsylvania State Univ.; **Ruyan Guo,** The Univ. of Texas at San Antonio

Program Committee: **Partha P. Banerjee,** Univ. of Dayton; **Kung-Li Deng,** GE Global Research; **Joseph Grant,** NASA Stennis Space Ctr.; **Ken Yuh Hsu,** National Chiao Tung Univ. (Taiwan); **Rongqing Hui,** The Univ. of Kansas; **Yoochan Jeong,** Univ. of Southampton (United Kingdom); **Suganda Jutamulia,** Univ. of Northern California; **Tsuyoshi Konishi,** Osaka Univ. (Japan); **Eckhard Kratzig,** Univ. Osnabrück (Germany); **Nickolai V. Kukhtarev,** Alabama A&M Univ.; **Ravindra B. Lal,** Alabama A&M Univ.; **Byoungho Lee,** Seoul National Univ. (South Korea); **Sergei F. Lyuksyutov,** Univ. of Akron; **Karl M. Reichard,** The Pennsylvania State Univ.; **Gérald Roosen,** Institut d'Optique (France); **Paul B. Ruffin,** U.S. Army Aviation and Missile Research, Development and Engineering Ctr.; **Ching-Cherng Sun,** National Central Univ. (Taiwan); **Xiang Zhang,** Univ. of California/Berkeley

Honorary Chair: **Francis T. S. Yu,** The Pennsylvania State Univ.

Tuesday 12 August

Poster/Demo Session-Tuesday

Room: Conv. Ctr. Exhibit Hall B2 . . . . .Tues. 8:00 to 10:00 pm

Poster authors will begin displaying posters after 10:00 am Tuesday morning. A poster session and demo session, with authors present at their posters, will be held Tuesday evening from 8:00 to 10:00 pm. Light refreshments will be served.

Poster Setup

Poster presenters must set up their posters between 10:00 am and 5:00 pm on Tuesday. Poster presenters who have not set up by 5:00 pm on Tuesday will be considered a "no show" and their manuscript will not be published. Presenters must remove their posters immediately after the poster session. Posters not removed will be considered unwanted and will be discarded. SPIE assumes no responsibility for posters left up after the end of each poster session.

Development of a Mach-Zehnder interferometer based on a twin-core fiber and analysis of its thermal stability, Luis A. Fernandez Ortega, Rafael A. Betancur Lopera, Jesus D. Causado Buelvas, Univ. Nacional de Colombia/ Medellín (Colombia). . . . . [7056-34]

Modified sol-gel method for patterned lithium niobate thin film preparation, Armen R. Poghosyan, Institute for Physical Research (Armenia); Ruyan Guo, The Univ. of Texas at San Antonio; Stepan G. Grigoryan, Aleksandr L. Manukyan, Eduard S. Vardanyan, Institute for Physical Research (Armenia) . . . . . [7056-41]

Domain switching of congruent lithium niobate crystals with surface modification, Armen R. Poghosyan, Eduard S. Vardanyan, Ira A. Ghambaryan, Institute for Physical Research (Armenia) . . . . . [7056-42]

Piezoelectric resonance enhanced optical transmission at microwave frequencies, Ruyan Guo, The Univ. of Texas at San Antonio and The Pennsylvania State Univ.; Hongbo Liu, Univ. Texas at San Antonio; William D. Jamieson, Lafayette College; Amar S. Bhalla, The Univ. of Texas at San Antonio . . . . . [7056-43]

A novel approach to improve switch performance of linear negative tapered Bragg gratings, Jianfeng Tian, Taiyuan Normal Univ. (China) . . . . . [7056-45]

Investigation of the double threshold effect of ultraviolet-laser-induced preferential domain nucleation in near stoichiometric $LiTaO_3$, Ya'nan Zhi, De'an Liu, Aimin Yan, Jianfeng Sun, Yu Zhou, Zhu Luan, Yin Hang, Liren Liu, Shanghai Institute of Optics and Fine Mechanics (China) . . . . . [7056-46]

Recent advances on multiple channel unequally spaced optical phased array for ultrafast LADAR, Shizhuo Yin, Jae Hun Kim, The Pennsylvania State Univ.; Paul B. Ruffin, Eugene Edwards, Christina L. Brantley, U.S. Army Aviation and Missile Research, Development and Engineering Ctr.; Claire Luo, General Opto Solutions, LLC . . . . . [7056-47]

THz generation by X(3) media, Shizhuo Yin, Meng-Ku Chen, Peng Li, The Pennsylvania State Univ.. . . . . [7056-48]

Floating zone growth of Ni-doped $MgGa_2O_4$ single crystal for near-infrared tunable laser, Takenobu Suzuki, Yusuke Arai, Yasutake Ohishi, Toyota Technological Institute (Japan) . . . . . [7056-49]

Structural study of superprism phenomena in photonic crystals, Anshu D. Varshney, Ravindra K. Sinha, Delhi College of Engineering (India) . . . [7056-52]

Maximized diffraction efficiency for integrated volume grating instruments, Zhifang Chai, East China Normal Univ. (China) . . . . . [7056-53]

Simulation of multimode interference couplers with deep rib structure and tunable power splitting ratio, ChaoJun Yan, Xiang Liu, Binghua Jiang, Junli Wan, China Three Gorges Univ. (China) . . . . . [7056-54]

Silica-based diffractive/refractive hybrid microlenses fabricated by multiphoton lithography, Hiroaki Nishiyama, Mizue Mizoshiri, Osaka Univ. (Japan); Junji Nishii, National Institute of Advanced Industrial Science and Technology (Japan); Yoshinori Hirata, Osaka Univ. (Japan) . . . . . [7056-55]

Thermal effects of third-harmonic generation crystal in high repetition frequency laser system, Wei Li, Guoying Feng, Qiuhui Zhang, Tianxiang Zhang, Hai Liao, Sichuan Univ. (China). . . . . [7056-56]

All-optical threshold-like switching of ultrashort optical pulses during their coherent interaction with a two-level quasi-resonant system in a single-mode semiconductor laser waveguide, Ana L. Muñoz, Alexandre S. Shcherbakov, Instituto Nacional de Astrofísica, Óptica y Electrónica (Mexico); Sergey A. Nemov, St. Petersburg State Polytechnical Univ. (Russia); Joaquin Campos Acosta, Consejo Superior de Investigaciones Científicas (Spain) . . . . . [7056-57]

Broad tuning range band pass optical filtering system with Optune interferometers, Nicolae Miron, Roctest Ltd. (Canada). . . . . [7056-59]

A novel reference architecture for the collinear holographic storage system, Ye-Wei Yu, Shu-Ching Hsieh, Tun-Chien Teng, Chih-Yuan Cheng, Shih-Hsin Ma, Chi-Shou Wu, Ching-Cherng Sun, National Central Univ. (Taiwan) . . . . . [7056-60]

Chromatic dispersions in highly nonlinear glass nanofibers, Chitrarekha B. Chaudhari, Takenobu Suzuki, Yasutake Ohishi, Toyota Technological Institute (Japan). . . . . [7056-61]

Alignment method of fusion splicing process for photonic crystal fiber using nonlinear data fitting and cross-reference, Guangwei Fu, Yanshan Univ. (China) . . . . . [7056-62]

Random phase multiplexing for volume holographic storage with a phase plate of micro-lens array, Xuan-Hao Lee, Shih-Hsin Ma, Ching-Cherng Sun, National Central Univ. (Taiwan) . . . . . [7056-63]

Adaptive phase-shifting digital holography compensating positional inaccuracy and tilting of optics, Joonku Hahn, Hwi Kim, Eun-Hee Kim, Byoungho Lee, Seoul National Univ. (South Korea) . . . . . [7056-66]

Generation of self-focused electron beam by pyroelectric/photogalvanic crystal accelerators, Nickolai V. Kukhtarev, Alabama A&M Univ. . . [7056-68]

A 3D shape sensing system using multiple fringe projections from different partial views to form an entire shape, Wei-Hung Su, National Sun Yat-Sen Univ. (Taiwan); Chun-Chieh Wang, Chung-Fan Tu, Industrial Technology Research Institute (Taiwan) . . . . . [7056-69]

Speckles removal from interference patterns illuminated by coherent light using empirical mode decomposition, Wei-Hung Su, Chao-Kuei Lee, Cheng-Wei Lee, National Sun Yat-Sen Univ. (Taiwan) . . . . . [7056-70]

Projected fringe profilometry using a holographic technique: a compact design for endoscopes, Wei-Hung Su, Chi-Hung Shao, National Sun Yat-Sen Univ. (Taiwan). . . . . [7056-71]

Development of heat-assisted high speed MOSLM in broadband wavelength, Jin Heo, Toru Miyazawa, Jooyoung Kim, Mitsuteru Inoue, Toyohashi Univ. of Technology (Japan) . . . . . [7056-72]

First-order Bragg grating filters in silicon on insulator, Peter M. Waugh, Univ. of Surrey (United Kingdom) . . . . . [7056-73]

The investigation of angular separation for holographic angle multiplexing, Jung-Ping Liu, Tzu-Wei Lin, Feng Chia Univ. (Taiwan); Hon-Fai Yau, National Central Univ. (Taiwan). . . . . [7056-74]

Preparations for the low-cost substrate of CIGS solar cell, Ming-Seng Hsu, Chung-Chih Chang, Hsiang-Hsi Cheng, Yueh Ouyang, Yu-Tse Tsai, Jai-Bo Chen, Chin-Han Chen, Chinese Military Academy (Taiwan). . . . . [7056-76]

Laser modelocking and dual wavelength lasing in silicon, En-Kuang Tien, Xinzhu Sang, Feng Qing, Nuh S. Yuksek, Ozdal Boyraz, Univ. of California/Irvine . . . . . [7056-78]

Projected fringe profilometry using the area-encoded algorithm for dynamic and complex objects, Wei-Hung Su, National Sun Yat-Sen Univ. (Taiwan) . . . . . [7056-82]

Decoupled temperature and strain measurements using fiber Bragg grating sensors, Eric J. Ruggiero, Hua Xia, Binayak Roy, Yu Zhao, GE Global Research; Bala Corattiyil, GE Aviation . . . . . [7056-84]

Enhanced rotational Bragg selectivity by use of random phase encoding in volume holographic filter, Ye-Wei Yu, Shih-Hsin Ma, Xuan-Hao Lee, Bo-Rong Wu, Che-Chih Hsu, Tun-Chien Teng, Jui-Wen Chang, Ching-Cherng Sun, National Central Univ. (Taiwan). . . . . [7056-85]

Photonic crystal based polarization beam splitter utilizing the phenomenon of negative refraction, Monika Rajput, Ravindra K. Sinha, Delhi College of Engineering (India) . . . . . [7056-86]

Dynamic photonic crystal in organic liquids, Claudio Enrique Valencia-Loredo, Cesar Augusto Navarro Gaetan, Univ. de Guanajuato (Mexico); Igor V. Guryev, Kharkiv National Univ. of Radio Electronics (Ukraine); Edgar Alvarado Méndez, Monica Trejo Duran, Igor A. Sukhoivanov, Univ. de Guanajuato (Mexico). . . . . [7056-87]

Microfluidic configuration used to measure the refractive index of liquids, Sergio Calixto-Carrera, Ctr. de Investigaciones en Óptica, A.C. (Mexico); Martha Rosete Aguilar, Univ. Nacional Autonoma de Mexico (Mexico); David Monzon-Hernandez, Vladimir P. Minkovich, Ctr. de Investigaciones en Óptica, A.C. (Mexico). . . . . [7056-90]

Broadband white light laser combiner system, Daniel Ryan, Alireza Azizi, Hong Tang, Xin An, Jet Propulsion Lab. . . . . [7056-91]

Directive emission of flourescent nanowire and its applicaiton to luminescent solar collector, Shizhuo Yin, Chia-En Yang, The Pennsylvania State Univ.; Rongging Hui, The Univ. of Kansas; Zhengwei Pan, Univ. of Georgia . . . . . [7056-92]

Wednesday 13 August

SESSION 1

Room: Conv. Ctr. 7A . . . . . Wed. 8:00 to 10:10 am

Advances in Material Synthesis, Property, and Characterization I

Session Chair: **Shizhuo Yin,** The Pennsylvania State Univ.

8:00 am: **Photodynamics of azobenzene film and its application to one-beam image recording** *(Invited Paper)*, Daisuke Barada, Utsunomiya Univ. (Japan); Kiyonobu Tamura, Univ. of Tsukuba (Japan); Takashi Fukuda, Akira Emoto, National Institute of Advanced Industrial Science and Technology (Japan); Masahide Itoh, Univ. of Tsukuba (Japan); Toyohiko Yatagai, Utsunomiya Univ. (Japan) . . . . . [7056-01]

8:30 am: **Sapphire fibers grown from the melt by the EFG technique: dependence of the impurity distribution on temperature and surface tension gradients**, Thomas F. George, Univ. of Missouri/St. Louis; Liliana Braescu, West Univ. of Timisoara (Romania) . . . . . [7056-02]

8:50 am: **Erbium-doped tellurite glasses with higher lifetime of excited 4I13/2 level**, Enver F. Chillcce, Sergio P. A.Osorio, Mauro B. Elias, Gilberto J. Jacob, Carlos L. Cesar, Luiz C. Barbosa, Univ. Estadual de Campinas (Brazil) . . . . . [7056-03]

9:10 am: **Investigation of the electronic, linear, and second-order nonlinear optical properties for the wide bandgap chalcopyrite ternary nitrides**, Li-Chuan Tang, National Chiao Tung Univ. (Taiwan); Yia-Chung Chang, Univ. of Illinois at Urbana-Champaign; Jung-Yau Huang, Chen-Shiung Chang, National Chiao Tung Univ. (Taiwan) . . . . . [7056-04]

9:30 am: **Next-generation processing schemes for InP-based devices for applications in integrated photonics**, Rab Nawaz, COMSATS Institute of Information Technology (Pakistan); Shuja Ahmed, Arbab A. Khan, International Islamic Univ. (Pakistan); Mahnaz Q. Haseeb, Ehsan U. Khan, COMSATS Institute of Information Technology (Pakistan) . . . . . [7056-05]

9:50 am: **High-birefringent photonic crystal fiber: core with micro-air holes**, Anshu D. Varshney, Ravindra K. Sinha, Delhi College of Engineering (India). . . . . [7056-06]

Coffee Break . . . . . 10:10 to 10:40 am

SESSION 2

Room: Conv. Ctr. 7A . . . . . Wed. 10:40 am to 12:10 pm

Advances in Material Synthesis, Property, and Characterization II

Session Chair: **Abdalla M. Darwish,** Dillard Univ.

10:40 am: **Laser-diode stratified reflection volume holograms with red-sensitive photopolymers** *(Invited Paper)*, Yukihiro Ishii, Tokyo Univ. of Science (Japan); Toshihiro Kubota, Kyoto Institute of Technology (Japan). . . . . [7056-77]

11:10 am: **Unique nonlinear optical properties of SiC:Ge:Fe waveguide for device applications: part II**, Abdalla M. Darwish, Dillard Univ.; Brent Koplitz, Tulane Univ.; Khadijia Ransom, Dillard Univ. . . . . [7056-08]

11:30 am: **PbTe quantum dots multilayer grown by femtosecond laser ablation**, Eugenio Rodriguez, Lourdes Moya, Ricardo S. Moreira, Walfrido A. Pippo, Carlos L. Cesar, Luiz C. Barbosa, Univ. Estadual de Campinas (Brazil) . . . . . [7056-09]

11:50 am: **Optical properties of sapphire**, Radion Mogilevsky, Liudmila G. Sharafutdinova, Emerging Material Technologies; Scott D. Mittl, Insaco Inc.. . . . . [7056-10]

Lunch/Exhibition Break . . . . . 12:10 to 1:30 pm

SESSION 3

Room: Conv. Ctr. 7A . . . . . Wed. 1:30 to 3:20 pm

Development in Component and Integrative Photonic Devices I

Session Chair: **Kyoung-Youm Kim,** Sejong Univ. (South Korea)

1:30 pm: **Study on trapping force of tapered optical field on the microsphere with the FDTD method** *(Invited Paper)*, Hao Yang, Guoying Feng, Guorui Zhou, Hao Zhou, Sichuan Univ. (China); Qihua Zhu, Jianjun Wang, China Academy of Engineering Physics (China) . . . . . [7056-11]

2:00 pm: **Novel technique for characterization of photovoltaic devices using light phase modulation**, Sergei F. Lyuksyutov, Univ. of Akron; John B. Ferguson, Air Force Research Lab; James R. Deneault, Air Force Research Lab.; Nickolai V. Kukhtarev, Alabama A&M Univ. . . . . [7056-12]

2:20 pm: **Ultralow cross talk in crossed strip waveguides with the assistance of a photonic crystal cavity**, Rami A. Wahsheh, Mustafa A. G.Abushagur, Zhaolin Lu, Stefan F. Preble, Rochester Institute of Technology . . . . . [7056-13]

2:40 pm: **Integration of opto-fluidic microring resonator lasers for lab-on-a-chip development**, Jonathan D. Suter, Yuze Sun, John A. Viator, Xudong Fan, Univ. of Missouri/Columbia . . . . . [7056-14]

3:00 pm: **Single-beam phase conjugation for lasers phase locking in free space and image formation**, Nickolai V. Kukhtarev, Tatiana V. Kukhtareva, Michael J. Curley, Gregory Stargell, Alabama A&M Univ.. . . . . [7056-89]

Coffee Break . . . . . 3:20 to 3:50 pm

SESSION 4

Room: Conv. Ctr. 7A . . . . . Wed. 3:50 to 5:40 pm

Development in Component and Integrative Photonic Devices II

Session Chair: **Wei-Hung Su,** National Sun Yat-Sen Univ. (Taiwan)

3:50 pm: **Recent advance in fiber SERS sensors** *(Invited Paper)*, Claire Gu, Chao Shi, He Yan, Debraj Ghosh, Leo Seballos, Shaowei Chen, Jin Zhang, Univ. of California/Santa Cruz . . . . . [7056-16]

4:20 pm: **Ultrahigh-sensitivity frequency-comb-referenced multiparametric sensors based on 1D photonic components**, Paolo De Natale, Gianluca Gagliardi, Pasquale Maddaloni, Pietro Malara, Mario Salza, Pietro Ferraro, Istituto Nazionale di Ottica Applicata (Italy). . . . . [7056-17]

4:40 pm: **GaN photonic crystal-based, enhanced fluorescence biomolecule detection system**, Randy P. Tompkins, Josh R. Nightingale, Satish Yeldandi, Alex Reddington, Kyoo Jo, Jeremy M. Dawson, Xiana A. Cao, Aaron Timperman, Larry A. Hornak, Dimitris Korakakis, Thomas H. Myers, West Virginia Univ. . . . . [7056-18]

5:00 pm: **Single-mode tunable 980nm double-clad ytterbium-doped MMI-based fiber laser**, Carlos Calles-Arriaga, Romeo Selvas-Aguilar, Arturo Castillo-Guzman, Univ. Autonoma de Nuevo Leon (Mexico); Daniel May-Arrioja, Instituto Nacional de Astrofísica, Óptica y Electrónica (Mexico); Gilberto Anzueto-Sanchez, Univ. de Guanajuato (Mexico). . . . . [7056-19]

5:20 pm: **Optical investigation of elastic strain distributions on the surface of a fixed crystal plate under excitation**, Sergei V. Kulakov, Victor V. Kludzin, Victor V. Molotok, Leonid M. Preslenev, St. Petersburg State Univ. of Aerospace Instrumentation (Russia) . . . . . [7056-20]

Thursday 14 August

SESSION 5

Room: Conv. Ctr. 7A . . . . . Thurs. 8:00 to 10:10 am

Novel Materials and Devices: Theoretical and Experimental Approaches I

Session Chair: **Ruyan Guo,** The Univ. of Texas at San Antonio

8:00 am: **Guided modes and light trapping in the negative-refractive-index slab waveguides** *(Invited Paper)*, Kyoung-Youm Kim, Sejong Univ. (South Korea); Junghyun Park, Byoungho Lee, Seoul National Univ. (South Korea) . . . . . [7056-21]

8:30 am: **Novel all-fiber band pass filter and multimode-single-mode converter for interconnection between multimode fiber and single mode fiber network** *(Invited Paper)*, Yong Zhu, Hao Mei, Tao Zhu, Chongqing Univ. (China) . . . . . [7056-22]

9:00 am: **Dynamic hologram for biomedical imaging and image display**, Guoqiang Li, College of Optical Sciences/The Univ. of Arizona; Peng Wang, Nitto Denko Technical Corp.; Urs Utzinger, Jayan Thomas, College of Optical Sciences/The Univ. of Arizona; Michiharu Yamamoto, Nitto Denko Technical Corp.; Nasser N. Peyghambarian, College of Optical Sciences/The Univ. of Arizona. . . . . [7056-88]

9:30 am: **Single-mode index-guiding photonic crystal fibers for the middle infrared**, Lilya Lobachinsky, Arnon Millo, Abraham Katzir, Tel-Aviv Univ. (Israel) . . . . . [7056-24]

9:50 am: **Optical spatial solitons, the power law, and the swing effect**, Sihon H. Crutcher, U.S. Army Research, Development and Engineering Command; Albert J. Osei, Oakwood College; Matthew E. Edwards, Alabama A&M Univ. . . . . [7056-25]

Coffee Break . . . . . 10:10 to 10:40 am

Courses of Related Interest

See SPIE Cashier for information and to register.

SC608 Photonic Crystals: A Crash Course, from Bandgaps to Fibers (Johnson) Wednesday, 8:30 am to 12:30 pm

SESSION 6

Room: Conv. Ctr. 7A . . . . . Thurs. 10:40 to 12:00 pm

Novel Materials and Devices: Theoretical and Experimental Approaches II

Session Chair: **Ching-Cherng Sun,** National Central Univ. (Taiwan)

10:40 am: **Integrated optical comb filter for dispersion compensation with slanted grating lines**, Rene Günster, Udo Barabas, Univ. der Bundeswehr München (Germany) . . . . . [7056-27]

11:00 am: **Light-activated ultrafast magneto-optic switches**, Shizhuo Yin, Chia-En Yang, Meng-Ku Chen, The Pennsylvania State Univ. . . . . [7056-28]

11:20 am: **Dual-band wavelength demultiplexer consisting of SOI based photonic crystals: design and analysis**, Swati Rawal, Ravindra K. Sinha, Delhi College of Engineering (India). . . . . [7056-30]

11:40 am: **Polarization rotation enhancement and gyrotropic photonic bandgaps in birefringent magneto-photonic crystals,** Amier A. Jalali, Miguel Levy, Ziyou Zhou, Neluka Dissanayake, Michigan Technological Univ. . . . . [7056-93]

Lunch/Exhibition Break . . . . . 12:00 to 1:50 pm

SESSION 7

Room: Conv. Ctr. 7A . . . . . Thurs. 1:50 to 3:30 pm

Innovations in Optic and Photonic Applications I

Session Chair: **Paul B. Ruffin,** U.S. Army Aviation and Missile Research, Development and Engineering Ctr.

1:50 pm: **Middle-IR supercontinuum generations and applications** *(Invited Paper)*, Shizhuo Yin, Jae Hun Kim, The Pennsylvania State Univ.; Paul B. Ruffin, Eugene Edwards, Christina L. Brantley, U.S. Army Aviation and Missile Research, Development and Engineering Ctr.; Claire Luo, General Opto Solutions, LLC . . . . . [7056-31]

2:20 pm: **Simultaneously sensing multiple gases using a single length of hollow-core photonic bandgap fiber with sub-minute response times**, Rosalind M. Wynne, Kevin Creedon, Jason Merritt, Villanova Univ. . . [7056-32]

2:40 pm: **Modeling standard techniques to improve core/multishell nanowire light emitting diodes efficiencies**, Clarisse Mazuir, Winston V. Schoenfeld, College of Optics & Photonics/Univ. of Central Florida . [7056-35]

3:00 pm: **Ultraviolet-infrared laser-induced domain inversion in MgO-doped congruent $LiNbO_3$ and near stoichiometric $LiTaO_3$ crystals** *(Invited Paper)*, Ya'nan Zhi, Weijuan Qu, De'an Liu, Jianfeng Sun, Aimin Yan, Liren Liu, Shanghai Institute of Optics and Fine Mechanics (China) . . . . . [7056-65]

Coffee Break . . . . . 3:30 to 4:00 pm

SESSION 8

Room: Conv. Ctr. 7A . . . . . Thurs. 4:00 to 5:20 pm

Innovations in Optic and Photonic Applications II

Session Chair: **Ken Yuh Hsu,** National Chiao Tung Univ. (Taiwan)

4:00 pm: **Polarization and drift analysis of thermally symmetric double-sided crossover-free SM fiber coils**, Chris Heaton, Stanley Associates; Jeff Williams, Stanley Associates, Inc.; Paul B. Ruffin, U.S. Army Aviation and Missile Research, Development and Engineering Ctr.; Arthur Lompado, John E. Reinhardt, Polaris Sensor Technologies, Inc. . . . . [7056-36]

4:20 pm: **Photonic crystal fiber for magnetic field sensing**, Enver F. Chillcce, Sergio P. A.Osorio, Mauro B. Elias, Gilberto J. Jacob, Carlos L. Cesar, Luiz C. Barbosa, Univ. Estadual de Campinas (Brazil) . . . . . [7056-37]

4:40 pm: **Ultrafast pulse characterization using XPM in silicon**, Nuh S. Yuksek, Xinzhu Sang, En-Kuang Tien, Qi Song, Feng Qian, Ivan V. Tomov, Ozdal Boyraz, Univ. of California/Irvine. . . . . [7056-39]

5:00 pm: **Bragg tunable filter: from hyperspectral imaging to supercontinuum-based tunable source**, Sebastien Blais-Ouellette, Photon Etc. Inc. (Canada) . . . . . [7056-40]

Optical Engineering +Applications

Part of SPIE Optics+Photonics

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Toru Yoshizawa, Saitama Medical Univ. (Japan)
Richard N. Youngworth, Light Capture, Inc.

Sunday	Monday	Tuesday	Wednesday	Thursday

Special Program

7057 **The Nature of Light: Light in Nature II** *(Creath)*, p. 126

Illumination Engineering

7058 **Eighth International Conference on Solid State Lighting** *(Ferguson/Taguchi/Ashdown/Park)*, p. 127

7059 **Nonimaging Optics and Efficient Illumination Systems V** *(Winston/Koshel)*, p. 130

Optical Design

Program Chair: **R. John Koshel,** Photon Engineering LLC and College of Optical Sciences/The Univ. of Arizona

7060 **Current Developments in Lens Design and Optical Engineering IX** *(Mouroulis/Smith/Johnson)*, p. 132

7061A **Novel Optical Systems Design and Optimization XI** *(Koshel/Gregory)*, p. 135

7061B **Polymer Optics Design, Fabrication, and Materials** *(Moore/Krevor)*, p. 137

7062 **Laser Beam Shaping IX** *(Forbes/Lizotte)*, p. 138

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Advanced Metrology

Program Chair: **Katherine Creath,** Optineering and College of Optical Sciences/The Univ. of Arizona

7066 **Two- and Three-Dimensional Methods for Inspection and Metrology VI** *(Huang/Yoshizawa/Harding)*, p. 149

7063 **Interferometry XIV: Techniques and Analysis** *(Schmit/Creath/Towers)*, p. 141

7065 **Reflection, Scattering, and Diffraction from Surfaces** *(Gu/Hanssen)*, p. 146

7064 **Interferometry XIV: Applications** *(Novak/Osten/Gorecki)*, p. 144

Optical Systems Engineering

Program Chair: **José Sasian,** College of Optical Sciences/The Univ. of Arizona

7068 **Optical System Alignment and Tolerancing II** *(Sasian/Youngworth)*, p. 153

7067 **Advances in Thin-Film Coatings for Optical Applications V** *(Kruschwitz/Ellison)*, p. 151

7071 **An Optical Believe It Or Not: Key Lessons Learned** *(Kahan)*, p. 159

7069 **Optical System Contamination: Effects, Measurements and Control 2008** *(Straka)*, p. 155

7070 **Optical Technologies for Arming, Safing, Fuzing, and Firing IV** *(Dickey/Beyer)*, p. 157

Image and Signal Processing

Program Chair: **Khan M. Iftekharuddin,** The Univ. of Memphis

7072 **Optics and Photonics for Information Processing II** *(Awwal/Iftekharuddin/Javidi)*, p. 160

7073 **Applications of Digital Image Processing XXXI** *(Tescher)*, p. 163

7074 **Advanced Signal Processing Algorithms, Architectures, and Implementations XVIII** *(Luk)*, p. 167

7075 **Mathematics of Data/Image Pattern Recognition, Compression, and Encryption with Applications XI,** *(Schmalz/Ritter/Barrera/Astola)*, p. 169

7076 **Image Reconstruction from Incomplete Data V** *(Bones/Fiddy/Millane)*, p. 171

X-Ray, Gamma-Ray, and Particle Technologies

Program Chairs: **Sandra G. Biedron,** Argonne National Lab.; **Massimo Altarelli,** Deutsches Elektronen-Synchrotron (Germany)

7077 **Advances in X-Ray/EUV Optics and Components III** *(Khounsary/Morawe/Goto)*, p. 173

7078 **Developments in X-Ray Tomography VI** *(Stock)*, p. 176

7079 **Hard X-Ray, Gamma-Ray, and Neutron Detector Physics X** *(Burger/Franks/James)*, p. 180

7080 **Penetrating Radiation Systems and Applications IX** *(Doty/Barber/Roehrig/Schirato)*, p. 183

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10:00 am to 5:00 pm	10:00 am to 5:00 pm	10:00 am to 2:00 pm

Sunday	Monday	Tuesday	Wednesday	Thursday

Remote Sensing

Program Chair: **Allen H.-L. Huang,** Univ. of Wisconsin/Madison

7081 **Earth Observing Systems XIII** *(Butler/Xiong)*, p. 185

7082 **Infrared Spaceborne Remote Sensing and Instrumentation XVI** *(Strojnik)*, p. 188

7084 **Satellite Data Compression, Communication, and Processing IV** *(Huang/Heymann/Serra-Sagrista)*, p. 194

7083 **Remote Sensing and Modeling of Ecosystems for Sustainability V** *(Gao)*, p. 191

7089 **Remote Sensing of Fire: Science and Application** *(Hao)*, p. 205

7085 **Atmospheric and Environmental Remote Sensing Data Processing and Utilization IV: Readiness for GEOSS II** *(Goldberg/Bloom)*, p. 196

7086 **Imaging Spectrometry XIII** *(Shen/Lewis)*, p. 197

7087 **Remote Sensing System Engineering** *(Ardanuy/Puschell)*, p. 201

7088 **Remote Sensing Applications for Aviation Weather Hazard Detection and Decision Support** *(Feltz/Murray)*, p. 203

Atmospheric and Space Optical Systems

7090 **Atmospheric Optics: Models, Measurements, and Target-in-the-Loop Propagation II** *(Hammel/van Eijk/Vorontsov)*, p. 206

7091 **Free-Space Laser Communications VIII** *(Majumdar/Davis)*, p. 208

7096 **Adaptive Coded Aperture Imaging and Non-Imaging Sensors II** *(Casasent/Rogers)*, p. 216

7094 **Unconventional Imaging IV** *(Dolne/Karr/Gamiz)*, p. 213

7092 **Quantum Communications and Quantum Imaging VI** *(Meyers/Shih/Deacon)*, p. 210

7093 **Advanced Wavefront Control: Methods, Devices, and Applications VI** *(Gonglewski/Carreras/Rhoadarmer)*, p. 212

7095 **Nanophotonics and Macrophotonics for Space Environments II** *(Taylor/Cardimona)*, p. 214

7097 **Instruments, Methods, and Missions for Astrobiology XI** *(Hoover/Levin/Rozanov/Davies)*, p. 218

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10:00 am to 5:00 pm	10:00 am to 5:00 pm	10:00 am to 2:00 pm

Don't miss the Special Events, Plenaries Receptions, Technical Workshops, Courses, Poster Sessions—and more!

See Special Event Daily Schedule, p. 9.

Conference 7057

Sunday 10 August 2008 • Proceedings of SPIE Vol. 7057

The Nature of Light: Light in Nature II

Conference Chair: **Katherine Creath,** Optineering and College of Optical Sciences/The Univ. of Arizona

Program Committee: **Helen Ghiradella,** SUNY/Univ. at Albany; **Mitsuo Takeda,** The Univ. of Electro-Communications (Japan); **Jean-Pol Vigneron,** Facultes Univ. Notre Dame de la Paix (Belgium); **Wei Wang,** Heriot-Watt Univ. (United Kingdom)

Sunday 10 August

SESSION 1

Room: Conv. Ctr. 11A . . . . . Sun. 1:30 to 2:50 pm

Fundamental Properties of Light

1:30 pm: **Gaussian-like shaping of coherent synchrotron x-rays: 3D diffraction at a 90-degree Bragg reflection**, Andrei Y. Nikulin, Monash Univ. (Australia); Alexei Y. Suvorov, Japan Synchrotron Radiation Research Institute (Japan). . . . . [7057-03]

1:50 pm: **Singular optical phenomena in nature** *(Invited Paper)*, Grover A. Swartzlander, Jr., College of Optical Sciences/The Univ. of Arizona; Greg Gbur, The Univ. of North Carolina at Charlotte . . . . . [7057-01]

2:20 pm: **Experimental investigation of the singular phenomena in statistical optical fields** *(Invited Paper)*, Wei Wang, Heriot-Watt Univ (United Kingdom); Akihiro Matsuda, Mitsuo Takeda, The Univ. of Electro-Communications (Japan). . . . . [7057-02]

Coffee Break . . . . . 2:50 to 3:20 pm

SESSION 2

Room: Conv. Ctr. 11A . . . . . Sun. 3:20 to 5:10 pm

Light and Biological Systems

3:20 pm: **Product piracy from nature: biomimetic microstructures and interfaces for high-performance optics** *(Invited Paper)*, Robert Brunner, Michael Helgert, Michael Sundermann, Carl Zeiss Jena GmbH (Germany); Theobald Lohmueller, Joachim P. Spatz, Max-Planck-Institut für Metallforschung (Germany) . . . . . [7057-05]

3:50 pm: **Photonic nanoarchitectures occurring in butterfly scales as selective gas/vapor sensors**, Laszlo P. Biro, Krisztián Kertész, Zofia Vértesy, Research Institute for Technical Physics and Materials Science (Hungary); Zsolt Bálint, Hungarian Natural History Museum (Hungary) . . . . . [7057-06]

4:10 pm: **Biologically inspired optics: beetle exoskeleton**, Kaia N. Buhl, Zachary Roth, The Univ. of North Carolina at Charlotte; Pradeep Srinivasan, College of Optics & Photonics/Univ. of Central Florida; Raymond C. Rumpf, Prime Research, LC; Eric G. Johnson, The Univ. of North Carolina at Charlotte . . . . . [7057-07]

4:30 pm: **A look at some systemic properties of self-bioluminescent emission**, Katherine Creath, College of Optical Sciences/The Univ. of Arizona and Optineering. . . . . [7057-08]

4:50 pm: **High Dynamic Range Image rendering of color in chameleons' camouflage using optical thin films**, Mark J. Prusten, Chris Castillo, Optical Design Labs. . . . . [7057-09]

Room: Conv. Ctr. 6A . . . . . Sun. 6:00 to 6:45 pm

All-Conference Plenary Session

View plenary presentation details p. 13.

6:00 pm: **The Solar Decathlon: building a better future with solar energy**, Richard J. King, U.S. Dept. of Energy

Monday 11 August

Room: Conv. Ctr. Exhibit Hall B2 . . . . . Mon. 6:00 to 7:30 pm

Posters-Monday

Poster authors will begin displaying posters after 10:00 am Monday morning. A poster session, with authors present at their posters, will be held Monday evening from 6:00 to 7:30 pm. Light refreshments will be served.

Poster Setup

Poster presenters must set up their posters between 10:00 am and 5:00 pm on Monday. Poster presenters who have not set up by 5:00 pm on Monday will be considered a "no show" and their manuscript will not be published. Presenters must remove their posters immediately after the poster session. Posters not removed will be considered unwanted and will be discarded. SPIE assumes no responsibility for posters left up after the end of each poster session.

Novel keys for analysing physical features of light, Rafael A. Betancur Lopera, Roman E. Castaneda-Sepulveda, Univ. Nacional de Colombia/ Medellín (Colombia). . . . . [7057-10]

Prediction of spectral shifts proportional to source distances by time-varying frequency or wavelength selection, V. Guruprasad, Inspired Research, LLC. . . . . [7057-11]

New Doppler-free resonance in counterpropagating light waves, Denis V. Brazhnikov, Institute of Laser Physics (Russia); Vladimir L. Velichansky, P.N. Lebedev Physical Institute (Russia) and Moscow Engineering Physics Institute (Russia); Vitaliy V. Vasil'ev, Sergei A. Zibrov, P.N. Lebedev Physical Institute (Russia); Leonid A. Sidorenkov, Peter A. Siushev, Moscow Engineering Physics Institute (Russia); Alexey V. Taichenachev, Valeriy I. Yudin, Institute of Laser Physics (Russia) and Novosibirsk State Univ. (Russia) . . . . . [7057-12]

Photo-real rendering of bioluminescence and iridescence in creatures from the abyss, Mark J. Prusten, Chris Castillo, Optical Design Labs. . . . . [7057-13]

Conference 7058

Monday-Wednesday 11-13 August 2008 • Proceedings of SPIE Vol. 7058

Eighth International Conference on Solid State Lighting

Conference Chairs: **Ian T. Ferguson,** Georgia Institute of Technology; **Tsunemasa Taguchi,** Yamaguchi Univ. (Japan); **Ian E. Ashdown,** Philips Lighting Co. (Canada); **Seong-Ju Park,** Gwangju Institute of Science and Technology (South Korea)

Program Committee: **Srinath K. Aanegola,** GE Lumination LLC; **Andrew A. Allerman,** Sandia National Labs.; **Lianghui Chen,** Institute of Semiconductors (China); **Steven P. DenBaars,** Univ. of California/Santa Barbara; **Kevin J. Dowling,** Color Kinetics Inc.; **Volker K. Härle,** OSRAM Opto Semiconductors GmbH (Germany); **Christoph G Hoelen,** Philips Lighting B.V. (Netherlands); **Jianzhong Jiao,** OSRAM Opto Semiconductors Inc.; **Matthew Hartmann Kane,** Univ. of Oklahoma; **Asif M. Khan,** Univ. of South Carolina; **Michael R. Krames,** Philips Lumileds Lighting Co.; **Yung-Sheng Liu,** National Tsing Hua Univ. (Taiwan); **Shuji Nakamura,** Univ. of California/Santa Barbara; **Eun-Hyun Park,** EpiValley Co., Ltd. (South Korea); **Robert V. Steele,** Strategies Unlimited; **Brent K. Wagner,** Georgia Institute of Technology; **Chih-Chung Yang,** National Taiwan Univ. (Taiwan)

Monday 11 August

SESSION 1

Room: Conv. Ctr. 10 . . . . . Mon. 1:00 to 2:50 pm

Source Performance I

Session Chair: **Edward D. Petrow,** Lincoln Technical Services, Inc.

1:00 pm: **New methods for phosphor conversion of LED light** *(Invited Paper)*, Gerd O. Mueller, Regina Mueller-Mach, Michael R. Krames, Lumileds Lighting US LLC . . . . . [7058-01]

1:30 pm: **Development of high luminous flux phosphor-conversion white light-emitting diodes by using large-scale integrated light-emitting diodes**, Tsutomu Miyachi, Hiroaki Sakuta, Hideki Hayashi, Yuji Uchida, Satoshi Kurai, Tsunemasa Taguchi, Yamaguchi Univ. (Japan) . . . . . [7058-02]

1:50 pm: **On-chip very low junction temperature GaN-based light emitting diodes by selective ion implantation**, Yun-Wei Cheng, Hung-Hsien Chen, Min-Yung Ke, Cheng-Pin Chen, JianJang Huang, National Taiwan Univ. (Taiwan) . . . . . [7058-03]

2:10 pm: **Calibration procedure for LED simulation**, Chung-Jen Ou, Hsuiping Institute of Technology (Taiwan) . . . . . [7058-05]

2:30 pm: **Design and fabrication of optical homogenizer with micro structure by injection molding process**, Chao-Chang A. Chen, National Taiwan Univ. of Science and Technology (Taiwan); Shian-Wen Chang, Instrument Technology Research Ctr. (Taiwan) . . . . . [7058-46]

Coffee Break . . . . . 2:50 to 3:20 pm

SESSION 2

Room: Conv. Ctr. 10 . . . . . Mon. 3:20 to 4:50 pm

Application

Session Chair: **Tsunemasa Taguchi,** Yamaguchi Univ. (Japan)

3:20 pm: **Efficient simulation of nitride LEDs and lasers** *(Invited Paper)*, Benjamin Klein, Georgia Institute of Technology . . . . . [7058-06]

3:50 pm: **The theoretical evaluation of the concept of "RGB-CYM-RGB" cluster white LED lighting and the experimental evaluation of RGBCYM cluster white LED lighting devise for the endoscope application**, Yuji Uchida, Hiroki Ishikawa, Kentaro Sugi, Takashi Fukui, Tsutomu Miyachi, Satoshi Kurai, Tsunemasa Taguchi, Yamaguchi Univ. (Japan). . . . . [7058-07]

4:10 pm: **Rapid prototyping of an adaptive light source for mobile manipulators with EasyKit and EasyLab**, Martin Wojtczyk, Simon Barner, Michael Geisinger, Alois Knoll, Technische Univ. München (Germany)[7058-08]

4:30 pm: **High-power RGB LED for LCD projector,** Wei-Ting Chien, Ming-Yuan Han, Ching-Cherng Sun, National Central Univ. (Taiwan) . . . . . [7058-09]

Room: Marriott Coronado . . . . . Mon. 8:00 to 10:00 pm

Illumination Technical Event

Chair: **R. John Koshel,** Photon Engineering LLC and College of Optical Sciences/The Univ. of Arizona

We will be discussing state-of-the-art displays. Representatives from display companies, both full displays and components used in displays, will present examples of their technology and discuss some of the nuances of their operation. Examples include backlit and projection displays, LED displays, immersive environments, and novel display methods. If you would like to present display technology at this Illumination Technical Event, please contact John Koshel, john.koshel@osa.org to be included in the schedule. At the end of the planned event, any member of the audience may present information within the broad field of illumination.

Light refreshments will be served.

Tuesday 12 August

SESSION 3

Room: Conv. Ctr. 10 . . . . . Tues. 8:00 to 9:30 am

Solid State Lighting and OLEDs Plenary Session

Session Chair: **Ian T. Ferguson,** Georgia Institute of Technology

View plenary presentation details p. 16.

8:00 am: **Why the Developing World is the Perfect Market Place for SSL**, Dave Irvine-Halliday, Univ. of Calgary (Canada) . . . . . [7058-10]

8:45 am: **The Use of Heavy Metal Complexes in Solid State Light Sources (OLEDs) (Presentation Only),** Mark E. Thompson, Univ. of Southern California

SESSION 4

Room: Conv. Ctr. 10 . . . . . Tues. 9:30 am to 12:00 pm

OLEDs and Solid State Lighting

Session Chair: **Ian T. Ferguson,** Georgia Institute of Technology

Joint Session with Conference 7051: Organic Light Emitting Materials and Devices XII

9:30 am: **DOE solid state lighting program overview** *(Invited Paper)*, Ryan J. Egidi, National Energy Technology Lab. . . . . [7051-40]

9:55 am: **Nanostructured LEDs for lighting** *(Invited Paper)*, Norbert Linder, OSRAM Opto Semiconductors GmbH (Germany) . . . . . [7058-11]

Coffee Break . . . . . 10:20 to 10:45 am

10:45 am: **High-performance OLEDs and their application to lighting** *(Invited Paper)*, Nobuhiro Ide, Takuya Komoda, Matsushita Electric Works, Ltd. (Japan). . . . . [7051-41]

11:10 am: **Improvement of efficiency droop by resonance tunneling LED** *(Invited Paper)*, Wang N. Wang, Univ. of Bath (United Kingdom) . . . . [7058-12]

11:35 am: **OLEDs for lighting applications** *(Invited Paper)*, Volker van Elsbergen, Herbert F. Boerner, Georg Gaertner, Claudia Goldmann, Stefan Grabowski, Horst J. Greiner, Hans-Peter Loebl, Edward W. A.Young, Philips Research Labs. (Germany) . . . . . [7051-42]

Lunch/Exhibition Break . . . . . 12:00 to 1:30 pm

SESSION 5

Room: Conv. Ctr. 10 . . . . . Tues. 1:30 to 3:20 pm

Source Performance II

Session Chair: **Seong-Ju Park,** Gwangju Institute of Science and Technology (South Korea)

1:30 pm: **Lumiramic ™: a new phosphor technology for high performance solid state light sources** *(Invited Paper)*, Helmut Bechtel, Peter Schmidt, Wolfgang Busselt, Baby Schreinemacher, Philips Research Labs. (Germany) . . . . . [7058-13]

2:00 pm: **Characterization of white light source with high color rendering by multi-layered phosphors excited by near-ultraviolet light-emitting diodes**, Takeshi Fukui, Hiroaki Sakuta, Kunihito Kamon, Yuji Uchida, Satoshi Kurai, Tsunemasa Taguchi, Yamaguchi Univ. (Japan) . . . . . [7058-14]

2:20 pm: **Analysis of strain relaxation and emission spectrum of a free-standing GaN-based nanopillar**, Yuh-Renn Wu, National Taiwan Univ. (Taiwan); Peichen Yu, Ching-Hua Chiu, Hao-Chung Kuo, National Chiao-Tung Univ. (Taiwan) . . . . . [7058-15]

2:40 pm: **Thermal characterization of single-die and multi-die high power light-emitting diodes**, Arno Keppens, Peter Hanselaer, Kaho Sint- Lieven Hogeschool (Belgium); Geert Deconinck, Katholieke Univ. Leuven (Belgium) . . . . . [7058-16]

3:00 pm: **Effect of PdZn catalyst on the performance of high-efficiency green light-emitting diodes**, Ja-Yeon Kim, Min-Ki Kwon, Chu-Young Cho, Sang-Jun Lee, Seong-Ju Park, Gwangju Institute of Science and Technology (South Korea); Sunwoon Kim, Je-Won Kim, Yong-Chun Kim, SAMSUNG Electro-Mechanics Co., Ltd. (South Korea). . . . . [7058-43]

Coffee Break . . . . . 3:20 to 3:50 pm

SESSION 6

Room: Conv. Ctr. 10 . . . . . Tues. 3:50 to 5:40 pm

LED I

Session Chair: **Ian T. Ferguson,** Georgia Institute of Technology

3:50 pm: **Materials and devices for tomorrow's lighting** *(Invited Paper)*, Jeff Nause, Cermet, Inc.. . . . . [7058-17]

4:20 pm: **Metalorganic vapor deposition of GaN and InGaN on ZnO substrate using Al_2O_3 as a transition layer**, Nola Li, Shen-Jie Wang, Georgia Institute of Technology; Adriana Valencia, Jeff Nause, Cermet, Inc.; Christopher J. Summers, Ian T. Ferguson, Georgia Institute of Technology . . . . . [7058-18]

4:40 pm: **Layered oxonitrido silicate (SiON) phosphors for high power LEDs**, Peter J. Schmidt, Andreas Tuecks, Helmut Bechtel, Detlef U. Wiechert, Philips Research Labs. (Germany); Wolfgang Schnick, Ludwig-Maximilians-Univ. München (Germany); Regina Mueller-Mach, Gerd O. Mueller, Philips Lumileds Lighting Co. . . . . [7058-19]

5:00 pm: **Remote phosphor LED modules for general illumination**, Christoph G. A.Hoelen, Huub Borel, Philips Lighting B.V. (Netherlands); Paul Deeben, Philips Lighting BV (Netherlands); Jan de Graaf, Rene Hendriks, Matthijs Keuper, Martijn Lankhorst, Claudia Mutter, Rene Wegh, Lars Waumans, Philips Lighting B.V. (Netherlands) . . . . . [7058-20]

5:20 pm: **Phosphor-free white light-emitting diode using InGaN/GaN multiple quantum wells grown on GaN microfacets,** Chu-Young Cho, Il-Kyu Park, Min-Ki Kwon, Ja-Yeon Kim, Seong-Ju Park, Gwangju Institute of Science and Technology (South Korea); Dong-Ryul Jung, Kwang-Woo Kwon, NINEX Co., Ltd. (South Korea) . . . . . [7058-44]

Poster/Demo Session-Tuesday

Room: Conv. Ctr. Exhibit Hall B2 . . . . .Tues. 8:00 to 10:00 pm

Poster authors will begin displaying posters after 10:00 am Tuesday morning. A poster session and demo session, with authors present at their posters, will be held Tuesday evening from 8:00 to 10:00 pm. Light refreshments will be served.

Poster Setup

Poster presenters must set up their posters between 10:00 am and 5:00 pm on Tuesday. Poster presenters who have not set up by 5:00 pm on Tuesday will be considered a "no show" and their manuscript will not be published. Presenters must remove their posters immediately after the poster session. Posters not removed will be considered unwanted and will be discarded. SPIE assumes no responsibility for posters left up after the end of each poster session.

Protection of GaN-based light-emitting diode from electrostatic discharge (ESD) by capacitor, Tae-Young Park, Chang-Hee Cho, Baek-Hyun Kim, Seong-Ju Park, Gwangju Institute of Science and Technology (South Korea) . . . . . [7058-41]

Wednesday 13 August

SESSION 7

Room: Conv. Ctr. 10 . . . . . Wed. 8:20 to 9:50 am

LED II

Session Chair: **Norbert Linder,** OSRAM Opto Semiconductors GmbH (Germany)

8:20 am: **Color rendering and efficacy limits for solid-state lighting technology** *(Invited Paper)*, Eric C. Bretschneider, Equallux Corp. . . [7058-21]

8:50 am: **Spectral variations in an InGaN/GaN quantum-well light-emitting diode in varying prestrained barrier thickness**, Chih-Feng Lu, Chi-Feng Huang, Chih-Chung Yang, National Taiwan Univ. (Taiwan) . . . . . [7058-22]

9:10 am: **External efficiency and thermal dissipation enhanced package for light-emitting diode**, Meng-Han Tang, Tsung-Han Wu, Guo-Dung J. Su, National Taiwan Univ. (Taiwan) . . . . . [7058-23]

9:30 am: **LED array: where does far field begin?**, Ivan Moreno, Univ. Autónoma de Zacatecas (Mexico); Ching-Cherng Sun, National Central Univ. (Taiwan) . . . . . [7058-25]

Coffee Break . . . . . 9:50 to 10:20 am

SESSION 8

Room: Conv. Ctr. 10 . . . . . Wed. 10:20 am to 12:10 pm

Growth

Session Chair: **Eric C. Bretschneider,** Equallux Corp.

10:20 am: **Optical and structural properties of dual wavelength InGaN/GaN multiple quantum well light emitting diodes** *(Invited Paper)*, Zhe-Chuan Feng, Ting Wei Kuo, National Taiwan Univ. (Taiwan); C. Y. Wu, Uni-Light Technology Corp. (Taiwan); Alex H.Tsai, Jer-Ren Yang, Y. S. Huang, National Taiwan Univ. (Taiwan); Ian T. Ferguson, Georgia Institute of Technology; Weijie Lu, Fisk Univ.. . . . . [7058-26]

10:50 am: **High-quality white-light generation by using surface plasmon-enhanced CdSe/ZnS nano-crystal wavelength conversion on a blue/green two-color light-emitting diode**, Dong-Ming Yeh, Chi-Feng Huang, Yen-Cheng Lu, Chih-Chung Yang, National Taiwan Univ. (Taiwan). . . . . [7058-27]

11:10 am: **Formation of Visible Narrow-Band Light Sources using Quantum Dots**, Sarfaraz Baig, Univ. of Miami; Pengfei Wu, Jianfeng Xu, New Span Opto-Technology Inc.; Michael R. Wang, Univ. of Miami . . . . . [7058-28]

11:30 am: **Metalorganic chemical vapor deposition of III-nitride epilayers on ZnO substrates for green emitter applications**, Hongbo Yu, William Fenwick, Shen-Jie Wang, Nola Li, Andrew Melton, Benjamin Klein, Ian T. Ferguson, Georgia Institute of Technology. . . . . [7058-29]

11:50 am: **Improved performance of hybrid polymer light emitting device by using inorganic nanocomposite and polymer solutions**, A. Mohammed Hussain, B. Neppolian, Sun Hee Kim, Jin Young Kim, Hee-Chul Choi, Kwanghee Lee, Seong-Ju Park, Gwangju Institute of Science and Technology (South Korea). . . . . [7058-30]

Lunch/Exhibition Break . . . . . 12:10 to 1:40 pm

SESSION 9

Room: Conv. Ctr. 10 . . . . . Wed. 1:40 to 3:30 pm

Optics

Session Chair: **Jeff Nause,** Cermet, Inc.

1:40 pm: **Efficient and cost-effective polarized-light backlights for LCDs** *(Invited Paper)*, Hugo J. Cornelissen, Philips Research Labs. (Netherlands) . . . . . [7058-31]

2:10 pm: **Highly efficient (infra)-red-conversion of InGaN light emitting diodes by nanocrystals, enhanced by color selective mirrors**, Juergen Roither, Maksym V. Kovalenko, Wolfgang Heiss, Johannes Kepler Univ. Linz (Austria) . . . . . [7058-32]

2:30 pm: **Optical design of a desktop lamp based on multi-chip white LED**, Yi-Chien Lo, Chang-Yu Tsai, Hsin-Ying Ho, Ching-Cherng Sun, National Central Univ. (Taiwan) . . . . . [7058-33]

2:50 pm: **An integrated LED reflector for backlight system**, Zhi-Peng Chen, Chao-Heng Chien, Tatung Univ. (Taiwan). . . . . [7058-34]

3:10 pm: **Creating a desired lighting pattern with an LED array**, Ivan Moreno, Rumen Ivanov, Univ. Autónoma de Zacatecas (Mexico) . . . [7058-35]

Coffee Break . . . . . 3:30 to 4:00 pm

SESSION 10

Room: Conv. Ctr. 10 . . . . . Wed. 4:00 to 5:30 pm

Source Performance III

Session Chair: **Zhe-Chuan Feng,** National Taiwan Univ. (Taiwan)

4:00 pm: **Polarization engineering of III-nitride nanostructures for high-efficiency light emitting diodes** *(Invited Paper)*, Nelson Tansu, Ronald A. Arif, Hongping Zhao, Yik-Khoon Ee, Lehigh Univ. . . . . [7058-45]

4:30 pm: **Enhanced output power of GaN LED via magnetic field applied**, Rong Xuan, Industrial Technology Research Institute (Taiwan) . . . . . [7058-36]

4:50 pm: **Improvement of electrostatic discharge (ESD) characteristics of GaN-based light-emitting diodes by plasma discharging**, Tae-Young Park, Min-Seok Oh, Seong-Ju Park, Gwangju Institute of Science and Technology (South Korea). . . . . [7058-37]

5:10 pm: **Practical photonic crystal light-emitting diode fabricated with photoelectrochemical wet etching and phase mask interference**, Cheng-Hung Lin, Cheng-Yen Chen, Dong-Ming Yeh, Chih-Feng Lu, Chi-Feng Huang, Chih-Chung Yang, National Taiwan Univ. (Taiwan). . . . . [7058-38]

Courses of Related Interest

See SPIE Cashier for information and to register.

SC011 Design of Efficient Illumination Systems (Cassarly) Monday, 1:30 to 5:30 pm
SC388 Non-Imaging Optics (Winston) Monday, 8:30 am to 12:30 pm
SC490 Solid State Lighting I (Ferguson) Sunday, 1:30 to 5:30 pm
SC657 Accurate Measurement of LED Optical Properties (Tirpak) Wednesday, 1:30 to 5:30 pm

Conference 7059

Sunday-Monday 10-11 August 2008 • Proceedings of SPIE Vol. 7059

Nonimaging Optics and Efficient Illumination Systems V

Conference Chairs: **Roland Winston,** Univ. of California/Merced; **R. John Koshel,** Photon Engineering LLC and College of Optical Sciences/The Univ. of Arizona

Program Committee: **Pablo Benítez,** Univ. Politécnica de Madrid (Spain) and Light Prescriptions Innovators LLC (Spain); **William J. Cassarly,** Optical Research Associates; **Philip L. Gleckman,** Energy Innovations; **Jeffrey M. Gordon,** Ben-Gurion Univ. of the Negev (Israel); **Anurag Gupta,** Optical Research Associates; **Kenneth K. Li,** Wavien, Inc.; **Juan Carlos Miñano,** Univ. Politécnica de Madrid (Spain) and Light Prescriptions Innovators LLC (Spain); **Holger Moench,** Philips Research Labs. (Germany); **Narkis E. Shatz,** Science Applications International Corp.; **John Felix Van Derlofske,** 3M Co.

Sunday 10 August

Room: Conv. Ctr. 6F . . . . . Sun. 8:00 to 8:10 am

Introduction

R. John Koshel, Photon Engineering LLC and College of Optical Sciences/The Univ. of Arizona and **Roland Winston,** Univ. of California/Merced

SESSION 1

Room: Conv. Ctr. 6F . . . . . Sun. 8:10 to 10:00 am

Limits of Design

Session Chair: **Roland Winston,** Univ. of California/Merced

8:10 am: **Increased brightness by light recirculation through an LED source**, Julio C. Chaves, Light Prescriptions Innovators Europe, S. L. (Spain); Waqidi Falicoff, Light Prescriptions Innovators, LLC; Pablo Benítez, Juan C. Miñano, Univ. Politécnica de Madrid (Spain) . . . . . [7059-01]

8:30 am: **High-irradiance reactor design and performance near the étendue limit with practical unfolded optics**, Jeffrey M. Gordon, Daniel Feuermann, Ben-Gurion Univ. of the Negev (Israel) . . . . . [7059-02]

8:50 am: **On the tolerancing of illumination devices** *(Invited Paper)*, Gerhard Kloos, Hella KGaA Hueck & Co. (Germany) . . . . . [7059-03]

9:20 am: **Incoherent beam shaping with freeform mirror**, Dirk Michaelis, Sergey V. Kudaev, Ralf Steinkopf, Andreas Gebhardt, Peter Schreiber, Andreas Bräuer, Fraunhofer-Institut für Angewandte Optik und Feinmechanik (Germany) . . . . . [7059-04]

9:40 am: **High-efficiency free-form nonimaging condenser overcoming rotational symmetry limitations**, Juan C. Miñano, Pablo Benitez, Univ. Politécnica de Madrid (Spain) and LPI (Spain); Jose Blen, Asuncion Santamaria, Univ. Politécnica de Madrid (Spain) . . . . . [7059-05]

Coffee Break . . . . . 10:00 to 10:30 am

SESSION 2

Room: Conv. Ctr. 6F . . . . . Sun. 10:30 to 11:40 am

Solar and Daylighting

Session Chair: **Jeffrey M. Gordon,** Ben-Gurion Univ. of the Negev (Israel)

10:30 am: **Design of experiments for simulated non-imaging light sources**, Mario Cappitelli, Dietmar Vogt, Michael Olbert, EADS Innovation Works (Germany). . . . . [7059-06]

10:50 am: **High-performance Kohler concentrators with uniform irradiance on solar cell** *(Invited Paper)*, Maikel Hernandez, Pablo Benítez, Juan C. Miñano, Light Prescriptions Innovators Europe, S. L. (Spain); Aleksandra Cvetkovic, Univ. Politécnica de Madrid (Spain) . . . . . [7059-07]

11:20 am: **The SMS3D XR photovoltaic concentrator**, Aleksandra Cvetkovic, Univ. Politécnica de Madrid (Spain); Maikel Hernandez, Light Prescriptions Innovators Europe, S. L. (Spain); Pablo Benítez, Juan Carlos Miñano, Univ. Politécnica de Madrid (Spain) and Light Prescriptions Innovators Europe, S. L. (Spain); Joel Schwartz, Boeing Satellite Systems; Adam Plesniak, Russ Jones, Dave Whelan, The Boeing Co. . . . . [7059-08]

Lunch Break . . . . . 11:40 am to 1:30 pm

SESSION 3

Room: Conv. Ctr. 6F . . . . . Sun. 1:30 to 3:00 pm

LED Applications

Session Chair: **R. John Koshel,** College of Optical Sciences/ The Univ. of Arizona and Photon Engineering LLC

1:30 pm: **Scaling of the LED collimators with folded multiple reflections** *(Invited Paper)*, Sergey V. Kudaev, Peter Schreiber, Fraunhofer-Institut für Angewandte Optik und Feinmechanik (Germany). . . . . [7059-12]

2:00 pm: **Advanced optics for LED flashlights**, Narkis E. Shatz, John Bortz, Science Applications International Corp.; John Matthews, Paul Kim, SureFire . . . . . [7059-13]

2:20 pm: **A low-cost, high performance solid-state NVIS lighting solution for legacy aircraft**, Scott V. Johnson, Air Force Research Labs.; John J. Martin, Air Force Research Lab. . . . . [7059-14]

2:40 pm: **The study of LED uniform lightguide for liquid crystal display backlight applications**, Zhi-Peng Chen, Chao-Heng Chien, Tatung Univ. (Taiwan) . . . . . [7059-15]

Coffee Break . . . . . 3:00 to 3:30 pm

SESSION 4

Room: Conv. Ctr. 6F . . . . . Sun. 3:30 to 5:30 pm

Lightguides

Session Chair: **Anurag Gupta,** Optical Research Associates

3:30 pm: **A novel LED backlight system with high polarization conversion efficiency**, Shuang-Chao Chung, Industrial Technology Research Institute (Taiwan) and National Central Univ. (Taiwan); Ching-Cherng Sun, National Central Univ. (Taiwan) . . . . . [7059-17]

3:50 pm: **High efficient illumination system utilizing light-guide and white light LED for document scanner application**, Kyung-Rok Kim, Hyun Surk Kim, HyeongChae Kim, SAMSUNG Electronics Co., Ltd. (South Korea) . . . . . [7059-18]

4:10 pm: **Design of no-loss bent lightpipe with a novel transformation of elliptical form**, Yi-Wen Peng, National Chiao Tung Univ. (Taiwan); Jyh-Long Chern, National Chiao Tung Univ. (Taiwan) and Foxsemicon (FITI) (Taiwan) . . . . . [7059-19]

4:30 pm: **Polarization-preserving angular shifter**, Yi-Kai Cheng, National Chiao Tung Univ. (Taiwan); Jyh-Long Chern, Foxsemicon Integrated Technology Inc. (Taiwan) and National Chiao Tung Univ. (Taiwan) . . [7059-20]

4:50 pm: **Non-imaging optical concentrators for low-cost optical interconnect**, Robert P. Dahlgren, Jacob A. Wysocki, Kenneth D. Pedrotti, Univ. of California/Santa Cruz. . . . . [7059-21]

5:10 pm: **Fuzzy scheduling strategy of dot pattern design for a light guide in an edge-lit backlight,** Heng Zhao, Supin Fang, Xi'an Jiaotong Univ. (China) . . . . . [7059-22]

Room: Conv. Ctr. 6A. . . . . Sun. 6:00 to 6:45 pm

All-Conference Plenary Session

View plenary presentation details p. 13.

6:00 pm: **The Solar Decathlon: building a better future with solar energy**, Richard J. King, U.S. Dept. of Energy

Monday 11 August

Room: Conv. Ctr. Exhibit Hall B2 . . . . . Mon. 6:00 to 7:30 pm

Posters-Monday

Poster authors will begin displaying posters after 10:00 am Monday morning. A poster session, with authors present at their posters, will be held Monday evening from 6:00 to 7:30 pm. Light refreshments will be served.

Poster Setup

Poster presenters must set up their posters between 10:00 am and 5:00 pm on Monday. Poster presenters who have not set up by 5:00 pm on Monday will be considered a "no show" and their manuscript will not be published. Presenters must remove their posters immediately after the poster session. Posters not removed will be considered unwanted and will be discarded. SPIE assumes no responsibility for posters left up after the end of each poster session.

Design and analysis of light-pipe-based parabola solar concentrator for sunlight collection and transmission, Wei Huang, Chun-Hsien Chuang, Yi-Yung Chen, Jong-Woei Whang, National Taiwan Univ. of Science and Technology (Taiwan) . . . . . [7059-09]

Design and analysis of optical unit used to compress light for guiding system, Chun-Cheng Wang, Yi-Yung Chen, Chen-Ming Yi, Jong-Woei Whang, National Taiwan Univ. of Science and Technology (Taiwan) . . . . . [7059-10]

The analysis of ray path in secondary optics design of LED for die-imaging phenomena, Yi-Yung Chen, Yi-Ju Chen, National Taiwan Univ. of Science and Technology (Taiwan); Liang-Tang Chen, National Taiwan Univ. of Science and Technology; Jong-Woei Whang, National Taiwan Univ. of Science and Technology (Taiwan) . . . . . [7059-11]

Design and simulation of optical-engine for DLP projection system by high-power LEDs, Yi-Chin Fang, Wei-Chi Lai, National Kaohsiung First Univ. of Science and Technology (Taiwan) . . . . . [7059-23]

Innovative collimator design based on array structure, Cheng-Yen Liu, Yi-Yung Chen, Jong-Woei Whang, National Taiwan Univ. of Science and Technology (Taiwan) . . . . . [7059-24]

Further studies on output couplers for edge-lit backlight with emission angle control, Ichiro Fujieda, Keita Imai, Ritsumeikan Univ. (Japan). [7059-26]

High efficiency 90º elbow for light guides, Daniel Vazquez-Molini, Antonio A. Fernandez-Balbuena, Berta Garcia-Fernandez, Eusebio Bernabeu, Univ. Complutense de Madrid (Spain) . . . . . [7059-27]

Random microstructure generation of different aspect-ratios and orientation for the optical design of LED edge-lit backlight using a generalized molecular dynamics force model, Jee-Gong Chang, National Ctr. for High-Performance Computing (Taiwan); Chuan Chen, Meiho Institute of Technology (Taiwan); Yu-Bin Fang, National Ctr. for High-Performance Computing (Taiwan); Shin-Pon Ju, National Sun Yat-Sen Univ. (Taiwan) . . . . . [7059-28]

Room: Marriott Coronado . . . . . .Mon. 8:00 to 10:00 pm

Illumination Technical Event

Chair: **R. John Koshel,** Photon Engineering LLC and College of Optical Sciences/The Univ. of Arizona

We will be discussing state-of-the-art displays. Representatives from display companies, both full displays and components used in displays, will present examples of their technology and discuss some of the nuances of their operation. Examples include backlit and projection displays, LED displays, immersive environments, and novel display methods. If you would like to present display technology at this Illumination Technical Event, please contact John Koshel, john.koshel@osa.org, to be included in the schedule. At the end of the planned event, any member of the audience may present information within the broad field of illumination.

Light refreshments will be served.

Courses of Related Interest

See SPIE Cashier for information and to register.

SC011 Design of Efficient Illumination Systems (Cassarly) Monday, 1:30 to 5:30 pm

SC388 Non-Imaging Optics (Winston) Monday, 8:30 am to 12:30 pm

Conference 7060

Monday-Tuesday 11-12 August 2008 • Proceedings of SPIE Vol. 7060

Current Developments in Lens Design and Optical Engineering IX

Conference Chairs: **Pantazis Z. Mouroulis,** Jet Propulsion Lab.; **Warren J. Smith,** Rockwell Collins Optronics; **R. Barry Johnson,** PanTechne Corp. and Alabama A&M Univ.

Program Committee: **Florian Bociort,** Technische Univ. Delft (Netherlands); **Michael Chrisp,** Lawrence Livermore National Lab.; **Apostolos Deslis,** InPhase Technologies; **Robert E. Fischer,** OPTICS 1, Inc.; **Virendra N. Mahajan,** The Aerospace Corp.; **Andrew Rakich,** Univ. of Arizona; **Simon Thibault,** ImmerVision (Canada); **Andrew P. Wood,** QIOPTIQ (United Kingdom); **James M. Zavislan,** Univ. of Rochester

This conference is dedicated to **Warren J. Smith.**

Warren was one of the founding chairs of the Current Developments conference, and widely regarded as one of the most influential leaders in lens design and optical engineering. He died on 19 June in California.

Monday 11 August

Room: Conv. Ctr. 6C . . . . . Mon. 8:00 to 8:10 am

Introduction

R. Barry Johnson, PanTechne Corp. and Alabama A&M Univ.; **Pantazis Z. Mouroulis,** Jet Propulsion Lab.

SESSION 1

Room: Conv. Ctr. 6C . . . . . Mon. 8:10 to 10:10 am

Fabrication

Session Chair: **James M. Zavislan,** Univ. of Rochester

8:10 am: **Low-scatter bare aluminum optics via chemical mechanical polishing**, Kevin J. Moeggenborg, Carlos Barros, Stanley Lesiak, Nevin Naguib, Stan Reggie, Cabot Microelectronics Corp. . . . . [7060-01]

8:30 am: **RAP processing of Zerodur® optics for astronomical applications**, Yogesh Verma, Tom H. Yu, Kurt Pang, Ning Li, RAPT Industries, Inc.. . . . . [7060-02]

8:50 am: **Fabrication of a ULE® asphere using reactive atom plasma (RAP) processing**, Yogesh Verma, Tom H. Yu, Kurt Pang, RAPT Industries, Inc.. . . . . [7060-03]

9:10 am: **Large quartz crystals for high power optical and laser applications**, Vladimir Klipov, Sawyer Technical Materials, LLC . . . . [7060-04]

9:30 am: **Forces acting between polishing tool and workpiece surface in magnetorheological finishing**, Markus Schinhaerl, Christian Vogt, Andreas Geiss, Fachhochschule Deggendorf (Germany); Richard J. Stamp, Univ. of the West of England (United Kingdom); Peter Sperber, Fachhochschule Deggendorf (Germany); Lyndon N. Smith, Gordon Smith, Univ. of the West of England (United Kingdom); Rolf Rascher, Fachhochschule Deggendorf (Germany) . . . . . [7060-05]

9:50 am: **Material removal study at silicon nitride molds for the precision glass molding using MRF process**, Andreas Geiss, Rolf Rascher, Fachhochschule Deggendorf (Germany); Juraj Slabeycius, Alexander Dubcek Univ. of Trencin (Slovak Republic); Markus Schinhaerl, Peter Sperber, Fathima Patham Kadeer Mohideen, Fachhochschule Deggendorf (Germany). [7060-06]

Coffee Break . . . . . 10:10 to 10:40 am

SESSION 2

Room: Conv. Ctr. 6C . . . . . Mon. 10:40 am to 12:00 pm

Lens Design I

Session Chair: **R. Barry Johnson,** PanTechne Corp. and Alabama A&M Univ.

10:40 am: **Design and fabrication of low-cost thermal imaging optics using precision chalcogenide glass molding**, George C. Curatu, LightPath Technologies, Inc. . . . . [7060-07]

11:00 am: **Day and night security camera**, Milton Laikin, Laikin Optical Corp.; Gyeong-il Kweon, Young-ho Choi, Honam Univ. (South Korea). . . . . [7060-08]

11:20 am: **High-resolution UV relay lens for particle size distribution measurements using holography**, Robert M. Malone, Brent C. Frogget, Morris I. Kaufman, Aric Tibbitts, Gene A. Capelle, Michael Grover, Gerald D. Stevens, William D. Turley, National Security Technologies, LLC; Peter D. Pazuchanics, Danny S. Sorenson, Los Alamos National Lab. . . . . [7060-09]

11:40 am: **New tools for the lens designer**, Donald C. Dilworth, Optical Systems Design, Inc.. . . . . [7060-10]

Lunch Break . . . . . 12:00 to 1:30 pm

SESSION 3

Room: Conv. Ctr. 6C . . . . . Mon. 1:30 to 3:20 pm

Lens Design II

Session Chair: **Virendra N. Mahajan,** The Aerospace Corp.

1:30 pm: **Optical design of reflective wide-field cameras** *(Invited Paper)*, José Sasian, College of Optical Sciences/The Univ. of Arizona . . . . . [7060-11]

2:00 pm: **Five-lens corrector for Cassegrain-form telescopes**, Mark R. Ackermann, Sandia National Labs.; John T. McGraw, Peter C. Zimmer, The Univ. of New Mexico . . . . . [7060-12]

2:20 pm: **Material selection for color correction in the short-wave infrared**, R. Hamilton Shepard III, Patrick L. McCarthy, Raytheon Co. . . . . [7060-13]

2:40 pm: **Correctly making panoramic imagery and the meaning of optical center**, R. Barry Johnson, Alabama A&M Univ. . . . . [7060-42]

3:00 pm: **Design of two-color infrared high-speed lens objectives for 3-to 5-µm and 8-to 12-µm applications**, Sergey N. Bezdidko, S.A. Zverev Krasnogorsky Zavod JSC (Russia); Elena Morozova, House of Optics Scientific Ctr. (Russia) . . . . . [7060-15]

Coffee Break . . . . . 3:20 to 3:50 pm

SESSION 4

Room: Conv. Ctr. 6C . . . . . Mon. 3:50 to 5:10 pm

Applications

Session Chair: **Pantazis Z. Mouroulis,** Jet Propulsion Lab.

3:50 pm: **Automated design and fabrication of ocular optics from stock lenses**, Mikhail A. Gutin, Olga N. Gutin, Applied Science Innovations, Inc.. . . . . [7060-16]

4:10 pm: **Multi-slice tissue imaging by sequential measurement of laser reflectance**, Indumathi Jothiramalingam, Pillai Nisha, Singh Megha, VIT Univ. (India) . . . . . [7060-17]

4:30 pm: **A novel multi-point transparent optical touch sensor: theory and analysis**, Huseyin Afser, Heba Yuksel, Bogaziçi Univ. (Turkey) . . . . . [7060-18]

4:50 pm: **A novel multi-point transparent optical touch sensor: simulation and experiment,** Huseyin Afser, Heba Yuksel, Bogaziçi Univ. (Turkey) . . . . . [7060-19]

Room: Conv. Ctr. Exhibit Hall B2 . . . . . Mon. 6:00 to 7:30 pm

Posters-Monday

Poster authors will begin displaying posters after 10:00 am Monday morning. A poster session, with authors present at their posters, will be held Monday evening from 6:00 to 7:30 pm. Light refreshments will be served.

Poster Setup

Poster presenters must set up their posters between 10:00 am and 5:00 pm on Monday. Poster presenters who have not set up by 5:00 pm on Monday will be considered a "no show" and their manuscript will not be published. Presenters must remove their posters immediately after the poster session. Posters not removed will be considered unwanted and will be discarded. SPIE assumes no responsibility for posters left up after the end of each poster session.

