2013 Remote Sensing

www.spie.org/rs

2013 Security+ Defence

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Technical Programme

Conference: 23–26 September 2013
Exhibition: 24–25 September 2013

Location
Internationales Congress Center
Dresden, Germany

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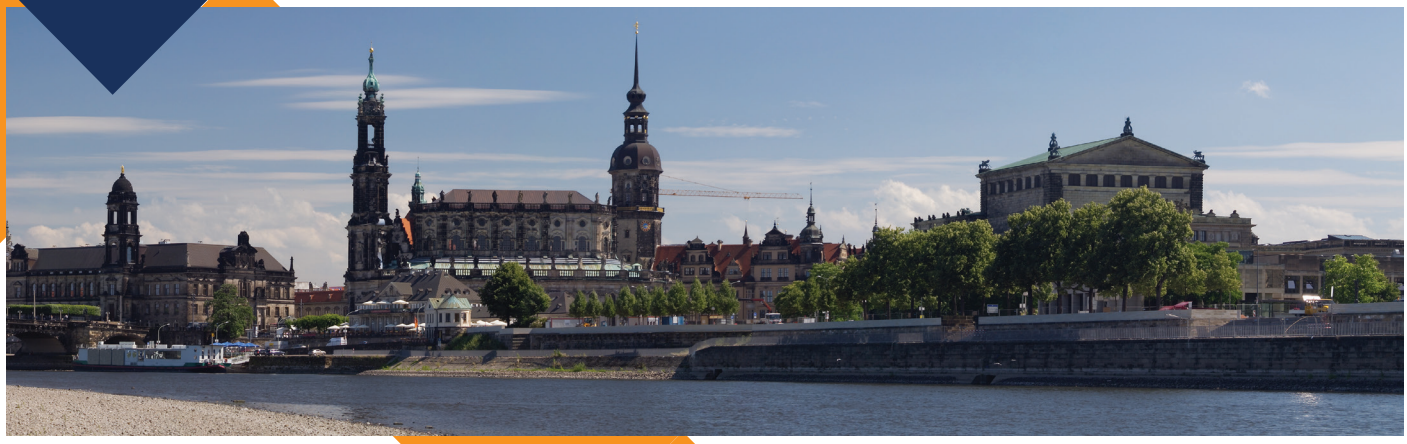

SPIE Remote Sensing

Charles R. Bostater
Marine-Environmental Optics Lab & Remote Sensing Center, Florida Institute of Technology (United States)
2013 Symposium Chair

Ulrich Michel
University of Education Heidelberg, Germany
2013 Symposium Co-Chair

Cooperating Organisations

EARSC European Association of Remote Sensing Companies

Remote Sensing and Photogrammetry Society

DGPF

EOS European Optical Society — Coherence for Europe®

SPIE Security+Defence

David H. Titterton
Defence Science and Technology Lab., United Kingdom
2013 Symposium Chair

Reinhard Ebert
Fraunhofer IOSB, Institute of Optronics, System Technologies and Image Exploitation, Germany
2013 Symposium Co-Chair

Cooperating Organisations

Fraunhofer IOF

SPIE would like to express its deepest appreciation to the symposium chairs, conference chairs, Programme 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 Programme is based on commitments received up to the time of publication and is subject to change without notice.

Remote Sensing 2013

Conferences

Security + Defence 2013

Conferences

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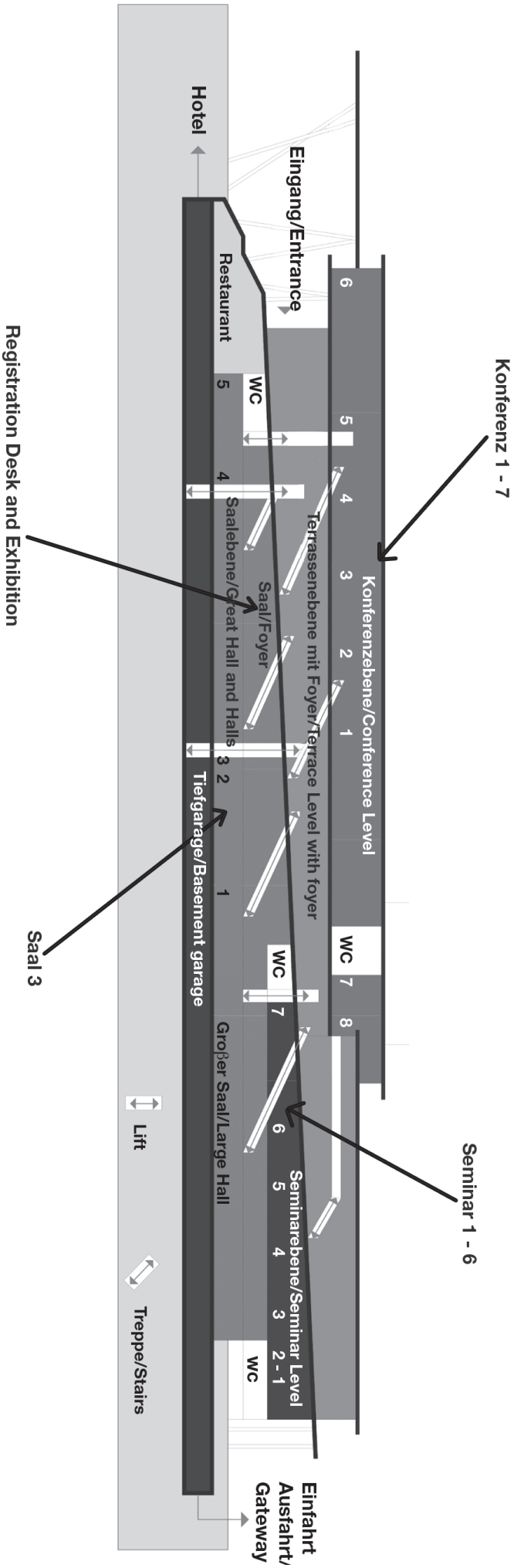
Floor Plan

Conference Level 1



SPIE Remote Sensing

MONDAY	TUESDAY	WEDNESDAY	THURSDAY
Conferences			
	Conf. 8887: **Remote Sensing for Agriculture, Ecosystems, and Hydrology** (Neale, Maltese) p. 15		
	Conf. 8888: **Remote Sensing of the Ocean, Sea Ice, Coastal Waters, and Large Water Regions 2011** (Bostater, Neyt, Mertikas) p. 19		
Conf. 8889: **Sensors, Systems, and Next-Generation Satellites** (Meynart, Neeck, Shimoda) p. 21			
Conf. 8890B: **Optics in Atmospheric Propagation and Adaptive Systems** (Stein, Gonglewski) p. 27		Conf. 8890A: **Remote Sensing of Clouds and the Atmosphere** (Kassianov, Schafer, Comeron, Picard) p. 25	
			Conf. 8891: **SAR Image Analysis, Modeling, and Techniques** (Notarnicola, Paloscia, Perdicca) p. 28
Conf. 8892: **Image and Signal Processing for Remote Sensing** (Bruzzone) p. 30			
Conf. 8893: **Earth Resources and Environmental Remote Sensing/GIS Applications** (Michel, Civco) p. 34			
Conf. 8894: **Lidar Technologies, Techniques, and Measurements for Atmospheric Remote Sensing** (Singh, Pappalardo) p. 38		Conf. 8895: **High-Performance Computing in Remote Sensing** (Huang, Plaza) p. 40	

SPIE Security + Defense

MONDAY	TUESDAY	WEDNESDAY	THURSDAY
Conferences			
Conf. 8896: **Electro-Optical and Infrared Systems: Technology and Applications X** (Huckridge, Ebert) p. 52		Conf. 8897A: **Electro-Optical Remote Sensing VII** (Kamerman, Steinvall) p. 54	
Conf. 8898B: **High-Power Lasers 2013: Technology and Systems** (Ackerman, Bohn) p. 59	Conf. 8897B: **Military Applications in Hyperspectral Imaging and High Spatial Resolution Sensing** (Bishop, Gonglewski) p. 56		
	Conf. 8899B: **Quantum-Physics-Based Information Security II** (Gruneisen, Dusek, Rarity) p. 61		
Conference 8899C **Unmanned/ Unattended Sensors and Sensor Networks X** (Carapezza) p. 63			
Conf. 8900: **Millimetre Wave and Terahertz Sensors and Technology VI** (Salmon, Jacobs) p. 64		Conf. 8898A: **Technologies for Optical Countermeasures X** (Titterton, Richardson, Grasso) p. 57	
	Conf. 8901A: **Optics and Photonics for Counterterrorism, Crime Fighting and Defence IX** (Burgess, Owen) p. 66	Conf. 8899A: **Emerging Technologies** (Lewis, Hollins, Merlet) p. 60	
		Conf. 8901B: **Optical Materials and Biomaterials in Defence Systems Technology X** (Zamboni, Kajzar, Szep) p. 68	
Special Events			
ERS Plenary Session	ESD Plenary Session		
Welcome Reception	Poster Session		
	Exhibition		

Remote Sensing Plenary Session

Monday 23 September | 16:00 to 17:45 | Saal 3

Welcome and Introduction

16:00 to 16:10

Charles R. Bostater, Marine-Environmental Optics Lab & Remote Sensing Center, Florida Institute of Technology, United States

Ulrich Michel, University of Education Heidelberg, Germany

2013 Symposium Chairs

16:10 to 16:15

SPIE Fellow Award Presentation:

Jón Atli Benediktsson
University of Iceland

for achievements in multi-temporal and hyperspectral remote sensing

16:10 to 16:15

Very High Resolution Imaging Systems

Andreas Eckardt, Head of the Faclity Optical Information Systems and Head of the Dept. Optical Sensorics and Electronics at the Institute of Robotics and Mechatronics of the German Aerospace Center DLR, Germany

Starting at the end of the 90th with IKONOS (1 m GSD) and the Hubble Space Telescope a fast development for high spatial resolution systems for civil applications have become available. Today with GeoEye-2 and Worldview 3 the 35 cm range will be reached. Key Drivers for such developments are different governmental requirements for their own capabilities, which are related to dual use aspects. But there is also a need for mapping applications with lower resolution. Other aspects are the investigations of gases (CO2, etc. .) which can be based on laser systems or high resolution spectrographs.

Very High Resolution can be related to the following dimensions

- Spatial (20 cm or less)
- Spectral (hyperspectral systems from UV up to thermal infrared)
- Time (real time implementations in CMOS, real time calculation on FPGA)

Major challenges at various system levels can be are related with payload and platform:

Payload
- Telescope Optics,
- Active Optics,
- Focal Plane Technology,
- Active high speed focus control.

Platform
- High Torque Wheels,
- AOCS,
- On Board high speed data link.

Auxiliary instruments for atmospheric parameter measurements and laser distance measurements for TDI synchronisation are important for the reproducibility of the image quality. The presentation focuses on new trends, which are also related to developments in our institute.

Biography: **Dr.-Ing. Andreas Eckardt** graduated (Dipl.-Ing.) from Technical University Ilmenau in 1988. He began to work with the Space Research Institute of the Academy of Sciences of the GDR in 1988; since 1992 he has worked with the Institute of Space Sensor Technology and the Institute of Planetary Exploration and Space Sensor Technology of the German aerospace research establishment DLR.

Dr. Eckardt Received his PhD in the field of digital cameras in 2002 at the Technical University Berlin.

Since 2004 he is the head of the Department Optical Sensors and Electronics and since 2005 Dr. Eckhardt acts as the deputy head at the DLR Robotics and Mechatronics Center. Since 2012 he has become a member of IAA.

Dr. Eckardt has acted as the Lead on several space and airborne projects, ADS40 and KompSat3/3A & OPSIS FPA being the most important ones. He is the author/co-author of about 55 publications and holds about 52 patents.

17:00 to 17:45

Novel Imaging Spectrometers and Polarimeters

Eustace L. Dereniak, Univ. of Arizona, College of Optical Sciences, United States

The use of two dimensional arrays has enabled the development of novel imaging spectrometers and polarimeters. This presentation will discuss the development of imagers that use new optical designs based on old ideas. The presentation contains an overview of the various types of imaging sensors that have been developed at the Optical Detection Lab of the University of Arizona. The goal of our research is to develop instruments capable of discriminating objects in a remote sensing environment. These instruments of are capable of spectrally monitoring simultaneously chemical or biological processes in real time in four dimensions (x,y,?,t).

Biography: **Eustace L. Dereniak** is a Professor of Optical Sciences and Electrical and Computer Engineering at the University of Arizona, Tucson, AZ. His research interests are in the areas of detectors for optical radiation, imaging spectrometers and imaging polarimeters instrument development.

Dr. Dereniak is a co-author of several textbooks including Optical Radiation Detectors and Infrared Detectors and Systems, published by Wiley-Interscience. He has written chapters in Imaging in Medicine, edited by S. Nudelman and D. Patton, related to research and development using thermograph instrumentation for the early detection of breast cancer. More recently he published a book on Geometrical and Trigonometric Optics with Cambridge University press. His publications also include over 100 authored or co-authored refereed articles.

Prior to his academic career, he spent many years in industrial research with Raytheon, Rockwell International, and Ball Brothers Research Corporation.

He has served as a Visiting Professor with the U.S. Army and Air Force, a Research Associate with the Air Force's Rome Air Development Center, and a consultant to the University of Hawaii Institute for Astronomy.

During the summers, he has taught at the University of Michigan, University of New Mexico and University of Central Florida.

He was President (2012) of SPIE and a Fellow of the SPIE and OSA. He is currently on the BOD of Council of Scientific Society Presidents.

16:00 to 16:10

Welcome and Introduction

David H. Titterton, Defence Science and Technology Lab., United Kingdom

Reinhard Ebert, Fraunhofer-IOSB Institute of Optronics, System Technologies and Image Exploitation, Germany
2013 Symposium Chairs

16:10 to 16:20

In Memoriam of Colin Lewis

2004-2012 Chair of the Optics and Photonics for Counter-terrorism and Crime Fighting Conference

16:20 to 17.05

The Force of Light

Roland Sauerbrey, Scientific Director of the Helmholtz-Zentrum Dresden-Rossendorf (HZDR), Germany

Lasers today reach intensities of about 1022 W/cm2. At such laser intensities the interaction of light and matter is dominated by relativistic effects. These new effects include laser particle acceleration with potential applications in radiation oncology as well as polarization of the vacuum.

Biography: **Roland Sauerbrey** received his Ph.D. in Physics from the University of Würzburg, Germany, in 1981. After a post doc period at the Rice University in Houston, Texas, he became an Assistant Professor at Würzburg University. From 1985 to 1994 he was a member of the Electrical Engineering Faculty at Rice University. In 1994 Dr. Sauerbrey accepted a position as a Professor of Physics at the Friedrich-Schiller-University in Jena, Germany. From 2002 to 2004 he was also the President of the German Physical Society. Since April 2006 he has been the Scientific Director of the Forschungszentrum Dresden-Rossendorf and he simultaneously holds a professorship for quantum optics at the Technical University of Dresden. Dr. Sauerbrey's scientific work is mainly concerned with the interaction of intense laser light with matter as well as laser development.

17:05 to 17:50

High Power Fiber Lasers for Defence Applications

Markus Jung, Rheinmetall Defence, Germany
Presented by: **Michael Gowin,** Rheinmetall Defence, Germany

Lasers are widely used for defence and sensor applications ranging from laser range finders, LIDAR, obstacle avoidance systems for helicopters, explosive detection. High power lasers are developed for use in Air Defence, UXO, DIRCM applications deployed to operate on stationary sites, ships, vehicles, airborne platforms against various threats from missiles, UAV's, mortars to speed boats.

Laser technology has shifted from gas lasers to diode pumped solid state laser DPSSL in the last decade, in order to fulfil the demanding requirements of these applications regarding optical output power, beam quality, power efficiency, wavelength selection and ruggedness.

An attractive and power scalable DPSSL concept for these applications is based on rare-earth-doped optical fibers. By using large mode area fibers continuous laser power in the 10kW range combined with beam qualities close to fundamental mode operation have been demonstrated. Compact, reliable fiber laser systems with wall plug efficiencies above 25% are commercially available and have been used in laser weapon demonstrations world wide.

The contribution will discuss in particular the requirements for defence applications and give a compressed review on science and technology of fiber lasers and amplifiers. The prospects for future developments in power scaling of fiber lasers and beam combining technologies will be discussed.

Biography: **Markus Jung** received the Dipl.-Ing. degree in electrical engineering from the University of Karlsruhe in 1990 on optical communication.

For this further graduation he started working at the DLR Institute of Technical Physics in Stuttgart on the field of pulsed CO2 Lasers. Investigations on different excitation technologies like RF and electron beams and other pulsed power technologies were performed. Fast thyristors for generating pulsed excitation of the Laser medium were studied. Beside his work on excitation he investigated the temporal and spatial Laser beam profile during the optical pulse generation.

In 1996 he successfully demonstrated with the team a pulsed CO2 laser with an optical energy of 100 J /shot and a repetition rate of 100 pps.

He received his Dr.-Ing. degree from the University of Karlsruhe for his work on Q-switched High Power CO2 Laser. Since 1997 Markus Jung has been with Rheinmetall Waffe Munition GmbH in Unterlüß, he started in the field of developing pulsed power systems, with pulsed energies up to 1 MJ and peak voltages above 1 MV. He established the High Power Electromagnetics area at Rheinmetall Waffe Munition.

In 2008 he became the head of the R&D department Directed Energy and has been responsible for the laser research program. The research is focused on coupling technologies for high power lasers, beam forming, tracking, compensation of the atmospheric influence and system aspects. He is has been responsible for the live fire laser demonstration of Rheinmetall Waffe Munition since 2010 in Switzerland.

In 1999 he joined the IEEE Electromagnetic Compatibility (EMC) and the Optical Science (OS) society. Since February 2012 he has been a Senior Member of the IEEE.

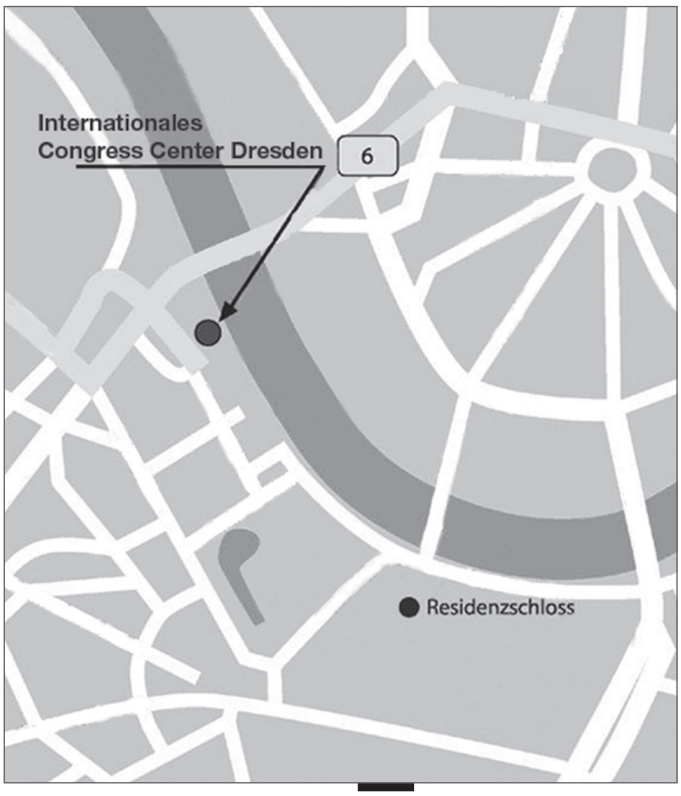
Biography: **Michael Gowin** received his Ph.D. in Physics from the University of Bonn, Germany, in 2001 on laser and accelerator physics. Since 2002 Michael Gowin has been with Rheinmetall Waffe Munition GmbH in Unterlüß. From 2002 till 2011 he has been working for the laser research program in different functions. Starting as technical project leader for several medium and high power laser projects, he became group leader of the laser team in 2008. Since 2013 he is working for Business Development as the consultant for Pre Futureristic Technology and Safety-Management.

Special Events

Welcome Reception
Residenzschloss Kleiner Schlosshof

Monday 23 September. . . . . .19:00 to 21:30

All attendees are invited to relax, socialize, and enjoy light refreshments. Please remember to wear your conference registration badges. Dress is casual.



Poster Session
Exhibition Hall Mezzanine Level

Tuesday 24 September . . . . . .17:40 to 19:10

All symposium attendees are invited to attend Tuesday poster session provided as an opportunity to enjoy networking and refreshments while reviewing poster papers. Posters will be on display Monday through Thursday noon. Poster presenters may begin posting their poster papers starting at 10.00 hrs on Monday in the designated Conference Area. Each poster presenter is provided a space 0.95 x 1.20m in which to display a summary of the paper. Poster authors are requested to attend the official poster session and should be at their papers on Tuesday from 17.40 to 19.10 hrs to answer questions from attendees. Poster presenters who have not set up by 17.40 on Tuesday will be considered a “no show” and their manuscript will not be published. The posters space will be available through Thursday noon. At that time all posters must be removed. SPIE assumes no responsibility for posters left up after 12:00 pm on Thursday. Any papers left on the boards at that time will be considered unwanted and will be discarded. Attendees are requested to wear their conference registration badges to the poster sessions.

Fraunhofer Company Visit
Jena, Germany

Friday 27 September . . . . . .9:00 to 17:00

At the occasion of SPIE Security + Defence and Remote Sensing this coming September in Dresden, Germany, the Fraunhofer IOF Institute would like to use this opportunity and invite all interested experts to a lab tour and demonstrations.

Within Fraunhofer, the following can be seen:
- 3D data acquisition for biometrics
- Fiber laser systems
- Precision optics for earth observation systems
- Infrared optics

The Fraunhofer IOF possesses comprehensive expertise in the entire process chain from the design of optical components and systems all the way to system integration. Developments include miniaturized imaging and projection systems for communication and safety, mirror systems for astronomy and aerospace, laser systems for materials processing, as well as 3D measuring systems for quality assurance, criminology and medicine. The optical components and systems of the Fraunhofer IOF cover the entire spectral range starting from extreme ultraviolet up to terahertz.

FREE with conference registration, sign-up required; space for up to 50; first come-first served. Please use the relevant tickbox on the event registration form.

For registration details please check with the registration desk.

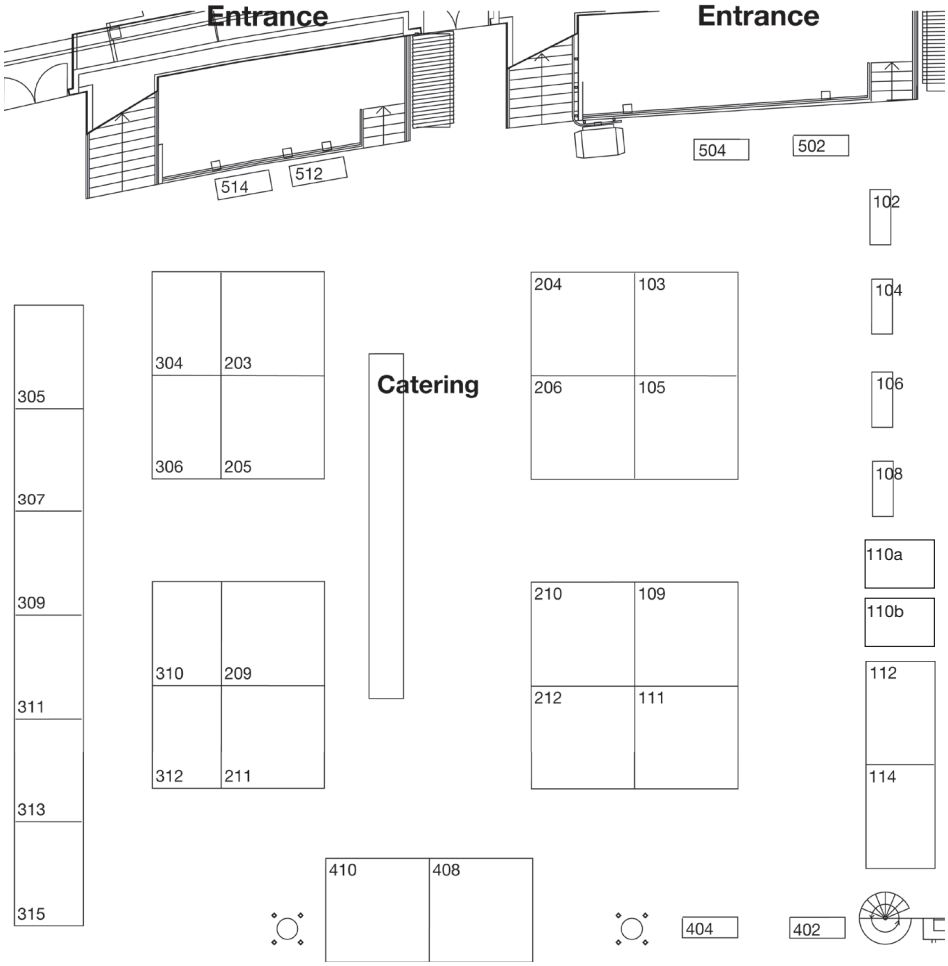
Exhibition Guide

Don’t miss Europe's top Security + Defence Exhibition

Exhibition Hours

Internationales Congress Center Halls 4-5

Tuesday 24 September • 10:00 to 17:00
Wednesday 25 September • 10:00 to 16:00



Exhibitor List *(Current as of 8/28/2013)*

Company Name	Booth #
3S PHOTONICS S.A.S	104
ABB Analytical Measurement	204
ACAL BFi Germany GmbH	212
AIM INFRAROT-MODULE GmbH	114
atumLASER GmbH	108
Bruker Optik GmbH	105
Carl Hanser Verlag GmbH & Co. KG	110a
CeramOptec GmbH	112
DILAS Diodenlaser GmbH	504
Electro Optics	110b
Fraunhofer-IOF	512
Geosense	205
Gooch & Housego PLC	310
Hellma Materials GmbH	305
HGH Systèmes Infrarouges	312
HÜBNER GmbH	210
IRnova AB	111
Laser Components GmbH	304
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3S PHOTONICS S.A.S. #104

Route De Nozay, Marcoussis, 91460 France
+33 1 6980 5883; fax +33 1 6980 5884
sales@3spgroup.com; http://www.3spgroup.com/

Featured Product: Fiber lasers and amplifiers at 1.0µm, 1.5µm and 2.0µm , pump diodes, seeders & fused components

3SP Group is a leading provider of innovative optical products and solutions for laser, sensor, industrial and telecommunication markets. 3SP Group designs and manufactures high power fiber lasers and amplifiers at 1.0µm 1.5µm and 2.0µm, pto cover telecom, industrial, scientific, medical and LIDAR applications. 3SP Group also provides a complete range of pump diodes in the 980nm range up to 950mw, seeders at 1030nm and 1064nm, and fused components such as FBGs, multimode combiners and MFA. Contact: BRUNO LEFEVRE, Sales Director Europe, blefevre@3spgroup.com

ABB Analytical Measurement #204

SPIE Corporate Member

585 blvd Charest Est Ste 300, Québec, QC, G1K 9H4 Canada
+418 877 2944; fax +418 877 2834
http://www.abb.com/analytical

Featured Product: MR Series, an FT Spectroradiometers and new MR-I, an FT-IR hyperspectral imaging spectroradiometer

ABB continues to set the standards for FT-IR Spectroradiometry used in atmospheric sounding, military targets IR signature characterization and gas detection. ABB also develops solutions with reliable airborne and spaceborne optical instruments, infrared calibration systems, hyperspectral imagers, and software for ground segments and simulation. ABB counts several projects in Defense & Security and Space success stories, positioning her at the forefront of the Remote Sensing Industry. Contact: Christian Vallieres, usiness Development Manager - Defence & Security, christian.a.vallieres@ca.abb.com

Acal BFi Germany GmbH #212

Oppelner Str 5, Gröbenzell, 82194 Germany
+49 8142 6520 0; fax +49 8142 6520 190
sales.de@acalbfi.com; http://www.acalbfi.de

Featured Product: Hyper-Cam: Hyperspectral MWIR and LWIR Imaging System for Remote Sensing applications

Acal BFi is Europe's leading provider of advanced technology solutions, operating in 11 countries throughout Europe, China and South Korea. We offer products across twelve specialist technology areas, such as photonics, fiber optics, high-frequency components, sensors, power supplies, magnetic components, imaging and wireless M2M modules.Customers use our design-led expertise and expert consultation services to find the best technology solutions for their design, prototype and production needs.