Design considerations for high NA DUV objective for inspection applications, Kirill Sobolev, Stanislav Smirnov, Bruce A. Tirri, Richard Lewis, Adel Joobeur, ASML US, Inc. . . . . [7060-33]

An optically passive athermal infrared optical system, Hua Li, Mangzuo Shen, Institute of Optics and Electronics (China) . . . . . [7060-34]

The effect of ruling grating constant errors on the spectrum characteristics of Echelle grating, Zhengji Ni, Pin Xie, Yuanshen Huang, Dawei Zhang, Songlin Zhuang, Univ. of Shanghai for Science and Technology (China) . . . . . [7060-35]

Effects of substrate thickness on primary aberrations of diffractive lenses, Ujjal Dutta, Lakshminarayan Hazra, Univ. of Calcutta (India). [7060-36]

Aspherical optics design for minimal spherical aberration in vision correction of human eyes, Minshan Jiang, Shanghai Jiao Tong Univ. (China); J. T. Lin, National Chiao-tung Univ. (Taiwan); Chuanqing Zhou, Qiushi Ren, Shanghai Jiao Tong Univ. (China) . . . . . [7060-37]

Progress and challenges in the optical design of the adaptive secondary setup and instrument stimulator (ASSIST), Pascal Hallibert, Univ. Leiden (Netherlands); Robin Arsenault, European Southern Observatory (Germany); Atul Deep, Univ. Leiden (Netherlands); Bernard Delabre, European Southern Observatory (Germany); Simone Esposito, Osservatorio Astrofisico di Arcetri (Italy); Norbert Hubin, European Southern Observatory (Germany); Sarah Kendrew, Univ. Leiden (Netherlands); Armando Riccardi, Osservatorio Astrofisico di Arcetri (Italy); Stefan Stroebele, European Southern Observatory (Germany); Remko Stuik, Univ. Leiden (Netherlands) . . . . . [7060-38]

Modeling diffractive optical elements in hybrid systems with the effect of the material dispersion, Hu Zhang, Hua Liu, Changchun Institute of Optics, Fine Mechanics and Physics (China) and Graduate School of the Chinese Academy of Sciences (China); Zhenwu Lu, Hongxin Zhang, Changchun Institute of Optics, Fine Mechanics and Physics (China) . . . . . [7060-39]

A design of imaging spectrometer composed of a convex grating, Yuanshen Huang, Dawei Zhang, Zhengji Ni, Jiabi Chen, Songlin Zhuang, Univ. of Shanghai for Science and Technology (China) . . . . . [7060-40]

Design, builds, and characterization of an elastic flexible lens, Agustin Santiago Alvarado, Univ. Technologica de la Mixteca (Mexico); Sergio Vazquez y Montiel, Instituto Nacional de Astrofísca, Óptica y Electrónica (Mexico); Ruben Arriaga Martinez, Jorge Gonzalez-Garcia, Univ. Technologica de la Mixteca (Mexico) . . . . . [7060-41]

Tuesday 12 August

SESSION 5

Room: Conv. Ctr. 6C . . . . . Tues. 8:30 to 10:20 am

Instruments and Techniques

Session Chair: **Simon Thibault,** ImmerVision (Canada)

8:30 am: **3D imaging from theory to practice: the Mona Lisa story** *(Invited Paper)*, Francois Blais, Luc Cournoyer, J.-Angelo Beraldin, National Research Council Canada (Canada) . . . . . [7060-20]

9:00 am: **Compact catadioptric scanning system**, Rongguang Liang, Mark Shafer, Carestream Health, Inc. . . . . [7060-21]

9:20 am: **Design of a discrete scan laser focusing system with a ring grating scan element**, Michael Rodgers, Optical Research Associates . . . . . [7060-22]

9:40 am: **Development and testing of the camera, handlens, and microscope probe with laser spectroscopy (CHAMP-LS)**, Gregory S. Mungas, Yekta Gursel, Cesar A. Sepulveda, Kenneth R. Johnson, Jet Propulsion Lab. . . . . [7060-23]

10:00 am: **Lens design and system optimization for foveated imaging**, George C. Curatu, LightPath Technologies, Inc.; James Harvey, College of Optics & Photonics/Univ. of Central Florida . . . . . [7060-24]

Coffee Break . . . . . 10:20 to 10:50 am

SESSION 6

Room: Conv. Ctr. 6C . . . . . Tues. 10:50 am to 12:10 pm

Optimization and Testing

Session Chair: **Pantazis Z. Mouroulis,** Jet Propulsion Lab.

10:50 am: **Best worst field optimization and focusing**, David Vaughnn, NASA Goddard Space Flight Ctr.; Kenneth E. Moore, ZEMAX Development Corp.; Noah Bock, Wei Zhou, Rudolph Technologies, Inc.; Ming Liang, National Optical Astronomy Observatory; Mark E. Wilson, NASA Goddard Space Flight Ctr. . . . . [7060-25]

11:10 am: **Design efficiency of 3047 optical designs**, Ozan Cakmakci, College of Optics & Photonics/Univ. of Central Florida; John R. Rogers, Kevin P. Thompson, Optical Research Associates; Jannick P. Rolland, College of Optics & Photonics/Univ. of Central Florida . . . . . [7060-26]

11:30 am: **High resolution wavefront measurement of aspheric optics**, Iris Erichsen, Stefan Krey, Josef Heinisch, Aiko K. Ruprecht, Eugen Dumitrescu, Trioptics GmbH (Germany) . . . . . [7060-27]

11:50 am: **Recent advances in the modulation transfer function testing of detector arrays**, Alfred D. Ducharme, Univ. of Central Florida . . . . . [7060-28]

Lunch/Exhibition Break . . . . . 12:10 to 1:40 pm

Conference 7060

SESSION 7

Room: Conv. Ctr. 6C . . . . . .Tues. 1:40 to 3:00 pm

Theory and Design

Session Chair: **Virendra N. Mahajan,** The Aerospace Corp.

1:40 pm: **Wavefront generated by reflection of a plane wave from a conic section**, John A. Hoffnagle, IBM Almaden Research Ctr.; David L. Shealy, The Univ. of Alabama at Birmingham. . . . . [7060-29]

2:00 pm: **Physical optics modeling including color and temporal coherence**, Frank Wyrowski, Friedrich-Schiller-Univ. Jena (Germany); Christian Hellmann, Rene C. Krieg, Michael Kuhn, LightTrans GmbH (Germany) [7060-30]

2:20 pm: **Optimized modeling of laser resonators using locally adapted propagation techniques**, Frank Wyrowski, Friedrich-Schiller-Univ. Jena (Germany); Michael Kuhn, LightTrans GmbH (Germany); Konrad Altmann, LAS-CAD GmbH (Germany) . . . . . [7060-31]

2:40 pm: **Display system analysis with critical polarization elements in a non-sequential ray tracing environment**, Jon A. Herlocker, Kevin J. Garcia, Breault Research Organization, Inc. . . . . [7060-32

Room: Marriott Marina D . . . . . Tues. 8:00 to 10:00 pm

Lens Design Technical Event

Chairs: **Mary Turner,** Breault Research Organization, Inc.; **Steve Johnston,** Photon Engineering, LLC; **Rich Pfisterer,** Photon Engineering, LLC

"Let's Give 'Em Something to Talk About!"

We are in the process of inviting a panel of experienced, "recognized" professional lens designers to come and talk about...lens design! We want to hear about what they're designing, how they're going about doing it (what materials, software, techniques, etc.), and what problems they're encountering. We want to hear about technical and commercial trends in the marketplace. We want to hear who's making the optics! We want them to give us something to talk about!

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SC552 Aspheric Optics: Design, Fabrication, and Test (Fischer) Wednesday, 8:30 am to 12:30 pm
SC792 Polarization in Optical Design (Chipman) Sunday, 1:30 to 5:30 pm
NEW! SC911 Optical Layout and Analysis Using the Matrix Approach (Kloos) Monday, 8:30 am to 5:30 pm
NEW! SC912 Intermediate Lens Design (Bentley) Sunday, 8:30 am to 5:30 pm

Conference 7061A

Wednesday-Thursday 13-14 August 2008 • Proceedings of SPIE Vol. 7061

Novel Optical Systems Design and Optimization XI

Conference Chairs: **R. John Koshel,** Photon Engineering LLC and College of Optical Sciences/The Univ. of Arizona; **G. Groot Gregory,** Optical Research Associates

Program Committee: **Dmitry V. Bakin,** Micron Technology Inc.; **Scott C. Cahall,** Moondog Optics, Inc.; **Jyh-Long Chern,** National Chiao Tung Univ. (Taiwan); **Alexander Epple,** Carl Zeiss AG (Germany); **Joseph M. Howard,** NASA Goddard Space Flight Ctr.; **Richard C. Juergens,** Raytheon Missile Systems; **Scott A. Lerner,** Hewlett-Packard Co.; **Rongguang Liang,** Carestream Health, Inc.; **Andrew B. Locke,** ZEMAX Development Corp.; **Paul K. Manhart,** ASML Wilton Optics; **Craig Olson,** L-3 Communications Corp.; **Richard N. Pfisterer,** Photon Engineering LLC; **Andrew Rakich,** Large Binocular Telescope Corp.; **Dirk Robinson,** Ricoh Innovations, Inc.; **Jannick P. Rolland,** College of Optics & Photonics/Univ. of Central Florida; **José Sasian,** College of Optical Sciences/The Univ. of Arizona; **David L. Shealy,** The Univ. of Alabama at Birmingham; **Donn M Silberman,** PI Physik Instrumente L.P. and Optics Institute of Southern California; **Marija Strojnik,** Ctr. de Investigaciones en Óptica, A.C.; **Kevin P. Thompson,** Optical Research Associates; **Mary G. Turner,** Breault Research Organization, Inc.

Tuesday 12 August

Room: Marriott Marina D . . . . . Tues. 8:00 to 10:00 pm

Lens Design Technical Event

Chairs: **Mary Turner,** Breault Research Organization, Inc.; **Steve Johnston,** Photon Engineering, LLC; **Rich Pfisterer,** Photon Engineering, LLC

"Let's Give 'Em Something to Talk About!"

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Wednesday 13 August

Room: Conv. Ctr. 6C . . . . . Wed. 8:10 to 8:20 am

Introduction

R. John Koshel, Photon Engineering LLC and College of Optical Sciences/The Univ. of Arizona; **G. Groot Gregory,** Optical Research Associates

SESSION 1

Room: Conv. Ctr. 6C . . . . . Wed. 8:20 to 10:30 am

Imaging in the Optical Design Process: Depth of Field

Session Chair: **Michael D. Robinson,** Ricoh Innovations, Inc.

8:20 am: **Miniaturization and simplification of zoom lenses using wavefront coding**, Mads Demenikov, Andrew Harvey, Heriot-Watt Univ. (United Kingdom); Ewan Findlay, STMicroelectronics Ltd. (United Kingdom) . . . . . [7061A-30]

8:40 am: **Optics optimization in high-resolution imaging module with extended depth-of-field**, Xi Chen, Dmitry V. Bakin, Changmeng Liu, Micron Technology, Inc.; Nicholas George, Univ. of Rochester . . . . . [7061A-01]

9:00 am: **Digital image processing as an integral component of optical design** *(Invited Paper)*, Andrew R. Harvey, Heriot-Watt Univ. (United Kingdom); Gonzalo D. Muyo, Mads Demenikov, Bertrand Lucotte, Tom Vettenburg, Heriot Watt Univ. (United Kingdom) . . . . . [7061A-02]

9:30 am: **Extended depth-of-field (EDOF) image using sharpness transport across colour channels**, Christel-Loic Tisse, Frederic Guichard, Regis Tessieres, Hoang-Phi Nguyen, DxO Labs. (France) . . . . . [7061A-03]

9:50 am: **Imaging with depth extension: Where are the limits in fixed-focus cameras?**, Dmitry V. Bakin, Micron Technology, Inc.; Brian W. Keelan, Micron Technology Inc. . . . . [7061A-04]

10:10 am: **Design of mobile phone lens to extended depth of field based on point-spread function focus invariance**, Hsin-Yueh Sung, Sidney S. Yang, National Tsing Hua Univ. (Taiwan); Horng Chang, Industrial Technology Research Institute (Taiwan) . . . . . [7061A-05]

Coffee Break . . . . . 10:30 to 11:00 am

SESSION 2

Room: Conv. Ctr. 6C . . . . . Wed. 11:00 am to 12:20 pm

Imaging in the Optical Design Process: Systems

Session Chair: **Dmitry V. Bakin,** Micron Technology, Inc.

11:00 am: **Sensor array with separated colors images for on-chip camera module**, Scott T. Smith, Dmitry V. Bakin, Richard L. Baer, Micron Technology, Inc.. . . . . [7061A-06]

11:20 am: **Design of the first optical system for real-time tomographic holography (RTTH)**, John M. Galeotti, Mel Siegel, Carnegie Mellon Univ.; Richard D. Rallison, Wasatch Photonics; George D. Stetten M.D., Univ. of Pittsburgh and Carnegie Mellon Univ.. . . . . [7061A-07]

11:40 am: **CGH designed by 64-bit PC technology for polymer volume holograms**, Christian Hellmann, Michael Kuhn, LightTrans GmbH (Germany); Frank Wyrowski, Friedrich-Schiller-Univ. Jena (Germany); Gerhard Hochenbleicher, Linhof Prazisions-Systemtechnik GmbH (Germany)[7061A-08]

12:00 pm: **Superresolution imaging combining the design of an optical coherence microscope objective with liquid-lens based dynamic focusing capability and computational methods**, Supraja Murali, Apurva Jain, College of Optics & Photonics/Univ. of Central Florida; Hassan Foroosh, Univ. of Central Florida; Kevin P. Thompson, Optical Research Associates; Jannick P. Rolland, College of Optics & Photonics/Univ. of Central Florida . . . [7061A-37]

Lunch/Exhibition Break . . . . . 12:20 to 1:50 pm

SESSION 3

Room: Conv. Ctr. 6C . . . . . Wed. 1:50 to 3:40 pm

Freeform Optics

Session Chair: **R. John Koshel,** Photon Engineering LLC and College of Optical Sciences/The Univ. of Arizona

1:50 pm: **Meshfree approximation methods for surface representation in optical design** *(Invited Paper)*, Ozan Cakmaki, University of Central Florida; Jannick Rolland, College of Optics & Photonics/Univ. of Central Florida . . . . . [7061A-10]

2:20 pm: **Design of a novel free-form condenser overcoming rotational symmetry limitations**, Juan C. Miñano, Pablo Benitez, Univ. Politécnica de Madrid (Spain) and LPI; Jose Blen, Asuncion Santamaria, Univ. Politécnica de Madrid (Spain) . . . . . [7061A-11]

2:40 pm: **Freeform optical system design with NURBS surfaces**, Dewen Cheng, Yongtian Wang, Sr., Beijing Institute of Technology (China); Hong Hua, College of Optical Sciences/The Univ. of Arizona. . . . . [7061A-12]

3:00 pm: **High-order aspherics: application of the SMS nonimaging design method in imaging optics**, Fernando Munoz, Light Prescriptions Innovators Europe, S. L. (Spain); Pablo Benitez, Juan C. Miñano, Univ. Politécnica de Madrid (Spain) . . . . . [7061A-13]

3:20 pm: **Optimization without point sources**, Mary G. Turner, Breault Research Organization, Inc. . . . . [7061A-14]

Coffee Break . . . . . 3:40 to 4:10 pm

SESSION 4

Room: Conv. Ctr. 6C . . . . . .Wed. 4:10 to 5:10 pm

Space Optics

Session Chair: **Joseph M. Howard,** NASA Goddard Space Flight Ctr.

4:10 pm: **Improved spherical aberration corrector**, Mark R. Ackermann, Sandia National Labs.; John T. McGraw, Peter C. Zimmer, The Univ. of New Mexico. . . . . .[7061A-15]

4:30 pm: **Imaging lidars for space applications**, João P. N.Pereira do Carmo, Richard Fisackerly, Berengere Houdou, European Space Research and Technology Ctr. (Netherlands); Bettina G. U.Moebius, Jena-Optronik GmbH (Germany); Martin Pfennigbauer, RIEGL Laser Measurement Systems GmbH (Austria); Robert A. Bond, ABSL Space Products (United Kingdom); Ivelin Bakalski, Lidar Technologies Inc.; Michael Foster, Lidar Technologies Ltd. (United Kingdom); Stephen J. Bellis, SensL (Ireland); Martin Humphries, Sula Systems Ltd. (United Kingdom) . . . . . .[7061A-16]

4:50 pm: **Space imaging infrared optical guidance for autonomous ground vehicle,** Akira Akiyama, Kanazawa Technical College (Japan); Nobuaki Kobayashi, Kanazawa Institute of Technology (Japan); Eiichiro Mutoh, Kawasaki Heavy Industries, Ltd. (Japan); Hideo Kumagai, Tamagawa Seiki Co., Ltd. (Japan); Hirofumi Yamada, Kanazawa Technical College (Japan); Hiromitsu Ishii, Nihon Univ. (Japan). . . . . .[7061A-17]

Room: Conv. Ctr. Exhibit Hall B2 . . . . . .Wed. 5:30 to 7:00 pm

Posters-Wednesday

Poster authors will begin displaying posters after 10:00 am Wednesday morning. A poster session, with authors present at their posters, will be held Wednesday evening from 5:30 to 7:00 pm. Light refreshments will be served.

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Fielding of a time-resolved tomographic diagnostic, Daniel Frayer, Brian Cox, Wendi Dreesen, Douglas Johnson, Morris Kaufman, National Security Technologies, LLC. . . . . .[7061A-32]

A novel design in dynamic individual particles scattering measurement based on sheath flow technology, Lu Zhang, Xi'an Jiaotong Univ. (China) . . . . . .[7061A-34]

Zoom lens design and optimization work with digital image process, Bo-Wen Wu, Yi-Chin Fang, National Kaohsiung First Univ. of Science and Technology (Taiwan); Chen-Mu Tsai, Kun Shan Univ. (Taiwan); Yu-Cheng Lin, National Kaohsiung First Univ. of Science and Technology (Taiwan)[7061A-35]

'Ab initio' synthesis of optically compensated zoom lenses by evolutionary programming, Sourav Pal, Lakshminarayan Hazra, Univ. of Calcutta (India) . . . . . .[7061A-36]

Thursday 14 August

SESSION 5

Room: Conv. Ctr. 6C . . . . . .Thurs. 8:00 to 10:20 am

Liquid Optics

Session Chair: **Jyh-Long Chern,** National Chiao Tung Univ. (Taiwan)

8:00 am: **Raman analysis of common gases using a multi-pass capillary cell (MCC)**, Christopher M. Gordon, William F. Pearman, Univ. of South Carolina; Chance Carter, Lawrence Livermore National Lab.; Michael Angel, Univ. of South Carolina; James W. Chan, Lawrence Livermore National Lab. . . . . .[7061A-19]

8:20 am: **Design issues of variable-focus liquid lens systems** *(Invited Paper)*, Stephan Reichelt, SeeReal Technologies GmbH (Germany) [7061A-20]

8:50 am: **Miniaturized universal imaging device using fluidic lens** *(Invited Paper)*, Frank S. Tsai, Sung Hwan Cho, Univ. of California/San Diego; Nam-Hyong Kim, Robert Vasko, Jeffrey R. Vasko, Rhevision Technology, Inc.; Yu-Hwa Lo, Univ. of California/San Diego and Rhevision Technology, Inc.. . . . . .[7061A-21]

9:20 am: **Using liquid lens in wavefront coded imaging system**, Chir-Weei Chang, Yung-Lin Chen, Industrial Technology Research Institute (Taiwan) . . . . . .[7061A-22]

9:40 am: **A study of magnetism-driven liquid-filled lens**, Chih-Wei Lin, Dein Shaw, Shy-Pin Cuo, National Tsing Hua Univ. (Taiwan) . . . . . .[7061A-23]

10:00 am: **A study of variable focus liquid gradient index lens**, Shy-Pin Cuo, Dein Shaw, Chih-Wei Lin, National Tsing-Hua Univ. (Taiwan) . . . . .[7061A-24]

Coffee Break . . . . . 10:20 to 10:50 am

SESSION 6

Room: Conv. Ctr. 6C . . . . . .Thurs. 10:50 am to 12:20 pm

Education

Session Chair: **G. Groot Gregory,** Optical Research Associates

10:50 am: **Laser camp: shining a light on optics careers**, Judith F. Donnelly, Three Rivers Community College . . . . . .[7061A-25]

11:10 am: **Problem-based learning in photonics technology education**, Nicholas M. Massa, Springfield Technical Community College; Richard Audet, Roger Williams Univ.; Michele Dischino, Central Connecticut State Univ.; Judith F. Donnelly, Three Rivers Community College; Fenna D. Hanes, New England Board of Higher Education . . . . . .[7061A-26]

11:30 am: **Interdisciplinary optics course for technical high schools**, Donna M. Goyette, H.H. Ellis Technical High School . . . . . .[7061A-27]

11:50 am: **The Robert E. Hopkins Center for Optical Design and Engineering** *(Invited Paper)*, James M. Zavislan, Thomas Brown, Univ. of Rochester . . . . . .[7061A-28]

Lunch/Exhibition Break . . . . . 12:20 to 1:50 pm

SESSION 7

Room: Conv. Ctr. 6C . . . . . .Thurs. 1:50 to 2:30 pm

Zoom Lenses

Session Chair: **Richard C. Juergens,** Raytheon Missile Systems

1:50 pm: **Soft-functional zoom lens design of mobile phone camera**, Jyh-Long Chern, National Chiao Tung Univ. (Taiwan) and Foxsemicon Integrated Technology Inc. (Taiwan). . . . . .[7061A-29]

2:10 pm: **Design and fabrication of soft zoom lens**, Wei Cheng Lin, Instrument Technology Research Ctr. (Taiwan); Chao-Chang Chen, National Taiwan Univ. of Science and Technology (Taiwan); Kuo-Cheng Huang, Ting-Ming Huang, Instrument Technology Research Ctr. (Taiwan). . . . . .[7061A-31]

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Conference 7061B

Sunday 10 August 2008 • Proceedings of SPIE Vol. 7061

Polymer Optics Design, Fabrication, and Materials

Conference Chairs: **James D. Moore, Jr.,** SRS Technologies, Inc.; **David H. Krevor,** Rockwell Collins

Sunday 10 August

SESSION 1

Room: Conv. Ctr. 1B . . . . . .Sun. 10:30 to 11:15 am

Keynote Session

Session Chair: **David H. Krevor,** Rockwell Collins

10:30 am: **Integrating functions in polymer optical components** *(Keynote Presentation),* Stefan M. B.Bäumer, Maurice van der Beek, Philips Applied Technologies (Netherlands) . . . . . .[7061B-37]

SESSION 2

Room: Conv. Ctr. 1B . . . . . Sun. 11:15 am to 12:05 pm

Materials

Session Chair: **David H. Krevor,** Rockwell Collins

11:15 am: **Gradient index polymer optics**, Guy Beadie, Erin Fleet, Armand Rosenberg, Paul Lane, James Shirk, Naval Research Lab.; Akshay R. Kamdar, Michael Ponting, Anne Hiltner, Eric Baer, Case Western Reserve Univ. . . . . .[7061B-38]

11:40 am: **Zero CTE polyimides for athermal optical membranes**, Garrett Poe, Brian G. Patrick, SRS Technologies, Inc. . . . . .[7061B-39]

Lunch Break . . . . . .12:05 to 1:30 pm

SESSION 3

Room: Conv. Ctr. 1B . . . . . Sun. 1:30 to 3:10 pm

Processes

Session Chair: **James D. Moore, Jr.,** SRS Technologies, Inc.

1:30 pm: **Optical and durability measurements of hardcoats on polycarbonate**, John M. Pina, Christopher M. Buchholz, David H. Krevor, Rockwell Collins Display Systems . . . . . .[7061B-40]

1:55 pm: **Coatings on plastics with plasma ion assisted deposition** *(Invited Paper)*, Harro Hagedorn, Markus Fuhr, Michael Klosch, Holger Reus, Alfons Zoeller, Leybold Optics GmbH (Germany) . . . . . .[7061B-41]

2:20 pm: **Manufacturing plastic injection optical molds** *(Invited Paper)*, David Bourque, ABCO Tool & Die, Inc. . . . . .[7061B-42]

2:45 pm: **Minimized process chain for polymer optics**, Rainer Boerret, Juergen Klingenmaier, Achim Frick, Hochschule Aalen (Germany) .[7061B-43]

Coffee Break . . . . . .3:10 to 3:30 pm

Panel Discussion

Room: Conv. Ctr. 1B . . . . . Sun. 3:30 to 4:30 pm

Panel Moderator: **David H. Krevor,** Rockwell Collins

Room: Conv. Ctr. 6A . . . . . Sun. 6:00 to 6:45 pm

All-Conference Plenary Session

View plenary presentation details p. 13.

6:00 pm: **The Solar Decathlon: building a better future with solar energy**, Richard J. King, U.S. Dept. of Energy

Monday 11 August

Room: Conv. Ctr. Exhibit Hall B2 . . . . . Mon. 6:00 to 7:30 pm

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Optical properties of Dy3+ doped epoxy novolak resin, Vitezslav Jerabek, Vaclav Prajzler, Czech Technical Univ. in Prague (Czech Republic); Ivan Huettel, Oleksiy Lyutakov, Institute of Chemical Technology (Czech Republic); Jiri Oswald, Instytut Fizyki (Czech Republic); Jiri Zavadil, Institute of Photonics and Electronics (Czech Republic); Jarmila Spirková, Institute of Chemical Technology (Czech Republic) . . . . . .[7061B-44]

Developing polymeric antireflective coatings, Lynley J. Crawford, Neil R. Edmonds, Peter Plimmer, The Univ. of Auckland (New Zealand); Jonathan Lowy, Antireflective Technologies Ltd. (New Zealand) . . . . . .[7061B-45]

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SC003 Practical Optical System Design - EXPANDED 2-Day Format (Fischer) Sunday, 8:30 am to 5:30 pm
SC010 Introduction to Optical Alignment Techniques - EXPANDED 2-Day Format (Ruda) Monday, 8:30 am to 5:30 pm
SC384 The Design of Plastic Optical Systems (Schaub) Monday, 8:30 am to 12:30 pm
SC552 Aspheric Optics: Design, Fabrication, and Test (Fischer) Wednesday, 8:30 am to 12:30 pm
SC792 Polarization in Optical Design (Chipman) Sunday, 1:30 to 5:30 pm
NEW! SC911 Optical Layout and Analysis Using the Matrix Approach (Kloos) Monday, 8:30 am to 5:30 pm
NEW! SC912 Intermediate Lens Design (Bentley) Sunday, 8:30 am to 5:30 pm

Conference 7062

Monday-Tuesday 11-12 August 2008 • Proceedings of SPIE Vol. 7062

Laser Beam Shaping IX

Conference Chairs: **Andrew Forbes,** Council for Scientific and Industrial Research (South Africa); **Todd E. Lizotte,** Hitachi Via Mechanics USA, Inc.

Program Committee: **Daniel M. Brown,** Optosensors Technology, Inc.; **Fred M. Dickey,** Sandia National Labs.; **Michael Rudolf Duparré,** Friedrich-Schiller-Univ. Jena (Germany); **Julio César Gutiérrez-Vega,** Instituto Tecnológico y de Estudios Superiores de Monterrey (Mexico); **John A. Hoffnagle,** IBM Almaden Research Ctr.; **Kurt J. Kanzler,** Diffractive Laser Solutions; **Alexis V. Kudryashov,** Moscow State Open Univ. (Russia); **William Pete Latham,** Air Force Research Lab.; **Carlos Lopez-Mariscal,** National Institute of Standards and Technology; **Günter Luepke,** The College of William & Mary; **Olivier Magnin,** C2 Diagnostics (France); **Paul F. Michaloski,** Corning Tropel Corp.; **Tasso R. M. Sales,** RPC Photonics, Inc.; **José Sasian,** College of Optical Sciences/The Univ. of Arizona; **David L. Shealy,** The Univ. of Alabama at Birmingham; **Kenneth J. Weible,** SUSS MicroOptics SA (Switzerland); **Uwe-Detlef Zeitner,** Fraunhofer-Institut für Angewandte Optik und Feinmechanik (Germany); **Shuyan Zhang,** The College of William & Mary

Conference Cosponsors:

Monday 11 August

SESSION 1

Room: Conv. Ctr. 11A . . . . . Mon. 8:00 to 10:20 am

Femtosecond Laser Beam Shaping

Session Chair: **Fred M. Dickey,** Sandia National Labs.

8:00 am: **Smart spatio-temporal beam shaping with thin-film microoptics** *(Keynote Presentation)*, Ruediger Grunwald, Max-Born-Institut für Nichtlineare Optik und Kurzzeitspektroskopie (Germany). . . . . [7062-01]

8:40 am: **Formation of femtosecond Bessel and conical light beams by single and double axicons**, Svetlana N. Kurilkina, Vladimir N. Belyi, Nikolai S. Kazak, Anatolii A. Ryzhevich, B.I. Stepanov Institute of Physics (Belarus). . . . [7062-02]

9:00 am: **Micro-optic array applications in terawatt ultrafast laser amplifiers**, Barry C. Walker, Isaac Ghebregziabher, Sasi Palaniyappan, Anthony DiChiara, Univ. of Delaware . . . . . [7062-03]

9:20 am: **Compression of ultrashort pulses by using refractive elements**, Cristtel Y. Ramírez-Corral, Univ. Nacional Autónoma de México (Mexico); Martha Rosete-Aguilar, Univ. Nacional Autonoma de Mexico (Mexico); Jesus Garduño-Mejía, Roberto Ortega-Martínez, Univ. Nacional Autónoma de México (Mexico) . . . . . [7062-04]

9:40 am: **Optical pulse shaping and applications** *(Invited Paper)*, Andrew M. Weiner, Purdue Univ.. . . . . [7062-06]

Coffee Break . . . . . 10:20 to 10:50 am

SESSION 2

Room: Conv. Ctr. 11A . . . . . Mon. 10:50 am to 12:00 pm

Vortex and Non-diffracting Beams I

Session Chair: **John A. Hoffnagle,** IBM Almaden Research Ctr.

10:50 am: **Characterization of elliptic dark hollow beams** *(Invited Paper)*, Julio César Gutiérrez-Vega, Instituto Tecnológico y de Estudios Superiores de Monterrey (Mexico) . . . . . [7062-07]

11:20 am: **Two-component singular pulsed light beams in media with a saturable nonlinearity**, Vladimir N. Belyi, Nikolai S. Kazak, Vasilii M. Volkov, Rafael A. Vlasov, B.I. Stepanov Institute of Physics (Belarus) . . . . . [7062-08]

11:40 am: **Complex scalar fields using amplitude-only spatial light modulators**, Carlos López-Mariscal, National Institute of Standards and Technology; Julio C. Gutiérrez-Vega, Instituto Tecnológico y de Estudios Superiores de Monterrey (Mexico) . . . . . [7062-09]

Lunch Break . . . . . 12:00 to 1:30 pm

SESSION 3

Room: Conv. Ctr. 11A . . . . . Mon. 1:30 to 2:50 pm

Vortex and Non-diffracting Beams II

Session Chair: **John A. Hoffnagle,** IBM Almaden Research Ctr.

1:30 pm: **Nondiffracting and self-reconstructing properties of Hermite-Bessel beams**, Paulo Brandão, Willamys Soares, Dilson P. Caetano, Jandir Hickmann, Univ. Federal de Alagoas (Brazil) . . . . . [7062-10]

1:50 pm: **Accurate phase mapping of nondiffracting singular beams**, Carlos Lopez-Mariscal, National Institute of Standards and Technology; Julio C. Gutiérrez-Vega, Instituto Tecnológico y de Estudios Superiores de Monterrey; Daniel Burnham, Daniel Rudd, Univ. of St. Andrews (United Kingdom); David McGloin, Univ. of Dundee (United Kingdom). . . . . [7062-11]

2:10 pm: **New type of Bessel-like optical beams**, Vladimir N. Belyi, Nikolai S. Kazak, Nikolai A. Khilo, Piotr I. Ropot, Larisa I. Kramoreva, B.I. Stepanov Institute of Physics (Belarus) . . . . . [7062-12]

2:30 pm: **Beam shaping with vectorial vortex beams under low numerical aperture illumination condition**, Qiwen Zhan, Jianning Dai, Univ. of Dayton [7062-13]

Coffee Break . . . . . 2:50 to 3:20 pm

SESSION 4

Room: Conv. Ctr. 11A . . . . . Mon. 3:20 to 5:10 pm

Measurement and Theory

Session Chair: **David L. Shealy,** The Univ. of Alabama at Birmingham

3:20 pm: **Different approaches for optimization of diffractive optical elements: investigation and outlook** *(Invited Paper)*, Vladimir S. Pavelyev, Samara State Aerospace Univ. (Russia) . . . . . [7062-14]

3:50 pm: **Laser beam shaper alignment and analysis techniques**, Todd E. Lizotte, Orest Ohar, Tracie Tuttle, Hitachi Via Mechanics USA, Inc. . [7062-15]

4:10 pm: **Beam profiling at focus: essential for beam shaping**, Lawrence I. Green, Ophir-Spiricon . . . . . [7062-16]

4:30 pm: **Optimization of achromatic refractive laser beam shaping systems**, Hagen Schimmel, LightTrans GmbH (Germany); Frank Wyrowski, Friedrich Schiller Univ. (Germany). . . . . [7062-17]

4:50 pm: **Comparison between a super Gaussian and a "true" top hat,** John G. Smith, MEMS Optical, Inc. . . . . [7062-18]

Room: Conv. Ctr. Exhibit Hall B2 . . . . . Mon. 6:00 to 7:30 pm

Posters-Monday

Poster authors will begin displaying posters after 10:00 am Monday morning. A poster session, with authors present at their posters, will be held Monday evening from 6:00 to 7:30 pm. Light refreshments will be served.

Poster Setup

Poster presenters must set up their posters between 10:00 am and 5:00 pm on Monday. Poster presenters who have not set up by 5:00 pm on Monday will be considered a "no show" and their manuscript will not be published. Presenters must remove their posters immediately after the poster session. Posters not removed will be considered unwanted and will be discarded. SPIE assumes no responsibility for posters left up after the end of each poster session.

Diffraction properties of ultrashort pulsed beams with arbitrary temporal profiles by a volume holographic grating, Liping Guo, Shandong Univ. of Technology (China) . . . . . [7062-05]

High voltage discharge control by spatial shaping of a laser induced plasma, Nicholas J. West, Ian R. Jandrell, Univ. of the Witwatersrand (South Africa); Andrew Forbes, Council for Scientific and Industrial Research (South Africa) . . . . . [7062-40]

Beam shaping system based on polymer spherical gradient refractive index lenses, Ramzi Zahreddine, Robert M. Bunch, Richard S. Lepkowicz, Rose-Hulman Institute of Technology; Eric Baer, Anne Hiltner, Case Western Reserve Univ. . . . . [7062-41]

Fresnel ellipsoid approach for Gaussian beam focusing, Gabrielle Thériault, Réal Tremblay, Nathalie McCarthy, Univ. Laval (Canada). . . . . [7062-42]

Design of a simple optical system for beam shaping of diode laser bars, Víctor M. Durán Ramírez, Univ. de Guadalajara (Mexico); Alejandro Martínez Ríos, Ctr. de Investigaciones en Óptica, A.C. (Mexico); Romeo Selvas-Aguilar, Univ. Autonoma de Nuevo Leon (Mexico); Jesús Muñoz Maciel, Univ. de Guadalajara (Mexico). . . . . [7062-43]

Focal shift effect in vector parabolic-Gauss beams, Raul I. Hernandez-Aranda, Julio C. Gutiérrez-Vega, Instituto Tecnológico y de Estudios Superiores de Monterrey (Mexico) . . . . . [7062-45]

Propagation of obstructed Bessel and Bessel-Gauss beams, Igor Litvin, Melanie McLaren, Andrew Forbes, Council for Scientific and Industrial Research (South Africa). . . . . [7062-46]

Variable super-Gaussian order selection by dynamic control of an intra-cavity diffractive mirror, Andrew Forbes, Council for Scientific and Industrial Research (South Africa) and Univ. of KwaZulu-Natal (South Africa); Liesl Burger, Philip Loveday, Craig Long, Council for Scientific and Industrial Research (South Africa). . . . . [7062-47]

Laser beam propagation characteristics of incoherently added diode bar stacks, Andrew Forbes, Council for Scientific and Industrial Research (South Africa) and Univ. of KwaZulu-Natal (South Africa); Daniel Esser, Dieter Preussler, Sandile Ngcobo, Christoph Bollig, Council for Scientific and Industrial Research (South Africa). . . . . [7062-48]

Radiometry of flashing LED sources, Don A. Gregory, Stephanie Medley, Adam Roberts, The Univ. of Alabama in Huntsville . . . . . [7062-49]

Design and investigation of three-dimensional photonic quasicrystal with full band gap, Pavel N. Dyachenko, Vladimir S. Pavelyev, Image Processing Systems Institute (Russia); Yuri V. Miklyaev, South Ural State Univ. (Russia); Vladimir E. Dmitrienko, A.V. Shubnikov Institute of Crystallography (Russia) . . . . . [7062-50]

Dispersion compensation of femtosecond laser pulses by maximizing a second harmonic signal with a feedback loop containing a genetic search algorithm and an acoustic-optic modulator, Andrew Mori, Univ. Stellenbosch (South Africa) and CSIR National Laser Ctr. (South Africa); Lourens R. Botha, Anton du Plessis, Ted Roberts, Hendrik Maat, CSIR National Laser Ctr. (South Africa) . . . . . [7062-51]

Tuesday 12 August

SESSION 5

Room: Conv. Ctr. 11A . . . . . Tues. 8:00 to 10:10 am

Design and Fabrication I

Session Chair: **Kenneth J. Weible,** SUSS MicroOptics SA (Switzerland)

8:00 am: **Diamond micro-milling for array mastering** *(Invited Paper)*, Niels Christian R. Holme, Tommy W. Berg, Palle G. Dinesen, Kaleido Technology ApS (Denmark) . . . . . [7062-19]

8:30 am: **UV beam shaper alignment sensitivity: grayscale versus binary designs**, Todd E. Lizotte, Hitachi Via Mechanics USA, Inc. . . . . [7062-20]

8:50 am: **Diffractive, aspheric, or spherical beam transformers: a comparison in manufacturability**, John G. Smith, MEMS Optical, Inc. . . . . [7062-21]

9:10 am: **Microlens diffusers: design and fabrication**, Tasso R. Sales, RPC Photonics, Inc.. . . . . [7062-22]

9:30 am: **Thin copper film for plasma etching of quartz**, Stanislav Dmitriev, Aleksey Volkov, Vadim Eropolov, Oleg Moiseev, Boris Volodkin, Image Processing Systems Institute (Russia) . . . . . [7062-23]

9:50 am: **Optimization of technology for antireflection structure formation on the end face of silver-halide PIR-fiber**, Vadim A. Eropolov, Vladimir S. Pavelyev, Oleg Y. Moiseev, Alexey V. Volkov, Stanislav V. Dmitriev, Image Processing Systems Institute (Russia); Viatcheslav Artyushenko, Vitaliy Kashin, General Physics Institute (Russia) . . . . . [7062-24]

Coffee Break . . . . . 10:10 to 10:40 am

SESSION 6

Room: Conv. Ctr. 11A . . . . . Tues. 10:40 am to 12:20 pm

Design and Fabrication II

Session Chair: **Kenneth J. Weible,** SUSS MicroOptics SA (Switzerland)

10:40 am: **Refractive statistical concave 1D diffusers for laser beam shaping**, Roland Bitterli, Toralf Scharf, Hans Peter Herzig, Univ. of Neuchâtel (Switzerland); Andreas Bich, Christine Dumouchel, Sylvain Roth, Kenneth J. Weible, Reinhard Völkel, SUSS MicroOptics SA (Switzerland). . . . . [7062-25]

11:00 am: **Stochastic tandem microlens arrays for beam homogenization**, Frank C. Wippermann, Daniela Radtke, Peter Dannberg, Uwe-Detlef Zeitner, Andreas H. Bräuer, Fraunhofer-Institut für Angewandte Optik und Feinmechanik (Germany). . . . . [7062-26]

11:20 am: **Randomly varying micro-optical elements for the generation of uniform intensity profiles in coherent laser sources**, Kenneth J. Weible, Andreas Bich, Sylvain Roth, Christine Dumouchel, Pascal Pernet, Martin Eisner, Reinhard Voelkel, SUSS MicroOptics SA (Switzerland); Roland Bitterli, Toralf Scharf, Wilfried Noell, Univ. de Neuchâtel (Switzerland). . . . . [7062-27]

11:40 am: **Generation of several uniform spots with micro optics**, Jana Fruendt, Manfred Jarczynski, Thomas Mitra, LIMO-Lissotschenko Mikrooptik GmbH (Germany). . . . . [7062-28]

12:00 pm: **Free form micro-optics enable uniform off-axis illumination and superposition of high power laser devices**, Tanja Bizjak, Oliver Homburg, Andreas Bayer, Thomas Mitra, Lutz Aschke, LIMO-Lissotschenko Mikrooptik GmbH (Germany). . . . . [7062-29]

Lunch/Exhibition Break . . . . . 12:20 to 1:50 pm

Conference 7062

SESSION 7

Room: Conv. Ctr. 11A . . . . . .Tues. 1:50 to 5:10 pm

Applications

Session Chair: **John G. Smith,** MEMS Optical, Inc.

1:50 pm: **Laser beam interference and its applications in optical micromanipulation techniques** *(Invited Paper)*, Pavel Zemánek, Tomas Cizmar, Martin Siler, Vítìzslav Karàsek, Petr Jakl, Jan Jezek, Oto Brzobohaty, Institute of Scientific Instruments (Czech Republic) . . . . . [7062-30]

2:20 pm: **Continuous phase plate polishing using magnetorheological finishing**, Marc Tricard, Paul Dumas, QED Technologies Inc.; Joseph A. Menapace, Lawrence Livermore National Lab.. . . . . [7062-31]

2:40 pm: **Optical trapping in Bessel beams formed by conical diffraction**, David O'Dwyer, Ciaran Phelan, John F. Donegan, James G. Lunney, Yury P. Rakovich, The Univ. of Dublin, Trinity College (Ireland); Tomas Cizmar, Kishan Dholakia, Univ. of St. Andrews (United Kingdom). . . . . [7062-52]

3:00 pm: **Beam shaping of line generators based on high power diode lasers to achieve high intensity and uniformity levels**, Andreas Bayer, Thomas Mitra, Lutz Aschke, LIMO-Lissotschenko Mikrooptik GmbH (Germany) . . . . . [7062-33]

Coffee Break . . . . . 3:20 to 3:50 pm

3:50 pm: **Erbium-doped tunable fiber laser**, Arturo Castillo-Guzman, Romeo Selvas-Aguilar, Univ. Autonoma de Nuevo Leon (Mexico); Gilberto Anzueto-Sánchez, Univ de Guanajuato (Mexico); Julián Estudillo-Ayala, Roberto Rojas-Laguna, Univ. de Guanajuato (Mexico); Daniel May-Arrioja, Instituto Nacional de Astrofísica, Óptica y Electronica (Mexico); Alejandro Martinez-Rios, Ctr. de Investigaciones en Óptica, A.C. (Mexico) . . . . . [7062-34]

4:10 pm: **Experimental and modeling studies on a compact and efficient high power fiber-coupled diode-end-pumped Nd:YVO4 laser**, Ashraf F. El-Sherif, Military Technical College (Egypt) . . . . . [7062-35]

4:30 pm: **Intracavity mode competition between classes of flat-top beams**, Andrew Forbes, Liesl Burger, Philip Loveday, Craig Long, Council for Scientific and Industrial Research (South Africa) . . . . . [7062-36]

4:50 pm: **Adaptive optics push-pull electrostatic deformable mirror**, Stefano Bonora, Fabio Frassetto, Luca Poletto, CNR-National Institute for the Physics of Matter (Italy). . . . . [7062-37]

Courses of Related Interest

See SPIE Cashier for information and to register.

SC001 Optical System Design: Layout Principles and Practice (Greivenkamp) Sunday, 8:30 am to 5:30 pm
SC003 Practical Optical System Design - EXPANDED 2-Day Format (Fischer) Sunday, 8:30 am to 5:30 pm
SC010 Introduction to Optical Alignment Techniques - EXPANDED 2-Day Format (Ruda) Monday, 8:30 am to 5:30 pm
SC552 Aspheric Optics: Design, Fabrication, and Test (Fischer) Wednesday, 8:30 am to 12:30 pm
SC725 Optical & Laser Scanning Technology: Devices, Systems & Applications (Marshall) Wednesday, 8:30 am to 5:30 pm
SC792 Polarization in Optical Design (Chipman) Sunday, 1:30 to 5:30 pm
NEW! SC911 Optical Layout and Analysis Using the Matrix Approach (Kloos) Monday, 8:30 am to 5:30 pm
NEW! SC912 Intermediate Lens Design (Bentley) Sunday, 8:30 am to 5:30 pm

Conference 7063

Monday-Wednesday 11-13 August 2008 • Proceedings of SPIE Vol. 7063

Interferometry XIV: Techniques and Analysis

Conference Chairs: **Joanna Schmit,** Veeco Instruments Inc.; **Katherine Creath,** Optineering and College of Optical Sciences/The Univ. of Arizona; **Catherine E. Towers,** Univ. of Leeds (United Kingdom)

Program Committee: **Astrid Aksnes,** Norwegian University of Science and Technology (Norway); **Armando Albertazzi Goncalves, Jr.,** Univ. Federal de Santa Catarina (Brazil); **Gordon M. Brown,** Optical Systems Engineering; **Jan Burke,** Commonwealth Scientific and Industrial Research Organisation (Australia); **Werner P. O. Jüptner,** Bremer Institut für Angewandte Strahltechnik (Germany); **Guillermo H. Kaufmann,** Univ. Nacional de Rosario (Argentina); **Seung-Woo Kim,** Korea Advanced Institute of Science and Technology (South Korea); **Mahendra Prasad Kothiyal,** Indian Institute of Technology Madras (India); **Malgorzata Kujawinska,** Politechnika Warszawska (Poland); **Mike McCarthy,** National Physical Lab. (United Kingdom); **Michael B. North Morris,** 4D Technology Corp.; **Erik L. Novak,** Veeco Instruments Inc.; **Jiri Novák,** Czech Technical Univ. in Prague (Czech Republic); **Wolfgang Osten,** Univ. Stuttgart (Germany); **Yukitoshi Otani,** Tokyo Univ. of Agriculture and Technology (Japan); **Jérôme Primot,** ONERA (France); **Manuel Servín,** Ctr. de Investigaciones en Óptica, A.C. (Mexico); **H. Philip Stahl,** NASA Marshall Space Flight Ctr.; **Mitsuo Takeda,** The Univ. of Electro-Communications (Japan); **Song Zhang,** Harvard Univ.

Monday 11 August

SESSION 1

Room: Conv. Ctr. 6D . . . . . Mon. 8:00 to 9:50 am

On the Fringe

Session Chair: **Katherine Creath,** Optineering and College of Optical Sciences/The Univ. of Arizona

8:00 am: **It's a (meta)material world! The final frontier?** *(Invited Paper)*, Allan D. Boardman, Rhiannon Mitchell-Thomas, Yuriy G. Rapoport, Univ. of Salford (United Kingdom). . . . . [7063-01]

8:30 am: **Advanced and shaped light fields for the biosciences** *(Invited Paper)*, Kishan Dholakia, Univ. of St. Andrews (United Kingdom) . . . [7063-02]

9:00 am: **Coarse frequency comb interferometry** *(Invited Paper)*, Johannes Schwider, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany) . [7063-03]

9:30 am: **Generalized quantitative approach to two-beam fringe visibility (coherence) with different polarizations and frequencies** , Chandrasekhar Roychoudhuri, Univ. of Connecticut; A. Michael Barootkoob, Consultant . . . . . [7063-04]

Coffee Break . . . . . 9:50 to 10:20 am

SESSION 2

Room: Conv. Ctr. 6D . . . . . Mon. 10:20 to 11:50 am

Spatial and Shearing Techniques

Session Chair: **Mitsuo Takeda,** The Univ. of Electro-Communications (Japan)

10:20 am: **Spatially phase-shifted digital speckle pattern interferometry (SPS-DSPI) and cryogenic structures: recent improvements** *(Invited Paper)*, Peter N. Blake, Joycelyn T. Jones, Joseph A. Connelly, Carl F. Hostetter, NASA Goddard Space Flight Ctr.; Babak N. Saif, Perry E. Greenfield, Warren Hack, Bente H. Eegholm, Space Telescope Science Institute . . . . . [7063-05]

10:50 am: **Instantaneous phase-shift Fizeau interferometer utilizing a synchronous frequency shift mechanism**, Bradley T. Kimbrough, Eric Fry, James E. Millerd, 4D Technology Corp. . . . . [7063-06]

11:10 am: **Development of a multi-component shearography instrument for surface strain measurement on dynamic objects**, Ralph P. Tatam, Stephen W. James, Daniel Francis, Cranfield Univ. (United Kingdom)[7063-07]

11:30 am: **Optical wavefront sensors based on sub-wavelength metallic structures**, Grégory Vincent, Bruno Toulon, Riad Haïdar, ONERA (France); Stéphane S. Collin, Ctr. National de la Recherche Scientifique (France); Jérôme Primot, ONERA (France); Jean-Luc Pelouard, Ctr. National de la Recherche Scientifique (France) . . . . . [7063-08]

Lunch Break . . . . . 11:50 am to 1:20 pm

SESSION 3

Room: Conv. Ctr. 6D . . . . . Mon. 1:20 to 3:10 pm

Speckle and Unwrapping Techniques

Session Chair: **Catherine E. Towers,** Univ. of Leeds (United Kingdom)

1:20 pm: **A dynamic in-plane deformation measurement using virtual speckle patterns** *(Invited Paper)*, Yasuhiko Arai, Kansai Univ. (Japan)[7063-09]

1:50 pm: **The spatial degree of polarization and the first-order statistical properties of polarization speckle**, Wei Wang, Heriot-Watt Univ. (United Kingdom); Akihiro Matsuda, The Univ. of Electro-Communications (Japan); Steen G. Hanson, Danmarks Tekniske Univ. (Denmark); Mitsuo Takeda, The Univ. of Electro-Communications (Japan). . . . . [7063-10]

2:10 pm: **Lockin-speckle-interferometry for non-destructive testing**, Philipp Menner, Henry Gerhard, Gerhard Busse, Univ. of Stuttgart (Germany) . . . . . [7063-11]

2:30 pm: **Denoising of digital speckle pattern interferometry fringes by means of Bidimensional Empirical Mode Decomposition**, Maria B. Bernini, Consejo Nacional de Investigaciones Científicas y Técnicas (Argentina); Alejandro Federico, Instituto Nacional de Tecnologia Industrial (Argentina); Guillermo H. Kaufmann, Univ. Nacional de Rosario (Argentina) . . . . . [7063-12]

2:50 pm: **Filtering based phase unwrapping**, Kemao Qian, Nanyang Technological Univ. (Singapore) . . . . . [7063-13]

Coffee Break . . . . . 3:10 to 3:40 pm

SESSION 4

Room: Conv. Ctr. 6D . . . . . Mon. 3:40 to 5:40 pm

Digital Holography and Heterodyne Techniques

Session Chair: **Werner P. O. Jüptner,** Bremer Institut für Angewandte Strahltechnik (Germany)

3:40 pm: **Investigations and improvements of digital holographic tomography applied for 3D studies of transmissive photonics microelements** *(Invited Paper)*, Malgorzata Kujawinska, Agata Jozwicka, Tomasz Kozacki, Politechnika Warszawska (Poland) . . . . . [7063-14]

4:10 pm: **Strain distribution measurement by digital holographic interferometry using three spherical waves**, Motoharu Fujigaki, Kohhei Shiotani, Ryosuke Kido, Yoshiharu Morimoto, Wakayama Univ. (Japan). . . . . [7063-15]

4:30 pm: **Modeling and optical characterization of vibrating micro- and nanostructures** *(Invited Paper)*, Astrid Aksnes, Erlend Leirset, Hanne Martinussen, Helge E. Engan, Norwegian Univ. of Science and Technology (Norway) . . . . . [7063-16]

5:00 pm: **Real-time vibration amplitude and phase imaging with heterodyne interferometry and correlation image sensor**, Seichi Sato, Toru Kurihara, Shigeru Ando, The Univ. of Tokyo (Japan) . . . . . [7063-17]

5:20 pm: **Laser confocal feedback profilometry**, Xinjun Wan, GE (China) Research & Development Ctr. Co. Ltd. (China); Shulian Zhang, Zhou Ren, Tsinghua Univ. (China). . . . . [7063-18]

Tuesday 12 August

SESSION 5

Room: Conv. Ctr. 6D . . . . . .Tues. 8:30 to 10:20 am

Phase Analysis and Fringe Projection Techniques

Session Chair: **Jan Burke,** Commonwealth Scientific and Industrial Research Organisation (Australia)

8:30 am: **New algorithms and error analysis for sinusoidal phase shifting interferometry** *(Invited Paper)*, Peter J. de Groot, Leslie L. Deck, Zygo Corp. . . . . [7063-19]

9:00 am: **Iterative algorithm for phase shifting interferometry with finite bandwidth illumination**, Florin Munteanu, Joanna Schmit, Veeco Instruments Inc.. . . . . [7063-20]

9:20 am: **Simultaneous geometry and color texture acquisition using a single-chip color camera**, Song Zhang, Harvard Univ. . . . . [7063-21]

9:40 am: **Shape and color measurement of colorful objects by fringe projection**, Zonghua Zhang, Catherine E. Towers, David P. Towers, Univ. of Leeds (United Kingdom) . . . . . [7063-22]

10:00 am: **Moiré topography with frequency modulation technique by LC grating**, Fumio Kobayashi, Yukitoshi Otani, Tokyo Univ. of Agriculture and Technology (Japan); Toru Yoshizawa, Saitama Medical Univ. (Japan). . . . . [7063-23]

Coffee Break . . . . . 10:20 to 10:50 am

SESSION 6

Room: Conv. Ctr. 6D . . . . . Tues. 10:50 am to 12:10 pm

Thickness Measurement

Session Chair: **Astrid Aksnes,** Norwegian Univ. of Science and Technology (Norway)

10:50 am: **Fizeau interferometer for quasi parallel optical plate testing**, Adam R. Styk, Krzysztof Patorski, Politechnika Warszawska (Poland)[7063-24]

11:10 am: **Angle-resolved reflectometer for thickness measurement of multi-layered thin-film structures**, Woo Deok Joo, Joonho You, Young-Sik Ghim, Seung-Woo Kim, Korea Advanced Institute of Science and Technology (South Korea). . . . . [7063-25]

11:30 am: **Uncertainty analysis on the absolute thickness of a cavity using a commercial wavelength scanning interferometer**, Amit R. Suratkar, Angela Davies, Faramarz Farahi, The Univ. of North Carolina at Charlotte . . . . . [7063-26]

11:50 am: **Measurement of absolute optical thickness distribution of a mask-glass by wavelength tuning interferometry**, Kenichi Hibino, National Institute of Advanced Industrial Science and Technology (Japan); Yangjin Kim, The Univ. of Tokyo (Japan); Youichi Bitou, Sonko Osawa, National Institute of Advanced Industrial Science and Technology (Japan); Mamoru Mitsuishi, The Univ. of Tokyo (Japan). . . . . [7063-27]

Lunch/Exhibition Break . . . . . 12:10 to 1:40 pm

SESSION 7

Room: Conv. Ctr. 6D . . . . . .Tues. 1:40 to 3:30 pm

Multi Wavelength Interferometry

Session Chair: **Johannes Schwider,** Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany)

1:40 pm: **Dual frequency sweeping interferometry with range-invariant accuracy for absolute distance metrology** *(Invited Paper)*, Alexandre P. Cabral, José M. Rebordão, Manuel A. Abreu, Instituto Nacional de Engenharia, Tecnologia e Inovação, I.P. (Portugal). . . . . [7063-28]

2:10 pm: **Micro Fabry-Perot sensor for surface measurement**, Andrei Brunfeld, Xyratex International Inc.; Gregory Toker, Xyratex International Inc. (Israel); Bryan Clark, Morey Roscrow, Xyratex International Inc. . . . . [7063-29]

2:30 pm: **Optimum wavelength selection for the method of excess fractions**, Konstantinos Falaggis, David P. Towers, Catherine E. Towers, Univ. of Leeds (United Kingdom) . . . . . [7063-30]

2:50 pm: **Multiple wavelength interferometry for surface profiling**, Paul K. Upputuri, Nandigana Krishna Mohan, Sr., Mahendra P. Kothiyal, Sr., Indian Institute of Technology Madras (India) . . . . . [7063-47]

3:10 pm: **A hybrid technique for ultra-high dynamic range interferometry**, Konstantinos Falaggis, David P. Towers, Catherine E. Towers, Univ. of Leeds (United Kingdom). . . . . [7063-32]

Coffee Break . . . . . 3:30 to 4:00 pm

SESSION 8

Room: Conv. Ctr. 6D . . . . . .Tues. 4:00 to 5:20 pm

Complex Structures and Ultra Short Pulse Measurement

Session Chair: **Joanna Schmit,** Veeco Instruments Inc.

4:00 pm: **Surface profile detection with nanostructures by Mueller matrix polarimeter**, Yukitoshi Otani, Tomohito Kuwagaito, Yasuhiro Mizurtani, Tokyo Univ. of Agriculture and Technology (Japan) . . . . . [7063-33]

4:20 pm: **3D profilometer for micro structures with large bevel angles in BEFs by white-light interferometry**, Wei Cheng Wang, Yan Jen Su, Shih Hsuan Kuo, Industrial Technology Research Institute (Taiwan) . . . . . [7063-34]

4:40 pm: **Surface metrology of silicon wafers using a femtosecond pulse laser**, Taekmin Kwon, Ki-Nam Joo, Seung-Woo Kim, Korea Advanced Institute of Science and Technology (South Korea) . . . . . [7063-35]

5:00 pm: **Noncollinear autocorrelation with radially symmetric nondiffracting beams**, Silke Huferath, Bremer Institut für Angewandte Strahltechnik (Germany); Volker Kebbel, Bremer Werk fur Montagesysteme (Germany); Martin Bock, Ruediger Grunwald, Max-Born-Institut für Nichtlineare Optik und Kurzzeitspektroskopie (Germany). . . . . [7063-36]

Wednesday 13 August

SESSION 9

Room: Conv. Ctr. 6D . . . . . Wed. 8:30 to 10:00 am

Testing of Aspheric Surfaces

Session Chair: **Seung-Woo Kim,** Korea Advanced Institute of Science and Technology (South Korea)

8:30 am: **Testing of a diamond-turned off-axis parabolic mirror** *(Invited Paper)*, Jan Burke, Commonwealth Scientific and Industrial Research Organisation (Australia); Kai Wang, Adam Bramble, Macquarie Univ. (Australia). . . . . [7063-37]

9:00 am: **Distortion mapping correction in aspheric null testing**, Matthew J. Novak, Chunyu Zhao, James H. Burge, College of Optical Sciences/The Univ. of Arizona . . . . . [7063-38]

9:20 am: **Interferometric null test of a parabolic reflector generating a Hertzian dipole field**, Johannes Schwider, Gerd Leuchs, Norbert Lindlein, Klaus Mantel, Markus Sondermann, Hildegard Konermann, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany) . . . . . [7063-39]

9:40 am: **Optical testing by means of one-dimensional interferograms performed with a point-diffraction interferometer**, Luis Rodríguez-Castillo, Fermín-Solomon S. Granados-Agustín, Alejandro Cornejo-Rodríguez, Instituto Nacional de Astrofísica, Óptica y Electrónica (Mexico). . . . . [7063-41]

Coffee Break . . . . . 10:00 to 10:30 am

SESSION 10

Room: Conv. Ctr. 6D . . . . . Wed. 10:30 to 11:30 am

Testing of Aspheric Surfaces and Wavefront Collimation

10:30 am: **Stitching of off-axis sub-aperture null measurements of an aspheric surface**, Chunyu Zhao, James H. Burge, College of Optical Sciences/The Univ. of Arizona . . . . . [7063-40]

10:50 am: **Measurements of aspheric surfaces with Fizeau interferometer**, Piotr Szwaykowski, Engineering Synthesis Design, Inc.. . . . . [7063-56]

11:10 am: **Wide dynamic beam size range lateral-shear interferometer,** King-Ung Hii, Kuan-Hiang Kwek, Univ. of Malaya (Malaysia) . . . . . [7063-45]

Room: Conv. Ctr. Exhibit Hall B2 . . . . . Wed. 5:30 to 7:00 pm

Posters-Wednesday

Poster authors will begin displaying posters after 10:00 am Wednesday morning. A poster session, with authors present at their posters, will be held Wednesday evening from 5:30 to 7:00 pm. Light refreshments will be served.

Poster Setup

Poster presenters must set up their posters between 10:00 am and 5:00 pm on Wednesday. Poster presenters who have not set up by 5:00 pm on Wednesday will be considered a "no show" and their manuscript will not be published. Presenters must remove their posters immediately after the poster session. Posters not removed will be considered unwanted and will be discarded. SPIE assumes no responsibility for posters left up after the end of each poster session.

Interferometer design for optical stochastic cooling demonstration at Bates, Wilbur Franklin, James Hays-Wehle, Franz X. Kaertner, Jan van der Laan, Richard Milner, Aleem Siddiqui, Chris Tschalaer, Fuhua Wang, Massachusetts Institute of Technology. . . . . [7063-42]

Optical heterodyne laser encoder for in-plane nanopositioning, Chyan-Chyi Wu, Cheng-Chih Hsu, Industrial Technology Research Institute (Taiwan); Ju-Yi Lee, National Central Univ. (Taiwan) . . . . . [7063-48]

Temporal phase detection of interferograms without frequency carrier, Julio C. Estrada Rico, Manuel Servin, Diana A. Arroyo, Ctr. de Investigaciones en Óptica, A.C. (Mexico) . . . . . [7063-49]

Spatial coherence wavelets and the phase-space representation of holography, Rafael A. Betancur Lopera, John F. Restrepo, Roman E. Castaneda-Sepulveda, Univ. Nacional de Colombia/Medellín (Colombia) . . . . . [7063-51]

Distance method of inner structure of layered mediums diagnostic, Alexander L. Kalyanov, Vladislav V. Lychagov, Dmitry V. Lyakin, Vladimir P. Ryabukho, Saratov State Univ. (Russia); Mark D. Model, Harvard Medical School . . . . . [7063-53]

Dynamic measurement of strain in test specimen by fringe projection, Andrea Leon Huerta, Amalia Martinez, Juan Antonio Rayas, Ctr. de Investigaciones en Óptica, A.C. (Mexico); Raúl Cordero, Univ. de Santiago de Chile (Chile) . . . . . [7063-54]

An ESPI technique based on panoramic interferometry with paraboloid mirrors, Aracely Soto, Juan B. Hurtado-Ramos, Liliana Reséndiz-Sánchez, J. Joel González-Barbosa, Ctr. de Investigación en Ciencia Aplicada y Tecnología Avanzada (Mexico) . . . . . [7063-55]

Courses of Related Interest

See SPIE Cashier for information and to register.

SC211 Practical Interferometry and Fringe Analysis (Creath) Wednesday, 1:30 to 5:30 pm
SC213 Introduction to Interferometric Optical Testing (Wyant) Sunday, 1:30 to 5:30 pm
SC850 Metrology for Modern Optical Manufacturing (Murphy) Wednesday, 8:30 am to 12:30 pm

Conference 7064

Wednesday-Thursday 13-14 August 2008 • Proceedings of SPIE Vol. 7064

Interferometry XIV: Applications

Conference Chairs: **Erik L. Novak,** Veeco Instruments Inc.; **Wolfgang Osten,** Univ. Stuttgart (Germany); **Christophe Gorecki,** Univ. de Franche-Comté (France)

Program Committee: **Armando Albertazzi Goncalves, Jr.,** Univ. Federal de Santa Catarina (Brazil); **Anand Krishna Asundi,** Nanyang Technological Univ. (Singapore); **Katherine Creath,** Optineering and College of Optical Sciences/The Univ. of Arizona; **Angela Davies,** The Univ. of North Carolina at Charlotte; **Peter J. de Groot,** Zygo Corp.; **Cosme Furlong,** Worcester Polytechnic Institute; **Pietro Ferraro,** Istituto Nazionale di Ottica Applicata (Italy); **Kay Gastinger,** SINTEF (Norway); **Zhenbang Gong,** Shanghai Univ. (China); **James B. Hadaway,** The Univ. of Alabama in Huntsville; **Tobias Haist,** Univ. Stuttgart (Germany); **Sen Han,** Veeco Instruments, Inc.; **Steen Gruner Hanson,** Riso National Lab., Technical Univ. of Denmark (Denmark); **Pierre M. Jacquot,** École Polytechnique Fédérale de Lausanne (Switzerland); **Jae Wan Kim,** Korea Research Institute of Standards and Science (South Korea); **Malgorzata Kujawinska,** Politechnika Warszawska (Poland); **Gunther Notni,** Fraunhofer-Institut für Angewandte Optik und Feinmechanik (Germany); **Xiang Peng,** Shenzhen Univ. (China); **Leszek A. Salbut,** Politechnika Warszawska (Poland); **Pierre R. L. Slangen,** Ecole des Mines d'Alès (France); **Vivi Tornari,** Foundation for Research and Technology-Hellas (Greece); **Rainer Tutsch,** Technische Univ. Braunschweig (Germany)

Wednesday 13 August

SESSION 1

Room: Conv. Ctr. 6D . . . . . Wed. 1:20 to 2:50 pm

Measurement of Dynamic Processes

Session Chair: **Erik L. Novak,** Veeco Instruments Inc.

1:20 pm: **Twymann Green interferometry in study of AlN material as an actuation layer in MEMS** *(Invited Paper)*, Christophe Gorecki, Univ. de Franche-Comté (France); Katarzyna Krupa, Politechnika Warszawska (Poland) and Univ. de Franche-Comté (France); Alexandru Andrei, Univ. de Franche-Comté (France); Michal Józwik, Warsaw Univ. of Technology Chapter (Poland); Lukasz Nieradko, Patrick Delobelle, Laurent Hirsinger, Univ. de Franche-Comté (France) . . . . . [7064-01]

1:50 pm: **Phase-shift Fizeau interferometer in presence of vibration**, Nicolae R. Doloca, Rainer Tutsch, Technische Univ. Braunschweig (Germany) . . . . . [7064-02]

2:10 pm: **Interferometric characterization of pyroelectrically activated micro-arrays of liquid lenses in lithium niobate crystals**, Simonetta Grilli, Lisa Miccio, Veronica Vespini, Pietro Ferraro, Istituto Nazionale di Ottica Applicata (Italy) . . . . . [7064-03]

2:30 pm: **Vibration insensitive 3D-profilometry: a new type of white light interferometric microscopy**, Joseph Cohen-Sabban, David Marsaut, David Reolon, Sciences et Techniques Industrielles de la Lumiere (France) [7064-05]

Coffee Break . . . . . 2:50 to 3:20 pm

SESSION 2

Room: Conv. Ctr. 6D . . . . . Wed. 3:20 to 5:20 pm

Precision Measurements for Industry

Session Chair: **Christophe Gorecki,** Univ. de Franche-Comté (France)

3:20 pm: **Application of nonlinear optical interferometer to nondestructive inspection of concrete structure**, Shigeaki Uchida, Tokyo Institute of Technology (Japan); Yoshinori Shimada, Oleg Kotiaev, Osaka Univ. (Japan) . . . . . [7064-06]

3:40 pm: **Application of interferometry for evaluation of the effect of contact lens material on tear film quality**, Dorota H. Szczesna, Henryk T. Kasprzak, Politechnika Wroclawska (Poland); Ulf Stenevi, Sahlgrenska Univ. Hospital (Sweden) . . . . . [7064-07]

4:00 pm: **Recurrence quantification analysis applied to sequential speckle images of machined surface for detection of chatter in turning**, Jacob Elias, V. G. Rajesh, V. N. N.Namboothiri, Cochin Univ. of Science & Technology (India) . . . . . [7064-08]

4:20 pm: **Permutation entropy based speckle analysis in metal cutting**, Usha Nair, Bindu M. Krishna, V. N. N.Nambhoothiri, Vadakedathu P. N.Nampoori, Cochin Univ. of Science & Technology (India) . . . . . [7064-09]

4:40 pm: **Integrated quantum efficiency, reflectance, topography and stress metrology for solar cell manufacturing**, Wojtek J. Walecki, Fanny Szondy, Sunrise Optical LLC . . . . . [7064-10]

5:00 pm: **Applications of a white light interferometer for wear measurement in cylinders**, Armando Albertazzi Goncalves, Jr., Univ. Federal de Santa Catarina (Brazil); Matias R. Viotti, Rafael M. Miggiorin, PhotonITA (Brazil) . . . . . [7064-11]

Room: Conv. Ctr. Exhibit Hall B2 . . . . . Wed. 5:30 to 7:00 pm

Posters-Wednesday

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Accurately measuring a surface by using a computer-generated hologram, Hua Liu, Zhenwu Lu, Hongxin Zhang, Changchun Institute of Optics, Fine Mechanics and Physics (China) . . . . . [7064-15]

Towards automated forensic fracture matching of snap-off blade knives, Davy Hollevoet, Ghent Univ. (Belgium); Patrick De Smet, Belgian National Forensic Institute (Belgium); Johan De Bock, Wilfried R. Philips, Ghent Univ. (Belgium) . . . . . [7064-27]

A sensing system for monitoring the thickness of thin films by spectrum analysis of white-light interference, Yongkai Zhu, Nanjing Univ. of Aeronautics and Astronautics (China) . . . . . [7064-28]

Far-infrared Fizeau interferometer for large aspheric mirror, Yongqian Wu, Yudong Zhang, Fan Wu, Qiang Chen, Lianghong Li, Institute of Optics and Electronics (China) . . . . . [7064-30]

Development of a new laser gravimeter, Il'ia A. Bunin, Novosibirsk State Technical Univ. (Russia); Yuriy F. Stus, Institute of Automation and Electrometry (Russia) . . . . . [7064-31]

Comparison of photoacoustic and optogalvanic effect in laser Doppler velocimetry using the self-mixing effect of CO_2 laser, Jong-Woon Choi, Honam Univ. (South Korea) . . . . . [7064-32]

A simple method for measuring the small displacements, Kun-Huang Chen, Jing-Heng Chen, Feng Chia Univ. (Taiwan); Her-Lih Chiueh, Kun-Tsan Chen, Lunghwa Univ. of Science and Technology (Taiwan); Jiun-You Lin, National Changhua Univ. of Education (Taiwan); Nung-Yu Wu, Feng Chia Univ. (Taiwan) . . . . . [7064-33]

Interferometric analysis of the ablation profile in refractive surgery, Eduardo Tepichin-Rodriguez, Instituto Nacional de Astrofísica, Óptica y Electrónica (Mexico); Marco Antonio Rosales-Medina, Univ. de las Américas Puebla (Mexico); Gustavo Ramirez-Zavaleta, Martin Isias Rodríguez-Rodríguez, Estela López-Olazagasti, Instituto Nacional de Astrofísica, Óptica y Electrónica (Mexico) . . . . . [7064-34]

Interference: dark rays description, Rafael A. Betancur Lopera, John F. Restrepo Agudelo, Roman E. Castaneda-Sepulveda, Univ. Nacional de Colombia/Medellín (Colombia) . . . . . [7064-36]

Thursday 14 August

SESSION 3

Room: Conv. Ctr. 6D . . . . . Thurs. 8:20 to 10:10 am

High Accuracy Optical Element Measurements

Session Chair: **Tobias Haist,** Univ. Stuttgart (Germany)

8:20 am: **Measuring the phase transfer function of a phase-shifting interferometer** *(Invited Paper)*, Jiyoung Chu, Quandou Wang, National Institute of Standards and Technology; John P. Lehan, NASA Goddard Space Flight Ctr.; Ulf Griesmann, National Institute of Standards and Technology . . . . . [7064-12]

8:50 am: **The manufacturing and testing of an unrotational-symmetric SiC mirror**, Feng Yan, Changchun Institute of Optics, Fine Mechanics and Physics (China) and Graduate School of Chinese Academy of Science (China); Xue-jun Zhang, Changchun Institute of Optics, Fine Mechanics and Physics (China) . . . . . [7064-13]

9:10 am: **Fabrication and testing of a high-precision concave spherical mirror**, Jan Burke, Katie L. Green, Wayne Stuart, Edita Puhanic, Bob F. Oreb, Commonwealth Scientific and Industrial Research Organisation (Australia). . . . . [7064-14]

9:30 am: **Phase error correction in wavefront curvature sensing via phase retrieval**, Percival F. Almoro, Steen Hanson, Danmarks Tekniske Univ. (Denmark) . . . . . [7064-16]

9:50 am: **SIM Planet Quest Lite interferometer Guide 2 Telescope pointing control system**, Bryan H. Kang, Dhemetrio Boussalis, Nanaz Fathpour, Jet Propulsion Lab. . . . . [7064-17]

Coffee Break . . . . . 10:10 to 10:40 am

SESSION 4

Room: Conv. Ctr. 6D . . . . . Thurs. 10:40 to 11:40 am

Measurement Through Transmissive Media

Session Chair: **Sen Han,** Veeco Metrology Inc.

10:40 am: **Tomographic studies of 3D refractive index and birefringence distribution in M-O elements replicated by hot embossing technology**, Malgorzata Kujawinska, Politechnika Warszawska (Poland); Nitish Kumar, Cochin Univ. of Science & Technology (India); Rafal Krajewski, Politechnika Warszawska (Poland); Jürgen Mohr, Forschungszentrum Karlsruhe GmbH (Germany) . . . . . [7064-18]

11:00 am: **Transparent film profiling and analysis by interference microscopy**, Peter J. de Groot, Xavier Colonna de Lega, Zygo Corp.[7064-19]

11:20 am: **Design and fabrication of a fiber based waveguide interferometer**, Chung-Mei Chen, Chung-Kai Hsu, Shi-Ming Lin, Chih-Kung Lee, National Taiwan Univ. (Taiwan) . . . . . [7064-20]

Lunch/Exhibition Break . . . . . 11:40 am to 1:30 pm

SESSION 5

Room: Conv. Ctr. 6D . . . . . Thurs. 1:30 to 3:10 pm

Micro- and Nano-metrology

Session Chair: **Erik L. Novak,** Veeco Instruments Inc.

1:30 pm: **Automatic three-dimensional localization of micro-particles using digital holographic microscopy**, Maciej K. Antkowiak, Natacha Callens, Catherine Yourassowsky, Frank Dubois, Univ. Libre de Bruxelles (Belgium) . . . . . [7064-22]

1:50 pm: **Uncertainty consideration of the mirror-interferometer system in nanopositioning and nanomeasuring machines**, Roland Füßl, Rainer Grünwald, Philipp Kreutzer, Technische Univ. Ilmenau (Germany). . . [7064-23]

2:10 pm: **Scene-based wavefront correction with spatial light modulators**, Tobias Haist, Jan Hafner, Michael Warber, Wolfgang Osten, Univ. Stuttgart (Germany) . . . . . [7064-24]

2:30 pm: **Multi-wavelength interferometer for high accuracy length measurement of long gauge blocks**, Michal M. Wengierow, Dariusz Lukaszewski, Anna Pakula, Leszek Salbut, Politechnika Warszawska (Poland) . . . . . [7064-25]

2:50 pm: **Interferometric method for controlling of fiber fixation in connectors**, Anna Pakula, Dariusz Lukaszewski, Leszek A. Salbut, Politechnika Warszawska (Poland); Jurgen Van Erps, Virginia Gomez, Hugo Thienpont, Vrije Univ. Brussel (Belgium) . . . . . [7064-26]

Courses of Related Interest

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SC213 Introduction to Interferometric Optical Testing (Wyant) Sunday, 1:30 to 5:30 pm
SC850 Metrology for Modern Optical Manufacturing (Murphy) Wednesday, 8:30 am to 12:30 pm

Conference 7065

Monday-Tuesday 11-12 August 2008 • Proceedings of SPIE Vol. 7065

Reflection, Scattering, and Diffraction from Surfaces

Conference Chairs: **Zu-Han Gu,** Surface Optics Corp.; **Leonard M. Hanssen,** National Institute of Standards and Technology

Program Committee: **Neil Charles Bruce,** Univ Nacional Autónoma de México (Mexico); **Gary Carver,** Princeton Lightwave Corp.; **Mei Graham,** Lockheed Martin Corp.; **Dan-Hong Huang,** Air Force Research Lab.; **Alexei A. Maradudin,** Univ. of California/Irvine; **Eugenio R. Méndez,** Ctr. de Investigación Científica y de Educación Superior de Ensenada; **Soe-Mie F. Nee,** National Yang-Ming Univ. (Taiwan); **Arne Roos,** Uppsala Univ. (Sweden); **Hendrik Rothe,** Univ. der Bundeswehr Hamburg (Germany); **Shouhong Tang,** KLA-Tencor Corp.; **Michael E. Thomas,** The Johns Hopkins Univ. Applied Physics Lab.

Monday 11 August

SESSION 1

Room: Conv. Ctr. 1A . . . . . Mon. 8:40 to 10:20 am

Theory and Analysis I

Session Chair: **Alexei A. Maradudin,** Univ. of California/Irvine

8:40 am: **Consequences of random scattering of light by a nanotube network** *(Invited Paper)*, Shawn-Yu Lin, Rensselaer Polytechnic Institute . . . . . [7065-01]

9:10 am: **Limits of renormalized scalar diffraction theory for periodic diffractive optical elements** *(Invited Paper)*, Poul-Erik Hansen, Dansk Fundamental Metrologi A/S (Denmark) . . . . . [7065-02]

9:40 am: **Surface-plasmon-polariton-enhanced reflected THz-field**, Dan-Hong Huang, Air Force Research Lab.; Godfrey A. Gumbs, Hunter College/CUNY; Paul M. Alsing, David A. Cardimona, Air Force Research Lab.[7065-03]

10:00 am: **Design of random surfaces that produce nonstandard refraction of light**, Tamara A. Leskova, Alexei A. Maradudin, Univ. of California/Irvine . . [7065-04]

Coffee Break . . . . . 10:20 to 10:50 am

SESSION 2

Room: Conv. Ctr. 1A . . . . . Mon. 10:50 am to 12:10 pm

Instruments and Applications I

Session Chair: **Hendrik Rothe,** Helmut-Schmidt Univ. (Germany)

10:50 am: **Utilization of the Scheimpflug principle in scatterometer design**, Cornelius F. Hahlweg, Hendrik Rothe, Helmut-Schmidt Univ. (Germany) . . . . . [7065-05]

11:10 am: **Variable-angle directional emissometer for moderate-temperature emissivity measurements**, A. R. Ellis, Sandia National Labs.; H. M. Graham, Lockheed Martin Aeronautics Co.; Michael B. Sinclair, J. C. Verley, Sandia National Labs. . . . . [7065-06]

11:30 am: **Improved hyperspectral imagery using a rotating polarizer**, David Wellems, David Bowers, Air Force Research Lab. . . . . [7065-07]

11:50 am: **Analytical performance evaluation of a tunable polarization mode dispersion compensator based on high-birefringence linearly chirped FBG in a WDM system**, Md. Saiful Islam, Bangaldesh Univ. of Engineering and Technology (Bangladesh); Satya Prasad Majumder, Bangladesh Univ. of Engineering and Technology (Bangladesh) . . . . [7065-08]

Lunch Break . . . . . 12:10 to 1:40 pm

SESSION 3

Room: Conv. Ctr. 1A . . . . . Mon. 1:40 to 3:10 pm

Theory and Analysis II

Session Chair: **Danhong Huang,** Air Force Research Lab.

1:40 pm: **Modeling scatter in dense composite media** *(Invited Paper)*, Eric C. Fest, Raytheon Missile Systems . . . . . [7065-09]

2:10 pm: **General purpose BRDF/BSDF model for coated surfaces and transparencies**, Michael E. Thomas, The Johns Hopkins Univ. Applied Physics Lab.; Richard I. Joseph, Daniel V. Hahn, Johns Hopkins Univ. . . . . [7065-10]

2:30 pm: **Goos-Haenchen effect applied for the design of Collett-Wolf beams**, Zu-Han Gu, Surface Optics Corp. and Univ. of California/San Diego; Anting Wang, Univ. of Science and Technology of China (China) and Surface Optics Corp. and Univ. of California/San Diego . . . . . [7065-11]

2:50 pm: **Unification of geometric and diffractive scattering from randomly rough surfaces**, Bernd E. Aschenbach, Max-Planck-Institut für Extraterrestrische Physik (Germany) . . . . . [7065-12]

Coffee Break . . . . . 3:10 to 3:40 pm

SESSION 4

Room: Conv. Ctr. 1A . . . . . Mon. 3:40 to 5:00 pm

Instruments and Applications II

Session Chair: **Soe-Mie F. Nee,** National Yang-Ming Univ. (Taiwan)

3:40 pm: **An infrared laser-based reflectometer for low reflectance measurements of samples and cavity structures**, Jinan Zeng, Leonard M. Hanssen, National Institute of Standards and Technology . . . . . [7065-13]

4:00 pm: **Controlling and measuring the polarization state of light using compound gratings and other plasmonic/photonic crystal structures and applications to polarimetric sensors**, David T. Crouse, City College/CUNY . . . . . [7065-14]

4:20 pm: **Rough surface scatterometry of bodies with rotational symmetry**, Cornelius F. Hahlweg, Hendrik Rothe, Helmut-Schmidt Univ. (Germany) . . . . . [7065-15]

4:40 pm: **A fast and accurate image-based measurement system for isotropic reflection materials,** Duck-Bong Kim, Kang Yeon Kim, Kang Su Park, Myoung Kook Seo, Kwan-Heng Lee, Gwangju Institute of Science and Technology (South Korea) . . . . . [7065-16]

Room: Conv. Ctr. Exhibit Hall B2 . . . . . Mon. 6:00 to 7:30 pm

Posters-Monday

Poster authors will begin displaying posters after 10:00 am Monday morning. A poster session, with authors present at their posters, will be held Monday evening from 6:00 to 7:30 pm. Light refreshments will be served.

Poster Setup

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Laser assisted surface modification using WC-Ti-Si on AISI 304 SS by preplaced coating method, Rajarajan Petchimuthu, National Institute of Technology/Tiruchirappalli (India); Jamal Mohamed J. Mohamed, Jamal Mohamed College (India); Sekar Subramaniam, Angel College of Engineering and Technolgy (India); Sastikumar Dillibabu, National Institute of Technology/ Tiruchirappalli (India); Ashish K. Nath, Indian Institute of Technology Kharagpur (India); Rakesh Kaul, Raja Ramanna Ctr. for Advanced Technology (India). . . . . [7065-36]

Steels' hardness and their optical properties, José G. Suárez-Romero, Instituto Tecnológico de Querétaro (Mexico); Eduardo Tepichin-Rodríguez, Instituto Nacional de Astrofísica Óptica y Electrónica (Mexico); Eric Secundino-Palma, Instituto Tecnológico de Querétaro (Mexico) . . . . . [7065-37]

Study on excitation emission matrix fluorescence spectra of Buprofezin, Hui Chen, Zhimin Zhao, Lexin Wang, Nanjing Univ. of Aeronautics and Astronautics (China) . . . . . [7065-38]

On the abrupt occurrence of low visibility heavy fog over the highway with its inducing causes, Yan Mingliang, Qilong Miao, Nanjing Univ. of Information Science & Technology (China). . . . . [7065-39]

Measurement method of optical scatter using a STAR GEM as a scatterometer, Etsuo Kawate, National Institute of Advanced Industrial Science and Technology (Japan) and TRAS Inc. (Japan) . . . . . [7065-40]

Determining thickness of films on a curved substrate by use of ellipsometric measurement, Chien-Yuan Han, National United Univ. (Taiwan); Yu-Faye Chao, Zhen-You Lee, National Chiao Tung Univ. (Taiwan) . [7065-41]

Temperature fiber optic sensor using a thermosensible hydrogel, Rafael R. Coello, Arcos Mariella, Denisse Chana, Kevin Contreras, Guillermo Baldwin-Olguin, Juan Carlos Rueda, Pontificia Univ. Católica del Perú (Peru); Mauro Lomer, Univ. de Cantabria (Spain) . . . . . [7065-42]

Optical diffraction by inhomogeneous volume objects, Gustavo Forte, Alberto Lencina, Myrian Tebaldi, Nestor Bolognini, Ctr. de Investigaciones Ópticas (Argentina) and Univ. Nacional de La Plata (Argentina) . . . . . [7065-43]

Design and measurement of refractive index of liquids using fiber optic displacement sensor, Sekar Subramaniam, Angel College of Engieering and Technology (India); Gobi Govindan, Rajarajan Petchimuthu, Renganathan Balusamy, Sastikumar Dillibabu, National Institute of Technology/ Tiruchirappalli (India) . . . . . [7065-44]

Combining CPP-ACP with fluoride: a synergistic remineralization potential of artificially demineralized enamel or not?, Iman El-Sayad, Cairo Univ. (Egypt); Amal Sakr, Misr Univ. for Science & Technology (Egypt); Mostafa Gheith, Yahia Badr, National Laser Institute of Laser Enhanced Sciences (Egypt) . . . . . [7065-45]

A versatile low-cost approach to dynamic light scattering, Denis Pristinski, Thomas Q. Chastek, National Institute of Standards and Technology[7065-46]

Tuesday 12 August

SESSION 5

Room: Conv. Ctr. 1A . . . . . .Tues. 8:30 to 10:00 am

Optical Diagnostics I

Session Chair: **Leonard M. Hanssen,** National Institute of Standards and Technology

8:30 am: **Results of a nationwide star intercomparison of infrared reflectance** *(Invited Paper)*, Leonard M. Hanssen, Boris Wilthan, National Institute of Standards and Technology . . . . . [7065-17]

9:00 am: **Measurements of multi-angle polarization properties of the water-bearing yellow brown soil using multi-band polarimetric imagery in the laboratory**, Xiaobing Sun, Jin Hong, Yanli Qiao, Anhui Institute of Optics and Fine Mechanics (China) . . . . . [7065-18]

9:20 am: **Control of tiny dew droplet deposited on a copper plate by scattered laser light**, Shigeaki Matsumoto, Univ. of Industrial Technology (Japan). . . . . [7065-19]

9:40 am: **An optical accessory for absolute reflection and transmission measurements in the wavelength range from 0.2µm to 25µm**, Etsuo Kawate, National Institute of Advanced Industrial Science and Technology (Japan). . . . . [7065-20]

Coffee Break . . . . . 10:00 to 10:30 am

SESSION 6

Room: Conv. Ctr. 1A . . . . . Tues. 10:30 am to 12:00 pm

Tissue Optics and Drug Analysis

Session Chair: **Gary E. Carver,** Princeton Lightwave Corp.

10:30 am: **Diagnostic and therapeutic role of in-vivo tumor blood oxygenation measured by broadband diffuse reflectance spectroscopy** *(Invited Paper)*, Hsing-Wen Wang, National Yang-Ming Univ. (Taiwan); Theresa Busch, Arjun G. Yodh, Univ. of Pennsylvania . . . . . [7065-21]

11:00 am: **Scattering depolarization by a bio-medium with anisotropic bio-molecules**, Tsu-Wei Nee, National Yang-Ming Univ. (Taiwan). . . . . [7065-22]

11:20 am: **Polarization of dipole scattering by isotropic medium**, Soe-Mie F. Nee, National Yang-Ming Univ. (Taiwan). . . . . [7065-23]

11:40 am: **Spatially resolved spectral imaging of pharmaceutical powders**, Gary E. Carver, Sabbir S. Rangwala, Princeton Lightwave Corp.. . . . [7065-24]

Lunch/Exhibition Break . . . . . 12:00 to 1:20 pm

SESSION 7

Room: Conv. Ctr. 1A . . . . . .Tues. 1:20 to 2:40 pm

Optical Diagnostics II

Session Chair: **Michael E. Thomas,** The Johns Hopkins Univ. Applied Physics Lab.

1:20 pm: **Light-scattering properties of a woven shade-screen material used for daylighting and solar heat-gain control**, Jacob C. Jonsson, Eleanor S. Lee, Mike D. Rubin, Lawrence Berkeley National Lab.. . . . . [7065-25]

1:40 pm: **The effect of integrating sphere non-uniformity on the measurement accuracy of an infrared reflectometer**, Leonard M. Hanssen, Alexander V. Prokhorov, National Institute of Standards and Technology . . . . . [7065-26]

2:00 pm: **Analysis of the uniqueness of an inverse grating characterization method**, Bastian Trauter, Jochen Hetzler, Carl Zeiss SMT AG (Germany); Karl-Heinz Brenner, Univ. Heidelberg (Germany) . . . . . [7065-27]

2:20 pm: **NIR reflectance method to determine the moisture content in food products,** Chari V. K.Kandala, USDA Agricultural Research Service; K. N. Govindarajan, Jeyam Subbiah, Univ. of Nebraska . . . . . [7065-28]

SESSION 8

Room: Conv. Ctr. 1A . . . . . .Tues. 2:40 to 4:20 pm

Theory and Analysis III

Session Chair: **Zu-Han Gu,** Surface Optics Corp.

2:40 pm: **Representative layer theory: describing absorption by particulate samples** *(Invited Paper)*, Kevin D. Dahm, Donald J. Dahm, Rowan Univ. . . . . [7065-29]

Coffee Break . . . . . 3:10 to 3:40 pm

3:40 pm: **A procedural model of reflection from random rough surfaces**, Leonard M. Hanssen, Alexander V. Prokhorov, National Institute of Standards and Technology. . . . . [7065-30]

4:00 pm: **Modeling of femtosecond pulse propagation through dense scattering media,** Nicolas Rivière, Barthelemy Marie, Laurent Hespel, Thibault Dartigalongue, ONERA (France) . . . . . [7065-31]

SESSION 9

Room: Conv. Ctr. 1A . . . . . .Tues. 4:20 to 5:20 pm

Optical Diagnostics III

Session Chair: **Mei Graham,** Lockheed Martin Corp.

4:20 pm: **A comparison of optical properties between solid PTFE and sintered PTFE**, Benjamin K. Tsai, David W. Allen, National Institute of Standards and Technology . . . . . [7065-33]

4:40 pm: **Pump probe experiment for light scattering media diagnosis**, Marie Barthelemy, Thibault Dartigalongue, Laurent Hespel, Nicolas Rivière, ONERA (France); Gérard Gréhan, Univ. de Rouen (France) . . . . . [7065-34]

5:00 pm: **Temperature dependent spectral emissivities of ceramics with different spectral distributions**, Wolfgang Bauer, Alexander Moldenhauer, Univ. Duisburg-Essen (Germany) . . . . . [7065-35]

Courses of Related Interest

See SPIE Cashier for information and to register.

SC017 Principles of Fourier Optics and Diffraction (Gaskill) Tuesday, 8:30 am to 5:30 pm
SC020 Optical Scattering: Measurement and Analysis (Stover) Sunday, 8:30 am to 12:30 pm
SC492 Predicting, Modeling, and Interpreting Light Scattered by Surfaces (Germer) Sunday, 1:30 to 5:30 pm

Conference 7066

Sunday 10 August 2008 • Proceedings of SPIE Vol. 7066

Two- and Three-Dimensional Methods for Inspection and Metrology VI

Conference Chairs: **Peisen S. Huang,** Stony Brook Univ.; **Toru Yoshizawa,** Saitama Medical Univ. (Japan); **Kevin G. Harding,** GE Global Research

Program Committee: **Motoharu Fujigaki,** Wakayama Univ. (Japan); **Qingying Hu,** GE Global Research; **Heinz Hügli,** Univ. de Neuchâtel (Switzerland); **Seung-Woo Kim,** Korea Advanced Institute of Science and Technology (South Korea); **Gunther Notni,** Fraunhofer Institute for Applied Optics and Precision Engineering (Germany); **Guiju Song,** GE Research & Development Ctr. Co. Ltd. (China); **Muralidhara Subbarao,** Stony Brook Univ.; **Toshiyuki Takatsuji,** National Institute of Advanced Industrial Science and Technology (Japan); **Shenghua Ye,** Tianjin Univ. (China); **Shizhuo Yin,** The Pennsylvania State Univ.

Sunday 10 August

Room: Conv. Ctr. 3 . . . . . .Sun. 8:00 to 8:30 am

Keynote Session

Session Chair: **Peisen S. Huang,** Stony Brook Univ.

8:00 am: **Standardization of noncontact 3D measurement** *(Keynote Presentation),* Toshiyuki Takatsuji, Sonko Osawa, Osamu Sato, National Institute of Advanced Industrial Science and Technology (Japan) . . . [7066-01]

SESSION 2

Room: Conv. Ctr. 3 . . . . . .Sun. 8:30 to 10:30 am

Calibration and Errors

Session Chair: **Peisen S. Huang,** Stony Brook Univ.

8:30 am: **Geometric errors in 3D optical metrology systems**, Kevin G. Harding, Christopher A. Nafis, GE Global Research. . . . . [7066-02]

8:50 am: **Modeling and compensating measurement errors caused by scattering in time-of-flight cameras**, Tom Kavli, Trine Kirkhus, Jens T. Thielemann, SINTEF (Norway); Borys Jagielski, Univ. of Oslo (Norway) . . . . . [7066-03]

9:10 am: **Measurement of optical free-forms with fringe projection**, Peter Kuehmstedt, Christian Braeuer-Burchardt, Martin Breitbarth, Matthias Heinze, Gunther Notni, Fraunhofer-Institut für Angewandte Optik und Feinmechanik (Germany) . . . . . [7066-04]

9:30 am: **Development of real-time shape measurement system using whole-space tabulation method**, Motoharu Fujigaki, Akihiro Takagishi, Toru Matui, Yoshiharu Morimoto, Wakayama Univ. (Japan) . . . . . [7066-05]

9:50 am: **An algorithm for 3D measurement and stitch oriented regular meshes**, Analucia V. F.Pezzotta, Univ. Federal de Santa Catarina (Brazil) . . . . . [7066-06]

10:10 am: **3D surface defect analysis and evaluation**, Bo Yang, Ming Jia, Guiju Song, Li Tao, GE Global Research (China); Kevin G. Harding, GE Global Research . . . . . [7066-07]

Coffee Break . . . . . 10:30 to 10:50 am

SESSION 3

Room: Conv. Ctr. 3 . . . . . Sun. 10:50 am to 12:10 pm

3-D Methods I

Session Chair: **Kevin G. Harding,** GE Global Research

10:50 am: **Robust depth-from-defocus for real-time autofocusing in the presence of image shifts without pixel correspondence**, Younsik Kang, Xue Tu, Satyaki Dutta, Muralidhara Subbarao, Stony Brook Univ. . . . . [7066-08]

11:10 am: **High dynamic range scanning technique**, Song Zhang, Harvard Univ. . . . . [7066-09]

11:30 am: **Phase-shifting shadow moiré for 3-D shape measurement**, Peisen S. Huang, Hong Guo, Stony Brook Univ. . . . . [7066-11]

11:50 pm: **3D surface profile measurement by projection type moiré using LC grating**, Fumio Kobayashi, Yukitoshi Otani, Tokyo Univ. of Agriculture and Technology (Japan); Toru Yoshizawa, Saitama Medical Univ. (Japan)[7066-12]

Lunch Break . . . . . 12:10 to 1:30 pm

SESSION 4

Room: Conv. Ctr. 3 . . . . . Sun. 1:30 to 3:30 pm

3-D Methods II

Session Chair: **Gunther Notni,** Fraunhofer Institut für Angewandte Optik und Feinmechanik (Germany)

1:30 pm: **Simultaneous measurement of internal and external profiles using a ring beam device**, Toshitaka Wakayama, Toru Yoshizawa, Saitama Medical Univ. (Japan) . . . . . [7066-13]

1:50 pm: **3-D shape measurement by use of a modified Fourier transform method**, Hong Guo, Peisen S. Huang, Stony Brook Univ.. . . . . [7066-14]

2:10 pm: **Challenges and opportunities for 3D optical metrology: What is needed today from an industry perspective,** Kevin G. Harding, GE Global Research . . . . . [7066-33]

2:30 pm: **Camera-based 10KHz distance gage**, Gil Abramovich, Kevin G. Harding, GE Global Research . . . . . [7066-16]

2:50 pm: **Application of computer vision in stereoscopic microscope**, Hao Yan, Shanxi Provincial Meteorological Institute (China); Wuyi Wang, Shanxi Provincial Metrological Institute (China) . . . . . [7066-17]

3:10 pm: **Three dimensional shape measurement using liquid crystal grating scanner**, Yukitoshi Otani, Takumi Kimura, Tokyo Univ. of Agriculture and Technology (Japan); Toshitaka Wakayama, Toru Yoshizawa, Saitama Medical Univ. (Japan) . . . . . [7066-18]

Coffee Break . . . . . 3:30 to 3:50 pm

SESSION 5

Room: Conv. Ctr. 3 . . . . . Sun. 3:50 to 4:50 pm

Optical Metrology Applications

Session Chair: **Toru Yoshizawa,** Saitama Medical Univ. (Japan)

3:50 pm: **Calibration of a soft x-ray projection system**, Robert Schmitt, Björn Damm, RWTH Aachen (Germany); Raimund Volk, HOMMEL-ETAMIC GmbH (Germany). . . . . [7066-20]

4:10 pm: **Merging of range images for inspection or safety applications**, James Mure-Dubois, Heinz Hügli, Univ. de Neuchâtel (Switzerland) . [7066-22]

4:30 pm: **Optimal measurement method for diffraction-based overlay metrology,** Weite Hsu, Yi-Sha Ku, Industrial Technology Research Institute (Taiwan) . . . . . [7066-23

Room: Conv. Ctr. 6A . . . . . Sun. 6:00 to 6:45 pm

All-Conference Plenary Session

View plenary presentation details p. 13.

6:00 pm: **The Solar Decathlon: building a better future with solar energy**, Richard J. King, U.S. Dept. of Energy

Monday 11 August

Room: Conv. Ctr. Exhibit Hall B2 . . . . . Mon. 6:00 to 7:30 pm

Posters-Monday

Poster authors will begin displaying posters after 10:00 am Monday morning. A poster session, with authors present at their posters, will be held Monday evening from 6:00 to 7:30 pm. Light refreshments will be served.

Poster Setup

Poster presenters must set up their posters between 10:00 am and 5:00 pm on Monday. Poster presenters who have not set up by 5:00 pm on Monday will be considered a "no show" and their manuscript will not be published. Presenters must remove their posters immediately after the poster session. Posters not removed will be considered unwanted and will be discarded. SPIE assumes no responsibility for posters left up after the end of each poster session.

A novel method for range images integration, Ameng Li, Xiaoli Liu, Jindong Tian, Xiang Peng, Shenzhen Univ. (China) . . . . . [7066-24]

Measuring the profile of a simulated machined aspherical surface using a genetic algorithm, Jaime Sánchez, Sr., Ctr. de Enseñanza Técnica Industrial (Mexico); Liliana Barbosa Santillán, Univ. Politécnica de Madrid (Spain) . . . . . [7066-25]

3D profile measurement of large-scale curvature plates using structured light source, ByoungChang Kim, EunChang Heo, Kyungnam Univ. (South Korea); HyunHo Lee, Jong Man Han, DSME Co. Ltd. (South Korea) . [7066-26]

Evaluation of low-speed impact damage in CFRP with pulsed and lock-in thermography, Lichun FENG, Ning Tao, Capital Normal Univ. (China)[7066-27]

A comprehensive method for inspecting cone prism base on Hartmann wavefront sensor, Jinye Zhang, Jun Li, Wei Gong, Wuhan Univ. (China) . . . . . [7066-29]

Evaluation of large convex surfaces using a machine of measurement for coordinated and genetic algorithms, Agustin Santiago Alvarado, Univ. Technologica de la Mixteca (Mexico); Sergio Vazquez-Montiel, Instituto Nacional de Astrofísca, Óptica y Electrónica (Mexico); Jorge Gonzalez-Garcia, Alejandro Lopez-Lopez, Univ. Tecnologica de la Mixteca (Mexico) . . [7066-31]

Laser vision measurement of the large size, Xinglin Zhou, Wuhan Univ. of Science and Technology (China); Shenghua Ye, Tianjin Univ. (China) [7066-32]

Conference 7067

Monday 11 August 2008 • Proceedings of SPIE Vol. 7067

Advances in Thin-Film Coatings for Optical Applications V

Conference Chairs: **Jennifer D. T. Kruschwitz,** JK Consulting; **Michael J. Ellison,** Alpine Research Optics Corp.

Program Committee: **Stuart T. Allan,** Qioptiq Coatings, Ltd. (United Kingdom); **Michael L. Fulton,** Ion Beam Optics Inc.; **Sen Han,** Veeco Instruments, Inc.; **Carol L. Martinez,** Ion Beam Optics Inc.; **Robert J. Sczupak,** Reynard Corp.; **Ian C. Stevenson,** Quantum Coating, Inc.

Monday 11 August

SESSION 1

Room: Conv. Ctr. 2 . . . . . Mon. 8:30 to 10:20 am

Advances in Coating Technology and Optimization

Session Chair: **Jennifer D. T. Kruschwitz,** JK Consulting

8:30 am: **Demonstration of narrowband notch and multi-notch filters** *(Invited Paper)*, Karen D. Hendrix, Charles A. Hulse, Georg J. Ockenfuss, JDS Uniphase Corp. . . . . [7067-01]

9:00 am: **Design and fabrication of large spectral waveband mirror coatings for scanning Fabry-Perot etalons**, Clinton E. Evans, COM DEV International Ltd. (Canada); Michel Poirier, Institut National d'Optique (Canada); Rene Doyon, Mathilde Beaulieu, Univ. de Montréal (Canada); Alan Scott, Driss Touahri, COM DEV International Ltd. (Canada). . . . . [7067-02]

9:20 am: **Innovative stationary and in-line sputter technologies for precision optical coatings**, Eberhard Schultheiss, Fraunhofer-Institut für Elektronenstrahl- und Plasmatechnik (Germany) and Technische Univ. Dresden (Germany); Peter Frach, Hagen Bartzsch, Jörn-Steffen Liebig, Fraunhofer-Institut für Elektronenstrahl- und Plasmatechnik (Germany). . . . . [7067-03]

9:40 am: **Integrated optics based on plasma processed dielectric materials**, Thomas Begou, Akram Soussou, Marie Paule Besland, Agnès Granier, Univ. de Nantes (France); Etienne Gaviot, Univ. du Maine (France); Bruno Bêche, Univ. de Rennes I (France); Antoine Goullet, Univ. de Nantes (France) . . . . . [7067-04]

10:00 am: **Analysis of sensitivity for optical monitoring in runsheet and admittance diagram**, Yu-Jen Chen, National Central Univ. (Taiwan) [7067-05]

Coffee Break . . . . . 10:20 to 10:50 am

SESSION 2

Room: Conv. Ctr. 2 . . . . . Mon. 10:50 am to 11:50 pm

Characterization and Optimization of Deep Ultraviolet Optics

Session Chair: **Michael J. Ellison,** Alpine Research Optics Corp.

10:50 am: **Characterization of thin and thick films by means of corona-assisted surface potential measurements**, Naima Kaabouch, Univ. of North Dakota. . . . . [7067-06]

11:10 am: **Characterization of challenging DUV coatings**, Parag V. Kelkar, Bruce A. Tirri, Ronald A. Wilklow, David Peterson, ASML US, Inc. . . [7067-07]

11:30 am: **Coating induced phase aberration in a DUV Schwarschild objective**, Samad M. Edlou, Lan Sun, Charles E. Synborski, CVI Melles Griot. . . . . [7067-08]

Lunch Break . . . . . 11:50 to 1:10 pm

SESSION 3

Room: Conv. Ctr. 2 . . . . . Mon. 1:10 to 3:30 pm

Novel Material Synthesis

Session Chair: **Robert J. Sczupak,** Reynard Corp.

1:10 pm: **Nanocomposite thin films exhibiting high mechanical and optical flexibility**, Thad L. Druffel, Matt Lattis, Omar Buazza, Scott Farmer, Optical Dynamics Corp. . . . . [7067-10]

1:30 pm: **Mechanical issues in the reliability of thin film encapsulation materials**, Namsu Kim, Nicholas Ginga, Suresh K. Sitaraman, Samuel Graham, Georgia Institute of Technology . . . . . [7067-11]

1:50 pm: **Influence of doping rate in Er3+:ZnO films on emission characteristics**, Lawrence Douglas, Norfolk State Univ.. . . . . [7067-12]

2:10 pm: **Admixture influence on optical properties and electronic structure of cobalt**, Roman I. Khakimov, Vasyl S. Staschuk, National Taras Shevchenko Univ. of Kyiv (Ukraine) . . . . . [7067-13]

2:30 pm: **Structural and optical properties of Zn1-xMgxO films grown by pulsed laser deposition**, P. S. Krishnaprasad, E. K. Ragitha, Madambi K. Jayaraj, Cochin Univ. of Science & Technology (India). . . . . [7067-14]

2:50 pm: **Some studies on TiO_2 films deposited by sol-gel technique**, Narasimha Rao Kolli, Indian Institute of Science (India) . . . . . [7067-15]

3:10 pm: **Optical constant of SiOx films in mid-IR range prepared by ion-assisted deposition,** Shih-Liang Ku, Cheng-Chung Lee, National Central Univ. (Taiwan) . . . . . [7067-16]

Room: Conv. Ctr. Exhibit Hall B2 . . . . . Mon. 6:00 to 7:30 pm

Posters-Monday

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Microstructure- and optic-related characteristics of magnesium oxide thin film, Ming Chung Liu, Shih-Chin Yang, Cheng-Chung Lee, National Central Univ. (Taiwan); Shih-Pu Chen, Jung-Yu Li, Yi-Ping Lin, Industrial Technology Research Institute (Taiwan) . . . . . [7067-17]

Study of europium visible emissions in a waveguide of planar metallic walls, Aldo S. Ramirez-Duverger, Raúl Aceves-Torres, Raul Garcia-Llamas, Jorge A. Gaspar-Armenta, Univ. de Sonora (Mexico). . . . . [7067-18]

Adjusting the characteristic deviations of guided-mode resonant filters by using the cover layer, Dawei Zhang, Yuanshen Huang, Zhengji Ni, Jiabi Chen, Songlin Zhuang, Univ. of Shanghai for Science and Technology (China); Jianyong Ma, Hongbo He, Shanghai Institute of Optics and Fine Mechanics (China) . . . . . [7067-25]

Courses of Related Interest

See SPIE Cashier for information and to register.

SC321 Thin Film Optical Coatings (Macleod) Tuesday, 8:30 am to 5:30 pm

Conference 7068

Sunday 10 August 2008 • Proceedings of SPIE Vol. 7068

Optical System Alignment and Tolerancing II

Conference Chairs: **José Sasian,** College of Optical Sciences/The Univ. of Arizona; **Richard N. Youngworth,** Light Capture, Inc.

Program Committee: **Sen Han,** Veeco Instruments, Inc.; **Chao-Wen Liang,** National Central Univ. (Taiwan); **Raymond G. Ohl IV,** NASA Goddard Space Flight Ctr.; **Robert E. Parks,** Optical Perspectives Group, LLC; **Mitchell C. Ruda,** Ruda and Associates, Inc.; **David V. Wick,** Sandia National Labs.

Sunday 10 August

SESSION 1

Room: Conv. Ctr. 5A . . . . . .Sun. 8:00 to 10:00 am

Tolerancing Optical Systems

Session Chairs: **Sen Han,** Veeco Metrology Inc.; **José Sasian,** College of Optical Sciences/The Univ. of Arizona

8:00 am: **Probabilistic method for multiparameter tolerancing in microlithographic illuminator design**, Stan Smirnov, Eric Catey, ASML Wilton . . . . . [7068-01]

8:20 am: **Tolerances don't lie... and stories of the Grand Canyon!** *(Invited Paper)*, Robert E. Fischer, OPTICS 1, Inc. . . . . [7068-02]

8:50 am: **Tolerancing and corner cases in optical simulation**, Robert P. Dahlgren, Kenneth D. Pedrotti, Univ. of California/Santa Cruz. . . . . [7068-03]

9:10 am: **Tolerancing a Panomorph lens** *(Invited Paper)*, Simon Thibault, ImmerVision (Canada) . . . . . [7068-04]

9:40 am: **The effect on tolerance distributing of wavefront coding technology for an off-axis three mirror anastigmatic optical system**, Feng Yan, Changchun Institute of Optics, Fine Mechanics and Physics (China) and Graduate Univ. of Chinese Academy of Sciences (China); Xue-jun Zhang, Changchun Institute of Optics, Fine Mechanics and Physics (China) [7068-05]

Coffee Break . . . . . 10:00 to 10:30 am

SESSION 2

Room: Conv. Ctr. 5A . . . . . Sun. 10:30 am to 12:20 pm

Alignment Methodology and Theory

Session Chairs: **Chao-Wen Liang,** National Central Univ. (Taiwan); **Mitchell C. Ruda,** Ruda and Associates, Inc.

10:30 am: **IR spectrometer using 90-degree off-axis parabolic mirrors**, Robert M. Malone, Ian J. McKenna, National Security Technologies, LLC; Daniel H. Dolan, Sandia National Labs. . . . . [7068-06]

10:50 am: **Alignment considerations for systems having a space-variant pupil polarization** *(Invited Paper)*, Thomas G. Brown, Univ. of Rochester . . . . . [7068-07]

11:20 am: **Alignment analysis of optical systems using derivative information**, Craig Olson, L-3 Communications Corp.; Richard N. Youngworth, Light Capture, Inc. . . . . [7068-08]

11:40 am: **Centering using an alignment telescope or an autostigmatic microscope: a comparison**, Robert E. Parks, Optical Perspectives Group, LLC and College of Optical Sciences/The Univ. of Arizona . . . . . [7068-09]

12:00 pm: **A simple tool for alignment and wavefront testing: experimental results**, William P. Kuhn, Opt-E . . . . . [7068-10]

Lunch Break . . . . . 12:20 to 1:20 pm

SESSION 3

Room: Conv. Ctr. 5A . . . . . Sun. 1:20 to 3:10 pm

Instrument and System Alignment

Session Chairs: **Robert E. Parks,** Optical Perspectives Group, LLC; **David V. Wick,** Sandia National Labs.

1:20 pm: **Active optical alignment on the Large Binocular Telescope: first results**, Andrew Rakich, The Univ. of Arizona . . . . . [7068-11]

1:40 pm: **Development of a robust alignment strategy for wide-field space telescopes using nodal aberration theory and SVD with an example using NASA's JWST** *(Invited Paper)*, Tobias Schmid, College of Optics & Photonics/ Univ. of Central Florida; Kevin P. Thompson, Optical Research Associates; Jannick P. Rolland, College of Optics & Photonics/Univ. of Central Florida . . [7068-12]

2:10 pm: **Overview of the optical alignment and test of the James Webb Space Telescope Integrated Science Instrument Module**, Raymond G. Ohl IV, Brent Bos, Pamela Davila, William Eichhorn, Bradley Frey, Jason Hylan, James Marsh, Douglas McGuffey, NASA Goddard Space Flight Ctr.; Joseph McMann, ManTech International Corp.; Maria Nowak, NASA Goddard Space Flight Ctr.; Kevin Redman, ManTech International Corp.; Henry Sampler, NASA Goddard Space Flight Ctr.; Derek Sabatke, Jonathan Seerveld, Ball Aerospace & Technologies Corp.; Joseph Stock, SGT, Inc.; Joseph Sullivan, Ball Aerospace & Technologies Corp.; Gregory Wenzel, ManTech International Corp.; Geraldine Wright, NASA Goddard Space Flight Ctr.; Philip Young, Young Engineering Services . . . . . [7068-13]

2:30 pm: **Determination of wavefront measurement points for predicting full-field NIRCam wavefront performance**, Bruce J. Herman, Lockheed Martin Advanced Technology Ctr.; Torben B. Andersen, Lockheed Martin Corp.; Paul F. Schweiger, Lockheed Martin Advanced Technology Ctr.. . . . . [7068-14]

2:50 pm: **Assessment of NIRCam alignment tolerances by Monte Carlo simulations**, Torben B. Andersen, Lockheed Martin Corp.; Paul F. Schweiger, Lockheed Martin Advanced Technology Ctr. . . . . [7068-15]

Coffee Break . . . . . 3:10 to 3:40 pm

OPTICS

SESSION 4

Room: Conv. Ctr. 5A . . . . . .Sun. 3:40 to 5:30 pm

Alignment Devices, Metrology, and Fabrication

Session Chairs: **Maria D. Nowak,** NASA Goddard Space Flight Ctr.; **Richard N. Youngworth,** Light Capture, Inc.

3:40 pm: **Phase shifting grating-slit test with a X beam-splitter**, Chao-Wen Liang, Chien-Fu Ou, National Central Univ. (Taiwan) . . . . . [7068-16]

4:00 pm: **Alignment and tolerancing issues in the fabrication of microoptic components, diffractive optical elements, and computer generated holograms** *(Invited Paper)*, Thomas D. Milster, College of Optical Sciences/The Univ. of Arizona . . . . . [7068-17]

4:30 pm: **Metrologically speaking**, Matthew E. Hansen, ASML Wilton . . . . . [7068-18]

4:50 pm: **An alignment technique based on the speckle correlation properties of Fresnel transforming optical systems**, Jennifer E. Ward, Univ. College Dublin (Ireland); Damien P. Kelly, Technische Univ. Wien (Austria); John T. Sheridan, Univ. College Dublin (Ireland) . . . . . [7068-19]

5:10 pm: **Miniaturized optical encoder,** John Carr, Renishaw plc (United Kingdom); Marc P. Y.Desmulliez, Heriot-Watt Univ. (United Kingdom); Nick Weston, David McKendrick, Graeme Cunningham, Geoff MacFarland, Renishaw plc (United Kingdom); Wyn Meredith, Andrew McKee, Conrad Langton, Compound Semiconductor Technologies Global Ltd. (United Kingdom) . . . . . [7068-20]

Room: Conv. Ctr. 6A . . . . . Sun. 6:00 to 6:45 pm

All-Conference Plenary Session

View plenary presentation details p. 13.

6:00 pm: **The Solar Decathlon: building a better future with solar energy**, Richard J. King, U.S. Dept. of Energy

Monday 11 August

Room: Conv. Ctr. Exhibit Hall B2 . . . . . Mon. 6:00 to 7:30 pm

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Poster authors will begin displaying posters after 10:00 am Monday morning. A poster session, with authors present at their posters, will be held Monday evening from 6:00 to 7:30 pm. Light refreshments will be served.

Poster Setup

Poster presenters must set up their posters between 10:00 am and 5:00 pm on Monday. Poster presenters who have not set up by 5:00 pm on Monday will be considered a "no show" and their manuscript will not be published. Presenters must remove their posters immediately after the poster session. Posters not removed will be considered unwanted and will be discarded. SPIE assumes no responsibility for posters left up after the end of each poster session.

Design and fabrication of a machine vision-based closed-loop piezo-derived laser beam deflector, Hamid Reza Golnabi, Imam Khomeini Hospital (Iran); H. Estaki, Amirkabir Univ. of Technology (Iran); A. Shahidi, Imam Khomeini Hospital (Iran); S. H. Mahboobi, Sahand Pirouzpanah, Sharif Univ. of Technology (Iran); S. Sarkar, Imam Khomeini Hospital (Iran) . . . . . [7068-21]

Closed-loop high-precision position control system with two modes, Chengliang Ge, Institute of Applied Electronics (China) . . . . . [7068-22]

Misalignment parameters estimation in refractive optical systems, Braulio Fonseca Carneiro Albuquerque, Roberto Vieira da Fonseca Lopes, Helio K. Kuga, Instituto Nacional de Pesquisas Espaciais (Brazil); Erica G. Carvalho, Lucimara C. Nakata Scaduto, Mario A. Stefani, Opto Eletrônica S.A. (Brazil) . . . . . [7068-23]

Verification of the James Webb Space Telescope Integrated Science Instrument Module cryogenic structural alignment requirements via photogrammetry, Maria D. Nowak, NASA Goddard Space Flight Ctr.; Paul Cleveland, Energy Solutions International, LLC; Allen Crane, Alliant Techsystems Inc.; Pamela Davila, NASA Goddard Space Flight Ctr.; Jim Heaney, Stinger Ghaffarian Technologies, Inc.; Acey Herrera, Jason Hylan, NASA Goddard Space Flight Ctr.; Andrew Liehr, Stinger Ghaffarian Technologies, Inc.; James Marsh, Raymond G. Ohl IV, NASA Goddard Space Flight Ctr.; Kevin Redman, ManTech International Corp.; Henry Sampler, NASA Goddard Space Flight Ctr.; Joseph Stock, Stinger Ghaffarian Technologies Inc; Greg Wenzel, ManTech International Corp.; Robert Woodruff, Lockheed Martin Space Systems Co.; Philip Young, Young Engineering Services . . . . . [7068-24]

Courses of Related Interest

See SPIE Cashier for information and to register.

SC003 Practical Optical System Design - EXPANDED 2-Day Format (Fischer) Sunday, 8:30 am to 5:30 pm
SC010 Introduction to Optical Alignment Techniques (Ruda) Monday, 8:30 am to 5:30 pm
SC552 Aspheric Optics: Design, Fabrication, and Test (Fischer) Wednesday, 8:30 am to 12:30 pm
SC561 Optomechanics for Space Applications (Shipley) Wednesday, 8:30 am to 5:30 pm
NEW! SC912 Intermediate Lens Design (Bentley) Sunday, 8:30 am to 5:30 pm

Conference 7069

Wednesday-Thursday 13-14 August 2008 • Proceedings of SPIE Vol. 7069

Optical System Contamination: Effects, Measurements and Control 2008

Conference Chair: **Sharon A. Straka,** NASA Goddard Space Flight Ctr.

Conference Cochair: **Nancy Carosso,** SGT, Inc.

Wednesday 13 August

SESSION 1

Room: Conv. Ctr. 1A . . . . . Wed. 8:00 to 10:05 am

Contamination Effects I

Session Chair: **David P. Taylor,** The Aerospace Corp.

8:00 am: **Minimizing contamination to multilayer-dielectric-diffraction gratings within a large vacuum system**, Brian Ashe, Graham Myhre, Dino Mastrosimone, Corey McAtee, Univ. of Rochester. . . . . [7069-01]

8:25 am: **Photochemical processes in a two-component molecular contaminant film**, Kenneth T. Luey, Dianne J. Coleman, The Aerospace Corp. . . . . [7069-02]

8:50 am: **Optical characterization of condensed and photofixed RTV effluent**, Natale J. Ianno, Daniel W. Thompson, Univ. of Nebraska/ Lincoln. . . . . [7069-03]

9:15 am: **Effects of vacuum ultraviolet radiation on the desorption of molecular contaminants**, Keith R. Olson, Kelsey A. Folgner, Gidget K. Ternet, The Aerospace Corp. . . . . [7069-04]

9:40 am: **Chemical analysis of outgassed contaminants from common silicone materials**, Randy M. Villahermosa, Alexis D. Ostrowski, Sara R. Halper, The Aerospace Corp. . . . . [7069-05]

Coffee Break . . . . . 10:05 to 10:35 am

SESSION 2

Room: Conv. Ctr. 1A . . . . . Wed. 10:35 to 11:25 am

Contamination Effects II

Session Chair: **Mark T. Boies,** Research Support Instruments, Inc.

10:35 am: **Particulate infiltration into a simulated space telescope**, De-Ling Liu, Kenneth T. Luey, The Aerospace Corp. . . . . [7069-06]

11:00 am: **Managing contamination-enhanced laser induced damage (CLID)**, Randy M. Villahermosa, David P. Taylor, Shabnam Virji, The Aerospace Corp. . . . . [7069-07]

Lunch/Exhibition Break . . . . . 11:25 am to 1:20 pm

SESSION 3

Room: Conv. Ctr. 1A . . . . . Wed. 1:20 to 3:25 pm

Anti-Contamination/Protective Coatings

Session Chair: **Wanda C. Peters,** NASA Goddard Space Flight Ctr.

1:20 pm: **Mitigating molecular and particulate contamination via surface energy**, Mark S. Crowder, Ball Aerospace & Technologies Corp.; Christina Haley, Ball Aerospace & Technologies Corp. and National Renewable Energy Lab . . . . . [7069-09]

1:45 pm: **Characterizing the optical performance of AZ93 with a Teflon overcoat under space environment exposure**, William D. Schmidl, Alvin Huang, Carlos Soares, The Boeing Co. . . . . [7069-10]

2:10 pm: **Self-cleaning and anti-contamination coatings for space exploration: an overview**, Ronald G. Pirich, Northrop Grumman Corp. . . . . [7069-11]

2:35 pm: **Modified polymers for contamination sensing and prevention of optical and space systems**, Sara R. Halper, Randy M. Villahermosa, The Aerospace Corp. . . . . [7069-12]

3:00 pm: **Surface metrology of cleaning and protecting optical surfaces using polymers strip coatings**, James P. Hamilton, Univ. of Wisconsin-Platteville and Photonic Cleaning Technologies . . . . . [7069-13]

Coffee Break . . . . . 3:25 to 3:55 pm

SESSION 4

Room: Conv. Ctr. 1A . . . . . Wed. 3:55 to 5:10 pm

Contamination Analyses/Space Environments

3:55 pm: **Degradation of solar cell optical performance due to thruster plume particle pitting**, William D. Schmidl, Kendall Smith, Carlos Soares, Chris Shaw, The Boeing Co. . . . . [7069-14]

4:20 pm: **Molecular-transport modeling using direct simulation Monte Carlo methods for use in analyzing spacecraft and spacecraft instruments**, Bruce A. Matheson, Ball Aerospace & Technologies Corp.; Joseph Hueser D.D.S., Aeroscience Consultants Corp. . . . . [7069-15]

4:45 pm: **Modeling of volatile contamination transport for surface operations of the Mars Science Laboratory**, Brian Blakkolb, Ira Katz, Ioannis Mikellides, Jet Propulsion Lab. . . . . [7069-16]

Thursday 14 August

SESSION 5

Room: Conv. Ctr. 1A . . . . . Thurs. 8:30 to 9:45 am

Contamination Control, Monitoring and Verification

Session Chair: **Joanne Egges,** Ball Aerospace & Technologies Corp.

8:30 am: **Examining water vapor content for purging critical space systems**, Chien W. Chang, Jeffrey D. Bush, Robert R. Peabody, Lockheed Martin Co. . . . . [7069-18]

8:55 am: **A comparison of two identical SAW devices**, Jack Sanders, Stinger Ghaffarian Technologies, Inc. . . . . [7069-19]

9:20 am: **Effects of contamination and its control for the James Webb Space Telescope**, Eve M. Wooldridge, NASA Goddard Space Flight Ctr.; Jonathan W. Arenberg, Northrop Grumman Space Technology . . . . [7069-20]

Coffee Break . . . . . 9:45 to 10:20 am

SESSION 6

Room: Conv. Ctr. 1A . . . . . Thurs. 10:20 am to 12:25 pm

Stray Light in Optical Systems

Session Chairs: **Richard N. Pfisterer,** Photon Engineering LLC; **John C. Fleming,** Ball Aerospace & Technologies Corp.

10:20 am: **Data reduction of BSDF measurements from curved surfaces**, Eric C. Fest, Raytheon Missile Systems . . . . . [7069-22]

10:45 am: **Stray light analysis of SALEX instrument**, Sun Jeong Ham, Yonsei Univ. (South Korea); Hanshin Lee, Univ. of Oxford (United Kingdom); Sug-Whan Kim, Yonsei Univ. (South Korea); Tony Richards, Mike Lockwood, Rutherford Appleton Lab. (United Kingdom). . . . . [7069-23]

11:10 am: **Stray light test station for measuring point source transmission and thermal background of visible and infrared sensors**, Gary L. Peterson, Breault Research Organization, Inc. . . . . [7069-24]

11:35 am: **Statistical index and control theory for the critical path elimination of ghost images**, Chung-Jen Ou, Hsiuping Institute of Technology (Taiwan) . . . . . [7069-25]

12:00 pm: **New stray light test facility and initial results**, John C. Fleming, Ball Aerospace & Technologies Corp.. . . . . [7069-26]

Courses of Related Interest

See SPIE Cashier for information and to register.

SC020 Optical Scattering: Measurement and Analysis (Stover) Sunday, 8:30 am to 12:30 pm

SC492 Predicting, Modeling, and Interpreting Light Scattered by Surfaces (Germer) Sunday, 1:30 to 5:30 pm

Conference 7070

Wednesday-Thursday 13-14 August 2008 • Proceedings of SPIE Vol. 7070

Optical Technologies for Arming, Safing, Fuzing, and Firing IV

Conference Chairs: **Fred M. Dickey,** Sandia National Labs.; **Richard A. Beyer,** Army Research Lab.

Program Committee: **Adrian A. Akinci,** Los Alamos National Lab.; **Ron Bechtold,** Alfalight, Inc.; **Thomas J. Blachowski,** Naval Surface Warfare Ctr.; **Mike D. Bowden,** Atomic Weapons Establishment (United Kingdom); **David P. Bour,** Photodigm, Inc.; **David W. Ewick,** Ensign-Bickford Aerospace & Defense Co.; **Andrew Forbes,** Council for Scientific and Industrial Research (South Africa); **Everett S. Hafenrichter,** Sandia National Labs.; **Christopher R. Hardy,** Kigre, Inc.; **Keren K. Jobbins,** Atomic Weapons Establishment (United Kingdom); **Todd E. Lizotte,** Hitachi Via Mechanics USA, Inc.; **Stephen R. Lerner,** Tyco Electronics Corp.; **Keith L. Lewis,** Electro Magnetic Remote Sensing Defence Technology Ctr. (United Kingdom); **Mikhail Maiorov,** Vullfort, Inc.,**Robert V. McDaniel,** Kollsman, Inc.; **Gregg Leo Morelli,** National Nuclear Security Administration's Kansas City Plant; **Barry T. Neyer,** Perkin Elmer Optoelectronics; **Adam Parker,** QinetiQ Ltd. (United Kingdom); **Alex Rosiewicz,** EM4, Inc.; **Raymond J. Silva,** BAE Systems North America; **Kelly Simmons-Potter,** The Univ. of Arizona; **Bolesh J. Skutnik,** CeramOptec Industries, Inc.; **Gabriel L. Smith,** U.S. Army Research, Development and Engineering Command; **John G. Smith,** MEMS Optical, Inc.; **Donald R. Snyder,** Air Force Research Lab.; **Louis S. Weichman,** Sandia National Labs.; **James A. Wilder, Jr.,** Sandia National Labs.

Wednesday 13 August

SESSION 1

Room: Conv. Ctr. 1B . . . . . Wed. 8:00 to 10:10 am

Initiation

Session Chair: **Todd E. Lizotte,** Hitachi Via Mechanics USA, Inc.

8:00 am: **An evaluation of the T-6A Texan (JPATS) functional performance of the CFIS laser assemblies** *(Invited Paper)*, Thomas J. Blachowski, George Eccard, Naval Surface Warfare Ctr. . . . . [7070-01]

8:30 am: **Small-scale laser ignition of a transparent liquid propellant**, Richard A. Beyer, Army Research Lab.. . . . . [7070-02]

8:50 am: **Evaluation of critical energy criteria for hexanitrostilbene using laser-driven flyer plates**, Mike D. Bowden, Atomic Weapons Establishment (United Kingdom); Adrian A. Akinci, Los Alamos National Lab. . . . . [7070-03]

9:10 am: **Beam shaping for laser initiated optical primers**, Todd E. Lizotte, Hitachi Via Mechanics USA, Inc.. . . . . [7070-04]

9:30 am: **A comparison of two prototype laser-optical firing systems**, Gregg L. Morelli, Honeywell International, Inc. . . . . [7070-05]

9:50 am: **The use of composite films in laser-driven flyer initiation of hexanitrostilbene**, Adam Parker, T. A. Vine, R. P. Claridge, QinetiQ Ltd. (United Kingdom); William G. Proud, Univ. of Cambridge (United Kingdom); N. A. D.Johnson, QinetiQ Ltd. (United Kingdom). . . . . [7070-06]

Coffee Break . . . . . 10:10 to 10:40 am

SESSION 2

Room: Conv. Ctr. 1B . . . . . Wed. 10:40 am to 12:20 pm

Harsh Environments I

Session Chair: **Richard A. Beyer,** Army Research Lab.

10:40 am: **Applications of optical fiber assemblies in harsh environments: the journey past, present, and future** *(Invited Paper)*, Melanie N. Ott, Shawn MacMurphy, Rick Chuska, Frank V. LaRocca, William J. Thomes, Jr., Rob Switzer, NASA Goddard Space Flight Ctr. . . . . [7070-08]

11:10 am: **Vibration performance comparison study on current fiber optic connector technologies** *(Invited Paper)*, William J. Thomes, Jr., Frank V. LaRocca, Melanie N. Ott, Richard F. Chuska, Robert C. Switzer, NASA Goddard Space Flight Ctr. . . . . [7070-07]

11:40 am: **Fiber optic cable preparation to ensure stable operation**, Frank V. LaRocca, Richard F. Chuska, William J. Thomes, Jr., Melanie N. Ott, Robert C. Switzer, NASA Goddard Space Flight Ctr.. . . . . [7070-09]

12:00 pm: **Lightning vulnerability of fiber optic cables**, Leonard E. Martinez, Sandia National Labs. . . . . [7070-10]

Lunch/Exhibition Break . . . . . 12:20 to 1:50 pm

SESSION 3

Room: Conv. Ctr. 1B . . . . . Wed. 1:50 to 3:10 pm

Harsh Environments II

Session Chair: **Richard A. Beyer,** Army Research Lab.

1:50 pm: **A variety of optical fibers in ionizing radiation environments for use in a DOI system**, Matthew C. Cheeseman, Mike D. Bowden, Atomic Weapons Establishment (United Kingdom). . . . . [7070-11]

2:10 pm: **Radiation effects on laser diodes: a literary review**, Sarah L. Waterhouse, Keren K. Jobbins, Mike D. Bowden, Atomic Weapons Establishment (United Kingdom). . . . . [7070-12]

2:30 pm: **Permanent and transient response of Nd:YAG and Cr:YAG to ionizing radiation**, Boris L. Glebov, College of Optical Sciences/The Univ. of Arizona; Kelly S. Potter, The Univ. of Arizona; Dorothy C. Meister, Sandia National Labs. . . . . [7070-13]

2:50 pm: **Post mortem results of laser-optical system packaged for use in harsh environments**, Michelle R. Bright, Honeywell Technology . . . [7070-14]

Coffee Break . . . . . 3:10 to 3:40 pm

SESSION 4

Room: Conv. Ctr. 1B . . . . . Wed. 3:40 to 5:00 pm

Lasers and Applications I

Session Chair: **Mike D. Bowden,** Atomic Weapons Establishment (United Kingdom)

3:40 pm: **Beam shaping diffractive optical elements for high power laser applications**, Andrew J. Waddie, Adam J. Caley, Mohammed R. Taghizadeh, Heriot-Watt Univ. (United Kingdom); Keren K. Jobbins, Chris J. Smith, Mike D. Bowden, Atomic Weapons Establishment (United Kingdom) . . . . . [7070-15]

4:00 pm: **Remote triggering of high voltage systems by laser induced plasmas**, Nicholas J. West, Ian R. Jandrell, Univ. of the Witwatersrand (South Africa); Andrew Forbes, Council for Scientific and Industrial Research (South Africa) . . . . . [7070-16]

4:20 pm: **Use of fiber optic tapers to increase connector tolerance for DOI systems**, Mike D. Bowden, Atomic Weapons Establishment (United Kingdom); Adrian A. Akinci, Tim Schaefer, Los Alamos National Lab.. . . . . [7070-17]

4:40 pm: **Forensic firearm identification of semiautomatic handguns using laser formed microstamping elements,** Todd E. Lizotte, Orest Ohar, Hitachi Via Mechanics USA, Inc.. . . . . [7070-18]

Room: Conv. Ctr. Exhibit Hall B2 . . . . . Wed. 5:30 to 7:00 pm

Posters-Wednesday

Poster authors will begin displaying posters after 10:00 am Wednesday morning. A poster session, with authors present at their posters, will be held Wednesday evening from 5:30 to 7:00 pm. Light refreshments will be served.

Poster Setup

Poster presenters must set up their posters between 10:00 am and 5:00 pm on Wednesday. Poster presenters who have not set up by 5:00 pm on Wednesday will be considered a "no show" and their manuscript will not be published. Presenters must remove their posters immediately after the poster session. Posters not removed will be considered unwanted and will be discarded. SPIE assumes no responsibility for posters left up after the end of each poster session.

Occurrence of oxygen deficiency center on fused-silica surface irradiated by vacuum UV laser, Haibing Lv, China Academy of Engineering Physics (China) . . . . . [7070-30]

In-situ strain monitoring in liquid containers of LNG transporting carriers, Jun-Kyu Seo, Pusan National Univ. (South Korea); Min-Cheol Oh, Pusan National Univ (South Korea); Kyung-Jo Kim, Young-Jea Kim, Sang-Min Lee, Myung-Hyun Kim, Pusan National Univ. (South Korea) . . . . . [7070-31]

Thursday 14 August

SESSION 5

Room: Conv. Ctr. 1B . . . . . Thurs. 8:00 to 9:20 am

Lasers and Applications II

Session Chair: **Mike D. Bowden,** Atomic Weapons Establishment (United Kingdom)

8:00 am: **Porro prism lasers: a new perspective**, Liesl Burger, Andrew Forbes, Council for Scientific and Industrial Research (South Africa) [7070-19]

8:20 am: **Dynamics of flashlamp pumping a Nd:Cr:GSGG laser**, Michael V. Pack, Paul Miller, Jason Shelton, Sandia National Labs. . . . . [7070-20]

8:40 am: **Power scaling of passively phased fiber amplifier arrays**, Sami A. Shakir, Bill R. Culver, Yuji Starcher, Burke Nelson, George M. Bates, Jerry Hedrick, Northrop Grumman. . . . . [7070-21]

9:00 am: **System response in passively phased fiber amplifier arrays,** Sami A. Shakir, Bill R. Culver, Burke Nelson, Yuji Starcher, Jerry Hedrick, George M. Bates, Northrop Grumman . . . . . [7070-22]

SESSION 6

Room: Conv. Ctr. 1B . . . . . Thurs. 9:20 am to 12:00 pm

Diagnostics and Sensors

Session Chair: **Gregg Leo Morelli,** Honeywell International, Inc.

9:20 am: **Characterization of detonator performance using photonic Doppler velocimetry** *(Invited Paper)*, Mike D. Bowden, Matthew P. Maisey, Atomic Weapons Establishment (United Kingdom) . . . . . [7070-25]

9:50 am: **Development of an optically diagnosed initiation train characterization (ITRAC) test**, Mark W. Wright, Andrew P. Stoodley, Tobias Barrowclough, Mike D. Bowden, Atomic Weapons Establishment (United Kingdom) . . . . . [7070-24]

Coffee Break . . . . . 10:10 to 10:40 am

10:40 am: **Vibrational spectroscopy of HNS degradation**, Kathy Alam, Laura E. Martin, Randal L. Schmitt, Eric J. Welle, Sandia National Labs. . . [7070-26]

11:00 am: **Fiber-optic current sensors based on polarization coherence and power scattering in magneto-optical films**, Alan Y. Hsu, Alexander M. Robinson, Richard W. Cernosek, Sandia National Labs. . . . . [7070-27]

11:20 am: **Packaging and thermal management of photovoltaic cells for high-power applications**, Jeffrey Humphries, Honeywell Federal Manufacturing & Technologies . . . . . [7070-28]

11:40 pm: **VCSEL-based microsensors for photonic proximity fuzing of munitions**, Gordon A. Keeler, Alan Mar, Kent M. Geib, Alan Y. Hsu, Darwin K. Serkland, David D. Gill, Gregory M. Peake, Sandia National Labs. . . [7070-29]

Conference 7071

Monday-Tuesday 11-12 August 2008 • Proceedings of SPIE Vol. 7071

An Optical Believe It or Not: Key Lessons Learned

Conference Chair: **Mark Kahan,** Optical Research Associates

Monday 11 August

SESSION 1

Room: Conv. Ctr. 11B . . . . . Mon. 8:30 to 9:45 am

NASA: Great Observatories

8:30 am: **Hubble space telescope spherical aberration: lessons learned**, Domenick J. Tenerelli, Lockheed Martin Space Systems Co. . . . . [7071-17]

8:55 am: **Why the Hubble space telescope life cycle program cost over $15B in today's dollars (and why it didn't have to)**, Greg S. Davidson, Northrop Grumman Space Technology . . . . . [7071-01]

9:20 am: **Applying HST lessons learned to JWST** *(Presentation Only)*, Lee D. Feinberg, Paul H. Geithner, NASA Goddard Space Flight Ctr. . . . . [7071-21]

SESSION 2

Room: Conv. Ctr. 11B . . . . . Mon. 9:45 to 10:10 am

NASA/ESA: Special Missions

9:45 am: **CHIPS microsatellite optical system: lessons learned**, Michael J. Sholl, Univ. of California/Berkeley; Geoffrey A. Gaines, Lawrence Berkeley National Lab.; Mark Hurwitz, Ellen Taylor, Univ. of California/Berkeley[7071-02]

Coffee Break . . . . . 10:10 to 10:40 am

SESSION 3

Room: Conv. Ctr. 11B . . . . . Mon. 10:40 to 11:05 am

Advanced Ground-Based Projects

10:40 am: **The sine condition: it's not just a good idea; it's the law,** Philip M. Hinz, The Univ. of Arizona/Steward Observatory. . . . . [7071-03]

SESSION 4

Room: Conv. Ctr. 11B . . . . . Mon. 11:05 to 11:30 am

Military Systems

11:05 am: **Total redundancy,** Alan E. DeCew, Jr., MIT Lincoln Lab.. [7071-04]

SESSION 5

Room: Conv. Ctr. 11B . . . . . Mon. 11:30 to 11:55 am

A Broad Mix of Added Truths

11:30 am: **To be determined** . . . . . [7071-22]

Lunch Break . . . . . 11:55 pm to 1:25 am

SESSION 6

Room: Conv. Ctr. 11B . . . . . Mon. 1:25 to 2:40 pm

Technologies/Parts

1:25 pm: **The importance of defensive optical engineering** *(Presentation Only)*, Kevin P. Thompson, Optical Research Associates. . . . . [7071-05]

1:50 pm: **Three-bar resolution versus MTF: how different can they be anyway?**, John R. Rogers, Optical Research Associates. . . . . [7071-06]

2:15 pm: **Optical analysis of a radio-frequency lens,** David C. Redding, Paul B. Willis, Jet Propulsion Lab.. . . . . [7071-07]

SESSION 7

Room: Conv. Ctr. 11B . . . . . Mon. 2:40 to 3:05 pm

Fabrication

2:40 pm: **Specifications: figure and finish are not enough**, Robert E. Parks, Optical Perspectives Group, LLC . . . . . [7071-09]

Coffee Break . . . . . 3:05 to 3:35 pm

SESSION 8

Room: Conv. Ctr. 11B . . . . . Mon. 3:35 to 4:00 pm

Image Processing

3:35 pm: **Image processing: the nature and value of fuzzy metrology,** H. John Caulfield, Fisk Univ. . . . . [7071-11]

SESSION 9

Room: Conv. Ctr. 11B . . . . . Mon. 4:00 to 4:25 pm

Materials/Plastics/Molded/Bonding

4:00 pm: **Now what happens?**, Roger A. Paquin, Advanced Materials Consultant . . . . . [7071-12]

Tuesday 12 August

SESSION 10

Room: Conv. Ctr. 11B . . . . . Tues. 8:30 to 8:55 am

Structural

8:30 am: **A rondo in three flats,** Alson E. Hatheway, Alson E. Hatheway, Inc.. . . . . [7071-14]

SESSION 11

Room: Conv. Ctr. 11B . . . . . Tues. 8:55 to 9:20 am

Integrated Modeling

8:55 am: **A thermo/opto/mechanical testbed validation using Cielo,** Gregory J. Moore, Jet Propulsion Lab. . . . . [7071-15]

SESSION 12

Room: Conv. Ctr. 11B . . . . . Tues. 9:20 to 9:45 am

Optical Systems Engineering

9:20 am: **From the Navy to the three little pigs: universal optical systems engineering take-aways to help us all,** Mark A. Kahan, Optical Research Associates . . . . . [7071-16]

SESSION 13

Room: Conv. Ctr. 11B . . . . . Tues. 9:45 to 10:10 am

Companies/Organizations/Universities

9:45 am: **They never said anything about this in engineering school: lessons from the real world**, Jonathan W. Arenberg, Northrop Grumman Space Technology. . . . . [7071-18]

Coffee Break . . . . . 10:10 to 10:40 am

SESSION 14

Room: Conv. Ctr. 11B . . . . . Tues. 10:40 to 11:30 am

Experts

10:40 am: **Lessons learned from Theodore Maiman's success in making the first laser**, Jeffrey C. Hecht, Laser Focus World/Pennwell . . . . . [7071-19]

11:05 am: **How to solve your problems with borrowed technology,** Frank L. Leard, Rockwell Automation, Inc. . . . . [7071-20]

Room: Marriott Marina G . . . . . Tues. 8:00 to 10:00 pm

Optical Believe It or Not/Key Lessons Learned Technical Event and Awards Presentation

Chair: **Mark Kahan,** Optical Research Associates

A mini-session with a judging panel evaluating selected 5-minute skits resulting from the Monday/Tuesday Optical Believe It Or Not: Key Lessons Learned conference. An award will be presented to the last presenter standing.

Conference 7072

Wednesday-Thursday 13-14 August 2008 • Proceedings of SPIE Vol. 7072

Optics and Photonics for Information Processing II

Conference Chairs: **Abdul Ahad Sami Awwal,** Lawrence Livermore National Lab.; **Khan M. Iftekharuddin,** The Univ. of Memphis; **Bahram Javidi,** Univ. of Connecticut

Program Committee: **Henri H. Arsenault,** Univ. Laval (Canada); **George Barbastathis,** Massachusetts Institute of Technology; **Fred Richard Beyette, Jr.,** Univ. of Cincinnati; **David P. Casasent,** Carnegie Mellon Univ.; **H. John Caulfield,** Fisk Univ.; **Yeshaiahu Fainman,** Univ. of California/San Diego; **Pietro Ferraro,** Istituto Nazionale di Ottica Applicata (Italy); **James G. Grote,** Air Force Research Lab.; **Laurence G. Hassebrook,** Univ. of Kentucky; **Kazuyoshi Itoh,** Osaka Univ. (Japan); **Mohammad A. Karim,** Old Dominion Univ.; **Yao Li,** Alliance Fiber Optic Products Inc.; **Robert Magnusson,** Univ. of Connecticut; **Abhijit Mahalanobis,** Lockheed Martin Missiles and Fire Control; **Manuel Martinez-Corral,** Univ. de València (Spain); **Mohammad A. Matin,** Univ. of Denver; **Osamu Matoba,** Kobe Univ. (Japan); **Alastair D. McAulay,** Lehigh Univ.; **Maria S Millan Garcia-Varela,** Univ. Politècnica de Catalunya (Spain); **Nasser M. Nasrabadi,** Army Research Lab.; **Thomas J. Naughton,** National Univ. of Ireland/Maynooth (Ireland); **Takanori Nomura,** Wakayama Univ. (Japan); **Elisabet Pérez-Cabré,** Univ. Politècnica de Catalunya (Spain); **Ting-Chung Poon,** Virginia Polytechnic Institute and State Univ.; **Philippe Réfrégier,** Institut Fresnel (France); **Nabeel Agha Riza,** College of Optics & Photonics/Univ. of Central Florida; **Joseph Rosen,** Ben-Gurion Univ. of the Negev (Israel); **Firooz A. Sadjadi,** Lockheed Martin Corp.; **John T. Sheridan,** National Univ. of Ireland/Dublin (Ireland); **Jung-Young Son,** Hanyang Univ. (South Korea); **Clay James Stanek,** DataPath, Inc.; **Enrique Tajahuerce,** Univ. Jaume I (Spain); **Jun Tanida,** Osaka Univ. (Japan); **Shyh-Lin Tsao,** National Taiwan Normal Univ. (Taiwan); **Kelvin H. Wagner,** Univ. of Colorado at Boulder; **Cardinal Warde,** Massachusetts Institute of Technology; **Frank Wyrowski,** Friedrich Schiller Univ. Jena (Germany); **Toyohiko Yatagai,** Univ. of Tsukuba (Japan); **Francis T. S. Yu,** The Pennsylvania State Univ.; **Maria Josefa Yzuel,** Univ. Autònoma de Barcelona (Spain)

Wednesday 13 August

SESSION 1

Room: Conv. Ctr. 11A . . . . . Wed. 8:10 to 10:20 am

Switching

Session Chair: **Alastair D. McAulay,** Lehigh Univ.

8:10 am: **All-optical swapping of spectral amplitude code labels for packet-switched networks** *(Invited Paper)*, Lawrence R. Chen, McGill Univ. (Canada) . . . . . [7072-01]

8:40 am: **Liquid crystal-based dynamic channel blocker/equalizer for optical networks**, Shuping Wang, Univ. of North Texas; Chi-Hao Cheng, Miami Univ.; Yanqing Lu, Nanjing Univ. (China) . . . . . [7072-02]

9:00 am: **Applying the triple correlation functions to characterizing high-frequency repetition trains of picosecond optical pulses**, Ana L. Muñoz, Alexandre S. Shcherbakov, Instituto Nacional de Astrofísica, Óptica y Electrónica (Mexico); Sergey A. Nemov, St.-Petersburg State Polytechnical Univ. (Russia); Joaquin Campos Acosta, Consejo Superior de Investigaciones Científicas (Spain) . . . . . [7072-03]

9:20 am: **Characterization of layered semiconductor for optical devices**, Yashar M. Hajiyev, Univ. of Denver and Azerbaijan Technical Univ. (Azerbaijan); Mohammad A. Matin, Univ. of Denver . . . . . [7072-04]

9:40 am: **Application of the effect polarization self-modulation for processing an output signal one-fiber few-modes interferometers**, Vladislav A. Kolchinskiy, Far Eastern State Technical Univ. (Russia) . [7072-05]

10:00 am: **A two-pass Sagnac loop for high-contrast ultrafast switching at 1053nm**, Alain Jolly, Sébastien Jonathas, Commissariat à l'Energie Atomique (France); Jacques Luce, Commissariat a l'Energie Atomique (France); Herve Coic, Jean-François Gleyze, Commissariat à l'Energie Atomique (France); Sophie Letourneur, Patrice Le Boudec, IDIL Fibres Optiques (France)[7072-38]

Coffee Break . . . . . 10:20 to 10:50 am

SESSION 2

Room: Conv. Ctr. 11A . . . . . Wed. 10:50 am to 12:40 pm

Holography/Modeling

Session Chair: **Khan M. Iftekharuddin,** The Univ. of Memphis

10:50 am: **Removing the twin image in on-axis digital holography by localisation and suppression**, Bryan M. Hennelly, Conor P. Mc Elhinney, Lukas Ahrenberg, National Univ. of Ireland/Maynooth (Ireland); Thomas J. Naughton, National Univ. of Ireland/Maynooth (Ireland) and Univ. of Oulu (Finland) . . . . . [7072-07]

11:10 am: **Segmentation of three-dimensional scenes encoded in digital holograms**, Karen M. Molony, National Univ. of Ireland/Maynooth (Ireland); Thomas J. Naughton, National Univ. of Ireland/Maynooth (Ireland) and Univ. of Oulu (Finland) . . . . . [7072-08]

11:30 am: **Coherence holography and singular optical coherence** *(Invited Paper)*, Mitsuo Takeda, The Univ. of Electro-Communications (Japan); Wei Wang, Heriot-Watt Univ. (United Kingdom) . . . . . [7072-09]

12:00 pm: **Improvements in inline digital holography applied to microscopy**, James P. Ryle, National Univ. of Ireland/Dublin (Ireland); Guohai Situ, Unnikrishnan Gopinathan, National Univ. of Ireland/Dublin (Ireland) and Univ. Stuttgart (Germany); Susan McDonnell, John T. Sheridan, National Univ. of Ireland/Dublin (Ireland) . . . . . [7072-10]

12:20 pm: **Modeling and characterizations of multi-segment DFB laser**, Saeed Mohseni, Bader Alhasson, Mohammad A. Matin, Univ. of Denver . . . . . [7072-11]

Lunch/Exhibition Break . . . . . 12:40 to 2:30 pm

SESSION 3

Room: Conv. Ctr. 11A . . . . . Wed. 2:30 to 5:30 pm

Imaging

Session Chair: **Mohammad A. Matin,** Univ. of Denver

2:30 pm: **Measuring chromatic dispersion using single-arm interferometers: from millimeters to kilometers** *(Invited Paper)*, Li Qian, Bing Qi, Univ. of Toronto (Canada); Waleed Mohammed, Chulalongkorn Univ. (Thailand); Michael Galle, Fei Ye, Univ. of Toronto (Canada) . . . . . [7072-12]

3:00 pm: **Simulating paraxial optical systems using the linear canonical transform: properties, issues and applications**, John J. Healy, Paul O'Grady, John T. Sheridan, Univ. College Dublin (Ireland). . . . . [7072-13]

3:20 pm: **Point spread function (PSF) measurement for an extended depth of field cell phone camera with a high resolution PSF of the imaging lens and a sub-pixel digital algorithm**, Changmeng Liu, Xi Chen, Micron Technology, Inc. . . . . [7072-14]

Coffee Break . . . . . 3:40 to 4:10 pm

4:10 pm: **A compound-eye imaging system with an irregular lens-array arrangement**, Ryoichi Horisaki, Osaka Univ. (Japan); Yoshizumi Nakao, Takashi Toyoda, Funai Electric Co., Ltd. (Japan); Keiichiro Kagawa, Osaka Univ. (Japan); Yasuo Masaki, Funai Electric Co., Ltd. (Japan); Jun Tanida, Osaka Univ. (Japan) . . . . . [7072-15]

4:30 pm: **Package inspection using inverse diffraction**, Alastair D. McAulay, Lehigh Univ.. . . . . [7072-16]

4:50 pm: **Combined pre- and post-detection processing for imaging systems fitted with low-redundancy pupil plane masks**, William T. Rhodes, Florida Atlantic Univ.; Jennifer E. Ward, John T. Sheridan, Univ. College Dublin (Ireland) . . . . . [7072-17]

5:10 pm: **New mode-locked laser for optical digital signal processing,** Shyh-Lin Tsao, Ssu-Chieh Weng, Nan-Hsin Liu, Min-Hung Lee, Yung-Tsung Liu, National Taiwan Normal Univ. (Taiwan) . . . . . [7072-18]

Room: Conv. Ctr. Exhibit Hall B2 . . . . . Wed. 5:30 to 7:00 pm

Posters-Wednesday

Poster authors will begin displaying posters after 10:00 am Wednesday morning. A poster session, with authors present at their posters, will be held Wednesday evening from 5:30 to 7:00 pm. Light refreshments will be served.

Poster Setup

Poster presenters must set up their posters between 10:00 am and 5:00 pm on Wednesday. Poster presenters who have not set up by 5:00 pm on Wednesday will be considered a "no show" and their manuscript will not be published. Presenters must remove their posters immediately after the poster session. Posters not removed will be considered unwanted and will be discarded. SPIE assumes no responsibility for posters left up after the end of each poster session.