AIM INFRAROT-MODULE GmbH #114

Theresienstr 2, Heilbronn, 74072 Germany
+49 7131 6212 0; fax +49 7131 6212 929
info@aim-ir.de; http://www.aim-ir.com

Featured Product: MCT SWIR modules, MCT 640x512 MWIR for HOT applications, MBE-grown MCT 640x512 MW or LW modules

AIM is a leading supplier of advanced IR-detectors and Stirling cryocoolers. Modules with outstanding E/O performance, stable NUC coefficients and minimum size, weight and power meet the requirements of most challenging military and space applications. AIM provides cooled detectors from VIS-NIR to VLWIR based on MCT- and T2SL-technology. MBE-technology is introduced for 3rd Gen or cost reduction by alternative substrates. Highly efficient coolers are available for HOT and 3rd Gen applications. Contact: Rolf Muenter, Head of Business Development, rolf.muenter@aim-ir.de; Harald Ehrler, Key Account Manager, harald.ehrler@aim-ir.de

atumLASER GmbH #108

Am Schlangengraben 16, Berlin, 13597 Germany
+1 49 30 33774 0; fax +1 49 30 33774 477
contact@atum-laser.com; www.atum-laser.com

Featured Product: atumLASER offers cw-pumped and pulsed-pumped Q-switched DPSS Nd:YAG and Nd:YLF laser beam sources.

atumLASER develops and produces diode pumped solid-state laser for industrial and scientific applications. Our laser beam sources are used in different applications and industries: machining, semiconductor, electronics fabrication, scientific as well as defense and remote sensing (LIDAR) Contact: Manuel Toplak, Key Account Manager, manuel.toplak@atum-laser.com

Bruker Optik GmbH #105

Rudolf-Plank-Str 27, Ettlingen, 76275 Germany
+49 7243 504 2000; fax +49 7243 504 2050
info@brukeroptics.de; http://www.bruker.com/optics

Bruker is the leading manufacturer and worldwide supplier of Infrared, Near Infrared and Raman Spectrometers for various industries and applications including Remote Sensing. The HI 90 represents a state of the art high performance Hyperspectral Imaging System in Bruker's broad remote sensing product line, which also consists of the remote sensing spectrometer EM 27, the Scanning Infrared Gas Imaging System SIGIS 2 and the Open Path Spectrometer OPS.

PROMOTIONAL PARTNER

Carl Hanser Verlag GmbH & Co. KG #110A

Kolbergerstr 22, Muenchen, 81679 Germany
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CeramOptec GmbH #112

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We offer a broad range of fibers and cables for industrial application as well as fiber bundles for spectroscopy, laser application, sensor technology etc. For further information see www.ceramoptec.com

DILAS Diodenlaser GmbH #504

SPIE Corporate Member

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+49 6131 9226 0; fax +49 6131 9226 257
sales@dilas.de; http://www.dilas.com

Featured Product: diode lasers

Founded in 1994 in Mainz, Germany, with operations in North America and China, DILAS, the diode laser company, designs, develops and manufactures high-power semiconductor laser components, modules and turn-key diode laser systems, including fiber-coupled products, for worldwide distribution. For more information about DILAS, visit our website at www.DILAS.com. Contact: Dr. Jörg Neukum, Director Sales & Marketing, sales@dilas.de

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Electro Optics #110B

Clifton Ct Unit 9, Cambridge, CB1 7BN United Kingdom
+44 1223 275 462; fax +44 1223 211 107
info@europascience.com; http://www.europascience.com/

Featured Product: Electro Optics is available in print and digital formats free to qualifying individuals

Electro Optics is Europe's leading magazine and website for the photonics industry. Its unrivalled pan-European coverage ensures photonics engineers, integrators and innovators are kept informed of the latest trends, opinions and technologies that shape the business of photonics. Independently-written, in-depth features lead our high quality editorial content, supported by a regularly updated website packed with need-to-know information for those in the European photonics industry. Contact: Warren Clark, Publishing Director, warren.clark@europascience.com; Jon Hunt, Advertising Sales Manager, jon.hunt@europascience.com

Fraunhofer-IOF #512

Albert-Einstein-Str. 7, Jena, 07745 Germany
+49 36 41 807 0; fax +49 36 41 807 600
info@iof.fraunhofer.de; www.iof.fraunhofer.de

Geosense #205

Leertendijk 8 SE, Den Ham, 7683 Netherlands
+31 546 673 734
goossens@geosense.nl; http://www.geosense.nl/

Featured Product: Remote Sensing, Field spectroscopy, Hyperspectral imaging, Unmanned airborne surveying

GEOSENSE is a reputable remote sensing consultant specialised in Satellite& Airborne remote sensing and field spectroscopy. Ours services include: Processing of optical imagery such as Landsat, Aster, Ikonos, Quickbird, GeoEye and WorldView2; Custom made Colour Composites, Ortho-images, Digital Elevation Models, topographic basemaps etc.; Spectral analysis, Alteration Mapping and Target Generation; Specialists in mining and environmental monitoring; Unmanned airborne surveying Contact: marc goossens, director, goossens@geosense.nl

Gooch & Housego #310

SPIE Corporate Member

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Hellma Materials GmbH #305

Moritz-von-Rohr-Str 1, Jena, 07745 Germany
+49 3641 2877; fax +49 3641 2877 203
info.materials@hellma.com; www.hellma-materials.com

Featured Product: Calcium Fluoride crystals (max. 440 mm dia), Barium Fluoride crystals, Radiation Detection crystals

Hellma Materials produces high quality materials for various optical applications from deep UV to IR. Continuing the Calcium Fluoride business of Schott Lithotec, we supply to diverse markets including Microlithography, Excimer Laser Optics, Analytical Instrumentation, Astronomy, Defense and more. Radiation detection materials from Hellma Materials enable high resolution and high sensitivity detection of nuclear radiation. Contact: Daniel Hahn, Area Sales Manager, daniel.hahn@hellma.com

HGH Systèmes Infrarouges #312

10 rue Maryse Bastié, Igny, 91430 France
+33 1 69 35 47 70; fax +33 1 69 35 47 80
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Featured Product: New Blackbody reference sources with high speed temperature stabilization time

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Hübner GmbH #210

Heinrich-Hertz-Str. 2, Kassel, 34123 Germany
+49 56 1998 0; fax +49 56 1998 1515
info@hubner-germany.com; http://www.hubner-germany.com

Featured Product: T-SENSE T-COGNITION C-WAVE

The Terahertz Imager T-SENSE visualizes enclosed hazardous substances precisely in letters as well as small parcels safely and effectively. With the Terahertz Spectrometer T-COGNITION hidden drugs or explosives can be identified with reliability and precision. The concept of C-WAVE allows to build sources for tunable continuous-wave emission from 450-650 nm and 900-1300 nm. Contact: Thorsten Sprenger, Head of R&D Public Security, publicsecurity@hubner-germany.com; Daniel Hübsch, Project Manager R&D Public Security, publicsecurity@hubner-germany.com

IRnova AB #111

Electrum 236, Kista, 164 40 Sweden
+46 8 793 66 23; fax +46 8 750 54 30
info@ir-nova.se; http://www.ir-nova.se

Featured Product: IR detectors

IRnova develop and supply high quality, high performance infrared detectors and related components to infrared module, camera and system manufacturers all over the world. The combination of experienced personnel, long track record with thousands of supplied detectors and well-established manufacturing process with high yield and capacity results in cost-effective production and deliveries of high quality and reliable performance detectors. Contact: Lars Karlsson, VP Sales & Marketing, lars.karlsson@ir-nova.se

Laser Components GmbH #304

SPIE Corporate Member

Werner-von-Siemens-Str. 15, Olching, 82140 Germany
+49 8142 2864-0; fax +49 8142 2864-11
info@lasercomponents.com; http://www.lasercomponents.com/de/

Featured Product: Opto-electronic components for rangefinding applications: Pulsed laser diodes, avalanche photodiodes

LASER COMPONENTS is specialized in the development, manufacture, and sale of components and services for the laser and opto-electronics industries. With sales offices in four different countries, the company has served its customers since 1982. In-house production at six locations in Germany, Canada, and the USA began in 1986 and is meanwhile responsible for about half of its turnover. Currently, the family-run business employs more than 150 people worldwide.

LOT-QuantumDesign GmbH #408

Im Tiefen See 58, Darmstadt, 64293 Germany
+49 6151 88060; fax +49 6151 896667
info@lot-qd.de; http://www.lot-qd.de

Featured Product: NIR / IR cameras; Hyperspectral cameras; Polarizer

For over 40 years, LOT-QuantumDesign has been one of the leading technical sales and service companies in Europe. Our product range comprises components and unique state-of-the-art systems for material characterization, thin film analysis, imaging, spectroscopy, photonics, bio- and nanotechnology. Our headquarters including a well-equipped application lab are in Darmstadt, Germany. Contact: Stefan Wittmer, Productmanager, wittmer@lot-qd.de

MWTechnologies, Lda #402

R Eng Frederico Ulrich, 2650, Maia, 4470-605 Portugal
+351 220 168 902
info@mw-technologies.com; http://www.mw-technologies.com

Featured Product: Pulsed Fiber Lasers, Optical ASE Sources, Optical Amplifiers, compact Laser Diode Driver

MWTechnologies offers innovative optical sources based on fiber-optic technologies, as well as product design, product development and engineering services aimed at developing and selling cost-effective and reliable products and solutions that fulfill customer needs. Contact: Miguel Melo, info@mw-technologies.com

Nanomotion Ltd #306

HaYetsira St PO Box 223, Mordot HaCarmel Industrial Park
Yokneam, 20692 Israel
+972 732498000; fax +972 732498099
nano@nanomotion.com; www.nanomotion.com

Featured Product: RS08 Silent Rotary Piezo Shutter, Linear IR Shutter, Filter changers, OIS stages

Nanomotion specializes in small motion modules used for linear and rotary shutters & filter changers that optimize SWaP and operate silently, based on our ultrasonic piezo techology. Small XY optical image stabilization stages are used for laser steering or image stabilization. NanoGimbal is a miniature pan & tilt module that provides gryo stabilized pan and tilt motion for moving sensors or mirrors. Nanomotion provides motor & drive component level solutions and complete solutions

Nufern #307

SPIE Corporate Member

7 Airport Park Rd, East Granby, CT, 06026-9523 United States
+860 408 5000; fax +860 844 0210
info@nufern.com; http://www.nufern.com

Featured Product: High Power Fibers & Fiber Amplifiers

Nufern is a leading U.S. manufacturer of specialty optical fibers, gyro coil winding, fiber lasers and amplifiers serving diverse markets. Current products include over 300 standard fibers and range from sub-assemblies to complete turn-key fiber systems from mW to kW power levels. Nufern's integrated teams also provide rapid, cost-effective OEM fiber laser design, assembly and contract manufacturing. Contact: Andrzej Szkotnicki, Sales & Application Engineer - EU, aszkotnicki@nufern.eu; Peter Pietrzak, Sales & Application Engineer - EU, ppietrzak@nufern.eu

Ocean Optics B.V. #410

Geograaf 24, Service and Support, Duiven, 6921 EW Netherlands
+31 26 319 0500; fax +31 26 319 0504
info@oceanoptics.eu; http://www.oceanoptics.eu

Ocean Optics is the inventor of the world's first miniature spectrometer and a global leader in photonics for research, life sciences, quality assurance, education and OEM applications. Ocean Optics' extensive line of technologies includes spectrometers, chemical sensors, metrology instrumentation, optical fibres and thin films and optics. Recognized as an industry innovator, Ocean Optics has specified and delivered over 150,000 modular miniature spectrometers and systems throughout the world. Contact: Danielle Ravenshorst, Marketing Manager, danielle.ravenshorst@oceanoptics.eu

PROMOTIONAL PARTNER

optics.org #311

2 Alexandra Gate, Ffordd Pengam, Cardiff, CF24 2SA United Kingdom
+44 117 905 5330; fax +44 117 905 5331
rob.fisher@optics.org; www.optics.org

Optics.org is the longest-running online resource targeted toward OEMs and system integrators in the core growth markets for photonics applications, and is your gateway to thousands of potential new customers looking to buy your products and services. From LEDs to industrial lasers and from sensing to microscopy, optics.org covers all the latest company, product and business news as well as in-depth articles on product application and market analysis. Contact: Robert Fisher, Head of Sales and Marketing, rob.fisher@optics.org

Opto Engineering #309

Via Cremona 29/2, Mantova, 46100 Italy
+39 0376 263 525; fax +39 0376 262 432
info@opto-engineering.com; www.opto-engineering.com

Opto-E #309

Laser & Infrared Optics Division Opto Engineering,
Via Cremona 29/2, Mantova, 46100 Italy
+39 0376 263 525; fax +39 0376 262 432
info@opto-engineering.com; www.opto-e.com

Opto-E is the Infra-red and Laser optics division of Opto-Engineering s.r.l. Opto-E designs, manufactures and markets precision IR and Laser optical systems for a wide variety of applications, spanning from commercial to industrial, medical and military applications. Opto-E products include near-visible SWIR and MWIR, LWIR thermal imaging lens assemblies in addition to F-theta lenses for laser marking/ scanning. Moreover Opto-E provides customized lenses for infra-red cameras, thermograph applications and custom laser optics, specifically designed to fit your application. We pride ourselves on providing innovative, quality and reliable optical assemblies in addition to precision custom solutions that meet our customers' specific challenging needs. Thanks to our 10-years experience in providing custom solutions for machine vision applications, we combine optics, mechanics and electronics to solve our customers' most challenging integration problems. Passion for new optics development stands behind all our products, from the simplest optical component to the most complex integrated optical assembly. Our goal is to help you solve your vision problem, whether the optical solution is required for a commercial application, a laboratory environment or the most challenging defense applications.

OptroMech Ltd. #404

POB 10439, Petach-Tikva, 49003 Israel
+972 503 502808; fax +972 2 5814457
ziv.goren@optromechcom; http://www.optromech.com

OptroMech specializes in providing premium, state of the art, mechanical design and consultant services for the electro-optics industry. We excel in design of precision mechanisms for a large variety of products and industries, with exceptional expertise in optronics and opto-mechanics. We have worked with Elbit Systems, Temmek Optics, RP Optical, irZoom, and many others that recognized the advantages of working with a professional, responsive design team to meet the most demanding challenges. Contact: Ziv Goren, CEO, ziv.goren@optromech.com

Exhibitor Listings

Photron (Europe) Ltd. #209

Bottom Rd, The Barn, West Wycombe Bucks,
HP14 4BS United Kingdom
+44 1494 481011; fax +44 1494 487011
info@photron.com; http://www.photron.com

Featured Product: Photron, the leading name worldwide in high speed imaging:

Used in internationally renowned research facilities more than 30 countries worldwide, Photron FASTCAM high speed cameras are trusted to provide high quality results in the most challenging applications and environments. Photron continues to utilise the latest technological innovations to further advance product performance in order to meet the most demanding requirements from users around the world. Specialist high-speed imaging applications knowledge. Photron's specialist applications engineers have a wealth of knowledge and experience in demanding imaging requirements and are able to advise both new and experienced users on High-speed imaging solutions and imaging techniques to achieve the optimum results. Cameras which are recommended for Ballistic/Security High-Speed Applications: FASTCAM SA-X2; Range Version FASTCAM SA5, SA1.1 & SA4; HIGH G - FASTCAM MH-4 : 4 cameras heads. Contact: Phil Holloway, Sales and Applications Engineer, pholloway@photron.com

Pixelteq, Inc. #315

Geograaf 24, Duiven, 6921 Netherlands
+31 263831707; fax +31 263190505
info@pixelteq.com; http://www.pixelteq.com/

QUANTEL #211

2 bis avennue du Pacifique, BP 23, Les Ulis Cedex, 91941 France
33 1 6929 1700; fax 33 1 6929 1729
quantel@quantel.fr; http://www.quantel-laser.com

A key international player in the solid-state laser industry since 1970, Quantel offers a wide range of products that meet the requirements of both industrial, scientific and military applications: Pulsed solid-state lasers (Nd:YAG and Nd:Glass); Fiber lasers; High power laser diodes. Quantel can also design and manufacture custom lasers to meet specific customer application requirements Contact: Olivier Rabot, Program & Diodes Director, olivier.rabot@quantel-diodes.com

Raptor Photonics #103

Millbrook Larne, Willowbank Business Park, Co Antrim N Ireland,
BT40 2SF United Kingdom
+44 2828 270141; fax +44 2828 275685
info@raptorphotonics.com; www.raptorphotonics.com

Raptor Photonics offers a full line of high performance, rugged ultra-low light cameras, which are optimized for day/night surveillance, homeland security, industrial and scientific applications. Raptor specializes in complete cameras and core engine solutions using CCD, EMCCD, SCMOS and SWIR sensors. The extreme low light capability of Raptor's cameras makes them ideal in a variety of applications, including Border & Coastal Surveillance, Airport & Port Surveillance and Airborne/Land EO systems.

RP Optical Lab. #106

5 Shimshon St, Bldg B, Petach Tikva, 49517 Israel
+972 3 505 7436; fax +972 9 199 878
info@rp-optical-lab.com; http://www.rp-optical-lab.com

Featured Product: A new and innovative line of SWIR, MWIR and LWIR lenses for different applications.

RP Optical Lab is a leading company in the field of developing and producing Electro-Optical modules. RP specializes in the field of thermal imaging. RP is involved in the defense, homeland security, commercial and medical markets. The company has in-house innovative design and engineering, resulting in the fastest time to market available. At RP one will find the ultimate combination between a company with top of the line products and flexible and dedicated business partners. Contact: Vadim Edelman, Projects & Marketing Manager, vadim@rp-optical-lab.com

SCHOTT AG #203

SPIE Corporate Member

Hattenbergstrasse 10, Mainz, 55122 Germany
+49 6131 66 0; fax +49 6131 66 2000
info@schott.com; http://www.schott.com/

SCHOTT with its approximately 16,000 employees in 35 countries has been supplying high-tech materials, components and systems for defense and security applications for more than 125 years. Proven products and solutions in the areas of window systems, optical material and components, hermetic glass-to-metal seals as well as fiber optics and LED increase the safety and efficiency of military forces all over the world. By land. By air. By sea. By SCHOTT. Contact: Gernot Weber, Sales Manager, gernot.weber@schott.com; Stefan Haase, Manager Protection, stefan.haase@schott.com

SOFRADIR #109

BP 21, Veurey-Voroize, 381113 France
+33 4 76 28 77 00; fax +33 4 76 53 85 97
www.sofradir.com

Sofradir is the number one developer and manufacturer of a key class of infrared (IR) detectors for military, space and industrial applications. It specializes in cooled IR detectors based on a sophisticated high performance technology, MCT to which InSb, InGaAs and QWIP technologies are now added. Its vast product portfolio of scanning and staring arrays covers the entire infrared spectrum, from near infrared to very far infrared. Contact: Marc Larive, Marketing Manager, Marc.larive@sofradir.com

Soliton Laser-und Messtechnik GmbH #514

Talhofstr 32, Gilching, 82205 Germany
+49 8105 7792 0; fax +49 8105 7792 77
info@soliton-gmbh.de; http://www.soliton-gmbh.de

Spectrogon AB #102

SPIE Corporate Member

Tillverkarvägen 1, Täby, 187 12 Sweden
+46 8 638 28 00; fax +46 8 638 28 08
sales.se@spectrogon.com; http://www.spectrogon.com

SphereOptics GmbH #206

Bergstr 36, Uhldingen, 88690 Germany
+49 7556 9299 666; fax +49 7556 5108
info@sphereoptics.de; http://www.sphereoptics.de

SPIE Digital Library #502

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Astronomy
Hellma Materials GmbH
SCHOTT AG

Basic Research, Science
3S PHOTONICS S.A.S.
atumLASER GmbH
Bruker Optik GmbH
HGH Systèmes Infrarouges
Laser Components GmbH
LOT-QuantumDesign GmbH
Nufern

Biomedical, Medical Imaging, Health Care
DILAS Diodenlaser GmbH
Hübner GmbH
MWTechnologies, Lda
Nanomotion Ltd.

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Hellma Materials GmbH
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LOT-QuantumDesign GmbH
Nanomotion Ltd.
RP Optical Lab.

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Nufern

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Consulting Services
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atumLASER GmbH
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DILAS Diodenlaser GmbH
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Hellma Materials GmbH
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Detectors, Sensors
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Hellma Materials GmbH
Hübner GmbH
Laser Components GmbH
Nanomotion Ltd.
Nufern

Displays: Consumer, Information, Entertainment
DILAS Diodenlaser GmbH

Distributor, Reseller, Integrator
Geosense

Earth Sciences, Environmental Monitoring, Climate
Bruker Optik GmbH
Geosense

Education and Training
MWTechnologies, Lda

Electronic Components
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Fiber Optics and Accessories
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Gooch & Housego
Laser Components GmbH
MWTechnologies, Lda
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Industrial Sensing and Measurement
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Hübner GmbH
Laser Components GmbH
Nanomotion Ltd.

Laser Components and Accessories
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Hübner GmbH
Laser Components GmbH
MWTechnologies, Lda

Laser Industry
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DILAS Diodenlaser GmbH
Hübner GmbH
Laser Components GmbH
MWTechnologies, Lda
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Lasers and Systems
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DILAS Diodenlaser GmbH
Gooch & Housego
MWTechnologies, Lda
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LED, OLED, non-laser Light Sources
Hübner GmbH

Lighting and Illumination
SCHOTT AG

Lithographic Equipment
Hellma Materials GmbH
Nanomotion Ltd.

Machine Vision, Factory Automation
Nanomotion Ltd.

Materials Processing, Lasers in Manufacturing
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atumLASER GmbH
DILAS Diodenlaser GmbH
Laser Components GmbH

Materials, Abrasives, Chemicals
Hellma Materials GmbH

Optical Coatings, Thin Films
Laser Components GmbH

Optical Communication, Networking Devices
3S PHOTONICS S.A.S.

Optical Components - Filters, Mirrors, Other
Gooch & Housego
Hellma Materials GmbH
SCHOTT AG

Optical Components - Lenses
Laser Components GmbH
SCHOTT AG

Optical Design and Engineering
RP Optical Lab.

Optics Manufacturing
HGH Systèmes Infrarouges

Positioning Equipment, Motion Control and Accessories
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Publishers, Associations, Clusters, Societies
Electro Optics
optics.org

Spectroscopy Devices and Equipment
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Geosense

Test and Measurement, Metrology
Gooch & Housego
HGH Systèmes Infrarouges

Vacuum, Cooling, Gas Handling Equipment
AIM INFRAROT-MODULE GmbH

SPIE Remote Sensing

Conference: 23–26 September 2013
Internationales Congress Center
Dresden, Germany

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Marine-Environmental Optics Lab &
Remote Sensing Center,
Florida Institute of Technology
(United States)
2013 Symposium Chair

Ulrich Michel
University of Education Heidelberg,
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Remote Sensing for Agriculture, Ecosystems, and Hydrology XV

Conference Chairs: **Christopher M. U. Neale,** Utah State Univ. (United States); **Antonino Maltese,** Univ. degli Studi di Palermo (Italy)

Programme Committee: **Guido D'Urso,** Univ. degli Studi di Napoli Federico II (Italy); **Goffredo La Loggia,** Univ. degli Studi di Palermo (Italy); **Katja Richter,** Ludwig-Maximilians-Univ. München (Germany); **Francesco Vuolo,** Univ. für Bodenkultur Wien (Austria)

Tuesday 24 September

OPENING REMARKS

Room: Konferenz 3 . . . . . .8:30 to 8:40

SESSION 1

Room: Konferenz 3 . . . . . Tue 8:40 to 10:00

Forest Monitoring

Session Chair: **Christopher M. U. Neale,** Utah State Univ. (United States)

8:40: **Assessing the potential of hyperspectral imagery to map bark beetle-induced forest damages**, Fabian Fassnacht, Albert-Ludwigs-Univ. Freiburg (Germany); Hooman Latifi, Julius-Maximilians-Univ. Würzburg (Germany); Aniruddha Ghosh, Pawan Kumar Joshi, TERI Univ. (India); Barbara Koch, Albert-Ludwigs-Univ. Freiburg (Germany) . . . . . [8887-1]

9:00: **Spatial and temporal uncertainty source analysis for Lidar driven individual tree growth projections**, George Z. Gertner, Univ. of Illinois at Urbana-Champaign (United States) . . . . . [8887-2]

9:20: **Mapping tropical rainforest canopies using multi-temporal spaceborne imaging spectroscopy**, Ben Somers, VITO NV (Belgium); Gregory P. Asner, Carnegie Institution for Science (United States) . . . . . [8887-3]

9:40: **Optimization of spectral bands for hyperspectral remote sensing of forest vegetation**, Yegor V. Dmitriev, Institute of Numerical Mathematics (Russian Federation); Vladimir V. Kozoderov, Lomonosov Moscow State Univ. (Russian Federation) . . . . . [8887-4]

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

SESSION 2

Room: Konferenz 3 . . . . . Tue 10:30 to 12:10

Classification and Change Detection

Session Chair: **Christopher M. U. Neale,** Utah State Univ. (United States)

10:30: **Alternating least-squares unmixing for the extraction of sub-pixel information from agricultural areas**, Laurent Tits, Katholieke Univ. Leuven (Belgium); Ben Somers, VITO NV (Belgium); Wouter Saeys, Pol Coppin, Katholieke Univ. Leuven (Belgium) [8887-7]

10:50: **Ingesting MODIS land surface classification into AOD retrievals**, Barry M. Gross, Adam Atia, The City College of New York (United States); Ana J. Picon, U.S. Patent and Trademark Office (United States); Fred Moshary, The City College of New York (United States) . . . . . [8887-5]

11:10: **Using high resolution CIR imagery in the classification of non-cropped areas in agricultural landscapes in the UK**, Jerome O'Connell, Ute Bradter, Tim Benton, Univ. of Leeds (United Kingdom) . . . . . [8887-6]

11:30: **Integrated analysis of ASTER and Landsat data to map land cover change using vegetation indices**, Wafa T. Nori, Univ. of Kordofan (Sudan); Elmar Csaplovics, Technische Univ. Dresden (Germany) . . . . . [8887-8]

11:50: **Analysis of urban heat island and NDVI changes in Nanning City based on Landsat TM and HJ data**, Zhenghua Chen, Guangxi Univ. (China) . . . . . [8887-9]

Lunch/Exhibtion Break . . . . . Tue 12:10 to 13:20

SESSION 3

Room: Konferenz 3 . . . . . Tue 13:20 to 15:20

Estuaries, Rivers, Lakes

Session Chair: **Antonino Maltese,** Univ. degli Studi di Palermo (Italy)

13:20: **Estimation of turbidity along the Guadalquivir estuary using Landsat TM and ETM+ images**, Miriam M. Carpintero, Eva Contreras, Univ. de Córdoba (Spain); Agustín Millares, Univ. de Granada (Spain); María José Polo-Gómez, Grupo de Dinámica Fluvial e Hidrología (Spain) . . . . . [8887-10]

13:40: **Comparison of approaches for water surface area segmentation using high resolution TerraSAR-X data for reservoir monitoring in a large semi-arid catchment in Northeast Brazil**, Iris Kleine, Christian Rogass, Helmholtz-Zentrum Potsdam Deutsches GeoForschungsZentrum GFZ (Germany); Pedro H. Medeiros, IFCE (Brazil); Saskia Förster, Helmholtz-Zentrum Potsdam Deutsches GeoForschungsZentrum GFZ (Germany); Nora Meyer zu Erpen, EADS Astrium GmbH (Germany) . . . . . [8887-11]

14:00: **Correlation between the habitats productivity and species richness (amphibians and reptiles) in Portugal, through remote sensed data**, Ana Cláudia M. Teodoro, Univ. de Porto (Portugal); Neftali P. Sillero, Susana Alves, Lia Duarte, Univ. of Porto (Portugal) . . . . . [8887-12]

14:20: **Water surface temperature profiles for the Rhine River derived from Landsat and ASTER data**, Katharina Fricke, Björn Baschek, Bundesanstalt für Gewässerkunde (Germany) . . . . [8887-13]

14:40: **Fluorescence lidar remote sensing of oils: merging spectral and time-decay measurements**, Lorenzo Palombi, David Lognoli, Valentina Raimondi, Istituto di Fisica Applicata Nello Carrara (Italy) . . . . . [8887-14]

15:00: **Assessing distribution patterns, extent and current condition of Mangrove in Iranian coast of Persian Gulf**, Alireza Salehipour Milani, Razyeh Lak, Geological Survey of Iran (Iran, Islamic Republic of) . . . . . [8887-15]

Coffee Break . . . . . Tue 15:20 to 15:50

SESSION 4

Room: Konferenz 3 . . . . . Tue 15:50 to 17:10

Nitrogen and Chlorophyll Assessment

Session Chair: **Antonino Maltese,** Univ. degli Studi di Palermo (Italy)

15:50: **A case study of a precision fertilizer application task generation for wheat based on classified hyperspectral data from UAV combined with farm history data**, Jere Kaivosoja, Liisa Pesonen, MTT Agrifood Research Finland (Finland); Jouko Kleemola, Tmi Jouko Kleemola (Finland); Ilkka Pölönen, Heikki A. Salo, Univ. of Jyväskylä (Finland); Eija Honkavaara, Finnish Geodetic Institute (Finland); Heikki Saari, Jussi H. Mäkynen, VTT Photonic Devices and Measurement Solutions (Finland); Ari Rajala, MTT Agrifood Research Finland (Finland) . . . . . [8887-16]

16:10: **Assessing pasture quality and degradation status using hyperspectral imaging: a case study from western Tibet**, Lukas W. Lehnert, Philipps-Univ. Marburg (Germany); Hanna Meyer, Faculty of Geography, Philipps-University of Marburg (Germany); Nele Me?er, Department of Geography, University of Bonn (Germany); Christoph Reudenbach, Jörg Bendix, Faculty of Geography, Philipps-University of Marburg (Germany) . . . . . [8887-17]

16:30: **Hyperspectral imaging based biomass and nitrogen content estimations from light-weight UAV**, Ilkka Pölönen, Univ. of Jyväskylä (Finland); Heikki Saari, VTT Technical Research Ctr. of Finland (Finland); Jere Kaivosoja, MTT Agrifood Research Finland (Finland); Eija Honkavaara, Finnish Geodetic Institute (Finland); Liisa Pesonen, MTT Agrifood Research Finland (Finland) . . . . . [8887-18]

16:50: **Remote estimation of nitrogen contents of summer corn leaf by hyperspectral reflectance using spectral vegetation indices**, Muhammad Naveed Tahir, Pir Mehr Ali Shah Arid Agriculture Univ. Rawalpindi (Pakistan) and Northwest A&F Univ. (China); Jun Li, Fuqi Yao, Northwest A&F Univ. (China). . . . . [8887-19]

POSTER SESSION
Room: Mezzanine Level Exhibition Hall
Tue 17:40 to 19:10

Conference attendees are invited to attend the Remote Sensing Poster Session on Tuesday afternoon. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. 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. Poster authors, view poster presentation guidelines and set-up instructions on page 6 and at http://spie.org/x32234.xml.

Monitoring and analysis of degradation using remote sensing in semi-arid lands of gash agricultural scheme, Eastern Sudan, Majdaldin Rahamtallah Abualgasim, GWT-TUD GmbH (Germany); Elmar Csaplovics, Technische Univ. Dresden (Germany); Osunmadewa Babatunde Adeniyi, GWT-TUD GmbH (Germany) . . . . . [8887-54]

Evaluation of land ecological environment in Zhoushan islands by remotely sensed impervious surfaces, Xiao Ping Zhang, Delu Pan, Jianyu Chen, The Second Institute of Oceanography, SOA (China) . . . . . [8887-55]

Simulation and forecasting changes of typical lakes in Nam Co Lake in Tibetan Plateau using remote sensing data (1980-2020), Yanhong Wu, Liping Lei, Bing Zhang, Institute of Remote Sensing and Digital Earth (China). . . . . [8887-56]

Poyang Lake wetland classification using time series Envisat ASAR data and Beijing-1 imagery, Lin Wang, Chinese Academy of Fishery Sciences (China) and Institute of Remote Sensing (China) and Poyang Lake Ecological Research Station for Environment and Health (China); Peng Gong, Tsinghua Univ. (China) and Univ. of California, Berkeley (United States); Iryna Dronova, Univ. of California, Berkeley (United States); Yingren Li, Chinese Academy of Fishery Sciences (China) . . . . . [8887-57]

Monte Carlo method based radiative transfer simulation of stochastic open forest generated by circle packing application, Shengye Jin, Masayuki Tamura, Kyoto Univ. (Japan). . . . . [8887-58]

Using the ratio of optical channels in satellite image decoding in monitoring biodiversity of boreal forests, Yurj P. Rozhkov, State Nature Reserve Olekminsky (Russian Federation); Maria Kondakova, Hydrochemical Institute (Russian Federation). . . . . [8887-59]

11-year variability of summer snow cover extent over Himalayas, Jung-Mok Ha, Kyung-Soo Han, Jae-Il Cho, Chang-Suk Lee, Kyoung-Jin Pi, In-Hwan Kim, Jae-Hyun Ryu, Eun-Bin Park, Pukyong National Univ. (Korea, Republic of) . . . . . [8887-60]

Variations of spectral signature profiles of wet and dry targets for supporting the detection of water-leakages using satellite data, Athos Agapiou, Kyriakos Themistocleous, Dimitrios D. Alexakis, Nikolas Kourtis, Cyprus Univ. of Technology (Cyprus); Apostolos Sarris, Foundation for Research and Technology-Hellas (Greece); Paraskevi Perdikou, Frederick Institute of Technology (Cyprus); Diofantos G. Hadjimitsis, Cyprus Univ. of Technology (Cyprus) . . . . . [8887-61]

The thermal inertia approach to map soil water content under sparse vegetation, Antonino Maltese, Fulvio Capodici, Goffredo La Loggia, Univ. degli Studi di Palermo (Italy); Chiara Corbari, Marco Mancini, Politecnico di Milano (Italy) . . . . . [8887-62]

Remote sensing of viral infection of pepper plants (Capsicum annuum L.) using hyperspectral reflectance data, Dora D. Krezhova, Space Research and Technology Institute (Bulgaria); Svetla Maneva, Nikolai M. Petrov, Plant Protection Institute (Bulgaria) . . . . . [8887-63]

Hyperspectral chlorophyll fluorescence technique for early detection of plant disease, Dora D. Krezhova, Space Research and Technology Institute (Bulgaria); Svetla Maneva, Plant Protection Institute (Bulgaria) . . . . . [8887-64]

Comparing the new generation WorldView-2 to hyperspectral image data for species discrimination, Khalid M. Mansour, Univ. of KwaZulu-Natal (South Africa) and Univ. of El-Fashir (Sudan); Onisimo Mutanga, Univ. of KwaZulu-Natal (South Africa). . . . . [8887-65]

Estimating catechin concentrations of new shoots in the green tea field using ground-based hyperspectral image, Chanseok Ryu, Gyeongsang National Univ. (Korea, Republic of); Masahiko Suguri, Shi-bum Park, Mikio Umeda, Kyoto Univ. (Japan) . . . . . [8887-66]

Retrieve leaf area index from HJ-1 CCD Image based on support vector regression and physical model, Jingjing Pan, Hua Yang, Wei He Sr., Peipei Xu, Beijing Normal Univ. (China) . . . . . [8887-68]

Estimation of wheat LAI by assimilating remote sensed data into crop model, Xiaohua Zhu, Lingling Ma, Lingli Tang, ChuanRong Li, Academy of Opto-Electronics (China). . . . . [8887-69]

Spectral reflectance pattern as a method for potato crop characterization, Mohamed Aboelghar, National Authority for Remote Sensing and Space Sciences (Egypt) . . . . . [8887-70]

Spatial variability of sorghum grain yield: site-specific relations of growth factors to irrigation and N-fertilization, Yousef Y. Aldakheel, King Faisal Univ. (Saudi Arabia) . . . . . [8887-71]

Seasonal spectral response patterns of winter wheat canopy for crop performance monitoring, Rumiana Kancheva, Denitsa Borisova, Georgi Georgiev, Space Research and Technology Institute (Bulgaria) . . . . . [8887-73]

Estimating potential soil erosion for environmental services in a sugarcane growing area using multisource remote sensing data, Betty A. Mulianga, Kenya Sugar Research Foundation (Kenya); Agnés Bégué D.D.S., CIRAD (France); Margareth Simoes, EMBRAPA (France); Pierre Todoroff, Pascal Clouvel, CIRAD (France) . . . [8887-74]

Estimation of maximum air temperature using COMS data in Northeast Asia, Jae-Hyun Ryu, Kyung-Soo Han, Pukyong National Univ. (Korea, Republic of); Jae-Il Cho, Pukyoung National Univ. (Korea, Republic of); Chang-Suk Lee, In-Hwan Kim, Kyoung-Jin Pi, Pukyong National Univ. (Korea, Republic of); Jung-Mok Ha, Eun-Bin Park, Pukyoung National Univ. (Korea, Republic of) . . . . . [8887-75]

Aalto spectral imager calibration and qualification for a CubeSat flight, Heikki H. Saari, Kai H. Viherkanto, Antti Näsilä, Christer Holmlund, Jussi H. Mäkynen, Tapani Antila, Rami Mannila, VTT Technical Research Ctr. of Finland (Finland). . . . . [8887-76]

Remote sensing terminology: past experience and recent needs, Rumiana Kancheva, Space Research and Technology Institute (Bulgaria) . . . . . [8887-77]

Urban vegetation land covers change detection using multi-temporal MODIS Terra/Aqua data, Maria A. Zoran, National Institute of Research and Development for Optoelectronics (Romania); Adrian I. Dida, Transilvania University of Brasov (Romania) and Faculty of Forest Sciences (Romania); Ovidiu M. Ionescu, Transilvania Univ. of Brasov (Romania) and Faculty of Forest Sciences (Romania) [8887-78]

Urban thermal environment and its biophysical parameters derived from satellite remote sensing imagery, Maria A. Zoran, Roxana S. Savastru, Dan M. Savastru, Marina-Nicoleta Tautan, National Institute of Research and Development for Optoelectronics (Romania); Laurentiu V Baschir, National Institute of R & D for Optoelectronics (Romania) . . . . . [8887-79]

Isolating and interpreting parcels from remote images as administrative census data, Luis García-Torres, Instituto de Agricultura Sostenible (Spain) . . . . . [8887-80]

Land surface emissivity retrieval from airborne hyperspectral scanner thermal infrared data over different land surfaces, Caixia Gao, Academy of Opto-Electronics (China); Xiaoguang Jiang, Graduate Univ. of Chinese Academy of Sciences (China); Yonggang Qian, Academy of Opto-Electronics (China); Hua Wu, Bohui Tang, Institute of Geographical Sciences and Natural Resources Research (China); Zhaoliang Li, Institute of Agricultural Resources and Regional Planning (China) . . . . . [8887-81]

Monitoring gully erosion at Nyaba river of Enugu state southeastern Nigeria, using remote sensing, Virginia U. Okwu-Delunzu, Enugu State Univ. of Science and Technology (Nigeria); I. C. Enete, Nnamdi Azikwe Univ. (Nigeria); A. S. Abubakar, Federal Univ. of Technology (Nigeria); S. Lamidi, Univ. of Nigeria (Nigeria) . . . [8887-82]

Wednesday 25 September

SESSION 5

Room: Konferenz 3 . . . . . Wed 9:00 to 10:20

Land Characterization

Session Chair: **Christopher M. U. Neale,** Utah State Univ. (United States)

9:00: **Estimating snow albedo patterns in a Mediterranean site from Landsat TM images**, Rafael Pimentel, Javier Herrero, Ctr. Andaluz de Medio Ambiente (Spain) and Grupo de Dinámica Fluvial e Hidrología (Spain); María José Polo-Gómez, Grupo de Dinámica Fluvial e Hidrología (Spain) and Ctr. Andaluz de Medio Ambiente (Spain) . . . . . [8887-20]

9:20: **Variability of the accuracy of fuzzy burned area maps as a function of the parameterization of atmospheric correction**, Saidiazar Ramin, Politecnico di Milano (Italy) and Istituto per il Rilevamento Elettromagnetico dell'Ambiente (Italy); Daniela Stroppiana, Pietro A. Brivio, Mirco Boschetti, Mariano Bresciani, Claudia Giardino, Istituto per il Rilevamento Elettromagnetico dell'Ambiente (Italy) . . . . . [8887-21]

9:40: **ARIN® procedure for the normalization of multitemporal remote images through vegetative pseudo-invariant features**, Luis García-Torres, Instituto de Agricultura Sostenible (Spain) . . . [8887-22]

10:00: **Details of the use of NIR reflectance as a tool for crop monitoring**, Fermin Pascual-Ramirez, Jacovo Morales-Morales, Marcos Perez-Sato, Delfino Reyes-Lopez, Benemérita Univ. Autónoma de Puebla (Mexico) . . . . . [8887-23]

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

SESSION 6

Room: Konferenz 3 . . . . . Wed 10:50 - 12:10

Environmental Monitoring

Session Chair: **Antonino Maltese,** Univ. degli Studi di Palermo (Italy)

10:50: **EO4Water (Earth observation technologies for rural water management): a case study of transferability of satellite-based irrigation advisory services between two agricultural areas**, Francesco Vuolo, Nikoluas Neugebauer, Univ. für Bodenkultur Wien (Austria) . . . . . [8887-24]

11:10: **Strategic system development toward biofuel, desertification and crop production monitoring in continental scales using satellite-based photosynthesis models**, Daijiro Kaneko, Remote Sensing Environmental Monitor, Inc. (Japan). . . . . [8887-25]

11:30: **The predictive models for estimating above ground biomass and stand volume of oil palm plantations using Landsat TM**, Nazlin Asari, Mohd Nazip Suratman, Jasmee Jaafar, Univ. Teknologi MARA (Malaysia). . . . . [8887-26]

11:50: **Forest biomass estimation from the fusion of C-band SAR and optical data using wavelet transform**, Md Latifur Rahman Sarker, Univ. Teknologi Malaysia (Malaysia) . . . . . [8887-27]

Lunch/Exhibition Break . . . . . .Wed 12:10 to 13:40

SESSION 7

Room: Konferenz 3 . . . . . Wed 13:40 to 15:00

Hydrology

Session Chair: **Goffredo La Loggia,** Univ. degli Studi di Palermo (Italy)

13:40: **Using spatio-temporal Marcov model for flood mapping : the case study of Yialias River in Cyprus**, Dimitrios D. Alexakis, Cyprus Univ. of Technology (Cyprus); Aristeidis G. Koutroulis, Manolis Grillakis, Technical Univ. of Crete (Greece); Athos Agapiou, Kyriacos Themistocleous, Cyprus Univ. of Technology (Cyprus); Ioannis Tsanis, Technical Univ. of Crete (Greece); Diofantos G. Hadjimitsis, Cyprus Univ. of Technology (Cyprus) . . . . . [8887-28]

14:00: **Dynamic characterization of the vegetation using remote sensing for hydrological modelling at basin scale**, Elisabet Carpintero García, IFAPA Ctr. Alameda Del Obispo (Spain); María José Polo Gómez, Grupo de Dinámica Fluvial e Hidrología (Spain); María Patrocinio González-Dugo, IFAPA Ctr. Alameda Del Obispo (Spain) . . . . . [8887-29]

14:20: **Spatial processing techniques for satellite altimetry applications in continental hydrology**, Philippe Maillard, UFMG (Brazil) and Observatoire Midi-Pyrrénées (France); Stéphane Calmant, Ctr. d'Etudes Spatiales de la Biosphère (France) . . . . . [8887-30]

14:40: **Wetland change detection with remote sensing and quantitative analyses of hydrological driving factors**, Hou Peng, Ministry of Environmental Protection (China) . . . . . [8887-31]

Coffee Break . . . . . .Wed 15:00 to 15:30

SESSION 8

Room: Konferenz 3 . . . . . Wed 15:30 to 17:30

Irrigation and Soil Water Content

Session Chair: **Antonino Maltese,** Univ. degli Studi di Palermo (Italy)

15:30: **Vegetation correction of surface soil moisture indices using hyperspectral artificial 3D-canopy models**, Daniel Spengler, Theres Kuester, Helmholtz-Zentrum Potsdam Deutsches GeoForschungsZentrum GFZ (Germany); Annett Frick, LUP - LUFTBILD UMWELT PLANUNG GmbH (Germany); Hermann J. Kaufmann, Helmholtz-Zentrum Potsdam Deutsches GeoForschungsZentrum GFZ (Germany) . . . . . [8887-33]

15:50: **Data assimilation of surface soil moisture, temperature and evapotranspiration estimates in a SVAT model over irrigated agriculture in semi-arid areas: what is best to constraint evapotranspiration predictions?**, Adrien Tavernier, Lionel Jarlan, Ctr. d'Etudes Spatiales de la Biosphère (France); Salah Er-Raki, Univ. Cadi Ayyad (Morocco); Guillaume Bigeard, Ctr. d'Etudes Spatiales de la Biosphère (France); Saïd Khabba, Univ. Cadi Ayyad (Morocco); Amina Saaidi, Direction de la Météorologie Nationale (Morocco); Lepage Michel, Jonas Chirouze, Gilles Boulet, Ctr. d'Etudes Spatiales de la Biosphère (France) . . . . . [8887-34]

16:10: **Enhancing TIR image resolution via Bayesian smoothing for IRRISAT irrigation management project**, Paolo Addesso, Univ. degli Studi di Salerno (Italy); Fulvio Capodici, Univ. degli Studi di Palermo (Italy); Guido D'Urso, Univ. degli Studi di Napoli Federico II (Italy); Maurizio Longo, Univ. degli Studi di Salerno (Italy); Antonino Maltese, Univ. degli Studi di Palermo (Italy); Rita Montone, Rocco Restaino, Gemine Vivone, Univ. degli Studi di Salerno (Italy) . . . . . [8887-35]

16:30: **Soil water content monitoring: a verification of thermal inertia approaches**, Antonino Maltese, Fulvio Capodici, Univ. degli Studi di Palermo (Italy); Guido D'Urso, Univ. degli Studi di Napoli Federico II (Italy); Paolo Addesso, Maurizio Longo, Rita Montone, Rocco Restaino, Gemine Vivone, Univ. degli Studi di Salerno (Italy) . . . . . [8887-36]

16:50: **Multisensor characterization of subsurface structures in a desert plain area in Egypt with implications for groundwater exploration**, Magaly Koch, Boston Univ. (United States); Ahmed Gaber, Port Said Univ. (Egypt); Mohamed H. Geriesh, Suez Canal Univ. (Egypt); El-Sayed A. Zaghloul, Sayed M. Arafat, National Authority for Remote Sensing and Space Sciences (Egypt); Mostafa Abubakr, Boston Univ. (United States) . . . . . [8887-37]

17:10: **Increased agricultural production by managing irrigation and drainage water using mathematical modelling**, A. F. M. Afzal Hossain, Institute of Water Modeling (Bangladesh); Muhammad Hassan Bin Afzal, Univ. of Dhaka (Bangladesh) . . . . . [8887-72]

Thursday 26 September

SESSION 9

Room: Konferenz 3 . . . . . Thu 8:40 to 10:00

Crop Monitoring

Session Chair: **Christopher M. U. Neale,** Utah State Univ. (United States)

8:40: **Retrieving water productivity parameters by using Landsat images in the Nilo Coelho irrigation scheme, Brazil**, Antônio H. Teixeira, Embrapa Monitoramento por Satélite (Brazil); Hélio L. Lopes, Univ. Federal do Vale do São Francisco (Brazil); Fernando Braz T. Hernandez, UNESP (Brazil); Morris Scherer-Warren, Agência Nacional das Águas (Brazil); Ricardo G Andrade, Embrapa Monitoramento por Satélite (Brazil). . . . . [8887-40]

9:00: **Towards a near real-time remote sensing based agricultural monitoring system for the MENA region**, Rasmus M. Houborg, Matthew F. McCabe, King Abdullah Univ. of Science and Technology (Saudi Arabia); Martha C. Anderson, Feng Gao, Mitchell A. Schull, Carmelo Cammalleri, Agricultural Research Service (United States); Christopher R. Hain, Univ. of Maryland, College Park (United States); Tugrul M. Yilmaz, Agricultural Research Service (United States) . . . . . [8887-41]

9:20: **Multitemporal analysis of the relationship between production parameters and vegetation index in vineyard**, Tanino Santangelo, Rosario Di Lorenzo, Goffredo La Loggia, Antonino Maltese, Univ. degli Studi di Palermo (Italy) . . . . . [8887-42]

9:40: **Estimation of maize LAI by assimilating remotely sensed data into crop model**, Xiaohua Zhu, Academy of Opto-Electronics (China) . . . . . [8887-43]

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

SESSION 10

Room: Konferenz 3 . . . . . Thu 10:30 to 11:50

Energy Balance and Evotranspiration

Session Chair: **Antonino Maltese,** Univ. degli Studi di Palermo (Italy)

10:30: **Estimating surface energy fluxes over an Andalusian Dehesa ecosystem using a thermal-based two-source energy balance model and validation with flux tower measurements.**, Ana Andreu, Instituto de Investigación y Formación Agraria y Pesquera (Spain); William P. Kustas, Agricultural Research Service (United States); María José Polo-Gómez, Grupo de Dinámica Fluvial e Hidrología (Spain); Martha C. Anderson, Agricultural Research Service (United States); Maria Patrocinio González-Dugo, Instituto de Investigación y Formación Agraria y Pesquera (Spain) . . . . . [8887-44]

10:50: **Evaluating the daily actual evapotranspiration through an energy balance approach: an experiment to evaluate the self-preservation hypothesis with acquisition time**, Antonino Maltese, Fulvio Capodici, Giuseppe Ciraolo, Goffredo La Loggia, Antonio Motisi, Univ. degli Studi di Palermo (Italy) . . . . . [8887-45]

11:10: **Application of MODIS images for modelling the energy balance components in the semi-arid conditions of Brazil**, Antônio H. Teixeira, Embrapa Monitoramento por Satélite (Brazil); Morris Sherer-Warren, Agência Nacional de Águas (Brazil); Hélio L. Lopes, Univ. Federal do Vale do São Francisco (Brazil); Fernando Braz T. Hernandez, UNESP (Brazil); Ricardo G. Andrade, Embrapa Monitoramento por Satélite (Brazil) . . . . . [8887-47]

11:30: **Carbon cycling of European croplands: a framework for the assimilation of optical and microwave Earth observation data**, Andrew Revill, The Univ. of Edinburgh (United Kingdom) . . . . [8887-48]

Lunch Break . . . . . Thu 11:50 to 13:10

SESSION RJS

Room: Seminar 5-6 . . . . . Thu 13:10 to 15:30

Radar Applications in Agro-Hydrology Joint Session

Session Chairs: **Antonino Maltese,** Univ. degli Studi di Palermo (Italy); **Claudia Notarnicola,** EURAC research (Italy)

Conference 8887, Remote Sensing fro Agriculture, Ecosystems and Hydrology and Conference 8891, SAR Image Analysis, Modeling and Techniques Joint Session

13:10: **Comparison of three algorithms for the retrieval of soil moisture from ASCAT data in the framework of the round robin exercise**, Simonetta Paloscia, Emanuele Santi, Istituto di Fisica Applicata Nello Carrara (Italy) . . . . . [8891-15]

13:30: **Multi-temporal classification of TerraSAR-X data for wetland vegetation mapping**, Julie Betbeder, Sébastien Rapinel, Thomas Corpetti, Univ. Rennes 2 (France); Eric Pottier, Univ. de Rennes 1 (France); Samuel Corgne, Laurence Hubert Moy, Univ. Rennes 2 (France) . . . . . [8887-49]

13:50: **How far can be SAR considered a tool for mountain hydrology?**, Giacomo Bertoldi, Claudia Notarnicola, Luca Pasolli, EURAC research (Italy); Stefano Della Chiesa, Georg Niedrist, Ulrike Tappeiner, EURAC research (Italy) and Univ. Innsbruck (Austria) . . . . . [8891-16]

14:10: **Coupling X-Band COSMOS-SkyMed and optical DEIMOS-1 data for NDVI retrieval: model calibration and validation on two test areas**, Fulvio Capodici, Antonino Maltese, Univ. degli Studi di Palermo (Italy); Guido D'Urso, Univ. degli Studi di Napoli Federico II (Italy); Giuseppe Ciraolo, Univ. degli Studi di Palermo (Italy) . [8887-50]

14:30: **Soil moisture retrieval from three-day repeat ERS-2/SAR data: comparison with ASCAT- and SMOS-derived estimates and in situ measurements**, Luca Pulvirenti, Nazzareno Pierdicca, Fabio Fascaetti, Univ. degli Studi di Roma La Sapienza (Italy) . . . . . [8891-17]

14:50: **Integration of multispectral and C-band SAR data for crop monitoring applications**, Lorenzo Iannni, Ramses A. Molijn, Ramon F. Hanssen, Technische Univ. Delft (Netherlands) . . . . . [8887-51]

15:10: **GNSS-R sensor sensitivity to soil moisture and vegetation biomass and comparison with SAR data performance**, Simonetta Paloscia, Istituto di Fisica Applicata Nello Carrara (Italy) . . . . [8891-18]

Remote Sensing of the Ocean, Sea Ice, Coastal Waters, and Large Water Regions 2013

Conference Chairs: **Charles R. Bostater Jr.,** Florida Institute of Technology (United States); **Stelios P. Mertikas,** Technical Univ. of Crete (Greece); **Xavier Neyt,** Royal Belgian Military Academy (Belgium)

Programme Committee: **Richard J. Breitlow,** Agfa Corp. (United States); **Jean-Paul Bruyant,** ONERA (France); **Alex Gilerson,** The City College of New York (United States); **Carlton R. Hall,** InfoMedic (United States); **Heinz-Detlef Kronfeldt,** Technische Univ. Berlin (Germany); **Ana M. Martins,** Univ. dos Açores (Portugal); **Caroline Nichol,** The Univ. of Edinburgh (United Kingdom); **Frédéric Lamy,** ONERA (France); **Petri Pellikka,** Univ. of Helsinki (Finland);

Tuesday 24 September

OPENING REMARKS

Room: Konferenz 4 . . . . . .8:30 to 8:40

SESSION 1

Room: Konferenz 4 . . . . . Tue 8:40 to 10:00

Polar Region Remote Sensing

Session Chair: **Anis Elyouncha,**
Royal Belgian Military Academy (Belgium)

8:40: **Effect of denoising on assimilation of SAR data**, Zahra Ashouri, K. Andrea Scott, Univ. of Waterloo (Canada); Thomas G. Carrieres, Environment Canada (Canada). . . . . [8888-1]

9:00: **Recent 10-year changes and the prediction of Arctic sea ice: a multivariate ARIMA approach**, Jihye Ahn, Yang Won Lee, Pukyong National Univ. (Korea, Republic of) . . . . . [8888-2]

9:20: **Arctic environment monitoring using new satellite data from Suomi NPP VIIRS**, Yi Luo, Environment Canada (Canada) . . . [8888-3]

9:40: **Improved exploration of Fishery Resources through the integration of remotely sensed merged sea level anomaly, chlorophyll concentration and sea surface temperature**, Kanmani Shanmuga Priya R. Rajkumar, Indian Institute of Remote Sensing (India). . . . . [8888-4]

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

SESSION 2

Room: Konferenz 4 . . . . . Tue 10:30 to 12:10

Radar Remote Sensing

Session Chair: **Xavier Neyt,** Royal Belgian Military Academy (Belgium)

10:30: **Inter-calibration of Metop-A and Metop-B scatterometers using ocean measurements**, Anis Elyouncha, Xavier Neyt, Royal Belgian Military Academy (Belgium) . . . . . [8888-5]

10:50: **Measuring marine oil spill extent by Markov Random Fields**, Miguel Moctezuma Flores, Univ. Nacional Autónoma de México (Mexico); Flavio F. Parmiggiani, Istituto di Scienze dell'Atmosfera e del Clima (Italy); Ludwin Lopez Lopez, Univ. Nacional Autónoma de México (Mexico) . . . . . [8888-6]

11:10: **Analysis of spaceborne SAR monitoring capabilities for coastal areas bathymetry with COSMO-SkyMed and Alos data**, Valentina Boccia, Alfredo Renga, Univ. degli Studi di Napoli Federico II (Italy); Marco D'Errico, Seconda Univ. degli Studi di Napoli (Italy); Giancarlo Rufino, Antonio Moccia, Univ. degli Studi di Napoli Federico II (Italy); Maria Daniela Graziano, CO.RI.S.T.A. (Italy); Cesare Aragno, Kell S.r.l. (Italy); Simona Zoffoli, Agenzia Spaziale Italiana (Italy) . . . . . [8888-7]

11:30: **Laboratory investigation of short wind wave breaking modulation in the long surface wave field**, Victor V. Bakhanov, Nikolai A. Bogatov, Alexei V. Ermoshkin, Olga N. Kemarskaya, Institute of Applied Physics (Russian Federation). . . . . [8888-8]

11:50: **Satellite SAR and in situ observations of water eutrophication areas**, Stanislav A. Ermakov, Institute of Applied Physics (Russian Federation) and Russian State Hydrometeorological Univ. (Russian Federation) and Nizhny Novgorod State Univ. (Russian Federation); Jose da Silva, Univ. do Porto (Portugal); Ivan Kapustin, Institute of Applied Physics (Russian Federation) and Russian State Hydrometeorological Univ. (Russian Federation); Irina Sergievskaya, Tatiana Lazareva, Institute of Applied Physics (Russian Federation); Olga Shomina, Institute of Applied Physics (Russian Federation) and Nizhny Novgorod State Univ. (Russian Federation) . . . . . [8888-9]

Lunch/Exhbition Break . . . . . Tue 12:10 to 13:20

SESSION 3

Room: Konferenz 4 . . . . . Tue 13:20 to 15:00

Hyperspectral Remote Sensing

Session Chair: **Charles R. Bostater Jr.,** Florida Institute of Technology (United States)

13:20: **Analysis of historical MERIS and MODIS data to evaluate the impact of dredging to monthly mean surface TSM concentration**, Laura Raag, Liis Sipelgas, Rivo Uiboupin, Tallinn Univ. of Technology (Estonia). . . . . [8888-10]

13:40: **Operational multi-angle hyperspectral remote sensing for feature detection**, Charles R. Bostater Jr., Florida Institute of Technology (United States). . . . . [8888-11]

14:00: **Retrieval of solar-induced fluorescence spectral shape of oil slicks from the infilling of solar Fraunhofer lines**, Valentina Raimondi, Lorenzo Palombi, Donatella Guzzi, David Lognoli, Vanni Nardino, Ivan Pippi, Istituto di Fisica Applicata Nello Carrara (Italy); Francesco Petroni, Sitael (Italy). . . . . [8888-12]

14:20: **From multi-sensor tracking of sea surface films to mesoscale and sub-mesoscale sea surface current fields**, Benjamin Seppke, Martin Gade, Leonie Dreschler-Fischer, Univ. Hamburg (Germany) . . . . . [8888-13]

14:40: **Assessment of fine scale IOP variability over a wide range of environmental conditions in the Ligurian Sea using in situ lidar and volume scattering measurements**, Fraser R. Dalgleish, Harbor Branch Oceanographic Institute (United States); Michael S. Twardowski, WET Labs., Inc. (United States); Anni K. Vuorenkoski, Harbor Branch Oceanographic Institute (United States); Nicole Stockley, WET Labs., Inc. (United States); Bing Ouyang, Harbor Branch Oceanographic Institute (United States). . . . . [8888-14]

Coffee Break . . . . . Tue 15:00 to 15:30

SESSION 4

Room: Konferenz 4 . . . . . Tue 15:30 to 17:10

Optical Remote Sensing

Session Chair: **Alexander Gilerson,**
The City College of New York (United States)

15:30: **Polarization of light in shallow waters**, Alexander Gilerson, Amir Ibrahim, Jan Stepinski, Alberto Tonizzo, Carlos Carrizo, Samir Ahmed, The City College of New York (United States). . . . . [8888-15]

15:50: **Evaluation of ocean color data processing schemes for VIIRS sensor using in-situ data of coastal AERONET-OC sites**, Samir Ahmed, Alexander Gilerson, Soe Hlaing, Robert Foster, The City College of New York (United States); Alan Weidemann II, U.S. Naval Research Lab. (United States); Robert A. Arnone, The Univ. of Southern Mississippi (United States); Menghua Wang, National Oceanic and Atmospheric Administration (United States) . . . [8888-16]

16:10: **CDOM retrieval using measurements of downwelling irradiance**, Kathrin Linnemann, Technische Univ. München (Germany); Peter Gege, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany); Sebastian Rößler, Thomas Schneider, Arnulf Melzer, Technische Univ. München (Germany) . . . . . [8888-17]

16:30: **Remote sensing of sea surface features by optical RTI images**, Victor I. Titov, Institute of Applied Physics (Russian Federation) . . . . . [8888-18]

16:50: **Monitoring long-term ocean health using remote sensing: a case study of the Bay of Bengal**, Md Latifur Rahman Sarker, Lim Jin Yi, Univ. Teknologi Malaysia (Malaysia); Lei Zhang, The Hong Kong Polytechnic Univ. (Hong Kong, China); Eko Siswanto, Research Institute for Global Change (Japan); Ahmad Mubin, Univ. Teknologi Malaysia (Malaysia) . . . . . [8888-19]

POSTER SESSION
Room: Mezzanine Level Exhibition Hall
Tue 17:40 to 19:10

Conference attendees are invited to attend the Remote Sensing Poster Session on Tuesday afternoon. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. 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. Poster authors, view poster presentation guidelines and set-up instructions on page 6 and at http://spie.org/x32234.xml.