Cost function analysis in double random phase encoding, David S. Monaghan, Unnikrishnan Gopinathan, Guohai Situ, National Univ. of Ireland/Dublin (Ireland); Thomas Naughton, National Univ. of Ireland/Maynooth (Ireland); John T. Sheridan, National Univ. of Ireland/Dublin (Ireland). [7072-35]

An alternative design of holographic polarization-selective elements, Jing-Heng Chen, Kun-Huang Chen, Feng Chia Univ. (Taiwan); Jiun-You Lin, National Changhua Univ. of Education (Taiwan); Nung-Yu Wu, Feng Chia Univ. (Taiwan) . . . . . [7072-36]

Complex shadow extraction, Karl S. Gudmundsson, Francis S. Cagatin, Univ. of Iceland (Iceland) . . . . . [7072-37]

Global information-energy networks, Igor I. Tyutyunnyk, Olena V. Dronenko, Vinnitsa State Technical Univ. (Ukraine) . . . . . [7072-39]

Multi-beam coupling in doubly-doped photorefractive LiNbO[sub]3[/sub]:Fe:Mn crystals, Cuixia Dai, Shanghai Univ. (China) . . . . . [7072-40]

An improved quantum key distribution protocol, Tingwan Wu, Guohua Wu, South China Univ. of Technology (China) . . . . . [7072-41]

A practical method to overcome Nyquist in digital holography, Bryan M. Hennelly, National Univ. of Ireland/Maynooth (Ireland); Thomas J. Naughton, National Univ. of Ireland/Maynooth (Ireland) and Univ. of Oulu (Finland) . . . . . [7072-42]

A method to reduce the size of LUT for generation of a full-color CGH using a function of distance and wavelength in Fresnel diffraction, Jung-Hoon Yoon, Seung-Cheol Kim, Eun Soo Kim, Kwangwoon Univ. (South Korea) . . . . . [7072-43]

The system of polarization holographic memory with a standing wave, Vladimir I. Tarasashvili, Anna L. Purtseladze, Institute of Cybernetics (Georgia) . . . . . [7072-44]

Modeling and experiment of future hearing aid device, Houwen W. Tang, Mohammad A. Matin, Yun-Bo Yi, Univ. of Denver . . . . . [7072-46]

Optical encryption and decryption with hologram by double random phase mask, Shuguang Li, Shanghai Jiao Tong Univ. (China) . . . . . [7072-51]

Decoding software for computer instructions stored as Fourier holograms into a LiNbO[sub]3[/sub]:Fe crystal, Edmundo Rodriguez-Vázquez, Eduardo Tepichin-Rodriguez, Instituto Nacional de Astrofísica, Óptica y Electrónica (Mexico) . . . . . [7072-52]

Digital holographic XNOR multi-gate (DHMG-XNOR), Edmundo Rodriguez-Vázquez, Eduardo Tepichin-Rodríguez, Instituto Nacional de Astrofísica, Óptica y Electrónica (Mexico) . . . . . [7072-53]

Phase retrieval in digital holographic microscopy using a Gerchberg-Saxton algorithm, María-Luisa Cruz, Albertina Castro, Victor Arrizón, Instituto Nacional de Astrofísica, Óptica y Electrónica (Mexico). . . . . [7072-54]

Detection of circuit-board components with an adaptive multiclass correlation filter, Victor H. Diaz, Ctr. de Investigación Científica y de Educación Superior de Ensenada (Mexico); Vitaly Kober, Ctr. de Investigacion Cientifica y de Educacion Superior de Ensenada (Mexico) . . . . . [7072-55]

Acousto-optical data processing exploiting the wave heterodyning, Alexandre S. Shcherbakov, Instituto Nacional de Astrofísica, Óptica y Electronica (Mexico); Olga I. Belokurova, St.-Petersburg State Polytechnical Univ. (Russia); Eduardo Tepichin Rodriguez, Daniel Sanchez Lucero, Instituto Nacional de Astrofísica, Óptica y Electrónica (Mexico). . . . . [7072-56]

Signal processing for hologram pattern generation in an image system with multi-vision capturing and wavefront reconstruction, Kouichi Nitta, Takanori Kurahashi, Naoki Nishikawa, Osamu Matoba, Kobe Univ. (Japan). . . . . [7072-57]

Near lossless medical image compression using JPEG-LS and cubic spline interpolation, Tsung-Ching Lin, Trieu-Kien Truong, Chien-Wen Chen, I-Shou Univ. (Taiwan); Shi-Huang Chen, Shu-Te Univ. (Taiwan) . . . . [7072-58]

Characteristic analysis and comparison of novel photonic bandgap cell with alumina microwave stripline, Shyh-Lin Tsao, Meng-Han Liu, Yu-Ti Kuo, National Taiwan Normal Univ. (Taiwan). . . . . [7072-59]

Simulation of micro-ring resonator on non-isotropic material, Shyh-Lin Tsao, Da-Wei Yeh, Hsion-Yu Chang, National Taiwan Normal Univ. (Taiwan) . . . . . [7072-60]

Photonic generation of linearly chirped microwave signals based on a FBG-integrated Sagnac loop mirror, Chao Wang, Jianping Yao D.D.S., Univ. of Ottawa (Canada) . . . . . [7072-64]

Distortion-invariant target detection using shifted-reference joint transform correlator, Mohammed N. Islam, Vijayan K. Asari, Mohammad A. Karim, Old Dominion Univ.; Mohammad S. Alam, Univ. of South Alabama . . . . . [7072-65]

Wavelet based hyperspectral target detection using spectral fringe-adjusted joint transform correlation, Wesam A. Sakla, Texas A&M Univ.; Adel Sakla, Mohammad S. Alam, Univ. of South Alabama. . . . . [7072-66]

A new mean filter ratio technique for edge detection and foreground extraction, Mohammad M. Islam, Mohammed N. Islam, Vijayan K. Asari, Old Dominion Univ.; Mohammad S. Alam, Univ. of South Alabama . . . . . [7072-67]

Superresolution image reconstruction via panchromatic and multispectral image fusion, Mohamed I. Elbakary, Mohammad S. Alam, Univ. of South Alabama . . . . . [7072-68]

Thursday 14 August

SESSION 4

Room: Conv. Ctr. 11A . . . . . Thurs. 8:30 to 11:50 am

Computing

Session Chair: **Abdul Ahad Sami Awwal,** Lawrence Livermore National Lab.

8:30 am: **Introduction to synthesis algorithms for ternary quantum circuits** *(Invited Paper)*, Marek A. Perkowski, Portland State Univ. . . . . [7072-19]

9:00 am: **A defect inspection technique using polarized images for steel strip surface**, Akira Kazama, Takahiko Oshige, JFE R&D Corp. (Japan) . . . . . [7072-21]

9:20 am: **Ultra-fast wave optical computing**, Tobias Haist, Univ. Stuttgart (Germany) . . . . . [7072-22]

9:40 am: **Phase retrieval problems in optical encryption and watermarking**, Guohai Situ, Giancarlo Pedrini, Wolfgang Osten, Univ. Stuttgart (Germany) . . . . . [7072-23]

Coffee Break . . . . . 10:00 to 10:30 am

10:30 am: **The color schlieren digital visualization techniques for studies of gasdynamic processes**, Igor V. Ershov, Alex P. Fedotov, Vladimir N. Otmennikov, Central Research Institute of Machine Building (Russia)[7072-24]

10:50 am: **Three-channel dynamic photometric stereo: a new method for 4D surface reconstruction and volume recovery**, Jan Walter Schroeder, Wolfram Schulze, Thomas Wetter, Ruprecht-Karls-Univ. Heidelberg (Germany); Chi-Hsien Chen M.D., Wan Fang Hospital (Taiwan) and Taipei Medical Univ. (Taiwan) . . . . . [7072-25]

11:10 am: **Temperature and field effects on reflectivity of gallium selenide surface**, Bader H. Alhasson, Univ. of Denver; Yashar M. Hajiyev, Technical Univ. of Azerbaijan (Azerbaijan); Mohammad A. Matin, Univ. of Denver . . . . . [7072-26]

11:30 am: **Which optical processes are suitable to make probabilistic single photon sources for quantum cryptography?**, Amit Verma, Anirban Pathak, Jaypee Institute of Information Technology (India) . . . . . [7072-48]

Lunch Exhibition/Break . . . . . 12:10 to 1:20 pm

SESSION 5

Room: Conv. Ctr. 11A . . . . . Thurs. 1:20 to 3:50 pm

Image Processing

Session Chair: **Karl S. Gudmundsson,** Univ. of Iceland (Iceland)

1:20 pm: **Morphological diversity extraction method (MODEM) and annulets for surface/volume roughness and radiation asymmetry characterization (ARAC)** *(Invited Paper)*, Bedros Afeyan, Mathieu Charbonneau-Lefort, Marine Mardirian, Polymath Research Inc.; Jean-Luc Starck, Commissariat à l'Energie Atomique (France); Evan Mapoles, Robert Kirkwood, Steven Haan, Lawrence Livermore National Lab.; George R. McKee, Jr., Univ. of Wisconsin/Madison; Peter Jones, Yale Univ. . . . . [7072-27]

1:50 pm: **Single camera-based object detection and tracking for mobile robots using neural networks**, J. Keith Anderson, Khan Iftekharuddin, Elizabeth Threlkeld, The Univ. of Memphis . . . . . [7072-30]

2:10 pm: **Shadow extraction**, Karl S. Gudmundsson, Univ. of Iceland (Iceland); Abdul A. S.Awwal, Lawrence Livermore National Lab.; Francis S. Cagatin, Univ. of Iceland (Iceland). . . . . [7072-31]

2:30 pm: **Higher accuracy template for corner cube reflected image**, Abdul A. S.Awwal, Lawrence Livermore National Lab.; Kenneth L. Rice, Clemson Univ.; Richard R. Leach, Jr., Lawrence Livermore National Lab.; Tarek M. Taha, Clemson Univ. . . . . [7072-32]

2:50 pm: **Two-dimensional pattern processing by means of image compression**, Kouichi Nitta, Tomoyuki Minami, Osamu Matoba, Kobe Univ. (Japan). . . . . [7072-33]

3:10 pm: **Performance of complex shadow extraction technique in real data satellite images**, Karl S. Gudmundsson, Francis S. Cagatin, Univ. of Iceland (Iceland) . . . . . [7072-34]

3:30 pm: **Enhaced 3D image detection correlator using Blur metric-based resolution enhancement**, Keong-Jin Lee, Dong-Choon Hwang, Eun Soo Kim, Kwangwoon Univ. (South Korea) . . . . . [7072-45]

Courses of Related Interest

See SPIE Cashier for information and to register.

SC661 Advanced Image Processing and Applications (Iftekharuddin) Tuesday, 8:30 am to 5:30 pm
SC766 Information Processing for Video Surveillance (Ebrahimi, Dufaux) Monday, 8:30 am to 5:30 pm
NEW! SC913 Multivariate Analysis of Optical and Imaging Data (Bajorski) Monday, 8:30 am to 5:30 pm

Conference 7073

Monday-Thursday 11-14 August 2008 • Proceedings of SPIE Vol. 7073

Applications of Digital Image Processing XXXI

Conference Chair: **Andrew G. Tescher,** AGT Associates

Program Committee: **Vasudev Bhaskaran,** Marvell Semiconductor, Inc.; **Bernard V. Brower,** Eastman Kodak Co.; **Wo L. Chang,** National Institute of Standards and Technology; **Touradj Ebrahimi,** École Polytechnique Fédérale de Lausanne (Switzerland) and Emitall S.A. (Switzerland); **Ali Habibi,** The Aerospace Corp.; **Arianne T. Hinds,** InfoPrint Solutions Co.; **T. Russell Hsing,** Telcordia Technologies, Inc.; **Kristina M. Johnson,** Johns Hopkins Univ.; **C.-C. Jay Kuo,** Univ. of Southern California; **Catherine Lambert-Nebout,** Ctr. National d'Études Spatiales (France); **Andre J. Oosterlinck,** Katholieke Univ. Leuven (Belgium); **Sethuraman Panchanathan,** Arizona State Univ.; **Fernando Pereira,** Instituto Superior Técnico (Portugal); **Robert A. Rossi, Jr.,** Microsoft Corp.; **John A. Saghri,** California Polytechnic State Univ.; **Peter Schelkens,** Vrije Univ. Brussel (Belgium); **Gary J. Sullivan,** Microsoft Corp.; **Pankaj Topiwala,** FastVDO LLC; **Mihaela van der Schaar,** Univ. of California/Los Angeles

Monday 11 August

SESSION 1

Room: Conv. Ctr. 5A . . . . . Mon. 1:30 to 2:50 pm

Implementation and Processing Scenarios I

Session Chair: **Andrew G. Tescher,** AGT Associates

1:30 pm: **An improved image scene registration with wavelet preprocessing**, Eric P. Lam, ThalesRaytheonSystems . . . . . [7073-01]

1:50 pm: **Pattern recognition of an implicitly given target**, Pablo M. Aguilar-Gonzalez, Vitaly I. Kober, Ctr. de Investigación Científica y de Educación Superior de Ensenada (Mexico) . . . . . [7073-02]

2:10 pm: **Wavelet domain denoising by using the universal hidden Markov tree model**, Feng Li, Donald Fraser, Xiuping Jia, Andrew J. Lambert, Univ. of New South Wales/Australian Defence Force Academy (Australia) . . . [7073-03]

2:30 pm: **Image domain moving target tracking with advanced image registration and time-differencing techniques**, Hai-Wen Chen, Dennis C. Braunreiter, Science Applications International Corp. . . . . [7073-05]

Coffee Break . . . . . 2:50 to 3:30 pm

SESSION 2

Room: Conv. Ctr. 5A . . . . . Mon. 3:30 to 5:10 pm

Design and Implementation of Color Transformations

Session Chair: **Arianne T. Hinds,** InfoPrint Solutions Co.

3:30 pm: **CIELab to CMYK color conversion in the transform domain for JPEG compressed images**, Yue Qiao, Joan L. Mitchell, Nenad Rijavec, Arianne T. Hinds, InfoPrint Solutions Co. . . . . [7073-06]

3:50 pm: **Lifting based reversible color transformations for image compression**, Henrique S. Malvar, Gary J. Sullivan, Sridhar Srinivasan, Microsoft Corp. . . . . [7073-07]

4:10 pm: **Faster color conversion via lookup table mesh dimension management**, Nenad Rijavec, InfoPrint Solutions Co.. . . . . [7073-08]

4:30 pm: **Continued fractions, diophantine approximations, and design of color transforms**, Yuriy A. Reznik, Stanford Univ.. . . . . [7073-09]

4:50 pm: **Complex color management using optimized nonlinear three-dimensional look-up tables**, Lazar Bivolarski, Logitech Inc. . . . . [7073-10]

Tuesday 12 August

SESSION 3

Room: Conv. Ctr. 5A . . . . . Tues. 8:30 am to 12:00 pm

Advanced Video Coding

Session Chair: **Pankaj Topiwala,** FastVDO LLC

8:30 am: **High 444 vs high profile in H.264/AVC for high quality applications**, Pankaj Topiwala, FastVDO LLC . . . . . [7073-11]

8:50 am: **Low-complexity hierarchical overlapped block transform and quantization for lossy-to-lossless image coding in JPEG XR**, Chengjie Tu, Sridhar Srinivasan, Gary J. Sullivan, Microsoft Corp. . . . . [7073-12]

9:10 am: **SVC overview and performance evaluation**, Tobias Oelbaum, Technische Univ. München (Germany) . . . . . [7073-13]

9:30 am: **An early skip mode decision in spatial enhancement layer for low complexity scalable video encoder**, Bumshik Lee, Information and Communications Univ. (South Korea) . . . . . [7073-14]

9:50 am: **Towards a 3D video format for auto-stereoscopic displays**, Anthony Vetro, Sehoon Yea, Mitsubishi Electric Research Labs.; Aljoscha Smolic, Fraunhofer-Institut für Nachrichtentechnik, Heinrich-Hertz-Institut (Germany) . . . . . [7073-15]

10:10 am: **Throughput architecture for H.264/AVC CABAC decoder**, Yuan-Teng Chang, Industrial Technology Research Institute (Taiwan) . . . . [7073-16]

Coffee Break . . . . . 10:30 to 11:00 am

11:00 am: **Modern transform design for advanced image/video coding applications**, Pankaj Topiwala, Trac Tran, FastVDO LLC . . . . . [7073-17]

11:20 am: **A fast macroblock mode decision for low bitrate videos based on the region-of-interest coding in H.264|AVC**, Taeyoung Na, Yousun Lee, Information and Communications Univ. (South Korea); Jeongyeon Lim, Youngho Joo, Kimun Kim, Jaewoan Byun, SK Telecom (South Korea); Munchurl Kim, Information and Communications Univ. (South Korea)[7073-18]

11:40 am: **Balancing error concealment and network coding for robust wireless video streaming**, Hui Wang, C.-C. J. Kuo, Univ. of Southern California . . . . . [7073-19]

Lunch/Exhibition Break . . . . . 12:00 to 1:30 pm

SESSION 4

Room: Conv. Ctr. 5A . . . . . .Tues. 1:30 to 5:00 pm

Mobile Video and Applications

Session Chair: **Vasudev Bhaskaran,** Marvell Semiconductor, Inc.

1:30 pm: **Architectural challenges in video communications in low power wireless devices**, Moinul Khan, Srikanth Rengarajan, Steve Molloy, Qualcomm Inc. . . . . [7073-20]

1:50 pm: **Error resiliency of distributed video coding in wireless video communication**, Shuiming Ye, Mourad Ouaret, Frederic Dufaux, École Polytechnique Fédérale de Lausanne (Switzerland); Michael Ansorge, Univ. de Neuchâtel (Switzerland); Touradj Ebrahimi, École Polytechnique Fédérale de Lausanne (Switzerland) . . . . . [7073-21]

2:10 pm: **Temporal flicker reduction in video using sparse directional transforms**, Sandeep Kanumuri, Onur G. Guleryuz, Mehmet R. Civanlar, DoCoMo Communications Labs. USA, Inc. . . . . [7073-22]

2:30 pm: **Exploiting spatio-temporal characteristics of human vision for mobile video applications**, Hari Kalva, Chris Holder, Rashid Jillani, Florida Atlantic Univ. . . . . [7073-23]

2:50 pm: **Mobile video visual saliency map modeling using foreground object extraction**, Weisi Lin, Nanyang Technological Univ. (Singapore); C.-C. Jay Kuo, Univ. of Southern California; Shilin Xu, Huazhong Univ. of Science and Technology (China). . . . . [7073-24]

Coffee Break . . . . . 3:10 to 3:40 pm

3:40 pm: **Scorebox extraction from mobile sports videos using SVM**, Wonjun Kim, Jimin Park, Changick Kim, Information and Communications Univ. (South Korea) . . . . . [7073-25]

4:00 pm: **AAM-based restoration of face images for video communications**, Derek J. Shiell, Jing Xiao, Epson Research & Development, Inc.; Aggelos K. Katsaggelos, Northwestern Univ. . . . . [7073-26]

4:20 pm: **Coping with fingerprint smudges by adaptive image enhancement**, Wei-Chung Cheng, Chih-Nan Wu, National Chiao Tung Univ. (Taiwan) . . . . . [7073-27]

4:40 pm: **Video quality measure for mobile IPTV service**, Wonjun Kim, Changick Kim, Information and Communications Univ. (South Korea)[7073-28]

Wednesday 13 August

SESSION 5

Room: Conv. Ctr. 5A . . . . . Wed. 8:30 to 9:50 am

Rate Control for Video Systems

Session Chair: **Fernando Pereira,** Instituto Superior Técnico (Portugal)

8:30 am: **Rate-controlled requantization transcoding for H.264/AVC video streams**, Stijn Notebaert, Jan De Cock, Peter Lambert, Rik Van de Walle, Univ. Gent (Belgium). . . . . [7073-29]

8:50 am: **Rate-distortion optimization with error resilience awareness**, Luis D. Soares, Paulo J. Nunes, Instituto Superior de Ciéncias do Trabalho e da Empresa (Portugal) and Instituto de Telecomunicações (Portugal); Fernando Pereira, Instituto Superior Técnico (Portugal) and Instituto de Telecomunicações (Portugal) . . . . . [7073-30]

9:10 am: **A rate control mechanism for distributed video coding with maximum likelihood motion estimation**, Ivy Tseng, Antonio Ortega, Univ. of Southern California . . . . . [7073-31]

9:30 am: **Rate controlling for colour and depth based 3D video coding with flexible motion model**, Buncha Kamolrat, Anil Fernando, Marta Mrak, Univ. of Surrey (United Kingdom) . . . . . [7073-32]

Coffee Break . . . . . 9:50 to 10:30 am

SESSION 6

Room: Conv. Ctr. 5A . . . . . Wed. 10:30 am to 12:10 pm

Performance Evaluation in Image Coding Applications

Session Chair: **Gary J. Sullivan,** Microsoft Corp.

10:30 am: **Towards objective image quality metrics: the AIC Eval Program of the JPEG**, Thomas Richter, Univ. Stuttgart (Germany); Chaker M. Larabi, Univ. de Poitiers (France) . . . . . [7073-34]

10:50 am: **Comparative performance of leading image codecs: JPEG2000, HDPhoto, and H.264 High 444 Intra**, Pankaj Topiwala, FastVDO LLC. . . . . [7073-35]

11:10 am: **A comparative study of color image compression standards using perceptually-driven quality metrics**, Francesca De Simone, Daniele Ticca, Frederic Dufaux, Michael Ansorge, Touradj Ebrahimi, École Polytechnique Fédérale de Lausanne (Switzerland) . . . . . [7073-36]

11:30 am: **Objective quality evaluation of color images by perceptual weighting of single-channel metrics**, Touradj Ebrahimi, Francesca De Simone, École Polytechnique Fédérale de Lausanne (Switzerland); Chaker M. Larabi, Univ. de Poitiers (France); Frederic Dufaux, Michael Ansorge, École Polytechnique Fédérale de Lausanne (Switzerland) . . . . . [7073-37]

11:50 am: **Application-specific performance measurements of image compression codecs**, Thomas Richter, Univ. Stuttgart (Germany). . [7073-38]

Lunch/Exhibition Break . . . . . 12:10 to 1:50 pm

SESSION 7

Room: Conv. Ctr. 5A . . . . . Wed. 1:50 to 3:50 pm

Initiatives in Image Coding and Accessories and Applications

Session Chair: **Touradj Ebrahimi,** École Polytechnique Fédérale de Lausanne (Switzerland)

1:50 pm: **Multi-generation effects on lossy image coding and compressed-domain effects: analysis and effects using JPEG 1, JPEG 2000 and JPEG XR**, Gary J. Sullivan, Shijun Sun, Shankar L. Regunathan, Daniel Schonberg, Microsoft Corp. . . . . [7073-39]

2:10 pm: **ITU-T T.851: an enhanced entropy coding design for JPEG baseline images**, Joan L. Mitchell, Arianne T. Hinds, InfoPrint Solutions Co. . . . . [7073-40]

2:30 pm: **Techniques for optimization of image encoding compression capability for JPEG XR**, Gary J. Sullivan, Shijun Sun, Shankar L. Regunathan, Daniel Schonberg, Zhi Zhou, Microsoft Corp. . . . . [7073-41]

2:50 pm: **The JPEG digital imaging systems integration initiative**, Robert A. Rossi, Jr., Microsoft Corp. . . . . [7073-42]

3:10 pm: **A low-complexity wavelet based image codec for surveillance**, James J. Meany, The Boeing Co. . . . . [7073-43]

3:30 pm: **Scalable low complexity image coder for remote volume visualization**, Hariharan G. Lalgudi, Michael W. Marcellin, Ali Bilgin, The Univ. of Arizona; Mariappan S. Nadar, Siemens Corporate Research. . . . . [7073-44]

Coffee Break . . . . . 3:50 to 4:20 pm

SESSION 8

Room: Conv. Ctr. 5A . . . . . Wed. 4:20 to 5:00 pm

Biomedical Applications

Session Chair: **Peter Schelkens,** Vrije Univ. Brussel (Belgium)

4:20 pm: **Computer-aided colonoscopy: approaches for automated impurity and polyp detection**, Jona Apelbaum, Univ. Antwerpen (Belgium); Pierre J. Elbischger, Fachhochschule Technikum Kärnten (Austria). . [7073-47]

4:40 pm: **Hyperspectral imaging with wavelet transform for colon tissue biopsy samples,** Khalid Masood, Univ. of Warwick (United Kingdom)[7073-49]

Room: Conv. Ctr. Exhibit Hall B2 . . . . . .Wed. 5:30 to 7:00 pm

Posters-Wednesday

Poster authors will begin displaying posters after 10:00 am Wednesday morning. A poster session, with authors present at their posters, will be held Wednesday evening from 5:30 to 7:00 pm. Light refreshments will be served.

Poster Setup

Poster presenters must set up their posters between 10:00 am and 5:00 pm on Wednesday. Poster presenters who have not set up by 5:00 pm on Wednesday will be considered a "no show" and their manuscript will not be published. Presenters must remove their posters immediately after the poster session. Posters not removed will be considered unwanted and will be discarded. SPIE assumes no responsibility for posters left up after the end of each poster session.

Restoration of atmospherically-degraded images using a sparse prior, Zhiying Wen, Donald Fraser, Andrew J. Lambert, Univ. of New South Wales/ Australian Defence Force Academy (Australia) . . . . . [7073-68]

Diamond-pattern-based partial distortion search algorithm for fast motion estimation, Ming-Te Wu, Kao Yuan Univ. (China). . . . . [7073-71]

Efficient video segmentation using temporally updated mean shift clustering, Nemanja I. Petrovic, Aleksandra Pizurica, Ljubomir Jovanov, Wilfried Philips, Univ. Ghent (Belgium) . . . . . [7073-72]

Wavelet and PCA-based approach for 3D shape recovery from image focus, Muhammad T. Mahmood, Seong-O Shim, Tae-Sun Choi, Gwangju Institute of Science and Technology (South Korea) . . . . . [7073-73]

Optimization of focus measure using genetic algorithms, Ik Hyun Lee, Muhammad T. Mahmood, Tae-Sun Choi, Gwangju Institute of Science and Technology (South Korea). . . . . [7073-74]

Fast three-dimensional shape recovery in TFT-LCD manufacturing, Wook-Jin Choi, Tae-Sun Choi, Gwangju Institute of Science and Technology (South Korea). . . . . [7073-75]

Using wavelets for edge directed image interpolation, Eric P. Lam, ThalesRaytheonSystems. . . . . [7073-76]

A novel multiscale segmentation method for HRCT images, Soon-Chul Park, Tae-Sun Choi, Gwangju Institute of Science and Technology (South Korea) . . . . . [7073-77]

A new coding and decoding method for the colored pseudo-random array in camera self-calibration, Zhenying Xu, Yun Wang, Jiangsu Univ. (China) . . . . . [7073-78]

Video denoising using local Bessel K-form prior and MMSE estimator in 3D complex wavelet domain, Hossein Rabbani, Amirkabir Univ. of Technology (Iran). . . . . [7073-79]

Estimating surface roughness using image focus, Aamir S. Malik, Tae-Sun Choi, Gwangju Institute of Science and Technology (South Korea) . . [7073-80]

Estimation of depth map based on focus adjustment, Seong-O Shim, Aamir S. Malik, Muhammad T. Mahmood, Tae-Sun Choi, Gwangju Institute of Science and Technology (South Korea) . . . . . [7073-81]

A fast multi-pattern motion estimation algorithm based on the nature of error surfaces, Humaira Nisar, Tae-Sun Choi, Gwangju Institute of Science and Technology (South Korea) . . . . . [7073-82]

Image restoration based on camera microscanning, Jose L. Lopez-Martinez, Vitaly I. Kober, Ctr. de Investigación Científica y de Educación Superior de Ensenada (Mexico) . . . . . [7073-83]

Remote counseling using HyperMirror quasi space-sharing system, Sayuri Hashimoto, Univ. of Tsukuba (Japan); Osamu Morikawa, National Institute of Advanced Industrial Science and Technology (Japan); Nobuyuki Hashimoto, Citizen Technology Ctr. Co., Ltd. (Japan); Takanori Maesako, Osaka Univ. (Japan) . . . . . [7073-84]

Alignment of vectorial shearing interferometer using a simple recognition algorithm, Guillermo Garcia-Torales, Jorge-Luis Flores, Univ. de Guadalajara (Mexico); Josué Álvarez-Borrego, Ctr. de Investigación Científica y de Educación Superior de Ensenada (Mexico) . . . . . [7073-85]

System of invariant correlation to rotation using a ring mask, Selene Solorza, Univ. Autónoma de Baja California (Mexico); Josué Álvarez-Borrego, Vitaly I. Kober, Ctr. de Investigación Científica y de Educación Superior de Ensenada (Mexico) . . . . . [7073-86]

Invariant correlation to rotation, position and scale using nonlinear composite filters, Ricardo Enrique Guerrero-Moreno, Josué Álvarez-Borrego, Ctr. de Investigación Científica y de Educación Superior de Ensenada (Mexico) [7073-87]

Distortion-invariant pattern recognition with nonlinear correlation filters, Saul Martinez-Diaz, Vitaly I. Kober, Ctr. de Investigación Científica y de Educación Superior de Ensenada (Mexico) . . . . . [7073-88]

Real-time inspection with nonlinear composite correlation filters, Jorge-Luis Flores, Guillermo García-Torales, Univ. de Guadalajara (Mexico); Josué Álvarez-Borrego, Ctr. de Investigación Científica y de Educación Superior de Ensenada (Mexico) . . . . . [7073-89]

Invariant correlation to position, rotation and scale considering vectorial signatures, Jesús R. Lerma, Univ. Autónoma de Baja California (Mexico); Josué Álvarez-Borrego, Ctr. de Investigación Científica y de Educación Superior de Ensenada (Mexico) . . . . . [7073-90]

Motivation and implementation of a software SVC real-time VGA encoder for mobile TV, Vincent Bottreau, Thierry Viellard, Thomson R&D France (France) . . . . . [7073-91]

Digital holographic video of plankton, Victor V. Dyomin, Alexey S. Olshukov, Tomsk State Univ. (Russia) . . . . . [7073-92]

Study on depth of field of wavefront coding imaging system, Chao Pan, Jiabi Chen, Dawei Zhang, Songlin Zhuang, Univ. of Shanghai for Science and Technology (China) . . . . . [7073-93]

Analysis and synthesis of textures by structural methods, Leon Mariano Gutierrez Vazquez, Vitaly I. Kober, Ctr. de Investigación Científica y de Educación Superior de Ensenada (Mexico) . . . . . [7073-94]

An efficient algorithm based on dynamic programming for 3D shape recovery, Luis M. Jimenez-Medina, Vitaly I. Kober, Hugo H. Hidalgo-Silva, Ctr. de Investigación Científica y de Educación Superior de Ensenada (Mexico) . . [7073-95]

Application of digital image processing method for fish age estimation, Tingwan Wu, Jianhua Hong, South China Univ. of Technology (China)[7073-96]

Light scattering study of critical parameters of porous media, Anton V. Sadovoy, Maxim Vilenskiy, Dmitry A. Zimnyakov, Saratov State Univ. (Russia) [7073-97]

Nonlinear filter for pattern recognition using the scale transform, Angel Coronel-Beltrán, Univ. de Sonora (Mexico); Josué Álvarez-Borrego, Ctr. de Investigación Científica y de Educación Superior de Ensenada (Mexico) . . . . [7073-98]

Ordinal-based method for robust image/video signature generation, Daniel Chen, Lekha Chaisorn, Susanto Rahardja, A*STAR Institute for Infocomm Research (Singapore) . . . . . [7073-100]

Large-scale 3-D profilometer, Yu-Ying Lan, Industrial Technology Research Institute (Taiwan) . . . . . [7073-101]

Thursday 14 August

SESSION 9

Room: Conv. Ctr. 5A . . . . . Thurs. 8:00 to 10:20 am

Optical and Digital Image Processing Systems

Session Chair: **Peter Schelkens,** Vrije Univ. Brussel (Belgium)

8:00 am: **Optical flow processing for subpixel registration of speckle image sequences**, Corneliu Cofaru, Wilfried R. Philips, Wim van Paepegem, Univ. Ghent (Belgium) . . . . . [7073-50]

8:20 am: **Advanced super-resolution image enhancement process**, Hai-Wen Chen, Dennis C. Braunreiter, Science Applications International Corp. . . . . [7073-51]

8:40 am: **Fibered fluorescence microscopy (FFM) of intra epidermal nerve fibers--translational marker for peripheral neuropathies in preclinical research: processing and analysis of the data**, Frans Cornelissen, Rony Nuydens, Theo Meert, J&J Pharmaceutical Research & Development LLC (Belgium); Jan Lemaire, Peter Schelkens, Vrije Univ. Brussel (Belgium)[7073-52]

9:00 am: **Algorithm design of liquid lens inspection system**, Lu-Lin Hsieh, Industrial Technology Research Institute (Taiwan) . . . . . [7073-54]

9:20 am: **The interferogram processing for the double pulsed ESPI**, Haitao Wang, Nanjing Univ. of Aeronautics and Astronautics (China) . . . . . [7073-55]

9:40 am: **Laser-induced photoacoustic imaging for breast cancer detection using multivariate image analysis**, Yasser H. El-Sharkawy M.D., Cairo Univ. (Egypt). . . . . [7073-56]

10:00 am: **Parallel magnetic resonance imaging using compressed sensing**, Ali Bilgin, Yookyung Kim, Hariharan G. Lalgudi, Theodore P. Trouard, Maria I. Altbach, The Univ. of Arizona. . . . . [7073-57]

Coffee Break . . . . . 10:20 to 11:10 am

SESSION 10

Room: Conv. Ctr. 5A . . . . . Thurs. 11:10 am to 12:10 pm

Implementation and Processing Scenarios II

Session Chair: **John A. Saghri,** California Polytechnic State Univ.

11:10 am: **Endmember search methods based on lattice autoassociative memories: a case study on vegetation discrimination**, Juan Carlos Valdiviezo-Navarro, Gonzalo Urcid-Serrano, Instituto Nacional de Astrofísica, Óptica y Electrónica (Mexico); Gerhard X. Ritter, Univ. of Florida . . . [7073-58]

11:30 am: **SAR automatic target recognition using feature-based matchings and Dempster-Shaffer combination**, John A. Saghri, Scott J. Seims, California Polytechnic State Univ.. . . . . [7073-59]

11:50 am: **Fast generation of multi-resolution 360° panorama from image sequences**, Sean Ho, Philip David, Army Research Lab. . . . . [7073-60]

Lunch/Exhibition Break . . . . . 12:10 to 1:40 pm

SESSION 11

Room: Conv. Ctr. 5A . . . . . Thurs. 1:40 to 3:20 pm

Implementation and Processing Scenarios III

Session Chair: **John A. Saghri,** California Polytechnic State Univ.

1:40 pm: **Implementation and evaluation of real-time pan-tilt-zoom camera calibration**, Nicholas Fung, Army Research Lab.. . . . . [7073-61]

2:00 pm: **Adaptive fingerprint enhancement and identification**, Mehrube Mehrubeoglu, Lifford McLauchlan, Texas A&M Univ.. . . . . [7073-62]

2:20 pm: **Design and evaluation of sparse quantization index modulation watermarking schemes with Bose-Ray-Chaudhuri-Hocquenghem error correction codes**, Bruno Cornelis, Joeri Barbarien, Ann Dooms, Adrian Munteanu, Peter Schelkens, Vrije Univ. Brussel (Belgium) . . . . . [7073-63]

2:40 pm: **Acquisition and registration of aerial video imagery of urban traffic**, Rohan C. Loveland, Edward Rosten, Los Alamos National Lab. . . . . [7073-64]

3:00 pm: **High speed acquisition system of photo-colorimetric images to record and to model human visual signal**, Florian Greffier, Lab. des Ponts et Chaussées d'Angers; Vincent Boucher, Fabrice Fournela, Lab. des Ponts et Chaussées d'Angers (France) . . . . . [7073-67]

Courses of Related Interest

See SPIE Cashier for information and to register.

SC661 Advanced Image Processing and Applications (Iftekharuddin) Tuesday, 8:30 am to 5:30 pm
SC766 Information Processing for Video Surveillance (Ebrahimi, Dufaux) Monday, 8:30 am to 5:30 pm
NEW! SC913 Multivariate Analysis of Optical and Imaging Data (Bajorski) Monday, 8:30 am to 5:30 pm

Conference 7074

Sunday-Monday 10-11 August 2008 • Proceedings of SPIE Vol. 7074

Advanced Signal Processing Algorithms, Architectures, and Implementations XVIII

Conference Chair: **Franklin T. Luk,** Hong Kong Baptist Univ. (Hong Kong China)

Program Committee: **Leon Cohen,** Hunter College/CUNY; **W. Randolph Franklin,** Rensselaer Polytechnic Institute; **Patrick J. Loughlin,** Univ. of Pittsburgh; **V. Paul Pauca,** Wake Forest Univ.; **Daniel V. Rabinkin,** MIT Lincoln Lab.; **Xiaobai Sun,** Duke Univ.; **Alexandre F. Tenca,** Synopsys, Inc.; **William J. Williams,** Univ. of Michigan; **Kung Yao,** Univ. of California/Los Angeles

Sunday 10 August

SESSION 1

Room: Conv. Ctr. 5B . . . . . .Sun. 8:30 to 10:30 am

Computational and Array Imaging Systems I

Session Chair: **Xiaobai Sun,** Duke Univ.

8:30 am: **A fast variational method for solving a large system of linear equations with nonnegativity constraints**, Stephen G. Odaibo, Xiaobai Sun, Duke Univ. . . . . [7074-01]

8:50 am: **GPU implementations for fast factorizations of STAP covariance matrices** *(Invited Paper)*, Michael Roeder, Nolan R. Davis, Jeremy D. Furtek, Dennis C. Braunreiter, Science Applications International Corp.; Dennis Healy, DARPA Microsystems Technology Office . . . . . [7074-02]

9:10 am: **Accelerating nonuniform fast Fourier transform via reduction in memory access latency**, Nihshanka Debroy, Nikos P. Pitsianis, Xiaobai Sun, Duke Univ. . . . . [7074-03]

9:30 am: **Multi-dimensional FFT sequences on the cell**, Paolo Bientinesi, Nikos P. Pitsianis, Xiaobai Sun, Duke Univ. . . . . [7074-04]

9:50 am: **Object tracking in an omni-directional mosaic**, David Baran, Army Research Lab. . . . . [7074-05]

10:10 am: **DARPA STAP-BOY: graphics processing unit (GPU) implementation and tuning techniques for 3D object recognition and space-time adaptive processing**, Dennis M. Healy, Jr., DARPA; Dennis C. Braunreiter, Nolan R. Davis, Science Applications International Corp.; Xiaobai Sun, Nikos P. Pitsianis, Duke Univ.; Michael Roeder, Science Applications International Corp. . . . . [7074-06]

Coffee Break . . . . . 10:30 to 11:00 am

SESSION 2

Room: Conv. Ctr. 5B . . . . . Sun. 11:00 am to 12:20 pm

Computational and Array Imaging Systems II

Session Chair: **Daniel V. Rabinkin,** MIT Lincoln Lab.

11:00 am: **3D object matching on the GPU using spin-image surface matching** *(Invited Paper)*, Nolan R. Davis, Dennis C. Braunreiter, Cezario Tebcherani, Masatoshi Tanida, Science Applications International Corp. . . . . [7074-07]

11:20 am: **Real-time implementations of image background subtraction algorithms**, Ankit K. Jain, Daniel V. Rabinkin, MIT Lincoln Lab. . . . . [7074-08]

11:40 am: **A sharpness metric implementation for image processing applications with feedback**, Eric P. Lam, ThalesRaytheonSystems [7074-09]

12:00 pm: **Adaptive filter for reliable detection of a photoplethysmogram**, Omar Abdallah, Teresa Martinez Roca, Amparo Piera Tarazona, Armin Bolz, Univ. Karlsruhe (Germany). . . . . [7074-10]

Lunch Break . . . . . 12:20 to 1:50 pm

SESSION 3

Room: Conv. Ctr. 5B . . . . . Sun. 1:50 to 3:10 pm

Computational and Array Imaging Systems III

Session Chair: **Victor Paul Pauca,** Wake Forest Univ.

1:50 pm: **Superresolution imaging: a review**, Gabriel Cristóbal, Elena Gil, Consejo Superior de Investigaciones Científicas (Spain); Filip Sroubek, Akademie Ved Ceské Republiky (Czech Republic) . . . . . [7074-11]

2:10 pm: **Use of phase diversity for super-resolution image processing with lenslet arrays**, Victor P. Pauca, Todd C. Torgersen, Wake Forest Univ.; Joseph van der Gracht, HoloSpex, Inc.; Sudhakar Prasad, The Univ. of New Mexico; Robert J. Plemmons, Wake Forest Univ.. . . . . [7074-12]

2:30 pm: **Analytical Taylor series approximation of sub-pixel registration**, Qiang Zhang, Wake Forest Univ. . . . . [7074-13]

2:50 pm: **Multilevel image reconstruction by interpolating wavelet coefficients**, King Tai Leung, Hong Kong Baptist Univ. (Hong Kong China) . . . . . [7074-14]

Coffee Break . . . . . 3:10 to 3:40 pm

SESSION 4

Room: Conv. Ctr. 5B . . . . . Sun. 3:40 to 4:40 pm

Sensor Networks

Session Chair: **Kung Yao,** Univ. of California/Los Angeles

3:40 pm: **Simultaneous position and number of source estimate using random set theory**, Andreas M. Ali, Kung Yao, Univ. of California/Los Angeles . . . . . [7074-15]

4:00 pm: **Decision fusion in sensor networks based on likelihood ratio tests**, Wei-Ho Chung, Kung Yao, Univ. of California/Los Angeles . . . [7074-16]

4:20 pm: **Energy optimization for upstream data transfer in 802.15.4 beacon-enabled star formulation,** Hua Liu, Bhaskar Krishnamachari, Univ. of Southern California . . . . . [7074-17]

Room: Conv. Ctr. 6A . . . . . Sun. 6:00 to 6:45 pm

All-Conference Plenary Session

View plenary presentation details p. 13.

6:00 pm: **The Solar Decathlon: building a better future with solar energy**, Richard J. King, U.S. Dept. of Energy

Monday 11 August

SESSION 5

Room: Conv. Ctr. 5B . . . . . Mon. 8:30 to 10:10 am

Computer Arithmetic

Session Chair: **Daniel V. Rabinkin, MIT Lincoln Lab.**

8:30 am: **Design and FPGA implementation of complex multiply-add and other similar operators**, Milos D. Ercegovac, Pouya Dormiani, Univ. of California/Los Angeles . . . . . [7074-18]

8:50 am: **Design of reconfigurable operators at the computer arithmetic level**, José Lopes, Arnaud Tisserand, Univ. Montpellier II (France) . . [7074-19]

9:10 am: **Optimization of the final adder stage of fast multipliers**, Sabrina M. Smith, Sean Laughlin, Paul Zucknick, Earl E. Swartzlander, Jr., The Univ. of Texas at Austin . . . . . [7074-20]

9:30 am: **Floating point geometry**, Jean-Claude Bajard, Univ. Montpellier II (France); Dominique Michelucci, Univ. de Bourgogne (France); Philippe Langlois, Univ. de Perpignan (France); Nathalie Revol, École Normale Supérieure de Lyon (France) . . . . . [7074-21]

9:50 am: **A hardware error estimate for floating-point computations**, Javier D. Bruguera, Univ. de Santiago de Compostela (Spain); Tomas Lang, Univ. of California/Irvine . . . . . [7074-22]

Coffee Break . . . . . 10:10 to 10:40 am

SESSION 6

Room: Conv. Ctr. 5B . . . . . Mon. 10:40 am to 12:20 pm

Time-Frequency and Time-Scale Analysis I

Session Chairs: **Leon Cohen,** Hunter College/CUNY; **Patrick J. Loughlin,** Univ. of Pittsburgh

This Session is organized in Honor of Prof. William J. Williams

10:40 am: **Construction of time-frequency distributions**, Leon Cohen, Hunter College/CUNY . . . . . [7074-23]

11:00 am: **Directed information measures for structure discovery**, Alfred O. Hero III, Univ. of Michigan . . . . . [7074-24]

11:20 am: **Time-frequency analysis for the study of phase synchrony in the brain**, Selin Aviyente, Michigan State Univ. . . . . [7074-25]

11:40 am: **Band-limits and coherent modulation filtering of non-stationary signals**, Pascal Clark, Les E. Atlas, Univ. of Washington . . . . . [7074-26]

12:00 pm: **Separating cognitive processes with principal components analysis of EEG time-frequency distributions**, Edward M. Bernat, Lindsay D. Nelson, Univ. of Minnesota; Clay B. Holroyd, Univ. of Victoria (Canada); William J. Gehring, Univ. of Michigan; Christopher J. Patrick, Univ. of Minnesota . . . . . [7074-27]

Lunch Break . . . . . 12:20 to 1:50 pm

SESSION 7

Room: Conv. Ctr. 5B . . . . . Mon. 1:50 to 5:40 pm

Time-Frequency and Time-Scale Analysis II

Session Chairs: **Leon Cohen,** Hunter College/CUNY; **Patrick J. Loughlin,** Univ. of Pittsburgh

This Session is organized in Honor of Prof. William J. Williams

1:50 pm: **Defining large scale brain networks in epilepsy**, Hitten P. Zaveri, Yale Univ. . . . . [7074-28]

2:10 pm: **Psychoacoustic speech feature optimization through adaptive generalized scale transforms**, Robert M. Nickel, Bucknell Univ. . . . [7074-29]

2:30 pm: **Estimating delay and doppler from a super resolution delay function**, Douglas J. Nelson, U.S. Dept. of Defense . . . . . [7074-30]

2:50 pm: **Heart sounds identified by time-frequency methods help discriminate supraventricular from ventricular tachyarrhythmias**, Mark L. Brown, Univ. of Michigan . . . . . [7074-31]

Coffee Break . . . . . 3:10 to 3:40 pm

3:40 pm: **Positive time-frequency distributions and moments**, Patrick J. Loughlin, Univ. of Pittsburgh . . . . . [7074-32]

4:00 pm: **Applications of time-frequency analysis for aging aircraft component diagnostics and prognostics**, Kwangik Cho, John T. Abrams, Nicholas Goodman, Ronak Shah, Yong-June Shin, Abdel Bayoumi, Univ. of South Carolina. . . . . [7074-33]

4:20 pm: **Image analysis through high-order entropy measures extracted from time-frequency representations**, Gabriel Cristóbal, Salvador Gabarda, Consejo Superior de Investigaciones Científicas (Spain) . . . . . [7074-34]

4:40 pm: **A comparison of two methods for joint time-scale and TDOA estimation for geolocation of electromagnetic transmitters**, David C. Smith, Douglas J. Nelson, U.S. Dept. of Defense . . . . . [7074-35]

5:00 pm: **A spectral estimation method by non-equinterval smoothing of log periodogram**, Hisashi Yoshida, Isao Fujimoto, Sho Kikkawa, Kinki Univ. (Japan) . . . . . [7074-37]

5:20 pm: **Quantitative analysis of tomographic images using the Bayes Inference Engine (BIE)**, Greg Cunningham, U.S. Patent and Trademark Office . . . . . [7074-38]

Conference 7075

Tuesday-Wednesday 12-13 August 2008 • Proceedings of SPIE Vol. 7075

Mathematics of Data/Image Pattern Recognition, Compression, and Encryption with Applications XI

Conference Chairs: **Mark S. Schmalz,** Univ. of Florida; **Gerhard X. Ritter,** Univ. of Florida; **Junior Barrera,** Univ. de São Paulo (Brazil); **Jaakko T. Astola,** Tampere Univ. of Technology (Finland)

Program Committee: **Stefano Baronti,** Istituto di Fisica Applicata Nello Carrara (Italy); **Mark L. Fowler,** Binghamton Univ.; **Victoria T. Franques,** U.S. Dept. of Energy; **Andrea Garzelli,** Univ. degli Studi di Siena (Italy); **Abdelsalam A. Helal,** Univ. of Florida; **Lifford McLauchlan,** Texas A&M Univ.; **Daniel S. Myers,** Sandia National Labs.; **James F. Scholl,** College of Optical Sciences/The Univ. of Arizona

Tuesday 12 August

Room: Conv. Ctr. 5B . . . . . .Tues. 8:30 to 8:35 am

Introductory Remarks

Mark Schmalz, Conference Chair

SESSION 1

Room: Conv. Ctr. 5B . . . . . .Tues. 8:35 to 10:15 am

Compression I

Session Chair: **Mark L. Fowler,** Binghamton Univ.

8:35 am: **Data compression in emitter location systems via sensor pairing and selection**, Xi Hu, Mark L. Fowler, Binghamton Univ. . . . . [7075-01]

9:00 am: **Impact of signal model on data compression for TDOA/FDOA emitter location**, Mark L. Fowler, Xi Hu, Binghamton Univ. . . . . [7075-02]

9:25 am: **Performance analysis of object-based video compression**, Mark S. Schmalz, Univ. of Florida . . . . . [7075-03]

9:50 am: **Impact of wavelet types on image data characteristics during compression**, Daniel S. Myers, Sandia National Labs. . . . . [7075-04]

Coffee Break . . . . . 10:15 to 10:35 am

SESSION 2

Room: Conv. Ctr. 5B . . . . . .Tues. 10:35 to 11:50 am

Compression II

Session Chair: **Mark S. Schmalz,** Univ. of Florida

10:35 am: **Perceptual optimization of image coding based on a HVS model with eye tracking**, Karel Fliegel, Czech Technical Univ. in Prague (Czech Republic) . . . . . [7075-05]

11:00 am: **Analysis of compression of 4D volumetric medical image datasets using multi-view (MVC) video coding methods**, Uwe-Erik Martin, Siemens Medical Solutions (Germany); André Kaup, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany) . . . . . [7075-06]

11:25 am: **Permutation-based codebook approach**, Ziya Arnavut, Meral Arnavut, SUNY Fredonia . . . . . [7075-08]

Lunch/Exhibition Break . . . . . 11:50 am to 1:30 pm

SESSION 3

Room: Conv. Ctr. 5B . . . . . Tues. 1:30 to 2:45 pm

Watermarking and Authentication I

Session Chair: **James F. Scholl,** College of Optical Sciences/The Univ. of Arizona

1:30 pm: **A comparative study on insertion strategies in MPEG 4 AVC watermarking**, Sorin A. Duta, Mihai P. Mitrea, Maher Belhaj, Françoise J. Prêteux, Institut National des Télécommunications (France) . . . . . [7075-09]

1:55 pm: **GLCM and neural network based watermark identification**, Lifford McLauchlan, Texas A&M Univ.; Mehrube Mehrubeoglu, Texas A&M Univ.-Corpus Christi . . . . . [7075-10]

2:20 pm: **Neural network-based watermark embedding and identification**, Lifford McLauchlan, Texas A&M Univ.; Mehrube Mehrubeoglu, Texas A&M Univ.-Corpus Christi . . . . . [7075-11]

Coffee Break . . . . . 2:45 to 3:15 pm

SESSION 4

Room: Conv. Ctr. 5B . . . . . Tues. 3:15 to 4:05 pm

Watermarking and Authentication II

Session Chair: **Lifford McLauchlan,** Texas A&M Univ.

3:15 pm: **Theoretical limits versus practical solutions in DWT video watermarking,** Corneliu Dumitru, Mihai P. Mitrea, Françoise J. Prêteux, Institut National des Télécommunications (France) . . . . . [7075-12]

3:40 pm: **A watermarking benchmark and tutorial tool for Matlab**, Kevin Heylen, Hogeschool Antwerpen (Belgium); Tim Dams, Hogeschool Antwerpen (Belgium) and Vrije Univ. Brussel (Belgium); Ann Dooms, Vrije Univ. Brussel (Belgium) . . . . . [7075-13]

Room: Conv. Ctr. 5B . . . . . Tues. 4:05 to 5:00 pm

Panel Discussion

Wednesday 13 August

Room: Conv. Ctr. 5B . . . . . Wed. 8:30 to 8:35 am

Introductory Remarks

Gerhard Ritter, Conference Chair

SESSION 5

Room: Conv. Ctr. 5B . . . . . Wed. 8:30 to 9:45 am

Error Analysis

Session Chair: **Mark S. Schmalz,** Univ. of Florida

8:30 am: **The optimum approximation of an orthogonal expansion having bounded higher order correlations of stochastic coefficients**, Yuichi Kida, Ohu Univ. (Japan); Takuro Kida, Nihon Univ. (Japan) . . . . . [7075-15]

8:55 am: **Simultaneous minimization of various worst case measures of error in FIR filter bank**, Yuichi Kida, Ohu Univ. (Japan); Takuro Kida, Nihon Univ. (Japan) . . . . . [7075-16]

9:20 am: **Exact accounting of bit errors in floating-point computations**, Mark S. Schmalz, Univ. of Florida . . . . . [7075-17]

Coffee Break . . . . . 9:50 to 10:10 am

SESSION 6

Room: Conv. Ctr. 5B . . . . . Wed. 10:10 to 11:50 am

Hyperspectral Imaging and Processing

Session Chair: **Gerhard X. Ritter,** Univ. of Florida

10:10 am: **Hyperspectral imaging of non-stellar astronomical objects**, James F. Scholl, College of Optical Sciences/The Univ. of Arizona; E. Keith Hege, MKS Imaging Technology, LLC and The Univ. of Arizona/Steward Observatory; Michael Lloyd-Hart, The Univ. of Arizona/Steward Observatory; Daniel G. O'Connell, Hnu Photonics . . . . . [7075-19]

10:35 am: **A novel approach for fuzzy edge detection using Type II fuzzy sets**, Vamsi Krishna Madasu, The Univ. of Queensland (Australia); Hanmandlu Madasu, Indian Institute of Technology Delhi (India); Shantaram Vasikarla, American InterContinental Univ.-Los Angeles . . . . . [7075-20]

11:00 am: **The compensation method for quantitative observation of multicolor fluorescence with non-linear mapping**, Soichiro Morishita, The Univ. of Tokyo (Japan); Hideo Yokota, The Institute of Physical and Chemical Research (Japan); Hajime Asama, The Univ. of Tokyo (Japan); Ryutaro Himeno, The Institute of Physical and Chemical Research (Japan); Taketoshi Mishima, Saitama Univ. (Japan) . . . . . [7075-22]

11:25 am: **A new quality assessment index for compressed remote sensing image,** Liang Zhai, Chinese Academy of Surveying and Mapping (China) . . . . . [7075-23]

Room: Conv. Ctr. 5B . . . . . Wed. 11:50 am

Panel Discussion

Room: Conv. Ctr. Exhibit Hall B2 . . . . . Wed. 5:30 to 7:00 pm

Posters-Wednesday

Poster authors will begin displaying posters after 10:00 am Wednesday morning. A poster session, with authors present at their posters, will be held Wednesday evening from 5:30 to 7:00 pm. Light refreshments will be served.

Poster Setup

Poster presenters must set up their posters between 10:00 am and 5:00 pm on Wednesday. Poster presenters who have not set up by 5:00 pm on Wednesday will be considered a "no show" and their manuscript will not be published. Presenters must remove their posters immediately after the poster session. Posters not removed will be considered unwanted and will be discarded. SPIE assumes no responsibility for posters left up after the end of each poster session.

Dynamic mixing kernels in Gaussian Mixture Classifier for Hyperspectral Classification, Vikram Jayaram, University of Texas at El Paso . . . . [7075-29]

Video noise reduction employing a Bessel k-form prior with local parameters for modeling contourlet coefficients, Hossein Rabbani, Amirkabir Univ. of Technology (Iran) . . . . . [7075-28]

Finding the temperature using image analysis techniques, Ana Oprisan, Sorinel Oprisan, College of Charleston; John Hegseth, Univ. of New Orleans; Yves Garrabos, Institut de Chimie de la Matière Condensée de Bordeaux (France); Daniel Beysens, Lab. de Physique et Mécanique des Milieux Hétérogènes (France) . . . . . [7075-27]

Contourlet transform-based algorithm for enhancement of capillary microscopic images, Yuan Chen, Zhimin Zhao, Lei Liu, Min Zheng, Nanjing Univ. of Aeronautics and Astronautics (China) . . . . . [7075-24]

A Radix 4 based system for information theory, Bradley S. Tice, Advanced Human Design . . . . . [7075-32]

A comparison of a Radix 2 and a Radix 5 based systems, Bradley S. Tice, Advanced Human Design . . . . . [7075-26]

The analysis of binary, ternary and quaternary-based systems for communications theory, Bradley S. Tice, Advanced Human Design[7075-30]

Adaptive attacks against DCT-based watermarking, Tao Zhang, Tsinghua Univ. (China) . . . . . [7075-31]

Courses of Related Interest

See SPIE Cashier for information and to register.

SC661 Advanced Image Processing and Applications (Iftekharuddin) Tuesday, 8:30 am to 5:30 pm
SC766 Information Processing for Video Surveillance (Ebrahimi, Dufaux) Monday, 8:30 am to 5:30 pm
NEW! SC913 Multivariate Analysis of Optical and Imaging Data (Bajorski) Monday, 8:30 am to 5:30 pm

Conference 7076

Monday-Tuesday 11-12 August 2008 • Proceedings of SPIE Vol. 7076

Image Reconstruction from Incomplete Data V

Conference Chairs: **Philip J. Bones,** Univ. of Canterbury (New Zealand); **Michael A. Fiddy,** The Univ. of North Carolina at Charlotte; **Rick P. Millane,** Univ. of Canterbury (New Zealand)

Program Committee: **Mark A. Anastasio,** Illinois Institute of Technology; **David J. Brady,** Duke Univ.; **Julian C. Christou,** Univ. of California/ Santa Cruz; **Peter C. Doerschuk,** Cornell Univ.; **James R. Fienup,** Univ. of Rochester; **Andrew J. Lambert,** Univ. of New South Wales (Australia); **Richard G. Lane,** ARANZ Ltd. (New Zealand); **Marc Saillard,** Univ. de Toulon et du var (France); **Markus E. Testorf,** Dartmouth College; **Kevin J. Webb,** Purdue Univ.; **Jong-Chul Ye,** Korea Advanced Institute of Science and Technology (South Korea)

Monday 11 August

Room: Conv. Ctr. 1B . . . . . Mon. 8:50 to 9:00 am

Opening Remarks

Michael A. Fiddy, The Univ. of North Carolina at Charlotte

SESSION 1

Room: Conv. Ctr. 1B . . . . . Mon. 9:00 to 10:10 am

Sampling and Aperture Coding

Session Chair: **Michael A. Fiddy,** The Univ. of North Carolina at Charlotte

9:00 am: **Spectral image reconstruction techniques for a coded aperture snapshot spectral imager** *(Invited Paper)*, Ashwin Wagadarikar, Nikos P. Pitsianis, Xiaobai Sun, David J. Brady, Duke Univ.. . . . . [7076-11]

9:30 am: **Towards direct implementation of compressed sensing for MRI**, Philip J. Bones, Bing Wu, Univ. of Canterbury (New Zealand) . . . . . [7076-20]

9:50 am: **Spatio-temporal sampling for video**, Nikos P. Pitsianis, David J. Brady, Duke Univ. . . . . [7076-12]

Coffee Break . . . . . 10:10 to 10:50 am

SESSION 2

Room: Conv. Ctr. 1B . . . . . Mon. 10:50 am to 12:10 pm

Tomography and Inverse Scattering

Session Chair: **Andrew J. Lambert,** Univ. of New South Wales/ Australian Defence Force Academy (Australia)

10:50 am: **Multi-spectral intensity diffraction tomography**, Mark A. Anastasio, Qiaofeng Xu, Illinois Institute of Technology; Daxin Shi, Toshiba Medical Research Institute USA . . . . . [7076-10]

11:10 am: **Inversion of strongly scattered data: shape and permittivity recovery**, Umer Shahid, The Univ. of North Carolina at Charlotte; Markus E. Testorf, Dartmouth College; Michael A. Fiddy, The Univ. of North Carolina at Charlotte . . . . . [7076-15]

11:30 am: **Evaluation of surrogate data quality in sinogram-based CT metal-artefact reduction**, May Oehler, Bärbel Kratz, Jan Mueller, Tobias Knopp, Thorsten M. Buzug, Univ. zu Lübeck (Germany) . . . . . [7076-04]

11:50 am: **An EM-like optimization scheme for diffuse optical tomography**, Caifang Wang, Ming Jiang, Peking Univ. (China) . . . . . [7076-05]

Lunch Break . . . . . 12:10 to 1: 40 pm

SESSION 3

Room: Conv. Ctr. 1B . . . . . Mon. 1:40 to 3:00 pm

Phase Retrieval

1:40 pm: **Advancements in ptychographical coherent diffractive imaging**, Andreas Menzel, Pierre Thibault, Paul Scherrer Institut (Switzerland); Martin Dierolf, Paul Scherrer Institut (Switzerland) and Univ. Ulm (Germany); Oliver Bunk, Christian David, Paul Scherrer Institut (Switzerland); Franz Pfeiffer, Paul Scherrer Institut (Switzerland) and Ecole Polytechnique Fédérale de Lausanne (Switzerland) . . . . . [7076-06]

2:00 pm: **Image reconstruction by phase retrieval with transverse translation diversity**, Manuel Guizar-Sicairos, James R. Fienup, Univ. of Rochester . . . . . [7076-02]

2:20 pm: **Iterative projection algorithms for reconstructing compact binary imagests**, Victor Lo, Rick P. Millane, Univ. of Canterbury (New Zealand). . . . . [7076-03]

2:40 pm: **Experimental approaches to x-ray phase-retrieval for nano-resolution diffraction imaging**, Andrei Y. Nikulin, Monash Univ. (Australia). . . . . [7076-14]

Coffee Break . . . . . 3:00 to 3:40 pm

SESSION 4

Room: Conv. Ctr. 1B . . . . . Mon. 3:40 to 4:40 pm

Imaging through Turbulence

Session Chair: **Mark A. Anastasio,** Illinois Institute of Technology

3:40 pm: **Turbulence profiling for long range surveillance imaging**, Andrew J. Lambert, Donald Fraser, David Bowman, Shane Brandon, John Davies, Univ. of New South Wales/Australian Defence Force Academy (Australia). . . . . [7076-16]

4:00 pm: **Superresolution in dewarped anisoplanatic images**, Mikhail I. Charnotskii, Zel Technologies, LLC and National Oceanic and Atmospheric Administration . . . . . [7076-01]

4:20 pm: **Self-tuning Kalman filter estimation of atmospheric warp**, Murat Tahtali, Andrew J. Lambert, Donald Fraser, Univ. of New South Wales/ Australian Defence Force Academy (Australia) . . . . . [7076-13]

Tuesday 12 August

SESSION 5

Room: Conv. Ctr. 1B . . . . . Tues. 9:00 to 9:30 am

Invited Presentation

Session Chair: **Rick P. Millane,** Univ. of Canterbury (New Zealand)

9:00 am: **Image reconstruction in electron microscopy,** Peter C. Doerschuk, Cornell Univ.. . . . . [7076-21]

SESSION 6

Room: Conv. Ctr. 1B . . . . . .Tues. 9:30 to 10:20 am

Motion Compensation in MRI

Session Chair: **Rick P. Millane,** Univ. of Canterbury (New Zealand)

9:30 am: **Robust least squares approach to motion correction in MRI** *(Invited Paper)*, Philip J. Bones, Univ. of Canterbury (New Zealand); Julian R. Maclaren, Univ. Hospital Freiburg (Germany) . . . . . [7076-19]

10:00 am: **Radial k-t FOCUSS using motion estimation and compensation**, Hong Jung, Jaeheung Yoo, Jong-Chul Ye, Korea Advanced Institute of Science and Technology (South Korea) . . . . . [7076-17]

Coffee Break . . . . . 10:20 ro 10:50 am

SESSION 7

Room: Conv. Ctr. 1B . . . . . Tues. 10:50 am to 12:10 pm

Deconvolution and Superresolution

Session Chair: **Philip J. Bones,** Univ. of Canterbury (New Zealand)

10:50 am: **Wiener filtering of aliased imagery**, Samuel T. Thurman, James R. Fienup, Univ. of Rochester . . . . . [7076-09]

11:10 am: **Superresolution capabilities of 3D optical filters**, Michael A. Fiddy, The Univ. of North Carolina at Charlotte; Markus E. Testorf, Dartmouth College . . . . . [7076-18]

11:30 am: **Processing and restoration of the astronomical image data obtained from UWFC optical system**, Martin Rerabek, Czech Technical Univ. in Prague (Czech Republic) . . . . . [7076-08]

11:50 am: **Selected examples of deconvolution image processing in multimedia technology,** Daniel Kekrt, Milos Klima, Karel Fliegel, Czech Technical Univ. in Prague (Czech Republic) . . . . . [7076-07

Room: Conv. Ctr. 1B . . . . . .Tues. 12:10 to 12:20 pm

Closing Remarks

Philip J. Bones, Univ. of Canterbury (New Zealand)

Courses of Related Interest

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SC661 Advanced Image Processing and Applications (Iftekharuddin) Tuesday, 8:30 am to 5:30 pm
SC766 Information Processing for Video Surveillance (Ebrahimi, Dufaux) Monday, 8:30 am to 5:30 pm
NEW! SC913 Multivariate Analysis of Optical and Imaging Data (Bajorski) Monday, 8:30 am to 5:30 pm

Conference 7077

Monday-Wednesday 11-13 August 2008 • Proceedings of SPIE Vol. 7077

Advances in X-Ray/EUV Optics and Components III

Conference Chairs: **Ali M. Khounsary,** Argonne National Lab.; **Christian Morawe,** European Synchrotron Radiation Facility (France); **Shunji Goto,** Japan Synchrotron Radiation Research Institute (Japan)

Program Committee: **John R. Arthur,** Stanford Synchrotron Radiation Lab.; **Lahsen Assoufid,** Argonne National Lab.; **Stefan Braun,** Fraunhofer-Institut für Werkstoff- und Strahltechnik (Germany); **Shih-Lin Chang,** National Tsing Hua Univ. (Taiwan); **Sultan B. Dabagov,** Istituto Nazionale di Fisica Nucleare (Italy); **Ralf D. Geckeler,** Physikalisch-Technische Bundesanstalt (Germany); **Hans M. Hertz,** Kungliga Tekniska Högskolan (Sweden); **Werner H. Jark,** Sincrotrone Trieste S.C.p.A. (Italy); **Alexander Yu. Kazimirov,** Cornell Univ.; **Igor V. Kozhevnikov,** A.V. Shubnikov Institute of Crystallography (Russia); **George A. Kyrala,** Los Alamos National Lab.; **Carolyn A. MacDonald,** SUNY/Univ. at Albany; **Kazuya Ota,** Nikon (Japan); **Howard A. Padmore,** Lawrence Berkeley National Lab.; **Ladislav Pina,** Czech Technical Univ. in Prague (Czech Republic); **Michael James Pivovaroff,** Lawrence Livermore National Lab.; **Yuriy Ya Platonov,** Rigaku/MSC, Inc.; **Seungyu Rah,** Pohang Univ. of Science and Technology (South Korea); **Kawal J. S. Sawhney,** Diamond Light Source Ltd. (United Kingdom); **Anatoly A. Snigirev,** European Synchrotron Radiation Facility (France); **Regina Soufli,** Lawrence Livermore National Lab.; **Peter Z. Takacs,** Brookhaven National Lab.; **Kai Tiedtke,** Deutsches Elektronen-Synchrotron (Germany); **Makina Yabashi,** Japan Synchrotron Radiation Research Institute (Japan); **Kazuto Yamauchi,** Osaka Univ. (Japan); **Brian W. Yates,** Canadian Light Source Inc. (Canada)

Monday 11 August

SESSION 1

Room: Conv. Ctr. 4 . . . . . Mon. 8:00 to 9:50 am

Multilayers

Session Chair: **Christian Morawe,** European Synchrotron Radiation Facility (France)

8:00 am: **Multilayer optics under CHESS A2 wiggler beam**, Alexander Y. Kazimirov, Peter Revesz, Cornell Univ.; Rong Huang, Argonne National Lab. . . . . [7077-01]

8:15 am: **Ion beam sputtering of multilayer x-ray optics**, Peter Gawlitza, Stefan Braun, Sebastian Lipfert, Andreas Leson, Fraunhofer-Institut für Werkstoff- und Strahltechnik (Germany) . . . . . [7077-02]

8:30 am: **Surface roughness analysis of multilayer x-ray optics**, Vladimir V. Martynov, Rigaku Innovative Technologies, Inc.; Yuriy Platonov, Rigaku/MSC, Inc.. . . . . [7077-03]

8:45 am: **Mono- and multi-layer mirrors for current and next-generation light sources**, Michael Störmer, Christian Horstmann, GKSS-Forschungszentrum Geeshacht, GmbH (Germany); Dietrich Häussler, Wolfgang Jäger, Christian-Albrechts-Univ. zu Kiel (Germany); Frank Hertlein, Jörg Wiesmann, Carsten Michaelsen, Incoatec GmbH (Germany); Rüdiger Bormann, GKSS-Forschungszentrum Geeshacht, GmbH (Germany) [7077-04]

9:00 am: **Development and status of depth-graded multilayers for x-ray and neutrons in IPOE**, Zhanshan Wang, Zhong Zhang, Fengli Wang, Xinbin Cheng, Jing Xu, Jingtao Zhu, Baozhong Mu, Lingyan Chen, Tongji Univ. (China) . . . . . [7077-05]

9:15 am: **Design and fabrication of the chirped multilayer mirror in the extreme ultraviolet region for subfemtosecond pulses**, Fengli Wang, Rui Chen, Zhanshan Wang, Jing Xu, Baozhong Mu, Zhong Zhang, Jingtao Zhu, Lingyan Chen, Tongji Univ. (China) . . . . . [7077-06]

9:30 am: **Fabrication and characterization of a new high density Sc/Si multilayer sliced grating**, Dmitriy L. Voronov, Rossana Cambie, Eric M. Gullikson, Valeriy V. Yashchuk, Howard A. Padmore, Lawrence Berkeley National Lab.; Yuriy P. Pershyn, Alexander G. Ponomarenko, Valeriy V. Kondratenko, Kharkov Polytechnical Institute (Ukraine) . . . . . [7077-07]

Coffee Break . . . . . 9:50 to 10:30 am

SESSION 2

Room: Conv. Ctr. 4 . . . . . Mon. 10:30 am to 12:15 pm

Mirrors + Metrology

Session Chair: **Ali M. Khounsary,** Argonne National Lab.

10:30 am: **Development of adaptive mirror for wavefront correction of hard x-ray nanobeam**, Takashi Kimura, Soichiro Handa, Hidekazu Mimura, Osaka Univ. (Japan); Hirokatsu Yumoto, Japan Synchrotron Radiation Research Institute (Japan); Daisuke Yamakawa, Satoshi Matsuyama, Hasuhisa Sano, Osaka Univ. (Japan); Kenji Tamasaku, Yoshinori Nishino, The Institute of Physical and Chemical Research (Japan); Makina Yabashi, Japan Synchrotron Radiation Research Institute (Japan); Tetsuya Ishikawa, The Institute of Physical and Chemical Research (Japan); Kazuto Yamauchi, Osaka Univ. (Japan) and Research Ctr. for Ultra-Precision Science and Technology (Japan). . . . . [7077-09]

10:45 am: **Performance of the upgraded LTP-II at the ALS Optical Metrology Laboratory**, Jonathan L. Kirschman, Edward E. Domning, Wayne R. McKinney, Gregory Y. Morrison, Brian V. Smith, Valeriy V. Yashchuk, Lawrence Berkeley National Lab. . . . . [7077-10]

11:00 am: **Distance dependent influences on angle metrology with autocollimators in deflectometry**, Ralf D. Geckeler, Andreas Just, Physikalisch-Technische Bundesanstalt (Germany) . . . . . [7077-11]

11:15 am: **Development of a surface gradient integrated profiler**, Yasuo Higashi, High Energy Accelerator Research Organization (Japan) . . . [7077-12]

11:30 am: **Statistical analysis of the metrological properties of float glass**, Brian W. Yates, Alan M. Duffy, Canadian Light Source Inc. (Canada) [7077-13]

11:45 am: **Opto-mechanical design considerations for the Linac coherent light source x-ray mirror system**, Thomas J. McCarville, Regina Soufli, Michael J. Pivovaroff, Richard M. Bionta, Lawrence Livermore National Lab.; Peter M. Stefan, Stanford Linear Accelerator Ctr.; Bruce W. Woods, Lawrence Livermore National Lab. . . . . [7077-14]

12:00 pm: **Correction of optical distortions in projection lithography system at 13,5 nm**, Sergey A. Dimakov, Andrey A. Mak, S.I. Vavilov State Optical Institute (Russia) . . . . . [7077-16]

Lunch Break . . . . . 12:15 to 2:00 pm

SESSION 3

Room: Conv. Ctr. 4 . . . . . Mon. 2:00 to 3:00 pm

X-Ray Lenses

Session Chair: **Werner H. Jark,** (Italy)

2:00 pm: **Numerical simulations of achromatic x-ray lenses**, Marion Umbach, Forschungszentrum Karlsruhe (Germany); Vladimir P. Nazmov, Elena F. Reznikova, Univ. Karlsruhe (Germany); Markus Simon, Forschungszentrum Karlsruhe (Germany); Arndt Last, Univ. Karlsruhe (Germany); Volker Saile, Univ. Karlsruhe and Forschungszentrum Karlsruhe (Germany) . . . . . [7077-17]

2:15 pm: **X-ray imaging with compound refractive lens and microfocus x-ray tube**, Ladislav Pina, Czech Technical Univ. (Czech Republic); Yury Dudchik, Belarusian State Univ. (Belarus); Vaclav Jelinek, Reflex s.r.o. (Czech Republic) . . . . . [7077-18]

2:30 pm: **Transmission hard x-ray microscope using planar crossed SU-8 parabolic objective and condenser**, Elena Reznikova, Rolf Simon, Vladimir P. Nazmov, Markus Simon, Arndt Last, Volker Saile, Forschungszentrum Karlsruhe (Germany) . . . . . [7077-19]

2:45 pm: **Multi-plate crystal cavity with compound refractive lenses**, Shih-Lin Chang, Sung-Yu Chen, Ying-Yi Chang, National Tsing Hua Univ. (Taiwan); Mau-Tsu Tang, Yuriy P. Stetsko, National Synchrotron Radiation Research Ctr. (Taiwan); Makina Yabashi, Japan Synchrotron Radiation Research Institute (Japan); Hsueh-Hung Wu, National Synchrotron Radiation Research Ctr. (Taiwan); Yen-Ru Lee, National Tsing Hua Univ. (Taiwan); Bo-Yuan Shew, National Synchrotron Radiation Research Ctr. (Taiwan). . . . . [7077-20]

Coffee Break . . . . . 3:00 to 3:30 pm

SESSION 4

Room: Conv. Ctr. 4 . . . . . Mon. 3:30 to 4:45 pm

Crystals + Diffraction

Session Chair: **Shunji Goto,** Japan Synchrotron Radiation Research Institute (Japan)

3:30 pm: **Diffraction imaging with conventional sources**, Carolyn A. MacDonald, Wei Zhou, Ayhan Bingolbali, SUNY/Univ. at Albany. . . . [7077-21]

3:45 pm: **Diffraction of a focused x-ray beam by a strained silicon layer**, Alexander Y. Kazimirov, Cornell Univ.; Zhonghou Cai, Argonne National Lab.; Victor G. Kohn, Russian Research Ctr. Kurchatov Institute (Russia) . [7077-22]

4:00 pm: **Focused beam powder diffraction with polycapillary and bent crystal optics**, Carolyn A. MacDonald, Ayhan Bingolbali, Wei Zhou, SUNY/Univ. at Albany . . . . . [7077-23]

4:15 pm: **Investigation of polycrystalline structure of CVD diamond using white-beam x-ray diffraction**, Alexey Souvorov, Kentaro Kajiwara, Hiroaki Kimura, Shunji Goto, Japan Synchrotron Radiation Research Institute (Japan); Tetsuya Ishikawa, The Institute of Physical and Chemical Research (Japan). . . . . [7077-24]

4:30 pm: **Mosaic GaAs crystals for hard x-ray astronomy,** Claudio Ferrari, Lucio Zanotti, Andrea Zappettini, Consiglio Nazionale delle Ricerche (Italy); Stephen Arumainathan, Univ. of Madras (India) . . . . . [7077-25]

Room: Conv. Ctr. Exhibit Hall B2 . . . . . Mon. 6:00 to 7:30 pm

Posters-Monday

Poster authors will begin displaying posters after 10:00 am Monday morning. A poster session, with authors present at their posters, will be held Monday evening from 6:00 to 7:30 pm. Light refreshments will be served.