New method for extracting internal wave parameters from SAR image, Kaiguo Fan, The Second Institute of Oceanography, SOA (China); Xingxiu Yu, Linyi Univ. (China); Bin Fu, Xilin Gan, The Second Institute of Oceanography, SOA (China) . . . . . [8888-20]

Model of airborne imaging system with complex modulated beam of illumination, adaptive to wavy surface, Alexander G. Luchinin, Institute of Applied Physics (Russian Federation) . . . . . [8888-21]

Imitation model validation of HF-band signal backscattering from sea surface, Vladimir T. Lobach, Michael V. Potipak, Southern Federal Univ. (Russian Federation). . . . . [8888-22]

Directional ocean wave spectra extracted from the dual-polarization SAR imagery, Lin Ren, Jingsong Yang, Juan Wang, Gang Zheng, Peng Chen, The Second Institute of Oceanography, SOA (China); Jianyu Chen, Second Institute of Oceanography SOA (China) . . . . . [8888-23]

Spectral imaging AOTF spectrometer for world ocean observation, Alexey V. Perchik, Bauman Moscow State Technical Univ. (Russian Federation). . . . . [8888-24]

In-orbit optical performance analysis for geostationary ocean color imager using integrated ray tracing technique, Eunsong Oh, Korea Institute of Ocean Science & Technology (Korea, Republic of); Dongok Y. Ry, Jinsuk Hong, Sug-Whan Kim, Yonsei Univ. (Korea, Republic of) . . . . . [8888-25]

Determining sea surface heights using small footprint airborne laser scanning, Anti Gruno, Tallinn Univ. of Technology (Estonia); Aive Liibusk, Estonian Univ. of Life Sciences (Estonia); Artu Ellmann, Tallinn Univ. of Technology (Estonia); Ants Vain, Tõnis Oja, Estonian Land Board (Estonia); Harli Jürgenson, Estonian Univ. of Life Sciences (Estonia). . . . . [8888-26]

Sensors, Systems, and Next-Generation Satellites XVII

Conference Chairs: **Roland Meynart,** European Space Research and Technology Ctr. (Netherlands); **Steven P. Neeck,** NASA Headquarters (United States); **Haruhisa Shimoda,** Tokai Univ. (Japan)

Programme Committee: **Olivier Saint-Pé,** EADS Astrium (France); **Xiaoxiong Xiong,** NASA Goddard Space Flight Ctr. (United States)

Monday 23 September

OPENING REMARKS

Room: Konferenz 6 . . . . . .8:30 to 8:40

SESSION 1

Room: Konferenz 6 . . . . . Mon 8:40 to 10:10

Japanese Missions I

Session Chair: **Haruhisa Shimoda,** Tokai Univ. (Japan)

8:40: **Overview of Japanese Earth observation programs** *(Invited Paper)*, Haruhisa Shimoda, Tokai Univ. (Japan) . . . . . [8889-1]

9:10: **Onboard electrical calibration of the ASTER VNIR**, Fumihiro Sakuma, Masakuni Kikuchi, Japan Space Systems (Japan); Hitomi Inada, NEC TOSHIBA Space Systems, Ltd. (Japan). . . . . [8889-2]

9:30: **Current status of the Global Change Observation Mission 1st Water 'SHIZUKU' (GCOM-W1) and the advanced microwave scanning radiometer 2 (AMSR2)**, Misako Kachi, Keiji Imaoka, Takashi Maeda, Kazuhiro Naoki, Arata Okuyama, Marehito Kasahara, Norimasa Ito, Japan Aerospace Exploration Agency (Japan); Taikan Oki, The Univ. of Tokyo (Japan) and Japan Aerospace Exploration Agency (Japan); Haruhisa Shimoda, Tokai Univ. (Japan) and Japan Aerospace Exploration Agency (Japan) . . . . . [8889-3]

9:50: **On-orbit status of TANSO on GOSAT over 4 years**, Kei Shiomi, Shuji Kawakami, Hiroshi Suto, Akihiko Kuze, Masakatsu Nakajima, Japan Aerospace Exploration Agency (Japan) . . . . . [8889-4]

Coffee Break . . . . . Mon 10:10 to 10:40

SESSION 2

Room: Konferenz 6 . . . . . Mon 10:40 to 12:40

Japanese Missions II

Session Chair: **Haruhisa Shimoda,** Tokai Univ. (Japan)

10:40: **CO_2, CH_4 , and other trace gases retrieved from thermal infrared spectra of GOSAT satellite**, Naoko Saitoh, Chiba Univ. (Japan); Ryoichi Imasu, The Univ. of Tokyo (Japan) . . . . . [8889-5]

11:00: **The current status of GOSAT-2: mission and sensor system**, Masakatsu Nakajima, Hiroshi Suto, Kazuhiko Yotsumoto, Masashi Abe, Akihiko Kuze, Kei Shiomi, Japan Aerospace Exploration Agency (Japan). . . . . [8889-6]

11:20: **ALOS-2 current status and operation plan**, Shinichi Suzuki, Yukihiro Kankaku, Yuji Osawa, Japan Aerospace Exploration Agency (Japan). . . . . [8889-7]

11:40: **Status of Japanese Global Precipitation Measurement (GPM) Mission**, Misako Kachi, Riko Oki, Takuji Kubota, Takeshi Masaki, Satoshi Kida, Yuki Kaneko, Kinji Furukawa, Takeshi Miura, Masahiro Kojima, Japan Aerospace Exploration Agency (Japan); Toshio Iguchi, National Institute of Information and Communications Technology (Japan); Yukari N. Takayabu, The Univ. of Tokyo (Japan) and Japan Aerospace Exploration Agency (Japan); Kenji Nakamura, Dokkyo Univ. (Japan) and Japan Aerospace Exploration Agency (Japan). . . . . [8889-8]

12:00: **EarthCARE/CPR design results and PFM performance**, Yoshihisa Aida, Japan Aerospace Exploration Agency (Japan) [8889-9]

12:20: **Ground-based demonstration experiment of imaging SWIR-FTS for space-based detection of air pollution and greenhouse gases**, Tadashi Imai, Hiroshi Suto, Jumpei Murooka, Akihiko Kuze, Ryota Sato, Japan Aerospace Exploration Agency (Japan) . . [8889-10]

Lunch Break . . . . . Mon 12:40 to 14:00

SESSION 3

Room: Konferenz 6 . . . . . Mon 14:00 to 15:30

US Missions

Session Chair: **Steven P. Neeck,** NASA Headquarters (United States)

14:00: **NASA Earth science missions** *(Invited Paper)*, Steven P. Neeck, Stephen M. Volz, NASA Headquarters (United States) . . . . . [8889-11]

14:30: **Global precipitation measurement (GPM) L-6**, Steven P. Neeck, Ramesh K. Kakar, NASA Headquarters (United States); Ardeshir A. Azarbarzin, Arthur Y. Hou, NASA Goddard Space Flight Ctr. (United States) . . . . . [8889-12]

14:50: **NASA's Earth venture cyclone global navigation satellite system (CYGNSS) mission: designed to provide the science data to better understand the genesis and intensification of tropic cyclones**, Randall J. Rose, Southwest Research Institute (United States); Christofer Ruf, Univ. of Michigan (United States) . . . [8889-13]

15:10: **On the ozone mapper profiler suite Nadir sensor data record**, Chunhui Pan, Univ. of Maryland, College Park (United States); Xiangqian Wu, Fuzhong Weng, National Oceanic and Atmospheric Administration (United States); Richard H. Buss, Raytheon Co. (United States); Lawrence E. Flynn, National Oceanic and Atmospheric Administration (United States). . . . . [8889-14]

Coffee Break . . . . . Mon 15:30 to 16:00

PLENARY SESSION

Room: Saal 3 . . . . . .Mon 16:00 to 17:45

Remote Sensing 2013: Plenary Session

For details, please see page 4-5 in the printed programme or visit http://spie.org/remote-sensing-europe.xml

Tuesday 24 September

SESSION 4

Room: Konferenz 6 . . . . . Tue 8:30 to 10:00

European Missions I

Session Chair: **Roland Meynart,** European Space Research and Technology Ctr. (Netherlands)

8:30: **Overview of ESA Earth observation missions** *(Invited Paper)*, Roland Meynart, European Space Research and Technology Ctr. (Netherlands) . . . . . [8889-15]

9:00: **The EUMETSAT Polar System-Second Generation (EPS-SG) micro-wave and sub-millimetre wave imaging missions**, Christophe Accadia, Peter Schluessel, Pepe L. Phillips, European Organisation for the Exploitation of Meteorological Satellites (Germany) . . . . . [8889-16]

9:20: **The Multi-Viewing Multi-Channel Multi-Polarisation Imaging (3MI) Mission of the EUMETSAT Polar System: second generation (EPS-SG) dedicated to aerosol characterisation**, Thierry Marbach, Pepe L. Philips, Peter Schlüssel, European Organisation for the Exploitation of Meteorological Satellites (Germany) . . . . . [8889-17]

9:40: **The MetOp second generation 3MI instrument**, Ilias G. Manolis, European Space Research and Technology Ctr. (Netherlands); Semen Grabarnik, Jérôme Caron, European Space Agency / ESTEC (Netherlands); Jean-Loup Bézy, Marc Loiselet, Maurizio Betto, Hubert Barre, Graeme Mason, Roland Meynart, European Space Research and Technology Ctr. (Netherlands) . . . . . [8889-18]

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

SESSION 5

Room: Konferenz 6 . . . . . Tue 10:30 to 11:50

European Missions II

Session Chair: **Roland Meynart,** European Space Research and Technology Ctr. (Netherlands)

10:30: **Overview of sentinel-2**, Valérie Fernandez, European Space Agency (Netherlands); Philippe Martimort, European Space Research and Technology Ctr. (Netherlands); Francois Spoto, Omar Sy, Paolo Laberinti, European Space Agency (Netherlands). . . . . [8889-20]

10:50: **Sentinel-2: next generation satellites for optical land observation from space**, Stefan Bursch, Roland Gessner, R. Gockel, Cornelius Haas, Lisa Schweickert, Mario Welsch, Heinz Sontag, EADS Astrium GmbH (Germany) . . . . . [8889-19]

11:10: **The multispectral instrument of the Sentinel-2 PFM program results**, Vincent Chorvalli, Francis Delbru, Stéphane Espuche, EADS Astrium (France); Cornelius Haas, EADS Astrium GmbH (Germany); Philippe Martimort, European Space Research and Technology Ctr. (Netherlands); Valérie Fernandez, European Space Agency (Netherlands); Volker Kirshner, European Space Research and Technology Ctr. (Netherlands). . . . . [8889-21]

11:30: **Overview on GMES Sentinel-3 optical mission, development, products and calval preparation**, Jens Nieke, European Space Research and Technology Ctr. (Netherlands); Philippe Goryl, ESRIN (Italy); Constantin E. Mavrocordatos, Craig Donlon, Bruno Berutti, European Space Research and Technology Ctr. (Netherlands) . . . . . [8889-22]

Lunch/Exhibition Break . . . . . Tue 11:50 to 13:10

SESSION 6

Room: Konferenz 6 . . . . . Tue 13:10 to 15:10

European Missions III

Session Chair: **Roland Meynart,** European Space Research and Technology Ctr. (Netherlands)

13:10: **The ocean and land colour imager (OLCI) design and performance**, Yves Delclaud, Jean-Bernard Riti, Thierry Garnier, Thales Alenia Space (France); Jens Nieke, European Space Research and Technology Ctr. (Netherlands) . . . . . [8889-23]

13:30: **The Sentinel-3 microwave radiometer**, Ulf Klein, Bruno Berruti, Constantin E. Mavrocordatos, European Space Research and Technology Ctr. (Netherlands); Marc Bergada, EADS CASA Espacio (Spain) . . . . . [8889-24]

13:50: **The TROPOMI instrument: first H/W results**, Robert Voors, Johan de Vries, Dutch Space B.V. (Netherlands); Nick C. J. van der Valk, TNO Science and Industry (Netherlands); Ianjit Bhatti, David M. Woods, Surrey Satellite Technology Ltd. (United Kingdom); Ilse Aben, Ruud Hoogeveen, SRON Netherlands Institute for Space Research (Netherlands); Pepijn Veefkind, Quintus Kleipool, Koninklijk Nederlands Meteorologisch Instituut (Netherlands) . . . . . [8889-25]

14:10: **Progress in the hyperspectral payload for PRISMA programme**, Marco Meini, SELEX ES Ltd. (Italy); Fabrizio Battazza, Roberto Formaro, Agenzia Spaziale Italiana (Italy); Alessandro Bini, SELEX Galileo S.p.A. (Italy) . . . . . [8889-26]

14:30: **EnMAP hyperspectral imager: design, technology and predicted performance**, Bernhard Sang, Brian Heider, Markus Erhard, Bettina König, Kayser-Threde GmbH (Germany); Christoph Straif, Jan Grosser, Christian Chlebek, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany); Hermann J. Kaufmann, Helmholtz-Zentrum Potsdam Deutsches GeoForschungsZentrum GFZ (Germany) . . . . . [8889-27]

14:50: **FLORIS: phase A status of the fluorescence imaging spectrometer of the Earth Explorer mission candidate FLEX**, Stefan Kraft, Jean-Loup Bézy, Umberto Del Bello, Rene Berlich, Matthias Drusch, Antonio Gabriele, Bernd Harnisch, Roland Meynart, Pierluigi Silvestrin, European Space Research and Technology Ctr. (Netherlands) . . . . . [8889-28]

Coffee Break . . . . . Tue 15:10 to 15:40

SESSION 7

Room: Konferenz 6 . . . . . Tue 15:40 to 17:30

Calibration I

Session Chair: **Xiaoxiong Jack Xiong,** NASA Goddard Space Flight Ctr. (United States)

15:40: **Status of MODIS on-orbit calibration and characterization** *(Invited Paper)*, Xiaoxiong Xiong, NASA Goddard Space Flight Ctr. (United States); Brian Wenny, Sigma Space Corp. (United States); Amit Angal, Science Systems and Applications, Inc. (United States); Vincent V. Salomonson, The Univ. of Utah (United States) . . . . . [8889-29]

16:10: **MODIS and VIIRS lunar observations and applications**, Xiaoxiong Xiong, James Butler, NASA Goddard Space Flight Ctr. (United States); Amit Angal, Science Systems and Applications, Inc. (United States); Jon Fulbright, Sigma Space Corp. (United States) . . . . . [888

16:30: **Sentinel-2 diffuser on-ground calibration**, Emmanuel Mazy, Univ. de Liège (Belgium); Fabrice Camus, Vincent Chorvalli, EADS Astrium (France); Isabelle Domken, Anouk Laborie, Sara Marcotte, Yvan G. Stockman, Univ. de Liège (Belgium) . . . . . [8889-31]

16:50: **Sentinel 2: implementation of the means and methods for the CAL/VAL commissioning phase**, Thierry L. Trémas, Cécile Dechoz, Sophie Lacherade, Ctr. National d'Études Spatiales (France); Philippe Martimort, Claudia Isola, European Space Research and Technology Ctr. (Netherlands); Julien Nosavan, Beatrice Petrucci, Ctr. National d'Études Spatiales (France) . . . . . [8889-32]

17:10: **Calibration plan for the sea and land surface temperature radiometer (SLSTR)**, David L. Smith, Tim J. Nightingale, Hugh Mortimer, Kevin F. Middleton, Caroline V. Cox, Christopher T. Mutlow, Brian J. Maddison, Science and Technology Facilities Council (United Kingdom) . . . . . [8889-33]

POSTER SESSION

Room: Mezzanine Level Exhibition Hall
Tue 17:40 to 19:10

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TDRS satellite application to LEO satellite data link, Hu Jiang, Shanghai Institute of Microsystem and Information Technology (China); Xuemin Shen, Shanghai Institute of Technical Physics (China); Wenbin Gong, Jinpei Yu, Shanghai Institute of Microsystem and Information Technology (China) . . . . . [8889-70]

ALSAT-2A solar array in orbit performances after 32 months, Nacera Larbi, Mehdi Attaba, Fethi Bouchiba, Ctr. National des Techniques Spatiales (Algeria); Eric Beaufume, EADS Astrium (France) . . . . . [8889-71]

Flight experience of 329K star tracker, Ivan S. Kruzhilov, Moscow Power Engineering Institute (Russian Federation); Victor I. Fedoseev, Vladimir V. Kuniaev, Geofizika-Cosmos (Russian Federation); Gennadiy P. Titov, Sergey V. Latincev, Oleg V. Shevlyakov, JSC "Academician M.F. Reshetnev" Information Satellite Systems" (Russian Federation) . . . . . [8889-72]

Design and realization of the miniature long-life integrative coded sun sensor, Yanan Mo, Jian Cui, Yuan Zhao, Ran Chen, Xin Liu, Beijing Institute of Control Engineering (China). . . . . [8889-73]

Primary mirror alignment and assembly for a multispectral space telescope, Wei-Cheng Lin, Shenq-Tsong Chang, Instrument Technology Research Ctr. (Taiwan); Sheng-Hsiung Chang, Chen-Peng Chang, National Space Organization (Taiwan); Yu-Chuan Lin, Po-Hsuan Huang, Instrument Technology Research Ctr. (Taiwan) . . . . . [8889-74]

Analysis and design of grazing incidence x-ray optics for pulsar navigation, Fuchang Zuo, Jianwu Chen, Liansheng Li, Zhiwu Mei, Beijing Institute of Control Engineering (China). . . . . [8889-75]

X-ray photon arrival time tagging error analysis and simulation for pulsar navigation, Jianwu Chen, Liansheng Li, Fuchang Zuo, Zhiwu Mei, Beijing Institute of Control Engineering (China). . . . . [8889-76]

New class of monolithic sensors for low frequency motion measurement and control of spacecrafts and satellites, Fabrizio Barone, Fausto Acernese, Gerardo Giordano, Rocco Romano, Univ. degli Studi di Salerno (Italy). . . . . [8889-77]

The extended Maxwell Garnett formula for carbon-nanotube-doped nematic liquid crystal for remote sensing application, Kevin Yu-Chia Huang, National Cheng Kung Univ. (Taiwan) . . . . . [8889-78]

Supercontinuum-source-based facility for evaluation of hyperspectral imagers, Yu Yamaguchi, Yoshiro Yamada, Juntaro Ishii, National Metrology Institute of Japan (Japan) . . . . . [8889-79]

A new polarimetric SAR calibration method based on calibrators, Ping Zhang, Institute of Remote Sensing and Digital Earth (China) . . . . . [8889-80]

Wednesday 25 September

SESSION 8

Room: Konferenz 6 . . . . . Wed 8:40 to 10:00

Calibration II

Session Chair: **Xiaoxiong Jack Xiong,** NASA Goddard Space Flight Ctr. (United States)

8:40: **Absolute radiometric characterization of the transfer radiometer unit of RASTA in the UV, VIS and NIR spectral range**, Dieter R. Taubert, Jörg Hollandt, Christian Monte, Physikalisch-Technische Bundesanstalt (Germany); Peter Gege, Thomas Schwarzmaier, Karim Lenhard, Andreas Baumgartner, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany) . . . . . [8889-34]

9:00: **Calibration of a monochromator using a lambdameter**, Thomas Schwarzmaier, Peter Gege, Andreas Baumgartner, Karim Lenhard, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany) . . . . . [8889-35]

9:20: **Straylight testing of the PROBA V payload**, Yvan G. Stockman, Univ. de Liège (Belgium); Matteo Taccola, European Space Research and Technology Ctr. (Netherlands); Didier P. Beghuin, LAMBDA-X sa (Belgium); Jorg Versluys, OIP N.V. (Belgium); Michael Francois, European Space Research and Technology Ctr. (Netherlands) . . . . . [8889-36]

9:40: **Stray light calibration of the DAWN framing camera**, Gabor Kovacs, Budapest Univ. of Technology (Hungary); Holger Sierks, Michael L. Richards, Pablo Gutierrez-Marques, Andreas Nathues, Max-Planck-Institut für Sonnensystemforschung (Germany) . [8889-37]

Coffee Break . . . . . .Wed 10:00 to 10:20

SESSION 9

Room: Konferenz 6 . . . . . Wed 10:20 to 12:40

Focal Plane Assemblies I

Session Chair: **Olivier Saint-Pe,** EADS Astrium (France)

10:20: **Characterization results of the TROPOMI-SWIR detector**, Ruud Hoogeveen, SRON Netherlands Institute for Space Research (Netherlands); Robert Voors, Dutch Space B.V. (Netherlands); Mark S. Robbins, Surrey Satellite Technology Ltd. (United Kingdom); Paul J. J. Tol, Toncho Ivanov, SRON Netherlands Institute for Space Research (Netherlands) . . . . . [8889-38]

10:40: **The sea and land surface temperature radiometer (SLSTR) detection assembly design and performance**, Peter Coppo, SELEX Galileo S.p.A. (Italy); Carmine Mastrandrea, Moreno Stagi, Luciano Calamai, Marco Barilli, Selex ES Ltd. (Italy); Jens Nieke, European Space Research and Technology Ctr. (Netherlands) . . . . . [8889-39]

11:00: **Infrared detector units for SLSTR of GMES Sentinel-3 mission**, Holger Höhnemann, Markus Haiml, Lothar Mester, Richard Wollrab, AIM INFRAROT-MODULE GmbH (Germany) . . . . . [8889-40]

11:20: **VNIR back illuminated CMOS focal plane**, Ralf Reulke, Andreas Eckardt, Horst Schwarzer, Holger Venus, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany); Christian Neumann, Fabian Gansmann, Bernhard Sang, Kayser-Threde GmbH (Germany) . . . . . [8889-41]

11:40: **The PRISMA hyperspectral imaging spectrometer: detectors and front-end electronics**, Massimo Camerini, Mauro Mancini, SELEX ES Ltd. (Italy); Enrico Fossati, SELEX Galileo S.p.A. (Italy); Fabrizio Battazza, Roberto Formaro, Agenzia Spaziale Italiana (Italy) . . . . . [8889-42]

12:00: **ENMAP SWIR FPA: design cooling system, performance, and test results**, Markus Haiml, Luis-Dieter Haas, Dominique Hübner, Stefan Rutzinger, Richard Thöt, Sebastian Zehner, AIM INFRAROT-MODULE GmbH (Germany); Christian Neumann, Bernhard Sang, Kayser-Threde GmbH (Germany) . . . . . [8889-43]

12:20: **Acceptance and first post-launch results of the 3000 pixel SWIR array on the Proba-V satellite**, Koen van der Zanden, Xenics NV (Belgium); Jorg Versluys, OIP N.V. (United States); Tanja Van Achteren, VITO NV (Belgium); Michael Francois, European Space Research and Technology Ctr. (Netherlands); Jan P. Vermeiren, Xenics NV (Belgium) . . . . . [8889-81]

Lunch/Exhibition Break . . . . . .Wed 12:40 to 13:40

SESSION 10

Room: Konferenz 6 . . . . . Wed 13:40 to 15:40

Focal Plane Assemblies II

Session Chair: **Olivier Saint-Pe,** EADS Astrium (France)

13:40: **SWIR space detectors and future developments at Sofradir**, Cédric Leroy, Nicolas Jamin, Bruno Fièque, SOFRADIR (France) . . . . . [8889-44]

14:00: **MTF optimization of MCT detectors**, Lilian Martineau, Laurent Rubaldo, Fabien Chabuel, SOFRADIR (France); Olivier Gravrand, CEA-LETI-Minatec (France) . . . . . [8889-45]

14:20: **High performance multispectral TDI CCD image sensors**, Yichun Luo, Charles R. Smith, Nixon O, Melanie Ledgerwood, Sukhbir Kullar, Teledyne DALSA (Canada) . . . . . [8889-46]

14:40: **Investigations on performance of electron multiplied CCD detectors (EMCCDs) after radiation for observation of low light star-like objects in scientific space missions**, Harald Michaelis, Thomas Behnke, Stefano Mottola, Andrej Krimlowski, Belinda Borgs, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany); Andrew D. Holland, XCAM Ltd. (United Kingdom) . . . . . [8889-47]

15:00: **High resolution, high bandwidth global shutter CMOS area scan sensors**, Naser Faramarzpour, Matthias Sonder, Binqiao Li, Teledyne DALSA (Canada) . . . . . [8889-48]

15:20: **CMOS image sensors optimised for GEO observation**, Michel Bréart de Boisanger, Franck Larnaudie, Olivier Saint-Pe, EADS Astrium (France); Pierre Magnan, Institut Supérieur de l'Aéronautique et de l'Espace (France); Paul Jerram, e2v technologies plc (United Kingdom) . . . . . [8889-49]

Coffee Break . . . . . .Wed 15:40 to 16:00

SESSION 11

Room: Konferenz 6 . . . . . Wed 16:00 to 17:40

Missions and Sensing I

Session Chair: **Olivier Saint-Pe,** EADS Astrium (France)

16:00: **An Earth imaging camera simulation using wide-scale construction of reflectance surfaces**, Kiran Murthy, Dirk Robinson, Skybox Imaging, Inc. (United States); Minesh B. Amin, MBA Sciences, Inc. (United States) . . . . . [8889-50]

16:20: **Compare and contrast next generation climate monitoring architectural alternatives from three different perspectives: suggesting logical collaborative paths forward**, Douglas B. Helmuth, Lockheed Martin Space Systems Co. (United States) . . . . . [8889-51]

16:40: **LOCUS: low cost upper atmosphere sounder**, Daniel Gerber, RAL Space (United Kingdom); Bruce M. Swinyard, RAL Space (United Kingdom) and Univ. College London (United Kingdom); Brian N. Ellison, RAL Space (United Kingdom); John M. C. Plane, Wuhu Feng, Univ. of Leeds (United Kingdom); Nimal Navarathinam, Stuart J. Eves, Rachel Bird, Surrey Satellite Technology Ltd. (United Kingdom) . . . . . [8889-52]

17:00: **On-ground evaluation of MTG Image Navigation and Registration (INR) performances**, Thomas Chambon, Vincent Soulignac, Francis Olivier, Philippe Tanguy, Thales Alenia Space (France) . . . . . [8889-53]

17:20: **High rejection VNIR-SWIR beam splitter for the multispectral instrument of Sentinel 2**, Vincent Moreau, AMOS s.a. (Belgium) . . . . . [8889-54]

Thursday 26 September

SESSION 12

Room: Konferenz 6 . . . . . Thu 8:40 to 10:00

Missions and Sensing II

Session Chair: **Roland Meynart,** European Space Research and Technology Ctr. (Netherlands)

8:40: **3D wind field from spaceborne Doppler radar**, Yvon Lemaître, Nicolas Viltard, Lab. Atmosphères, Milieux, Observations Spatiales (France) . . . . . [8889-55]

9:00: **Design heritage for a compact atmospheric imager**, Joseph Mobilia, Lockheed Martin Advanced Technology Ctr. (United States); John B. Kumer, Alice L. Palmer, Lockheed Martin Space Systems Co. (United States); Kevin A. Sawyer, Yalan Mao, Jack Mix, Theodore C. Nast, Charles S. Clark, Roel Vanbezooijen, David L. Chenette, Lockheed Martin Advanced Technology Ctr. (United States). [8889-56]