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Crystal quality analysis and improvement using x-ray tomography, Jozef Maj, K. Goetze, Albert T. Macrander, Yuncheng Zhong, X. Huang, Argonne National Lab.; L. Maj, The Univ. of Chicago . . . . . [7077-52]

Calibration of MCP transmissivity from 2-5.5keV, Cao Zhurong, China Academy of Engineering Physics (China) . . . . . [7077-54]

Ray traces of an arbitrarily deformed double-crystal Laue x-ray monochromator, John P. Sutter, Thomas Connolley, Michael Drakopoulos, Timothy P. Hill, Doug W. Sharp, Diamond Light Source Ltd. (United Kingdom) [7077-55]

Mo/B4C multilayer mirrors at wavelength of 7 nm, Zhong Zhang, Zhanshan Wang, Huijing Zhang, Jingtao Zhu, Shuji Qin, Lingyan Chen, Tongji Univ. (China) . . . . . [7077-56]

Diamond detectors for x-ray spectroscopy, Marco Girolami, Paolo Allegrini, Gennaro Conte, Andrea Fabbri, Eleuterio Spiriti, Stefano Salvatori, Univ. degli Studi di Roma Tre (Italy) . . . . . [7077-57]

X-ray prism lenses with large apertures, Markus Simon, Elena Reznikova, Forschungszentrum Karlsruhe (Germany); Vladimir Nazmov, Arndt Last, Univ. Karlsruhe (Germany) . . . . . [7077-58]

EUV polarimetry with single multilayer optical element, Sara Zuccon, Maria-Guglielmina Pelizzo, Piergiorgio Nicolosi, Univ. degli Studi di Padova (Italy); Angelo Giglia, Nicola Mahne, Stefano Nannarone, Consiglio Nazionale delle Ricerche (Italy) . . . . . [7077-59]

Avalanche photodiode time-resolved diagnostics for interaction experiment, Josef Blazej, Czech Technical Univ. in Prague (Czech Republic); Ladislav Pina, Czech Technical Univ. in Prague (Czech Republic) and Reflex s.r.o. (Czech Republic); Miroslava Vrbova, Alexandr Jancarek, Ivan Prochazka, Czech Technical Univ. in Prague (Czech Republic) . . . . . [7077-60]

Graded multilayer mirrors for the "carbon window" Schwarzschild objective, Igor A. Artyukov, P.N. Lebedev Physical Institute (Russia); Yegor A. Bugaev, Oleksandr Y. Devizenko, Valeri V. Kondratenko, Dmytro L. Voronov, Kharkov Polytechnic Institute (Ukraine); Eric M. Gullikson, Lawrence Berkeley National Lab.; Yuri A. Uspenski, Alexander V. Vinogradov, P.N. Lebedev Physical Institute (Russia) . . . . . [7077-61]

Development of an extreme ultraviolet imaging spectrometer for the Telescope Observatory for Planets on Small-satellite (TOPS) mission, Ichiro Yoshikawa, Takenori Toyota, Kazuo Yoshioka, Go Murakami, The Univ. of Tokyo (Japan) . . . . . [7077-62]

Development of EUV multilayer mirrors for astronomical observation in IPOE, Jingtao Zhu, Zhanshan Wang, Zhong Zhang, Jing Xu, Fengli Wang, Lingyan Chen, Tongji Univ. (China) . . . . . [7077-63]

Enhanced reflectivity and stability of high-temperature LPP collector mirrors for EUV lithography, Torsten Feigl, Sergiy A. Yulin, Nicolas Benoit, Marco Perske, Mark Schürmann, Norbert Kaiser, Fraunhofer-Institut für Angewandte Optik und Feinmechanik (Germany); Norbert R. Bowering, Oleg V. Khodykin, Igor V. Fomenkov, David C. Brandt, Cymer, Inc. . . . . [7077-64]

The role of spatial coherence, diffraction and refraction in the focusing of x-rays with prism arrays of the Clessidra type, Werner H. Jark, Sincrotrone Trieste (Italy); Liberato De Caro, Istituto di Cristallografia/CNR (Italy); Marco Matteucci, Sincrotrone Trieste (Italy). . . . . [7077-65]

Multilayers and crystals for a multi-band pass monochromator, Renfei Feng, Canadian Light Source, Inc. (Canada); Yurig Platonov, Nick Grupido, Rigaku Innovative Technologies, Inc.; Gene Ice, Oak Ridge National Lab.; Stewart McIntyre, Univ. of Western Ontario (Canada) . . . . . [7077-66]

Tuesday 12 August

SESSION 5

Room: Conv. Ctr. 4 . . . . . Tues. 8:00 to 9:45 am

Focusing

Session Chair: **Ladislav Pina,** REFLEX s.r.o. (Czech Republic)

8:00 am: **Two-dimensional focusing by multilayer Laue lenses**, Hanfei Yan, Brookhaven National Lab. and Argonne National Lab.; Jorg Maser, Deming Shu, Argonne National Lab.; Hyon Chol Kang, Gwangju Institute of Science and Technology (South Korea); Ray Conley, Jr., Chian Liu, Albert T. Macrander, Brian Stephenson, Argonne National Lab. . . . . [7077-27]

8:15 am: **Fabrication of a 400 mm-long mirror for focusing x-ray free electron laser to sub-100 nm**, Hidekazu Mimura, Osaka Univ. (Japan); Shinya Morita, The Institute of Physical and Chemical Research (Japan); Takashi Kimura, Daisuke Yamakawa, Osaka Univ. (Japan); Weimin Lin, Akita Prefectural Univ. (Japan); Takahiro Uehara, The Institute of Physical and Chemical Research (Japan); Hirokatsu Yumoto, Japan Synchrotron Radiation Research Institute (Japan); Satoshi Matsuyama, Osaka Univ. (Japan); Yoshinori Nishino, Kenji Tamasaku, The Institute of Physical and Chemical Research (Japan); Haruhiko Ohashi, Makina Yabashi, Japan Synchrotron Radiation Research Institute (Japan); Tetsuya Ishikawa, Hitoshi Ohmori, The Institute of Physical and Chemical Research (Japan); Kazuto Yamauchi, Osaka Univ. (Japan). . . . . [7077-28]

8:30 am: **On extreme x-ray nanofocusing**, Sultan B. Dabagov, Istituto Nazionale di Fisica Nucleare (Italy); Herbert Uberall, The Catholic Univ. of America . . . . . [7077-29]

8:45 am: **Aberrations in curved x-ray multilayers**, Christian Morawe, Jean-Pierre Guigay, European Synchrotron Radiation Facility (France); Vito Mocella, Istituto per la Microelettronica e Microsistemi (Italy) and European Synchrotron Radiation Facility (France); Claudio Ferrero, European Synchrotron Radiation Facility (France) . . . . . [7077-30]

9:00 am: **X-ray microfocusing by polycapillary optics**, Dariush Hampai, Univ. Roma di Tor Vergata (Italy); Sultan Dabagov, Giorgio Cappuccio, Istituto Nazionale di Fisica Nucleare (Italy); Giannantonio Cibin, Diamond Light Source Ltd. (United Kingdom); Vito Sessa, Univ. Roma di Tor Vergata (Italy) [7077-31]

9:15 am: **Polycapillary x-ray microbeams**, Andrey Y. Romanov, Institute for Roentgen Optics (Russia) . . . . . [7077-32]

9:30 am: Micro and imaging x-ray analysis by using polycapillary x-ray optics, Kouichi Tsuji, Tasuku Yonehara, Osaka City Univ. (Japan). . . . . [7077-33]

SESSION 6

Room: Conv. Ctr. 4 . . . . . .Tues. 9:45 to 11:15 am

X-Ray Sources

Session Chair: **Carolyn A. MacDonald,** SUNY/Univ. at Albany

9:45 am: **A microfocus liquid-metal-jet x-ray tube**, Oscar Hemberg, Mikael Otendal, Excillum AB (Sweden); Tomi T. Tuohimaa, Hans M. Hertz, Kungliga Tekniska Högskolan (Sweden) . . . . . [7077-36]

10:00 am: **Development of polarized x-ray beams from tube sources**, Robert Schmitz, Carolyn A. MacDonald, SUNY/Univ. at Albany . . . . [7077-37]

10:15 am: **The ENEA 14.4 nm micro-exposure tool: the laser-produced plasma source and the debris mitigation system**, Amalia Torre, Sarah Bollanti, Paolo Di Lazzaro, Francesco Flora, Luca Mezi, Daniele Murra, Ente per le Nuove Tecnologie, l'Energia e l'Ambiente (Italy) . . . . . [7077-38]

10:30 am: **Portable micro-focal x-ray sources**, Michael L. Chibel, . [7077-39]

Coffee Break . . . . . 10:45 to 11:00 am

SESSION 7

Room: Conv. Ctr. 4 . . . . . Tues. 11:00 am to 12:15 pm

XUV Optics + Applications

Session Chair: **Regina Soufli,** Lawrence Livermore National Lab.

11:00 am: **Beam separator for high-order harmonics below 10 nm**, Fabio Frassetto, Paolo Villoresi, Luca Poletto, Istituto Nazionale per la Fisica della Materia (Italy) . . . . . [7077-42]

11:15 am: **High-resolution grazing-incidence echelle monochromator for XUV radiation**, Fabio Frassetto, Luca Poletto, Istituto Nazionale per la Fisica della Materia (Italy); Juan I. Larruquert, José A. Mendez, Consejo Superior de Investigaciones Científicas (Spain) . . . . . [7077-43]

11:30 am: **XUV monochromator for ultrashort pulses at the ARTEMIS facility**, Luca Poletto, Stefano Bonora, Fabio Frassetto, Paolo Villoresi, Istituto Nazionale per la Fisica della Materia (Italy); Emma Springate, Chris Froud, Edmond Turcu, Andrew Langley, Dan Wolff, John Collier, Rutherford Appleton Lab. (United Kingdom); Sarnjeet Dhesi, Diamond Light Source Ltd. (United Kingdom); Andrea Cavalleri, Univ. of Oxford (United Kingdom) . . . . . [7077-44]

11:45 am: **Innovative approaches for surface analysis techniques on the basis of plasma-based off-synchrotron XUV/EUV light sources**, Matus Banyay, Larissa Juschkin, RWTH Aachen (Germany). . . . . [7077-45]

12:00 pm: **Transmittance and extinction coefficient of evaporated Pr films in the 4-1,600-eV spectral range**, Mónica Fernández-Perea, Manuela Vidal-Dasilva, Juan I. Larruquert, José Antonio Aznárez, José Antonio Méndez, Consejo Superior de Investigaciones Científicas (Spain); Luca Poletto, Denis Garoli, Univ. degli Studi di Padova (Italy); Andrea M. Malvezzi, Univ. degli Studi di Pavia (Italy); Angelo Giglia, Stefano Nannarone, Consiglio Nazionale delle Ricerche (Italy) . . . . . [7077-46]

Lunch/Exhibition Break . . . . . 12:15 to 1:45 pm

SESSION 8

Room: Conv. Ctr. 4 . . . . . .Tues. 1:45 to 3:00 pm

Beamline Optics

Session Chair: **Alexander Yu. Kazimirov,** Cornell Univ.

1:45 pm: **Development, characterization and experimental performance of x-ray optics for the Linac Coherent Light Source**, Regina Soufli, Michael J. Pivovaroff, Sherry L. Baker, Jeffrey C. Robinson, Jay Ayers, Lawrence Livermore National Lab.; Peter M. Stefan, Stanford Linear Accelerator Ctr.; Tom J. Mccarville, Lawrence Livermore National Lab.; Andrew L. Aquila, Eric M. Gullikson, Lawrence Berkeley National Lab.; Richard M. Bionta, Lawrence Livermore National Lab. . . . . [7077-47]

2:00 pm: **A design of the first XFEL beamline at SPring-8**, Makina Yabashi, The Institute of Physical and Chemical Research (Japan); Shunji Goto, Haruhiko Ohashi, Hiroaki Kimura, Togo Kudo, Sunao Takahashi, Japan Synchrotron Radiation Research Institute (Japan); Kenji Tamasaku, Tetsuya Ishikawa, The Institute of Physical and Chemical Research (Japan) . [7077-48]

2:15 pm: **Polarisation characterisation of soft x-rays with multilayers**, Ulrich H. Wagner, Diamond Light Source Ltd. (United Kingdom); Mike A. MacDonald, Ian Poole, Frances M. Quinn, Clive Hill, Science and Technology Facilities Council (United Kingdom); Sarnjeet Dhesi, Kawal J. S.Sawhney, Diamond Light Source Ltd. (United Kingdom) . . . . . [7077-49]

2:30 pm: **Improvement of stability of x-ray monochromator: water-cooled radiation and electron shields to prevent mechanical stages from heating**, Hiroshi Yamazaki, Yasuhiro Shimizu, Yasunori Senba, Haruhiko Ohashi, Shunji Goto, Japan Synchrotron Radiation Research Institute (Japan) . . . . . [7077-50]

2:45 pm: **Development of ultrahigh resolution in elastic scattering optics for NSLS-II**, Xianrong Huang, Zhong Zhong, Yong Cai, Scott Coburn, Brookhaven National Lab. . . . . [7077-51]

Wednesday 13 August

Room: Conv. Ctr. 4 . . . . . Wed. 8:00 am to 5:00 pm

Workshop: Focus on X-Ray Focusing

Workshop Chairs: **Ali M. Khounsary,** Argonne National Lab.; **Christian Morawe,** European Synchrotron Radiation Facility (France); **Shunji Goto,** Japan Synchrotron Radiation Research Institute (Japan)

This one-day workshop is devoted to X-ray micro- and nano-focusing techniques, optics, and applications. Various techniques are described by some of the renowned practitioners, and challenges, limitations, and prospects are discussed. The workshop should provide the audience with a comprehensive introduction and up-to-date information on various focusing techniques including theory, development, implementation, and recent applications.

See page 29 for details.

Courses of Related Interest

See SPIE Cashier for information and to register.

SC794 X-ray microCT (Micro Computed Tomography) (Stock) Monday, 1:30 to 5:30 pm

Conference 7078

Tuesday-Thursday 12-14 August 2008 • Proceedings of SPIE Vol. 7078

Developments in X-Ray Tomography VI

Conference Chair: **Stuart R. Stock,** Northwestern Univ.

Program Committee: **Felix Beckmann,** GKSS-Forschungszentrum Geeshacht, GmbH (Germany); **Graham R. Davis,** Queen Mary Univ. of London (United Kingdom); **Bert Müller,** Univ. Basel (Switzerland); **Erik Leo Ritman,** Mayo Clinic College of Medicine; **Mark L. Rivers,** The Univ. of Chicago; **Ge Wang,** Virginia Polytechnic Institute and State Univ.; **Stephen W. Wilkins,** Commonwealth Scientific and Industrial Research Organisation (Australia)

Tuesday 12 August

Room: Conv. Ctr. 2 . . . . . .Tues. 8:00 to 8:05 am

Conference Chair Welcome

Stuart R. Stock, Northwestern Univ.

SESSION 1

Room: Conv. Ctr. 2 . . . . . .Tues. 8:05 to 10:10 am

The Third Decade

Session Chair: **Stuart R. Stock,** Northwestern Univ.

8:05 am: **X-ray imaging: past and present** *(Invited Paper)*, Ulrich Bonse, Univ. Dortmund (Germany) . . . . . [7078-01]

8:45 am: **X-ray microtomography: past and present** *(Invited Paper)*, James C. Elliott, Graham R. Davis, Queen Mary Univ. of London (United Kingdom); David Dover, Dover Software Ltd. (United Kingdom) . . . . . [7078-02]

9:10 am: **Trends in the micro- and nano-CT literature**, Stuart R. Stock, Northwestern Univ. . . . . [7078-03]

9:20 am: **X-ray tomography at the cellular level** *(Invited Paper)*, Christian G. Knoechel, Dilworth Y. Parkinson, Weiwei Gu, Gerry McDermot, Mark A. LeGros, Carolyn A. Larabell, Lawrence Berkeley National Lab. . . . . [7078-04]

9:45 am: **Whole-body imaging of organ basic functional unit (BFU) perfusion characteristics** *(Invited Paper)*, Erik L. Ritman M.D., Mayo Clinic College of Medicine. . . . . [7078-05]

Coffee Break . . . . . 10:10 to 10:40 am

Room: Conv. Ctr. 2 . . . . . .Tues. 10:40 to 10:45 am

Introduction by Session Chair

Erik L. Ritman, Mayo Clinic College of Medicine

SESSION 2

Room: Conv. Ctr. 2 . . . . . Tues. 10:45 am to 12:15 pm

Life Sciences I

Session Chair: **Erik Leo Ritman,** Mayo Clinic College of Medicine

10:45 am: **Principals and applications of dual source CT** *(Invited Paper)*, Thomas G. Flohr, Siemens Medical Solutions (Germany). . . . . [7078-06]

11:10 am: **Dynamic volume CT: the next revolution in clinical CT** *(Invited Paper)*, Kirsten L. Boedeker, Richard T. Mather, Toshiba America Medical Systems, Inc.. . . . . [7078-07]

11:35 am: **Four-dimensional time-resolved micro-CT imaging for small animals**, Xuan Liu, Faisal Nadeem, Phil Salmon, Alexander Sasov, SkyScan N.V. (Belgium) . . . . . [7078-08]

11:55 am: **Use of synchrotron tomography to image naturalistic anatomy in insects**, John J. Socha, Virginia Polytechnic Institute and State Univ.; Francesco De Carlo, Argonne National Lab.. . . . . [7078-09]

Lunch Exhibition/Break . . . . . 12:15 to 1:30 pm

SESSION 3

Room: Conv. Ctr. 2 . . . . . .Tues. 1:30 to 3:00 pm

Life Sciences II

Session Chair: **Graham R. Davis,** Queen Mary Univ. of London (United Kingdom)

1:30 pm: **High-resolution tomographic imaging of tumor angiogenesis** *(Invited Paper)*, Bert Müller, Univ. Basel (Switzerland); Marco Dominietto, ETH Zürich (Switzerland); Sabrina Lang, Univ. Basel (Switzerland); Markus Rudin, ETH Zürich (Switzerland). . . . . [7078-10]

1:55 pm: **Three-dimensional characterization of the bone-cartilage interface using micro-computed tomography**, Susanne Drews, Magdalena Müller-Gerbl, Univ. Basel (Switzerland); Felix Beckmann, Julia Herzen, GKSS-Forschungszentrum Geeshacht, GmbH (Germany); Oliver Brunke, Thomas Hemberger, phoenix|x-ray systems + services GmbH (Germany); Sebastian Fries, Gloor Instruments AG (Switzerland); Phil Salmon, SkyScan N.V. (Belgium); Bruno Koller, Andres Laib, SCANCO Medical AG (Switzerland); Bert Müller, Univ. Basel (Switzerland). . . . . [7078-11]

2:15 pm: **Applying x-ray tomography in the field of vertebrate biology: form, function and evolution of the skull of caecilians (Lissamphibia: Gymnophiona)**, Thomas Kleinteich, Univ. Hamburg (Germany); Felix Beckmann, Julia Herzen, GKSS-Forschungszentrum Geeshacht, GmbH (Germany); Adam P. Summers, Univ. of California/Irvine; Alexander Haas, Univ. Hamburg (Germany) . . . . . [7078-12]

2:35 pm: **Quantitative characterization of microcirculatory networks by x-ray tomography** *(Invited Paper)*, Peter D. Lee, Robert C. Atwood, Imperial College London (United Kingdom); Christopher A. Mitchell, Univ. of Ulster (United Kingdom); Moritz A. Konerding, Johannes Gutenberg Univ. Mainz (Germany); Julian R. Jones, Imperial College London (United Kingdom); Peter Rockett, Univ. of Oxford (United Kingdom). . . . . [7078-13]

Coffee Break . . . . . 3:00 to 3:30 pm

Room: Conv. Ctr. 2 . . . . . .Tues. 3:30 to 3:35 pm

Introduction by Session Chair

Ge Wang, Virginia Polytechnic and State Univ.

SESSION 4

Room: Conv. Ctr. 2 . . . . . .Tues. 3:35 to 5:45 pm

Algorithms

Session Chair: **Ge Wang,** Virginia Polytechnic Institute and State Univ.

3:35 pm: **Interior tomography: theory, algorithms and applications** *(Invited Paper)*, Hengyong Yu, Virginia Polytechnic Institute and State Univ.; Yangbo Ye, The Univ. of Iowa; Ge Wang, Virginia Polytechnic Institute and State Univ. [7078-14]

4:00 pm: **The discrete radon transform: a more efficient tool for reconstruction?**, Andrew M. Kingston, The Australian National Univ. (Australia); Imants D. Svalbe, Monash Univ. (Australia); Jean-Pierre V. Guédon, Univ. de Nantes (France). . . . . [7078-15]

4:20 pm: **A BPF-based reconstruction algorithm and its GPU Implementation for cone-beam CT with unilateral off-centered RT multi-scan**, Peng Zhang, Defeng Chen, Weiwei Qi, Huitao Zhang, Capital Normal Univ. (China) . . . . . [7078-16]

4:40 pm: **Investigation of helix-saddle trajectories in cone beam CT**, Yang Lu, Jun Zhao, Shanghai Jiao Tong Univ. (China); Erwei Bai, The Univ. of Iowa; Ge Wang, Virginia Polytechnic Institute and State Univ. . . . . [7078-17]

5:00 pm: **Determination of the exact reconstruction region in the cone-beam composite-circling mode**, Lena P. Ye, Iowa City West High School; Hengyong Yu, Ge Wang, Virginia Polytechnic Institute and State Univ.[7078-18]

5:20 pm: **Exact image reconstruction for triple-source cone-beam CT along saddle trajectories** *(Invited Paper)*, Yang Lu, Jun Zhao, Shanghai Jiao Tong Univ. (China); Ge Wang, Virginia Polytechnic Institute and State Univ.[7078-19]

Wednesday 13 August

SESSION 5

Room: Conv. Ctr. 2 . . . . . Wed. 8:00 to 9:20 am

Life Sciences III

Session Chair: **Bert Müller,** Univ. Basel (Switzerland)

8:00 am: **Visualizing the root/periodontal ligament/bone interface using high-resolution micro-tomography**, Michel Dalstra, Paolo M. Cattaneo, Åarhus Univ. (Denmark); Julia Herzen, Felix Beckmann, GKSS-Forschungszentrum Geeshacht, GmbH (Germany) . . . . . [7078-20]

8:20 am: **De- and re-mineralization of dentin quantified by synchrotron-radiation-based micro-computed tomography**, Bert Müller, Tuomas Waltimo, Univ. Basel (Switzerland). . . . . [7078-21]

8:40 am: **Reduction of artifacts from dental implants in clinical and micro-computed tomographic imaging**, Dorothea Berndt, Marlen Luckow, J. Thomas Lambrecht, Bert Müller, Univ. Basel (Switzerland) . . . . . [7078-22]

9:00 am: **The dentinoenamel junction: its structure and function under compression studied with synchrotron x-radiation,** Stuart R. Stock, Northwestern Univ.; Jonathan D. Almer, Francesco De Carlo, Xianghui Xiao, Konstantin Ignatiev, Argonne National Lab.; Mark L. Cannon, Children's Memorial Hospital; Alberto C. B.Delbem, Univ. Estadual de São Paulo (Brazil); Ana Elisa M. Vieira, Univ. Estadual Paulista (Brazil) . . . . . [7078-23]

Room: Conv. Ctr. 2 . . . . . Wed. 9:20 to 9:25 am

Introduction by Session Chair

Stephen L. Wilkins, CSIRO (Australia)

SESSION 6

Room: Conv. Ctr. 2 . . . . . Wed. 9:25 am to 12:00 pm

Technical Advances

Session Chair: **Stephen W. Wilkins,** Commonwealth Scientific and Industrial Research Organisation (Australia)

9:25 am: **MIRRORCLE light source demonstrating one micron resolution and clear density mapping** *(Invited Paper)*, Hironari Yamada D.V.M., Ritsumeikan University (Japan) . . . . . [7078-24]

9:50 am: **Novel sampling strategies for x-ray fluorescence computed tomography**, Patrick J. La Riviere, Phillip Vargas, The Univ. of Chicago . . . . . [7078-25]

Coffee Break . . . . . 10:10 to 10:40 am

10:40 am: **A compact Micro-CT/Micro-XRF scanner for nondestructive 3D chemical analysis**, Alexander Sasov, David Rushmer, Xuan Liu, SkyScan N.V. (Belgium) . . . . . [7078-26]

11:00 am: **Region of interest reconstruction in x-ray fluorescence computed tomography**, Patrick J. La Riviere, Phillip Vargas, Dan Xia, Xiaochuan M. Pan, The Univ. of Chicago . . . . . [7078-27]

11:20 am: **Comparative study of desktop and synchrotron radiation-based micro computed tomography analyzing bare and cell-seeded scaffolds in tissue engineering of bone**, Adam Papadimitropoulos, Basel Univ. Hospital (Switzerland); Sebastian D. Friess, Gloor Instruments AG (Switzerland); Felix Beckmann, GKSS-Forschungszentrum Geeshacht, GmbH (Germany); Phil Salmon, SkyScan N.V. (Belgium); Sarper Gürel, Stefania Riboldi, Basel Univ. Hospital (Switzerland); Dietmar W. Hutmacher, Queensland Univ. of Technology (Australia); Ivan Martin, Bert Müller, Basel Univ. Hospital (Switzerland)[7078-28]

11:40 am: **Comparison between x-ray tube based and synchrotron radiation based Î1/4CT**, Oliver Brunke, phoenix|x-ray Systems + Services GmbH (Germany); Kathleen Brockdorf, phoenix|x-ray Systems + Services Inc.; Felix Beckmann, GKSS-Forschungszentrum Geeshacht, GmbH (Germany); Bert MÃ1/4ller, Univ. Basel (Switzerland); Tilman Donath, Paul Scherrer Institut (Switzerland) . . . . . [7078-29]

Lunch Exhibiton/Break . . . . . 12:00 to 1:30 pm

Room: Conv. Ctr. 2 . . . . . Wed. 1:30 to 1:35 pm

Introduction by Session Chair

Felix Beckmann, GKSS-Forschungszentrum Geeschact GmbH (Germany)

SESSION 7

Room: Conv. Ctr. 2 . . . . . Wed. 1:35 to 3:35 pm

Synchrotron Radiation

Session Chair: **Felix Beckmann,** GKSS-Forschungszentrum Geeshacht, GmbH (Germany)

1:35 pm: **Hierarchical multimodal tomographic x-ray imaging at a superbend**, Marco Stampanoni, Federica Marone, Christoph Hintermueller, Samuel McDonald, Andreas Isenegger, Mikuljan Gordan, Christian David, Konstantin Jefimovs, Joan Vila, Rafael Abela, Paul Scherrer Institut (Switzerland) . . . . . [7078-30]

1:55 pm: **X-ray imaging with synchrotron radiation by GKSS: recent results and future possibilities**, Felix Beckmann, Astrid Haibel, Thomas Lippmann, Lars Lottermoser, Norbert Schell, Sven Utcke, Thomas Dose, Torben Fischer, Julia Herzen, Hans-Ulrich Ruhnau, Hilmar Burmester, Rene Kirchhof, Andreas Schreyer, GKSS-Forschungszentrum Geeshacht, GmbH (Germany) . . . . . [7078-31]

2:15 pm: **The high-resolution synchrotron-based imaging stations at the BAMline (BESSY II) and TopoTomo (ANKA)**, Alexander Rack, Forschungszentrum Karlsruhe (Germany); Heinrich Riesemeier, Bundesanstalt für Materialforschung und -prüfung (Germany); Simon Zabler, Max-Planck-Institut für Kolloid- und Grenzflächenforschung (Germany); Timm Weitkamp, European Synchrotron Radiation Facility (France); Bernd R. Müller, Gerd Weidemann, Bundesanstalt für Materialforschung und -prüfung (Germany); Lukas Helfen, Peter Modregger, Marian Cholewa, Forschungszentrum Karlsruhe (Germany); John Banhart, Hahn-Meitner-Institut Berlin GmbH (Germany); Andreas N. Danilewsky, Albert-Ludwigs-Univ. Freiburg (Germany); Jürgen Goebbels, Bundesanstalt für Materialforschung und -prüfung (Germany); Tilo Baumbach, Forschungszentrum Karlsruhe (Germany)[7078-32]

2:35 pm: **New opportunities for imaging and tomography at the DIAMOND beamline I13L**, Christoph Rau, Diamond Light Source Ltd. (United Kingdom) . . . . . [7078-33]

2:55 pm: **The imaging beamline at PETRA III**, Astrid Haibel, Felix Beckmann, Julia Herzen, Thomas Dose, Sven Utcke, Andreas Schreyer, GKSS-Forschungszentrum Geeshacht, GmbH (Germany) . . . . . [7078-34]

3:15 pm: **X-ray zoom-in tomography of calcified tissue,** Xianghui Xiao, Francesco De Carlo, Argonne National Lab.; Stuart R. Stock, Northwestern Univ. . . . . [7078-35]

Room: Conv. Ctr. 2 . . . . . Wed. 4:05 to 4:10 pm

Introduction by Session Chair

Stephen W. Wilkins, CSIRO (Australia)

SESSION 8

Room: Conv. Ctr. 2 . . . . . Wed. 4:10 to 5:35 pm

Phase Imaging I

Session Chair: **Stephen W. Wilkins,** Commonwealth Scientific and Industrial Research Organisation (Australia)

4:10 pm: **Sensitivity of x-ray phase tomography based on Talbot and Talbot-Lau interferometer** *(Invited Paper)*, Atsushi Momose, Yoshihiro Takeda, Wataru Yashiro, The Univ. of Tokyo (Japan); Daiji Noda, Tadashi Hattori, Univ. of Hyogo (Japan) . . . . . [7078-36]

4:35 pm: **X-ray phase-contrast local tomography reconstruction on pi-lines,** Mark A. Anastasio, Illinois Institute of Technology; Xiaochuan M. Pan, The Univ. of Chicago . . . . . [7078-37]

4:55 pm: **Noise properties of in-line x-ray imaging and tomography**, Cheng-Ying Chou, National Taiwan Univ. (Taiwan); Mark A. Anastasio, Illinois Institute of Technology . . . . . [7078-38]

5:15 pm: **Quantitative validation of the image retrieval from x-ray phase contrast tomographic microimages,** Herbert O. Moser, National Univ. of Singapore (Singapore) . . . . . [7078-39]

Room: Conv. Ctr. Exhibit Hall B2 . . . . . Wed. 5:30 to 7:00 pm

Posters-Wednesday

Poster authors will begin displaying posters after 10:00 am Wednesday morning. A poster session, with authors present at their posters, will be held Wednesday evening from 5:30 to 7:00 pm. Light refreshments will be served.

Poster Setup

Poster presenters must set up their posters between 10:00 am and 5:00 pm on Wednesday. Poster presenters who have not set up by 5:00 pm on Wednesday will be considered a "no show" and their manuscript will not be published. Presenters must remove their posters immediately after the poster session. Posters not removed will be considered unwanted and will be discarded. SPIE assumes no responsibility for posters left up after the end of each poster session.

X-ray computed tomography with sub-micron resolution using laboratory and synchrotron sources, J. Gelb, Michael Feser, Andrei Tkachuk, Frederick W. Duewer, Hauyee Chang, Wenbing Yun, Xradia, Inc. . . . . [7078-64]

Angiofil: a novel radiocontrast agent for postmortem microangiography, Silke Grabherr, Univ. de Lausanne (Switzerland); Marco Dominietto, Swiss Federal Institute of Technology (Switzerland); Valentin Djonov, Univ. Fribourg (Switzerland); Bert Mueller, Univ. Basel (Switzerland); Sebastian Friess, Gloor Instruments AG (Switzerland) . . . . . [7078-60]

Development of a system for high-resolution x-ray tomography of biological specimens, Luca Poletto, Matteo Caldon, Giuseppe Tondello, CNR-National Institute for the Physics of Matter (Italy); Aram Megighian, Univ. degli Studi di Padova (Italy) . . . . . [7078-59]

Adaptive acquisition geometry for micro-CT with large-format detectors, Alexander Sasov, Koen Verelst, Faisal Nadeem, SkyScan N.V. (Belgium) . . . . . [7078-65]

Optimization of pinhole cameras for emission tomographic systems, Alexander Sasov, SkyScan N.V. (Belgium) . . . . . [7078-70]

Coherent x-ray scattering for discriminating bio-compatible materials in tissue scaffolds, Congwu Cui, Steven M. Jorgensen, Erik L. Ritman M.D., Mayo Clinic College of Medicine . . . . . [7078-71]

MicroCT and microMRI imaging of a prenatal mouse model of increased brain size, Elisabeth K. N.Nicholson, Stuart R. Stock, Anjen Chenn, Northwestern Univ.; Matthew J. Ravosa, Univ. of Missouri/Columbia [7078-69]

Micro-computer tomography and a renaissance of insect morphology, Rolf G. Beutel, Frank Friedrich, Friedrich-Schiller-Univ. Jena (Germany); Felix Beckmann, GKSS-Forschungszentrum Geeshacht, GmbH (Germany)[7078-66]

SRÎ¼CT study of crack growth within laser welded Al-alloy T-joints, Julia Herzen, Felix Beckmann, Astrid Haibel, Sven Utcke, GKSS-Forschungszentrum Geeshacht, GmbH (Germany); Tilman Donath, Paul Scherrer Institut (Switzerland); Funda Bayraktar, Stafan Riekehr, Mustafa Kocak, Andreas Schreyer, GKSS-Forschungszentrum Geeshacht, GmbH (Germany) . . . . . [7078-68]

High-density resolution synchrotron radiation based x-ray microtomography (SRÎ¼CT) for quantitative 3D-morphometrics in zoological sciences, Michael Nickel, JÃ¶rg U. Hammel, Friedrich-Schiller-Univ. Jena (Germany); Julia Herzen, GKSS-Forschungszentrum Geeshacht, GmbH (Germany); Eric Bullinger, Univ. of Strathclyde (United Kingdom); Felix Beckmann, GKSS-Forschungszentrum Geeshacht, GmbH (Germany)[7078-67]

Internal structures of scaffold-free 3D cell cultures visualized by synchrotron-radiation-based micro-computed tomography, Belma Saldamli, Johann Wolfgang Goethe-Univ. Frankfurt am Main (Germany); Julia Herzen, Felix Beckmann, GKSS-Forschungszentrum Geeshacht, GmbH (Germany); Jutta Tübel, Johannes Schauwecker, Rainer Burgkart, Technische Univ. München (Germany); Philipp Jürgens, Hans-Florian Zeilhofer, Univ. Basel (Switzerland); Robert Sader, Johann Wolfgang Goethe-Univ. Frankfurt am Main (Germany); Bert Müller, Univ. Basel (Switzerland) . . . . . [7078-72]

GPU-based 3D cone-beam CT image reconstruction for large data volume, Xing Zhao, Capital Normal Univ. (China); Jingjing Hu, Beijing Institute of Technology (China); Peng Zhang, Capital Normal Univ. (China). . . [7078-58]

High energy x-ray scattering tomography, Stuart R. Stock, Northwestern Univ.; Francesco De Carlo, Jonathan D. Almer, Argonne National Lab. . . . . [7078-61]

Progressing the construction of JEEP, the high-energy x-ray beamline for imaging at the Diamond Light Source, UK, Michael Drakopoulos, Thomas Connolley, Timothy P. Hill, Guy Wilkin, Mark Basham, Ulrik Pedersen, John P. Sutter, John Emmins, Doug W. Sharp, Mark R. Harman, Adrian Birt, Diamond Light Source Ltd. (United Kingdom) . . . . . [7078-62]

ROI tomography using the 2-step Hilbert transform method, Albrecht Kyrieleis, P. J. Withers, The Univ. of Manchester (United Kingdom); Mark Ibison, The Univ. of Liverpool (United Kingdom); William B. Lionheart, David Szotten, The Univ. of Manchester (United Kingdom) . . . . . [7078-63]

X-ray tomographic microscopy at TOMCAT, Federica Marone, Christoph Hintermueller, Samuel McDonald, Rafael Abela, G. Mikuljan, Andreas Isenegger, Marco Stampanoni, Paul Scherrer Institut (Switzerland). . [7078-76]

Thursday 14 August

SESSION 9

Room: Conv. Ctr. 2 . . . . . Thurs. 8:00 to 10:10 am

Phase Imaging II

Session Chair: **Felix Beckmann,** GKSS-Forschungszentrum Geeshacht, GmbH (Germany)

8:00 am: **Hard x-ray phase-contrast and dark-field imaging using a grating interferometer** *(Invited Paper)*, Franz Pfeiffer, Paul Scherrer Institut (Switzerland) and Ecole Polytechnique Fédérale de Lausanne (Switzerland); Oliver Bunk, Christian David, Tilman Donath, Paul Scherrer Institut (Switzerland); Martin Bech, Paul Scherrer Institut (Switzerland) and Københavns Univ. (Denmark); Christian Grünzweig, Paul Scherrer Institut (Switzerland); Timm Weitkamp, Peter Cloetens, Geraldine Le Duc, Alberto Bravin, European Synchrotron Radiation Facility (France) . . . . . [7078-40]

8:25 am: **X-ray phase-contrast imaging with 2D grating interferometry** *(Invited Paper)*, Ming Jiang, Peking Univ. (China); Christopher L. Wyatt, Ge Wang, Virginia Polytechnic Institute and State Univ. . . . . [7078-41]

8:50 am: **Interferometric phase-contrast tomography using conventional x-ray tube sources**, Tilman Donath, Paul Scherrer Institut (Switzerland); Eckhard Hempel, Stefan M. Popescu, Martin Hoheisel, Siemens AG (Germany); Franz Pfeiffer, Oliver Bunk, Christian Grünzweig, Christian David, Paul Scherrer Institut (Switzerland) . . . . . [7078-42]

9:10 am: **Development of ultrafast laser-based x-ray in vivo phase-contrast micro-CT beamline for biomedical applications at Advanced Laser Light Source (ALLS)**, Russell E. Kincaid, Syracuse Univ.; Andrzej Krol, Upstate Medical Univ./SUNY and Syracuse University; Jean-Claude Kieffer, Marina Servol, Univ. du Québec (Canada); Levon Vogelsang, Syracuse Univ.; Sylvain Fourmaux, Univ. du Québec (Canada); Stephen W. Wilkins, Andrew W. Stevenson, Timur E. Gureyev, Yakov I. Nesterets, Commonwealth Scientific and Industrial Research Organisation (Australia); Edward D. Lipson, Syracuse University and Upstate Medical Univ./SUNY; Hongwei Ye, Syracuse Univ.; Andrew Pogany, Commonwealth Scientific and Industrial Research Organisation (Australia) . . . . . [7078-43]

9:30 am: **Quantitative phase-contrast tomography using polychromatic radiation**, Glenn R. Myers, Monash Univ. (Australia); Timur E. Gureyev, Commonwealth Scientific and Industrial Research Organisation (Australia); David M. Paganin, Monash Univ. (Australia); Sherry C. Mayo, Stephen W. Wilkins, Commonwealth Scientific and Industrial Research Organisation (Australia). . . . . [7078-44]

9:50 am: **Validity of a fully coherent field model for in-line x-ray phase imaging**, Adam M. Zysk, Miles N. Wernick, Mark A. Anastasio, Illinois Institute of Technology . . . . . [7078-45]

Coffee Break . . . . . 10:10 to 10:40 am

Room: Conv. Ctr. 2 . . . . . Thurs. 10:40 to 10:45 am

Introduction by Session Chair

Graham R. Davis, Queen Mary Univ. of London (UK)

SESSION 10

Room: Conv. Ctr. 2 . . . . . Thurs. 10:45 to 11:55 am

Metrology I

Session Chair: **Graham R. Davis,** Queen Mary Univ. of London (United Kingdom)

10:45 am: **Some quality control measures for routine quantitative analysis of tomographic images** *(Invited Paper)*, Arthur Sakellariou, Christoph H. Arns, Adrian P. Sheppard, Andrew M. Kingston, Robert M. Sok, Tim J. Sawkins, Tim J. Senden, Mark A. Knackstedt, The Australian National Univ. (Australia). . . . . [7078-46]

11:10 am: **Iterative compensation of mechanical inaccuracy in micro-CT and nano-CT**, Alexander Sasov, Xuan Liu, SkyScan N.V. (Belgium) . [7078-47]

11:30 am: **High-density resolution in SR-based attenuation-contrast microtomography** *(Invited Paper)*, Felix Beckmann, Julia Herzen, Astrid Haibel, GKSS-Forschungszentrum Geeshacht, GmbH (Germany); Bert Müller, Univ. Basel (Switzerland); Andreas Schreyer, GKSS-Forschungszentrum Geeshacht, GmbH (Germany) . . . . . [7078-48]

Lunch Exhibition/Break . . . . . 11:55 am to 1:30 pm

SESSION 11

Room: Conv. Ctr. 2 . . . . . Thurs. 1:30 to 2:55 pm

Metrology II

Session Chair: **Erik Leo Ritman,** Mayo Clinic College of Medicine

1:30 pm: **A modeling approach to beam hardening correction** *(Invited Paper)*, Graham R. Davis, Queen Mary Univ. of London (United Kingdom); Nitin Jain, Indian Institute of Technology Kanpur (India); James C. Elliott, Queen Mary Univ. of London (United Kingdom) . . . . . [7078-49]

1:55 pm: **Sub-micron CT: visualization of internal structures**, Kathleen Brockdorf, phoenix|x-ray Systems + Services Inc.; Oliver Brunke, Dirk Neuber, phoenix|x-ray Systems + Services GmbH (Germany). . . . . [7078-50]

2:15 pm: **Metrology with Î1⁄4CT: precision challenge**, Alexander Suppes, Eberhard K. Neuser, phoenix|x-ray systems + services GmbH (Germany) . . . . . [7078-51]

2:35 pm: **Three-dimensional quantification of intra-aggregate pore space features using synchrotron-radiation-based microtomography**, Stephan Peth, Rainer Horn, Christian-Albrechts-Univ. zu Kiel (Germany); Felix Beckmann, Tilman Donath, GKSS-Forschungszentrum Geeshacht, GmbH (Germany); Alvin J. M.Smucker, Michigan State Univ. . . . . [7078-52]

Coffee Break . . . . . 2:55 to 3:25 pm

Room: Conv. Ctr. 2 . . . . . Thurs. 3:25 to 3:30 pm

Introduction by Session Chair

Bert Müller, Univ. Basel (Switzerland)

SESSION 12

Room: Conv. Ctr. 2 . . . . . Thurs. 3:30 to 5:15 pm

Physical Sciences, Engineering

Session Chair: **Bert Müller,** Univ. Basel (Switzerland)

3:30 pm: **3D analysis of MMC microstructure and deformation by Î1⁄4CT and FE simulations**, Horst-Artur Crostack, Univ. Dortmund (Germany); Jens Nellesen, Gottfried Fischer, RIF e.V. (Germany); Siegfried Schmauder, Ulrich Weber, Univ. Stuttgart (Germany); Felix Beckmann, GKSS-Forschungszentrum Geeshacht, GmbH (Germany) . . . . . [7078-53]

3:50 pm: **In situ synchrotron tomography investigation of creep damage**, Anke R. Pyzalla, András Borbély, Augusta Isaac, Federico Sket, Krzysztof Dzieciol, Max-Planck-Institut für Eisenforschung GmbH (Germany); Marco di Michiel, Thomas Buslaps, European Synchrotron Radiation Facility (France) . [7078-54]

4:10 pm: **Diffraction microtomography to image diluted phases in polycrystalline materials** *(Invited Paper)*, Pierre Bleuet, European Synchrotron Radiation Facility (France); Eleonore Welcomme, Ctr. de Recherche et de Restauration des Musées de France (France); Eric Dooryhee, Institut Neel (France); Jean Susini, European Synchrotron Radiation Facility (France); Jean-Louis Hodeau, Institut Neel (France); Philippe Walter, Ctr. de Recherche et de Restauration des Musées de France (France). . . . . [7078-55]

4:35 pm: **Simultaneous characterization of 3D shape, orientation and strain state of individual grains in polycrystals by diffraction contrast tomography**, Péter Reischig, Wolfgang Ludwig, Andrew King, Gregory Johnson, Marcelo Goncalves Hönnicke, European Synchrotron Radiation Facility (France) . . . . . [7078-56]

4:55 pm: **In situ x-ray diffraction profiling of cracks and metal-metal interfaces at the nanoscale,** Andrei Y. Nikulin, Aliaksandr V. Darahanau, Ruben A. Dilanian, Barry C. Muddle, Monash Univ. (Australia); Alexei Y. Suvorov, Osami Sakata, Japan Synchrotron Radiation Research Institute (Japan). . . . . [7078-57]

Room: Conv. Ctr. 2 . . . . . Thurs. 5:15 to 5:25 pm

End Summary

Stuart R. Stock, Northwestern Univ.

Courses of Related Interest

See SPIE Cashier for information and to register.

SC794 X-ray microCT (Micro Computed Tomography) (Stock) Monday, 1:30 to 5:30 pm

Conference 7079

Monday-Wednesday 11-13 August 2008 • Proceedings of SPIE Vol. 7079

Hard X-Ray, Gamma-Ray, and Neutron Detector Physics X

Conference Chairs: **Arnold Burger,** Fisk Univ.; **Larry A. Franks,** Consultant; **Ralph B. James,** Brookhaven National Lab.

Program Committee: **Toru Aoki,** Shizuoka Univ. (Japan); **H. Bradford Barber,** The Univ. of Arizona; **Zane W. Bell,** Oak Ridge National Lab.; **Lynn A. Boatner,** Oak Ridge National Lab.; **Aleksey E. Bolotnikov,** Brookhaven National Lab.; **Henry Chen,** Redlen Technologies (Canada); **Nerine J. Cherepy,** Lawrence Livermore National Lab.; **F. Patrick Doty,** Sandia National Labs.; **Michael Fiederle,** Albert-Ludwigs-Univ. Freiburg (Germany); **Jonathan E. Grindlay,** Harvard-Smithsonian Ctr. for Astrophysics; **Yoshinori Hatanaka,** Aichi Univ. of Technology (Japan); **Zhong He,** Univ. of Michigan; **Alan Janos,** U.S. Dept. of Homeland Security; **Warnick J. Kernan,** National Security Technologies, LLC; **Glenn F. Knoll,** Univ. of Michigan; **Henric S. Krawczynski,** Washington Univ. in St. Louis; **Longxia Li,** Yinnel Tech, Inc.; **Paul N. Luke,** Lawrence Berkeley National Lab.; **Kelvin G. Lynn,** Washington State Univ.; **Krishna C. Mandal,** EIC Labs., Inc.; **Jim L. Matteson,** Univ. of California/San Diego; **Douglas Scott McGregor,** Kansas State Univ.; **Robert D. McLaren,** Consultant; **Richard W. Olsen,** Consultant; **Alan Owens,** European Space Agency (Netherlands); **Ann M. Parsons,** NASA Goddard Space Flight Ctr.; **Bradley E. Patt,** Gamma Medica-Ideas, Inc.; **Eugenio Perillo,** Univ. degli Studi di Napoli Federico II (Italy); **Raulf M. Polichar,** Science Applications International Corp.; **James M. Ryan,** Univ. of New Hampshire; **Eiichi Sato,** Iwate Medical Univ. (Japan); **Michael M. Schieber,** The Hebrew Univ. of Jerusalem (Israel); **Paul Siffert,** Ctr. National de la Recherche Scientifique (France); **Michael R. Squillante,** Radiation Monitoring Devices, Inc.; **Csaba Szeles,** eV Products, Inc.; **Jacob I. Trombka,** NASA Goddard Space Flight Ctr.; **Tomay O. Tumer,** Nova R&D, Inc.; **Sergey E. Ulin,** Moscow Engineering Physics Institute (Russia); **Lodewijk van Den Berg,** Constellation Technology Corp.; **Peter E. Vanier,** Brookhaven National Lab.; **Nikolay B. Zaletaev,** Orion Research and Production Association (Russia)

Funding provided by:

Monday 11 August

SESSION 1

Room: Conv. Ctr. 3 . . . . . Mon. 1:30 to 3:10 pm

CZT Detectors

Session Chair: **Alan Janos,** U.S. Dept. of Homeland Security

1:30 pm: **Development of large-volume CdZnTe detectors** *(Invited Paper)*, Zhong He, Feng Zhang, Yuefeng Zhu, William Kaye, Cedric Herman, Univ. of Michigan . . . . . [7079-01]

2:00 pm: **Spectral responses of virtual Frisch-grid CdZnTe detectors and their relation to IR microscopy and x-ray diffraction topography data**, Aleksey E. Bolotnikov, Giuseppe S. Camarda, Yonggang Cui, Anwar Hossain, Ge Yang, Ralph B. James, Brookhaven National Lab. . . . . [7079-02]

2:20 pm: **Various methods in measuring mu-tau**, Kelvin G. Lynn, Kelly A. Jones, Washington State Univ.; Larry A. Franks, Consultant . . . . . [7079-03]

2:40 pm: **Reliability of pixellated CZT detector modules used for medical imaging and homeland security** *(Invited Paper)*, Henry Chen, Salah Awadalla, Fraser Harris, Pinghe Lu, Glenn Bindley, Redlen Technologies (Canada); Howard Lenos, Bill Cardoso, Aguila Technologies, Inc. . . . . [7079-04]

Coffee Break . . . . . 3:10 to 3:40 pm

SESSION 2

Room: Conv. Ctr. 3 . . . . . Mon. 3:40 to 4:50 pm

Neutron Detectors

Session Chair: **Douglas Scott McGregor,** Kansas State Univ.

3:40 pm: **Performance parameters of a large-area fast-neutron double-scatter directional detector** *(Invited Paper)*, Peter E. Vanier, Brookhaven National Lab.; Leon Forman, Ion Focus Technology; Istvan Dioszegi, Vinita J. Ghosh, Brookhaven National Lab. . . . . [7079-05]

4:10 pm: **Prospects for neutron detection and imaging with the GammaTracker handheld radioisotope identifier**, Carolyn E. Seifert, Debra S. Barnett, Mitchell J. Myjak, Pacific Northwest National Lab. . . . . [7079-06]

4:30 pm: **A novel solid state self-powered neutron detector,** Nicholas V. LiCausi, Justin A. Dingley, Yaron Danon, James J. Lu, Ishwara B. Bhat, Rensselaer Polytechnic Institute . . . . . [7079-08]

Room: Conv. Ctr. Exhibit Hall B2 . . . . . Mon. 6:00 to 7:30 pm

Posters-Monday

Poster authors will begin displaying posters after 10:00 am Monday morning. A poster session, with authors present at their posters, will be held Monday evening from 6:00 to 7:30 pm. Light refreshments will be served.

Poster Setup

Poster presenters must set up their posters between 10:00 am and 5:00 pm on Monday. Poster presenters who have not set up by 5:00 pm on Monday will be considered a "no show" and their manuscript will not be published. Presenters must remove their posters immediately after the poster session. Posters not removed will be considered unwanted and will be discarded. SPIE assumes no responsibility for posters left up after the end of each poster session.

Gamma-ray nonvolatile sensor by using SONOS capacity device, Wen-Ching Hsieh, Ming Hsin Univ. of Science and Technology (Taiwan) . [7079-42]

New application of scintillator ZnSe(Te) in scintielectronic detectors for detection of neutrons, medical imaging, explosive detection and NDT, Volodymyr D. Ryzhikov, Oleksandr D. Opolonin, Institute for Single Crystals (Ukraine); Alexander G. Fedorov, Olena K. Lysetska, Institute for Scintillation Materials (Ukraine); Sergey A. Kostyukevych, Institute of Semiconductor Physics (Ukraine). . . . . [7079-45]

Characterization studies and performance of half-strip high-speed x-ray microchannel plate imager, Kenneth J. Moy, National Security Technologies, LLC . . . . . [7079-50]

Cavity detection in the proximal surfaces, Luis M. G.Reyes, Adelaide de Almeida, Robert L. Zimmerman, Univ. de São Paulo (Brazil) . . . . . [7079-49]

High-spectral-resolution x-ray mapping of CdZnTe detectors, Ge Yang, Aleksey E. Bolotnikov, Giuseppe S. Camarda, Yonggang Cui, Anwar M. Hossain, Ralph B. James, Brookhaven National Lab.. . . . . [7079-47]

Effects of chemical polishing on the performance of CZT and CMT gamma radiation detectors, Anwar M. Hossain, Aleksey E. Bolotnikov, Giuseppe S. Camarda, Yonggang Cui, Ge Yang, Brookhaven National Lab.; D. Kochanowska, Andrzej Mycielski, Instytut Fizyki (Poland); Ralph B. James, Brookhaven National Lab.. . . . . [7079-46]

Performance of RENA-3 IC with position-sensitive solid-state detectors, Victoria B. Cajipe, Martin Clajus, Satoshi Hayakawa, Tumay O. Tumer, Alexander Volkovskii, Nova R&D, Inc.. . . . . [7079-44]

Model compounds for cadmium zinc telluride (CZT) chemical impurities, Dale L. Perry, Lawrence Berkeley National Lab.; Larry Franks, Special Technologies Lab.. . . . . [7079-43]

Tuesday 12 August

SESSION 3

Room: Conv. Ctr. 3 . . . . . .Tues. 8:00 to 10:00 am

CZT Growth and Characterization I

Session Chair: **Mark Wrobel,** DTRA

8:00 am: **New approaches in compensation and reducing Te inclusions in the growth of CdZnTe** *(Invited Paper)*, Kelvin G. Lynn, Kelly A. Jones, Washington State Univ.. . . . . [7079-09]

8:30 am: **Modeling the growth of CZT by the EDG process**, Jeffrey J. Derby, David Gasperino, Lisa Lun, Andrew Yeckel, Univ. of Minnesota . . . . [7079-10]

8:50 am: **Final surface treatment effect on performance of CdZnTe Frisch collar gamma-ray detectors**, Alireza Kargar, Adam C. Brooks, Douglas S. McGregor, Kansas State Univ.; Henry Chen, Glenn Bindley, Redlen Technologies (Canada) . . . . . [7079-11]

9:10 am: **Investigation of CdZnTe crystal defects using scanning spreading resistance microscopy**, Goutam Koley, Jie Liu, Univ. of South Carolina; Krishna C. Mandal, EIC Labs., Inc. . . . . [7079-12]

9:30 am: **Investigation of extended defects of CdZnTe using synchrotron radiation** *(Invited Paper)*, Giuseppe S. Camarda, Aleksey E. Bolotnikov, Ge Yang, Anwar Hossain, Yonggang Cui, Ralph James, Brookhaven National Lab. . . . . [7079-13]

Coffee Break . . . . . 10:00 to 10:30 am

SESSION 4

Room: Conv. Ctr. 3 . . . . . Tues. 10:30 am to 12:10 pm

CdTe Crystals and Detectors

Session Chair: **Robert D. McLaren,** Consultant

10:30 am: **Deposition of thick films CdTe**, Michael Fiederle, Ralf Sorgenfrei, Dominc Greiffenberg, Karl-Heinz Bachem, Albert-Ludwigs-Univ. Freiburg (Germany) . . . . . [7079-14]

10:50 am: **Photon counting x-ray CT with 3D holograms by CdTe detector array**, Akifumi Koike, Toru Aoki, Yoichiro Neo, Hidenori Mimura, Shizuoka Univ. (Japan) . . . . . [7079-15]

11:10 am: **Features of characteristics and stability of CdTe nuclear radiation detectors fabricated by laser doping technique**, Volodymyr A. Gnatyuk, V.E. Lashkaryov Institute of Semiconductor Physics (Ukraine) and Shizuoka Univ. (Japan); Oleksandr I. Vlasenko, Sergiy N. Levytskyi, V.E. Lashkaryov Institute of Semiconductor Physics (Ukraine); Toru Aoki, Shizuoka Univ. (Japan); Yoshinori Hatanaka, Aichi Univ. of Technology (Japan); Charalambos Lambropoulos, Technological Educational Institute of Halkis (Greece) . . . . . [7079-16]

11:30 am: **X-ray computed tomography system using a multipixel photon counter**, Eiichi Sato, Iwate Medical Univ. (Japan); Hiroshi Matsukiyo, Akihiro Osawa, Toshiyuki Enomoto, Manabu Watanabe, The Toho Univ. (Japan); Purkhet Abderyim, Iwate Univ. (Japan); Seiitiro Nomiya, Raytech Corp. (Japan); Keitaro Hitomi, Tohoku Institute of Technology (Japan); Akira Ogawa, Shigehiro Sato, Iwate Medical Univ. (Japan). . . . . [7079-17]

11:50 am: **Application of the dual energy technique by using a photon counting CdTe detector**, Wenjuan Zou, Takuya Nakashima, Yoshiaki Onishi, Hisashi Morii, Yoichiro Neo, Hidenori Mimura, Aoki Toru, Shizuoka Univ. (Japan). . . . . [7079-18]

Lunch/Exhibition Break . . . . . 12:10 to 1:40 pm

SESSION 5

Room: Conv. Ctr. 3 . . . . . .Tues. 1:40 to 3:10 pm

Other Wide Bandgap Semiconductors I

Session Chair: **Lodewijk van Den Berg,** Constellation Technology Corp.

1:40 pm: **Evaluation of TlBr detectors with Tl electrodes** *(Invited Paper)*, Keitaro Hitomi, Tadayoshi Shoji, Tohoku Institute of Technology (Japan). . . . . [7079-19]

2:10 pm: **Purification, crystal growth and detector performance of TlBr**, Alexei V. Churilov, William M. Higgins, Guido Ciampi, Hadong Kim, Leonard J. Cirignano, Yuri Dmitriev, Kanai S. Shah, Radiation Monitoring Devices, Inc. . . . . [7079-20]

2:30 pm: **A systematic study on the growth factors of mercuric iodide crystals**, Elsa Ariesanti, Lisel M. Kraft, Marty Rudolph, Christopher D. Frampton, Sarah E. Appelhans, Douglas S. McGregor, Kansas State Univ. . . . . [7079-21]

2:50 pm: **Room temperature nuclear spectrometers: a comparative study of heavy metal halides with CdZnTe and PbI2 crystals**, Narsingh B. Singh, Northrop Grumman Corp.; T. E. Schlesinger, Carnegie Mellon Univ.; Andre Berghmans, David Kahler, David Knuteson, Brian Wagner, Steve Gottesman, Manisha Singh, David Machuga, Northrop Grumman Corp. . . . . [7079-22]

Coffee Break . . . . . 3:10 to 3:40 pm

SESSION 6

Room: Conv. Ctr. 3 . . . . . .Tues. 3:40 to 5:10 pm

Other Wide Bandgap Semiconductors II

Session Chair: **Dale L. Perry,** Lawrence Berkeley National Lab.

3:40 pm: **Potential application of (Cd,Mn)Te in x-ray and gamma-ray detection** *(Invited Paper)*, Yonggang Cui, Anwar Hossain, Aleksey Bolotnikov, Giuseppe Camarda, Brookhaven National Lab.; Andrzej Mycielski, Instytut Fizyki (Poland); Ge Yang, Brookhaven National Lab.; Dominika Kochanowska, Marta Witkowska-Baran, Instytut Fizyki (Poland); Ralph B. James, Brookhaven National Lab. . . . . [7079-23]

4:10 pm: **Layered III-VI chalcogenide semiconductor crystals for radiation detectors**, Krishna C. Mandal, Alket Mertiri, Gary W. Pabst, Ronald G. Roy, EIC Labs., Inc.; Yunlong Cui, Pijush Battacharya, Michael Groza, Arnold Burger, Fisk Univ.; Adam M. Conway, Rebecca J. Nikolic, Art J. Nelson, Stephen A. Payne, Lawrence Livermore National Lab.. . . . . [7079-24]

4:30 pm: **Unipolar charge sensing using Frisch and coplanar grid techniques for amorphous selenium-based radiation detectors**, Amir H. Goldan, Karim S. Karim, Univ. of Waterloo (Canada) . . . . . [7079-25]

4:50 pm: **Theoretical studies of defect states in GaSe and GaTe**, Zsolt Rak, S. D. Mahanti, Michigan State Univ.; Krishna C. Mandal, EIC Labs., Inc.; Nils C. Fernelius, Air Force Research Lab.. . . . . [7079-26]

Wednesday 13 August

SESSION 7

Room: Conv. Ctr. 3 . . . . . Wed. 8:30 to 10:10 am

CZT Growth and Characterization II

Session Chair: **Aleksey E. Bolotnikov,** Brookhaven National Lab.

8:30 am: **AFM characterization of laser-induced damage on CdZnTe crystal surfaces**, Samantha A. Hawkins, Lucile C. Teague, Eliel Villa-Aleman, Martine C. Duff, Savannah River National Lab.; Arnold Burger, Michael Groza, Vladimir Buliga, Fisk Univ.. . . . . [7079-27]

8:50 am: **Study of defects in CdZnTe and CdMnTe crystals revealed by etch pit densities and x-ray diffraction topography**, Anwar M. Hossain, Aleksey E. Bolotnikov, Giuseppe S. Camarda, Yonggang Cui, Ge Yang, Brookhaven National Lab.; Andrzej Mycielsky, Polish Academy of Sciences (Poland); Ralph B. James, Brookhaven National Lab. . . . . [7079-28]

9:10 am: **Characterization studies with detector grade CZT**, Martine C. Duff, Savannah River National Lab. . . . . [7079-29]

9:30 am: **Defects, measurements, and performance testing of CdZnTe detectors**, Rubi Gul, Brookhaven National Lab. and Idaho State Univ.; Zheng Li, Ralph B. James, Aleksey Boltnikov, Brookhaven National Lab.; Rene Rodriguez, Kara Keeter, Idaho State Univ. . . . . [7079-30]

9:50 am: **Reproducibility of vertical Bridgman grown CdZnTe radiation detectors**, Kelly A. Jones, Kelvin G. Lynn, Raji Soundararajan, Santosh Swain, Washington State Univ.. . . . . [7079-31]

Coffee Break . . . . . 10:10 to 10:40 am

SESSION 8

Room: Conv. Ctr. 3 . . . . . Wed. 10:40 to 11:50 am

Scintillators

Session Chair: **Zhong He,** Univ. of Michigan

10:40 am: **Precision crystal calorimetry in high-energy physics** *(Invited Paper)*, Ren-yuan Zhu, California Institute of Technology. . . . . [7079-32]

11:10 am: **Transparent ceramic scintillator fabrication, properties and applications**, Nerine J. Cherepy, Joshua D. Kuntz, Jeffery J. Roberts, Stephen J. Asztalos, Douglas R. Manatt, Robert D. Sanner, Thomas M. Tillotson, Giulia Hull, Alexander D. Drobshoff, Stephen A. Payne, Lawrence Livermore National Lab. . . . . [7079-33]

11:30 am: **SrI $_2$: a novel scintillator crystal for nuclear isotope identifiers**, Rastgo H. Hawrami, Alabama A&M Univ. and Fisk Univ.; Mohan Aggarwal, Alabama A&M Univ.; Michael Groza, Arnold Burger, Fisk Univ.; Nerine Cherepy, Giulia Hull, Stephan Friedrich, Stephen A. Payne, Lawrence Livermore National Lab. . . . . [7079-34]

Lunch/Exhibition Break . . . . . 11:50 am to 1:20 pm

SESSION 9

Room: Conv. Ctr. 3 . . . . . Wed. 1:20 to 3:10 pm

Imaging I

Session Chair: **Krishna C. Mandal,** EIC Labs., Inc.

1:20 pm: **Photon-counting x-ray camera utilizing a cadmium telluride detector**, Eiichi Sato, Iwate Medical Univ. (Japan); Purkhet Abderyim, Iwate Univ. (Japan); Hiroshi Matsukiyo, Akihiro Osawa, Toshiyuki Enomoto, Manabu Watanabe, The Toho Univ. (Japan); Seiitiro Nomiya, Raytech Corp. (Japan); Keitaro Hitomi, Tohoku Institute of Technology (Japan); Akira Ogawa, Shigehiro Sato, Iwate Medical Univ. (Japan); Toshio Ichimaru, Hirosaki Univ. (Japan). . . . . [7079-35]

1:40 pm: **CdTe pixel detectors using Medipix2 read-out electronics** *(Invited Paper)*, Michael Fiederle, Alex Fauler, Andreas Zwerger, Albert-Ludwigs-Univ. Freiburg (Germany) . . . . . [7079-36]

2:10 pm: **Performance of an improved readout IC for multi-energy photon-counting x-ray detector arrays**, Martin Clajus, Victoria B. Cajipe, Satoshi Hayakawa, Tumay O. Tumer, Nova R&D, Inc. . . . . [7079-37]

2:30 pm: **CdTe x-ray image sensor driven by field emitter array** *(Invited Paper)*, Toru Aoki, Takuya Sakata, Yuichiro Hanawa, Masashi Nakagawa, Hisashi Morii, Akifumi Koike, Yoichiro Neo, Hidenori Mimura, Shizuoka Univ. (Japan). . . . . [7079-38]

2:50 pm: **New two-dimensional ASICs for solid state pixel detectors**, Tomay O. Tumer, Victoria B. Cajipe, Martin Clajus, Satoshi Hayakawa, Alexander Volkovskii, Nova R&D, Inc.. . . . . [7079-39]

Coffee Break . . . . . 3:10 to 3:40 pm

SESSION 10

Room: Conv. Ctr. 3 . . . . . Wed. 3:40 to 4:50 pm

Imaging II

Session Chair: **Michael Fiederle,** Albert-Ludwigs-Univ. Freiburg (Germany)

3:40 pm: **A CMOS-based large-area high-resolution imaging system for low-energy x-ray applications**, Brian G. Rodricks, Fairchild Imaging[7079-40]

4:00 pm: **An explosives detection system for airline security using coherent x-ray scattering technology**, Robert Madden, L-3 Communications . . . . . [7079-41]

4:20 pm: **Response of composite boron nitride semiconductor neutron detectors**to 241Am/Be non-thermalized neutron source (Invited Paper), Michael M. Schieber, Michael Roth, Oleg Khakhan, A. Fleider, The Hebrew Univ. of Jerusalem (Israel) . . . . . [7079-07]

Room: Conv. Ctr. 3 . . . . . Wed. 4:50 to 5:50 pm

Post-Deadline Papers

Session Chair: **Arnold Burger,** Fisk Univ.

The following post-deadline presentations were accepted due to their exceptional quality and scientific merit.

4:50 pm: **Strontium iodide scintillators for high energy resolution famma ray spectroscopy,** Cody M. Wilson, Edgar V. van Loet, Jarek Glodo, Radiation Monitroing Devices, Inc.; Nerine J. Cherepy, Giuha Hill, Stephen A. Payne, Lawrence Livermore National Lab.; Woon-Seng Choong, William W. Moses, Lawrence Berkeley National Lab.; Kanai S. Shah, Radiation Monitoring Devices, Inc. . . . . [7079-52]

Courses of Related Interest

See SPIE Cashier for information and to register.

SC794 X-ray microCT (Micro Computed Tomography) (Stock) Monday, 1:30 to 5:30 pm

Conference 7080

Thursday 14 August 2008 • Proceedings of SPIE Vol. 7080

Penetrating Radiation Systems and Applications IX

Conference Chairs: **F. Patrick Doty,** Sandia National Labs.; **H. Bradford Barber,** The Univ. of Arizona; **Hans Roehrig,** The Univ. of Arizona; **Richard C. Schirato,** Science Applications International Corp.

Program Committee: **Zane Bell,** Oak Ridge National Lab; **Gary P. Grim,** Los Alamos National Lab.; **Geoffrey Harding,** GE Security (Germany); **Bruce H. Hasegawa,** Univ. of California/San Francisco; **Ralph B. James,** Brookhaven National Lab.; **Denny L. Y. Lee,** DxRay, Inc.; **Vivek V. Nagarkar,** Radiation Monitoring Devices, Inc.; **Stephen A. Payne,** Lawrence Livermore National Lab.; **Ladislav Pina,** Reflex s.r.o (Czech Republic); **Eiichi Sato,** Iwate Medical Univ. (Japan); **Irina Shestakova,** Schlumberger Princeton Technology Ctr.; **Michael R. Squillante,** Radiation Monitoring Devices, Inc.; **Douglas J. Wagenaar,** Gamma Medica-Ideas, Inc.

Tuesday 12 August

Room: Marriott Balboa . . . . . Tues. 8:00 to 10:00 pm

Penetrating Radiation Technical Event

Chair: **Warnik J. Kernan,** Pacific Northwest National Lab.

Special Presentation: Aspects of detector development for neutrinoless double beta decay experiments **Dr. John L. Orrell,** Pacific Northwest National Lab.

The event brings together technologists and scientists with interests in neutron, x- and gamma-ray detection, spectroscopy, and imaging for all applications.

Wednesday 13 August

Room: Conv. Ctr. Exhibit Hall B2 . . . . . Wed. 5:30 to 7:00 pm

Posters-Wednesday

Poster authors will begin displaying posters after 10:00 am Wednesday morning. A poster session, with authors present at their posters, will be held Wednesday evening from 5:30 to 7:00 pm. Light refreshments will be served.

Poster Setup

Poster presenters must set up their posters between 10:00 am and 5:00 pm on Wednesday. Poster presenters who have not set up by 5:00 pm on Wednesday will be considered a "no show" and their manuscript will not be published. Presenters must remove their posters immediately after the poster session. Posters not removed will be considered unwanted and will be discarded. SPIE assumes no responsibility for posters left up after the end of each poster session.

Aliovalent doping of CeBr3, Mark J. Harrison, Douglas S. McGregor, Kansas State Univ.; Kip O. Findley, Washington State Univ.; Raulf M. Polichar, Science Applications International Corp.; F. Patrick Doty, Sandia National Labs. . . . . [7080-24]

Thursday 14 August

SESSION 1

Room: Conv. Ctr. 3 . . . . . Thurs. 8:00 to 10:05 am

Biomedical Applications I

Session Chair: **H. Bradford Barber,** The Univ. of Arizona

8:00 am: **Ultrashort relativistic electron bunches and spatio-temporal radiation biology** *(Invited Paper)*, Yann A. Gauduel, Jerome Faure, Victor Malka, Ecole Nationale Supérieure de Techniques Avancées (France)[7080-01]

8:25 am: **Novel x-ray topography system utilizing energy subtraction**, Akihiro Osawa, The Toho Univ. (Japan); Eiichi Sato, Iwate Medical Univ. (Japan); Hiroshi Matsukiyo, Toshiyuki Enomoto, Manabu Watanabe, The Toho Univ. (Japan); Purkhet Abderyim, Iwate Univ. (Japan); Etsuro Tanaka, Tokyo Univ. of Agriculture and Technology (Japan); Mitsuru Izumisawa, Akira Ogawa, Shigehiro Sato, Iwate Medical Univ. (Japan). . . . . [7080-02]

8:45 am: **Phase-contrast imaging with a liquid-metal-jet-anode x-ray tube**, Hans M. Hertz, Tomi T. Tuohimaa, Mikael Otendal, Richard Tjörnhammar, Peter Skoglund, Kungliga Tekniska Högskolan (Sweden); Marina Vita, Marie Henriksson, Karolinska Institutet (Sweden). . . . . [7080-03]

9:05 am: **DQE of imaging detectors for application in crystallography**, Hans Roehrig, The Univ. of Arizona; William V. Schempp, Michael A. Damento, Alonzo Pickett, Wayne Maher, Rigaku Innovative Technologies, Inc. [7080-04]

9:25 am: **Developing three-dimensional display technologies**, William J. Dallas, Hans Roehrig, The Univ. of Arizona; Daniel J. Allen, Veterans Administration . . . . . [7080-05]

9:45 am: **X-ray fluorescence camera for biomedical imaging**, Hiroshi Matsukiyo, The Toho Univ. (Japan); Eiichi Sato, Iwate Medical Univ. (Japan); Purkhet Abderyim, Iwate Univ. (Japan); Akihiro Osawa, Toshiyuki Enomoto, Manabu Watanabe, The Toho Univ. (Japan); Seiitiro Nomiya, Raytech Corp. (Japan); Koetsu Sato, Thorek, Inc. (Japan); Akira Ogawa, Shigehiro Sato, Iwate Medical Univ. (Japan); Toshio Ichimaru, Hirosaki Univ. (Japan) . . . . . [7080-06]

Coffee Break . . . . . 10:05 to 10:25 am

SESSION 2

Room: Conv. Ctr. 3 . . . . . Thurs. 10:25 am to 12:30 pm

Biomedical Applications II

Session Chair: **F. Patrick Doty,** Sandia National Labs.

10:25 am: **Advances in cardiovascular SPECT and SPECT/CT** *(Invited Paper)*, Bruce H. Hasegawa, Celeste D. Winant, Stephen L. Bacharach, Univ. of California/San Francisco; Grant T. Gullberg, Bryan W. Reutter, Rostyslav Buchko, Qiu Huang, Lawrence Berkeley National Lab.; Eric C. Frey, Yong Du, Xin He, Johns Hopkins Univ.; Carina Mari M.D., Elias H. Botvinick M.D., Univ. of California/San Francisco . . . . . [7080-07]

10:50 am: **A mammography imaging hybrid pixel sensor test chip with low-noise CMOS readout IC on fully depleted silicon-on-insulator design and characterization**, Dung C. Nguyen, Bioptics, Inc. and The Univ. of Arizona; Hugh Cormican, Akif Baysal, Bioptics, Inc.; Janet M. Wang, The Univ. of Arizona; Emre Toker, Bioptics, Inc.; DongSheng B. Ma, The Univ. of Arizona. . . . . [7080-08]

11:10 am: **X-ray fluorescence computed tomography system for biomedical imaging**, Toshiyuki Enomoto, The Toho Univ. (Japan); Eiichi Sato, Iwate Medical Univ. (Japan); Purkhet Abderyim, Iwate Univ. (Japan); Hiroshi Matsukiyo, Akihiro Osawa, Manabu Watanabe, The Toho Univ. (Japan); Seiichiro Nomiya, Raytech Corp. (Japan); Keitaro Hitomi, Tohoku Institute of Technology (Japan); Mitsuru Izumisawa, Akira Ogawa, Shigehiro Sato, Iwate Medical Univ. (Japan) . . . . . [7080-09]

11:30 am: **K-edge x-ray computed tomography system**, Manabu Watanabe, The Toho Univ. (Japan); Eiichi Sato, Iwate Medical Univ. (Japan); Purkhet Abderyim, Iwate Univ. (Japan); Hiroshi Matsukiyo, Akihiro Osawa, Toshiyuki Enomoto, The Toho Univ. (Japan); Seiichiro Nomiya, Raytech Corp. (Japan); Keitaro Hitomi, Tohoku Institute of Technology (Japan); Akira Ogawa, Shigehiro Sato, Iwate Medical Univ. (Japan); Toshio Ichimaru, Hirosaki Univ. (Japan). . . . . [7080-10]

11:50 am: **APD imaging probe for tritium surface contamination**, R. A. Myers, R. Farrell, F. Robertson, G. Derderian, Radiation Monitoring Devices, Inc.; D. Dogruel, R. S. Willms, Los Alamos National Lab. . . . . [7080-11]

12:10 pm: **Consistent color calibration of color LCDs in medical applications**, Hans Roehrig, TheUniv. of Arizona; William J. Dallas, Kelly Rehm, The Univ. of Arizona; Gary R. Redford, Arete Associates . . . . [7080-12]

Lunch/Exhibition Break . . . . . 12:30 to 1:30 pm

SESSION 3

Room: Conv. Ctr. 3 . . . . . Thurs. 1:30 to 3:15 pm

Neutrons and ICF

Session Chair: **Hans Roehrig,** The Univ. of Arizona

1:30 pm: **A fuel/ablator mix diagnostic for inertial confinement fusion experiments** *(Invited Paper)*, Gary Grim, Thomas N. Archuleta, Paul A. Bradley, Todd A. Bredeweg, David D. Clark, Scott C. Evans, Malcolm M. Fowler, Felix P. Garcia, Jeffrey R. Griego, Anna C. Hayes, Gerard Jungman, Andrew W. Obst, Robert S. Rundberg, Phillip G. Sanchez, David J. Vieira, Jerry B. Wilhelmy, Yongqiang Wang, Los Alamos National Lab.. . . . . [7080-13]

1:55 pm: **Neutron imaging development for the National Ignition Facility**, Mark Wilke, Robert Day, David Clark, Gary Grim, Valerie Fatherley, Felix Garcia, Andrew Montoya, George Morgan, John Oertel, Jeremy Payton, Pete Pazuchanics, Derek Schmidt, Adelaida Valdez, Carl Wilde, Los Alamos National Lab. . . . . [7080-14]

2:15 pm: **Improved neutron detectors based on CMOS solid state photomultipliers**, Radia Sia, James Christian, Radiation Monitoring Devices, Inc.; Thomas Prettyman, Planetary Science Institute . . . . . [7080-15]

2:35 pm: **Neutron imaging of radioactive sources**, Fareeha Hameed, Sam Karimzadeh, Michael Zawisky, Vienna Univ. of Technology (Austria). [7080-16]

2:55 pm: **Progress toward a semiconducting polymer neutron detector**, Tiffany M.Wilson, Sandia National Labs. and The Ohio State Univ.; Douglas A. Chinn, F. Patrick Doty, Sandia National Labs. . . . . [7080-17]

Coffee Break . . . . . 3:15 to 3:35 pm

SESSION 4

Room: Conv. Ctr. 3 . . . . . Thurs. 3:35 to 5:40 pm

Scintillators and Other Applications

Session Chair: **H. Bradford Barber,** The Univ. of Arizona

3:35 pm: **Scintillation properties and imaging performance of microcolumnar ZnSe:Te films** *(Invited Paper)*, Vivek Nagarkar, Valeriy Gaysinskiy, Samta Thacker, Bipin Singh, Stuart Miller, Radiation Monitoring Devices, Inc. . . . . [7080-18]

4:00 pm: **SNM detection with x-ray diffraction**, Geoffrey Harding, GE Security Germany (Germany) . . . . . [7080-19]

4:20 pm: **Vapor deposited coatings of Lu2O3:Eu3+ for scintillating applications**, S. G. Topping, C. H. Park, V. K. Sarin, Boston Univ. . . [7080-20]

4:40 pm: **New metal organic framework scintillator results**, F. Patrick Doty, Charles A. Bauer, Raghunandan K. Bhakta, Blake A. Simmons, M. D. Allendorf, Ronald J. T.Houk, Sandia National Labs. . . . . [7080-21]

5:00 pm: **Characteristic x-ray generator and its applications**, Eiichi Sato, Iwate Medical Univ. (Japan); Hiroshi Matsukiyo, Akihiro Osawa, Toshiyuki Enomoto, Manabu Watanabe, The Toho Univ. (Japan); Akira Ogawa, Shigehiro Sato, Iwate Medical Univ. (Japan). . . . . [7080-22]

5:20 pm: **Fracture resistant lanthanide halide alloys**, Kip O. Findley, David F. Bahr, Washington State Univ.; Mark J. Harrison, Douglas S. McGregor, Kansas State Univ.; Raulf M. Polichar, Science Applications International Corp.; F. Patrick Doty, Sandia National Labs. . . . . [7080-23]

Courses of Related Interest

See SPIE Cashier for information and to register.