9:20: **Validation and simulation examples of an end-to-end simulator for optical imaging systems**, Peter Coppo, Leandro Chiarantini, SELEX Galileo S.p.A. (Italy); Luciano Alparone, Univ. degli Studi di Firenze (Italy) . . . . . [8889-57]

9:40: **Miniaturized hyperspectral imager calibration and UAV flight campaigns**, Heikki Saari, VTT Technical Research Ctr. of Finland (Finland); Ilkka Pölönen, Heikki A. Salo, Univ. of Jyväskylä (Finland); Eija Honkavaara, Teemu Hakala, Finnish Geodetic Institute (Finland); Christer Holmlund, Jussi H. Mäkynen, Rami Mannila, Tapani Antila, Altti Akujärvi, VTT Technical Research Ctr. of Finland (Finland). . . . . [8889-58]

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

SESSION 13

Room: Konferenz 6 . . . . . Thu 10:30 to 11:50

Missions and Sensing III

Session Chair: **Haruhisa Shimoda,** Tokai Univ. (Japan)

10:30: **GeoCARB image navigation and registration performance**, Roel W. H. van Bezooijen, John B. Kumer, Charles S. Clark, Harald J. Weigl, Ketao Liu, Lockheed Martin Space Systems Co. (United States) . . . . . [8889-66]

10:50: **Raytheon high-bandwidth, large-angle, reactionless fast steering mirror**, Islam Shawki, Andrew Bullard, Raytheon Co. (United States) . . . . . [8889-67]

11:10: **Development of a compressive-sampling hyperspectral imager prototype**, Alessandro Barducci, Donatella Guzzi, Cinzia Lastri, Vanni Nardino, Paolo Marcoionni, Ivan Pippi, Istituto di Fisica Applicata Nello Carrara (Italy) . . . . . [8889-68]

11:30: **Assessment of FLD-based algorithms for the retrieval of vegetation solar-induced fluorescence from the in-filling of the telluric O2-A and O2-B lines**, Lorenzo Palombi, Paola Di Ninni, Donatella Guzzi, David Lognoli, Vanni Nardino, Ivan Pippi, Valentina Raimondi, Istituto di Fisica Applicata Nello Carrara (Italy) . . . [8889-69]

SESSION 14

Room: Konferenz 6 . . . . . Thu 11:50 to 13:30

Missions and Sensing IV

Session Chair: **Xiaoxiong Jack Xiong,** NASA Goddard Space Flight Ctr. (United States)

11:50: **Design and realization of linear APS-based sun sensor**, He Liang, Fu Jian Zhang, Xin Z. Lv, Zhong Jin Jia, Beijing Institute of Control Engineering (China). . . . . [8889-59]

12:10: **A carbon dioxide radiance model of the earth planet using the conical earth sensor data**, Loulou Deng, Zhiwu Mei, Zhijun Tu, Jun Yuan, Jing Wang, Ting He, Wei Yi, Beijing Institute of Control Engineering (China) . . . . . [8889-61]

12:30: **Design concepts for mechanical architecture of geo imaging payloads**, Anup Vora, J. Rami, Naimesh R. Patel, H. H. Mavani, Chirag P. Dewan, Space Applications Ctr. (India) . . . [8889-63]

12:50: **Spectral response function effects on surface reflectance and NDVI measured with CCD cameras of HJ-1A/B small satellite constellation**, Wenjuan Zhang, Bing Zhang, Zhengchao Chen, Lianru Gao, Hao Zhang, Institute of Remote Sensing and Digital Earth (China) . . . . . [8889-64]

13:10: **Research on complicated imaging condition of GEO optical high resolution Earth observing satellite**, Linghua Guo, China Academy of Space Technology (China); Biru Wang, Xiaofeng Sun, Tsinghua Univ. (China). . . . . [8889-82]

Remote Sensing of Clouds and the Atmosphere XVIII

Conference Chairs: **Adolfo Comeron,** Univ. Politècnica de Catalunya (Spain); **Evgueni I. Kassianov,** Pacific Northwest National Lab. (United States); **Klaus Schäfer,** Karlsruher Institut für Technologie (Germany)

Programme Committee: **Aldo Amodeo,** Istituto di Metodologie per l'Analisi Ambientale (Italy); **Christoph C. Borel-Donohue,** Air Force Institute of Technology (United States); **Young Joon Kim,** Gwangju Institute of Science and Technology (Korea, Republic of); **Richard H. Picard,** ARCON Corp. (United States); **Michiel van Weele,** Koninklijk Nederlands Meteorologisch Instituut (Netherlands); **Konradin Weber,** Fachhochschule Düsseldorf (Germany)

Tuesday 24 September

POSTER SESSION
Room: Mezzanine Level Exhibition Hall
Tue 17:40 to 19:10

Conference attendees are invited to attend the Remote Sensing Poster Session on Tuesday afternoon. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. 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. Poster authors, view poster presentation guidelines and set-up instructions on page 6 and at http://spie.org/x32234.xml.

Measurements of PM2.5 in megacity, Makiko Nakata, Itaru Sano, Sonoyo Mukai, Kinki Univ. (Japan) . . . . . [8890-35]

Analysis of the relation between GPS tropospheric delay and intense precipitation, Pedro J. Benevides, João Catalão, Pedro Miranda, Maria J. Chinita, Univ. de Lisboa (Portugal) . . . . . [8890-36]

Detecting climate signatures with high spectral resolution infrared satellite measurements, Daniel H. DeSlover, David C. Tobin, Henry E. Revercomb, Robert O. Knuteson, Univ. of Wisconsin-Madison (United States). . . . . [8890-37]

Development a computation code of radiation simulation based on the superposition method, Masayoshi Yasumoto, Kinki Univ. (Japan); Sonoyo Mukai, Kyoto College of Graduate Studies for Informatics (Japan); Itaru Sano, Makiko Nakata, Kinki Univ. (Japan). . . . . [8890-38]

Focused sunrays and forest fire danger: new concept, G. V. Kuznetsov, N. V. Baranovskiy, Tomsk Polytechnic Univ. (Russian Federation) . . . . . [8890-39

Wednesday 25 September

OPENING REMARKS
Room: Seminar 2 . . . . . .8:55 to 9:00

SESSION 1
Room: Seminar 2 . . . . . Wed 9:00 to 12:00

Lidar, Radar, and Passive Atmospheric Measurements

Session Chair: **Klaus Schäfer,**
Karlsruher Institut für Technologie (Germany)

9:00: **LACROS: the Leipzig aerosol and cloud remote observations system** *(Invited Paper)*, Johannes Bühl, Leibniz Institut für Troposphärenforschung (Germany); Patric Seifert, Leibniz-Institut für Atmosphärenphysik e.V. (Germany); Ulla Wandinger, Holger Baars, Thomas Kanitz, Jörg Schmidt, Alexander Myagkov, Ronny Engelmann, Annett Skupin, Birgit Heese, Andre Klepel, Dietrich Althausen, Albert Ansmann, Leibniz Institut für Troposphärenforschung (Germany) . . . . . [8890-1]

9:30: **Tropospheric IWV profiles estimation through multifrequency signal attenuation measurements between two counter-rotating LEO satellites: performance analysis**, Luca Facheris, Fabrizio Cuccoli, Univ. degli Studi di Firenze (Italy) . . . . . [8890-2]

9:50: **Atmospheric trace gas profiles from Suomi-NPP cross track infrared sounder**, Xu Liu, NASA Langley Research Ctr. (United States) . . . . . [8890-4]

Coffee Break . . . . . .Wed 10:10 to 10:40

10:40: **Monitoring of nitrogen dioxide, ozone and halogens radicals in Antarctica**, Daniele Bortoli, Univ. de Évora (Portugal) and Institute of Atmospheric Sciences and Climate (Italy); Fabrizio Ravegnani, Istituto di Scienze dell'Atmosfera e del Clima (Italy); Maria Joao T. Costa, Univ. de Évora (Portugal); Silvia Genco, Istituto di Scienze dell'Atmosfera e del Clima (Italy); Pavan Kumar S. Kulkarni, Rui Mendes, Univ. de Évora (Portugal); Manuel Anton, Univ. de Extremadura (Spain); Giorgio Giovanelli, Istituto di Scienze dell'Atmosfera e del Clima (Italy); Ana Maria Silva, Univ. de Évora (Portugal) . . . . . [8890-5]

11:00: **Remote sensing monitoring of the global ozonosphere**, Fabrizio Ravegnani, Silvia Genco, Daniele Bortoli, Istituto di Scienze dell'Atmosfera e del Clima (Italy) . . . . . [8890-6]

11:20: **Spectral reference data of molecules relevant to Earth's atmosphere: impact of European metrology research on atmospheric remote sensing**, Olav Werhahn, Andrea Pogány, Javis A. Nwaboh, Viktor Werwein, Volker Ebert, Physikalisch-Technische Bundesanstalt (Germany) . . . . . [8890-7]

11:40: **Retrievals of atmospheric CO_2, CH_4 and optical path modifications from the GOSAT observations**, Andrey I. Bril, Sergey Oshchepkov, Tatsuya Yokota, Yukio Yoshida, Isamu Morino, Osamu Uchino, Dmitry A. Belikov, Shamil Maksyutov, National Institute for Environmental Studies (Japan) . . . . . [8890-8]

Lunch/Exhibition Break . . . . . .Wed 12:00 to 13:30

SESSION 2
Room: Seminar 2 . . . . . Wed 13:30 to 17:00

Atmospheric Profiling of Aerosol, Trace Gases, and Meteorological Parameters of Remote Sensing

Session Chair: **Adolfo Comerón,**
Univ. Politècnica de Catalunya (Spain)

13:30: **Long-term detection of mixing layer height by integration of ceilometer and radio-acoustic sounding system measurements**, Klaus Schäfer, Stefan Emeis, Michael Tuma, Carsten Jahn, Maria Hoffmann, Karlsruher Institut für Technologie (Germany); Christoph Muenkel, Vaisala GmbH (Germany) . . . . . [8890-9]

13:50: **Influence of mixing layer height measured by ceilometer upon traffic-related air pollution in urban area**, Klaus Schäfer, Stefan Emeis, Hong Ling, Carsten Jahn, Maria Hoffmann, Karlsruher Institut für Technologie (Germany); Christoph Muenkel, Vaisala GmbH (Germany) . . . . . [8890-10]

14:10: **Investigation of boundary layer dynamics, dust and volcanic ash clouds with laser ceilometer**, Christoph Münkel, Vaisala GmbH (Germany); Klaus Schäfer, Stefan Emeis, Karlsruher Institut für Technologie (Germany) . . . . . [8890-11]

14:30: **A static birefringent interferometer for the measurement of upper atmospheric winds**, Jeffery A. Langille, William E. Ward, William A. Gault, Univ. of New Brunswick (Canada); Alan D. Scott, Driss Touahri, COM DEV Canada (Canada); Andrew Bell, EMS Aviation (Canada) . . . . . [8890-12]

14:50: **Capability and limitations in measuring atmospheric nitrogen dioxide column amounts by means of the MKIV Brewer spectrophotometers**, Henri Diémoz, Agenzia Regionale per la Protezione dell'Ambiente della Valle d'Aosta (Italy) and Univ. degli Studi di Roma La Sapienza (Italy); Vladimir Savastiouk, International Ozone Services Inc. (Canada); Anna Maria Siani, Univ. degli Studi di Roma La Sapienza (Italy). . . . . [8890-13]

Coffee Break . . . . . .Wed 15:10 to 15:40

15:40: **Optimum interpolation algorithms for ABI multiple channel radiance downscaling processing**, Haibing Sun, I. M. Systems Group, Inc. (United States); Walter Wolf, National Oceanic and Atmospheric Administration (United States); Thomas S. King, Shanna Sampson, I. M. Systems Group, Inc. (United States); Eric S. Maddy, Science and Technology Corp. (United States) . . . . . [8890-14]

16:00: **GOMOS one-step retrieval algorithm**, Janne Hakkarainen, Marko Laine, Johanna Tamminen, Finnish Meteorological Institute (Finland) . . . . . [8890-15]

16:20: **Use of satellite data for air quality applications in northern China**, Stefanie Schrader, Karlsruher Institut für Technologie (Germany); Irina N. Sokolik, Georgia Institute of Technology (United States); Bernhard Vogel, Heike Vogel, Peter Suppan, Klaus Schäfer, Stefan Norra, Karlsruher Institut für Technologie (Germany) . [8890-16]

16:40: **The principle of fragmentary spectrum registration for acousto-optical spectrometers based on differential optical absorption spectroscopy**, Alexander V. Fadeyev, Vitold E. Pozhar, V. I. Pustovoit, Scientific and Technological Ctr. for Unique Instrumentation (Russian Federation) . . . . . [8890-17]

Thursday 26 September

SESSION 3

Room: Seminar 2 . . . . . Thu 8:30 to 11:50

Radiative Transfer I

Session Chair: **Evgueni I. Kassianov,**
Pacific Northwest National Lab. (United States)

8:30: **Contemplating synergistic algorithms for the NASA ACE Mission** *(Invited Paper)*, Gerald G. Mace, The Univ. of Utah (United States) . . . . . [8890-18]

9:00: **Automated cloud classification using a ground based infrared camera and texture analysis techniques**, Emal Rumi, Campbell Scientific Ltd. (United Kingdom); David Kerr, Jeremy M. Coupland, Loughborough Univ. (United Kingdom); Andrew Sandford, Mike Brettle, Campbell Scientific Ltd. (United Kingdom). . . . . [8890-19]

9:20: **Remote sensing of water clouds temperature with an IR camera on board the ISS in the frame of JEM-EUSO Mission**, Susana Briz, Isabel Fernández-Gómez, Irene Rodríguez Muñoz, Univ. Carlos III de Madrid (Spain); Antonio J. de Castro González, Universidad Carlos III de Madrid (Spain); Fernando López Martinez, Univ. Carlos III de Madrid (Spain); Guadalupe Sáez Cano, María Dolores Rodríguez Frías, Univ. de Alcalá (Spain) . . . . . [8890-20]

9:40: **Two-stage algorithm for cloud detection with ZY-1 02C multispectral measurements**, Ye-Yao Wang, National Environmental Monitoring Ctr. (China); Wei-Min Wang, Lijun Yang, Hong Liang, China National Environmental Monitoring Ctr. (China) . . . . . [8890-21]

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

10:30: **Estimation of a radiative transfer model in the longwave spectral range: sensitivity study and application to real cases**, Michaël Sicard, Santi Bertolín, Univ. Politècnica de Catalunya (Spain); Marc Mallet, Univ. de Toulouse (France) and Ctr. National de la Recherche Scientifique (France); Philippe Dubuisson, Univ. de Lille 1 (France); Adolfo Comerón, Univ. Politècnica de Catalunya (Spain) . . . . . [8890-22]

10:50: **Gas plume characterization from infrared airborne hyperspectral sensors at high spatial resolution using 3D spatial a priori information**, Pierre-Yves Foucher, Ramzi Idoughi, Laurent Poutier, Xavier Briottet, ONERA (France) . . . . . [8890-23]

11:10: **Aerosol information over Osaka during DRAGON Japan experiment**, Itaru Sano, Sonoyo Mukai, Kinki Univ. (Japan); Brent N. Holben, NASA Goddard Space Flight Ctr. (United States); Makiko Nakata, Kinki Univ. (Japan); Nobuo Sugimoto, National Institute for Environmental Studies (Japan) . . . . . [8890-24]

11:30: **Temporal variability of aerosol properties during TCAP: impact on radiative forcing**, Evgueni I. Kassianov, James Barnard, Mikhail Pekour, Larry K. Berg, Pacific Northwest National Lab. (United States); Joseph J. Michalsky Jr., National Oceanic and Atmospheric Administration (United States); Kathleen O. Lantz, Cooperative Institute for Research in Environment Sciences (United States); Gary Hodges, National Oceanic and Atmospheric Administration (United States) and Cooperative Institute for Research in Environment Sciences (United States) . . . . . [8890-25]

Lunch Break . . . . . Thu 11:50 to 13:10

SESSION 4

Room: Seminar 2 . . . . . Thu 13:10 to 16:20

Radiative Transfer II

Session Chair: **Evgueni I. Kassianov,**
Pacific Northwest National Lab. (United States)

13:10: **Application of MAIAC high spatial aerosol retrievals over Po Valley (Italy)**, Barbara Arvani M.D., Univ. degli Studi di Modena e Reggio Emilia (Italy); Robert B. Pierce, NOAA / NESDIS Office of Satellite Operations (United States); Alexei Lyapustin, NASA Goddard Space Flight Ctr. (United States); Yujie Wang, Univ. of Maryland (United States); Sergio Teggi, Grazia Ghermandi, Univ. degli Studi di Modena e Reggio Emilia (Italy) . . . . . [8890-26]

13:30: **Ground-based high resolution Fourier transform spectrometer and its application in Beijing**, Dongdong Fan, DFH Satellite Co., Ltd. (China). . . . . [8890-27]

13:50: **Retrieval of water cloud top and bottom heights and the validation with ground-based observations**, Makoto Kuji, Nara Women's Univ. (Japan) . . . . . [8890-28]

14:10: **Analytical model and spectral correction of vibration effects on Fourier transform spectrometer**, Irina Shatalina, Politecnico di Milano (Italy); Frederic Schmidt, Univ. Paris-Sud 11 (France); Bortolino Saggin, Politecnico di Milano (Italy); Nicolas Gac, Matthieu Kowalski, Univ. Paris-Sud 11 (France); Marco Giuranna, Istituto di Fisica dello Spazio Interplanetario (Italy) . . . . . [8890-29]

14:30: **MicroMIMA FTS: design of spectrometer for Mars atmosphere investigation**, Irina Shatalina, Bortolino Saggin, Diego Scaccabarozzi, Roberto Panzeri, Politecnico di Milano (Italy); Giancarlo Bellucci, Istituto Nazionale di Astrofisica (Italy) . . . [8890-30]

Coffee Break . . . . . Thu 14:50 to 15:20

15:20: **Assessing satellite based PM2.5 estimates against CMAQ model forecasts**, Barry M. Gross, Lina Cordero, Nazmi Chowdhury, Fred Moshary, The City College of New York (United States); Mike Ku, New York State Dept. of Environmental Conservation (United States) . . . . . [8890-31]

15:40: **Uncertainty quantification in aerosol optical thickness retrieval from Ozone Monitoring Instrument (OMI) measurements**, Anu Määttä, Marko Laine, Johanna Tamminen, Finnish Meteorological Institute (Finland); Pepijn Veefkind, Koninklijk Nederlands Meteorologisch Instituut (Netherlands) . . . . . [8890-32]

16:00: **Development of 3D Earth system scattering model with ray tracing method**, Dongok Ryu, Sug-Whan Kim, Sehyun Seong, Yonsei Univ. (Korea, Republic of) . . . . . [8890-33]

Optics in Atmospheric Propagation and Adaptive Systems XVI

Conference Chairs: **Karin Stein,** Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung (Germany); **John D. Gonglewski,** European Office of Aerospace Research and Development (United Kingdom)

Programme Committee: **Ivo Buske,** Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany); **Sylvain Cheinet,** Institut Franco-Allemand de Recherches de Saint-Louis (France); **David C. Dayton,** Applied Technology Associates (United States); **Gregory C. Dente,** Air Force Research Lab. (United States); **Denis Dion Jr.,** Defence Research and Development Canada, Valcartier (Canada); **Stephen M. Hammel,** Space and Naval Warfare Systems Command (United States); **Vladimir P. Lukin,** V.E. Zuev Institute of Atmospheric Optics (Russian Federation); **Cheryl Matson,** Univ. of California, San Diego (United States); **Sergio R. Restaino,** U.S. Naval Research Lab. (United States); **Jim Riker,** Air Force Research Lab. (United States); **Marc J. F. Séchaud,** ONERA (France); **Alexander M. J. van Eijk,** TNO Defence, Security and Safety (Netherlands); **Arthur D. van Rheenen,** Norwegian Defence Research Establishment (Norway)

Monday 23 September

OPENING REMARKS

Room: Konferenz 4 . . . . . .8:30 to 8:40

SESSION 5

Room: Konferenz 4 . . . . . Mon 8:40 to 10:00

Characterization of the Environment I

Session Chair: **Karin Stein,** Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung (Germany)

8:40: **Measuring non-Kolmogorov turbulence**, Szymon Gladysz, Detlev Sprung, Karin Stein, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung (Germany) . . . . . [8890-40]

9:00: **A comparison of slant-path scintillometry, sonic anemometry and high speed videography for vertical profiling of atmospheric turbulence in the surface layer**, Derek J. Griffith, Council for Scientific and Industrial Research (South Africa); Lufuno Vhengani, Arshath Ramkilowan, Council for Scientific and Industrial Research Chapter (South Africa); Detlev Sprung, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung (Germany) . . . . . [8890-41]

9:20: **Characterization of optical turbulence at telescope dome level affecting the solar observatory at the Mount Teide**, Detlev Sprung, Erik Sucher, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung (Germany). . . . . [8890-42]

9:40: **Characterizing inertial and convective optical turbulence by detrended fluctuation analysis**, Gustavo Funes, Ctr. de Investigaciones en Óptica, A.C. (Argentina); Eduardo Figueroa, Pontificia Univ. Católica de Valparaíso (Chile); Ángel Fernandez, Pontificia Univ. Católica de Valparaíso (Chile) and Univ. Técnica Federico Santa María (Chile); Damián Gulich, Ctr. de Investigaciones en Óptica, A.C. (Argentina); Luciano Zunino, Ctr. de Investigaciones en Óptica, A.C. (Argentina) and Univ. Nacional de la Plata (Argentina); Darío G. Pérez, Pontificia Univ. Católica de Valparaíso (Chile)[8890-43]

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

SESSION 6

Room: Konferenz 4 . . . . . Mon 10:30 to 11:50

Characterization of the Environment II

10:30: **Evaluation of refractive index structure**, ... [8890-44]

10:50: **Validation of MATISSE background images and cloud simulations: comparing results with MODIS satellite images**, Caroline Schweitzer, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung (Germany); Claire Malherbe, ONERA (France); Norbert Wendelstein, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung (Germany). . . . . [8890-45]

11:10: **Propagation of shot-pulsed partially coherent laser beams**, Olga V. Tikhomirova, Viktor A. Banakh, Iya Zaloznaya, V.E. Zuev Institute of Atmospheric Optics (Russian Federation). . . . . [8890-46]

11:30: **Density oscillations generated by vortex rings and their effect on scintillation of a Gaussian beam**, Fedor V. Shugaev, Evgeni N. Terentiev, Ludmila S. Shtemenko, Lomonosov Moscow State Univ. (Russian Federation). . . . . [8890-47]

SESSION 7

Room: Konferenz 4 . . . . . Mon 11:50 to 12:30

Imaging through Turbulence

11:50: **Imaging through atmospheric turbulence for laser based C-RAM systems: an analytical approach**, Ivo Buske, Wolfgang Riede, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany); Jürgen Zoz, MBDA Germany (Germany). . . . . [8890-48]

12:10: **High-resolution imaging through strong atmospheric turbulence**, Stuart M. Jefferies, Douglas A. Hope, Univ. of Hawai'i (United States); Michael Hart, The Univ. of Arizona (United States); James Nagy, Emory Univ. (United States) . . . . . [8890-49]

Lunch Break . . . . . Mon 12:30 to 13:40

SESSION 8

Room: Konferenz 4 . . . . . Mon 13:40 to 15:20

Adaptive Optics Systems

Session Chair: **John D. Gonglewski,** European Office of Aerospace Research and Development (United Kingdom)

13:40: **Solar adaptive optics at the Observatorio del Teide, Tenerife**, Dirk Soltau, Thomas Berkefeld, Kiepenheuer-Institut für Sonnenphysik (Germany); Dirk Schmidt, National Solar Observatory (United States); Oskar von der Lühe, Kiepenheuer-Institut für Sonnenphysik (Germany) . . . . . [8890-50]

14:00: **Compensation of laser beam initial wave front aberrations using backscattered radiation as a signal for adaptive control**, Viktor A. Banakh, V.E. Zuev Institute of Atmospheric Optics (Russian Federation) . . . . . [8890-51]

14:20: **Characterization of the holographic wavefront sensor for free-space optical communications**, Andreas Zepp, Szymon Gladysz, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung (Germany) . . . . . [8890-52]

14:40: **Adaptive optical focusing of laser beam in turbulent atmosphere with use fluctuating reference source**, Lidiia A. Bolbasova, Vladimir P. Lukin, V.E. Zuev Institute of Atmospheric Optics (Russian Federation) . . . . . [8890-53]

15:00: **A new method to measure atmospheric turbulence**, Régis Barillé, Univ. d'Angers (France); Darío G. Perez, Pontificia Univ. Católica de Valparaíso (Chile); Ewelina Ortyl, Sonia Zielinska, Wroclaw Univ. of Technology (Poland); Yohann Morille, Univ. d'Angers (France) . . . . . [8890-54]

Coffee Break . . . . . Mon 15:20 to 16:00

PLENARY SESSION

Room: Saal 3 . . . . . .Mon 16:00 to 17:45

Remote Sensing 2013: Plenary Session

For details, please see page 4-5 in the printed programme or visit http://spie.org/remote-sensing-europe.xml

SAR Image Analysis, Modeling, and Techniques XIII

Conference Chairs: **Claudia Notarnicola,** EURAC research (Italy); **Simonetta Paloscia,** Istituto di Fisica Applicata Nello Carrara (Italy); **Nazzareno Pierdicca,** Univ. degli Studi di Roma La Sapienza (Italy)

Programme Committee: **Richard Bamler,** Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany); **Fabio Bovenga,** Consiglio Nazionale delle Ricerche (Italy); **Fabio Covello,** Agenzia Spaziale Italiana (Italy); **Mihai P. Datcu,** Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany); **Fabio Del Frate,** Univ. degli Studi di Roma Tor Vergata (Italy); **Linda Marchese,** INO (Canada); **Antonio Moccia,** Univ. degli Studi di Napoli Federico II (Italy); **Francesco Nirchio,** Agenzia Spaziale Italiana (Italy); **Luca Pasolli,** EURAC research (Italy); **Luca Pulvirenti,** Univ. degli Studi di Roma La Sapienza (Italy); **Fabio Rocca,** Politecnico di Milano (Italy); **Emanuele Santi,** Istituto di Fisica Applicata Nello Carrara (Italy); **Stefan Schneiderbauer,** EURAC research (Italy); **David Small,** Univ. of Zürich (Switzerland)

Tuesday 24 September

POSTER SESSION
Room: Mezzanine Level Exhibition Hall
Tue 17:40 to 19:10

Conference attendees are invited to attend the Remote Sensing Poster Session on Tuesday afternoon. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. 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. Poster authors, view poster presentation guidelines and set-up instructions on page 6 and at http://spie.org/x32234.xml.

Tomographic SAR inversion by generic log-barrier algorithm: the second order cone programming approach, Filippo Biondi, Ministro Della Difesa (Italy); Nazzareno Pierdicca, Univ. degli Studi di Roma La Sapienza (Italy); Piero Ciotti, Univ. degli Studi dell'Aquila (Italy)[8891-7]

Experimental extraction of sub-pixel resolution in RADAR images via amplitude, phase and polarization readouts, Zeev Zalevsky, Sara Cohen, Bar-Ilan Univ. (Israel) . . . . . [8891-23]

A new detection method of oil rig in SAR imagery, Peng Chen, Jingsong Yang, The Second Institute of Oceanography, SOA (China) . . . . . [8891-26]

SAR data analysis in mineral ore utilization, G. A. Shanmugha Sundaram, Amrita Visshwa Vidyapeetham Univ. (India) . . . . . [8891-27]

Radar clutter as an indicator in vegetation classification: vegetation classification using a single dual polarimetric TSX-1 image, Marina Hetz, Dan G. Blumberg, Stanley R. Rotman, Ben-Gurion Univ. of the Negev (Israel) . . . . . [8891-28]

Estimating the surface age of arid-zone alluvial fans using spaceborne radar data, Guy Hetz, Ben-Gurion Univ. of the Negev (Israel); Amit Mushkin, Geological Survey of Israel (Israel); Dan G. Blumberg, Ben-Gurion Univ. of the Negev (Israel) . . . . . [8891-29]

Compact polarimetry evaluation for reconstruction of full polarimetric information in SAR RS, Mmaamar Abimouloud, Univ. des Sciences et de la Technologie Houari Boumediene (Algeria) . . . . . [8891-30]

Wednesday 25 September

SESSION SJS1
Room: Seminar 5-6 . . . . . Wed 13:30 to 15:10

SAR Data Processing I: Joint Session
Session Chair: **Lorenzo Bruzzone,** Univ. degli Studi di Trento (Italy)

Conference 8892, Image and Signal Processing for Remote Sensing and Conference 8891, SAR Image Analysis, Modeling and Techniques Joint Session

13:30: **Simulation of imaging effects of very high resolution SAR systems**, Harald Anglberger, Rainer Speck, Helmut Suess, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany) . . . . . [8891-1]

13:50: **Label co-occurrence matrix for the detection of urban areas in high-resolution SAR Images**, Na Li, National Univ. of Defense Technology (China) and Univ. degli Studi di Trento (Italy); Lorenzo Bruzzone, Univ. degli Studi di Trento (Italy); Zeng-Ping Chen, Fang Liu, National Univ. of Defense Technology (China) . . . . [8892-48]

14:10: **Robust tie points selection for InSAR image coregistration**, Takieddine Skanderi, Boulerbah Chabira, Univ. des Sciences et de la Technologie Houari Boumediene (Algeria); Afifa Belkacem, Univ. des Sciences et de la Technologie (Algeria); Aichouche Belhadj Aissa, Univ. des Sciences et de la Technologie Houari Boumediene (Algeria) . . . . . [8892-46]

14:30: **A new heterogeneity scale to improve anisotropic diffusion based speckle filters in SAR images**, Rohit K. Chatterjee, Birla Institute of Technology (India); Avijit Kar, Jadavpur Univ. (India) . . . . . [8892-47]

14:50: **A change detection approach applied to COSMO-SkyMed images to characterize snow cover areas**, Simonetta Paloscia, Simone Pettinato, Istituto di Fisica Applicata Nello Carrara (Italy) . . . . . [8891-3]

Coffee Break . . . . . .Wed 15:10 to 15:40

SESSION SJS2
Room: Seminar 5-6 . . . . . Wed 15:40 to 17:00

SAR Data Processing II: Joint Session
Session Chair: **Claudia Notarnicola,** EURAC research (Italy)

Conference 8892, Image and Signal Processing for Remote Sensing and Conference 8891, SAR Image Analysis, Modeling and Techniques Joint Session

15:40: **Multichromatic analysis of SAR images for target analysis,** Fabio Bovenga, Consiglio Nazionale delle Ricerche (Italy); Dominique Derauw, Univ. de Liège (Belgium); Fabio M. Rana, Alberto Refice, Nicola Veneziani, Consiglio Nazionale delle Ricerche (Italy); Raffaele Vitulli, European Space Research and Technology Ctr. (Netherlands) . . . . . [8891-4]

16:00: **A novel multiband SAR data technique for fully automatic oil spill detection in the ocean,** Fabio Del Frate, Daniele Latini, Alireza Taravat, Univ. degli Studi di Roma Tor Vergata (Italy); Cathleen E. Jones, Jet Propulsion Lab. (United States). . . . . [8891-5]

16:20: **A system for the automatic classification of Earth continental ice subsurface features in radar sounder data,** Ana-Maria Ilisei, Lorenzo Bruzzone, Univ. degli Studi di Trento (Italy) . . . . . [8892-75]

16:40: **A semi-automatic approach for estimating bedrock and surface layers from multichannel coherent radar depth sounder imagery,** Jerome E. Mitchell, David J. Crandall, Geoffrey C. Fox, Indiana Univ. (United States); John D. Paden, Ctr. for Remote Sensing of Ice Sheets (United States). . . . . [8892-49]

Thursday 26 September

OPENING REMARKS
Room: Seminar 5-6 . . . . . Thurs 08:55 to 09:00

SESSION 1
Room: Seminar 5-6 . . . . . Thurs 09:00 to 10:00

Interferometry I

Session Chair: **Fabio Bovenga,**
Consiglio Nazionale delle Ricerche (Italy)

09:00: **Detection of partially coherent scatterers in multidimensional SAR tomography: a theoretical study,** Antonio Pauciullo, Istituto per il Rilevamento Elettromagnetico dell'Ambiente (Italy); Antonio De Maio, Univ. degli Studi di Napoli Federico II (Italy); Stefano Perna, Univ. degli Studi di Napoli Parthenope (Italy); Diego Reale, Gianfranco Fornaro, Istituto per il Rilevamento Elettromagnetico dell'Ambiente (Italy) . . . . . [8891-6]

09:20: **2D phase unwrapping using Markov random field based phase locked loops,** Nazli Deniz Kahyaoglu, Mihai P. Datcu, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany) . . [8891-8]

09:40: **End-to-end design consideration of a radar altimeter for terrain-aided navigation,** Inchan Paek, Dongmin Park, Kyungju Yoo, Samsung Thales Co., Ltd. (Korea, Republic of); Joohwan Chun, KAIST (Korea, Republic of) . . . . . [8891-9]

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

SESSION 2
Room: Seminar 5-6 . . . . . Thurs 10:30 to 12:10

Interferometry II

Session Chair: **Nazzareno Pierdicca,**
Univ. degli Studi di Roma La Sapienza (Italy)

10:30: **Assessment of INSAR potential in simulating subsurface geological structure,** Negin Fouladi Moghaddam, Chris Rudiger, Monash Univ. (Australia); Sergey Samsonov, Natural Resources Canada (Canada) and European Ctr. for Geodynamics and Seismology (Luxembourg); Jeffrey P. Walker, Mike Hall, Monash Univ. (Australia) . . . . . [8891-10]

10:50: **An algorithm for phase-offset evaluation in InSAR DEM generation,** Stefano Perna, Univ. degli Studi di Napoli Parthenope (Italy) and CNR-IREA (Italy); Carmen Esposito, Istituto per il Rilevamento Elettromagnetico dell'Ambiente (Italy) and Univ. degli Studi del Sannio (Italy); Riccardo Lanari, Antonio Pauciullo, Istituto per il Rilevamento Elettromagnetico dell'Ambiente (Italy); Christian Wimmer, Orbisat Remote Sensing (Brazil); Paolo Berardino, Istituto per il Rilevamento Elettromagnetico dell'Ambiente (Italy) . . . . . [8891-11]

11:10: **Decorrelation of L-band and C-band interferometry to volcanic risk prevention,** Eva Savina Malinverni, Anna Nora Tassetti, Univ. Politecnica delle Marche (Italy); David Sandwell, Univ. of California, San Diego (United States) . . . . . [8891-12]

11:30: **C/X-band SAR interferometry applied to ground monitoring: examples and new potentials,** Raffaele Nutricato, Davide O. Nitti, GAP S.r.l. (Italy); Fabio Bovenga, Alberto Refice, Janusz Wasowski, Consiglio Nazionale delle Ricerche (Italy); Maria Teresa Chiaradia, Politecnico di Bari (Italy) . . . . . [8891-13]

11:50: **Monitoring of infrastructural sites by means of advanced multi-temporal DInSAR methods,** Andreas Vollrath, Francesco Zucca, Univ. degli Studi di Pavia (Italy); Salvatore Stramondo, Istituto Nazionale di Geofisica e Vulcanologia (Italy) . . . . . [8891-14]

Lunch Break . . . . . Thu 12:10 to 13:10

SESSION RJS
Room: Seminar 5-6 . . . . . Thurs 13:10 to 15:30

Radar Applications in Agro-Hydrology Joint Session

Session Chairs: **Antonino Maltese,** Univ. degli Studi di Palermo (Italy);
Claudia Notarnicola, EURAC research (Italy)

Conference 8887, Remote Sensing fro Agriculture, Ecosystems and Hydrology and Conference 8891, SAR Image Analysis, Modeling and Techniques Joint Session

13:10: **Comparison of three algorithms for the retrieval of soil moisture from ASCAT data in the framework of the round robin exercise,** Simonetta Paloscia, Emanuele Santi, Istituto di Fisica Applicata Nello Carrara (Italy) . . . . . [8891-15]

13:30: **Multi-temporal classification of TerraSAR-X data for wetland vegetation mapping,** Julie Betbeder, Sébastien Rapinel, Thomas Corpetti, Univ. Rennes 2 (France); Eric Pottier, Univ. de Rennes 1 (France); Samuel Corgne, Laurence Hubert Moy, Univ. Rennes 2 (France) . . . . . [8887-49]

13:50: **How far can be SAR considered a tool for mountain hydrology?,** Giacomo Bertoldi, Claudia Notarnicola, Luca Pasolli, EURAC research (Italy); Stefano Della Chiesa, Georg Niedrist, Ulrike Tappeiner, EURAC research (Italy) and Univ. Innsbruck (Austria) . . . . . [8891-16]

14:10: **Coupling X-Band COSMOS-SkyMed and optical DEIMOS-1 data for NDVI retrieval: model calibration and validation on two test areas,** Fulvio Capodici, Antonino Maltese, Univ. degli Studi di Palermo (Italy); Guido D'Urso, Univ. degli Studi di Napoli Federico II (Italy); Giuseppe Ciraolo, Univ. degli Studi di Palermo (Italy) . . . . . [8887-50]

14:30: **Soil moisture retrieval from three-day repeat ERS-2/SAR data: comparison with ASCAT- and SMOS-derived estimates and in situ measurements,** Luca Pulvirenti, Nazzareno Pierdicca, Fabio Fascaetti, Univ. degli Studi di Roma La Sapienza (Italy) . . . . . [8891-17]

14:50: **Integration of multispectral and C-band SAR data for crop monitoring applications,** Lorenzo Iannni, Ramses A. Molijn, Ramon F. Hanssen, Technische Univ. Delft (Netherlands) . . . . . [8887-51]

15:10: **GNSS-R sensor sensitivity to soil moisture and vegetation biomass and comparison with SAR data performance,** Simonetta Paloscia, Istituto di Fisica Applicata Nello Carrara (Italy) . . . . [8891-18]

Coffee Break . . . . . Thu 15:30 to 16:00

SESSION 3
Room: Seminar 5-6 . . . . . Thurs 16:00 to 17:20

SAR Applications

Session Chair: **Emanuele Santi,**
Istituto di Fisica Applicata Nello Carrara (Italy)

16:00: **Combining polarimetric and contextual information using autoassociative neural networks,** Ruggero G. Avezzano, Fabio Del Frate, Univ. degli Studi di Roma Tor Vergata (Italy) . . . . . [8891-19]

16:20: **Dealing with flood mapping using SAR data in the presence of wind or heavy precipitation**, Nazzareno Pierdicca, Luca Pulvirenti, Univ. degli Studi di Roma La Sapienza (Italy) . . . . . [8891-20]

16:40: **Phenomenology of fully polarimetric TerraSAR-X data,** Jorge V. Geaga, Consultant (United States) . . . . . [8891-21]

17:00: **Asymmetric decomposition method for polarimetric SAR data using a modified four-component scattering model,** Bin Zou, Ning Cao, Yan Zhang, Hongjun Cai, Harbin Institute of Technology (China) . . . . . [8891-22]

Image and Signal Processing for Remote Sensing XIX

Conference Chair: **Lorenzo Bruzzone,** Univ. degli Studi di Trento (Italy)

Conference Co-Chairs: **Jon Atli Benediktsson,** Univ. of Iceland (Iceland); **Sebastiano Bruno Serpico,** Univ. degli Studi di Genova (Italy)

Programme Committee: **Selim Aksoy,** Bilkent Univ. (Turkey); **Luciano Alparone,** Univ. degli Studi di Firenze (Italy); **José M. Bioucas-Dias,** Univ. Técnica de Lisboa (Portugal); **Francesca Bovolo,** Univ. degli Studi di Trento (Italy); **Gustavo Camps-Valls,** Univ. de València (Spain); **Jocelyn Chanussot,** Lab. des Images et des Signaux (France); **Chi-Hau Chen,** Univ. of Massachusetts Dartmouth (United States); **Melba M. Crawford,** Purdue Univ. (United States); **Fabio Dell'Acqua,** Univ. degli Studi di Pavia (Italy); **Peijun Du,** Nanjing Univ. (China); **Giles M. Foody,** The Univ. of Nottingham (United Kingdom); **Andrea Garzelli,** Univ. degli Studi di Siena (Italy); **Jordi Inglada,** Ctr. d'Etudes Spatiales de la Biosphère (France); **Gabriele Moser,** Univ. degli Studi di Genova (Italy); **Allan A. Nielsen,** Technical Univ. of Denmark (Denmark); **Ryuei Nishii,** Kyushu Univ. (Japan); **Antonio J. Plaza,** Univ. de Extremadura (Spain); **John A. Richards,** The Australian National Univ. (Australia); **Josiane B. Zerubia,** INRIA Sophia Antipolis - Méditerranée (France)

Monday 23 September

OPENING REMARKS

Room: Seminar 5-6 . . . . . .8:25 to 8:30

SESSION 1

Room: Seminar 5-6 . . . . . Mon 8:30 to 10:10

Panshapening, Super-Resolution and Interpolation

Session Chair: **Andrea Garzelli,** Univ. degli Studi di Siena (Italy)

8:30: **Quality assessment of pan-sharpening methods**, Gintautas Palubinskas, Peter Reinartz, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany) . . . . . [8892-1]

8:50: **Pansharpening of hyperspectral images: a critical analysis of requirements and assessment on simulated PRISMA data**, Andrea Garzelli, Univ. degli Studi di Siena (Italy); Bruno Aiazzi, Istituto di Fisica Applicata Nello Carrara (Italy); Luciano Alparone, Univ. degli Studi di Firenze (Italy); Stefano Baronti, Massimo Selva, Istituto di Fisica Applicata Nello Carrara (Italy) . . . . . [8892-2]

9:10: **A new super resolution method based on combined sparse representations for remote sensing imagery**, Feng Li, Lingli Tang, ChuanRong Li, Academy of Opto-Electronics (China); Yi Guo, Commonwealth Scientific and Industrial Research Organisation (Australia); JunBin Gao, Charles Sturt Univ. (Australia) . . . . . [8892-3]

9:30: **Linear spectral unmixing-based method including extended nonnegative matrix factorization for pan-sharpening multispectral remote sensing images**, Moussa Sofiane Karoui, Ctr. des Techniques Spatiales (Algeria) . . . . . [8892-4]

9:50: **On non-uniform sampling for remote sensing optical images: the METEOSAT Third Generation rectification case study**, Rebeca Gutiérrez, Dieter Just, European Organisation for the Exploitation of Meteorological Satellites (Germany) . . . . . [8892-5]

Coffee Break . . . . . Mon 10:10 to 10:40

SESSION 2

Room: Seminar 5-6 . . . . . Mon 10:40 to 12:20

Image Restoration and Segmentation

Session Chair: **Gulsen Taskin Kaya,** Istanbul Technical Univ. (Turkey)

10:40: **Hyperspectral image restoration using wavelets**, Behnood Rasti, Johannes R. Sveinsson, Magnus O. Ulfarsson, Jon Atli Benediktsson, Univ. of Iceland (Iceland) . . . . . [8892-6]

11:00: **Evaluation of a segmentation algorithm designed for an FPGA implementation**, Kurt Schwenk, Maria von Schönermark, Felix Huber, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany) . . . . . [8892-7]

11:20: **Comparison of an L1-regression-based and a RANSAC-based planar segmentation procedure for urban terrain data with many outliers**, Dimitri Bulatov, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung (Germany); Jian Luo, Zhibin Deng, North Carolina State Univ. (United States); John E. Lavery, North Carolina State Univ. (United States) and U.S. Army Research Lab. (United States); Shu-Cherng Fang, North Carolina State Univ. (United States) . . . . . [8892-8]

11:40: **Automatic urban road extraction on DSM data based-on fuzzy ART, region growing, morphological operations and Radon transform**, Darlis Herumurti, Keiichi Uchimura, Gou Koutaki, Kumamoto Univ. (Japan); Takumi Uemura, Sojo Univ. (Japan) [8892-9]

12:00: **Soil surface roughness modeling: limit of global characterization in remote sensing**, Olivier Chimi Chiadjeu, Edwige Vannier, Richard Dusséaux, Odile Taconet, LATMOS (France) . . . . . [8892-10]

Lunch Break . . . . . Mon 12:20 to 13:30

SESSION 3

Room: Seminar 5-6 . . . . . Mon 13:30 to 15:10

Image Registration and Object Recognition

Session Chair: **Lorenzo Bruzzone,** Univ. degli Studi di Trento (Italy)

13:30: **Dense registration of CHRIS-Proba and Ikonos images using multi-dimensional mutual information maximization**, Claude Cariou, Kacem Chehdi, Univ. de Rennes 1 (France) . . . . . [8892-11]

13:50: **An self-adaptive image registration method: from local learning to overall processing**, Peng Ye, Na Li, Fang Liu, Guirong Guo, Juhong Wu, National Univ. of Defense Technology (China) . . . . . [8892-12]

14:10: **Automatic SAR and optical images registration method based on improved SIFT**, Chunyu Yue, Beijing Institute of Space Mechanics and Electricity (China); Wanshou Jiang, Wuhan Univ. (China) . . . . . [8892-13]

14:30: **Automated search for livestock enclosures of rectangular shape in remotely sensed imagery**, Igor Zingman, Dietmar Saupe, Univ. Konstanz (Germany); Karsten Lambers, Otto-Friedrich-Univ. Bamberg (Germany) . . . . . [8892-14]

14:50: **A comprehensive analysis of earthquake damage patterns using high dimensional model representation feature selection**, Gulsen Taskin Kaya, Istanbul Technical Univ. (Turkey) . . . . . [8892-15]

Coffee Break . . . . . Mon 15:10 to 16:00

PLENARY SESSION

Room: Saal 3 . . . . . .Mon 16:00 to 17:45

Remote Sensing 2013: Plenary Session

For details, please see page 4-5 in the printed programme or visit http://spie.org/remote-sensing-europe.xml

Tuesday 24 September

SESSION 4

Room: Seminar 5-6 . . . . . Tue 8:30 to 10:10

Hyperspectral Image Processing

Session Chair: **Jon Atli Benediktsson,** Univ. of Iceland (Iceland)

8:30: **Preprocessing of hyperspectral images: a comparative study of destriping algorithms for EO1-Hyperion**, Daniel Scheffler, Pierre Karrasch, Technische Univ. Dresden (Germany). . . . . [8892-16]

8:50: **Wavelet based hyperspectral image restoration using spatial and spectral penalties**, Behnood Rasti, Johannes R. Sveinsson, Magnus O. Ulfarsson, Jon Atli Benediktsson, Univ. of Iceland (Iceland) . . . . . [8892-17]

9:10: **Hyperspectral image segmentation using a cooperative nonparametric approach**, Akar Taher, Kacem Chehdi, Univ. de Rennes 1 (France); Claude Cariou, Univ de Rennes 1 (France) . . . . . [8892-18]

9:30: **Hyperspectral image simulation over heterogeneous non-Lambertian rugged terrain**, Alijafar Mousivand, Technische Univ. Delft (Netherlands); Wouter Verhoef, Univ. Twente (Netherlands); Massimo Menenti, Ben Gorte, Technische Univ. Delft (Netherlands) . . . . . [8892-19]

9:50: **VST-based lossy compression of hyperspectral data for new generation sensors**, Alexander N. Zemliachenko, Ruslan A. Kozhemiakin, Mykhail L. Uss, Sergey K. Abramov, Vladimir V. Lukin, National Aerospace Univ. (Ukraine); Benoit Vozel, Kacem Chehdi, Univ. de Rennes 1 (France) . . . . . [8892-20]

Coffee Break . . . . . Tue 10:10 to 10:40

SESSION 5

Room: Seminar 5-6 . . . . . Tue 10:40 to 12:20

Unmixing and Classification in Hyperspectral Images

Session Chair: **Antonio J. Plaza,** Univ. de Extremadura (Spain)

10:40: **Estimating the number of endmembers in hyperspectral imagery using hierarchical agglomerate clustering**, Jee-Cheng Wu, Heng-Yang Wu, Gwo-Chyang Tsuei, National Ilan Univ.. (Taiwan) . . . . . [8892-21]

11:00: **Boundary constraints for singular value decomposition of spectral data**, John H. Gruninger, Hoang Dothe, Spectral Sciences, Inc. (United States) . . . . . [8892-22]

11:20: **Extraction of spatial features in hyperspectral images based on the analysis of differential attribute profiles**, Nicola Falco, Univ. degli Studi di Trento (Italy) and Univ. of Iceland (Iceland); Jon Atli Benediktsson, Univ. of Iceland (Iceland); Lorenzo Bruzzone, Univ. degli Studi di Trento (Italy) . . . . . [8892-24]

11:40: **Affinity propagation for large scale hyperspectral image classification**, Mariem Soltani, Kacem Chehdi, Claude Cariou, Univ. de Rennes 1 (France) . . . . . [8892-25]

12:00: **Improving the efficiency of MESMA through geometric unmixing principles**, Laurent Tits, Katholieke Univ. Leuven (Belgium); Ben Somers, VITO NV (Belgium); Rob Heylen, Univ. Antwerpen (Belgium) and Univ. of Florida (United States); Paul Scheunders, Univ. Antwerpen (Belgium); Pol Coppin, Katholieke Univ. Leuven (Belgium) . . . . . [8892-23]

Lunch/Exhibition Break . . . . . Tue 12:20 to 13:30

SESSION 6

Room: Seminar 5-6 . . . . . Tue 13:30 to 15:10

Image Classification

Session Chair: **Lorenzo Bruzzone,** Univ. degli Studi di Trento (Italy)

13:30: **Hyperspectral image classification using a spectral-spatial sparse coding model**, Jiang Li, Ender Oguslu, Old Dominion Univ. (United States); Guoqing Zhou, Guilin Univ. of Technology (China) . . . . . [8892-26]

13:50: **Classification of hyperspectral images with binary fractional order Darwinian PSO and random forests**, Pedram Ghamisi, Univ. of Iceland (Iceland); Micael S. Couceiro, Univ. de Coimbra (Portugal); Jon Atli Benediktsson, Univ. of Iceland (Iceland) . . . . . [8892-27]

14:10: **Smoothing parameter estimation framework for Markov random field by using contextual and spectral information**, Hossein Aghighi, John C. Trinder, The Univ. of New South Wales (Australia). . . . . [8892-28]

14:30: **Road extraction from satellite images by self-supervised classification and perceptual grouping**, Eda Sahin, ASELSAN Inc. (Turkey); Ilkay Ulusoy, Middle East Technical Univ. (Turkey) . [8892-29]

14:50: **Extraction and refinement of building faces in 3D point clouds**, Melanie Pohl, Dimitri Bulatov, Jochen Meidow, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung (Germany) . . . . . [8892-30]

Coffee Break . . . . . Tue 15:10 to 15:40

SESSION 7

Room: Seminar 5-6 . . . . . Tue 15:40 to 17:20

Data Mining and Data Fusion

Session Chair: **Jon Atli Benediktsson,** Univ. of Iceland (Iceland)

15:40: **Multisource oil spill detection**, Arnt B. Salberg, Siri O. Larsen, Maciel Zortea, Norwegian Computing Ctr. (Norway) . . . . . [8892-31]

16:00: **Joint processing of Landsat ETM+ and ALOS-PALSAR data for species richness and forest biodiversity monitoring**, Sara Attarchi, Technische Univ. Bergakademie Freiberg (Germany); Richard Gloaguen, Technische Univ. Bergakademie Freiberg (Germany) and Helmholtz Institute Freiberg of Resource Technology (Germany) . . . . . [8892-32]

16:20: **Recurrent neural networks for automatic clustering of multispectral satellite images**, Petia Koprinkova-Hristova, Kiril Alexiev, Bulgarian Academy of Sciences (Bulgaria); Denitsa Borisova, Georgi Jelev, Space Research and Technology Institute (Bulgaria) . . . . . [8892-33]

16:40: **Data mining and model adaption for the land use and land cover classification of a Worldview 2 image**, Lidice C. Nascimento, Carla B. M. Cruz, Univ. Federal do Rio de Janeiro (Brazil) . . . [8892-34]

17:00: **Application of genetic programming and Landsat multi-date imagery for urban growth monitoring**, Khelifa Djerriri, Ctr. National des Techniques Spatiales (Algeria); Malki Mimoun, Univ. de Sidi-Bel-Abbes (Algeria) . . . . . [8892-35]

POSTER SESSION

Room: Mezzanine Level Exhibition Hall
Tue 17:40 to 19:10

Conference attendees are invited to attend the Remote Sensing Poster Session on Tuesday afternoon. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. 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. Poster authors, view poster presentation guidelines and set-up instructions on page 6 and at http://spie.org/x32234.xml.

Detection of region of interest based on visual saliency analysis in high spatial resolution remote sensing images, Libao Zhang, Bingchang Qiu, Xianchuan Yu, Beijing Normal Univ. (China) . [8892-51]

Observation of aerosol properties at Saga using GOSAT product validation lidar, Hiroshi Okumura, Takeru Kawasaki, Taiga Akaho, Saga Univ. (Japan); Osamu Uchino, Isamu Morino, Tatsuya Yokota, National Institute for Environmental Studies (Japan); Tomohiro Nagai, Tetsu Sakai, Takashi Maki, Akihiro Yamazaki, Meteorological Research Institute (Japan); Kohei Arai, Saga Univ. (Japan) . . . . . [8892-52]

Evaluation of the radiometric properties of infrared imaging Fourier-transform spectrometers, Mariusz Kastek, Military Univ. of Technology (Poland); Martin Chamberland, Telops (Canada); Tadeusz Piatkowski, Military Univ. of Technology (Poland); Philippe Lagueux, Telops (Canada); Rafal Dulski, Military Univ. of Technology (Poland); Vincent Farley, Telops (Canada); Piotr Trzaskawka, Military Univ. of Technology (Poland) . . . . . [8892-53]

Comparison on accuracy of image matching between lossy JPEG compression and lossy JPEG 2000 compression, Ryuji Matsuoka, Kokusai Kogyo Co., Ltd. (Japan) and Tokai Univ. (Japan); Mitsuo Sone, Noboru Sudo, Hideyo Yokotsuka, Tokai Univ. (Japan); Naoki Shirai, Kokusai Kogyo Co., Ltd. (Japan) . . . . . [8892-55]

GOES Imager IR channel to channel co-registration correction program, Zhenping Li, SGT, Inc. (United States); Michael G. Grotenhuis, National Oceanic and Atmospheric Administration (United States); Timothy J. Schmit, Xiangqian Wu, National Environmental Satellite, Data, and Information Service (United States); Tony Schreiner, Jim P. Nelson, Univ. of Wisconsin-Madison (United States); Fangfang Yu, Sam M. Chen, Hyre Bysal, National Environmental Satellite, Data, and Information Service (United States) . . . . . [8892-56]

Geometric correction of airborne radar image data, and overlay with map data and satellite, Philippe Durand, Luan Jaupi, Dariush Ghorbanzadeh, Conservatoire National des Arts Métiers (France); Jean-Paul Rudant, Univ. Paris-Est Marne-la-Vallée (France) . [8892-57]

Pixel Response Non -Uniformity Correction for Multi-TDICCD Camera based on FPGA, Guofang Zhai, Beijing Institute of Space Mechanics and Electricity (China) . . . . . [8892-58]

Research on unmanned aerial vehicle (UAV) remote sensing and its applications for natural disasters management in China, He Huang, Siquan Yang, Lei Wang, Wei Wu, Juan Nie, Haixia He, Wei Zhang, Yan Cui, Feng Xu, Qi H. Wen, Fan Chun Bo, Tong Tang, Ping Wang, Li Ling Ling, National Disaster Reduction Ctr. of China (China) . . . . . [8892-59]

Multi-source remote-sensing image matching based on epipolar line and least squares, Peng Chen, Wuhan Univ. (China) and The Second Institute of Oceanography, SOA (China); Zhihua Mao, Jianyu Chen, The Second Institute of Oceanography, SOA (China); Xiaoping Zhang, State Key Laboratory of Information Engineering in Surveying Mapping and Remote Sensing (China); Zifeng Li, State Key Lab. of Information Engineering in Surveying Mapping and Remote Sensing (China) . . . . . [8892-60]

Estimating urban surface component from Landsat-5 TM data using spectral index model and sub-pixel model, QingNi Huang, Zhiqiang Cao, China Meteorological Administration (China); Xiaohuan Xi, Institute of Remote Sensing and Digital Earth (China) . . . . [8892-62]

Study of spectrally segmented PCA for feature extraction of hyperspectral data, Lord N. Prabhu, Manoj K. Arora, Balasubramanian Raman, Indian Institute of Technology Roorkee (India) . . . . . [8892-63]

Effect of attribute variation on the extraction quality of objects from high resolution remote sensing data, Mohit Srivastava, Manoj K. Arora, Indian Institute of Technology Roorkee (India) . . . . . [8892-64]

Kernel-based linear spectral mixture analysis via multiple kernels, Keng-Hao Liu, Yen-Yu Lin, Chu-Song Chen, Academia Sinica (Taiwan) . . . . . [8892-65]

A method to correct the smile effect based on the combination correction of radiometric and spectrum, Chuncheng Zhou, Xinhong Wang, Lingling Ma, Academy of Opto-Electronics (China) . . . [8892-66]

Estimation of optical properties of aerosols and bidirectional reflectance from PARASOL/POLDER data over land, Takashi Kusaka, Kanazawa Institute of Technology (Japan) . . . . . [8892-67]

Bartlett algorithm modification for energy spectrum assessment of optical radiation, Arseny Zhdanov, Oleg D. Moskaletz, St. Petersburg State Univ. of Aerospace Instrumentation (Russian Federation) . . . . . [8892-69]

Region of interest coding for high spatial resolution remote sensing image using adaptive direction lifting integer wavelet, Libao Zhang, Bingchang Qiu, Xianchuan Yu, Beijing Normal Univ. (China) . . . . . [8892-70]

MIMO Radar Arrays with Minimum Redundancy: A Design Method, Andreas J. Kirschner, Uwe Siart, Johanna Guetlein, Juergen B. Detlefsen, Technische Univ. München (Germany) . . . . . [8892-71]

The remote sensing image retrieval based on multi-feature, Jianbo Duan, Caihong Ma, Shibin Liu, Jing Zhang, Institute of Remote Sensing and Digital Earth (China) . . . . . [8892-72]