SC794 X-ray microCT (Micro Computed Tomography) (Stock) Monday, 1:30 to 5:30 pm

Conference 7081

Monday-Wednesday 11-13 August 2008 • Proceedings of SPIE Vol. 7081

Earth Observing Systems XIII

Conference Chairs: **James J. Butler,** NASA Goddard Space Flight Ctr.; **Jack Xiong,** NASA Goddard Space Flight Ctr.

Program Committee: **Philip E. Ardanuy,** Raytheon Intelligence and Information Systems; **Robert A. Barnes,** Science Applications International Corp.; **Jeffrey S. Czapla-Myers,** College of Optical Sciences/The Univ. of Arizona; **Armin W. Doerry,** Sandia National Labs.; **Thomas S. Pagano,** Jet Propulsion Lab.; **Carl F. Schueler,** Schueler Consulting - Santa Barbara

Monday 11 August

SESSION 1

Room: Conv. Ctr. 17B . . . . . Mon. 8:30 to 10:30 am

Prelaunch Calibration

Session Chair: **Jeffrey S. Czapla-Myers,** College of Optical Sciences/The Univ. of Arizona

8:30 am: **Vacuum compatible large uniform radiance source for ground calibration of satellite cameras inside a thermal vacuum environment**, Angelo V. Arecchi, Joseph W. Jablonski, Marc Gervais, Mark Gugliotta, SphereOptics, LLC; Samir Pal, Harish Seth, Arun Bhardwaj, Hari S. Sahoo, Indian Space Research Organisation (India) . . . . . [7081-01]

8:50 am: **Design and validation of a transfer radiometer**, Nik J. Anderson, Kurt J. Thome, Stuart F. Biggar, Jeffrey S. Czapla-Myers, College of Optical Sciences/The Univ. of Arizona . . . . . [7081-02]

9:10 am: **Radiometric calibration of 100 cm sphere integrating source for Aerosol Polarimetry Sensor (APS)**, Eugene D. Kim, Raytheon Space & Airborne Systems . . . . . [7081-03]

9:30 am: **Pre-launch performance characterization of EOS-C camera**, Young-Wan Choi, Seongmin Kang, Jiho Yun, Jongun Kim, Myungseok Kang, Sungkeun Jeong, Hyungu Kim, Jaehun Song, Ee-Eul Kim, Satrec Initiative Co., Ltd. (South Korea) . . . . . [7081-04]

9:50 am: **BRDF study of gray Spectralon for calibration of spaceborne sensors**, Georgi T. Georgiev, Science Systems and Applications, Inc.; James J. Butler, NASA Goddard Space Flight Ctr. . . . . [7081-05]

10:10 am: **Pre-launch optical tests of a MODIS and MISR**, Eugene Waluschka, NASA Goddard Space Flight Ctr.; Carol J. Bruegge, Jet Propulsion Lab.; Jack Xiong, NASA Goddard Space Flight Ctr.. . . . . [7081-06]

Coffee Break . . . . . 10:30 to 11:00 am

SESSION 2

Room: Conv. Ctr. 17B . . . . . Mon. 11:00 am to 12:00 pm

MODIS I

Session Chair: **Robert A. Barnes,** Science Applications International Corp.

11:00 am: **MODIS scan-direction Line Spread Function (LSF) modeling and verification by using the measurement of the Integration and Alignment Collimator (IAC)**, Nianzeng Che, Taeyoung Choi, Science Systems and Applications, Inc.; Xiaoxiong Xiong, NASA Goddard Space Flight Ctr.; David Moyer, The Aerospace Corp. . . . . [7081-07]

11:20 am: **On-orbit aqua MODIS modulation transfer function along scan trending from the spectro-radiometric calibration assembly**, Taeyoung J. Choi, Nianzeng Che, Science Systems and Applications, Inc.; Xiaoxiong Xiong, NASA Goddard Space Flight Ctr. . . . . [7081-08]

11:40 am: **Assessment of MODIS scan mirror reflectance changes on-orbit**, Xiaoxiong (Jack) Xiong, NASA Goddard Space Flight Ctr.; Aisheng Wu, Science Systems and Applications, Inc.. . . . . [7081-09]

Lunch. . . . . 12:00 to 1:40 pm

SESSION 3

Room: Conv. Ctr. 17B . . . . . Mon. 1:40 to 3:00 pm

MODIS II

Session Chair: **James J. Butler,** NASA Goddard Space Flight Ctr.

1:40 pm: **Characterization of MODIS VIS/NIR spectral band detector-to-detector difference**, Xiaoxiong (Jack) Xiong, NASA Goddard Space Flight Ctr.; Junqiang Sun, Science Systems and Applications, Inc.; Gerhard Meister, Futuretech Corp. and NASA Goddard Space Flight Ctr.; Ewa Kwiatkowska, Science Applications International Corp. . . . . [7081-10]

2:00 pm: **Sun yaw angle residuals in solar diffuser measurements of the MODIS ocean bands**, Gerhard Meister, Futuretech Corp. and NASA Goddard Space Flight Ctr.; Junqiang Sun, Science Systems and Applications, Inc.; Robert E. Eplee, Frederick S. Patt, Science Applications International Corp.; Xiaoxiong Xiong, Charles R. McClain, NASA Goddard Space Flight Ctr.. . . . . [7081-11]

2:20 pm: **Long-term MODIS spatial characterization using ground target approach**, Yong Xie, George Mason Univ.; Xiaoxiong Xiong, NASA Goddard Space Flight Ctr.; John J. Qu, George Mason Univ.; Nianzeng Che, Science Systems and Applications, Inc.. . . . . [7081-12]

2:40 pm: **Determination of the noise characterization of the MODIS thermal emissive bands for cold scene observations**, Aisheng Wu, Science Systems and Applications, Inc.; Xiaoxiong Xiong, NASA Goddard Space Flight Ctr.. . . . . [7081-13]

Coffee Break . . . . . 3:00 to 3:30 pm

SESSION 4

Room: Conv. Ctr. 17B . . . . . Mon. 3:30 to 5:30 pm

Vicarious Calibration and Validation

Session Chair: **Armin W. Doerry,** Sandia National Labs.

3:30 pm: **Vicarious calibration of GOES imager visible channel using long term measurements of stars**, Xiangqian Wu, National Oceanic and Atmospheric Administration . . . . . [7081-14]

3:50 pm: **Identification of contaminated pixels on desert target for AVHRR vicarious calibration**, Fangfang Yu, Earth Resources Technology, Inc.; Xiangqian Wu, National Oceanic and Atmospheric Administration . . [7081-15]

4:10 pm: **Temporal, spectral and spatial study of the automated vicarious calibration test site at Railroad Valley, Nevada**, Jeffrey S. Czapla-Myers, Kurtis J. Thome, Joel T. McCorkel, John H. Buchanan, College of Optical Sciences/The Univ. of Arizona . . . . . [7081-16]

4:30 pm: **Validation of the IASI temperature and water vapor profile retrievals by correlative radiosondes**, Nikita S. Pougatchev, Utah State Univ.; Thomas August, Xavier Calbet, EUMETSAT (Germany); Gail E. Bingham, Utah State Univ.; Tim Hultberg, Peter Schlüssel, EUMETSAT (Germany) . . . . . [7081-17]

4:50 pm: **New differential Fabry-Perot radiometer for remote sensing measurements of column CO_2, O_2, H_2O and other atmospheric trace gases**, William S. Heaps, Emily L. Wilson, Elena M. Georgieva, NASA Goddard Space Flight Ctr. . . . . [7081-18]

5:10 pm: **Level 1C spectra from the Atmospheric Infrared Sounder (AIRS),** Denis A. Elliott, Hartmut H. Aumann, Yibo Jiang, Daniel R. Feldman, Jet Propulsion Lab. . . . . [7081-19]

OPTICS

Room: Conv. Ctr. Exhibit Hall B2 . . . . . Mon. 6:00 to 7:30 pm

Posters-Monday

Poster authors will begin displaying posters after 10:00 am Monday morning. A poster session, with authors present at their posters, will be held Monday evening from 6:00 to 7:30 pm. Light refreshments will be served.

Poster Setup

Poster presenters must set up their posters between 10:00 am and 5:00 pm on Monday. Poster presenters who have not set up by 5:00 pm on Monday will be considered a "no show" and their manuscript will not be published. Presenters must remove their posters immediately after the poster session. Posters not removed will be considered unwanted and will be discarded. SPIE assumes no responsibility for posters left up after the end of each poster session.

Multi-wavelength lidar for remote sensing applications, Shalei Song, Pingxiang Li, Wei Gong, Liangpei Zhang, Wuhan Univ. (China) . . . . . [7081-49]

The simulator of single photon counting planetary altimeter, Josef Blazej, Ivan Prochazka, Czech Technical Univ. in Prague (Czech Republic) . [7081-50]

Derivation of the point-spread function for MODIS aqua ocean color bands, Gerhard Meister, FutureTech Corp. and NASA Goddard Space Flight Ctr.; Yuqin Zong, National Institute of Standards and Technology; Charles R. McClain, NASA Goddard Space Flight Ctr. . . . . [7081-51]

Novel laser approach for remote sensing of atmospheric CO_2 column, Elena M. Georgieva, Emily L. Wilson, William S. Heaps, NASA Goddard Space Flight Ctr.. . . . . [7081-54]

Tuesday 12 August

SESSION 5

Room: Conv. Ctr. 17B . . . . . Tues. 8:00 to 10:00 am

CLARREO

Session Chair: **Thomas S. Pagano,** Jet Propulsion Lab.

8:00 am: **The role of CLARREO in the Earth observing system**, David F. Young, NASA Langley Research Ctr.; Donald E. Anderson, Kenneth W. Jucks, NASA Headquarters, Office of Management and Planning . . . . . [7081-25]

8:20 am: **On-orbit accuracy of infrared spectra for climate model testing**, John A. Dykema, P. Jonathan Gero, Stephen S. Leroy, Harvard Univ.; Henry E. Revercomb, Univ. of Wisconsin/Madison; Daniel Kirk-Davidoff, Univ. of Maryland/College Park; James G. Anderson, Harvard Univ. . . . . [7081-26]

8:40 am: **On-orbit absolute calibration of temperature with application to the CLARREO mission**, Fred A. Best, Douglas P. Adler, Scott D. Ellington, Donald J. Thielman, Henry E. Revercomb, Univ. of Wisconsin/ Madison. . . . . [7081-27]

9:00 am: **Investigating the capability of CLARREO to calibrate operational sounders with a focus on both spatial and temporal sampling uncertainties**, Robert E. Holz, David C. Tobin, Robert O. Knuteson, Steven T. Dutcher, Henry E. Revercomb, Frederick W. Nagle, Univ. of Wisconsin/ Madison. . . . . [7081-28]

9:20 am: **On-orbit characterization of blackbody emissivity and spectrometer instrument line-shape using quantum cascade laser-based reflectometry**, Jonathan Gero, John A. Dykema, James G. Anderson, Stephen S. Leroy, Harvard Univ. . . . . [7081-29]

9:40 am: **NIST thermal emission metrology in support of climate benchmarks traceability**, Sergey N. Mekhontsev, Leonard M. Hanssen, National Institute of Standards and Technology. . . . . [7081-30]

Coffee Break . . . . . 10:00 to 10:30 am

SESSION 6

Room: Conv. Ctr. 17B . . . . . Tues. 10:30 am to 12:10 pm

New Missions and Technologies

Session Chair: **Carl F. Schueler,** Schueler Consulting - Santa Barbara

10:30 am: **ESA future Earth observation explorers missions**, Jean-Loup Bézy, Paolo Bensi, European Space Agency (Netherlands); Michael Berger, European Space Agency (Italy); Bernardo A. Carnicero, Malcolm Davidson, Mark R. Drinkwater, Yannig Durand, Florence Héliere, Paul Ingmann, Jörg Langen, Chung-Chi Lin, Roland Meynart, Helge Rebhan, Pierluigi Silvestrin, Alan Thompson, European Space Agency (Netherlands) . . . . . [7081-20]

10:50 am: **WindCam and MSPI: two cloud and aerosol instrument concepts derived from Terra/MISR heritage**, David J. Diner, Michael Mischna, Jet Propulsion Lab.; Russell A. Chipman, College of Optical Sciences/The Univ. of Arizona; Ab Davis, Jet Propulsion Lab.; Brian Cairns, Columbia Univ.; Roger Davies, The Univ. of Auckland (New Zealand); Ralph A. Kahn, NASA Goddard Space Flight Ctr.; Jan-Peter A. Muller, Univ. College London (United Kingdom); Omar Torres, Hampton Univ.. . . . . [7081-21]

11:10 am: **Space instrument performance traceability for high resolution satellite systems**, Andreas Eckardt, Anko Börner, Herbert Jahn, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany); Ralf Reulke, Humboldt-Univ. zu Berlin (Germany) . . . . . [7081-22]

11:30 am: **Observational considerations for moderate resolution nighttime lights**, Christopher D. Elvidge, National Oceanic and Atmospheric Administration; Donald R. Pettit, NASA Johnson Space Ctr.; Marc L. Imhoff, NASA Goddard Space Flight Ctr.; Ramakrishna Nemani, NASA Ames Research Ctr.; Dee Pack, The Aerospace Corporation. . . . . [7081-23]

11:50 am: **The key technologies research on the large field-of-view and high resolution optical synthesis telescope,** Haitao Wang, Nanjing Univ. of Aeronautics and Astronautics (China) . . . . . [7081-24]

Room: Conv. Ctr. 6A . . . . . Tues. 1:15 to 5:30 pm

Remote Sensing Plenary

Join this collaborative plenary session, to hear presentations from a cross section of remote sensing applications. For more detailed information see p. 17-18.

1:15 pm: **The Contributions from the NASA Earth Science Decadal Survey missions in understanding Global Climate Change** *(Presentation Only)*, Jason J. Hyon, Jet Propulsion Lab. . . . . [7085-158]

2:00 pm: **Recovering the Atmospheric Information from the High Resolution Dynamics Limb Sounder (HIRDLS)** *(Presentation Only)*, John C. Gille, National Ctr. for Atmospheric Research. . . . . [7082-45]

2:45 pm: **Measurement Science for Climate Remote Sensing** *(Presentation Only)*, Gerald T. Fraser, National Institute of Standards and Technology. . . . . [7081-53]

Coffee Break . . . . . 3:30 to 4:00

4:00 pm: **Application of MODIS Direct Broadcast System: Fire Detection, Burn Scars, Emissions, Air Quality Forecasting** *(Presentation Only)*, Wei Min Hao, Shawn P. Urbanski, J. M. Salmon, B. Nordgren, Alexander Petkov, U.S.D.A. Forest Service . . . . . [7089-18]

4:45 pm: **Infrared Retina Using Nanoscale Quantum Dots and Strain Layer Superlattices** *(Presentation Only)*, Sanjay Krishna, The Univ. of New Mexico . . . . . [7082-46]

Wednesday 13 August

SESSION 7

Room: Conv. Ctr. 17B . . . . . Wed. 8:00 to 9:40 am

Cross Calibration and Intercomparisons

Session Chair: **Philip E. Ardanuy,** Raytheon Intelligence and Information Systems

8:00 am: **Radiometric calibration stability and inter-calibration of solar-band instruments in orbit using the moon**, Thomas C. Stone, U.S. Geological Survey . . . . . [7081-31]

8:20 am: **MODIS and SeaWIFS on-orbit lunar calibration**, Junqiang Sun, Science Systems and Applications, Inc.; Robert E. Eplee, Jr., Science Applications International Corp.; Xiaoxiong Xiong, NASA Goddard Space Flight Ctr.; Thomas C. Stone, U.S. Geological Survey; Gerhard Meister, FutureTech Corp. and NASA Goddard Space Flight Ctr.; Charles R. McClain, NASA Goddard Space Flight Ctr. . . . . [7081-32]

8:40 am: **MODIS-Terra on-orbit cross-calibration for ocean-color bands**, Ewa J. Kwiatkowska, NASA Goddard Space Flight Ctr. and NASA Goddard Space Flight Ctr.; Bryan A. Franz, NASA Goddard Space Flight Ctr.; Gerhard Meister, FutureTech Corp. and NASA Goddard Space Flight Ctr.; Robert E. Eplee, Jr., Science Applications International Corp.; Charles R. McClain, Xiaoxiong Xiong, NASA Goddard Space Flight Ctr. . . . . [7081-33]

9:00 am: **Cross-calibration of the Terra MODIS and the Landsat 7 ETM+ sensors using an invariant desert site**, Taeyoung J. Choi, Amit Angal, Science Systems and Applications, Inc.; Gyanesh Chander, Science Applications International Corp. and Consultant; Xiaoxiong Xiong, NASA Goddard Space Flight Ctr. . . . . [7081-34]

9:20 am: **Simulation of the ETM+ and ALI spectral responses using AVIRIS**, David J. Meyer, Gyanesh Chander, Science Applications International Corp. . . . . [7081-35]

Coffee Break . . . . . 9:40 to 10:10 am

SESSION 8

Room: Conv. Ctr. 17B . . . . . Wed. 10:10 am to 12:10 pm

On-orbit Calibration

Session Chair: **Jack Xiong,** NASA Goddard Space Flight Ctr.

10:10 am: **The on-orbit calibration of SeaWiFS: functional fits to the lunar time series**, Robert E. Eplee, Jr., Frederick S. Patt, Science Applications International Corp.; Gerhard Meister, FutureTech Corp. and NASA Goddard Space Flight Ctr.; Charles R. McClain, NASA Goddard Space Flight Ctr.. . . . . [7081-37]

10:30 am: **Monitoring MODIS calibration stability of visible and near-IR bands from retrieved top-of-atmosphere BRDF-adjusted reflectances over desert and Antarctic surfaces**, Aisheng Wu, Science Systems and Applications, Inc.; Xiaoxiong Xiong, NASA Goddard Space Flight Ctr.; Changyong Cao, National Oceanic and Atmospheric Administration; Amit Angal, Science Systems and Applications, Inc. . . . . [7081-38]

10:50 am: **Landsat 5 thematic mapper radiometric recalibration procedure using the internal calibration gain trends from the NLAPS trending database**, Gyanesh Chander, Md. Obaidul Haque, Esad Micijevic, Science Applications International Corp.; Julia A. Barsi, Science Systems and Applications, Inc.. . . . . [7081-39]

11:10 am: **Development of Landsat-5 thematic mapper internal calibrator gain look-up table**, Julia A. Barsi, Science Systems and Applications, Inc.; Gyanesh Chander, Esad Micijevic, Science Applications International Corp.; Brian L. Markham, NASA Goddard Space Flight Ctr. . . . . [7081-40]

11:30 am: **WorldView-1 pre and post-launch radiometric calibration and early on-orbit characterization**, Keith S. Krause, DigitalGlobe, Inc. [7081-41]

11:50 am: **1999-2003 shortwave characterizations of Earth Radiation Budget Satellite (ERBS)/Earth Radiation Budget Experiment (ERBE) broadband active cavity radiometer sensors**, Robert B. Lee III, George L. Smith, National Institute of Aerospace; Takmeng Wong, NASA Langley Research Ctr.; Kathryn A. Bush, Science Applications International Corp. . . . . [7081-42]

Lunch. . . . . 12:10 to 2:00 pm

SESSION 9

Room: Conv. Ctr. 32B . . . . . Wed. 2:00 to 3:40 pm

GEOSS and EOS joint session I

Join this collaborative session between the Earth Observing Systems and Atmospheric and Environmental Remote Sensing Data Processing and Utilization IV: Readiness for GEOSS conferences.

2:00 pm: **Accuracy assessment for the radiometric calibration of Earth-observing imagers using preflight techniques relying on the sun as a source**, Kurtis J. Thome, Jeffrey S. Czapla-Myers, College of Optical Sciences/The Univ. of Arizona; Michele A. Kuester, Ball Aerospace & Technologies Corp. . . . . [7081-43]

2:20 pm: **Development of a heliostat facility for solar-radiation-based calibration of Earth observing sensors**, Michele A. Kuester, Ball Aerospace & Technologies Corp.; Jeffrey S. Czapla-Myers, College of Optical Sciences/ The Univ. of Arizona; Paul Kaptchen, James Lasnik, Tony Lin, Raymund To, Ball Aerospace & Technologies Corp.; Stuart F. Biggar, Kurtis J. Thome, College of Optical Sciences/The Univ. of Arizona. . . . . [7081-44]

2:40 pm: **Radiometric performance of the CERES broadband radiometers on the Terra and Aqua spacecraft**, Kory J. Priestley, NASA Langley Research Ctr.; Susan Thomas, Science Systems and Applications, Inc.; Grant M. Matthews, Analytical Services and Materials, Inc.. . . . . [7081-45]

3:00 pm: **Absolute radiometric calibration accuracy of the Atmospheric Infrared Sounder (AIRS)**, Thomas S. Pagano, Hartmut H. Aumann, Jet Propulsion Lab.; Kenneth R. Overoye, BAE Systems . . . . . [7081-46]

3:20 pm: **Towards reducing radiometric uncertainties in measurements with radiometric transfer standards**, Steven W. Brown, B. Carol Johnson, Robert D. Saunders, Michael Lin, Allan Smith, National Institute of Standards and Technology. . . . . [7081-47]

Coffee Break . . . . . 3:40 to 4:10 pm

SESSION 10

Room: Conv. Ctr. 32B . . . . . Wed. 4:10 to 5:30 pm

GEOSS and EOS joint session II

Session Chair: **Cheng-Zhi Zou,** National Oceanic and Atmospheric Administration

Join this collaborative session between the Earth Observing Systems and Atmospheric and Environmental Remote Sensing Data Processing and Utilization IV: Readiness for GEOSS conferences.

4:10 pm: **Evaluation of satellite land surface temperatures using ground measurements from surface radiation budget network**, Yunyue Yu, Dan Tarpley, National Oceanic and Atmospheric Administration; Konstantin Y. Vinnikov, Univ. of Maryland/College Park; Rama M. K.Varma Raja, Mitchell D. Goldberg, National Oceanic and Atmospheric Administration . . . . . [7085-20]

4:30 pm: **Using MODIS imagery for improving AVHRR geolocation**, Konstantin V. Khlopenkov, Alexander P. Trishchenko, Canada Ctr. for Remote Sensing (Canada) . . . . . [7085-22]

4:50 pm: **Impact of a near real-time AVHRR green vegetation fraction data on numerical weather predictions of WRF-ARW over USA**, Yuhong Tian, Cheng-Zhi Zou, Kenneth Mitchell, Le Jiang, Dan Tarpley, Felix Kogan, Vince Wong, Xiwu Zhan, National Oceanic and Atmospheric Administration[7085-24]

5:10 pm: **Two methods for the absolute calibration of SZ-3 CMODIS sensors and their comparison based on Dunhuang test size**, Xuan Li, National Meteorological Ctr. (China); Zhifeng Guo, Institute of Remote Sensing Applications (China). . . . . [7085-23]

Courses of Related Interest

See SPIE Cashier for information and to register.

SC567 Introduction to Optical Remote Sensing Systems (Shaw) Tuesday, 1:30 to 5:30 pm

Conference 7082

Monday-Wednesday 11-13 August 2008 • Proceedings of SPIE Vol. 7082

Infrared Spaceborne Remote Sensing and Instrumentation XVI

Conference Chair: **Marija Strojnik,** Ctr. de Investigaciones en Óptica (Mexico)

Program Committee: **John A. Antoniades,** BAE Systems; **Gail E. Bingham,** Utah State Univ.; **David A. Cardimona,** Air Force Research Lab.; **Catherine J. Cesarsky,** European Southern Observatory (Germany); **Jam Farhoomand,** TechnoScience Corp.; **Gerald T. Fraser,** National Institute of Standards and Technology; **John C. Gille,** National Ctr. for Atmospheric Research; **Sarath D. Gunapala,** Jet Propulsion Lab.; **Dietrich Lemke,** Max-Planck-Institut für Astronomie (Germany); **Jan Williams,** e-Systems Management Consultants; **Juergen Wolf,** NASA Ames Research Ctr.

Monday 11 August

SESSION 1

Room: Conv. Ctr. 18 . . . . . Mon. 8:30 am to 12:20 pm

Advanced Detectors and Technologies

Session Chairs: **Paul M. Alsing,** Air Force Research Lab.; **David A. Cardimona,** Air Force Research Lab.

8:30 am: **Development of material quality and structural design for high performance Type II InAs/GaSb superlattice photodiodes and focal plane arrays** *(Invited Paper)*, Manijeh Razeghi, Binh Minh Nguyen, Darin M. Hoffman, Pierre-Yves Delaunay, Edward K. Huang, Northwestern Univ. . . . . [7082-01]

9:00 am: **Very high performance LWIR Type-II InAs/GaSb superlattice photodiodes with M-structure barrier**, Binh Minh Nguyen, Darin M. Hoffman, Pierre-Yves Delaunay, Edward K. Huang, Manijeh Razeghi, Northwestern Univ. . . . . [7082-02]

9:20 am: **Infrared focal plane arrays based on nanoscale quantum dots and strain layer superlattices** *(Invited Paper)*, Sanjay Krishna, The Univ. of New Mexico. . . . . [7082-03]

9:50 am: **Low strain quantum dots in a double well infrared detector**, Rajeev V. Shenoi, Thomas E. Vandervelde, Jiayi Shao, Yagya D. Sharma, Sanjay Krishna, Ctr. for High Technology Materials . . . . . [7082-04]

Coffee Break . . . . . 10:10 to 10:40 am

10:40 am: **C-QWIP focal plane array development**, Kwong-Kit Choi, Jason Sun, Army Research Lab.; David P. Forrai, Darrel W. Endres, John W. Devitt, L-3 Communications Cincinnati Electronics, Inc. . . . . [7082-05]

11:00 am: **Mid-wave and long-wave infrared dualband megapixel QWIP focal plane array** *(Invited Paper)*, Sarath D. Gunapala, Jet Propulsion Lab. . . . . [7082-06]

11:30 am: **Uncooled semiconductor detectors for IR to UV sensing** *(Invited Paper)*, Unil A. Perera, Georgia State Univ. . . . . [7082-07]

12:00 pm: **Plasmon mediated InGaAs/InP tunable far-IR detector**, Walter R. Buchwald, Air Force Research Lab.; Himanshu Saxena, Robert E. Peale, Univ. of Central Florida. . . . . [7082-08]

Lunch/Exhibition Break . . . . . 12:20 to 1:30 pm

SESSION 2

Room: Conv. Ctr. 18 . . . . . Mon. 1:30 to 3:20 pm

Novel Focal Plane Technologies

Session Chairs: **Hans Zogg,** ETH Zürich (Switzerland); **Gonzalo Paez,** Ctr. de Investigaciones en Óptica, A.C. (Mexico)

1:30 pm: **Hydrostatic pressure dependence of intersubband transitions in HgTe/HgCdTe superlattices and FIR detector applications** *(Invited Paper)*, Charles R. Becker, Univ. of Illinois at Chicago . . . . . [7082-09]

2:00 pm: **Low temperature thermoelectric properties of HgCdTe-based superlattices**, Silviu Velicu, Christoph H. Grein, Jun Zhao, EPIR Technologies, Inc.; Yong Chang, Se Young An, Univ. of Illinois at Chicago . . . . . [7082-10]

2:20 pm: **Far-infrared detector development for space-based Earth observation**, Henry H. Hogue, Stacy Masterjohn, DRS Sensors & Targeting Systems, Inc.; Martin Mlynczak, Nurul Abedin, NASA Langley Research Ctr.; James Huffman, Lawrence Semiconductor Research Lab. . . . . [7082-11]

2:40 pm: **Advanced InGaAs/InAlAs/InP avalanche photodiodes for high-speed detection of 1.55 µm infrared radiation**, Janusz B. Kaniewski, Jan Muszalski, Instytut Technologii Elektronowej (Poland); Jozef F. Piotrowski, VIGO System S.A. (Poland) . . . . . [7082-12]

3:00 pm: **Fabrication and characterization of avalanche photodiode in low voltage CMOS technology**, Isaak Suhaila, Ian Harrison, Mark C. Pitter, The Univ. of Nottingham (United Kingdom) . . . . . [7082-13]

Coffee Break . . . . . 3:20 to 3:50 pm

SESSION 3

Room: Conv. Ctr. 18 . . . . . Mon. 3:50 to 5:30 pm

Detectors in Industry

Session Chairs: **Neil R. Malone,** Raytheon Vision Systems; **John L. Vampola,** Raytheon Co.

3:50 pm: **Tutorial: Image photons to FPA design** *(Invited Paper)*, John L. Vampola, Raytheon Vision Systems . . . . . [7082-14]

4:20 pm: **Silicon p-i-n focal plane arrays at Raytheon**, Sean P. Kilcoyne, John Vampola, Neil Malone, Micky Harris, Raytheon Co. . . . . [7082-15]

4:40 pm: **Comparisons between state-of-the-art HgCdTe/Si and HgCdTe/CdZnTe infrared FPAs for remote sensing applications**, David A. Buell, Raytheon Vision Systems . . . . . [7082-16]

5:00 pm: **Epitaxial lead-chalcogenides on Si for mid-IR detectors and emitters including cavities** *(Invited Paper),* Hans Zogg, Martin Arnold, Ferdinand Felder, Mohamed Rahim, Matthias Fill, ETH Zürich (Switzerland) . . . . . [7082-17]

Room: Conv. Ctr. Exhibit Hall B2 . . . . . Mon. 6:00 to 7:30 pm

Posters-Monday

Poster authors will begin displaying posters after 10:00 am Monday morning. A poster session, with authors present at their posters, will be held Monday evening from 6:00 to 7:30 pm. Light refreshments will be served.

Poster Setup

Poster presenters must set up their posters between 10:00 am and 5:00 pm on Monday. Poster presenters who have not set up by 5:00 pm on Monday will be considered a "no show" and their manuscript will not be published. Presenters must remove their posters immediately after the poster session. Posters not removed will be considered unwanted and will be discarded. SPIE assumes no responsibility for posters left up after the end of each poster session.

IR-to-visible conversion system using EuTTA fluorescence as active medium of conversion, Mariana Alfaro, Marija Strojnik, Gonzalo Paez, Ctr. de Investigaciones en Óptica, A.C. (Mexico) . . . . . [7082-41]

Misalignment study for a mirror in a rotationally-shearing interferometer using exact ray trace, Enoch Gutierrez-Herrera, Marija Strojnik, Ctr. de Investigaciones en Óptica, A.C. (Mexico) . . . . . [7082-43]

Comparison of rotational shearing interferometer to k-mirror interferometric configuration for star-light attenuation in the planet detection problem, Marija Strojnik, Gonzalo Paez, Ctr. de Investigaciones en Óptica, A.C. (Mexico) . . . . . [7082-42]

Evaluation of oxygen saturation, Camille Vazquez-Jaccaud, Marija Strojnik, Gonzalo Paez, Ctr. de Investigaciones en Óptica, A.C. (Mexico) . . . . [7082-47]

Tuesday 12 August

SESSION 4

Room: Conv. Ctr. 18 . . . . . .Tues. 9:00 to 10:00 am

IR Instruments

Session Chair: **Marija Strojnik,** Ctr. de Investigaciones en Óptica, A.C. (Mexico)

9:00 am: **MERTIS: from laboratory to Mercury**, Jorn Helbert, Thomas Säuberlin, Carsten Paproth, DLR Berlin-Adlershof (Germany); Ingo Walter, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany); Gabriele Armold, Harald Hiesinger, Univ. Münster (Germany) . . . . . [7082-19]

9:20 am: **Space-based mineral and gas identification using a high-performance thermal infrared imaging spectrometer**, Jeffrey L. Hall, John A. Hackwell, David M. Tratt, David W. Warren, Stephen J. Young, The Aerospace Corp. . . . . [7082-21]

9:40 am: **High performance Geiger mode InGaAs/InP avalanche photodiodes for 3D imaging,** P. Yuan, R. Sudharsanan, J. C. Boisvert, P. A. McDonald, T. Isshiki, S. Mesropian, E. Labios, Spectrolab, Inc. (United States); M. Salisbury, Boeing SVS, Inc. (United States) . . . . . [7082-48]

Coffee Break . . . . . 9:40 to 10:30 am

SESSION 5

Room: Conv. Ctr. 18 . . . . . Tues. 10:30 am to 12:00 pm

IR Instruments and Calibration

Session Chair: **Marija Strojnik,** Ctr. de Investigaciones en Óptica, A.C. (Mexico)

10:30 am: **Performance of a high resolution cryogenic spectrometer** *(Invited Paper)*, Philippe Lagueux, Martin Chamberland, André J. Villemaire, Francoys Aubé, Telops, Inc. (Canada); Adriaan C. Carter, National Institute of Standards and Technology; Jérôme Genest, Univ. Laval (Canada) . . [7082-22]

11:00 am: **Dyson spectrometers for high performance infrared applications**, David W. Warren, David J. Gutierrez, Eric R. Keim, The Aerospace Corp. . . . . [7082-23]

11:20 am: **Improved multiplexed infrared single photon detectors**, Sergey V. Polyakov, National Institute of Standards and Technology; Valentina Schettini, Ivo P. Degiovanni, Giorgio Brida, Istituto Nazionale di Ricerca Metrologica (Italy); Alan L. Migdall, National Institute of Standards and Technology . . . . . [7082-24]

11:40 am: **Precision radiometry using a tunable InAs/InGaAs quantum dot in a well infrared focal plane array,** Jonathan R. Andrews, Sergio R. Restaino, Naval Research Lab.; Scott W. Teare, New Mexico Institute of Mining and Technology; Sanjay Krishna, Luke F. Lester, The Univ. of New Mexico; Christopher C. Wilcox, Ty Martinez, Freddie Santiago, Naval Research Lab. . . . . [7082-25]

Room: Conv. Ctr. 6A . . . . . Tues. 1:15 to 5:30 pm

Remote Sensing Plenary

Join this collaborative plenary session, to hear presentations from a cross section of remote sensing applications. For more detailed information see p. 17-18.

1:15 pm: **The Contributions from the NASA Earth Science Decadal Survey missions in understanding Global Climate Change** *(Presentation Only)*, Jason J. Hyon, Jet Propulsion Lab. . . . . [7085-158]

2:00 pm: **Recovering the Atmospheric Information from the High Resolution Dynamics Limb Sounder (HIRDLS)** *(Presentation Only)*, John C. Gille, National Ctr. for Atmospheric Research. . . . . [7082-45]

2:45 pm: **Measurement Science for Climate Remote Sensing** *(Presentation Only)*, Gerald T. Fraser, National Institute of Standards and Technology. . . . . [7081-53]

Coffee Break . . . . . 3:30 to 4:00

4:00 pm: **Application of MODIS Direct Broadcast System: Fire Detection, Burn Scars, Emissions, Air Quality Forecasting** *(Presentation Only)*, Wei Min Hao, Shawn P. Urbanski, J. M. Salmon, B. Nordgren, Alexander Petkov, U.S.D.A. Forest Service . . . . . [7089-18]

4:45 pm: **Infrared Retina Using Nanoscale Quantum Dots and Strain Layer Superlattices** *(Presentation Only)*, Sanjay Krishna, The Univ. of New Mexico . . . . . [7082-46]

Wednesday 13 August

SESSION 6

Room: Conv. Ctr. 18 . . . . . Wed. 8:30 to 10:20 am

Detection Standards and Accuracy

Session Chairs: **Gerald T. Fraser,** National Institute of Standards and Technology; **Sergey N. Mekhontsev,** National Institute of Standards and Technology

8:30 am: **Guidelines on pre-launch characterization and calibration of infrared instruments for remote sensing** *(Invited Paper)*, Raju Datla, National Institute of Standards and Technology . . . . . [7082-26]

9:00 am: **IR3: a new tool for the characterization of infrared radiometers and imagers**, Sergey N. Mekhontsev, National Institute of Standards and Technology; Vladimir B. Khromchenko, Space Dynamics Lab.; Leonard M. Hanssen, National Institute of Standards and Technology. . . . . [7082-27]

9:20 am: **Angle-dependent infrared reflectance measurements in support of VIIRS**, Simon G. Kaplan, Leonard M. Hanssen, National Institute of Standards and Technology; Enrique J. Iglesias, Univ. Simon Bolivar (Venezuela) . . . . . [7082-28]

9:40 am: **Calibration of the spectral radiant power responsivity of windowed pyroelectric radiometers from 785 nm to 14 µm**, Jinan Zeng, Leonard M. Hanssen, Sergey N. Mekhontsev, National Institute of Standards and Technology. . . . . [7082-29]

10:00 am: **Preliminary results of the ESA assessment study of the European contribution to SPICA**, Thomas Jagemann, Dominic Doyle, Ana Maria Heras, Nicola A. Rando, European Space Research and Technology Ctr. (Netherlands); Takao Nakagawa, Japan Aerospace Exploration Agency (Japan); Bruce M. Swinyard, Science and Technology Facilities Council (United Kingdom) . . . . . [7082-30]

Coffee Break . . . . . 10:20 to 10:50 am

SESSION 7

Room: Conv. Ctr. 18 . . . . . Wed. 10:50 am to 12:20 pm

Weather and Climate Change Instruments

Session Chair: **Jan Williams,** e-Systems Management Consultants

10:50 am: **The evolution of the performance of the AVHRR, HIRS and AMSU-A instruments on board Metop-A after one year in orbit** *(Invited Paper)*, Abelardo Perez-Albinana, EUMETSAT (Germany); Douglas R. Battles, Robert W. Lambeck, Perot Systems; Roberto M. Aleman, NASA Goddard Space Flight Ctr.; Conrad Jackson, National Oceanic and Atmospheric Administration . . . . . [7082-31]

11:20 am: **ACE-FTS instrument: after five years on-orbit**, Louis Moreau, Marc-André A. Soucy, Henry L. Buijs, ABB Inc. (Canada) . . . . . [7082-32]

11:40 am: **Fabrication and assembly integration of the orbiting carbon observatory instrument**, Robert E. Haring, R. Pollock, Brian M. Sutin, Rick D. Blakley, Hamilton Sundstrand; Lawrence M. Scherr, David Crisp, Jet Propulsion Lab. . . . . [7082-33]

12:00 pm: **Prelaunch performance test results of TANSO-FTS and CAI on GOSAT**, Jun Yoshida, Takahiro Kawashima, NEC TOSHIBA Space Systems, Ltd. (Japan); Hiroshi Suto, Akihiko Kuze, Masakatsu Nakajima, Takashi Hamazaki, Japan Aerospace Exploration Agency (Japan) . . . . . [7082-34]

Lunch/Exhibition Break . . . . . 12:20 to 1:40 pm

SESSION 8

Room: Conv. Ctr. 18 . . . . . Wed. 1:40 to 3:30 pm

HIRDLS Global Warming and Climate Change Instrument

Session Chair: **Jan Williams,** e-Systems Management Consultants

1:40 pm: **Modeling the Kapton signal in the HIRDLS optical train and resulting data** *(Invited Paper)*, John C. Gille, Univ. of Colorado and National Ctr. for Atmospheric Research; Gene L. Francis, Charles Cavanaugh, Craig Hartsough, Thomas D. Eden, Jr., National Ctr. for Atmospheric Research; John J. Barnett, Univ. of Oxford. . . . . [7082-35]

2:10 pm: **Cross-validation of HIRDLS and COSMIC radio-occultation retrievals, particularly in relation to fine vertical structure**, John J. Barnett, Christopher L. Hepplewhite, Univ. of Oxford (United Kingdom); John C. Gille, National Ctr. for Atmospheric Research . . . . . [7082-36]

2:30 pm: **HIRDLS instrument mission performance**, Christopher L. Hepplewhite, Univ. of Oxford (United Kingdom); James V. Craft, Univ. of Colorado at Boulder; Trevor W. Walton, Univ. of Oxford (United Kingdom) . . . . . [7082-37]

2:50 pm: **Model estimation of the HIRDLS exit aperture fractional open area**, Thomas D. Eden, Jr., National Ctr. for Atmospheric Research . [7082-38]

3:10 pm: **HIRDLS data product comparisons with MIPAS and other ground data**, Christopher L. Hepplewhite, John J. Barnett, Univ. of Oxford (United Kingdom); John C. Gille, National Ctr. for Atmospheric Research; Alison Waterfall, Science and Technology Facilities Council; Anu Dudhia, Univ. of Oxford (United Kingdom). . . . . [7082-40]

Courses of Related Interest

See SPIE Cashier for information and to register.

SC188 Laser Beam Propagation for Applications in Laser Communications, Laser Radar, and Active Imaging (Phillips, Andrews) Monday, 8:30 am to 5:30 pm
SC561 Optomechanics for Space Applications (Shipley) Wednesday, 8:30 am to 5:30 pm
SC567 Introduction to Optical Remote Sensing Systems (Shaw) Tuesday, 1:30 to 5:30 pm
SC835 Infrared Systems - Technology & Design (Daniels) Monday, 8:30 am to 12:30 pm

Conference 7083

Wednesday 13 August 2008 • Proceedings of SPIE Vol. 7083

Remote Sensing and Modeling of Ecosystems for Sustainability V

Conference Chair: **Wei Gao,** Colorado State Univ.

Conference Co-Chair: **Hao Wang,** China Institute of Water Resources and Hydropower Research (China)

Program Committee: **Gregory Paul Asner,** Stanford Univ.; **Xiuwan Chen,** Peking Univ. (China); **John A. Gamon,** California State Univ./Los Angeles; **E. Raymond Hunt, Jr.,** USDA Agricultural Research Service; **John M. Melack,** Univ. of California/Santa Barbara; **Dennis Ojima,** Colorado State Univ.; **Jeffrey L. Privette,** NASA Goddard Space Flight Ctr.; **Jiaguo Qi,** Michigan State Univ.; **John Jianhe Qu,** George Mason Univ.; **Daniel L. Schmoldt,** U.S. Dept. of Agriculture; **Jiong Shu,** East China Normal Univ. (China); **James R. Slusser,** Colorado State Univ.; **Susan L. Ustin,** Univ. of California/Davis; **Denghua Yan,** China Institute of Water Resources and Hydropower Research (China); **Hua Zhang,** National Climate Ctr. (China)

Cooperating Organizations: **USDA UV-B Monitoring and Research Program and Ctr. of Remote Sesing and Modeling for Agricultural Sustainability, Colorado State Univ.; Water Resources Dept. of China Inst. of Water Resources and Hydropower Research**

Wednesday 13 August

Room: Conv. Ctr. 33B . . . . . Wed. 8:50 to 9:00 am

Welcome and Opening Remarks

SESSION 1

Room: Conv. Ctr. 33B . . . . . Wed. 9:00 to 10:10 am

Remote Sensing Theory, Techniques, and Applications I

Session Chairs: **Thomas J. Jackson,** U.S. Dept. of Agriculture; **Xinli Wang,** Colorado State Univ.

9:00 am: **Microwave vegetation indices derived from satellite microwave radiometers** *(Invited Paper)*, Thomas J. Jackson, U.S. Dept. of Agriculture; Jiancheng Shi, Univ. of California/Santa Barbara; Jing Tao, U.S. Dept. of Agriculture . . . . . [7083-01]

9:30 am: **Simulation of cotton yields over the U.S. cotton belt using cotton2k model**, Xinli Wang, Wei Gao, Colorado State Univ.; Min Xu, Xin-Zhong Liang, Univ. of Illinois at Urbana-Champaign . . . . . [7083-03]

9:50 am: **Assimilating ATOVS data in numerical weather prediction model to improve typhoon prediction in NSMC/CMA**, Qifeng Lu, Chinese Meteorological Administration (China); Wei Gao, Colorado State Univ. . . . . [7083-54]

Coffee Break . . . . . 10:10 to 10:40 am

SESSION 2

Room: Conv. Ctr. 33B . . . . . Wed. 10:40 am to 12:10 pm

Remote Sensing Theory, Techniques, and Applications II

Session Chairs: **Jiong Shu,** East China Normal Univ. (China); **John J. Cipar,** Air Force Research Lab.

10:40 am: **Character analysis of urban heat island in Shanghai City using remote sensing** *(Invited Paper)*, Jiong Shu, Zhigang Chen, East China Normal Univ. (China) . . . . . [7083-05]

11:10 am: **Object-based algorithms and methods for quantifying urban growth pattern using sequential satellite images**, Bailang Yu, East China Normal Univ. (China) and Texas A&M Univ.; Hongxing Liu, Yige Gao, Texas A&M Univ.; Jianping Wu, East China Normal Univ. (China) . . . . . [7083-06]

11:30 am: **Summer to autumn changes in vegetation spectral indices of deciduous trees**, John J. Cipar, Thomas Cooley, Ronald Lockwood, Air Force Research Lab. . . . . [7083-07]

11:50 am: **Obtaining three-dimensional forest canopy structure using TLS**, Ling Zhu, Beijing Normal Univ. (China) and Institute of Geographic Sciences and Natural Resources Research (China); Jie Zou, Beijing Normal Univ. (China) . . . . . [7083-08]

Lunch/Exhibition Break . . . . . 12:10 to 1:30 pm

SESSION 3

Room: Conv. Ctr. 33B . . . . . Wed. 1:30 to 4:50 pm

Remote Sensing Theory, Techniques, and Applications III

Session Chairs: **E. Raymond Hunt, Jr.,** USDA Agricultural Research Service; **Minhe Ji,** East China Normal Univ. (China)

1:30 pm: **Calculation of light use efficiency from net ecosystem CO_2 fluxes for remotely-sensed estimates of primary production in corn and soybean** *(Invited Paper)*, E. Raymond Hunt, Jr., Paul C. Doraiswamy, John H. Prueger, Jerry L. Hatfield, USDA Agricultural Research Service . . . . [7083-09]

2:00 pm: **Land surface variables and vegetation variables estimated from satellite remote sensing over the Tibetan Plateau**, Jianmao Guo, Shuanghe Shen, Shoudong Liu, Nanjing Univ. of Information Science & Technology (China) . . . . . [7083-10]

2:20 pm: **Quantified water resources assessment based on climate-hydrological coupling model**, Denghua Yan, Hao Wang, China Institute of Water Resources and Hydropower Research (China); Wei Gao, Colorado State Univ. . . . . [7083-11]

2:40 pm: **Monitoring and trend simulation of sediment yield of Jialingjiang River**, Yongzhong Tian, Southwest Univ. (China) . . . . . [7083-12]

Coffee Break . . . . . 3:00 to 3:30 pm

3:30 pm: **Mapping underwater topography for coastal estuary ecosystem monitoring from QuickBird high-resolution multispectral imagery**, Minhe Ji, East China Normal Univ. (China) . . . . . [7083-13]

3:50 pm: **Land cover dynamic monitoring model of Three-Gorge areas**, Lifen Zhu, Chongqing Technology and Business Univ. (China); Yongzhong Tian D.V.M., Southwest Univ. (China) . . . . . [7083-14]

4:10 pm: **Effect of increasing roof albedo on heat waves**, Hongyun Ma, Pinwen Guo, Nanjing Univ. of Information Science & Technology (China); Jie Song, Northern Illinois Univ. . . . . [7083-17]

4:30 pm: **The relationship between Rossby wave propagation in southern branch of westerlies and the formation of the India-Burma trough in wintertime,** Miaoqing Suo, Yihui Ding, Chinese Meteorological Administration (China) . . . . . [7083-16]

Room: Conv. Ctr. Exhibit Hall B2 . . . . . .Wed. 5:30 to 7:00 pm

Posters-Wednesday

Poster authors will begin displaying posters after 10:00 am Wednesday morning. A poster session, with authors present at their posters, will be held Wednesday evening from 5:30 to 7:00 pm. Light refreshments will be served.

Poster Setup

Poster presenters must set up their posters between 10:00 am and 5:00 pm on Wednesday. Poster presenters who have not set up by 5:00 pm on Wednesday will be considered a "no show" and their manuscript will not be published. Presenters must remove their posters immediately after the poster session. Posters not removed will be considered unwanted and will be discarded. SPIE assumes no responsibility for posters left up after the end of each poster session.

Courses of Related Interest

See SPIE Cashier for information and to register.

SC567 Introduction to Optical Remote Sensing Systems (Shaw) Tuesday, 1:30 to 5:30 pm

Conference 7084

Sunday-Monday 10-11 August 2008 • Proceedings of SPIE Vol. 7084

Satellite Data Compression, Communication, and Processing IV

Conference Chairs: **Bormin Huang,** Univ. of Wisconsin/Madison; **Roger W. Heymann,** National Oceanic and Atmospheric Administration; **Joan Serra-Sagrista,** Univ. Autònoma de Barcelona (Spain)

Conference Co-Chairs: **Aaron B. Kiely,** Jet Propulsion Lab.; **Shen-En Qian,** Canadian Space Agency (Canada); **Chengke Wu,** Xidian Univ. (China)

Program Committee: **Shila Ghosh,** B.P. Poddar Institute of Management & Technology (India); **Irina Gladkova,** City College/CUNY; **Shuxu Guo,** Jilin Univ. (China); **Mingyi He,** Northwestern Polytechnical Univ. (China); **Matthew A. Klimesh,** Jet Propulsion Lab.; **Chulhee Lee,** Yonsei Univ. (South Korea); **Yunsong Li,** Xidian Univ. (China); **Kai-Kuang Ma,** Nanyang Technological Univ. (Singapore); **Jarno S. Mielikäinen,** Univ. of Kuopio (Finland); **Donald P. Olsen,** The Aerospace Corp.; **Antonio J. Plaza,** Univ. de Extremadura (Spain); **Jeffery J. Puschell,** Raytheon Space and Airborne Systems; **Ana María Clara Ruedin,** Univ. de Buenos Aires (Argentina); **Carole Thiebaut,** Ctr. National d'Études Spatiales (France); **Raffaele Vitulli,** European Space Agency (Netherlands); **Shuai Wan,** Northwestern Polytechnical Univ. (China); **Frank Z. Wang,** Cambridge-Cranfield High Performance Computing Facility (United Kingdom); **Shih-Chieh Wei,** Tamkang Univ. (Taiwan)

Sunday 10 August

Room: Conv. Ctr. 32B . . . . . .Sun. 8:30 to 8:50 am

Opening Remarks

SESSION 1

Room: Conv. Ctr. 32B . . . . . .Sun. 8:50 to 10:30 am

Hyperspectral and Ultraspectral Data Compression I

Session Chair: **Kai-Kuang Ma,** Nanyang Technological Univ. (Singapore)

8:50 am: **Clusters versus FPGAs for spectral mixture analysis-based lossy hyperspectral data compression** *(Invited Paper)*, Antonio J. Plaza, Univ. de Extremadura (Spain) . . . . . [7084-01]

9:20 am: **Content-adaptive prediction for hyperspectral image compression**, Shuai Wan, Northwestern Polytechnical Univ. (China); Fuzheng Yang, Xidian Univ. (China); Mingyi He, Northwestern Polytechnical Univ. (China) . . . . . [7084-02]

9:40 am: **Optimal granule ordering for lossless compression of ultraspectral sounder data** *(Invited Paper)*, Jarno S. Mielikainen, Pekka Toivanen, Univ. of Kuopio (Finland). . . . . [7084-03]

10:10 am: **Interactive decoding of spectrally wavelet-transformed hyperspectral data**, José Lino Monteagudo-Pereira, Joan Bartrina-Rapesta, Francesc Aulí-Llinàs, Joan Serra-Sagrista, Alaitz Zabala, Xavier Pons, Univ. Autònoma de Barcelona (Spain) . . . . . [7084-04]

Coffee Break . . . . . 10:30 to 11:00 am

SESSION 2

Room: Conv. Ctr. 32B . . . . . Sun. 11:00 am to 12:00 pm

Hyperspectral and Ultraspectral Data Compression II

Session Chair: **Jarno S. Mielikainen,** Univ. of Kuopio (Finland)

11:00 am: **Ultraspectral sounder data compression using non-exhaustive Tunstall coding**, Shih-Chieh Wei, Tamkang Univ. (Taiwan); Bormin Huang, Univ. of Wisconsin/Madison . . . . . [7084-05]

11:20 am: **Enhancement of resilience to bit-errors of compressed data on board a hyperspectral satellite using forward error correction**, Pirouz Zarrinkhat, Shen-En Qian, Canadian Space Agency (Canada). . . . . [7084-06]

11:40 am: **Vector quantization with self-resynchronizing coding for lossless compression and rebroadcast of the NASA Geostationary Imaging Fourier Transform Spectrometer (GIFTS) data**, Bormin Huang, Univ. of Wisconsin/Madison . . . . . [7084-07]

Lunch Break . . . . . 12:00 to 1:30 pm

SESSION 3

Room: Conv. Ctr. 32B . . . . . Sun. 1:30 to 3:10 pm

Satellite Image Processing

Session Chair: **Antonio J. Plaza,** Univ. de Extremadura (Spain)

1:30 pm: **Unsupervised change detection for satellite images using dual-tree complex wavelet transform** *(Invited Paper)*, Kai-Kuang Ma, Turgay Celik, Nanyang Technological Univ. (Singapore) . . . . . [7084-08]

2:00 pm: **Feature acquisition from hyperspectral remote sensing data** *(Invited Paper)*, Mingyi He, Northwestern Polytechnical Univ. (China) [7084-09]

2:30 pm: **Unsupervised segmentation of hyperspectral images**, Sangwook Lee, Chulhee Lee, Yonsei Univ. (South Korea) . . . . . [7084-10]

2:50 pm: **Hopfield neural network based mixed pixel unmixing for multispectral data**, Shaohui Mei, Northwestern Polytechnical Univ. (China) and The Univ. of Sydney (Australia); David D. Feng, The Univ. of Sydney (Australia) and Hong Kong Polytechnic Univ. (China); Mingyi He, Northwestern Polytechnical Univ. (China) . . . . . [7084-11]

Coffee Break . . . . . 3:10 to 3:40 pm

SESSION 4

Room: Conv. Ctr. 32B . . . . . Sun. 3:40 to 5:00 pm

Multispectral Data Compression I

Session Chair: **Shih-Chieh Wei,** Tamkang Univ. (Taiwan)

3:40 pm: **Lossless compression algorithm for multispectral imager**, Irina Gladkova, Michael D. Grossberg, Srikanth Gottipati, City College/CUNY . . . . . [7084-12]

4:00 pm: **A new interferential multispectral image compression algorithm based on adaptive classification and curve-fitting**, Ke-Yan Wang, Yunsong Li, Kai Liu, Chengke Wu, Xidian Univ. (China). . . . . [7084-13]

4:20 pm: **CNES studies for on-board compression**, Carole Thiebaut, Ctr. National d'Études Spatiales (France) . . . . . [7084-14]

4:40 pm: **Compression of the interferential multispectral image based on distributed source coding,** Juan Song, Yunsong Li, Chengke Wu, Ying Feng, Xidian Univ. (China) . . . . . [7084-15]

Room: Conv. Ctr. 6A . . . . . Sun. 6:00 to 6:45 pm

All-Conference Plenary Session

View plenary presentation details p. 13.

6:00 pm: **The Solar Decathlon: building a better future with solar energy**, Richard J. King, U.S. Dept. of Energy

Monday 11 August

SESSION 5

Room: Conv. Ctr. 32B . . . . . Mon. 8:50 to 10:00 am

Data Communication, Distribution, and Analysis

Session Chair: **Matthew A. Klimesh,** Jet Propulsion Lab.

8:50 am: **Acceleration of geo-spatial data sharing on the grids** *(Invited Paper)*, Frank Z. Wang, Cambridge-Cranfield HPCF (United Kingdom); Na Helian, Univ. of Hertfordshire (United Kingdom); Lingkui Meng, Wuhan Univ. (China); Sining Wu, Cambridge-Cranfield HPCF (United Kingdom); Wendy Zhang, Wuhan Univ. (China) . . . . . [7084-16]

9:20 am: **Image compression effects in visual analysis**, Alaitz Zabala, Univ. Autònoma de Barcelona (Spain); Xavier Pons, Univ. Autònoma de Barcelona (Spain) and Ctr. de Recerca Ecològica i Aplicacions Forestals (Spain); Francesc Auli-Llinas, Joan Serra-Sagrista, Univ. Autònoma de Barcelona . . . . . [7084-18]

9:40 am: **An analysis of the information dependence between MODIS emissive bands**, Michael D. Grossberg, City College/CUNY; W. Paul Menzel, National Oceanic and Atmospheric Administration; Irina Gladkova, Srikanth Gottipati, City College/CUNY . . . . . [7084-19]

Coffee Break . . . . . 10:00 to 10:30 am

SESSION 6

Room: Conv. Ctr. 32B . . . . . Mon. 10:30 am to 12:10 pm

Multispectral Data Compression II

Session Chair: **Frank Z. Wang,** Cambridge-Cranfield High Performance Computing Facility (United Kingdom)

10:30 am: **Optimized adaptive error compensated prediction tree algorithm for the lossless compression of multi-spectral image** *(Invited Paper)*, Shuxu Guo, Lang Wang, Jilin Univ. (China) . . . . . [7084-20]

11:00 am: **A comparative study of lossless compression algorithms on multispectral imager data**, Srikanth Gottipati, Irina Gladkova, Michael D. Grossberg, City College/CUNY. . . . . [7084-21]

11:20 am: **Interferential multispectral imagery compression based on distribute source coding** *(Invited Paper)*, Yunsong Li, Ying Feng, Chengke Wu, Rui Song, Xidian Univ. (China) . . . . . [7084-22]

11:50 am: **Support vector machines and wavelets for the lossless compression of multispectral images**, Daniel G. Acevedo, Ana M. C.Ruedin, Univ. de Buenos Aires (Argentina). . . . . [7084-23]

Lunch/Exhibition Break . . . . . 12:10 to 2:00 pm

SESSION 7

Room: Conv. Ctr. 32B . . . . . Mon. 2:00 to 3:40 pm

Data Compression

Session Chair: **Mingyi He,** Northwestern Polytechnical Univ. (China)

2:00 pm: **A new pipelined VLSI architecture for JPEG-LS compression algorithm**, Jie Lei, Yunsong LI, Fan-Qiang Kong, Chengke Wu, Xidian Univ. (China) . . . . . [7084-24]

2:20 pm: **Onboard data compression of synthetic aperture radar data: status and prospects**, Matthew A. Klimesh, Jet Propulsion Lab. . . . [7084-25]

2:40 pm: **Effects comparison of JPEG2000 and JPEG compression on the accuracy of digital terrain models (DEM) automatically derived from digital aerial images**, Wang Yu, Hu Xin, Xi'an Research Institute of Surveying and Mapping (China); Yunsong Li, Xidian Univ. (China); Niu Rui, Xi'an Research Institute of Surveying and Mapping (China); Lishi Zhong, Harbin Institute of Technology (China) . . . . . [7084-26]

3:00 pm: **Coding scheme based on motion filed detection for DVC**, Xianyun Wu, Yunsong Li, Chengke Wu, Fan-Qiang Kong, Xidian Univ. (China)[7084-27]

3:20 pm: **Optimal two-region nonuniform quantization**, Bormin Huang, Univ. of Wisconsin/Madison. . . . . [7084-28]

Coffee Break . . . . . 3:40 to 4:00 pm

Room: Conv. Ctr. 32B . . . . . Mon. 4:00 to 4:30 pm

Panel Discussion

Join this panel discussion for an open exchange of views based upon the conference topics and presentations.

Room: Conv. Ctr. Exhibit Hall B2 . . . . . Mon. 6:00 to 7:30 pm

Posters-Monday

Poster authors will begin displaying posters after 10:00 am Monday morning. A poster session, with authors present at their posters, will be held Monday evening from 6:00 to 7:30 pm. Light refreshments will be served.

Poster Setup

Poster presenters must set up their posters between 10:00 am and 5:00 pm on Monday. Poster presenters who have not set up by 5:00 pm on Monday will be considered a "no show" and their manuscript will not be published. Presenters must remove their posters immediately after the poster session. Posters not removed will be considered unwanted and will be discarded. SPIE assumes no responsibility for posters left up after the end of each poster session.

The role of texture features in cloud classification with the MODIS data, Linli Cui, Shanghai Meteorological Bureau (China) . . . . . [7084-29]

Conference 7085

Tuesday-Thursday 12-14 August 2008 • Proceedings of SPIE Vol. 7085

Atmospheric and Environmental Remote Sensing Data Processing and Utilization IV: Readiness for GEOSS II

Conference Chair: **Mitchell D. Goldberg,** National Oceanic and Atmospheric Administration; **Hal J. Bloom,** NOAA, GOES-R Program

Conference Co-Chair: **Philip E. Ardanuy,** Raytheon Intelligence and Information Systems; **Allen H.-L. Huang,** Univ. of Wisconsin/Madison

Program Committee: **John J. Bates,** National Oceanic and Atmospheric Administration; **James J. Butler,** NASA Goddard Space Flight Ctr.; **Changyong Cao,** National Oceanic and Atmospheric Administration; **Wei Gao,** Colorado State Univ.; **Francois-Xavier Le Dimet,** Univ. Joseph Fourier (France); **John F. Le Marshall,** Bureau of Meteorology (Australia); **Stephen A. Mango,** NPOESS Integrated Program Office; **Johannes Schmetz,** EUMETSAT (Germany); **William L. Smith, Jr.,** NASA Langley Research Ctr.; **Xiaolei Zou,** Florida State Univ.

Tuesday 12 August

SESSION 1

Room: Conv. Ctr. 32B . . . . . Tues. 8:20 am to 12:10 pm

Climate and Satellite Calibration

Session Chair: **Mitchell D. Goldberg,** National Oceanic and Atmospheric Administration

8:20 am: **Direct broadcast activities in support of GEOSS** *(Invited Paper)*, Allen H.Huang, Univ. of Wisconsin/Madison. . . . . [7085-01]

8:50 am: **Recent activities and achievements of the GSICS Research Working Group** *(Invited Paper)*, Xiangqian Wu, Mitchell D. Goldberg, National Oceanic and Atmospheric Administration. . . . . [7085-02]

9:20 am: **Using AIRS and IASI data to evaluate absolute radiometric accuracy for climate trending**, Hartmut H. Aumann, Thomas S. Pagano, Jet Propulsion Lab. . . . . [7085-03]

9:40 am: **Using IASI observations to resolve HIRS spectral response function induced inter-satellite biases**, Changyong Cao, Mitchell D. Goldberg, National Oceanic and Atmospheric Administration . . . . . [7085-05]

Coffee Break . . . . . 10:00 to 10:30 am

10:30 am: **Intercalibration of microwave sounding unit with short overlaps**, Cheng-Zhi Zou, National Oceanic and Atmospheric Administration . [7085-06]

10:50 am: **Algorithms for the processing of integrated satellite observations and rapid collocations**, Haibing Sun, Perot Systems Government Service; Walter W. Wolf, QSS Group, Inc.; Lihang Zhou, Thomas S. King, Perot Systems Government Service; Christopher D. Barnet, Mitchell D. Goldberg, National Oceanic and Atmospheric Administration. . . . [7085-07]

11:10 am: **A system of systems approach to support integration and fusion of multiple data sets in decision support systems for improved weather, climate and hazard monitoring**, Brian K. Baldauf, Northrop Grumman Space Technology . . . . . [7085-08]

11:30 am: **McIDAS-V: a powerful data analysis and visualization tool for multi and hyperspectral environmental satellite data**, Thomas H. Achtor, Thomas D. Rink, Thomas M. Whittaker, David Parker, Univ. of Wisconsin/Madison. . . . . [7085-09]

11:50 am: **McIDAS-V applications: multi- and hyper-spectral analysis and visualization,** Thomas D. Rink, Thomas H. Achtor, Thomas M. Whittaker, Univ. of Wisconsin/Madison. . . . . [7085-10]

Room: Conv. Ctr. 6A . . . . . Tues. 1:15 to 5:30 pm

Remote Sensing Plenary

Join this collaborative plenary session, to hear presentations from a cross section of remote sensing applications. For more detailed information see p. 17-18.

1:15 pm: **The Contributions from the NASA Earth Science Decadal Survey missions in understanding Global Climate Change** *(Presentation Only)*, Jason J. Hyon, Jet Propulsion Lab. . . . . [7085-158]

2:00 pm: **Recovering the Atmospheric Information from the High Resolution Dynamics Limb Sounder (HIRDLS)** *(Presentation Only)*, John C. Gille, National Ctr. for Atmospheric Research. . . . . [7082-45]

2:45 pm: **Measurement Science for Climate Remote Sensing** *(Presentation Only)*, Gerald T. Fraser, National Institute of Standards and Technology. . . . . [7081-53]

Coffee Break . . . . . 3:30 to 4:00

4:00 pm: **Application of MODIS Direct Broadcast System: Fire Detection, Burn Scars, Emissions, Air Quality Forecasting** *(Presentation Only)*, Wei Min Hao, Shawn P. Urbanski, J. M. Salmon, B. Nordgren, Alexander Petkov, U.S.D.A. Forest Service . . . . . [7089-18]

4:45 pm: **Infrared Retina Using Nanoscale Quantum Dots and Strain Layer Superlattices** *(Presentation Only)*, Sanjay Krishna, The Univ. of New Mexico . . . . . [7082-46]

Wednesday 13 August

SESSION 2

Room: Conv. Ctr. 32B . . . . . Wed. 8:30 to 10:30 am

Geostationary Systems

Session Chair: **Hal J. Bloom,** NOAA, GOES-R Program

8:30 am: **An Overview of the GOES-R System** *(Invited Paper)*, Hal J. Bloom, NOAA, GOES-R Program; Mitchell D. Goldberg, National Oceanic and Atmospheric Administration; Allen H.Huang, Univ. of Wisconsin/Madison. . . . . [7085-11]

9:00 am: **TBD** *(Invited Paper)*, Allen H.Huang, Univ. of Wisconsin/Madison. . . . . [7085-12]

9:30 am: **Surface emissivity retrieval from high temporal resolution geostationary imager infrared radiances**, Jun Li, Xin Jin, Univ. of Wisconsin/Madison; Lihang Zhou, Mitchell D. Goldberg, National Oceanic and Atmospheric Administration; Jinlong Li, Timothy J. Schmit, Allen H. L.Huang, Univ. of Wisconsin/Madison . . . . . [7085-13]

9:50 am: **GOES-R/ABI legacy profile algorithm evaluation using MSG/SEVIRI and AMSR-E**, Xin Jin, Jun Li, Univ. of Wisconsin/Madison; Timothy Schmit, National Oceanic and Atmospheric Administration; Jinlong Li, Allen H. Huang, Univ. of Wisconsin/Madison; Mitchell Goldberg, National Oceanic and Atmospheric Administration . . . . . [7085-14]

10:10 am: **Linking water vapor channels of GOES-11 and GOES-12 imagers using IASI hyperspectral observations**, Likun Wang, National Oceanic and Atmospheric Administration. . . . . [7085-15]

Coffee Break . . . . . 10:30 to 11:00 am

SESSION 3

Room: Conv. Ctr. 32B . . . . . Wed. 11:00 am to 12:20 pm

Land Property Remote Sensing

Session Chair: **Xiwu Zhan,** National Oceanic and Atmospheric Administration

11:00 am: **Soil Moisture Active/Passive (SMAP) Mission**, Thomas J. Jackson, U.S. Dept. of Agriculture; Dara Entekhabi, Massachusetts Institute of Technology; Eni G. Njoku, Jet Propulsion Lab.; Peggy E. O'Neill, NASA Goddard Space Flight Ctr.; Jared K. Entin, NASA Headquarters; Eastwood Im, Jet Propulsion Lab. . . . . [7085-19]

11:20 am: **Soil moisture retrieval from WindSat using the single channel algorithm toward a blended global soil moisture product from multiple microwave sensors**, Jicheng Liu, Xiwu Zhan, National Oceanic and Atmospheric Administration; Thomas J. Jackson, U.S. Dept. of Agriculture . . . . . [7085-16]

11:40 am: **Merging satellite soil moisture retrievals and model simulations for a blended consistent operational global soil moisture data product**, Xiwu Zhan, Jicheng Liu, National Oceanic and Atmospheric Administration; Thomas J. Jackson, U.S. Dept. of Agriculture; Jesse Meng, Fuzhong Weng, Kenneth Mitchell, National Oceanic and Atmospheric Administration [7085-17]

12:00 pm: **Implementation of a global-scale operational data assimilation system for satellite-based soil moisture retrievals**, John D. Bolten, Wade Crow, U.S. Dept. of Agriculture; Xiwu Zhan, National Oceanic and Atmospheric Administration; Curt Reynolds, U.S. Dept. of Agriculture . . . . . [7085-18]

Lunch Break . . . . . 12:20 to 2:00 pm

SESSION 4

Room: Conv. Ctr. 32B . . . . . Wed. 2:00 to 3:40 pm

EOS and GEOSS joint session I

Join this collaborative session between the Earth Observing Systems and Atmospheric and Environmental Remote Sensing Data Processing and Utilization IV: Readiness for GEOSS conferences

2:00 pm: **Accuracy assessment for the radiometric calibration of Earth-observing imagers using preflight techniques relying on the sun as a source**, Kurtis J. Thome, Jeffrey S. Czapla-Myers, College of Optical Sciences/The Univ. of Arizona; Michele A. Kuester, Ball Aerospace & Technologies Corp. . . . . [7081-43]

2:20 pm: **Development of a heliostat facility for solar-radiation-based calibration of Earth observing sensors**, Michele A. Kuester, Ball Aerospace & Technologies Corp.; Jeffrey S. Czapla-Myers, College of Optical Sciences/ The Univ. of Arizona; Paul Kaptchen, James Lasnik, Tony Lin, Raymund To, Ball Aerospace & Technologies Corp.; Stuart F. Biggar, Kurtis J. Thome, College of Optical Sciences/The Univ. of Arizona. . . . . [7081-44]

2:40 pm: **Radiometric performance of the CERES broadband radiometers on the Terra and Aqua spacecraft**, Kory J. Priestley, NASA Langley Research Ctr.; Susan Thomas, Science Systems and Applications, Inc.; Grant M. Matthews, Analytical Services and Materials, Inc.. . . . . [7081-45]

3:00 pm: **Absolute radiometric calibration accuracy of the Atmospheric Infrared Sounder (AIRS)**, Thomas S. Pagano, Hartmut H. Aumann, Jet Propulsion Lab.; Kenneth R. Overoye, BAE Systems . . . . . [7081-46]

3:20 pm: **Towards reducing radiometric uncertainties in measurements with radiometric transfer standards**, Steven W. Brown, B. Carol Johnson, Robert D. Saunders, Michael Lin, Allan Smith, National Institute of Standards and Technology. . . . . [7081-47]

Coffee Break . . . . . 3:40 to 4:10 pm

SESSION 5

Room: Conv. Ctr. 32B . . . . . Wed. 4:10 to 5:30 pm

EOS and GEOSS joint session II

Session Chair: **Cheng-Zhi Zou,** National Oceanic and Atmospheric Administration

Join this collaborative session between the Earth Observing Systems and Atmospheric and Environmental Remote Sensing Data Processing and Utilization IV: Readiness for GEOSS conferences

4:10 pm: **Evaluation of satellite land surface temperatures using ground measurements from surface radiation budget network**, Yunyue Yu, Dan Tarpley, National Oceanic and Atmospheric Administration; Konstantin Y. Vinnikov, Univ. of Maryland/College Park; Rama M. K.Varma Raja, Mitchell D. Goldberg, National Oceanic and Atmospheric Administration . . . . . [7085-20]

4:30 pm: **Using MODIS imagery for improving AVHRR geolocation**, Konstantin V. Khlopenkov, Alexander P. Trishchenko, Canada Ctr. for Remote Sensing (Canada) . . . . . [7085-22]

4:50 pm: **Impact of a near real-time AVHRR green vegetation fraction data on numerical weather predictions of WRF-ARW over USA**, Yuhong Tian, Cheng-Zhi Zou, Kenneth Mitchell, Le Jiang, Dan Tarpley, Felix Kogan, Vince Wong, Xiwu Zhan, National Oceanic and Atmospheric Administration[7085-24]

5:10 pm: **Two methods for the absolute calibration of SZ-3 CMODIS sensors and their comparison based on Dunhuang test size,** Xuan Li, National Meteorological Ctr. (China); Zhifeng Guo, Institute of Remote Sensing Applications (China). . . . . [7085-23]

Room: Conv. Ctr. Exhibit Hall B2 . . . . . Wed. 5:30 to 7:00 pm

Posters-Wednesday

Poster authors will begin displaying posters after 10:00 am Wednesday morning. A poster session, with authors present at their posters, will be held Wednesday evening from 5:30 to 7:00 pm. Light refreshments will be served.

Poster Setup

Poster presenters must set up their posters between 10:00 am and 5:00 pm on Wednesday. Poster presenters who have not set up by 5:00 pm on Wednesday will be considered a "no show" and their manuscript will not be published. Presenters must remove their posters immediately after the poster session. Posters not removed will be considered unwanted and will be discarded. SPIE assumes no responsibility for posters left up after the end of each poster session.