Visual appearance of wind turbine tower at long range measured using imaging system, Ove K. S. Gustafsson, Sebastian Möller, Swedish Defence Research Agency (Sweden) . . . . . [8892-73]

Non-uniformity correction for multi-TDICCD mosaic camera on FPGA, Guofang Zhai, Yun Cheng, Beijing Institute of Space Mechanics and Electricity (China) . . . . . [8892-74]

Wednesday 25 September

SESSION 8

Room: Seminar 5-6 . . . . . Wed 8:30 to 10:10

Change Detection and Multitemporal Analysis

Session Chair: **Francesca Bovolo,** Univ. degli Studi di Trento (Italy)

8:30: **Extended image differencing for change detection in UAV video mosaics**, Günter Saur, Wolfgang Krüger, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung (Germany) . . . [8892-36]

8:50: **Detection of damage to building side-walls in the 2011 Tohoku, Japan earthquake using high-resolution TerraSAR-X images**, Fumio Yamazaki, Chiba Univ. (Japan); Wen Liu, Tokyo Institute of Technology (Japan) . . . . . [8892-37]

9:10: **Connectivity constraint-based sequential pattern extraction from Satellite Image Time Series (SITS)**, Andreea Maria Julea, Institute of Space Science (Romania); Nicolas Méger, Univ. de Savoie (France) . . . . . [8892-38]

9:30: **Fusion of satellite and aerial images for identification and modeling of nature types**, Arnt B. Salberg, Norwegian Computing Ctr. (Norway); Lars Erikstad, Maciel Zortea, Norwegian Institute for Nature Research (Norway) . . . . . [8892-39]

9:50: **A robust nonlinear scale space change detection approach for SAR images**, Berk Sevilmis, Osman Erman Okman, Fatih Nar, Can Demirkesen, SDT A.S. (Turkey); Müjdat Çetin, Sabanci Univ. (Turkey) . . . . . [8892-40]

Coffee Break . . . . . Wed 10:10 to 10:40

SESSION 9

Room: Seminar 5-6 . . . . . Wed 10:40 to 12:00

Data Processing Applications

Session Chair: **Gintautas Palubinskas,** Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany)

10:40: **Investigating vegetation spectral reflectance for detecting hydrocarbon pipeline leaks from multispectral data**, Bashir Adamu, Kevin J. Tansey, Michael J. Bradshaw, Univ. of Leicester (United Kingdom) . . . . . [8892-41]

11:00: **The development of a remote sensing system with real-time automated horizon tracking for distance estimation at sea**, Abdulquadir L. Baruwa, Adrian Evans, Univ. of Bath (United Kingdom); Roy Wyatt, Seiche Measurements Ltd. (United Kingdom) . . . [8892-42]

11:20: **On board processing procedures for the solar orbiter: METIS coronagraph**, Maurizio Pancrazzi, Mauro Focardi, INAF - Osservatorio Astrofisico di Arcetri (Italy); Michela C. Uslenghi, INAF - IASF Milano (Italy); Gianalfredo Nicolini, INAF - Osservatorio Astronomico di Torino (Italy); Federico Landini, INAF - Osservatorio Astrofisico di Arcetri (Italy); Marco Romoli, Univ. degli Studi di Firenze (Italy); Ester Antonucci, Silvano Fineschi, INAF - Osservatorio Astronomico di Torino (Italy); Giampiero Naletto, Piergiorgio Nicolosi, Univ. degli Studi di Padova (Italy) and Consiglio Nazionale delle Ricerche (Italy); Daniele Spadaro, INAF - Osservatorio Astrofisico di Catania (Italy); Vincenzo Andretta, INAF - Osservatorio Astronomico di Capodimonte (Italy) . . . . . [8892-43]

11:40: **A spectral water index based on visual bands**, Essa Basaeed, Harish Bhaskar, Mohammed Al-Mualla, Khalifa Univ. of Science, Technology and Research (United Arab Emirates). . [8892-45]

Lunch/Exhibition Break . . . . . Wed 12:00 to 13:30

SESSION SJS1

Room: Seminar 5-6 . . . . . Wed 13:30 to 15:10

SAR Data Processing I: Joint Session

Session Chair: **Lorenzo Bruzzone,** Univ. degli Studi di Trento (Italy)

Conference 8892, Image and Signal Processing for Remote Sensing and Conference 8891, SAR Image Analysis, Modeling and Techniques Joint Session

13:30: **Simulation of imaging effects of very high resolution SAR systems**, Harald Anglberger, Rainer Speck, Helmut Suess, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany) . . . . . [8891-1]

13:50: **Label co-occurrence matrix for the detection of urban areas in high-resolution SAR Images**, Na Li, National Univ. of Defense Technology (China) and Univ. degli Studi di Trento (Italy); Lorenzo Bruzzone, Univ. degli Studi di Trento (Italy); Zeng-Ping Chen, Fang Liu, National Univ. of Defense Technology (China) . . . . [8892-48]

14:10: **Robust tie points selection for InSAR image coregistration**, Takieddine Skanderi, Boulerbah Chabira, Univ. des Sciences et de la Technologie Houari Boumediene (Algeria); Afifa Belkacem, Univ. des Sciences et de la Technologie (Algeria); Aichouche Belhadj Aissa, Univ. des Sciences et de la Technologie Houari Boumediene (Algeria) . . . . . [8892-46]

14:30: **A new heterogeneity scale to improve anisotropic diffusion based speckle filters in SAR images**, Rohit K. Chatterjee, Birla Institute of Technology (India); Avijit Kar, Jadavpur Univ. (India). . . . . [8892-47]

14:50: **A change detection approach applied to COSMO-SkyMed images to characterize snow cover areas**, Simonetta Paloscia, Simone Pettinato, Istituto di Fisica Applicata Nello Carrara (Italy) . . . . . [8891-3]

Coffee Break . . . . . .Wed 15:10 to 15:40

SESSION SJS2

Room: Seminar 5-6 . . . . . Wed 15:40 to 17:00

SAR Data Processing II: Joint Session

Session Chair: **Claudia Notarnicola,** EURAC research (Italy)

Conference 8892, Image and Signal Processing for Remote Sensing and Conference 8891, SAR Image Analysis, Modeling and Techniques Joint Session

15:40: **Multichromatic analysis of SAR images for target analysis,** Fabio Bovenga, Consiglio Nazionale delle Ricerche (Italy); Dominique Derauw, Univ. de Liège (Belgium); Fabio M. Rana, Alberto Refice, Nicola Veneziani, Consiglio Nazionale delle Ricerche (Italy); Raffaele Vitulli, European Space Research and Technology Ctr. (Netherlands) . . . . . [8891-4]

16:00: **A novel multiband SAR data technique for fully automatic oil spill detection in the ocean,** Fabio Del Frate, Daniele Latini, Alireza Taravat, Univ. degli Studi di Roma Tor Vergata (Italy); Cathleen E. Jones, Jet Propulsion Lab. (United States). . . . . [8891-5]

16:20: **A system for the automatic classification of Earth continental ice subsurface features in radar sounder data,** Ana-Maria Ilisei, Lorenzo Bruzzone, Univ. degli Studi di Trento (Italy) . . . . . [8892-75]

16:40: **A semi-automatic approach for estimating bedrock and surface layers from multichannel coherent radar depth sounder imagery,** Jerome E. Mitchell, David J. Crandall, Geoffrey C. Fox, Indiana Univ. (United States); John D. Paden, Ctr. for Remote Sensing of Ice Sheets (United States). . . . . [8892-49]

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Earth Resources and Environmental Remote Sensing/GIS Applications IV

Conference Chairs: **Ulrich Michel,** Univ. of Education Heidelberg (Germany); **Daniel L. Civco,** Univ. of Connecticut (United States); **Karsten Schulz,** Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung (Germany)

Conference Co-Chairs: **Manfred Ehlers,** Univ. Osnabrück (Germany); **Konstantinos G. Nikolakopoulos,** Univ. of Patras (Greece)

Programme Committee: **Thomas Blaschke,** Univ. Salzburg (Austria); **Tilman U. Bucher,** Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany); **Ni-Bin Chang,** Univ. of Central Florida (United States); **Garik Gutman,** NASA Headquarters (United States); **Martin Kappas,** Georg-August-Univ. Göttingen (Germany); **Rosa Lasaponara,** Istituto di Metodologie per l'Analisi Ambientale (Italy); **Marguerite M. Madden,** The Univ. of Georgia (United States); **Derya Maktav,** Istanbul Technical Univ. (Turkey); **Matthias S. Moeller,** Beuth Univ. of Applied Sciences Berlin (Germany); **Pablo H. Rosso,** Univ. Osnabruck (Germany); **Florian Savopol,** Natural Resources Canada (Canada); **Jochen Schiewe,** HafenCity Univ. Hamburg (Germany); **Wenzhong Shi,** The Hong Kong Polytechnic Univ. (Hong Kong, China); **Alexander Siegmund,** Univ. of Education Heidelberg (Germany); **Karl Staenz,** Univ. of Lethbridge (Canada); **Josef Strobl,** Univ. Salzburg (Austria); **Kerstin Voss,** Rheinische Friedrich-Wilhelms-Univ. Bonn (Germany); **Christiane H. Weber,** Univ. of Strasbourg/Faculty of Georaphy (France)

Monday 23 September

OPENING REMARKS

Room: Konferenz 2 . . . . . .8:50 to 9:00

SESSION 1

Room: Konferenz 2 . . . . . Mon 9:00 to 10:20

Infrastructures and Urban Areas I

Session Chairs: **Ulrich Michel,** Pädagogische Hochschule Heidelberg (Germany); **Daniel L. Civco,** Univ. of Connecticut (United States)

9:00: **Quantification of anthropogenic and natural changes in oil sands mining infrastructure land based on RapidEye and SPOT5**, Ying Zhang, Canada Ctr. for Remote Sensing (Canada) . . . . . [8893-1]

9:20: **Derivation of urban objects and their attributes for large-scale urban areas based on very high resolution UltraCam true orthophotos and nDSM: a case study Berlin, Germany**, Anna Maria Poznanska, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany); Steven Bayer, Freie Univ. Berlin (Germany); Tilman U. Bucher, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany) . . . . . [8893-2]

9:40: **Object-based change detection in rapid urbanization regions with remotely-sensed observations: a case study of Shenzhen, China**, Lihuang He, Guihua Dong, China National Environmental Monitoring Ctr. (China); Wei-Min Wang, Lijun Yang, Hong Liang, Shenzhen Environmental Monitoring Ctr. (China) . . . . . [8893-3]

10:00: **Monitoring the effects of landuse/landcover changes on urban heat island**, Md Latifur Rahman Sarker, Univ. Teknologi Malaysia (Malaysia) . . . . . [8893-4]

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

SESSION 2

Room: Konferenz 2 . . . . . Mon 10:50 to 11:50

Infrastructures and Urban Areas II

Session Chair: **Markus Boldt,** Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung (Germany)

10:50: **Generalized interpretation scheme for arbitrary HR InSAR image pairs**, Markus Boldt, Antje Thiele, Karsten Schulz, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung (Germany) . . . . . [8893-5]

11:10: **Using high resolution lidar data for automated railroad infrastructure mapping**, Reinhard Beger, Marco Neubert, Leibniz-Institut für ökologische Raumentwicklung (Germany); Marco Trommler, Technische Univ. Dresden (Germany); Hendrik Herold, Leibniz-Institut für ökologische Raumentwicklung (Germany). . . . . [8893-6]

11:30: **Simulation of close range remote sensing of subsurface features using GPR for urban utility information system development**, Almelu Mangamma V. Hebsur, Muniappan Nagarajan, Emmella P. Rao, Gopalakrishnan Venkatachalam, Indian Institute of Technology Bombay (India). . . . . [8893-7]

SESSION 3

Room: Konferenz 2 . . . . . Mon 11:50 to 12:10

GIS Education

Session Chair: **Markus Boldt,** Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung (Germany)

11:50: **GIS4schools: custom-made GIS-applications for educational use**, Timo Demharter, Ulrich Michel, Pädagogische Hochschule Heidelberg (Germany) . . . . . [8893-9]

Lunch Break . . . . . Mon 12:10 to 13:40

SESSION 4

Room: Konferenz 2 . . . . . Mon 13:40 to 15:00

Processing Methodologies I

Session Chair: **Karsten Schulz,** Physikalisch-Technische Bundesanstalt (Germany)

13:40: **Value-added humanitarian information delivery from Earth observation data: investigating synergies of data fusion and image segmentation in rapid mapping workflows**, Chandi Witharana, Univ. of Connecticut (United States); Marco Neubert, Leibniz-Institut für ökologische Raumentwicklung (Germany); Daniel L. Civco, Univ. of Connecticut (United States) . . . . . [8893-10]

14:00: **Radiometric processing of aerial thermography in the framework of the EnergyCity project: the case of Bologna (Italy)**, Gabriele Bitelli, Paolo Conte, Francesca Franci, Emanuele Mandanici, Univ. degli Studi di Bologna (Italy) . . . . . [8893-11]

14:20: **Remote sensing of vegetation in a tropical mountain ecosystem**, Brenner S. G. Silva, Jörg Bendix, Philipps-Univ. Marburg (Germany) . . . . . [8893-12]

14:40: **Identification of urban tree crown in a tropical environment using WorldView-2 data: problems and perspectives**, Marilia Gomes, Philippe Maillard, UFMG (Brazil) . . . . . [8893-13]

Coffee Break . . . . . Mon 15:00 to 16:00

PLENARY SESSION

Room: Saal 3 . . . . . .Mon 16:00 to 17:45

Remote Sensing 2013: Plenary Session

For details, please see page 4-5 in the printed programme or visit http://spie.org/remote-sensing-europe.xml

Tuesday 24 September

SESSION 5

Room: Konferenz 2 . . . . . Tue 9:00 to 10:00

Remote Sensing for Archaeology, Cultural and Natural Heritage

Session Chair: **Timo Demharter,** Pädagogische Hochschule Heidelberg (Germany)

9:00: **Prospects and limitations of vegetation indices in archeological research: the Neolithic Thessaly case study**, Athos Agapiou, Dimitrios D. Alexakis, Maria Stavrou, Cyprus Univ. of Technology (Cyprus); Apostolos Sarris, Foundation for Research and Technology-Hellas (Greece); Kyriakos Themistocleous, Diofantos G. Hadjimitsis, Cyprus Univ. of Technology (Cyprus) . . . . . [8893-14]

9:20: **Fluorescence lidar measurements at the archaeological site House of Augustus at Palatino, Rome**, Valentina Raimondi, Istituto di Fisica Applicata Nello Carrara (Italy); Chiara Alisi, ENEA (Italy); Kerstin Barup, Lund Univ. (Sweden); Alessandra Broggi, Univ. degli Studi di Roma La Sapienza (Italy); Cinzia Conti, Soprintendenza Speciale ai Beni Archeologici di Roma (Italy); Jenny Hällström, Lund Univ. (Sweden); David Lognoli, Lorenzo Palombi, Istituto di Fisica Applicata Nello Carrara (Italy); Maria Laura Santarelli, Univ. degli Studi di Roma La Sapienza (Italy); Anna Rosa Sprocati, ENEA (Italy); Maria Paola Bracciale, Univ. degli Studi di Roma La Sapienza (Italy) . . . . . [8893-15]

9:40: **An analysis of the change of Aksu River in history and the relevant reasons based on remote sensing images**, Jiantao Bi, Institute of Remote Sensing and Digital Earth (China); Guilin Luo, Central South Univ. (China); Xingxing Wang, Institute of Remote Sensing and Digital Earth (China); Zuojia Zhu, Central South Univ. (China); Wenju Zhu, China Univ. of Geosciences (China) . . . . [8893-17]

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

SESSION 6

Room: Konferenz 2 . . . . . Tue 10:30 to 11:50

Environmental Monitoring I

Session Chair: **Sebastian Günthert,** Pädagogische Hochschule Heidelberg (Germany)

10:30: **Spatially explicit modeling of agricultural land use dynamics for assessing the ecosystem regeneration potential on Tenerife (Canary Islands)**, Sebastian Günthert, Simone Naumann, Alexander Siegmund, Pädagogische Hochschule Heidelberg (Germany) . . . . . [8893-18]

10:50: **GMES AgrEnv core services for monitoring of agri-environmental measures extensification: case study, Guadalquivir River Basin, Spain**, Hakki Emrah Erdogan, Palle Hastrup, European Commission Joint Research Ctr. (Italy) . . . . . [8893-20]

11:10: **Determining suitable image resolutions for accurate supervised crop classification using remote sensing data**, Fabian Loew, Julius-Maximilians-Univ. Würzburg (Germany); Grégory Duveiller, European Commission Joint Research Ctr. (Italy). . [8893-21]

11:30: **Retrieval of fire radiative power and biomass combustion using the Korean Geostationary Meteorological Satellite**, Dae Sun Kim, Yang Won Lee, Pukyong National Univ. (Korea, Republic of) . . . . . [8893-22]

Lunch/Exhibtion Break . . . . . Tue 11:50 to 13:30

SESSION 7

Room: Konferenz 2 . . . . . Tue 13:30 to 15:10

Environmental Monitoring II

Session Chair: **Fabian Loew,** Julius-Maximilians-Univ. Würzburg (Germany)

13:30: **Model-based assessment of land degradation trend and its relationship to land use change and climatic variability in semiarid zone by using remote sensed and situ data**, Abdelnasir I. Ali Hano, Technische Univ. Dresden (Germany) . . . . . [8893-23]

13:50: **Remote sensing methods to monitor habitats potentially threatened by climate change**, Michael Förster, Tobias Schmidt, Technische Univ. Berlin (Germany); Nadine Spindler, Kathrin Renner, EURAC research (Italy); Iris Wagner-Lücker, Univ. Wien (Austria); Marc Zebisch, EURAC research (Italy); Marco Neubert, Leibniz Institute of Ecological Urban and Regional Development (Germany) . . . . [8893-24]

14:10: **The effects of Landsat time series pre-processing on tropical forest change mapping in Vietnam and Ethiopia**, Michael Schultz, Alterra B.V. (Netherlands) . . . . . [8893-25]

14:30: **The use of decision trees in the classification of beach forms/patterns on IKONOS-2 data**, Ana Cláudia M. Teodoro, Dário Ferreira, Ctr. de Investigação em Ciências Geo-Espaciais (Portugal); Hernâni Gonçalves, Ctr. de Investigação em Ciências Geo-Espaciais (Portugal) and Univ. do Porto (Portugal) . . . . . [8893-26]

14:50: **Remote sensing and spatial analysis based study for detecting deforestation and the associated drivers**, Mustafa M. El-Abbas, Elmar Csaplovics, Taisser H. Deafalla, Technische Univ. Dresden (Germany) . . . . . [8893-27]

Coffee Break . . . . . Tue 15:10 to 15:40

SESSION 8

Room: Konferenz 2 . . . . . Tue 15:40 to 17:00

Hazard Mitigation: Geologic Applications

Session Chair: **Konstantinos G. Nikolakopoulos,** Univ. of Patras (Greece)

15:40: **Remote sensing data and GIS for hydrological studies**, Konstantinos G. Nikolakopoulos, Evi Kouzeli, Nikolaos Lambrakis, Univ. of Patras (Greece) . . . . . [8893-28]

16:00: **Landslide hazard assessment along a mountain highway in the Indian Himalayan Region (IHR) using remote sensing and computational models**, Akhouri Pramod Krishna, Birla Institute of Technology and Science (India); Santosh Kumar, Birla Institute of Technology (India) . . . . . [8893-29]

16:20: **Mineralogical and geochemical studies on the clay deposits, North Sinai, Egypt: using remote sensing data**, Safaa M. Sayed, Talaat M. Ramadan, National Authority for Remote Sensing and Space Sciences (Egypt) . . . . . [8893-30]

16:40: **Groundwater exploration in northeastern desert, Egypt: using radar, aster and geophysical data**, Safaa M. Sayed, National Authority for Remote Sensing and Space Sciences (Egypt) . . [8893-31]

POSTER SESSIONS

Room: Mezzanine Level Exhibition Hall
Tue 17:40 to 19:10

Conference attendees are invited to attend the Remote Sensing Poster Session on Tuesday afternoon. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. 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. Poster authors, view poster presentation guidelines and set-up instructions on page 6 and at http://spie.org/x32234.xml.

Use of ground penetrating radar for determination of water table depth and subsurface soil characteristics at Kennedy Space Center, Charles R. Bostater Jr., Gideon M. Hengari, Florida Institute of Technology (United States); Carlton R. Hall, Tim J. Kozusko, InoMedic Inc. (United States) . . . . . [8893-48]

Estimation and analysis of the movement of the Kuksay glacier in Muztag Ata from InSAR data, Jianmin Zhou, Zhen Li, Institute of Remote Sensing and Digital Earth (China) . . . . . [8893-49]

Simulation, visualization and GIS analysis based on globe model for PL19-3 oil spill of Bohai Sea, Linchong Kang, Suixiang Shi, Zengan Deng, Jiye Jin, Feng Zhang, Haiyan Huang, National Marine Data and Information Service (China) . . . . . [8893-50]

Research and implementation of coalfield spontaneous combustion of carbon emissions WebGIS based on Silverlight and ArcGIS Server, Zuojia Zhu, Central South Univ. (China); Jiantao Bi, Xingxing Wang, Institute of Remote Sensing and Digital Earth (China); Guilin Luo, Central South Univ. (China) . . . . . [8893-51]

Low frequency/high sensitivity triaxial monolithic inertial sensor, Fabrizio Barone, Fausto Acernese, Univ. degli Studi di Salerno (Italy); Rosario De Rosa, Univ. degli Studi di Napoli Federico II (Italy); Gerardo Giordano, Rocco Romano, Univ. degli Studi di Salerno (Italy) . . . . . [8893-53]

Satellite and in-situ monitoring of urban air pollution in relation with children's asthma, Mariana R. Dida, Univ. of Medicine and Pharmacy of Craiova (Romania); Maria A. Zoran, National Institute of Research and Development for Optoelectronics (Romania) . . [8893-54]

Satellite remote sensing image based-analysis of effects due to urbanization on climate and health, Maria A. Zoran, National Institute of Research and Development for Optoelectronics (Romania); Liviu-Florin V. I. Zoran, Univ. Politehnica of Bucharest (Romania); Adrian I. Dida, Transilvania Univ. of Brasov (Romania); Mariana R. Dida, Alexandra Theodora D. Zoran, Univ. of Medicine and Pharmacy of Craiova (Romania); Ovidiu M Ionescu, University Transivania of Brasov (Romania) . . . . . [8893-55]

Measuring pasture degradation on the Qinghai-Tibet Plateau using hyperspectral dissimilarities and indices, Hanna Meyer, Lukas W. Lehnert, Philipps-Univ. Marburg (Germany); Yun Wang, Senckenberg Museum of Natural History (Germany); Christoph Reudenbach, Jörg Bendix, Philipps-Univ. Marburg (Germany) . . . . . [8893-56]

Execution of natural resources cadastral plan in Pasargadae city of Iran by using QuickBird images, Ghanimat Azhdari, Univ. of Tehran (Iran, Islamic Republic of); Kaveh Deilami, Univ. Teknologi Malaysia (Malaysia); Naser Mehrdadi, Mohammad Javad Amiri, Univ. of Tehran (Iran, Islamic Republic of) . . . . . [8893-57]

Design and construction of information systems of ocean satellite monitoring for air-sea CO_2 Flux(IsscO_2), Qiankun Zhu, Bai Yan, The Second Institute of Oceanography, SOA (China); Fang Lei, Zhejiang Provincial Museum (China); Xianqiang He, Jianyu Chen, The Second Institute of Oceanography, SOA (China) . . . . . [8893-58]

Impact of climate and anthropogenic changes on a periurban forest surface albedo derived from MODIS satellite data, Maria A. Zoran, Roxana S. Savastru, Dan M. Savastru, National Institute of Research and Development for Optoelectronics (Romania); Adrian I. Dida, Ovidiu M. Ionescu, Transilvania Univ. of Brasov (Romania) . . . . . [8893-59]

Monitoring and predicting reclamation level for Jharia area (Bastacola) using multi temporal remote sensing and GIS, Sunny Soarabh, Mohammad S. Anwar, Indian School of Mines (India); Sunil Kumar, ISM Dhanbad (India) . . . . . [8893-60]

Extraction of urban impervious surface information based on object-oriented technology, Aixia Liu, China Land Surveying and Planning Institute (China). . . . . [8893-61]

Attempt of identification of wet areas with ASTER images for archeological studies, Eleonora Bertacchini, Francesca Despini, Sergio Teggi, Alessandro Capra, Univ. degli Studi di Modena e Reggio Emilia (Italy); Marco Dubbini, Univ. degli Studi di Bologna (Italy) . . . . . [8893-62]

Wetland mapping and flood extent monitoring using optical and radar remotely sensed data and ancillary topographical data in the Zhalong National Natural Reserve, China, Xiaodong Na, Shuying Zang, Harbin Normal Univ. (China); Yuhong Zhang, Lei Liu, Harbin Normal University (China) . . . . . [8893-63]

Accuracy assessment of SST estimation through inter-satellite calibration, Eun-Bin Park, Kyung-Soo Han, Jae-il Cho, Chang-Suk Lee, In-Hwan Kim, Kyoung-Jin Pi, Jae-Hyun Ryu, Jung-Mok Ha, Pukyong National Univ. (Korea, Republic of) . . . . . [8893-64]

Lake Manyara catchment vegetation phenology response to climate variability over the past 30 years using RS, Northern Tanzania, Dorothea M. Deus, Richard Gloaguen, Technische Univ. Bergakademie Freiberg (Germany) . . . . . [8893-65]

Glacier stagnant in central Karakorum derived from DEOS mass transport model GRACE data and one monthly degree-day model, Xiaowen Zhang, Lanzhou Univ. of Finance and Economics (China); Shiqiang Zhang, Junli Xu, Cold and Arid Regions Environmental and Engineering Research Institute (China) . . . . . [8893-66]

Comparison of different along the track high resolution satellite stereo-pair for DSM extraction, Konstantinos G. Nikolakopoulos, Univ. of Patras (Greece) . . . . . [8893-67]

Open quarry monitoring using gap-filled Landsat 7 ETM + SLC-off imagery, Konstantinos G. Nikolakopoulos, Univ. of Patras (Greece). . . . . [8893-68]

Remote sensing and dynamic landscapes in region of Nâama, Algeria, Idriss Haddouche, Univ. Abou Bekr Belkaid Tlemcen (Algeria) . . . . . [8893-69]

Integration of the standardized precipitation index (SPI) and remote sensing for drought monitoring in Sulaimaniya, the Kurdistan region of Iraq, Ayad M. Fadhil, Salahaddin Univ. (Iraq); Sarchil H. Qader, Univ. of Southampton (United Kingdom) . . [8893-70]

Land use and land cover classification, changes and analysis in gum arabic belt in North Kordofan, Sudan *(Invited Paper)*, Hassan E. Adam, Univ. of Kordofan (Sudan); Elmar Csaplovics, Technische Univ. Dresden (Germany); Mohamed E. Elhaja, Univ. of Kordofan (Sudan); Mustafa M. El-Abbas, Technische Univ. Dresden (Germany) . [8893-71]

Assessment of historical land use reconstruction and effect on the paleoflood, Pingping Luo, Bin He, Kaoru Takara, Kyoto Univ. (Japan); Weili Duan, Hunan Women's College (China); Daniel Nover, U.S. Environmental Protection Agency (United States) . . . . . [8893-72]

Wednesday 25 September

SESSION 9

Room: Konferenz 2 . . . . . Wed 9:00 to 10:20

Processing Methodologies II

Session Chair: **Konstantinos G. Nikolakopoulos,** Univ. of Patras (Greece)

9:00: **Evaluation of commercial available fusion algorithms for Geoeye data**, Konstantinos G. Nikolakopoulos, Univ. of Patras (Greece); Aristides D. Vaiopoulos, Univ. of Athens (Greece). . [8893-32]

9:20: **Forest structure estimates with GEOBIA and multiscale optical sensors**, Mustafa M. El-Abbas, Elmar Csaplovics, Taisser H. Deafalla, Technische Univ. Dresden (Germany) . . . . . [8893-33]

9:40: **Ground-based multispectral measurements for airborne data verification in non-operating open pit mine 'Kremikovtsi'**, Denitsa Borisova, Hristo N. Nikolov, Doyno Petkov, Space Research and Technology Institute (Bulgaria) . . . . . [8893-34]

10:00: **Optimizing multiresolution segmentation algorithm using empirical methods: exploring the sensitivity of supervised discrepancy measures**, Chandi Witharana, Univ. of Connecticut (United States); Dirk Tiede, Univ. Salzburg (Austria); Daniel L. CIvco, Univ. of Connecticut (United States). . . . . [8893-35]

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

SESSION 10

Room: Konferenz 2 . . . . . Wed 10:50 to 11:50

Environmental Monitoring III

Session Chair: **Anna M. Trosset,** Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany)

10:50: **Development of a fire detection dlgorithm for the COMS (Communication Ocean and Meteorological Satellite)**, Goo Kim, Dae Sun Kim, Yang Won Lee, Pukyong National Univ. (Korea, Republic of) . . . . . [8893-36]

11:10: **The impact of the day of observation of image composites on adequate time series generation**, Rene R. Colditz, CONABIO (Mexico) . . . . . [8893-37]