Annual evolution of precipitation in Fujian Province and its relation to east Asian summer monsoon, Yanzhen Chi, Nanjing Univ. of Information Science & Technology (China); Changrong Luo, Fujian Meteorological Observatory (China) . . . . . [7085-45]

The extratropical transition analyses on two landfall typhoons, Guirong H. Han, Nanjing Univ. of Information Science & Technology (China) and Jiangsu Meteorological Observatory (China); Jinhai He, Nanjing Univ. of Information Science & Technology (China). . . . . [7085-47]

Application of SEBS to drought monitoring in north China plain, Yanbo He, Houquan Lu, Jianlin Wang, Huanping Wu, National Meteorological Ctr. (China) . . . . . [7085-48]

An image reconstruction method for crop growth simulation, Yanbo He, Yingyu Hou, Huanping Wu, Shili Wang, National Meteorological Ctr. (China) . . . . . [7085-49]

Applying remote sensing techniques into crop emergency monitoring, Yanbo He, National Meteorological Ctr. (China); Jingwen Guo, Wageningen Univ. (Netherlands); Huanping Wu, National Meteorological Ctr. (China) . . . . . [7085-50]

Intraseasonal oscillation and south China flood in summer, Xinyan Lu, Chinese Meteorological Administration (China); Xiuzhi Zhang, Chinese Academy of Meteorological Sciences (China); Jinnian Chen, Chinese Meteorological Administration (China) . . . . . [7085-51]

Accuracy assessment on the crop area estimating method based on RS sampling at national scale, Yonglan Qian, Chinese Meteorological Administration (China); Bangjie Yang, Chinese Academy of Agricultural Sciences (China); Xianfeng Jiao, Zhiyuan Pei, Ministry of Agriculture of the People's Republic of China (China). . . . . [7085-52]

Crop area estimation based on TERRA/MODIS and ancillary data: a case study of North China's corn area estimation, Yonglan Qian, Jianlin Wang, Yingbo Song, Chinese Meteorological Administration (China) . . . . . [7085-53]

The structures and evolutions of the wintertime Indo-Burmese trough in the southern branch of Westerlies, Miaoqing Suo, Yihui Ding, Chinese Academy of Meteorological Sciences (China). . . . . [7085-54]

The circulation background of the extremely heavy rain causing severe floods in Huaihe River valley in 2003 and its relationship to the apparent heating, Lijuan Wang, Zhaoyong Guan, Nanjing Univ. of Information Science & Technology (China) . . . . . [7085-55]

The interannual variability of the precipitation and atmospheric heat source over the QTP, Shanshan Zhong, Nanjing Univ. of Information Science & Technology (China); Jinhai He, Zhaoyong Guan, Nanjing Univ of information Science & Technology (China). . . . . [7085-56]

Relation of Asian-Pacific oscillation to Chinese offshore tropical cyclone activities, Yan Zou, Fujian Meteorological Observatory (China); Ping Zhao, Chinese Academy of Meteorological Sciences (China). . . . . [7085-32]

The NOAA global vegetation processing systems, Hanjun Ding, Le Jiang, Wei Guo, National Oceanic and Atmospheric Administration. . . . . [7085-21]

Intercalibration of GOES imagers with AIRS and IASI data, Yaping Li, Xiangqian Wu, National Oceanic and Atmospheric Administration; Seung-hee Sohn, Korea Meteorological Administration (South Korea). . . . . [7085-58]

A comparison between two different stratospheric ozone datasets of HALOE observations and ERA-40 re-analysis, Chunhua Shi, Nanjing Univ. of Information Science & Technology (China); Bin Zheng, Chinese Meteorological Administration (China) . . . . . [7085-33]

Moisture structure of quasi-biweekly mode revealed by AIRS in western Pacific, Li Tao, Nanjing Univ. of Information Science & Technology (China); Xiouhua Fu, Univ. of Hawai'i at Manoa; Weisong Lu, Nanjing Univ. of Information Science & Technology (China) . . . . . [7085-44]

Stratospheric temperature trends from HALOE, Chunhua Shi, Nanjing Univ. of Information Science & Technology (China); Bin Zheng, Chinese Meteorological Administration (China) . . . . . [7085-41]

Thursday 14 August

SESSION 6

Room: Conv. Ctr. 32B . . . . . Thurs. 8:50 to 10:30 am

Data Assimilation I

Session Chair: **Xiaolei Zou,** Florida State Univ.

8:50 am: **Satellite imagery and numerical prediction**, Francois-Xavier Le Dimet, Univ. Joseph Fourier (France) . . . . . [7085-25]

9:10 am: **Can GIFTS capture vertical and temporal variability of a convective atmosphere?**, Haidao Lin, Xiaolei Zou, Florida State Univ. . . . . [7085-27]

9:30 am: **Assimilation of small scale observations with a nested adjoint model**, Clark M. Amerault, Naval Research Lab. . . . . [7085-28]

9:50 am: **Design for an assimilation and forecast system and its sensitivity experiments**, Jinzhong Min, Qingjiu Gao, Nanjing Univ. of Information Science & Technology (China) . . . . . [7085-29]

10:10 am: **Identification on the initial dates and final dates of rainy season over north China and their climatology**, Haiwen Liu, China Meteorological Administration (China) . . . . . [7085-30]

Coffee Break . . . . . 10:30 to 11:00 am

SESSION 7

Room: Conv. Ctr. 32B . . . . . Thurs. 11:00 am to 12:00 pm

Data Assimilation II

Session Chair: **Amerault Clark,** Florida State Univ.

11:00 am: **Cloud detection and clearing using IASI and MAIA AVHRR cloud mask and classification**, Hong Zhang, Allen H. L.Huang, Harold M. Woolf, Univ. of Wisconsin/Madison . . . . . [7085-34]

11:20 am: **The precipitation products generation chain for the EUMETSAT Hydrological Satellite Application Facility at C.N.M.C.A.**, Daniele Biron, Davide Melfi, Francesco Zauli, Italian Meteorological Service (Italy) . [7085-35]

11:40 am: **Enhancement to regression retrievals using combined information from multiple advanced instruments**, Lihang Zhou, Zhaohui Cheng, National Oceanic and Atmospheric Administration . . . . . [7085-36]

Lunch Break . . . . . 12:00 to 1:30 pm

SESSION 8

Room: Conv. Ctr. 32B . . . . . Thurs. 1:30 to 3:10 pm

Data Assimilation III

Session Chair: **Amerault Clark,** Florida State Univ.

1:30 pm: **Removing noise from AVHRR data due to volcanic-based stratospheric aerosols using statistical methods**, Marco Vargas, Felix Kogan, Wei Guo, National Oceanic and Atmospheric Administration [7085-38]

1:50 pm: **Synergistic use of high spectral sounder and high spatial imager radiance measurements for atmospheric profiling**, Chian-Yi Liu, Jun Li, Elisabeth Weisz, Jinlong Li, Timothy J. Schmit, Allen H. L.Huang, Univ. of Wisconsin/Madison . . . . . [7085-39]

2:10 pm: **Principal component analysis for simulated CrIS data**, Zhaohui Cheng, Lihang Zhou, National Oceanic and Atmospheric Administration; Thomas S. King, Perot Systems Government Service; Walter W. Wolf, QSS Group, Inc.; Mitchell D. Goldberg, Christopher D. Barnet, National Oceanic and Atmospheric Administration; Haibing Sun, Perot Systems Government Service. . . . . [7085-40]

2:30 pm: **A validation study on the atmosphere-sea wave two-way coupling model using Jason-1 satellite data**, Hanjie Wang, Hao Guan, Yinming He, Chinese Academy of Sciences (China). . . . . [7085-42]

2:50 pm: **Atmospheric thermal sources over the Tibetan Plateau: comparison of calculations based on re-analysis from different sources**, Shanshan Zhong, Jinhai He, Zhaoyong Guan, Nanjing Univ. of Information Science & Technology (China). . . . . [7085-43]

Conference 7086

Tuesday-Wednesday 12-13 August 2008 • Proceedings of SPIE Vol. 7086

Imaging Spectrometry XIII

Conference Chairs: **Sylvia S. Shen,** The Aerospace Corp.; **Paul E. Lewis,** U.S. Government

Conference Co-Chair: **Robert T. Kroutil,** Los Alamos National Lab.

Program Committee: **Christoph C. Borel,** Ball Aerospace & Technologies Corp.; **Chein-I Chang,** Univ. of Maryland/Baltimore County; **Thomas W. Cooley,** Air Force Research Lab.; **Eustace L. Dereniak,** College of Optical Sciences/The Univ. of Arizona; **David B. Gillis,** Naval Research Lab.; **Terrence S. Lomheim,** The Aerospace Corp.; **Anthony Ratowski,** Air Force Research Lab.; **Luc Rochette,** LR Tech (Canada); **John R. Schott,** Rochester Institute of Technology; **Winthrop Wadsworth,** D&P Instruments

Tuesday 12 August

SESSION 1

Room: Conv. Ctr. 33C . . . . . .Tues. 8:10 to 10:00 am

Spectrometer Design, Development, and Characterization

Session Chair: **Paul E. Lewis,** U.S. Government

8:10 am: **Microspectrometers: an industry and instrumentation overview** *(Invited Paper)*, Greg Neece, AVANTES Inc. . . . . [7086-01]

8:40 am: **Snapshot imaging spectropolarimeter utilizing polarization gratings**, Jihwan Kim, Michael J. Escuti, North Carolina State Univ.. [7086-02]

9:00 am: **Computed tomographic imaging spectropolarimeter characterization**, Corrie J. Vandervlugt, College of Optical Sciences/The Univ. of Arizona; Robert E. Sampson, I-Technology Applications; Eustace L. Dereniak, College of Optical Sciences/The Univ. of Arizona; Grant R. Gerhart, U.S. Army Tank-Automotive Research, Development and Engineering Ctr.. . . . . [7086-03]

9:20 am: **The EnMAP hyperspectral imaging spectrometer: instrument concept, calibration and technologies**, Bernhard Sang, Stefan Hofer, Klaus-Peter Förster, Timo Stuffler, Josef Schubert, Christian Neumann, Valery Mogulsky, Stefan Kaiser, Kayser-Threde GmbH (Germany); Hermann J. Kaufmann, GeoForschungsZentrum Potsdam e.V. (Germany); Andreas Müller, German Aerospace Ctr. (Germany); Christian Chlebek, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany) . . . . . [7086-04]

9:40 am: **Long-wave infrared Dyson spectrometer**, William R. Johnson, Pantazis Z. Mouroulis, Daniel W. Wilson, Sarath D. Gunapala, Jason M. Mumolo, Simon J. Hook, Jet Propulsion Lab.. . . . . [7086-28]

Coffee Break . . . . . 10:00 to 10:30 am

SESSION 2

Room: Conv. Ctr. 33C . . . . . Tues. 10:30 am to 12:10 pm

Spectral Methodologies and Applications

Session Chair: **John R. Schott,** Rochester Institute of Technology

10:30 am: **Stand-off detection of compounds that contain chlorine from an aircraft platform**, Robert T. Kroutil, Los Alamos National Lab. . . [7086-05]

10:50 am: **In-field diffuse ultraviolet spectroscopy and imaging**, D. E. Pugel, NASA Goddard Space Flight Ctr.; Mairead Stackpoole, ELORET Corp.; Karen M. McNamara, NASA Johnson Space Ctr.; Carol Schwarz, MEI Technologies, Inc.; Jack Warren, NASA Johnson Space Ctr.; Dean Kontinos, NASA Ames Research Ctr. . . . . [7086-06]

11:10 am: **Imaging spectrometry for near-range crop stress detection**, Jonas Franke, Thorsten Mewes, Gunter Menz, Univ. Bonn (Germany)[7086-08]

11:30 pm: **Multitemporal spectroscopy fro crop stress detection using band selection methods**, Thorsten Mewes, Jonas Franke, Univ. Bonn (Germany) . . . . . [7086-09]

11:50 pm: **Spectral perfusion imaging of the human retina using dual-wavelength laser source,** Seyed Hossein Rasta, Univ. of Aberdeen (United Kingdom) and Tabriz Univ. of Medical Sciences (Iran); A. Manivannan, Peter F. Sharp, Univ. of Aberdeen (United Kingdom) . . . . . [7086-10]

Room: Conv. Ctr. 6A . . . . . Tues. 1:15 to 5:30 pm

Remote Sensing Plenary

Join this collaborative plenary session, to hear presentations from a cross section of remote sensing applications. For more detailed information see p. 17-18.

1:15 pm: **The Contributions from the NASA Earth Science Decadal Survey missions in understanding Global Climate Change** *(Presentation Only)*, Jason J. Hyon, Jet Propulsion Lab. . . . . [7085-158]

2:00 pm: **Recovering the Atmospheric Information from the High Resolution Dynamics Limb Sounder (HIRDLS)** *(Presentation Only)*, John C. Gille, National Ctr. for Atmospheric Research. . . . . [7082-45]

2:45 pm: **Measurement Science for Climate Remote Sensing** *(Presentation Only)*, Gerald T. Fraser, National Institute of Standards and Technology. . . . . [7081-53]

Coffee Break . . . . . 3:30 to 4:00

4:00 pm: **Application of MODIS Direct Broadcast System: Fire Detection, Burn Scars, Emissions, Air Quality Forecasting** *(Presentation Only)*, Wei Min Hao, Shawn P. Urbanski, J. M. Salmon, B. Nordgren, Alexander Petkov, U.S.D.A. Forest Service . . . . . [7089-18]

4:45 pm: **Infrared Retina Using Nanoscale Quantum Dots and Strain Layer Superlattices** *(Presentation Only)*, Sanjay Krishna, The Univ. of New Mexico . . . . . [7082-46]

Wednesday 13 August

SESSION 3

Room: Conv. Ctr. 33C . . . . . Wed. 8:30 to 10:30 am

Spectral Data Analysis Techniques

Session Chair: **Robert T. Kroutil,** Los Alamos National Lab.

8:30 am: **Sequential N-FINDR algorithms**, Shihyu Chu, Chao-Cheng Wu, Chein-I Chang, Univ. of Maryland/Baltimore County . . . . . [7086-11]

8:50 am: **Block truncation signature coding for hyperspectral analysis**, Sumit Chakravarty, Chein-I Chang, Univ. of Maryland/Baltimore County. . . . . [7086-12]

9:10 am: **A family of distributions for the error term in linear mixing models for hyperspectral images**, Peter Bajorski, Rochester Institute of Technology . . . . . [7086-13]

9:30 am: **Analysis of concurrent space based and ground based atmospheric infrared spectrometer measurements**, Paul E. Lewis, National Geospatial-Intelligence Agency; David P. Miller, Northrop Grumman IT - TASC; Sylvia S. Shen, The Aerospace Corp.; Robert T. Kroutil, Los Alamos National Lab. . . . . [7086-14]

9:50 am: **Method for retrieving column water vapor at night using mid-wave infrared bands**, Christoph C. Borel, Michael D. Abel, Ball Aerospace & Technologies Corp.; Sandra K. Weaver, National Air and Space Intelligence Ctr.. . . . . [7086-15]

10:10 am: **Micro-scale modeling of contaminant effects on surface optical properties**, Michael G. Gartley, John R. Schott, Scott D. Brown, Rochester Institute of Technology . . . . . [7086-16]

Coffee Break . . . . . 10:30 to 11:00 am

Conference 7086

SESSION 4

Room: Conv. Ctr. 33C . . . . . Wed. 11:00 am to 12:40 pm

Imaging Systems and Components

Session Chair: **Luc Rochette,** LR Tech (Canada)

11:00 am: **Next Generation Airborne Imaging FT-IR Spectrometer for Emergency Response Applications**, Luc Rochette, LR Tech (Canada); Mark J. Thomas, U.S. Environmental Protection Agency; Robert T. Kroutil, Los Alamos National Lab.; Paul E. Lewis, National Geospatial-Intelligence Agency . . . . . [7086-17]

11:20 am: **SpIOMM: a wide field imaging FTS for astronomy**, Frederic Grandmont, ABB Inc. (Canada); Laurent Drissen, Anne-Pier Bernier, Maxime Charlebois, Univ. Laval (Canada) . . . . . [7086-18]

11:40 am: **Airborne configuration of a longwave infrared imaging hyperspectral sensor**, Alexandre Vallières, Jean-Pierre Allard, Martin Chamberland, Vincent Farley, Philippe Lagueux, André J. Villemaire, Telops, Inc. (Canada) . . . . . [7086-19]

12:00 pm: **Operational Characteristics of High Efficiency LWIR AOTF**, David A. Kahler, Narsingh B. Singh, Northrop Grumman Corp.; Milton Gottlieb, Dennis Suhre, Carnegie Mellon Univ.; Paul G. Lucey, Univ. of Hawai'i at Manoa; David Knuteson, Andre Berghmans, Brian Wagner, Sean McLaughlin, Jerry Hedrick, Jr., Northrop Grumman Corp. . . . . [7086-20]

12:20 pm: **Dual-channels spectral imaging with spectral zooming capability**, Bing Chen, Univ. of Miami; Jame J. Yang, New Span Opto-Technology Inc.; Michael R. Wang, Univ. of Miami. . . . . [7086-21]

Lunch/Exhibition Break . . . . . 12:40 to 1:40 pm

SESSION 5

Room: Conv. Ctr. 33C . . . . . Wed. 1:40 to 3:20 pm

Target Detection and Identification

Session Chair: **Sylvia S. Shen,** The Aerospace Corp.

1:40 pm: **Improved point target detection using local covariance matrices**, Stanley R. Rotman, Ben-Gurion Univ. of the Negev (Israel) and Solid State Scientific Corp.; David Avraham, Nava Belogus, Ben-Gurion Univ. of the Negev (Israel). . . . . [7086-22]

2:00 pm: **Hyperspectral oblique target detection**, Josef P. Bishoff, Canadian Air Forces (Canada) and Rochester Institute of Technology; David W. Messinger, Emmett J. Ientilucci, Rochester Institute of Technology . [7086-23]

2:20 pm: **Unsupervised hyperspectral target analysis**, Xiaoli Jiao, Chein-I Chang, Univ. of Maryland/Baltimore County. . . . . [7086-24]

2:40 pm: **Spectral fingerprint identification for whole cube identification**, Charles C. Wamsley, Ball Aerospace & Technologies Corp. . . . . [7086-25]

3:00 pm: **Spectral binning optimization for the ARTEMIS real-time processor,** Charles C. Wamsley, Ball Aerospace & Technologies Corp. . . . . [7086-26]

Room: Conv. Ctr. Exhibit Hall B2 . . . . . Wed. 5:30 to 7:00 pm

Posters-Wednesday

Poster authors will begin displaying posters after 10:00 am Wednesday morning. A poster session, with authors present at their posters, will be held Wednesday evening from 5:30 to 7:00 pm. Light refreshments will be served.

Poster Setup

Poster presenters must set up their posters between 10:00 am and 5:00 pm on Wednesday. Poster presenters who have not set up by 5:00 pm on Wednesday will be considered a "no show" and their manuscript will not be published. Presenters must remove their posters immediately after the poster session. Posters not removed will be considered unwanted and will be discarded. SPIE assumes no responsibility for posters left up after the end of each poster session.

Improved iterative error analysis for endmember extraction from hyperspectral imagery, Lixin Sun, Canada Ctr. for Remote Sensing (Canada) . . . . . [7086-27]

Courses of Related Interest

See SPIE Cashier for information and to register.

SC194 Multispectral and Hyperspectral Image Sensors (Lomheim) Monday, 1:30 to 5:30 pm

SC567 Introduction to Optical Remote Sensing Systems (Shaw) Tuesday, 1:30 to 5:30 pm

Conference 7087

Monday-Wednesday 11-13 August 2008 • Proceedings of SPIE Vol. 7087

Remote Sensing System Engineering

Conference Chairs: **Philip E. Ardanuy,** Raytheon Intelligence and Information Systems; **Jeffery J. Puschell,** Raytheon Space and Airborne Systems

Conference Co-Chairs: **Hal J. Bloom,** NOAA, GOES-R Program; **Allen H.-L. Huang,** Univ. of Wisconsin/Madison

Program Committee: **Stephen A. Cota,** The Aerospace Corp.; **William B. Gail,** Microsoft Corp.; **Gerry Jansson,** Intelsat Global Service Corp.; **Jay Pearlman,** The Boeing Co.; **Lars-Peter Riishojgaard,** Joint Ctr. for Data Assimilation; **Donald L. Thoma,** Iridium Satellite LLC

Monday 11 August

SESSION 1

Room: Conv. Ctr. 33C . . . . . Mon. 8:50 to 10:30 am

System Modeling and Simulation

Session Chair: **Jeffery J. Puschell,** Raytheon Space & Airborne Systems

8:50 am: **System processing approach in analyzing the GOES-R measurement impacts on the product requirements**, Allen H.Huang, Univ. of Wisconsin/Madison; Mitch Goldberg, National Oceanic and Atmospheric Administration . . . . . [7087-01]

9:10 am: **PICASSO: an end-to-end image simulation tool for space and airborne imaging systems**, Stephen A. Cota, Terrence S. Lomheim, Linda S. Kalman, Jabin T. Bell, Robert A. Keller, Diane Paulson, Christopher J. Florio, Thomas J. Grycewicz, Timothy S. Willkinson, The Aerospace Corp. . [7087-02]

9:30 am: **Focal plane resolution and overlapped array TDI imaging**, Thomas J. Grycewicz, Stephen A. Cota, Terrence S. Lomheim, Linda S. Kalman, The Aerospace Corp. . . . . [7087-03]

9:50 am: **Using noise equivalent reflectance difference (NERD) vs. spatial resolution (SR) as a good measure for system performances**, Guy Raz, Michael Berger, Elbit Systems Electro-Optics El-Op Ltd. (Israel) . . . . [7087-05]

10:10 am: **Simulation of Meteosat third generation: lightning imager through tropical rainfall measuring mission-lightning imaging sensor data**, Daniele Biron, De Leonibus Luigi, Italian Meteorological Service (Italy); Laquale Paolo, Demetrio Labate, Galileo Avionica S.p.A. (Italy); Francesco Zauli, Davide Melfi, Italian Meteorological Service (Italy) . . . . . [7087-06]

Coffee Break . . . . . 10:30 to 11:00 am

SESSION 2

Room: Conv. Ctr. 33C . . . . . Mon. 11:00 am to 12:40 pm

Geophysical Product Systems Engineering

Session Chair: **Philip E. Ardanuy,** Raytheon Intelligence and Information Systems

11:00 am: **Application of OSSEs to observing system design**, Robert M. Atlas, National Oceanic and Atmospheric Administration; Lars P. Riishojgaard, Joint Ctr. for Satellite Data Assimilation . . . . . [7087-07]

11:20 am: **Image quality vs. sensitivity: fundamental sensor system engineering**, Carl F. Schueler, Schueler Consulting . . . . . [7087-08]

11:40 am: **Zombie algorithms: a remote sensing systems engineering design tool**, Philip E. Ardanuy, Raytheon Intelligence and Information Systems; Dylan Powell, Lockheed Martin Corp. . . . . [7087-09]

12:00 pm: **Design of a generic level 2 operational product processing system framework**, Walter W. Wolf, Lihang Zhou, Peter Keehn, Qingzhao Guo, Shanna Sampson, Shuang Qiu, Thomas S. King, Mitchell D. Goldberg, National Oceanic and Atmospheric Administration . . . . . [7087-10]

12:20 pm: **Application of satellite surface wind data to ocean wind analysis**, Robert M. Atlas, National Oceanic and Atmospheric Administration; Joseph Ardizzone, NASA Goddard Space Flight Ctr.; Ross N. Hoffman, Atmospheric and Environmental Research, Inc. . . . . [7087-11]

Lunch Break . . . . . 12:40 to 1:40 pm

SESSION 3

Room: Conv. Ctr. 33C . . . . . Mon. 1:40 to 3:00 pm

Geophysical Product Systems Engineering II

Session Chair: **Philip E. Ardanuy,** Raytheon Intelligence and Information Systems

1:40 pm: **Geospatial visualization of atmospheric chemistry satellite data using Google Earth**, John C. Burke, Raytheon . . . . . [7087-12]

2:00 pm: **Product precedence considerations in a generic level 2 operational product processing system framework**, Shanna Sampson, Walter W. Wolf, Lihang Zhou, Peter Keehn, Qingzhao Guo, Shuang Qiu, Mitchell D. Goldberg, National Oceanic and Atmospheric Administration . . . . . [7087-13]

2:20 pm: **Design and implementation of a software generator for a level 2 operational product processing system framework**, Qingzhao Guo, Walter W. Wolf, Lihang Zhou, Peter Keehn, Shanna Sampson, Shuang Qiu, Thomas S. King, Zhaohui Cheng, Mitchell D. Goldberg, National Oceanic and Atmospheric Administration . . . . . [7087-14]

2:40 pm: **MLS near real time data processing system**, Ardvas Mousessian, Christina Vuu, Raytheon . . . . . [7087-15]

Coffee Break . . . . . 3:00 to 3:30 pm

SESSION 4

Room: Conv. Ctr. 33C . . . . . Mon. 3:30 to 5:50 pm

Sensor Systems Engineering and Technology

Session Chair: **Jeffery J. Puschell,** Raytheon Space & Airborne Systems

3:30 pm: **System engineering studies for advanced geosynchronous remote sensors**, Jeffery J. Puschell, Raytheon Space & Airborne Systems. . . . . [7087-16]

3:50 pm: **Jitter suppression techniques for mechanical cryocooler-induced disturbances**, Carl S. Kirkconnell, Robert C. Hon, Douglas W. Wolfe, Wallace Sunada, Raytheon Space and Airborne Systems . . . . . [7087-18]

4:10 pm: **Real-time simultaneous temperature and strain measurements at cryogenic temperatures in an optical fiber**, Scott B. Mahar, Massachusetts Institute of Technology; Jihong Geng, Shibin Jiang, NP Photonics, Inc.; Joseph Minervini, Joel Schultz, Peter Titus, Makoto Takayasu, Chen-Yu Gung, Massachusetts Institute of Technology. . . . . [7087-19]

4:30 pm: **Design of the stereoscopic eye-tracking system for quantitative remote sensing applications**, Aleksandr V. Sergeyev, Eugene Levin, Michigan Technological Univ.; Gennady Gienko, Univ. of the South Pacific (Fiji)[7087-20]

4:50 pm: **Assessment design study of a micro pulse lidar combined with high spectral resolution lidar**, Martha W. Dawsey, College of Optical Sciences/The Univ. of Arizona; John A. Reagan, The Univ. of Arizona[7087-21]

5:10 pm: **A dual-wavelength high altitude atmosphere lidar with 24 hour operation ability in the sodium fluorescence channel**, Shunsheng Gong, Xuewu Cheng, Faquan Li, Jiamin Wang, Wuhan Institute of Physics and Mathematics (China) . . . . . [7087-22]

5:30 pm: **One-dimensional tomographic fiber-optical measuring system based upon single fiber multimode interferometers**, Alexey D. Lantsov, Far Eastern State Technical Univ. (Russia); Oleg B. Vitrik, Yuriy N. Kul'chin, Institute for Automation and Control Processes (Russia) . . . . . [7087-23]

Conference 7087

Wednesday 13 August

SESSION 5

Room: Conv. Ctr. 32A . . . . . Wed. 1:30 to 3:10 pm

Commercial Assets in Future Remote Sensing Systems

Session Chair: **Jeffery J. Puschell,** Raytheon Space & Airborne Systems

1:30 pm: **Iridium NEXT partnership for Earth observation: exploiting global satellite constellations for new remote sensing capabilities**, Om P. Gupta, Don Thoma, Iridium Satellite LLC . . . . . [7087-24]

1:50 pm: **Intelsat as a commercial asset for future remote sensing systems**, Gerry Jansson, Intelsat Global Service Corp. . . . . [7087-25]

2:10 pm: **The "Boreas" concept for imaging polar winds from the Iridium-NEXT Constellation**, Dennis Chesters, NASA Goddard Space Flight Ctr.; Lars P. Riishojgaard, Joint Ctr. for Satellite Data Assimilation . . . . . [7087-26]

2:30 pm: **Commercial solution for ocean color: SeaWiFS-2 rideshare with GeoEye-2**, Gregory Hammann, Geoeye, Inc.; Jeffery J. Puschell, Raytheon Space & Airborne Systems . . . . . [7087-27]

2:50 pm: **A standardized interface and accommodation methodology for commercially hosted payloads on the StarBus**, Phillip C. Kalmanson, Carl F. Schueler, Michael Do, Quang Lam, Orbital Sciences Corp. . . . . [7087-28]

Courses of Related Interest

See SPIE Cashier for information and to register.

SC567 Introduction to Optical Remote Sensing Systems (Shaw) Tuesday, 1:30 to 5:30 pm

SC561 Optomechanics for Space Applications (Shipley) Wednesday, 8:30 am to 5:30 pm

Conference 7088

Wednesday-Thursday 13-14 August 2008 • Proceedings of SPIE Vol. 7088

Remote Sensing Applications for Aviation Weather Hazard Detection and Decision Support

Conference Chairs: **Wayne F. Feltz,** Univ. of Wisconsin/Madison; **John J. Murray,** NASA Langley Research Ctr.

Program Committee: **Taumi Daniels,** NASA Langley Research Ctr.; **Matthew Fladeland,** NASA Ames Research Ctr.; **David Helms,** National Oceanic and Atmospheric Administration; **Robert Neece,** NASA Langley Research Ctr.; **Ralph A. Petersen,** Univ. of Wisconsin/Madison; **John Williams,** National Ctr. for Atmospheric Research

Wednesday 13 August

Room: Conv. Ctr. Exhibit Hall B2 . . . . . Wed. 5:30 to 7:00 pm

Posters-Wednesday

Poster authors will begin displaying posters after 10:00 am Wednesday morning. A poster session, with authors present at their posters, will be held Wednesday evening from 5:30 to 7:00 pm. Light refreshments will be served.

Poster Setup

Poster presenters must set up their posters between 10:00 am and 5:00 pm on Wednesday. Poster presenters who have not set up by 5:00 pm on Wednesday will be considered a "no show" and their manuscript will not be published. Presenters must remove their posters immediately after the poster session. Posters not removed will be considered unwanted and will be discarded. SPIE assumes no responsibility for posters left up after the end of each poster session.

Innovations in convective and lightning initiation nowcasting using geostationary satellite at the University of Alabama in Huntsville, Wayne M. MacKenzie, Jr., John R. Mecikalski, The Univ. of Alabama in Huntsville . . . . . [7088-18]

Progress towards the remote sensing of aircraft icing hazards, Andrew L. Reehorst, David Brinker, NASA Glenn Research Ctr.; Marcia Politovich, David Serke, National Ctr. for Atmospheric Research; Charles Ryerson, U.S. Army Corps of Engineers; Andrew Pazmany, ProSensing Inc.; Frederick Solheim, Radiometrics Corp. . . . . [7088-19]

Integrated information to support decision makers, Daniele Biron, Francesco Zauli, Davide Melfi, Italian Meteorological Service (Italy) . [7088-20]

Concept, simulations and instrumentation for radiometric inflight icing detection, Charles C. Ryerson, George G. Koenig, U.S. Army Corps of Engineers; Andrew L. Reehorst, NASA Glenn Research Ctr.; Forrest Scott, Sensor Concept & Applications . . . . . [7088-21]

Application of support vector machines in cloud detection using images of EOS/MODIS, Hanjie Wang, Yinming He, Chinese Academy of Sciences (China) . . . . . [7088-22]

Laser optical feedback imaging system for vision in fog, Etienne Belin, Vincent Boucher, Lab. Central des Ponts et Chaussées (France) . . . [7088-23]

Two full-field imaging systems for vision in fog, Etienne Belin, Frederic Taillade, Lab. Central des Ponts et Chaussées (France). . . . . [7088-24]

Thursday 14 August

SESSION 1

Room: Conv. Ctr. 33C . . . . . Thurs. 8:30 to 10:00 am

Aviation Decision Support Systems

Session Chair: **Wayne F. Feltz,** Univ. of Wisconsin/Madison

8:30 am: **Sensor performance considerations for aviation weather observations using the recently-revised NOAA Consolidated Observations Requirements List (CORL CT-AWX)** *(Invited Paper)*, John J. Murray, NASA Langley Research Ctr.; David Helms, Cecilia Miner, National Oceanic and Atmospheric Administration . . . . . [7088-01]

9:00 am: **The Fog Remote Sensing And Modeling (FRAM) field project: visibility analysis and remote sensing of fog**, Ismail Gultepe, Environment Canada (Canada); Patrick Minnis, NASA Langley Research Ctr.; Jason Milbrandt, Stewart G. Cober, George A. Isaac, Environment Canada (Canada); Louis Nguyen, NASA Langley Research Ctr.; Bjarne Hansen, Patrick King, Environment Canada (Canada); Gary Ellrod,. . . . . [7088-02]

9:20 am: **Remote detection and diagnosis of thunderstorm turbulence**, John K. Williams, Robert D. Sharman, Jason A. Craig, Gary E. Blackburn, National Ctr. for Atmospheric Research . . . . . [7088-03]

9:40 am: **Combining observations and model data for short-term storm forecasting**, John K. Williams, David A. Ahijevych, Huaqing Cai, Susan Dettling, Cathy J. Kessinger, Eric J. Nelson, James O. Pinto, Rita D. Roberts, Matthias Steiner, National Ctr. for Atmospheric Research . . . . . [7088-04]

Coffee Break . . . . . 10:00 to 10:30 am

SESSION 2

Room: Conv. Ctr. 33C . . . . . Thurs. 10:30 am to 12:00 pm

Satellite-based Aviation Decision Support

Session Chair: **John J. Murray,** NASA Langley Research Ctr.

10:30 am: **Progress toward meeting GOES-R Aviation hazard detection requirements** *(Invited Paper)*, Wayne F. Feltz, Univ. of Wisconsin/Madison; Kenneth Pryor, National Oceanic and Atmospheric Administration . . [7088-05]

11:00 am: **Brightness temperature nowcasting for satellite-based short-term prediction of storms: opportunities and challenges**, Matthias Steiner, Huaqing Cai, Gyuwon Lee, Nancy Rehak, Gary Cunning, David Albo, National Ctr. for Atmospheric Research . . . . . [7088-07]

11:20 am: **Convection diagnosis and nowcasting for oceanic aviation applications**, Cathy J. Kessinger, Huaqing Cai, Nancy Rehak, Dan Megenhardt, National Ctr. for Atmospheric Research; Jeffrey D. Hawkins, Richard L. Bankert, Naval Research Lab.; Earle Williams, MIT Lincoln Lab. . . . . [7088-08]

11:40 am: **Nearcasting convective destabilization of isolated convection using objective tools which optimize the impact of sequences of GOES moisture products**, Ralph A. Petersen, Univ. of Wisconsin/Madison; Robert Aune, National Oceanic and Atmospheric Administration . . . . . [7088-09]

Lunch Break . . . . . 12:00 to 1:30 pm

SESSION 3

Room: Conv. Ctr. 33C . . . . . Thurs. 1:30 to 3:00 pm

External Hazard and Ground-based Aviation Decision Support I

Session Chair: **John K. Williams,** National Ctr. for Atmospheric Research

1:30 pm: **Interferometric radiometer for in-flight detection of aviation hazards** *(Invited Paper)*, Bill Smith, Sr., Stanislav Kireev, Hampton Univ.; Leanne West, Gary Gimmestad, Georgia Tech Research Institute; Larry Cornman, Univ. Corp. for Atmospheric Research; Wayne Feltz, Univ. of Wisconsin/Madison; Glen Perram, Air Force Institute of Technology; Taumi Daniels, NASA Langley Research Ctr.. . . . . [7088-10]

2:00 pm: **A near infra-red lidar system for external hazard detection and mitigation**, Richard I. Billmers, Elizabeth J. Billmers, Mary E. Ludwig, Joseph Matchett, George Claussen, RL Associates Inc.. . . . . [7088-11]

2:20 pm: **Using the TAMDAR sensor to calculate icing intensity (rate)**, Jamie T. Braid, Chris Flynn, Dan Mulally, AirDat LLC . . . . . [7088-12]

2:40 pm: **Further evaluation of the WVSS-II moisture sensor using co-located in-situ and remotely-sensed observations**, Ralph A. Petersen, Sarah Bedka, Wayne Feltz, Erik Olson, Univ. of Wisconsin/Madison. [7088-13]

Coffee Break . . . . . 3:00 to 3:30 pm

SESSION 4

Room: Conv. Ctr. 33C . . . . . Thurs. 3:30 to 5:00 pm

External Hazard and Ground-based Aviation Decision Support II

Session Chair: **Robert Neece,** NASA Langley Research Ctr.

3:30 pm: **The use of x-band radar to support the detection of in-flight icing hazards by the NASA icing remote sensing system during AIRS-II** *(Invited Paper)*, David J. Serke, Marcia Politovich, National Ctr. for Atmospheric Research; Andrew L. Reehorst, NASA Glenn Research Ctr.; Andrew Gaydos, National Ctr. for Atmospheric Research . . . . . [7088-14]

4:00 pm: **Multi-functional airborne external hazard monitoring radar with antenna diversity**, Yan Zhang, Robert Palmer, Guifu Zhang, Tian-You Yu, Keith Brewster, Mark Yeary, Ming Xue, Phillip Chilson, Univ. of Oklahoma . . . . . [7088-15]

4:20 pm: **Airborne bistatic radar for external hazard detection and avoidance**, Roland W. Lawrence, Old Dominion Univ.; Omar Torres, NASA Langley Research Ctr. and Univ. of Maryland/Baltimore County; George Ganoe, NASA Langley Research Ctr. . . . . [7088-16]

4:40 pm: **Study of phase scanning weather radar scanning strategies**, Jinhong Yang, Chinese Meteorological Administration . . . . . [7088-17]

Courses of Related Interest

See SPIE Cashier for information and to register.

SC567 Introduction to Optical Remote Sensing Systems (Shaw) Tuesday, 1:30 to 5:30 pm

Conference 7089

Sunday 10 August 2008 • Proceedings of SPIE Vol. 7089

Remote Sensing of Fire: Science and Application

Conference Chair: **Wei Min Hao,** U.S.D.A. Forest Service

Program Committee: **John P. Burrows,** Univ. Bremen (Germany); **Jack Fishman,** NASA Langley Research Ctr.; **Ulrich Platt,** Ruprecht-Karls-Univ. Heidelberg (Germany); **Mark Ruminski,** National Oceanic and Atmospheric Administration; **Martin Wooster,** King's College London (United Kingdom)

Sunday 10 August

Room: Conv. Ctr. 33C . . . . . Sun. 8:50 to 9:30 am

Keynote Session

Session Chair: **Wei Min Hao,** U.S.D.A. Forest Service

8:50 am: **Measurement of Air Pollution from Space: Addressing the Challenge of the National Research Council** *(Keynote Presentation) (Invited Paper),* Jack Fishman, Jassim Al-Saadi, Doreen O. Neil, John K. Creilson, Robert B. Pierce, James J. Szykman, NASA Langley Research Ctr. . . . . [7089-01]

SESSION 2

Room: Conv. Ctr. 33C . . . . . .Sun. 9:30 to 10:10 am

Ground Observations of Fires and Smoke

Session Chair: **Wei Min Hao,** U.S.D.A. Forest Service

9:30 am: **Acoustic and thermal characterization of a forest fire event**, Gaetano D'Altrui, Claudio Calisti Tassini, D'Appolonia S.p.A. (Italy); Xavier Viegas, Luis Paulo Pita, Association for the Development of Industrial Aerodynamics (Portugal); Finn Kryger Nielsen, Karim Haddad, Brüel & Kjær Sound & Vibration Measurement A/S (Denmark); Vincenzo Quaranta, Ignazio Dimino, Ctr. Italiano Ricerche Aerospaziali (Italy); Harris Tsangaris, Univ. of Cyprus (Cyprus). . . . . [7089-03]

9:50 am: **New possibilities for remote analysis of biomass burning: plumes by DOAS**, Ulrich Platt, Ruprecht-Karls-Univ. Heidelberg (Germany) . [7089-04]

Coffee Break . . . . . 10:10 to 10:40 am

SESSION 3

Room: Conv. Ctr. 33C . . . . . Sun. 10:40 am to 12:00 pm

Smoke Plume Dynamics

Session Chair: **Shawn P. Urbanski,** U.S.D.A. Forest Service

10:40 am: **Investigation of optical characteristics and smoke-plume dynamics in the wildfire vicinity with lidar**, Vladimir A. Kovalev, Wei Min Hao, Cyle E. Wold, Jenny O. Newton, U.S.D.A. Forest Service; Don J. Latham, Six Mile Systems LLC; Alexander Petkov, U.S.D.A. Forest Service . . [7089-05]

11:00 am: **Wildfire smoke near-source physical characteristics**, Ralph A. Kahn, NASA Goddard Space Flight Ctr.; Wei-Ting Chen, California Institute of Technology; David L. Nelson, Yang Chen, David J. Diner, Jet Propulsion Lab.; Jennifer A. Logan, Harvard Univ.; Fok-Yan Leung, Washington State Univ.; Maria Val Martin, Harvard Univ. . . . . [7089-06]

11:20 am: **Quantitative studies of wildfire smoke injection heights with the Terra multi-angle imaging spectroradiometer**, David J. Diner, David L. Nelson, Yang Chen, Jet Propulsion Lab.; Ralph A. Kahn, NASA Goddard Space Flight Ctr.; Jennifer A. Logan, Harvard Univ.; Fok-Yan Leung, Washington State Univ.; Maria Val Martin, Harvard Univ.. . . . . [7089-07]

11:40 am: **Example applications of the MISR INteractive eXplorer (MINX) software tool to wildfire smoke plume analyses**, David L. Nelson, Columbus Technologies and Services Inc.; David J. Diner, Jet Propulsion Lab.; Dominic Mazzoni, Google Inc.; Michael J. Garay, Raytheon Co.; Ralph A. Kahn, NASA Goddard Space Flight Ctr.; Jeffrey R. Hall, Brian E. Rheingans, Charles K. Thompson, Jet Propulsion Lab. . . . . [7089-08]

Lunch Break . . . . . 12:00 to 1:30 pm

Courses of Related Interest

See SPIE Cashier for information and to register.

SC567 Introduction to Optical Remote Sensing Systems (Shaw) Tuesday, 1:30 to 5:30 pm

SESSION 4

Room: Conv. Ctr. 33C . . . . . Sun. 1:30 to 3:10 pm

Fire Detection, Burned Areas, and Emissions

Session Chair: **Wei Min Hao,** U.S.D.A. Forest Service

1:30 pm: **Use of multiple satellite sensors in NOAA's operational near real time fire and smoke detection and characterization program,** M. Ruminski, J. Simko, J. Kibler, R. Draxler, P. Davidson, National Oceanic and Atmospheric Administration (United States); P. Li, Perot Systems (United States) [7089-19]

1:50 pm: **Hypertemporal satellite-based data products for wildland fire decision support**, Brad Quayle, USDA Forest Service . . . . . [7089-09]

2:10 pm: **The monitoring trends in burn severity project: historical fire severity data for the Pacific Southwest and Pacific Northwest regions of the United States**, Brian D. Schwind, Brad Quayle, U.S. Forest Service. . . . . [7089-10]

2:30 pm: **Vegetation burned areas derived from multiple satellite-based active fires**, Xiaoyang Zhang, Shobha Kondragunta, National Oceanic and Atmospheric Administration . . . . . [7089-11]

2:50 pm: **The impact of satellite-derived biomass burning emission estimates on air quality**, George A. Pouliot, Tom Pierce, U.S. Environmental Protection Agency. . . . . [7089-13]

Coffee Break . . . . . 3:10 to 3:40 pm

SESSION 5

Room: Conv. Ctr. 33C . . . . . Sun. 3:40 to 5:00 pm

Long-Range Transport of Smoke Plumes

Session Chair: **Ulrich Platt,** Ruprecht-Karls-Univ. Heidelberg (Germany)

3:40 pm: **Biomass burning emission estimates based on a MODIS direct broadcast burn scar mapping algorithm**, Shawn P. Urbanski, U.S.D.A. Forest Service . . . . . [7089-14]

4:00 pm: **The atmospheric composition constellation for aerosols: a project of the Committee on Earth Observation Satellites (CEOS)**, Jassim Al-Saadi, NASA Langley Research Ctr.; Robert B. Pierce, NOAA/NESDIS/STAR; Jack Fishman, Chieko Kittaka, James Szykman, Doreen Neil, Charles Trepte, David Winker, T. D. Fairlie, Kurt Severance, NASA Langley Research Ctr.; Shobha Kondragunta, NOAA/NESDIS/STAR; Terry Keating, U.S. Environmental Protection Agency. . . . . [7089-15]

4:20 pm: **Relationship between fire count and CO vertical column density retrieved from SCIAMACHY onboard ENVISAT**, Liu Cheng, Max-Planck-Institut für Chemie (Germany); Christian Frankenberg, SRON Netherlands Institute for Space Research (Netherlands); Ulrich Platt, Ruprecht-Karls-Univ. Heidelberg (Germany); Thomas Wagner, Max-Planck-Institut für Chemie (Germany) . . . . . [7089-16]

4:40 pm: **Biomass burning emissions from satellite observations: synergistic use of formaldehyde (HCHO), fire counts and Nitrogen Dioxide (NO 2) results,** Thierry Marbach, Steffen Beirle, Max Planck Institut für Chemie (Germany); Ulrich Platt, Ruprecht-Karls-Univ. Heidelberg (Germany); Thomas Wagner, Max-Planck-Institut für Chemie (Germany) . . . . . [7089-17]

Room: Conv. Ctr. 6A . . . . . Sun. 6:00 to 6:45 pm

All-Conference Plenary Session

View plenary presentation details p. 13.

6:00 pm: **The Solar Decathlon: building a better future with solar energy**, Richard J. King, U.S. Dept. of Energy

Conference 7090

Tuesday-Wednesday 12-13 August 2008 • Proceedings of SPIE Vol. 7090

Atmospheric Optics: Models, Measurements, and Target-in-the-Loop Propagation II

Conference Chairs: **Stephen M. Hammel,** Space and Naval Warfare Systems Ctr., San Diego; **Alexander M. J. van Eijk,** TNO Defence, Security and Safety (Netherlands); **Mikhail A. Vorontsov,** Army Research Lab.

Program Committee: **Matthew M. Bold,** Defense Strategies and Systems, Inc.; **Frank D. Eaton,** Air Force Research Lab.; **Charles Higgs,** MIT Lincoln Lab.; **Vladimir B. Markov,** MetroLaser, Inc.; **Vincent Michau,** ONERA (France); **Jennifer C. Ricklin,** Defense Advanced Research Projects Agency; **Jim F. Riker,** Air Force Research Lab.; **Michael C. Roggemann,** Michigan Technological Univ.; **Don D. Seeley,** High Energy Laser Joint Technology Office; **Alexander M. Sergeev,** Russian Academy of Sciences, Applied Physics Institute (Russia); **Michael T. Valley,** Sandia National Labs.; **Thomas Weyrauch,** Univ. of Maryland/College Park

Tuesday 12 August

SESSION 1

Room: Conv. Ctr. 32A . . . . . .Tues. 8:50 to 11:20 am

Tracking and Imaging

Session Chair: **Stephen M. Hammel,** Space and Naval Warfare Systems Ctr., San Diego

8:50 am: **Estimation of the error of tracked object coordinates measurement in conditions of thermal blooming and atmospheric turbulence**, Grigory A. Filimonov, Vadim V. Dudorov, Valeriy V. Kolosov, Institute of Atmospheric Optics (Russia) . . . . . [7090-01]

9:10 am: **Application of stereo laser tracking methods for quantifying flight dynamics-II**, Timothy J. Miller, Sandia National Labs.; Edward F. Romero, Michael T. Valley, Sandia National Labs; Hubert W. Schreier, Correlated Solutions, Inc. . . . . [7090-02]

9:30 am: **Laser applications in the littoral: search lidar and ship identification**, Johan C. van den Heuvel, Alexander M. J.van Eijk, Herman H.Bekman, Frank J.van Putten, Leo H. Cohen, TNO Defence, Security and Safety (Netherlands); Paul W. Pace, Defense Research and Development Canada (Canada). . . . . [7090-03]

9:50 am: **Infrared background analysis of Bay environments**, Piet B.Schwering, TNO Defence, Security and Safety (Netherlands); Dirk F. Bezuidenhout, Council for Scientific and Industrial Research (South Africa); Willem H. Gunter, Institute for Marine Technology (IMT) (South Africa); Francois P.Le Roux, Rheinhardt H. Sieberhagen, Council for Scientific and Industrial Research (South Africa); Alexander M. J.van Eijk, TNO Defence, Security and Safety (Netherlands) . . . . . [7090-04]

Coffee Break . . . . . 10:10 to 10:40 am

10:40 am: **Synthetic imaging through atmospheric turbulence from short-exposure anisoplanatic images: mixed metric approach**, Mathieu Aubailly, Univ. of Maryland/College Park; Mikhail A. Vorontsov, Gary W. Carhart, Army Research Lab.; Michael T. Valley, Sandia National Labs. . . . . [7090-05]

11:00 am: **Adaptive control of conformal laser beams in deep atmospheric turbulence,** Svetlana L. Lachinova, Univ. of Maryland/College Park; Mikhail A. Vorontsov, Army Research Lab. . . . . [7090-06]

SESSION 2

Room: Conv. Ctr. 32A . . . . . Tues. 11:20 am to 12:20 pm

Beam Propagation and Wavefront Control I

Session Chair: **Mikhail A. Vorontsov,** Army Research Lab.

11:20 am: **Development of adaptive fiber collimators for conformal fiber-based beam projection systems**, Leonid A. Beresnev, Army Research Lab.; Thomas Weyrauch, Univ. of Maryland/College Park; Mikhail A. Vorontsov, Army Research Lab. and Univ. of Maryland/College Park; Ling Liu, Univ. of Maryland/College Park; Gary W. Carhart, Army Research Lab. . . . . [7090-07]

11:40 am: **Wavefront phase originated of an extended light source: definition, analysis and adaptive optics applications**, Mikhail A. Vorontsov, Army Research Lab.; Ernst E. Polnau, Univ. of Maryland/College Park; Valeriy V. Kolosov, Institute of Atmospheric Optics (Russia) . . . . . [7090-08]

12:00 pm: **Wave front sensor based on phase knife**, Andrey V. Larichev, M.V. Lomonosov Moscow State Univ. (Russia) and Institute on Laser and Information Technologies (Russia); Alexey Goncharov, M.V. Lomonosov Moscow State Univ. (Russia). . . . . [7090-09]

Lunch/Exhibition Break . . . . . 12:20 to 1:40 pm

SESSION 3

Room: Conv. Ctr. 32A . . . . . .Tues. 1:40 to 3:20 pm

Beam Propagation and Wavefront Control II

Session Chair: **Mikhail A. Vorontsov,** Army Research Lab.

1:40 pm: **Strong atmospheric turbulence modeling using multiple scattering for optical wireless applications**, Heba Yuksel, Bogazici Univ. (Turkey) . . . . . [7090-10]

2:00 pm: **Robust method to reduce computational requirements for near point source beam propagation in turbulence**, Gary J. Baker, Lockheed Martin Advanced Technology Ctr.. . . . . [7090-11]

2:20 pm: **Femtosecond laser pulse filament robustness in aerosol layer**, Elena P. Silaeva, M.V. Lomonosov Moscow State Univ. (Russia). . . . [7090-12]

2:40 pm: **The propagation properties of focused partially coherent vortex beams in a turbulent atmosphere**, Ji Cang, Yi-Xin Zhang, Jiangnan Univ. (China) . . . . . [7090-13]

3:00 pm: **Mean-squared beam width and beam kurtosis parameter of complex-argument Laguerre-Gauss beams**, Ji Cang, Yi-Xin Zhang, Jiangnan Univ. (China). . . . . [7090-14]

Coffee Break . . . . . 3:20 to 3:50 pm

SESSION 4

Room: Conv. Ctr. 32A . . . . . .Tues. 3:50 to 5:10 pm

Optical Turbulence Characterization and Laser Beam Pointing

Join this joint session with conference 7091: Free-Space Laser Communications VIII

3:50 pm: **Aperture averaging and correlation function measurements in strong atmospheric turbulence for optical wireless applications**, Heba Yuksel, Bogaziçi Univ. (Turkey); Joseph Harris, Robert W. Gammon, Christopher Davis, Univ. of Maryland/College Park . . . . . [7091-24]

4:10 pm: **Beam wander of a collimated beam: comparing theory and experiment**, David T. Wayne, Ronald L. Phillips, Florida Space Institute; Larry Andrews, Univ. of Central Florida; Brad Griffis, Computer Sciences Corp. . . . . [7091-25]

4:30 pm: **Experiment to obtain optical turbulence information along a 2.33 km free-space laser propagation path from measurements of scintillation and focal spot displacement**, Arnold Tunick, Army Research Lab. . [7090-16]

4:50 pm: **Performance and characterization results of a lasercom testbed for the pointing, acquisition and tracking subsystem of satellite-to-satellite laser communications link**, Shinhak Lee, Jason C. Cardema, Jennifer N. Tanzillo, Christopher B. Dunbar, The Aerospace Corp. . . [7091-26]

Wednesday 13 August

SESSION 5

Room: Conv. Ctr. 32A . . . . . .Wed. 8:30 am to 12:00 pm

Transmission and Environment

Session Chair: **Alexander M. J. van Eijk,** TNO Defence, Security and Safety (Netherlands)

8:30 am: **High-power laser propagation in characterized maritime environment**, Diane Limsui, William L. Branderburg, William E. Torruellas, Michael E. Thomas, Edouard Hume, Richard Giannola, The Johns Hopkins Univ. Applied Physics Lab. . . . . [7090-17]

8:50 am: **Validation of a worldwide physics-based, high spectral resolution atmospheric characterization and propagation package for UV to RF wavelengths**, Steven Fiorino, Richard Bartell, Matthew J. Krizo, Kenneth Moore, Salvatore J. Cusumano, Air Force Institute of Technology . . [7090-18]

9:10 am: **Comparison of atmospheric laser propagation between the NIR and MWIR**, Frank E. Hanson, Peter M. Poirier, Delmar D. Haddock, Daniel Kichura, Mark E. Lasher, Space and Naval Warfare Systems Command . . . . . [7090-19]

9:30 am: **An analysis of laser beam degradation in a maritime environment**, Stephen M. Hammel, Daniel Kichura, Dimitris Tsintikidis, Space and Naval Warfare Systems Ctr., San Diego . . . . . [7090-20]

9:50 am: **Transmissometer versus sun photometer measurements of the aerosol optical properties**, Jolanta Kusmierczyk-Michulec, Alexander M. J.Van Eijk, Marcel M. Moerman, Leo H. Cohen, Arie N. de Jong, Peter J. Fritz, TNO Defence, Security and Safety (Netherlands) . . . . . [7090-21]

Coffee Break . . . . . 10:10 to 10:40 am

10:40 am: **Lidar measurements of temperature profile and turbulence in the atmosphere**, Qiuhua Zheng, Michigan Aerospace Corp.; James M. Ryan, Univ. of New Hampshire . . . . . [7090-23]

11:00 am: **Application of environmental effects on sensors in land warfare**, Piet B.Schwering, Alexander M. J.van Eijk, TNO Defence, Security and Safety (Netherlands) . . . . . [7090-24]

11:20 am: **Measurements of the absorption and scattering coefficients of aerosols in suburb of Nanjing**, Yan Yin, Nanjing Univ. of Information Science & Technology (China) and CMA Key Lab. of Atmosphysics & Environment (China); Yu Chen, Weiwei Wang, Jiade Yan, Ling Qian, Yaoqing Tong, Zhenyi Lin, Nanjing Univ. of Information Science & Technology (China) . . . . [7090-25]

11:40 am: **Microphysical properties of tropical anvil cirrus observed during ACTIVE: a statistical analysis,** Lianji Jin, Yan Yin, Nanjing Univ. of Information Science & Technology (China); Geraint Vaughan, Grant Allen, Paul Connolly, The Univ. of Manchester (United Kingdom); Andrew J. Heymsfield, Aaron Bansemer, National Ctr. for Atmospheric Research . . . . . [7090-26]

Courses of Related Interest

See SPIE Cashier for information and to register.

SC188 Laser Beam Propagation for Applications in Laser Communications, Laser Radar, and Active Imaging (Phillips, Andrews) Monday, 8:30 am to 5:30 pm

SC561 Optomechanics for Space Applications (Shipley) Wednesday, 8:30 am to 5:30 pm

Conference 7091

Sunday-Tuesday 10-12 August 2008 • Proceedings of SPIE Vol. 7091

Free-Space Laser Communications VIII

Conference Chairs: **Arun K. Majumdar,** Naval Air Warfare Ctr.; **Christopher C. Davis,** Univ. of Maryland/College Park

Program Committee: **Larry C. Andrews,** Univ. of Central Florida; **Shlomi Arnon,** Ben-Gurion Univ. of the Negev (Israel); **Mikhail S. Belen'kii,** Trex Enterprises Corp.; **Don M. Boroson,** MIT Lincoln Lab.; **Naresh Chand,** BAE Systems North America; **Frank D. Eaton,** Air Force Research Lab.; **Bernhard Epple,** DLR Standort Oberpfaffenhofen (Germany); **G. Charmaine Gilbreath,** Naval Research Lab.; **Hennes Henniger,** DLR Standort Oberpfaffenhofen (Germany); **Anton Kohnle,** Forschungsgesellschaft für Angewandte Naturwissenschaften e.V. (Germany); **Stuart D. Milner,** Univ. of Maryland/College Park; **Michela Muñoz Fernández,** Jet Propulsion Lab.; **Dominic C. O'Brien,** Univ. of Oxford (United Kingdom); **Jacobus M. Oschmann, Jr.,** Ball Aerospace & Technologies Corp.; **Narasimha S. Prasad,** NASA Langley Research Ctr.; **William S. Rabinovich,** Naval Research Lab.; **Marcos Reyes Garcia-Talavera,** Instituto de Astrofísica de Canarias (Spain); **Jennifer C. Ricklin,** Defense Advanced Research Projects Agency; **Thomas M. Shay,** Air Force Research Lab.; **Larry B. Stotts,** Defense Advanced Research Projects Agency

Sunday 10 August

SESSION 1

Room: Conv. Ctr. 32A . . . . . Sun. 1:50 to 3:20 pm

Components and Systems Design and Analysis I

Session Chairs: **Arun K. Majumdar,** Naval Air Warfare Ctr.; **Christopher C. Davis,** Univ. of Maryland/College Park

1:50 pm: **Optical RF communications adjunct** *(Invited Paper)*, Larry B. Stotts, Defense Advanced Research Projects Agency. . . . . [7091-01]

2:20 pm: **Ten Gb/s optically pre-amplified RZ-DPSK for FSO communications systems with very large link losses**, Christoph Wree, Discovery Semiconductors, Inc.; Charles P. Collier, Science Applications International Corp.; Steven Lane, Alan Turney, Air Force Research Lab.; Ben Armentrout, Jesse Yates, Schafer Corp.; Nathaniel Francis, Air Force Research Lab.; Abhay Joshi, Discovery Semiconductors, Inc.. . . . . [7091-02]

2:40 pm: **Low complexity error control codes for variable duty-cycle pulse-position-modulation**, Bruce Moision, Jet Propulsion Lab. . . . [7091-03]

3:00 pm: **Characterization of an optical phased array device for use in free space optical communication antennas**, Igor Anisimov, Ladar and Optical Communications Inst.; Scott R. Harris, Flatiron Research, LLC; Brian K. Stadler, Air Force Research Lab. . . . . [7091-04]

Coffee Break . . . . . 3:20 to 3:50 pm

SESSION 2

Room: Conv. Ctr. 32A . . . . . Sun. 3:50 to 5:10 pm

Components and Systems Design and Analysis II

Session Chairs: **Naresh Chand,** BAE Systems North America; **Michela Muñoz Fernández,** Jet Propulsion Lab.; **Marcos Reyes Garcia-Talavera,** Instituto de Astrofísica de Canarias (Spain)

3:50 pm: **Indoor visible light communications: challenges and prospects**, Dominic C. O'Brien, Hoa Le Minh, Lubin Zeng, Grahame Faulkner, Univ. of Oxford (United Kingdom); Kyungwoo Lee, Daekwang Jung, Yunje Oh, Eun Tae Won, SAMSUNG Electronics Co., Ltd. (South Korea) . . . . . [7091-06]

4:10 pm: **Design of free space optical omnidirectional transceivers for indoor applications using non-imaging optical devices**, Navik Agrawal, Christopher Davis, Univ. of Maryland/College Park . . . . . [7091-07]

4:30 pm: **Ground station pointing model determination using GPS**, Bernhard Epple, Markus Knapek, DLR Standort Oberpfaffenhofen (Germany). . . . . [7091-08]

4:50 pm: **Free-space high data rate communications technologies for near terrestrial space,** Bradley G. Boone, Clint L. Edwards, Jonathan R. Bruzzi, The Johns Hopkins Univ. Applied Physics Lab. . . . . [7091-09]

Room: Conv. Ctr. 6A . . . . . Sun. 6:00 to 6:45 pm

All-Conference Plenary Session

View plenary presentation details p. 13.

6:00 pm: **The Solar Decathlon: building a better future with solar energy**, Richard J. King, U.S. Dept. of Energy

Monday 11 August

SESSION 3

Room: Conv. Ctr. 32A . . . . . Mon. 8:40 to 10:20 am

Coding and Networking

Session Chair: **Stuart D. Milner,** Univ. of Maryland/College Park

8:40 am: **A convex optimization method for self-organization in dynamic heterogeneous (FSO/RF) networks**, Jaime Llorca, Stuart D. Milner, Christopher C. Davis, Univ. of Maryland/College Park . . . . . [7091-10]

9:00 am: **Implementation of dynamic path reconfiguration among hybrid FSO/Rf nodes**, Swapna Gurumani, Hazem Refai, Univ. of Oklahoma[7091-11]

9:20 am: **Multilayer diversity, coding and protocol optimization to mitigate fading in free space optical communication links**, Hennes Henniger, DLR Standort Oberpfaffenhofen (Germany); Bernhard Epple, DLR Standort Oberpfaffenhofen; Stuart D. Milner, Sugianto Trisno, Christopher C. Davis, Univ. of Maryland/College Park. . . . . [7091-12]

9:40 am: **Indoor free space optic: a new prototype, realization and evaluation**, Olivier Bouchet, France Télécom (France); Pascal Besnard, Adrian Mihaescu, Ecole Nationale Supérieure des Sciences Appliquées et de Technologie (France) . . . . . [7091-13]

10:00 am: **Optical terminal requirements for aeronautical networks**, Kimon Karras, Pavlos Kouros, Technological Educational Institute of Piraeus (Greece) . . . . . [7091-14]

Coffee Break . . . . . 10:20 to 10:50 am

SESSION 4

Room: Conv. Ctr. 32A . . . . . Mon. 10:50 am to 12:10 pm

Mitigation, Scintillation, and Adaptive Control I

Session Chair: **Mikhail Belenkii,** Trex Enterprises Corp.

10:50 am: **Direct reduction of aero-optical laser beam aberrations by active turbulence control**, Aaron Freeman, Jennifer Shockro, Adam Wachtor, Ryan Sokolowski, David Gwozdz, Haris J. Catrakis, Univ. of California/Irvine . . . . . [7091-15]

11:10 am: **A comparative study of OOK, DPSK and PPM optical waveforms for free-space laser communication**, Naresh Chand, Andrew J. Hunton, Bruce M. Eteson, BAE Systems North America . . . . . [7091-16]

11:30 am: **Statistical properties of the received current in FSO systems**, Jose Paulo G. de Oliveira, Univ. Karlsruhe (Germany); Maurus Tacke, Forschungsgesellschaft für Angewandte Naturwissenschaften e.V. (Germany) . . . . . [7091-17]

11:50 am: **The propagation properties of focused partially coherent dark hollow beams in a turbulent atmosphere**, Ji Cang, Yixin Zhang, Jiangnan Univ. (China) . . . . . [7091-18]

Lunch Break . . . . . 12:10 to 2:00 pm

SESSION 5

Room: Conv. Ctr. 32A . . . . . Mon. 2:00 to 3:20 pm

Experimental Measurements, Concepts, and Performance

Session Chairs: **Thomas M. Shay,** Air Force Research Lab.; **Don M. Boroson,** MIT Lincoln Lab.

2:00 pm: **Large area adaptive avalanche photodetector arrays for Free Space Optical (FSO) communication**, Mike S. Ferraro, Naval Research Lab.; Wade T. Freeman, Smart Logic, Inc.; Rita Mahon, L-3 Communications Titan Group; James L. Murphy, Peter G. Goetz, William S. Rabinovich, Harris R. Burris, Jr., Christopher I. Moore, Naval Research Lab.; Michael Colbert, Smart Logic, Inc.; William R. Clark, William D. Waters, OptoGration Inc. . . . [7091-20]

2:20 pm: **Investigations in channel capacity for the free space optical fading channel**, Hennes Henniger, German Aerospace Center (DLR) (Germany) . . . . . [7091-22]

2:40 pm: **Experimental comparison of B-PPM and NRZ coding formats in a 1550 nm trans-atmospheric optical communication link under deep fading conditions**, Robert Peach, Geoffrey L. Burdge, Michael Borbath, Harris Corp.; Ron Phillips, Larry Andrews, David Wayne, Univ. of Central Florida . [7091-23]

3:00 pm: **A parametric single scattering channel model for non-line-of-sight ultraviolet communications,** Haipeng Ding, Gang Chen, Univ. of California/Riverside; Arun K. Majumdar, Naval Air Warfare Ctr.; Zhengyuan Xu, Univ. of California/Riverside . . . . . [7091-35]

Room: Conv. Ctr. Exhibit Hall B2 . . . . . Mon. 6:00 to 7:30 pm

Posters-Monday

Poster authors will begin displaying posters after 10:00 am Monday morning. A poster session, with authors present at their posters, will be held Monday evening from 6:00 to 7:30 pm. Light refreshments will be served.

Poster Setup

Poster presenters must set up their posters between 10:00 am and 5:00 pm on Monday. Poster presenters who have not set up by 5:00 pm on Monday will be considered a "no show" and their manuscript will not be published. Presenters must remove their posters immediately after the poster session. Posters not removed will be considered unwanted and will be discarded. SPIE assumes no responsibility for posters left up after the end of each poster session.

Large-optics white light interferometer for laser wavefront test: apparatus and application, Luan Zhu, Shanghai Institute of Optics and Fine Mechanics (China) . . . . . [7091-27]

Test results of the optical PAT test bed for satellite laser communications, Jianfeng Sun, Liren Liu, Yu Zhou, De'an Liu, Shanghai Institute of Optics and Fine Mechanics (China) . . . . . [7091-28]

The mechanical design of the large-optics double-shearing interferometer for the test of diffraction-limited wavefront, Lijuan Wang, Liren Liu, Meilin Tang, Luan Zhu, Jianfeng Sun, Yu Zhou, De'an Liu, Shanghai Institute of Optics and Fine Mechanics (China). . . . . [7091-29]

Design of 2*6 optical hybrid in inter-satellite coherent laser communications, Nan Xu, Liren Liu, De'an Liu, Shanghai Institute of Optics and fine Mechanics (China); Lingyu Wan, Guangxi Univ. (China); Yu Zhou, Shanghai Institute of Optics and Fine Mechanics (China) . . . . . [7091-30]

Coherent area inside partially coherent laser beam through atmospheric and sea water turbulences, Wei Lu, Liren Liu, De'an Liu, Jianfeng Sun, Aimin Yan, Shanghai Institute of Optics and Fine Mechanics (China) . . . . . [7091-31]

Investigation of transmission of light through rain, Jiabi Chen, Zhonghua Hu, Dawei Zhang, Songlin Zhuang, Univ. of Shanghai for Science and Technology (China) . . . . . [7091-32]

Dual optics wireless test link, Otakar Wilfert, Brno Univ. of Technology (Czech Republic) . . . . . [7091-33]

Active connection monitoring for hybrid free-space optical and radio frequency communication links for efficient switching, David Kim, Naval Research Lab; Carlos O. Font-Jimenez, Jonathan Doffoh, G. Charmaine Gilbreath, Michele R. Suite, Naval Research Lab. . . . . [7091-34]

Tuesday 12 August

SESSION 6

Room: Conv. Ctr. 32A . . . . . Tues. 3:50 to 5:10 pm

Optical Turbulence Characterization and Laser Beam Pointing

Join this joint session with conference 7090: Atmospheric Optics: Models, Measurements, and Target-in-the-Loop Propagation II.

3:50 pm: **Aperture averaging and correlation function measurements in strong atmospheric turbulence for optical wireless applications**, Heba Yuksel, Bogaziçi Univ. (Turkey); Joseph Harris, Robert W. Gammon, Christopher Davis, Univ. of Maryland/College Park . . . . . [7091-24]

4:10 pm: **Beam wander of a collimated beam: comparing theory and experiment**, David T. Wayne, Ronald L. Phillips, Florida Space Institute; Larry Andrews, Univ. of Central Florida; Brad Griffis, Computer Sciences Corp. . . . . [7091-25]

4:30 pm: **Experiment to obtain optical turbulence information along a 2.33 km free-space laser propagation path from measurements of scintillation and focal spot displacement**, Arnold Tunick, Army Research Lab. . [7090-16]

4:50 pm: **Performance and characterization results of a lasercom testbed for the pointing, acquisition and tracking subsystem of satellite-to-satellite laser communications link**, Shinhak Lee, Jason C. Cardema, Jennifer N. Tanzillo, Christopher B. Dunbar, The Aerospace Corp. . . [7091-26]

Courses of Related Interest

See SPIE Cashier for information and to register.

SC188 Laser Beam Propagation for Applications in Laser Communications, Laser Radar, and Active Imaging (Phillips, Andrews) Monday, 8:30 am to 5:30 pm

SC561 Optomechanics for Space Applications (Shipley) Wednesday, 8:30 am to 5:30 pm

SC725 Optical & Laser Scanning Technology: Devices, Systems & Applications (Marshall) Wednesday, 8:30 am to 5:30 pm

Conference 7092

Tuesday-Thursday 12-14 August 2008 • Proceedings of SPIE Vol. 7092

Quantum Communications and Quantum Imaging VI

Conference Chairs: **Ronald E. Meyers,** Army Research Lab.; **Yanhua Shih,** Univ. of Maryland/Baltimore County; **Keith S. Deacon,** Army Research Lab.

Program Committee: **Stefania A. Castelletto,** The Univ. of Melbourne (Australia); **Milena D'Angelo,** Univ. degli Studi di Bari (Italy); **Richard J. Hughes,** Los Alamos National Lab.; **Yoon-Ho Kim,** Pohang Univ. of Science and Technology (South Korea); **Todd B. Pittman,** Univ. of Maryland/Baltimore County; **Barry C. Sanders,** Univ. of Calgary (Canada); **Alexander V. Sergienko,** Boston Univ.; **Dmitry V. Strekalov,** Jet Propulsion Lab.; **Shigeki Takeuchi,** Hokkaido Univ. (Japan); **Zhi Zhao,** Oak Ridge National Lab.

Tuesday 12 August

SESSION 1

Room: Conv. Ctr. 33A . . . . . .Tues. 1:00 to 3:20 pm

Quantum Technology I

1:00 pm: **Modeling resonant cavities for single-photon waveguide sources**, Philip G. Evans, Ryan S. Bennink, Warren P. Grice, Oak Ridge National Lab. . . . . [7092-01]

1:20 pm: **Interfacing quantum light with atoms using electromagnetically-induced transparency**, Eden V. Figueroa Barragan, Univ. of Calgary (Canada); Juergen Appel, Niels Bohr Institute (Denmark); Dmitry Korystov, Mirko Lobino, Alexander Lvovsky, Univ. of Calgary (Canada) . . . . . [7092-02]

1:50 pm: **Optical fiber source of correlated photon pairs with high temporal coherence and brightness**, Zhe-Yu J. Ou, Indiana Univ.-Purdue Univ. Indianapolis; Xiaoying Li, Lei Yang, Xiaoxin Ma, Cui Liang, Tianjin Univ. (China) . . . . . [7092-03]

2:20 pm: **Control of spatial quantum fluctuations using photonic crystals**, Roberta Zambrini, Maria Moreno, Damia Gomila, Univ. de les Illes Balears (Spain) . . . . . [7092-04]

2:50 pm: **Detection-time-bin-shift polarization encoding quantum key distribution system**, Lijun Ma, Tiejun Chang, Alan Mink, Barry Hershman, Xiao Tang, National Institute of Standards and Technology . . . . . [7092-05]

Coffee Break . . . . . 3:20 to 3:45 pm

SESSION 2

Room: Conv. Ctr. 33A . . . . . .Tues. 3:45 to 5:15 pm

Quantum Imaging I

3:45 pm: **Recent results in quantum imaging**, Robert W. Boyd, Univ. of Rochester . . . . . [7092-06]

4:15 pm: **Effect of loss and noise on quantum information science and technology**, Horace Yuen, Northwestern Univ. . . . . [7092-07]

4:45 pm: **Experimental implementation of quantum entanglement and hyper-entanglement with a fiber-based two-photon source**, Jun Chen, Matthew D. Eisaman, Elizabeth Goldschmidt, Jingyun Fan, Alan Migdall, National Institute of Standards and Technology and Joint Quantum Institute . . . . . [7092-08]

Wednesday 13 August

SESSION 3

Room: Conv. Ctr. 33A . . . . . Wed. 8:00 to 10:00 am

Quantum Imaging II

8:00 am: **Tailoring PDC speckle structure toward quantum imaging of weak objects**, Marco Genovese, Ivano R. Berchera, Alice Meda, Giorgio Brida, Istituto Nazionale di Ricerca Metrologica (Italy) . . . . . [7092-10]

8:30 am: **Quantum lithography: an overview, from working principle to reality**, Milena D'Angelo, Augusto Garuccio, Univ. degli Studi di Bari (Italy); Yanhua Shih, Univ. of Maryland/Baltimore County . . . . . [7092-11]

9:00 am: **Quantum imaging with uncorrelated single photon sources**, Thierry Bastin, Univ. de Liège (Belgium); Christoph Thiel, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); Enrique Solano, Ludwig-Maximilians-Univ. München (Germany); Joachim von Zanthier, Friedrich-Alexander Univ. Erlangen-Nuermberg (Germany); Girish S. Agarwal, Oklahoma State Univ. . . . . [7092-12]

9:30 am: **Dependence of source's transverse size on the ghost image formation**, Eduardo J. S.Fonseca, Itamar Vidal Silva de Lima, Dilson Caetano, Jandir Hickmann, Univ. Federal de Alagoas (Brazil) . . . . . [7092-13]

Coffee Break . . . . . 10:00 to 10:25 am

SESSION 4

Room: Conv. Ctr. 33A . . . . . Wed. 10:25 to 11:45 am

Quantum Imaging III

10:25 am: **Quantum imaging of an obscured object by measurement of reflected photons**, Ronald E. Meyers, Keith S. Deacon, Army Research Lab.; Yanhua Shih, Univ. of Maryland/Baltimore County . . . . . [7092-15]

10:55 am: **The physics of ghost imaging**, Yanhua Shih, Univ. of Maryland/Baltimore County . . . . . [7092-16]

11:25 am: **Compact source of entangled images and squeezed light using four-wave mixing in rubidium vapor**, Raphael Pooser, Alberto Marino, Vincent Boyer, Paul D. Lett, National Institute of Standards and Technology . . . . . [7092-17]

Lunch/Exhibition Break . . . . . 11:45 to 1:15 pm

SESSION 5

Room: Conv. Ctr. 33A . . . . . Wed. 1:15 to 3:05 pm

Quantum Communications I

1:15 pm: **A quantum stream cipher by Yuen 2000 protocol with nonlinear random number generator**, Osamu Hirota, Tamagawa Univ. (Japan); Kentaro Kato, National Tsing Hua Univ. (Taiwan) . . . . . [7092-18]

1:45 pm: **High-speed quantum key distribution systems for optical fiber networks in campus and metro area**, Xiao Tang, Lijun Ma, Alan Mink, Tiejun Chang, Carl Williams, National Institute of Standards and Technology[7092-19]

2:15 pm: **Gaussian-modulated coherent state quantum key distribution experiment over 20 km telecommunication fiber**, Bing Qi, Lei-Lei Huang, Yue-Meng Chi, Li Qian, Hoi-Kwong Lo, Univ. of Toronto (Canada) . . [7092-20]

2:45 pm: **Five-user QKD over switched fiber networks**, Jan J. Bogdanski, Nima Rafiei, Mohamed Bourennane, Stockholm Univ. (Sweden) . . . . [7092-21]

Coffee Break . . . . . 3:05 to 3:30 pm

SESSION 6

Room: Conv. Ctr. 33A . . . . . Wed. 3:30 to 5:30 pm

Quantum Technology II

3:30 pm: **Hybrid quantum computation in quantum optics**, Kae Nemoto, National Institute of Informatics (Japan); Peter van Loock, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); Samuel Braunstein, The Univ. of York (United Kingdom); Gerard Milburn, The Univ. of Queensland (Australia); Timothy Spiller, William Munro, Hewlett-Packard Labs. (United Kingdom) . . . . . [7092-22]

4:00 pm: **A high bandwidth hybrid quantum repeater**, William J. Munro, Hewlett-Packard Labs. (United Kingdom); Kae Nemoto, Rodney Van Meter, Sebastien Louis, Thaddeus Ladd, National Institute of Informatics (Japan). . . . . [7092-23]

4:30 pm: **Diamond for solid-state quantum optics: from single photons sources to quantum simulators**, Andrew D. Greentree, The Univ. of Melbourne (Australia). . . . . [7092-24]

5:00 pm: **Adaptive state discrimination,** Geoff J. Pryde, Brendon L. Higgins, B. Booth, Griffith Univ. (Australia); Andrew C. Doherty, The Univ. of Queensland (Australia); Stephen D. Bartlett, The Univ. of Sydney (Australia); Howard M. Wiseman, Griffith Univ. (Australia) . . . . . [7092-41]

Room: Conv. Ctr. Exhibit Hall B2 . . . . . Wed. 5:30 to 7:00 pm

Posters-Wednesday

Poster authors will begin displaying posters after 10:00 am Wednesday morning. A poster session, with authors present at their posters, will be held Wednesday evening from 5:30 to 7:00 pm. Light refreshments will be served.

Poster Setup

Poster presenters must set up their posters between 10:00 am and 5:00 pm on Wednesday. Poster presenters who have not set up by 5:00 pm on Wednesday will be considered a "no show" and their manuscript will not be published. Presenters must remove their posters immediately after the poster session. Posters not removed will be considered unwanted and will be discarded. SPIE assumes no responsibility for posters left up after the end of each poster session.

Security of two-way quantum cryptography against asymmetric attacks, Stefano Pirandola, Massachusetts Institute of Technology; Stefano Mancini, Univ. degli Studi di Camerino (Italy); Seth Lloyd, Massachusetts Institute of Technology; Samuel Braunstein, The Univ. of York (United Kingdom)[7092-43]

Experiments supporting the concept of a g^2 camera, Dmitri L. Boiko, École Polytechnique Fédérale de Lausanne (Switzerland); Neil J. Gunther, Performance Dynamics Consulting; Maximilian Sergio, Cristiano Niclass, École Polytechnique Fédérale de Lausanne (Switzerland); Giordano B. Beretta, Hewlett-Packard Labs.; Edoardo Charbon, École Polytechnique Fédérale de Lausanne (Switzerland) . . . . . [7092-44]

Avalanche photodiode single- and several-photon detection study, Josef Blazej, Ivan Prohazka, Czech Technical Univ. (Czech Republic) . . . . [7092-45]

Comparison of SNR between classical and quantum imager, Charles Kim, Gary Kanner, Northrop Grumman Corp. . . . . [7092-09]

Thursday 14 August

SESSION 7

Room: Conv. Ctr. 33A . . . . . Thurs. 8:00 to 10:45 am

Entanglement I

8:00 am: **Hyperentanglement for advanced quantum communication**, Julio T. Barreiro, Paul G. Kwiat, Univ. of Illinois at Urbana-Champaign . . . [7092-26]

8:30 am: **Spectral and spatial effects in spontaneous parametric down-conversion with a focused pump**, Warren P. Grice, Ryan S. Bennink, Zhi Zhao, Kent A. Meyer, William B. Whitten, Robert W. Shaw, Oak Ridge National Lab. . . . . [7092-27]

9:00 am: **Toward real NOON-state sources**, Augusto Garuccio, Milena D'Angelo, Univ. degli Studi di Bari (Italy); Vincenzo Tamma, Univ. of Maryland/ Baltimore County. . . . . [7092-28]

9:30 am: **Dynamics of entanglement**, Joseph H. Eberly, Univ. of Rochester . . . . . [7092-30]

10:00 am: **Macroscopic quantum entanglement**, Francesco De Martini, Univ. degli Studi di Roma/La Sapienza (Italy); Francesco S. Cataliotti, Univ. degli Studi di Firenze (Italy) . . . . . [7092-29]

Coffee Break . . . . . 10:45 to 11:00 am

SESSION 8

Room: Conv. Ctr. 33A . . . . . Thurs. 11:00 am to 12:20 pm

Quantum Technologies III

11:00 am: **Minimal disturbance measurement without postselection**, So-Young Baek, Pohang Univ. of Science and Technology (South Korea); Yong Wook Cheong, Seoul National Univ. (South Korea); Yoon-Ho Kim, Pohang Univ. of Science and Technology (South Korea). . . . . [7092-31]

11:30 am: **Total teleportation of a single-photon state**, Travis S. Humble, Ryan S. Bennink, Warren P. Grice, Oak Ridge National Lab. . . . . [7092-32]

11:50 am: **Entanglement preservation in a slow light medium**, John C. Howell, Curtis Broadbent, Univ. of Rochester . . . . . [7092-33]

Lunch Break . . . . . 12:20 to 1:40 pm

SESSION 9

Room: Conv. Ctr. 33A . . . . . Thurs. 1:40 to 3:40 pm

Quantum Information Science I

1:40 pm: **A practical scheme for quantum oblivious transfer and private database retrieval**, David A. Fattal, Marco Fiorentino, Raymond G. Beausoleil, Hewlett-Packard Labs. . . . . [7092-35]

2:10 pm: **Duality quantum computing in quantum computers**, Gui L. Long, Yang Liu, Tsinghua Univ. (China) . . . . . [7092-36]

2:40 pm: **Optical approach to quantum computing using quantum switching logic**, Bryan C. Jacobs, The Johns Hopkins Univ. Applied Physics Lab. . . . . [7092-37]

3:10 pm: **Quantum photonics on a chip,** J. Matthews , A. Politi, G. Marshall, M. Withford, A. Laing, M. Cryan, J. Rarity, S. Yu, and J. O'Brien , Univ. of Bristol (United Kingdom) . . . . . [7092-46]

Coffee Break . . . . . 3:40 to 4:00 pm

SESSION 10

Room: Conv. Ctr. 33A . . . . . Thurs. 4:00 to 6:00 pm

Quantum Technology IV

4:00 pm: **Controlling photonic qubits using geometrical phase**, Shigeki Takeuchi, Hokkaido Univ. (Japan). . . . . [7092-39]

4:30 pm: **Direct diffractive measurement of the orbital angular momentum of single photons**, Eduardo J. S.Fonseca, Willamys C. Soares, Dilson P. Caetano, Univ. Federal de Alagoas (Brazil); Sabino Chávez-Cerda, Instituto Nacional de Astrofísica, Óptica y Electrónica (Mexico); Jandir Hickmann, Univ. Federal de Alagoas (Brazil) . . . . . [7092-40]

5:00 pm: **Percolation meets linear optical quantum computing**, Konrad Kieling, Terry Rudolph, Jens Eisert, Imperial College London (United Kingdom) . . . . . [7092-42]

5:30 pm: **Correlations in two-mode cavity QED**, Luis A. Orozco, Univ. of Maryland/College Park . . . . . [7092-25]

Conference 7093

Thursday 14 August 2008 • Proceedings of SPIE Vol. 7093

Advanced Wavefront Control: Methods, Devices, and Applications VI

Conference Chairs: **John D. Gonglewski,** Air Force Research Lab.; **Richard A. Carreras,** Air Force Research Lab.; **Troy A. Rhoadarmer,** Science Applications International Corp.

Program Committee: **Geoff P. Andersen,** U.S. Air Force Academy; **Jeffrey D. Barchers,** Nutronics, Inc.; **Charles C. Beckner, Jr.,** Air Force Research Lab.; **Thomas G. Bifano,** Boston Univ.; **Philip J. Bos,** Kent State Univ.; **James M. Brase,** Lawrence Livermore National Lab.; **Keith A. Bush,** AgilOptics, Inc.; **David C. Dayton,** Applied Technology Associates; **Lewis F. DeSandre,** Office of Naval Research; **Sergey Alexandrovich Dimakov,** S.I. Vavilov State Optical Institute (Russia); **Matthew E. Goda,** Air Force Institute of Technology; **Mark T. Gruneisen,** Air Force Research Lab.; **Alexis V. Kudryashov,** Moscow State Open Univ. (Russia); **Tanya Cherazova,** M.V. Lomonosov Moscow State Univ. (Russia); **Gordon D. Love,** Durham Univ. (United Kingdom); **Justin D. Mansell,** MZA Associates Corp.; **Dan K. Marker,** Air Force Research Lab.; **Kent L. Miller,** Air Force Office of Scientific Research; **Dennis A. Montera,** Air Force Research Lab.; **Scot S. Olivier,** Lawrence Livermore National Lab.; **Jim F. Riker,** Air Force Research Lab.; **James R. Rotgé,** Boeing LTS, Inc.; **Darryl J. Sanchez,** The Univ. of New Mexico; **Jason D. Schmidt,** Air Force Institute of Technology; **Don D. Seeley,** High Energy Laser Joint Technology Office; **Vladimir Yu. Venediktov,** Research Institute for Laser Physics (Russia)

Thursday 14 August

SESSION 1

Room: Conv. Ctr. 17B . . . . . Thurs. 8:30 am to 12:00 pm

Adaptive Optics and Systems

8:30 am: **Wide-angle nonmechanical beam-steering using thin liquid crystal polarization gratings**, Jihwan Kim, Chulwoo Oh, Michael J. Escuti, North Carolina State Univ.; Lance Hosting, Steven Serati, Boulder Nonlinear Systems, Inc.. . . . . [7093-01]

8:50 am: **New generation of bimorph mirrors for laser beam control**, Alexis V. Kudryashov, Vadim V. Samarkin, Moscow State Open Univ. (Russia) . . . . . [7093-02]

9:10 am: **Investigation of closed loop adaptive optic performance**, Darryl J. Sanchez, Katherine Lilevjen, Air Force Research Lab.; Troy A. Rhodarmer, Science Applications International Corp.; Mala Mateen, Air Force Research Lab.; Denis W. Oesch, Deborah Fung, Science Applications International Corp.; Patrick R. Kelly, Air Force Research Lab. . . . . [7093-03]

9:30 am: **Atmospheric turbulence generation and adaptive optical correction testbed**, Christopher C. Wilcox, Jonathan R. Andrews, Sergio R. Restaino, Ty Martinez, Freddie Santiago, Naval Research Lab.; Scott W. Teare, New Mexico Institute of Mining and Technology; Don M. Payne, Narrascape, Inc.. . . . . [7093-04]

9:50 am: **A sodium-layer laser guide star wavefront sensing test bench**, Rodolphe Conan, Olivier Lardière, Colin Bradley, Univ. of Victoria (Canada); Glen Herriot, Herzberg Institute of Astrophysics (Canada); Kate Jackson, Univ. of Victoria (Canada) . . . . . [7093-05]

Coffee Break . . . . . 10:10 to 10:40 am

10:40 am: **Operation of phase-diversity adaptive-optics testbed with extended scenes**, Matthew Warmuth, Stuart Parker, Dean Liskow, Aaron Wilson, Kurt Gleichman, General Dynamics Advanced Information Systems. . . . . [7093-06]

11:00 am: **Pupil-plane-based broad-band correction using the electric field conjugation algorithm for high contrast imaging**, Amir Give'on, Brian Kern, Stuart Shaklan, Jet Propulsion Lab. . . . . [7093-07]

11:20 am: **Beam control by means of phase elements iterative control algorithms**, Inna V. Ilyina, Tatyana Y. Cherezova, M.V. Lomonosov Moscow State Univ. (Russia) . . . . . [7093-08]

11:40 am: **Investigation of closed loop adaptive optics performance with the deformable mirror not conjugate to the pupil**, Mala Mateen, Darryl Sanchez, Air Force Research Lab.; Troy Rhoadarmer, Science Applications International Corp.; Loretta Arguella, Boeing LTS Inc.; Denis W. Oesch, Deborah Fung, Science Applications International Corp.; Roger Petty, Boeing LTS Inc.; Patrick Kelly, Robert A. Vincent, Jeff Richey, Air Force Research Lab. . . . . [7093-09]

Lunch. . . . . 12:00 to 1:30 pm

SESSION 2

Room: Conv. Ctr. 17B . . . . . Thurs. 1:30 to 5:00 pm

Novel Systems, Analysis, and Applications

1:30 pm: **Direct detection and spectral characterization of exoplanets in the presence of extreme-contrast coronagraphic instrument noise**, Stuart B. Shaklan, John E. Krist, Amir Give'on, Jet Propulsion Lab.. . . . . [7093-10]

1:50 pm: **Study of local minima in metric adaptive optics**, Justin D. Mansell, Brian G. Henderson, MZA Associates Corp.. . . . . [7093-11]

2:10 pm: **Adaptive wavelets applied to phase-shifting interferometry for wavefront sensing**, Katherine J. Jones, WBAO . . . . . [7093-12]

2:30 pm: **Nonconventional wavefront sensing: point sourced SLODAR-theory and practical examples**, Sergey O. Galetskiy, Tatiana Y. Cherezova, M.V. Lomonosov Moscow State Univ. (Russia); Alexis V. Kudryashov, Moscow State Open Univ. (Russia) . . . . . [7093-13]

2:50 pm: **Analysis of non-uniform gain to a deformable mirror in an adaptive optics system**, Kevin P. Vitayaudom, Air Force Institute of Technology; Robert A. Vincent, Air Force Research Lab.; Jason D. Schmidt, Air Force Institute of Technoloy; Darryl J. Sanchez, Air Force Research Lab. . . . . [7093-14]

3:10 pm: **Dependence of adaptive cross-correlation algorithm performance on the extended scene image quality**, Erkin Sidick, Jet Propulsion Lab. . . . . [7093-15]

Coffee Break . . . . . 3:30 to 4:00 pm

4:00 pm: **Applications of wavefront phase estimation in band-limited coronagraphs**, Brian D. Kern, Jet Propulsion Lab. . . . . [7093-16]

4:20 pm: **Laser beam shaping with membrane deformable mirrors**, Brian G. Henderson, Justin D. Mansell, Active Optical Systems, LLC. . . . . [7093-17]

4:40 pm: **Limitations of segmented wavefront control devices in emulating optical turbulence**, Michael D. Plourde, Jason D. Schmidt, Air Force Institute of Technology . . . . . [7093-18]

Courses of Related Interest

See SPIE Cashier for information and to register.

SC188 Laser Beam Propagation for Applications in Laser Communications, Laser Radar, and Active Imaging (Phillips, Andrews) Monday, 8:30 am to 5:30 pm

Conference 7094

Monday 11 August 2008 • Proceedings of SPIE Vol. 7094

Unconventional Imaging IV

Conference Chairs: **Jean J. Dolne,** The Boeing Co.; **Thomas J. Karr,** Northrop Grumman Corp.; **Victor L. Gamiz,** Air Force Research Lab.

Program Committee: **Paul W. Fairchild,** Trex Enterprises Corp.; **James R. Fienup,** Univ. of Rochester; **Richard M. Heinrichs,** MIT Lincoln Lab.; **Charles L. Matson,** Air Force Research Lab.; **Paul F. McManamon,** Air Force Research Lab.; **Timothy J. Schulz,** Michigan Technological Univ.; **Robert K. Tyson,** The Univ. of North Carolina at Charlotte; **Laura J. Ulibarri,** Air Force Research Lab.; **David G. Voelz,** New Mexico State Univ.

Monday 11 August

SESSION 1

Room: Conv. Ctr. 33A . . . . . Mon. 8:30 to 10:20 am

Image Enhancement and Super-Resolution

Session Chair: **Victor L. Gamiz,** Air Force Research Lab.

8:30 am: **OTF compensation in structured illumination superresolution images** *(Invited Paper)*, Sapna A. Shroff, James R. Fienup, David R. Williams, Univ. of Rochester . . . . . [7094-01]

9:00 am: **Simulation of a passive-grating heterodyning super-resolution concept**, David W. Tyler, Eamon B. Barrett, Lockheed Martin Corp. [7094-02]

9:20 am: **Imaging through multiple planes of phase errors using a sharpness metric**, Abbie Tippie, James R. Fienup, Univ. of Rochester . . . . . [7094-03]

9:40 am: **Pixon(r) sub-diffraction space imaging**, Richard C. Puetter, PixonImaging LLC . . . . . [7094-04]

10:00 am: **Image fusion and sampling artifacts**, Gerald C. Holst, JCD Publishing . . . . . [7094-05]

Coffee Break . . . . . 10:20 to 10:50 am

SESSION 2

Room: Conv. Ctr. 33A . . . . . Mon. 10:50 am to 12:30 pm

Sensor Characterization

Session Chair: **Jean J. Dolne,** The Boeing Co.

10:50 am: **PSF uncertainty and image estimation errors**, Sudhakar Prasad, The Univ. of New Mexico . . . . . [7094-06]

11:10 am: **Analysis and verification of resolution limits of a hyperspectral imager using computed tomography**, Samuel V. Mantravadi, Steven C. Cain, Air Force Institute of Technology . . . . . [7094-07]

11:30 am: **Remote Ultra-Low Light Imaging (RULLI) for space situational awareness**, Michael C. Roggemann, Michigan Technological Univ.; Kris Hamada, Pacific Defense Solutions LLC; Rao Gudimetla, Kim Luu, Air Force Research Lab. . . . . [7094-08]

11:50 am: **Limitations on sensors exploiting night glow**, Richard G. Madonna, Northrop Grumman Corp. . . . . [7094-09]

12:10 pm: **Real-time hardware realization of a Deblurring Anisoplanaticism Corrector (DAC) for improvement of long-range video imagery**, Richard G. Hier, DigiVision, Inc.; Richard C. Puetter, PixonImaging LLC . . . . . [7094-10]

Lunch Break . . . . . 12:30 to 2:00 pm

SESSION 3

Room: Conv. Ctr. 33A . . . . . Mon. 2:00 to 3:20 pm

Image Synthesis and Active Imaging

Session Chair: **Thomas J. Karr,** Northrop Grumman Corp.

2:00 pm: **Image restoration**, Jean J. Dolne, The Boeing Co. . . . . [7094-11]

2:20 pm: **Shadow imaging of geosynchronous satellites: theoretical performance**, Leaf A. Jiang, Jane Luu, MIT Lincoln Lab. . . . . [7094-12]

2:40 pm: **Active multi/hyperspectral imaging and sensing with ultra-short pulse continuums**, Keith A. Blanks, The Aerospace Corp. . . . . [7094-13]

3:00 pm: **Optical antenna of telescope for synthetic aperture ladar**, Liren Liu, Shanghai Institute of Optics and Fine Mechanics (China) . . . . . [7094-14]

Coffee Break . . . . . 3:20 to 3:50 pm

SESSION 4

Room: Conv. Ctr. 33A . . . . . Mon. 3:50 to 4:50 pm

Active Imaging

Session Chair: **James R. Fienup,** Univ. of Rochester

3:50 pm: **Laboratory demonstration of a multiple beam Fourier telescopy LEO imaging system**, Edward L. Cuellar, Trex Enterprises Corp.; Justin Cooper, Interface & Control Systems, Inc.; James Mathis, Paul Fairchild, Trex Enterprises Corp. . . . . [7094-16]

4:10 pm: **Range resolution of synthetic aperture ladar in laboratory-scale testbed**, De'an Liu, Nan Xu, Yu Zhou, Jianfeng Sun, Liren Liu, Shanghai Institute of Optics and Fine Mechanics (China). . . . . [7094-17]

4:30 pm: **Operation of 3D ladar with diffractive-optic diffusers**, George R. Gray, Northrop Grumman Corp. . . . . [7094-18]

Courses of Related Interest

See SPIE Cashier for information and to register.

SC188 Laser Beam Propagation for Applications in Laser Communications, Laser Radar, and Active Imaging (Phillips, Andrews) Monday, 8:30 am to 5:30 pm

Conference 7095

Monday-Tuesday 11-12 August 2008 • Proceedings of SPIE Vol. 7095

Nanophotonics and Macrophotonics for Space Environments II

Conference Chairs: **Edward W. Taylor,** International Photonics Consultants, Inc.; **David A. Cardimona,** Air Force Research Lab.

Program Committee: **Mansoor Alam,** Nufern; **Natalie Clark,** NASA Langley Research Ctr.; **Koen J. Clays,** Katholieke Univ. Leuven (Belgium); **Douglas M. Craig,** Air Force Research Lab.; **Raluca Dinu,** Lumera Corp.; **Alexandre I. Fedoseyev,** CFD Research Corp.; **Allan Hahn,** Air Force Research Lab.; **Michael J. Hayduk,** Air Force Research Lab.; **Dan-Hong Huang,** Air Force Research Lab.; **Mark G. Kuzyk,** Washington State Univ.; **Narasimha S. Prasad,** NASA Langley Research Ctr.; **Kelly Simmons-Potter,** The Univ. of Arizona; **Robert C. Stirbl,** Jet Propulsion Lab.

Monday 11 August

Room: Conv. Ctr. 33B . . . . . Mon. 8:30 to 8:35 am

Opening Remarks

Session Chair: **Edward W. Taylor,** International Photonics Consultants, Inc.

SESSION 1

Room: Conv. Ctr. 33B . . . . . Mon. 8:35 to 9:55 am

Hybrid and Nanoparticle Materials for Radiation Environments

Session Chair: **Mark G. Kuzyk,** Washington State Univ.

8:35 am: **Electronic devices based upon Germanium nano-crystals with inviolability to strong neutron irradiation** *(Invited Paper)*, Zeev Zalevsky, Itamar Baron, Shai Levy, Avraham Chelly, Ofer Limon, Issai Shlimak, Bar-Ilan Univ. (Israel). . . . . [7095-01]

9:05 am: **The effects of ionizing radiation, temperature and space contamination effects on self-cleaning and anti-contamination coatings** *(Invited Paper)*, Ronald G. Pirich, Northrop Grumman Corp. . . . . [7095-02]

9:35 am: **Experimental investigation and numerical modeling of radiation effects in quantum dot-based solar cells**, Alexandre I. Fedoseyev, Marek Turowski, Ashok Raman, CFD Research Corp.; Seth Hubbard, Rochester Institute of Technology; Edward W. Taylor, International Photonics Consultants, Inc. . . . . [7095-03]

Coffee Break . . . . . 9:55 to 10:25 am

SESSION 2

Room: Conv. Ctr. 33B . . . . . Mon. 10:25 am to 11:45 pm

Innovative Photonic Materials and Components

Session Chair: **Natalie Clark,** NASA Langley Research Ctr.

10:25 am: **An antireflective coating suitable for use on polymer optics** *(Invited Paper)*, Lynley J. Crawford, Neil R. Edmonds, Peter Plimmer, The Univ. of Auckland (New Zealand); Jonathan Lowy, Antireflective Technologies Ltd. (New Zealand) . . . . . [7095-04]

10:55 am: **The physics of self-healing after photodegradation in a dye-doped polymer**, Mark G. Kuzyk, Natnael B. Embaye, Shiva K. Ramini, Ye Zhu, Juefei Zhou, Washington State Univ. . . . . [7095-06]

11:15 am: **Spectrally selective infrared absorption enhancement in photonic crystal cavities** *(Invited Paper)*, Weidong Zhou, Hongjun Yang, Zexuan Qiang, Li Chen, The Univ. of Texas at Arlington; Gail J. Brown, Air Force Research Lab. . . . . [7095-07]

Lunch. . . . . 11:45 to 1:15 pm

SESSION 3

Room: Conv. Ctr. 33B . . . . . Mon. 1:15 to 2:55 pm

Radiation Hardening of Photonic Components I

Session Chair: **Kelly Simmons Potter,** The Univ. of Arizona

1:15 pm: **Organic Materials Research at Air Force Office of Scientific Research (Keynote Presentation)**, Charles Lee, Air Force Office of Scientific Research. . . . . [7095-08]

1:55 pm: **Hybrid electro-optic polymer/sol-gel modulators for space environments**, Robert A. Norwood, College of Optical Sciences/The Univ. of Arizona. . . . . [7095-09]

2:15 pm: **Qualification of LEDs for cameras on NASA's Phoenix Mars lander**, Robert O. Reynolds, Roger D. Tanner, The Univ. of Arizona . [7095-24]

2:35 pm: **Temperature and dose-rate effects in gamma-irradiated rare-earth doped fibers**, Brian P. Fox, Kelly Simmons-Potter, The Univ. of Arizona; William J. Thomes, Jr., NASA Goddard Space Flight Ctr.; Dorothy C. Meister, Dahv A. V.Kliner, Ray P. Bambha, Sandia National Labs. . . . . [7095-11]

Coffee Break . . . . . 2:55 to 3:30 pm

SESSION 4

Room: Conv. Ctr. 33B . . . . . Mon. 3:30 to 5:20 pm

Radiation Hardening of Photonic Components II

Session Chair: **Douglas M. Craig,** Air Force Research Lab.

3:30 pm: **Active pixel sensor performance in an intelligent star tracker (IntelliStar)**, Natalie Clark, NASA Langley Research Ctr.; Edward W. Taylor, International Photonic Consultants, Inc. . . . . [7095-12]

3:50 pm: **MISSE6: testing materials in space**, Narasimha S. Prasad, William H. Kinnard, NASA Langley Research Ctr. . . . . [7095-13]

4:10 pm: **The impact of radiation hardened by design (RHBD) techniques on the performance of readout integrated circuits in radiation environments**, John E. Hubbs, Ball Aerospace & Technologies Corp.[7095-14]

4:30 pm: **Low-noise InGaAs-balanced p-i-n photoreceiver for space-based remote sensing applications at 2-micron wavelength**, Abhay M. Joshi, Donald A. Becker, Shubhashish Datta, Discovery Semiconductors, Inc. . . . . [7095-15]

4:50 pm: **Recent progress in development and nonlinear optical device application of optical fibers incorporated with noble metal nanoparticles** *(Invited Paper),* Aoxiang Lin, Won-Taek Han, Gwangju Institute of Science and Technology (South Korea) . . . . . [7095-16]

Room: Conv. Ctr. Exhibit Hall B2 . . . . . Mon. 6:00 to 7:30 pm

Posters-Monday

Poster authors will begin displaying posters after 10:00 am Monday morning. A poster session, with authors present at their posters, will be held Monday evening from 6:00 to 7:30 pm. Light refreshments will be served.

Poster Setup

Poster presenters must set up their posters between 10:00 am and 5:00 pm on Monday. Poster presenters who have not set up by 5:00 pm on Monday will be considered a "no show" and their manuscript will not be published. Presenters must remove their posters immediately after the poster session. Posters not removed will be considered unwanted and will be discarded. SPIE assumes no responsibility for posters left up after the end of each poster session.

Development, qualification, and integration of the optical fiber array assemblies for the Lunar Reconnaissance Orbiter, Melanie N. Ott, NASA Goddard Space Flight Ctr. . . . . [7095-28]

Tuesday 12 August

Room: Conv. Ctr. 33B . . . . . .Tues. 8:30 to 8:35 am

Chair Introduction

Session Chair: **David A. Cardimona,** Air Force Research Lab.

Room: Conv. Ctr. 33B . . . . . .Tues. 8:35 to 9:15 am

Keynote Address

8:35 am: **Technical Challenges for Improved Space Situational Awareness** *(Keynote Presentation),* Thomas R. Caudill, Air Force Research Lab. . . . . [7095-17]

SESSION 6

Room: Conv. Ctr. 33B . . . . . .Tues. 9:15 to 9:55 am

Novel Photonic Devices for Space-Based Applications I

Session Chair: **Allan Hahn,** Air Force Research Lab.

9:15 am: **Surface-acoustic-wave based quantum-well photodetectors**, Dan H. Huang, Air Force Research Lab.; Godfrey A. Gumbs, Hunter College/CUNY; Michael Pepper, Univ. of Cambridge . . . . . [7095-18]

9:35 am: **Fabrication, characterization of II-VI semiconductor nanowires and applications in infrared focal plane arrays**, David T. Crouse, City College/CUNY; Thomas James, Phoebus Optoelectronics, LLC . . . . [7095-19]

Coffee Break . . . . . 9:55 to 10:30 am

SESSION 7

Room: Conv. Ctr. 33B . . . . . Tues. 10:30 am to 12:30 pm

Novel Photonic Devices for Space-Based Applications II

Session Chair: **Dan H. Huang,** Air Force Research Lab.

10:30 am: **High performance of IR detectors due to controllable kinetics in quantum-dot structures**, Vladimir V. Mitin, Andrei Sergeev, Li-Hsin Chien, Nizami Z. Vagidov, Univ. at Buffalo. . . . . [7095-20]

10:50 am: **Voltage tunable hyperspectral quantum dot infrared photodetector (QDIP)**, Xuejun Lu, Jarrod Vaillancourt, Univ. of Massachusetts/Lowell. . . . . [7095-21]

11:10 am: **Plasmonic light focusing and polarized detection for infrared applications** *(Invited Paper)*, Shawn-Yu Lin, Rensselaer Polytechnic Institute . . . . . [7095-22]

11:40 am: **Plasmonic bloch modes: computational methods and sensitivity to external factors** *(Invited Paper)*, Igor Tsukerman, Frantisek Cajko, The Univ. of Akron. . . . . [7095-23]

12:10 pm: **Integrated multi-channel nano-engineered optical hydrogen sensor detection systems for launch vehicles,** M. Alam, J. Moreno, J. Aitchison, M. Mojahedi, Univ. of Toronto; A. Kazemi, The Boeing Company. . . . . [7095-25]

Courses of Related Interest

See SPIE Cashier for information and to register.

SC496 Fabrication and Processing of Nanostructures (Cao) Monday, 8:30 am to 5:30 pm
SC497 Nanophotonics (Prasad) Sunday, 1:30 to 5:30 pm
WS851 Nanotechnology: Science & Applications (Brahmbhatt) Wednesday, 8:30 am to 5:30 pm

Conference 7096

Sunday 10 August 2008 • Proceedings of SPIE Vol. 7096

Adaptive Coded Aperture Imaging and Non-Imaging Sensors II

Conference Chairs: **David P. Casasent,** Carnegie Mellon Univ.; **Stanley Rogers,** Air Force Research Lab.

Conference Co-Chairs: **Timothy Clark,** Defense Advanced Research Projects Agency; **Keith L. Lewis,** Electro Magnetic Remote Sensing Defence Technology Ctr. (United Kingdom)

Program Committee: **David J. Brady,** Duke Univ.; **Michael T. Eismann,** Air Force Research Lab.; **Stephen R. Gottesman,** Northrop Grumman Corp.; **Abhijit Mahalanobis,** Lockheed Martin Missiles and Fire Control; **Demetri Psaltis,** California Institute of Technology; **Mark Allen Neifeld,** The Univ. of Arizona; **Christopher W. Slinger,** QinetiQ Ltd. (United Kingdom); **Nikola S. Subotic,** Michigan Tech Research Institute; **Rebecca A. Wilson,** QinetiQ Ltd. (United Kingdom)

Sunday 10 August

SESSION 1

Room: Conv. Ctr. 33B . . . . . .Sun. 8:30 to 10:00 am

Imaging and Non-Imaging Sensor Needs

Session Chairs: **Stanley Rogers,** Air Force Research Lab.; **David P. Casasent,** Carnegie Mellon Univ.

8:30 am: **Theater use and integration of motion imagery and nontraditional ISR** *(Keynote presentation),* Patrick Heaney, U.S. Army . . . . . [7096-01]

9:00 am: **Multifunctional imaging systems** *(Invited Paper)*, Keith L. Lewis, Electro Magnetic Remote Sensing Defence Technology Ctr. (United Kingdom) . . . . . [7096-02]

9:30 am: **Large aperture coded optical search track and engage** *(Invited Paper)*, Timothy Clark, Defense Advanced Research Projects Agency[7096-03]

Coffee Break . . . . . 10:00 to 10:30 am

SESSION 2

Room: Conv. Ctr. 33B . . . . . Sun. 10:30 am to 12:20 pm

Imaging and Non-Imaging Diffraction System Concepts

Session Chairs: **Stephen R. Gottesman,** Northrop Grumman Corp.; **Timothy Clark,** Defense Advanced Research Projects Agency

10:30 am: **Pupil plane multiplexing for multidomain imaging sensors** *(Invited Paper)*, Roarke Horstmeyer, Gary W. Euliss, Ravindra A. Athale, The MITRE Corp.; Rick L. Morrison, Ronald A. Stack, Distant Focus Corp.; Joseph Ford, Univ. of California/San Diego. . . . . [7096-04]

11:00 am: **Large-scale multiwavelength optical lensless imaging with geometric fiber constructs**, Ayman F. Abouraddy, Fabien Sorin, Ofer Shapiro, Matthew E. Spencer, Yoel Fink, Massachusetts Institute of Technology . . . . . [7096-05]

11:20 am: **Optically multiplexed imaging with superposition space tracking**, Shikar Shikhar, Nathan A. Goodman, Mark A. Neifeld, The Univ. of Arizona; Changsoon Kim, Jungsang Kim, David J. Brady, Duke Univ.[7096-06]

11:40 am: **Direct reconstruction of difference images from optimal spatial-domain projections**, Shikhar Shikhar, Dept. of ECE, University of Arizona; Nathan A. Goodman, Mark A. Neifeld, The Univ. of Arizona. . . . . [7096-07]

12:00 pm: **Adaptive coded aperture imaging in the infrared: towards a practical implementation**, Christopher W. Slinger, Gavin R. Dyer, Neil T. Gordon, Mark E. McNie, Douglas A. Payne, Kevin D. Ridley, Michael A. Todd, Geoff De Villiers, Philip J. Watson, Rebecca A. Wilson, QinetiQ Ltd. (United Kingdom); Timothy Clark, Esko Jaska, Defense Advanced Research Projects Agency; Michael T. Eismann, Stanley Rogers, Air Force Research Lab. . . . . [7096-21]

Lunch Break . . . . . 12:20 to 1:40 pm

SESSION 3

Room: Conv. Ctr. 33B . . . . . Sun. 1:40 to 2:40 pm

Imaging and Non-Imaging Algorithms

Session Chairs: **Nikola S. Subotic,** Michigan Tech Research Institute; **Michael T. Eismann,** Air Force Research Lab.

1:40 pm: **Space-time coded apertures for high-resolution imaging**, Dennis C. Braunreiter, Science Applications International Corp. . . . . [7096-08]

2:00 pm: **Digital reconstruction algorithms for aperture coded imaging systems**, Mark Bernhardt, Waterfall Solutions Ltd. (United Kingdom)[7096-10]

2:20 pm: **Design and analysis of a coded aperture imaging system with engineered PSFs for wide field of view imaging,** Abhijit Mahalanobis, Lockheed Martin Missiles and Fire Control. . . . . [7096-11]

SESSION 4

Room: Conv. Ctr. 33B . . . . . Sun. 2:40 to 4:30 pm

Diffraction Imaging Hardware I

Session Chairs: **Lavern A. Starman,** Air Force Institute of Technology; **Keith L. Lewis,** Electro Magnetic Remote Sensing Defence Technology Ctr. (United Kingdom)

2:40 pm: **A large-area reconfigurable MOEMS microshutter array for a coded aperture imaging systems**, Mark E. McNie, David O. King, Nicola Price, David Combes, Gilbert W. Smith, Alan G. Brown, Kevin M. Brunson, Keith L. Lewis, Christopher W. Slinger, QinetiQ Ltd. (United Kingdom); Stanley Rogers, Air Force Research Lab. . . . . [7096-12]

3:00 pm: **Artificial eyelid dynamic aperture optical arrays for large scale coding elements with application in visible to MWIR**, Scott H. Goodwin, Brian Stoner, James Carlson, RTI International; Stanley Rogers, Air Force Research Lab. . . . . [7096-13]

Coffee Break . . . . . 3:20 to 3:50 pm

3:50 pm: **Broadband IR rugate filters at Eclipse Energy Systems, Inc.**, Rand D. Dannenberg, Kenneth C. Shannon III, Ronald F. Storm, Eclipse Energy Systems, Inc.; Stanley Rogers, Air Force Research Lab. . . . . [7096-14]

4:10 pm: **Fabrication studies for scaling photonic MEMS microshutter designs,** Derrick Langley, Stanley Rogers, Air Force Research Lab.; LaVern A. Starman, Air Force Institute of Technology. . . . . [7096-15]

SESSION 5

Room: Conv. Ctr. 33B . . . . . .Sun. 4:30 to 6:10 pm

Diffraction Imaging Hardware II

Session Chairs: **Derrick Langley,** Air Force Research Lab.; **Oren Sternberg,** Booz Allen Hamilton

4:30 pm: **Photonic MEMS-coded aperture technology defects and yields and its impact on the optical/system performance**, Oren Sternberg, Booz Allen Hamilton; Esko Jaska, Defense Advanced Research Projects Agency . . . . . [7096-16]

4:50 pm: **On the optimization of point spread functions of an interleaved set of sparse apertures for multidirectional beam steering**, Abhijit Mahalanobis, Lockheed Martin Missiles and Fire Control; Vijaya Kumar Bhagavatula, Carnegie Mellon Univ. . . . . [7096-17]

5:10 pm: **Membrane-mirror-on-VLSI spatial phase modulator for adaptive mask applications: preliminary results**, Travis L. Simpkins, Cardinal Warde, Optron Systems, Inc.. . . . . [7096-18]

5:30 pm: **Microshutter developments for IR applications**, Lavern A. Starman, Air Force Institute of Technology; Derrick Langley, Stanley Rogers, Air Force Research Lab. . . . . [7096-19]

5:50 pm: **Reconfigurable-pitch photonic MEMS devices,** Derrick Langley, Stanley Rogers, Air Force Research Lab.; Lavern A. Starman, Air Force Institute of Technology . . . . . [7096-20]

Room: Conv. Ctr. 6A . . . . . Sun. 6:00 to 6:45 pm

All-Conference Plenary Session

View plenary presentation details p. 13.

6:00 pm: **The Solar Decathlon: building a better future with solar energy**, Richard J. King, U.S. Dept. of Energy

Courses of Related Interest

See SPIE Cashier for information and to register.

SC188 Laser Beam Propagation for Applications in Laser Communications, Laser Radar, and Active Imaging (Phillips, Andrews) Monday, 8:30 am to 5:30 pm
SC661 Advanced Image Processing and Applications (Iftekharuddin) Tuesday, 8:30 am to 5:30 pm
SC766 Information Processing for Video Surveillance (Ebrahimi, Dufaux) Monday, 8:30 am to 5:30 pm
NEW! SC913 Multivariate Analysis of Optical and Imaging Data (Bajorski) Monday, 8:30 am to 5:30 pm

Conference 7097

Tuesday-Thursday 12-14 August 2008 • Proceedings of SPIE Vol. 7097

Instruments, Methods, and Missions for Astrobiology XI

Conference Chairs: **Richard B. Hoover,** NASA Marshall Space Flight Ctr.; **Gilbert V. Levin,** Arizona State Univ.; **Alexei Yu. Rozanov,** Paleontological Institute (Russia); **Paul C.W. Davies,** Arizona State Univ.

Program Committee: **Sabit S. Abyzov,** Institute of Microbiology (Russia); **Marina M. Astafieva,** Paleontological Institute (Russia); **Stanley M. Awramik,** Univ. of California/Santa Barbara; **Jean-Marc Baele,** Faculté Polytechnique de Mons (Belgium); **Bonnie K. Baxter,** Westminster College; **Lee Bebout,** NASA Ames Research Ctr.; **Asim Kumar Bej,** The Univ. of Alabama at Birmingham; **Adrian J. Brown,** SETI Institute; **Mark A. Bullock,** Southwest Research Institute; **Mark J. Burchell,** Univ. of Kent (United Kingdom); **Nathalie A. Cabrol,** NASA Ames Research Ctr.; **Francisco J. Carrapico,** Univ. de Lisboa (Portugal); **Julian Chela-Flores,** The Abdus Salam International Ctr. for Theoretical Physics (Italy); **Bin Chen,** SETI Institute; **Max L. Coleman,** Jet Propulsion Lab.; **David W. Deamer,** Univ. of California/Santa Cruz; **Michael H. Engel,** Univ. of Oklahoma; **Jack D. Farmer,** Arizona State Univ.; **Sabrina Feldman,** Jet Propulsion Lab.; **Valery Galchenko,** Institute of Microbiology (Russia); **Erik M. Galimov,** V.I. Vernadsky Institute of Geochemistry and Analytical Chemistry (Russia); **Victor Gallardo,** Univ. de Concepción (Chile); **Richard Gordon,** Univ. of Manitoba (Canada); **Todd M. Holden,** CUNY/Queensborough Community College; **Joop M. Houtkooper,** Justus-Liebig-Univ. Giessen (Netherlands); **Terrance L. Huntsberger,** Jet Propulsion Lab.; **Samantha Joye,** The Univ. of Georgia; **Thomas L. Kieft,** New Mexico Institute of Mining and Technology; **Kensei Kobayashi,** Yokohama National Univ. (Japan); **John P. Kociolek,** California Academy of Sciences; **Vera M. Kolb,** Univ. of Wisconsin/Parkside; **Laurence Lemelle,** École Normale Supérieure de Lyon (France); **Jere H. Lipps,** Univ. of California/Berkeley; **Godfrey Louis,** Cochin Univ. of Science & Technology (India); **Takafumi Matsui,** The Univ. of Tokyo (Japan); **David S. McKay,** NASA Johnson Space Ctr.; **Melanie R. Mormile,** Univ. of Missouri/Rolla; **P. K. Mukhopadhyay,** Global Geoenergy Research Ltd. (Canada); **Scott L. Murchie,** Johns Hopkins Univ.; **Masatoshi Ohishi,** National Astronomical Observatory of Japan (Japan); **Roland R. Paepe,** Geobound International Ltd. (Netherlands); **Randall S. Perry,** Imperial College London (United Kingdom); **Susan Pfiffner,** The Univ. of Tennessee; **Elena V. Pikuta,** National Space Science and Technology Ctr.; **Holly C. Pinkart,** Central Washington Univ.; **Francois C. Raulin,** Univ. Paris 12 Val-de-Marne (France); **Vladamir Samarkin,** The Univ. of Georgia; **Caleb Scharf,** Columbia Univ.; **Dirk Schulze-Makuch,** Washington State Univ.; **Joseph Seckbach,** The Hebrew Univ. of Jerusalem (Israel); **Zdenek Sekanina,** Jet Propulsion Lab.; **Mark A. Sephton,** Imperial College London (United Kingdom); **Alexandre S. Simionovici,** Lab. d'Astrophysique de l'Observatoire de Grenoble (France); **Peter A. Smith,** Arizona State Univ.; **Mitchell Sogin,** Marine Biological Lab.; **Carol R. Stoker,** NASA Ames Research Ctr.; **Michael C. Storrie-Lombardi,** Kinohi Institute; **Henry Sun,** Desert Research Institute; **Mary Ann Tiffany,** San Diego State Univ.; **Wesley A. Traub,** Jet Propulsion Lab.; **George Tremberger, Jr.,** CUNY/Queensborough Community College; **Esta van Heerden,** Univ. of Free State (South Africa); **Vitaly J. Vodyanoy,** Auburn Univ.; **Milton Wainwright,** The Univ. of Sheffield (United Kingdom); **Max K. Wallis,** Cardiff Univ. (United Kingdom); **J. T. Wickramasinghe,** Cardiff Univ. Astronomy Instrumentation Group (United Kingdom); **Nalin Chandra Wickramasinghe,** Cardiff Univ. (United Kingdom); **Diane Wooden,** NASA Ames Research Ctr.; **Andreja Zalar,** Institut National de la Recherche Agronomique (France)

Tuesday 12 August

Room: Conv. Ctr. 11B . . . . . .Tues. 12:00 to 12:05 pm

Welcome and Introductions

Session Chairs: **Richard B. Hoover,** NASA Marshall Space Flight Ctr.; **Alexei Yu. Rozanov,** Paleontological Institute (Russia)

SESSION 1

Room: Conv. Ctr. 11B . . . . . .Tues. 12:05 to 2:55 pm

Chemical and Morphological Biomarkers in Ancient Rocks and Astromaterials I

Session Chairs: **Stanley M. Awramik,** Univ. of California/Santa Barbara; **Victor Ariel Gallardo,** Univ. de Concepción (Chile)

12:05 pm: **Status of the life on Mars hypothesis (Overview Paper)**, Everett J. Gibson, Jr., David S. McKay, Kathy L. Thomas-Keprta, Simon J. Clemett, NASA Johnson Space Ctr. . . . . [7097-01]

12:45 pm: **Microfossils of filamentous prokaryotes in CI1 and CM2 meteorites**, Richard B. Hoover, NASA Marshall Space Flight Ctr. . . [7097-02]

1:05 pm: **Life development on the boundary lava-water (on the example of Palaeoproterozoic Ongeluk lavas of South Africa)**, Marina M. Astafieva, Alexei Y. Rozanov, Paleontological Institute (Russia); David Cornell, Univ. of Gothenburg (Sweden); Richard B. Hoover, NASA Marshall Space Flight Ctr.. . . . . [7097-03]

1:25 pm: **The origins of amino acids in terrestrial and extraterrestrial materials** *(Invited Paper)*, Michael H. Engel, Univ. of Oklahoma; Randall S. Perry, Imperial College (United Kingdom) . . . . . [7097-05]

1:55 pm: **On the astrobiological relevance of phenols** *(Invited Paper)*, Vera M. Kolb, Patrick J. Liesch, Univ. of Wisconsin/Parkside . . . . . [7097-06]

2:25 pm: **Coniform stromatolites from microbial mats in Carrizo Creek, California** *(Invited Paper)*, S. M. Awramik, D. J. Chapman, Univ. of California/Santa Barbara; H. P. Buchheim, Loma Linda Univ . . . . . [7097-45]

Coffee Break . . . . . 2:55 to 3:25 pm

SESSION 2

Room: Conv. Ctr. 11B . . . . . .Tues. 3:25 to 5:25 pm

Chemical and Morphological Biomarkers in Ancient Rocks and Astromaterials II

Session Chair: **Masatoshi Ohishi,** National Astronomical Observatory of Japan (Japan)

3:25 pm: **The early Earth and its environments (Overview Paper)**, Alexei Y. Rozanov, Marina M. Astafieva, Paleontological Institute (Russia); Richard B. Hoover, NASA Marshall Space Flight Ctr.. . . . . [7097-07]

4:05 pm: **Biomarker indicating bacteria activity and microbial changes during end Triassic mass extinction event** *(Invited Paper)*, Dan Jiao, Imperial College London (United Kingdom); Randall S. Perry, Imperial College London (United Kingdom) and Planetary Science Institute; Michael H. Engel, Univ. of Oklahoma; Mark A. Sephton, Imperial College London (United Kingdom) . . . . . [7097-08]

4:35 pm: **Abiotic, biotic, and in-between**, Vera M. Kolb, Patrick J. Liesch, Univ. of Wisconsin/Parkside . . . . . [7097-09]

4:55 pm: **Inferring climate change from stable isotope compositions of ancient speleothems on Earth: possible implications for climatic reconstructions elsewhere in the solar system** *(Invited Paper),* Brian S. Harms, Richard D. Elmore, Michael H. Engel, Univ. of Oklahoma . . . [7097-10]

Room: Marriott Marina F . . . . . .Tues. 8:00 pm

Panel Discussion: Life in the Cosmos

Join this interactive panel discussion on Life in the Cosmos.

See details page 28.

Wednesday 13 August

SESSION 3

Room: Conv. Ctr. 11B . . . . . Wed. 8:00 to 9:55 am

Astronomical and Robotic Instrumentation for Astrobiology

Session Chairs: **Brian S. Harms,** Univ. of Oklahoma; **Asim Kumar Bej,** The Univ. of Alabama at Birmingham

8:00 am: **Astrobiology related research activity in the National Astronomical Observatory of Japan** *(Invited Paper)*, Masatoshi Ohishi, National Astronomical Observatory of Japan (Japan). . . . . [7097-11]

8:45 am: **Instrumentation for reflectance imaging spectroscopy and microspectroscopy with application to astrobiology**, Pantazis Z. Mouroulis, Diana Blaney, Robert O. Green, Byron Van Gorp, Jet Propulsion Lab.[7097-12]

9:05 am: **Design and fabrication of hybrid masks for exoplanet coronagraphy**, John T. Trauger, Brian Gordon, Dwight C. Moody, Jr., Jet Propulsion Lab. . . . . [7097-13]

9:25 am: **Preliminary results on the assessment study of the ESA cosmic vision mission PLATO** *(Invited Paper)*, Ronnie N. Lindberg, Philippe A. Gondoin, David H. Lumb, Nicola A. Rando, Malcolm C. Fridlund, Frederic Safa, European Space Research and Technology Ctr. (Netherlands) . . . . . [7097-14]

Coffee Break . . . . . 9:55 to 10:30 am

SESSION 4

Room: Conv. Ctr. 11B . . . . . Wed. 10:30 to 11:40 am

Biosignatures of Habitable Planets

Session Chairs: **Vera M. Kolb,** Univ. of Wisconsin/Parkside; **Alexei Yu. Rozanov,** Paleontological Institute (Russia)

10:30 am: **Evolution of ocean colors** *(Invited Paper)*, Victor A. Gallardo, Carola S. Espinoza, Univ. de Concepción (Chile) . . . . . [7097-15]

11:00 am: **Why is planet Mars red?**, Roland R. Paepe, Geobound International Ltd (Netherlands). . . . . [7097-16]

11:20 am: **Potential photosynthetic systems in extraterrestrial habitable zones**, Gregory A. Konesky, K-Plasma Ltd. . . . . [7097-17]

Lunch Exhibition . . . . . 11:40 to 1:15 pm

SESSION 5

Room: Conv. Ctr. 11B . . . . . Wed. 1:15 to 2:55 pm

Microbial Extremophiles I

Session Chairs: **Jean-Marc Baele,** Faculté Polytechnique de Mons (Belgium); **Charles V. Rice,** Univ. of Oklahoma

1:15 pm: **Peculiarities of microbial biogeochemistry of sulfur and methane in three stratified perennially ice-covered Antarctic lakes: Lake Fryxell, Lake Vanda, and Lake Untersee** *(Invited Paper)*, Vladimir A. Samarkin, The Univ. of Georgia; Michael T. Madigan, Southern Illinois Univ./Carbondale; Matthew W. Sattley, Univ. of Washington; John C. Priscu, Montana State Univ./Bozeman; Ulrich Wand, Alfred-Wegener-Institut für Polar- und Meeresforschung (Germany); Christof Meile, Samantha B. Joye, The Univ. of Georgia . . . . . [7097-19]

1:45 pm: **Study of cold adaptation in Antarctic micro-organisms**, Asim K. Bej, Nazia Mojib, The Univ. of Alabama at Birmingham . . . . . [7097-20]

2:05 pm: **Microbial extremophiles from the 2008 Schirmacher Oasis Expedition: preliminary results**, Richard B. Hoover, Elena V. Pikuta, NASA Marshall Space Flight Ctr. and National Space Science and Technology Ctr.; Asim K. Bej, The Univ. of Alabama at Birmingham; Michael C. Storrie-Lombardi, Kinohi Institute . . . . . [7097-21]

2:25 pm: **What do membrane lipids tell us about the microorganisms living in extreme environments?** *(Invited Paper)*, Susan M. Pfiffner, Sarah A. DiFurio, Margaret Gan, The Univ. of Tennessee; Richard B. Hoover, NASA Marshall Space Flight Ctr.. . . . . [7097-22]

Coffee Break . . . . . 2:55 to 3:25 pm

SESSION 6

Room: Conv. Ctr. 11B . . . . . Wed. 3:25 to 5:25 pm

Microbial Extremophiles II

Session Chairs: **Susan M. Pfiffner,** The Univ. of Tennessee; **Michael C. Storrie-Lombardi,** Kinohi Institute

3:25 pm: **Iron microbial mats in modern and phanerozoic terrestrial environments**, Jean-Marc Baele, Faculté Polytechnique de Mons (Belgium); F. Bouvain, Univ. de Liège (Belgium); A. Préat, Univ. Libre de Bruxelles (Belgium); S. Papier, Faculté Polytechnique de Mons (Belgium) . . . . . [7097-23]

3:45 pm: **Magnetic resonance tells microbiology where to go; bacterial teichoic acid protects liquid water at sub-zero temperatures**, Charles V. Rice, Jason R. Wickham, Univ. of Oklahoma; Margaret A. Eastman, Oklahoma State Univ.; William Harrison, Univ. of Oklahoma; Mark Pereira, McMaster Univ. (Canada). . . . . [7097-24]

4:05 pm: **Epifluorescence surveys of extreme environments using PanCam imaging systems: Antarctica and the Mars regolith**, Michael C. Storrie-Lombardi, Kinohi Institute; Jan-Peter Muller, Univ. College London (United Kingdom); Martin R. Fisk, Oregon State Univ.; Andrew D. Griffiths, Andrew J. Coates, Univ. College London (United Kingdom) . . . . . [7097-25]

4:25 pm: **DNA sequence-based comparative studies between non-extremophile and extremophile organisms with implications in exobiology** *(Invited Paper)*, Todd M. Holden, Paul J. Marchese, George Tremberger, Jr., Eric Cheung, Raji Subramaniam, Regina Sullivan, Pat S. Schneider, Alex Flamholz, David H. Lieberman, Tak D. Cheung, CUNY/Queensborough Community College. . . . . [7097-26]

4:55 pm: **Phaeodactylum tricornutum photosynthesis and thalassiosira pseudonana bio-silica formation genes nucleotide fluctuations** *(Invited Paper)*, Todd M. Holden, Paul J. Marchese, Geroge Tremberger, Jr., Eric Cheung, Raji Subramaniam, Regina Sullivan, Pat S. Schneider, Alex Flamholz, Joshua Espinal, Marco Huerta, David H. Lieberman, Tak D. Cheung, CUNY/Queensborough Community College . . . . . [7097-27]

Thursday 14 August

SESSION 7

Room: Conv. Ctr. 11B . . . . . Thurs. 8:00 to 10:00 am

Microbial Extremophiles III

Session Chairs: **Nalin Chandra Wickramasinghe,** Cardiff Univ. (United Kingdom); **Godfrey Louis,** Cochin Univ. of Science & Technology (India)

8:00 am: **Metabolic promiscuity from the deep subsurface a story of survival or superiority** *(Invited Paper)*, Esta van Heerden, D. Litthauer, L. A. Piater, Univ. of the Free State (South Africa); Tullis C. Onstott, Princeton Univ. . . . . [7097-28]

8:30 am: **Dramatic blooms of Prymnesium sp. (Prymnesiophyceae) and Alexandrium margalefii (Dinophyceae) in the Salton Sea, California**, Mary A. Tiffany, San Diego State Univ.; Jennifer Wolny, Matthew Garrett, Karen Steidinger, Fish and Wildlife Research Institute and Florida Institute of Oceanography; Stuart H. Hurlbert, San Diego State Univ. . . . . [7097-29]

8:50 am: **Nucleotide fluctuation of RecA repair gene in Siberian Permafrost Psychrobacter cryohalolentis K5** *(Invited Paper)*, George Tremberger, Jr., Todd M. Holden, Eric Cheung, Raji Subramaniam, Regina Sullivan, Pat S. Schneider, Alex Flamholz, David H. Lieberman, Tak D. Cheung, CUNY/Queensborough Community College. . . . . [7097-30]

9:20 am: **Methanosarcina acetivorans 16S rRNA and transcription factor nucleotide fluctuation with implications in exobiology and pathology**, George Tremberger, Jr., Todd M. Holden, Eric Cheung, Raji Subramaniam, Regina Sullivan, Pat S. Schneider, Paul J. Marchese, Alex Flamholz, Osiris Hiciano, David H. Lieberman, Tak D. Cheung, CUNY/Queensborough Community College. . . . . [7097-31]

9:40 am: **How cold is too cold, even for endolithic life**, Henry Sun, Desert Research Institute . . . . . [7097-32]

Coffee Break . . . . . 10:00 to 10:30 am

Conference 7097

SESSION 8

Room: Conv. Ctr. 11B . . . . . Thurs. 10:30 to 11:50 am

Mars and Comets

Session Chairs: **George Tremberger, Jr.,** CUNY/Queensborough Community College; **Esta van Heerden,** (South Africa)

10:30 am: **The perennially ice covered lakes of the cold and rainless deserts of the Antarctic, and by extension, Mars** *(Invited Paper),* Alex T. Wilson, The Univ. of Arizona (United States). . . . . [7097-48]

11:00 am: **Episodic aging of cometary nuclei: what it means in terms of jet activity, fragmentation, and end state** *(Invited Paper)*, Zdenek Sekanina, Jet Propulsion Lab. . . . . [7097-35]

11:30 am: **Thickness of cryolithosphere and frozen rocks on Mars**, Ilya Komarov, Vladislav Isaev, Oleg Abramenko, M.V. Lomonosov Moscow State Univ. (Russia). . . . . [7097-36]

Lunch. . . . . 11:50 to 1:30 pm

SESSION 9

Room: Conv. Ctr. 11B . . . . . Thurs. 1:30 to 5:10 pm

Emergence of Complexity and the Origin/ Distribution of Life

Session Chairs: **Zdenek Sekanina,** Jet Propulsion Lab.; **Richard B. Hoover,** NASA Marshall Space Flight Ctr.

1:30 pm: **Interstellar Panspermia - a mechanism for dispersing life and high-grade organics in galaxies** *(Invited Paper)*, Nalin C. Wickramasinghe, J. T. Wickramasinghe, William Napier, Cardiff Univ. (United Kingdom) . [7097-37]

2:00 pm: **3D characterization of stromatolites and the emergence of complexity** *(Invited Paper)*, Michael C. Storrie-Lombardi, Kinohi Institute; Stanley M. Awramik, Univ. of California/Santa Barbara; John Nesson, Northern Inyo Hospital; Alexandre I. Tsapin, Jet Propulsion Lab. . . . . [7097-38]

2:30 pm: **Unusual autofluorescence characteristic of cultured red-rain cells** *(Invited Paper)*, Godfrey Louis, Cochin Univ. of Science & Technology (India); A. Santhosh Kumar, Mahatma Gandhi Univ. (India) . . . . . [7097-39]

Coffee Break . . . . . 3:00 to 3:30 pm

3:30 pm: **On the applicability of the dialetheism to the emergence of life**, Vera M. Kolb, Univ. of Wisconsin/Parkside. . . . . [7097-40]

3:50 pm: **The mysterious carbonaceous dark matter in comets** *(Invited Paper)*, Diane Wooden, NASA Ames Research Ctr. . . . . [7097-44]

4:20 pm: **Mix and match: enhanced Raman spectroscopy instrumentation in field applications** *(Invited Paper)*, Bin Chen, Christopher P. McKay, Carol R. Stoker, Nathalie A. Cabrol, NASA Ames Research Ctr. . . . . [7097-43]

4:50 pm: **Cosmological evolution: a post-Darwinian perspective,** Robert B. Sheldon, Richard B. Hoover, NASA Marshall Space Flight Ctr. . . . . [7097-41]

Room: Conv. Ctr. 11B . . . . . Thurs. 5:10 to 5:25 pm

Closing Remarks

Session Chairs: **Richard B. Hoover,** NASA Marshall Space Flight Ctr.; **Alexei Yu. Rozanov,** Paleontological Institute (Russia); **Gilbert V. Levin,** Arizona State Univ.

Courses of Related Interest

See SPIE Cashier for information and to register.

SC561 Optomechanics for Space Applications (Shipley) Wednesday, 8:30 am to 5:30 pm

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Registration

Registration Hours

San Diego Convention Center, Exhibit Hall A

Sunday 10 August . . . . . 7:00 am to 5:00 pm
Monday 11 August . . . . . 7:15 am to 5:00 pm
Tuesday 12 August . . . . . 7:30 am to 5:00 pm
Wednesday 13 August . . . . . 7:30 am to 5:00 pm
Thursday 14 August . . . . . 7:45 am to 4:00 pm

Exhibition Hours

San Diego Convention Center, Exhibit Hall A-B1

Tuesday 12 August . . . . . 10:00 am to 5:00 pm
Wednesday 13 August . . . . . 10:00 am to 5:00 pm
Thursday 14 August . . . . . 10:00 am to 2:00 pm

SPIE Receipts, Badge Corrections, Cashier

Receipts - Preregistered attendees who did not receive a receipt prior to the meeting may obtain a new copy of their registration receipt onsite at the Badge Corrections and Receipts counter in the registration area.

Badge Corrections - Attendees who need a correction to their badge information on-site may do so at the Badge Corrections and Receipts counter in the registration area. Please have your badge removed from the badge holder, marked with your changes, and ready to hand to the attendant upon approaching the counter.

Cashier Station - If you are paying by cash or check as part of your onsite registration, wish to add a short course, workshop, or special event requiring payment, or have questions regarding your registration, please see the onsite cashier at the Cashier station in the registration area.

Author/Presenter Services

Poster Setup

Convention Center Hall B2

Poster presenters must set up between 10:00 am to 5:00 pm on the day of their assigned presentation. Poster presenters who have not set up by 5:00 pm on the day of their presentation will be considered a "no show" and their manuscript will not be published. Presenters must remove their posters immediately after the poster session. Posters not removed will be considered unwanted and will be discarded. SPIE assumes no responsibility for posters left up after the end of each poster session.

Speakers Check-In Desk / Preview Station

Convention Center Ballroom 6 Lobby

Sunday through Thursday . . . . . 7:30 am to 5:00 pm

All conference rooms will have a computer workstation, LCD projector, screen, lapel microphone, and laser pointer. All Presenters are requested to come to the speaker check-in desk to confirm display settings of their presentations from their memory devices or laptops with the audiovisual equipment being used at this symposium.

Laser Pointer Safety Information

SPIE supplies tested and safety approved laser pointers for all conference meeting rooms, and for short course rooms if instructors request one. For safety reasons, SPIE requests that presenters use our provided laser pointers available in each meeting room.

If using your own laser pointer, have it tested at your facility to make sure it has <5 mW power output. Laser pointers in Class II and IIIa (<5 mW) are eye safe if power output is correct - but don't automatically trust the labeling. Commercially available laser pointers, red or green (or any color), could be incorrectly labeled as to their wavelength and power output.

Presenters intending to use their own laser pointer for presentations are required to come to the Audiovisual Desk onsite and test their pointer on our power meter. If the pointer fails the safe power level you may not use the pointer at the conference. You will be required to sign a waiver releasing SPIE of any liability for use of potentially non-safe laser pointers.

Use of a personal laser pointer at an SPIE event represents user's acceptance of liability for use of a non-SPIE supplied laser pointer device. Misuse of any laser pointer could lead to eye damage. In California, it is a criminal misdemeanor to shine a laser pointer at individuals "who perceive they are at risk."

Child Care Services

The San Diego Marriott Hotel & Marina does not provide child care services; however, a child sitting service available in San Diego and recommended by the San Diego Marriott Hotel & Marina is: Marion's Childcare. For reservations, email amy@hotelchildcare.com. Within San Diego call (619) 303-4379, or 1-888-891-5029, www.hotelchildcare.com

SPIE does not imply an endorsement or recommendation of this service. It is provided on an "information only" basis for your further analysis and decision. Other services may be available.

Restaurant Reservations and Information Desk

The San Diego Convention Center Corporation operates a Restaurant Reservations and Information Desk in Lobby B of the Convention Center. The desk will be staffed Sunday through Thursday, during the convention from 9am - 6pm. If you wish to pre-plan your individual or group dining arrangements, you may call Laurie Peters at 619 525 5291.

General Information

Internet Services

Internet Pavilion

Sponsored by Newport Experience | Solutions, Spectra-Physics A Division of Newport Corporation

SPIE has a complimentary Internet Pavilion Sunday through Thursday where attendees can use provided workstations or hook up their laptop to an Ethernet connection to access the Internet.

Internet Wireless Access

Sponsored by Newport Experience | Solutions, Spectra-Physics A Division of Newport Corporation

SPIE is pleased to provide complimentary wireless access to the Internet for all conference attendees with 802.11b wireless-enabled laptops or PDAs.

Properly secure your computer before accessing the public wireless network. Failure to do so may allow unauthorized access to your laptop as well as potentially introduce viruses to your computer and/or presentation.

Business Services

SPIE Copy Center

Sunday through Thursday during registration hours San Diego Copy will provide a copy service during the week for symposium attendees. The rates are 5 cents per copy. The Copy Center will be located near registration.

Business Center

FedEx Kinko's is the in-house business center for the San Diego CC. It is located inside Lobby D. The company provides small package FedEx shipping, packing supplies, color copying services, fax services and office supplies. Phone (619) 525-5450, Fax (619) 525-5477. Email usa1324@fedexkinkos.com.

SPIE Message Center

The SPIE Message Center telephone number is 619 525 6200. Messages will be taken during registration hours Sunday through Thursday. Please check the message board at the message center near SPIE registration daily to receive your messages.

Luggage/Package Storage and Coat Check

Convention Center - Lobby A

Sunday through Thursday

Complimentary luggage/package and coat storage is available to attendees.

Please note hours of operation. If you intend to stay later than closing time, you will need to claim your checked items before it closes.

Food and Beverage Services

Coffee Breaks

Complimentary coffee service will be at the following times and locations at the Convention Center.

Sunday and Monday
10:00 to 11:00 am, 3:00 to 4:00 pm
Upper Level Lobby, Mezzanine Level & Outside Room 32B

Tuesday and Wednesday
10:00 to 11:00 am, 3:00 to 4:00 pm
Exhibition Halls A and B1

Thursday
10:00 to 11:00 am, 3:00 to 4:00 pm
Exhibition Halls A and B1 (AM Only)
Upper Level Lobby, Mezzanine Level & Outside Room 32B (PM Only)

Please check the individual technical conference listings for exact times and locations.

Refreshment Purchases

For attendee purchase of light refreshments, including continental breakfast, specialty carts will be set up throughout the Convention Center Sunday through Thursday.

Cash Lunches and Exhibition Concessions

A cash sandwich bar will be available in the Convention Center Sunday through Thursday.

Visit the Exhibition Concessions located in the back of the exhibition halls on Tuesday-Thursday, featuring Domestic and International Cuisine. They will serve hot and cold snacks, beverages, deli-type sandwiches, salads, hot entrees, and pastries.

Free Popcorn

A popcorn cart will be located in the Exhibition Hall and will be open from 11:00 am to 3:00 pm Tuesday through Wednesday and 11:00 am to 2:00 pm on Thursday.

Desserts

Tuesday and Wednesday

Dessert snacks will be served from 3:00 to 3:30 pm. Complimentary tickets for the dessert snacks will be included in attendee registration packets.

SPIE Onsite Services

Press Room

Convention Center - Exhibition Hall A

The onsite Press Room provides media representatives with conference space, refreshments, convenient one-stop-shopping for press releases, and allows news to be communicated via phone and high-speed internet connections. Credentialed members of the press can pre-register by emailing: name, organization, and contact information to media@spie.org. Registration and exhibition fees are waived for media representatives. For more information about SPIE media services, see spie.org/x24601.xml.

Industry Resources at SPIE Pavilion

Exhibition Floor

Visit the SPIE Industry Resources Booth to learn how SPIE can help move your ideas and technology to market. Get information on events, marketing opportunities, education, and training that SPIE can provide you to make your venture a success.

Audio, Video, Digital Recording Policy

In the Meeting Rooms and Poster Sessions: For copyright reasons, recordings of any kind are strictly prohibited without prior written consent of the presenter in any conference session, course or of posters presented. Each presenter being taped must file a signed written consent form. Individuals not complying with this policy will be asked to leave a given session and asked to surrender their film or recording media. Consent forms are available at the SPIE Audiovisual Desk.

In the Exhibition Hall: For security and courtesy reasons, photographing or videotaping individual booths and displays in the exhibit hall is allowed ONLY with explicit permission from onsite company representatives. Individuals not complying with this policy will be asked to surrender their film and to leave the exhibit hall.

Underage Persons on Exhibition Floor

For safety and insurance reasons, no persons under the age of 16 will be allowed in the exhibition area during move-in and move-out. During open exhibition hours, only children over the age of 12 accompanied by an adult will be allowed in the exhibition area.

No Unauthorized Solicitation in the Exhibition

Please note that while all meeting attendees are invited to the exhibition, any attendee who is observed to be soliciting business in the aisles or other public spaces, in another company's booth, are in violation of any portion of the SPIE Exhibition Policy and will be asked to leave immediately. Additional penalties may be applied. Please report any violations you may observe to show management.

Unsecured Items

Personal belongings such as briefcases, backpacks, coats, book bags, etc. should not be left unattended in meeting rooms or public areas. These items will be subject to removal by security upon discovery.

Support of Green Meetings

SPIE supports the efforts of The San Diego Convention Center Corporation (SDCCC) in its commitment to encourage sustainable practices. We invite Optics+Photonics attendees to help minimize the impact of our large meeting by seeking out clearly marked bins throughout the building for mixed recyclables (paper, plastic, aluminum, glass). The bins are collected daily and recycled appropriately. Complete information about SDCCC efforts can be found at http://www.visitsandiego.com/meetingplanners/greenmeetings.cfm

Parking

(Note: All rates are subject to change)

At San Diego Convention Center

Convention Center: For underground parking, the Convention Center parking entrance is at the north end of Harbor Drive off Convention Center Way. A special convention parking rate of $8 per day will be in effect at the San Diego Convention Center for the duration of the meeting. However, please note that parking rates are subject to change and during Padre baseball season, parking rates increase by $10 during home games. Exhibitors may purchase a parking permit at the parking office inside the garage which allows in and out privileges for move-in/move-out days only. Exhibitors should purchase their $8 parking ticket at the gate, proceed to the parking office inside, hand in the $8 parking ticket along with an additional $4 to receive the $12 Parking Pass (with in & out privileges only on move-in/move-out days). Exhibitor badge ID is necessary to obtain the permit. They are open from 5:00 am to 11:00 pm, with no overnight parking. For further information contact Ace Parking at 619 237 0399.

Parking at Applicable Hotels

(Note: All rates are subject to change.)

SAN DIEGO MARRIOTT HOTEL & MARINA
For guests: Self $20, Valet $28
Non-Guests: Self $22, Valet $30

HOLIDAY INN ON THE BAY
For guests: Self $22, Valet $26
Non-Guests pay regular posted parking rate.

THE SOFIA HOTEL
Valet only: $25

SAN DIEGO MARRIOTT GASLAMP QUARTER
Valet only: $28

OMNI SAN DIEGO HOTEL
Self $16, Valet $30

TOWN AND COUNTRY RESORT & CONVENTION CENTER
Self: $7

HARD ROCK HOTEL
Valet only: $30

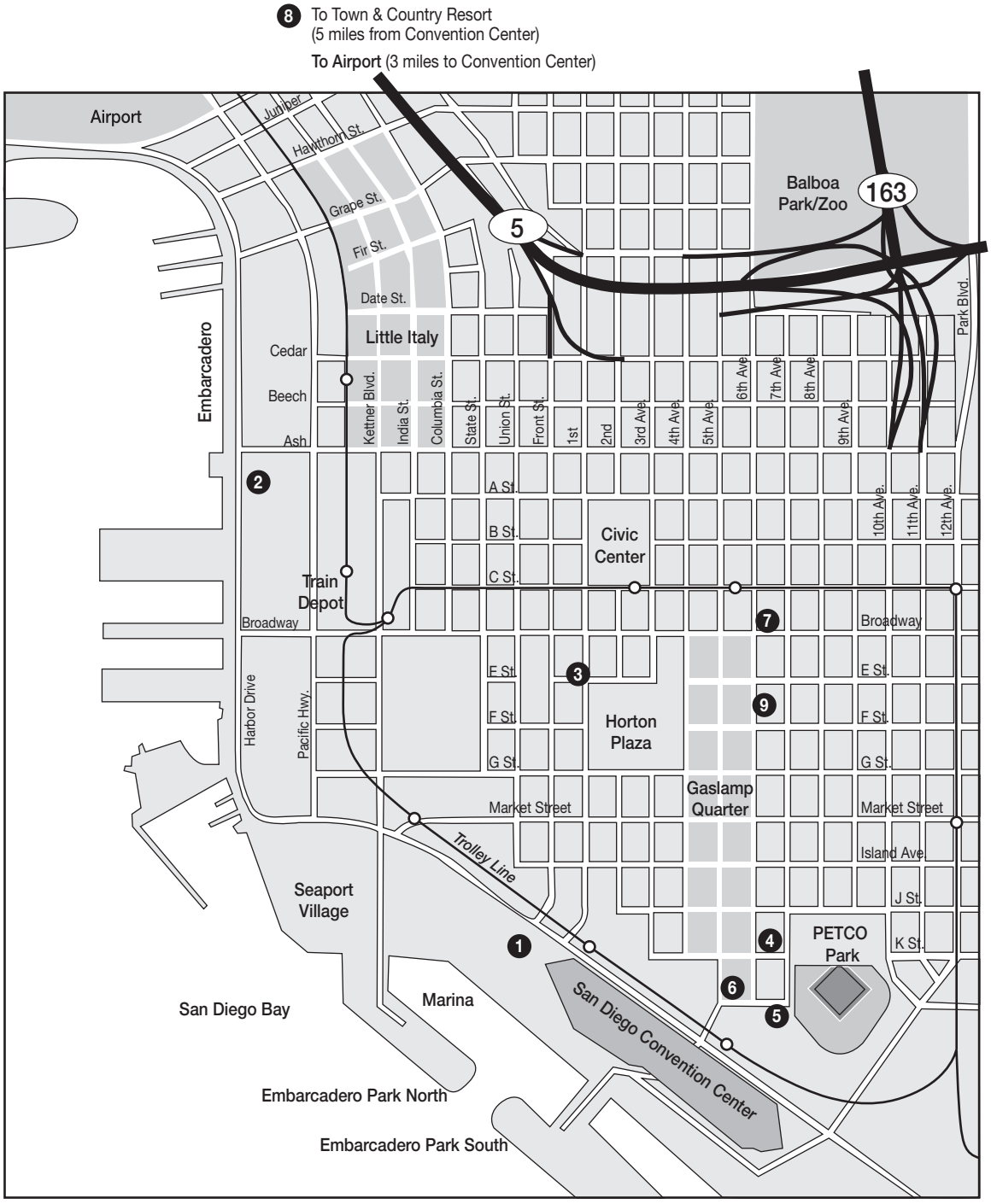
COURTYARD BY MARRIOTT
Valet only: $24

RAMADA INN & SUITES–GASLAMP
Valet only: $20

Car Rental

Hertz Car Rental has been selected as the official car rental agency for this Symposium. To reserve a car, identify yourself as an Optics + Photonics Conference attendee using the Hertz Meeting Code CV# 029B0011. Call 1 800 654 2240.

San Diego Area Map



1. San Diego Marriott Hotel & Marina
2. Holiday Inn on the Bay
3. The Sofia Hotel
4. San Diego Marriott Gaslamp Quarter
5. Omni San Diego Hotel
6. Hard Rock Hotel
7. Courtyard by Marriott
8. Town & Country Resort
9. Ramada Inn & Suites – Gaslamp

Proceedings of SPIE

NanoScience +Engineering

Part of SPIE Optics+Photonics

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Optical Engineering +Applications
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All orders must be PREPAID in U.S. dollars. Prices subject to change without notice. No returns without written authorization of SPIE. ITEMS WILL NOT BE SHIPPED UNLESS PAYMENT IS RECEIVED.

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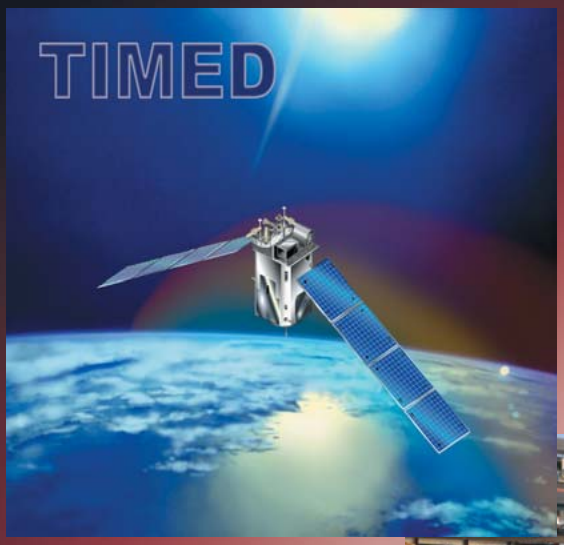

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