11:30: **Applying the Manning equation to determine the critical distance in non-point source pollution using remotely sensed data and cartographic modelling**, Lilia M. Oliveira, UFMG (Brazil); Nádia A. P. Santos, Instituto Mineiro de Gestão das Águas (Brazil); Philippe Maillard, UFMG (Brazil). . . . . [8893-38]

Lunch Break . . . . . .Wed 11:50 to 13:20

SESSION 11

Room: Konferenz 2 . . . . . Wed 13:20 to 15:00

Environmental Monitoring IV

Session Chairs: **Shahid Habib,** NASA Goddard Space Flight Ctr. (United States); **Daniel L. Civco,** Univ. of Connecticut (United States)

13:20: **Identification of bamboo patches in the lower Gangetic plains using very high resolution WorldView 2 imagery**, Aniruddha Ghosh, Pawan K. Joshi, TERI Univ. (India) . . . . . [8893-39]

13:40: **Use of empirical land UE dynamics models including climate and socio economic parameters: a case study in rain-fed agricultural area**, Vidhya V. Rangasamy, Manonmani Raju, Anna Univ. Chennai (India) . . . . . [8893-40]

14:00: **Assessment of vegetation change and its causes in the West Liaohe River Basin of China using SPOT-VGT image**, Fang Huang, Huijie Zhang, Ping Wang, Northeast Normal Univ. (China) . . . . . [8893-41]

14:20: **Estimate ecological indicators of karst rocky desertification by spectral unmixing algorithm**, Xia Zhang, Tong Shuai, Institute of Remote Sensing and Digital Earth (China); Banghui Yang, Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences (China); Zhi Zhuang, Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences (China) and University of Chinese Academy of Sciences (China) . . . . . [8893-42]

14:40: **Snow cover and land surface temperature assessment of Gangotri basin in the Indian Himalayan Region (IHR) using MODIS satellite data for climate change inferences**, Akhouri P. Krishna, Anurag Sharma, Birla Institute of Technology and Science (India) . . . . . [8893-43]

Coffee Break . . . . . Wed 15:00 to 15:30

SESSION 12

Room: Konferenz 2 . . . . . Wed 15:30 to 16:30

Environmental Monitoring V

Session Chair: **Denitsa Borisova,** Space Research and Technology Institute (Bulgaria)

15:30: **Application of multidimensional geospatial data integration approach to study the geo-environmental and socio-economic vulnerability due to climate change: case study, cyclone Aila affected Dacop and Koyra Upazila**, Md. S. Rahman, BRAC Univ. (Bangladesh); Hafizur Rahman, Bangladesh Space Research and Remote Sensing Organization (Bangladesh); Nandan Mukherjee, Ainun Nishat, Roufa Khanum, Tahmid Huq Easher, BRAC Univ. (Bangladesh) . . . . . [8893-44]

15:50: **Analysis of principal parameters of forest fires and identification of desertification process in semi-arid land in Algeria**, Ahmed Zegrar, Ctr. National des Techniques Spatiales (Algeria) . . . . . [8893-45]

16:10: **Identification of impacts on the Egyptian Nile using remote sensing and GIS**, Alaa H. El Nahry, National Authority for Remote Sensing and Space Sciences (Egypt) . . . . . [8893-46]

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Lidar Technologies, Techniques, and Measurements for Atmospheric Remote Sensing IX

Monday 23 September

WELCOME AND INTRODUCTION

Room: Seminar 2 . . . . . .8:45 to 8:50

SESSION 1

Room: Seminar 2 . . . . . Mon 8:50 to 10:00

Doppler Lidar for Wind Measurements

Session Chair: **Upendra N. Singh,**
NASA Langley Research Ctr. (United States)

8:50: **Fiber optic CW Doppler lidar using a synthetic broadband source** *(Invited Paper)*, Ernst Brinkmeyer, Thomas Waterholter, Technische Univ. Hamburg-Harburg (Germany) . . . . . [8894-1]

9:20: **Assessing the metrological capabilities of wind Doppler lidars**, Ludovic Thobois, Leosphere France (France) . . . . . [8894-2]

9:40: **Direct detection lidar for wind measurement**, Itai Afek, Gil Shamai, Pentalum Technologies (Israel) . . . . . [8894-3]

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

SESSION 2

Room: Seminar 2 . . . . . Mon 10:30 to 12:40

Lidar Methods and Measurements of Greenhouse Gases

Session Chair: **Upendra N. Singh,**
NASA Langley Research Ctr. (United States)

10:30: **High energy, double pulsed 2-micron direct detection lidar for NASA's airborne CO_2 measurements** *(Invited Paper)*, Upendra N. Singh, Jirong Yu, Mulugeta Petros, NASA Langley Research Ctr. (United States) . . . . . [8894-4]

11:00: **A direct detection 1.6µm DIAL with three wavelengths for high accuracy measurements of vertical CO_2 concentration and temperature profiles**, Yasukuni Shibata, Chikao Nagasawa, Makoto Abo, Tokyo Metropolitan Univ. (Japan) . . . . . [8894-5]

11:20: **Lidar sounding of volcanic plumes**, Luca Fiorani, ENEA (Italy); Alessandro Aiuppa, Univ. degli Studi di Palermo (Italy); Federico Angelini, Rodolfo Borelli, Mario Del Franco, Daniele Murra, Marco Pistilli, Adriana Puiu, ENEA (Italy); Simone Santoro, Univ. degli Studi di Palermo (Italy) . . . . . [8894-6]

11:40: **Scanning 1.6 µm lidar measurements of atmospheric CO_2 concentration and wind profiles**, Yasukuni Shibata, Chikao Nagasawa, Makoto Abo, Tokyo Metropolitan Univ. (Japan) . . . [8894-7]

12:00: **Investigating the effect of aerosol droplets in a volcanic plume for increasing sensitivity of a CO_2 DIAL measurement**, Manuel Queisser, Mike Burton, Istituto Nazionale di Geofisica e Vulcanologia (Italy); Luca Fiorani, Italian National Agency for New Technologies (Italy) . . . . . [8894-8]

12:20: **Dual-wavelength resonant pumping of compact Er:YAG lasers providing high power output at 1645.55 nm for methane detection**, Haro Fritsche, Oliver Lux, Casey Schuett, Technische Univ. Berlin (Germany); Stefan W. Heinemann, Wolfgang Gries, DirectPhotonics Industries GmbH (Germany); Hans Joachim Eichler, Technische Univ. Berlin (Germany) . . . . . [8894-9]

Lunch Break . . . . . Mon 12:40 to 13:50

SESSION 3

Room: Seminar 2 . . . . . Mon 13:50 to 15:40

Novel Lidar Systems for Air and Spaceborne Measurements

Session Chair: **Upendra N. Singh,**
NASA Langley Research Ctr. (United States)

13:50: **Overview of Japan's Spaceborne Vegetation Lidar Mission** *(Invited Paper)*, Jumpei Murooka, Takashi Kobayashi, Daisuke Sakaizawa, Tadashi Imai, Keiko Suzuki, Yohei Sato, Yoshikazu Chishiki, Shiro Yamakawa, Ryota Sato, Japan Aerospace Exploration Agency (Japan); Haruo Sawada, The Univ. of Tokyo (Japan); Kazuhiro Asai, Tohoku Institute of Technology (Japan) . . . . . [8894-10]

14:20: **Waveform simulator and analytical procedure for JAXA's future spaceborne Lidar to measure canopy height**, Takashi Kobayashi, Japan Aerospace Exploration Agency (Japan); Takahiro Endo, Remote Sensing Technology Ctr. of Japan (Japan); Yoshito Sawada, The Univ. of Tokyo (Japan); Shigeru Endo, Tokyo Univ. of Science (Japan); Masato Hayashi, National Institute for Environmental Studies (Japan); Yohei Satoh, Yoshikazu Chishiki, Shiro Yamakawa, Japan Aerospace Exploration Agency (Japan) . . . . . [8894-11]

14:40: **Design and development of a compact Dial system for aerial surveillance of urban areas**, Pasquale Gaudio, Michela Gelfusa, Andrea Malizia, Maria Richetta, Arianna Antonucci, Univ. degli Studi di Roma Tor Vergata (Italy); Piergirogio Ventura, Ctr. Tecnico Logistico Interforze NBC (Italy) . . . . . [8894-12]

15:00: **Development and testing of a high-power Q-switched DPSS laser for lidar applications: ESA QOMA project case**, Giorgos Avdikos, Raymetrics S.A. (Greece); Christos Evangelatos, Univ. of Athens (Greece); Dimitris Papadopoulos, Univ. of Ioannina (Greece); Paraskevas Bakopoulos, Giorgos Tsaknakis, Alexandros D. Papayannis, National Technical Univ. of Athens (Greece); Georgios D. Tzeremes, European Space Agency (Netherlands) . . . . . [8894-13]

15:20: **Design and performance of a fiber array coupled multichannel photon-counting, 3D imaging, airborne lidar system**, Genghua Huang, Rong Shu, Libing Hou, Ming Li, Shanghai Institute of Technical Physics (China) . . . . . [8894-14]

Coffee Break . . . . . Mon 15:40 to 16:00

PLENARY SESSION

Room: Saal 3 . . . . . .Mon 16:00 to 17:45

Remote Sensing 2013: Plenary Session

For details, please see page 4-5 in the printed programme or visit http://spie.org/remote-sensing-europe.xml

Tuesday 24 September

SESSION 4

Room: Seminar 2 . . . . . Tue 9:00 to 12:10

Atmospheric Aerosols, Clouds, and Temperature Measurements

Session Chair: **Upendra N. Singh,**
NASA Langley Research Ctr. (United States)

9:00: **Autonomous ozone and aerosol lidar measurements: a synergistic approach to air quality** *(Invited Paper)*, Kevin B. Strawbridge, Environment Canada (Canada) . . . . . [8894-15]

9:30: **Lidar measurements of atmospheric temperature profiles (2-15 km) by utilizing Rayleigh-Brillouin scattering**, Benjamin Witschas, Christian Lemmerz, Oliver Reitebuch, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany) . . . . . [8894-16]

9:50: **PollyNET: a network of multiwavelength polarization Raman lidars** *(Invited Paper)*, Dietrich Althausen, Ronny Engelmann, Holger Baars, Birgit Heese, Thomas Kanitz, Leibniz Institut für Troposphärenforschung (Germany); Mika Komppula, Eleni Giannakaki, Anne Pfüller, Finnish Meteorological Institute (Finland); Ana Maria Silva, Jana Preissler, Univ. de Évora (Portugal); Frank Wagner, Juan Luis Rascado, Sérgio Pereira, University Évora, Centro de Geofísica de Évora (Portugal); Jae-Hyun Lim, Joon Young Ahn, National Institute of Environmental Research (Korea, Republic of); Matthias Tesche, Stockholm Univ. (Sweden); Iwona S. Stachlewska, Institute of Geophysics, Faculty of Physics, University of Warsaw (Poland) . . . . . [8894-17]

10:10: **Monitoring and characterization of atmospheric aerosols with Raman and dual-polarization lidars**, Philippe ROYER, Laurent Sauvage, Anthony Bizard, Ludovic Thobois, Leosphere France (France) . . . . . [8894-18]

Coffe Break . . . . . Tue 10:30 to 11:00

11:00: **Assessment of long scale plume transport to the US East coast using coordinated CREST lidar network and synergistic AERONET and satellite measurements** *(Invited Paper)*, Fred Moshary, Lina Cordero, Yonghua Wu, Barry M. Gross, The City College of New York (United States); Daniel Orozco, Patrícia Sawamura, Raymond M. Hoff, Ruben Delgado, Univ. of Maryland, Baltimore County (United States); Jia Su, Kevin Leavor, Robert B. Lee III, Patrick McCormick, Hampton Univ. (United States) . . . . . [8894-19]

11:30: **A versatile instrument with an optical parametric oscillator transmitter tunable from 1.5 to 3.1 µm for aerosol Lidar and DIAL**, Iain Robinson, Jim W. Jack, The Univ. of Edinburgh (United Kingdom); Cameron F. Rae, Univ. of St. Andrews (United Kingdom); John B. Moncrieff, The Univ. of Edinburgh (United Kingdom) . . . . . [8894-20]

11:50: **Laser and microwave sensing of the stratosphere**, Gennady G. Matvienko, Valerii N. Marichev, V.E. Zuev Institute of Atmospheric Optics (Russian Federation); Yury Y. Kulikov, Vitaly G. Ryskin, Institute of Applied Physics (Russian Federation). . . . . [8894-21]

CONCLUDING REMARKS

Room: Seminar 2 . . . . . 12:10 to 12:20

POSTER SESSION

Room: Mezzanine Level Exhibition Hall
Tue 17:40 to 19:10

Conference attendees are invited to attend the Remote Sensing Poster Session on Tuesday afternoon. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. 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. Poster authors, view poster presentation guidelines and set-up instructions on page 6 and at http://spie.org/x32234.xml.

A direct detection 1.6µm DIAL with three wavelengths for high accuracy measurements of vertical CO2 concentration and temperature profiles, Yasukuni Shibata, Tokyo Metropolitan Univ. (Japan). . . . . [8894-5]

Improving the accuracy of aerosol extinction coefficient inversion, Nianwen Cao, Cunxiong Zhu, Nanjing Univ. of Information Science & Technology (China) . . . . . [8894-22]

Multiwave fine tuning laser source for simultaneous sounding atmosphere constituents and/or chemicals, Sergii M. Bashchenko, Ludmila Marchenko, Institute of Physics (Ukraine); Oksana Bashchenko, Kiev State Univ. (Ukraine) . . . . . [8894-23]

Stand-off mapping of the soot extinction coefficient in a refinery flare using a 3-wavelength elastic backscatter LIDAR, Renata F. Da Costa, Instituto de Pesquisas Energéticas e Nucleares (Brazil); Joshua Vande Hey, Loughborough Univ. (United Kingdom); Juliana Steffens, URI (Brazil); Riad Bourayou, Eduardo Landulfo, Instituto de Pesquisas Energéticas e Nucleares (Brazil); Roberto Guardani, Escola Politecnica da Univ. de São Paulo (Brazil); Igor A. Veselovskii, A. M. Prokhorov General Physics Institute (Russian Federation) . . . [8894-24]

3D building model reconstruction using aerial lidar data: a case study in Hendijan, Iran, Laleh Moghtader, Mahsa Siavashi, Maryam Safari, Mehran Satari, Univ. of Isfahan (Iran, Islamic Republic of) . . . . . [8894-25]

Laser femtosecond sensing of the aerosol atmosphere, Gennady G. Matvienko, Victor G. Oshlakov II, Alexander Y. Sukhanov, V.E. Zuev Institute of Atmospheric Optics (Russian Federation); Andrey N. Stepanov, Institute of Applied Physics (Russian Federation) . [8894-26]

Mid-IR DIAL for high-resolution mapping of explosive precursors, Valentin Mitev, Ctr. Suisse d'Electronique et de Microtechnique SA (Switzerland); Sergey M. Babichenko, Laser Diagnostic Instruments AS (Estonia); Jonathan Bennes, Ctr. Suisse d'Electronique et de Microtechnique SA (Switzerland); Rodolfo Borelli, ENEA (Italy); Agnes Dolfi-Bouteyre, ONERA (France); Luca Fiorani, ENEA (Italy); Laurent Hespel, Thierry Huet, ONERA (France); Antonio Palucci, Marco Pistilli, Adriana Puiu, ENEA (Italy); Ott Rebane, Laser Diagnostic Instruments AS (Estonia); Innokenti Sobolev, Tallinn Univ. of Technology (Estonia). . . . . [8894-27]

Automatic methods to detect the top of ABL, Gregori A. Moreira, Riad Bourayou, Instituto de Pesquisas Energéticas e Nucleares (Brazil); Fabio J. da Silva Lopes, Univ. de São Paulo (Brazil) and Instituto de Pesquisas Energéticas e Nucleares (Brazil); Taciana A. Albuquerque, Neyval C. Reis Jr., UFES (Brazil); Gerhard Held, Univ. Estadual Paulista "Júlio de Mesquita Filho" (Brazil); Eduardo Landulfo, Instituto de Pesquisas Energéticas e Nucleares (Brazil) . . . . . [8894-28]

A laser beam splitting and regulating technology of airborne laser radar: experiments and analysis, Ming Li, Weiming Xu, Rong Shu, Genghua Huang, Shanghai Institute of Technical Physics (China) . . . . . [8894-29]

Quality control of manual editing and checking for producing high resolution DEM from point cloud, Ming-Ko Chung, National Taipei Univ. of Technology (Taiwan); Che-Hao Chang, National Taiwan Univ. of Technology (Taiwan) . . . . . [8894-31]

Ceilometer, sun photometer and ozonometer measurements of the aerosol optical depth, water vapor and total ozone content over Sofia (Bulgaria), Nikolay Kolev, Tsvetina Evgenieva, Institute of Electronics (Bulgaria); Nikolay Miloshev, Plamen Muhtarov, National Institute of Geophysics, Geodesy and Geography (Bulgaria); Doyno Petkov, Space Research and Technology Institute (Bulgaria); Evgeni Donev, Danko Ivanov, Sofia Univ. "St. Kliment Ohridski" (Bulgaria); Ivan Kolev, Institute of Electronics (Bulgaria) . . . . . [8894-32]

Studying Taklamakan aerosol properties with lidar (STAPL), Paul W. Cottle, The Univ. of British Columbia (Canada); Detlef Mueller, Univ. of Hertfordshire (United Kingdom); Dong-Ho Shin, Gwangju Institute of Science and Technology (Korea, Republic of); XiaoXiao Zhang, Xinjiang Institute of Ecology and Geography (China); Kevin B. Strawbridge, Environment Canada (Canada); Ian McKendry, The Univ. of British Columbia (Canada); Guanglong Feng, Xinjiang Institute of Ecology and Geography (China) . . . . . [8894-33]

Vertically resolved optical and microphysical particle properties over Portugal in February 2012, Jana Preissler, Sergio Pereira, Ana Maria Silva, Frank Wagner, Univ. de Évora (Portugal). . . . . [8894-34]

Historical site scanning and monitoring by terrestrial lidar: Taiwan Songshan cultural and creative park, Ming-Ko Chung, Che-Hao Chang, Yu-Wei Shih, National Taipei Univ. of Technology (Taiwan) . . . . . [8894-36]

A temperature calibration method for CDOM fluorescence LIF Lidar, Peng Chen, Zhihua Mao, Jianyu Chen, The Second Institute of Oceanography, SOA (China) . . . . . [8894-37]

High-Performance Computing in Remote Sensing III

Wednesday 25 September

OPENING REMARKS

Room: Seminar 3-4 . . . . . .13:40 to 13:50

SESSION 1

Room: Seminar 3-4 . . . . . Wed 13:50 to 15:00

High-Performance Computing in Remote Sensing I

Session Chair: **Bormin Huang,**
Univ. of Wisconsin-Madison (United States)

13:50: **Simulation of complex visibilities in synthetic aperture imaging radiometry with the aid of GPU** *(Invited Paper)*, Eric Anterrieu, Ctr. National de la Recherche Scientifique (France) and Univ. de Toulouse (France); François Cabot, Ctr. d'Etudes Spatiales de la Biosphère (France) . . . . . [8895-1]

14:20: **High-performance grid for spaceborne and ground-based facilities for remote sensing data processing in Bulgaria for environmental modeling**, Hristo N. Nikolov, Doyno Petkov, Denitsa Borisova, Space Research and Technology Institute (Bulgaria) . . . . . [8895-2]

14:40: **Discrete cosine transform and hash functions toward implementing a (robust-fragile) watermarking scheme**, Saeed H. Al-Mansoori, Emirates Institution for Advanced Science and Technology (United Arab Emirates); Alavi Kunhu, Khalifa Univ. of Science, Technology and Research (United Arab Emirates). . . [8895-3]

Coffee Break . . . . . .Wed 15:00 to 15:30

SESSION 2

Room: Seminar 3-4 . . . . . Wed 15:30 to 17:20

High-Performance Computing in Remote Sensing II

Session Chair: **Antonio J. Plaza,** Univ. de Extremadura (Spain)

15:30: **GPU-based parallel design of the WRF Yonsei University planetary boundary layer scheme** *(Invited Paper)*, Melin Huang, Jarno Mielikainen, Bormin Huang, Univ. of Wisconsin-Madison (United States); Mitch Goldberg, Ajay Mehta, National Oceanic and Atmospheric Administration (United States); HungLung Allen Huang, Univ. of Wisconsin-Madison (United States). . . . . [8895-5]

16:00: **Creation of the BMA ensemble for SST using a parallel processing technique**, Kim Kwangjin, Yang Won Lee, Pukyong National Univ. (Korea, Republic of) . . . . . [8895-6]

16:20: **An improved maximum simplex volume algorithm to unmixing hyperspectral data**, Haicheng Qu, Harbin Institute of Technology (China); Bormin Huang, Univ. of Wisconsin-Madison (United States); Junping Zhang, Ye Zhang, Harbin Institute of Technology (China) . . . . . [8895-7]

16:40: **Calculation of scattering characteristic of complex target on multicore platform**, Xing Guo, Zhensen Wu, Xidian Univ. (China) . . . . . [8895-8]

17:00: **Acceleration of vertex component analysis for spectral unmixing with CUDA**, Shih-Chieh Wei, Tamkang Univ. (Taiwan); Bormin Huang, Univ. of Wisconsin-Madison (United States); Antonio J. Plaza, Univ. de Extremadura (Spain). . . . . [8895-9]

Thursday 26 September

SESSION 3

Room: Seminar 3-4 . . . . . Thu 8:50 to 10:00

High-Performance Computing in Remote Sensing III

Session Chair: **Zhensen Wu,** Xidian Univ. (China)

8:50: **Parallel method for sparse semisupervised hyperspectral unmixing** *(Invited Paper)*, Jose M. Nascimento, Instituto Superior de Engenharia de Lisboa (Portugal); Jose R. Alves, Univ. Técnica de Lisboa (Portugal); Antonio J. Plaza, Univ. de Extremadura (Spain); Vitor M. Silva, Univ. de Coimbra (Portugal); José M. Bioucas-Dias, Univ. Técnica de Lisboa (Portugal). . . . . [8895-10]

9:20: **Massively parallel computation of soil surface roughness parameters on a Fermi GPU**, Xiaojie Li, Northeast Institute of Geography and Agroecology (China); Changhe Song, Xidian Univ. (China); Bormin Huang, Univ. of Wisconsin-Madison (United States); Kai Zhao, Northeast Institute of Geography and Agroecology (China); Yunsong Li, Xidian Univ. (China) . . . . . [8895-12]

9:40: **Remote sensing image coding based on discrete wavelet transform using optimal adaptive direction prediction**, Libao Zhang, Bingchang Qiu, Xianchuan Yu, Beijing Normal Univ. (China) . . . . . [8895-13]

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

SESSION 4

Room: Seminar 3-4 . . . . . Thu 10:30 to 11:50

High-Performance Computing in Remote Sensing IV

Session Chair: **Jarno Mielikainen,**
Univ. of Wisconsin-Madison (United States)

10:30: **GPU accelerated FDTD method for investigation on the EM scattering from 1-D large scale rough surface under low grazing incidence**, Chungang Jia, Li-xin Guo, Peng-ju Yang, Xidian Univ. (China) . . . . . [8895-14]

10:50: **GPU acceleration experience with RRTMG long wave radiation model**, Erik Price, Jarno Mielikainen, Bormin Huang, HungLung A. Huang, Univ. of Wisconsin-Madison (United States); Tsengdar J. Lee, NASA Headquarters (United States) . . . . . [8895-15]

11:10: **Research on optimization of imaging parameters of optical remote sensing camera based on ground objects BRDF**, Fangqi Li, Hongyan He, Yunfei Bao, Kun Xing, Zhi Zhang, Beijing Institute of Space Mechanics and Electricity (China) . . . . . [8895-17]

11:30: **GPU-based acceleration of the hyperspectral signal subspace identification by minimum error (HySime)**, Xin Wu, Xidian Univ. (China); Bormin Huang, Univ. of Wisconsin-Madison (United States); Jianqi Zhang, Delian Liu, Xidian Univ. (China) . . . . . [8895-18]

Lunch Break . . . . . Thu 11:50 to 13:00

SESSION 5

Room: Seminar 3-4 . . . . . Thu 13:00 to 14:00

High-Performance Computing in Remote Sensing V

Session Chair: **Li-xin Guo,** Xidian Univ. (China)

13:00: **GPU-accelerated performance of the WRF Goddard cumulus ensemble model**, Melin Huang, Bormin Huang, HungLung Allen Huang, Univ. of Wisconsin-Madison (United States); Mitch Goldberg, Ajay Mehta, National Oceanic and Atmospheric Administration (United States). . . . . [8895-20]

13:20: **A 64-bit Orthorectification Algorithm using Fixed-Point Arithmetic**, Joseph C. French, Eric Balster, Univ. of Dayton (United States); William F Turri, University of Dayton Research Institute and Advanced Digital Design and Assessment Lab (United States) . . . . . [8895-21]

13:40: **GPU-based ray tracing algorithm for fast coverage zone prediction under urban microcellular environment**, Zhongyu Liu, Li-xin Guo, Chungang Jia, Xidian Univ. (China) . . . . . [8895-22]

SESSION 6

Room: Seminar 3-4 . . . . . Thu 14:00 to 15:20

High-Performance Computing in Remote Sensing VI

Session Chair: **Saeed H. Al-Mansoori,** Emirates Institution for Advanced Science and Technology (United Arab Emirates)

14:00: **An efficient advanced research weather research and forecast dynamics subroutine in CUDA C**, Jarno Mielikainen, Bormin Huang, HungLung A. Huang, Univ. of Wisconsin-Madison (United States); Mitch Goldberg, Ajay Mehta, National Oceanic and Atmospheric Administration (United States) . . . . . [8895-24]

14:20: **Parallel acceleration of diffuse scattering model for indoor radio prediction by CUDA**, Xiao Meng, Li-xin Guo, Wei Tao, Xidian Univ. (China) . . . . . [8895-25]

14:40: **GPU acceleration of the N-FINDR algorithm**, Xianyun Wu, Yunsong Li, Xidian Univ. (China); Bormin Huang, Univ. of Wisconsin-Madison (United States); Antonio J. Plaza, Univ. de Extremadura (Spain) . . . . . [8895-26]

15:00: **An improved two-scale model with volume and air bubble scattering for the dielectric sea surface**, Longxiang Linghu, Zhensen Wu, Xidian Univ. (China) . . . . . [8895-27]

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SPIE Security+Defence

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Exhibition: 25–26 September 2012
Edinburgh International Conference Centre
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Leslie C. Laycock, BAE Systems (United Kingdom)
Keith L. Lewis, Electro Magnetic Remote Sensing Defence Technology Ctr. (United Kingdom)
Thomas J. Merlet, Thales Air Systems S.A. (France)
John G. Rarity, Univ. of Bristol (United Kingdom)
Mark A. Richardson, Cranfield Univ. (United Kingdom)
Neil Anthony Salmon, MMW Sensors Ltd. (United Kingdom)
Ove Steinvall, Swedish Defence Research Agency (Sweden)
Attila A. Szep, Air Force Research Lab. (United States)
David H. Titterton, Defence Science and Technology Lab. (United Kingdom)
Henry J. White, BAE Systems (United Kingdom)
Roberto Zamboni, Consiglio Nazionale delle Ricerche (Italy)

Electro-Optical and Infrared Systems: Technology and Applications X

Conference Chairs: **David A. Huckridge,** Malvern Innovations (United Kingdom); **Reinhard Ebert,** Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung (Germany)

Programme Committee: **Christopher C. Alexay,** StingRay Optics, LLC (United States); **Jan Yngve Andersson,** Acreo AB (Sweden); **Gisele Bennett,** Georgia Institute of Technology (United States); **Rainer Breiter,** AIM INFRAROT-MODULE GmbH (Germany); **Gordon A. Cain,** Vision4ce Ltd. (United Kingdom); **David J. Clarke,** Placing Value Co.,Ltd (Thailand); **Gérard L. Destéfanis,** CEA-LETI-Minatec (France); **Jean-Claude L. Fontanella,** Thales Optronique S.A.S. (France); **Natan S. Kopeika,** Ben-Gurion Univ. of the Negev (Israel); **José Manuel López-Alonso,** Univ. Complutense de Madrid (Spain); **John F. Parsons,** Thales UK Ltd. (United Kingdom); **Stanley R. Rotman,** Ben-Gurion Univ. of the Negev (Israel); **Armin L. Schneider,** Institut Franco-Allemand de Recherches de Saint-Louis (France)

Monday 23 September

WELCOME AND INTRODUCTION

Room: Konferenz 5 . . . . . .8:35 to 8:40

SESSION 1

Room: Konferenz 5 . . . . . Mon 8:40 to 10:00

Optics and Materials

Session Chairs: **Reinhard Ebert,** Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung (Germany); **David A. Huckridge,** Ridgeway Consulting Ltd. (United Kingdom)

8:40: **Investigation of index of refraction changes in chalcogenide glasses during molding processes**, Ray J. Pini, Jacklyn Novak, LightPath Technologies, Inc. (United States); Erik F. Stover, M3 Measurement Solutions (United States); Alan Symmons, LightPath Technologies, Inc. (United States). . . . . [8896-1]

9:00: **Hyper-hemispheric and bifocal panoramic lenses**, Claudio Pernechele, INAF - Osservatorio Astronomico di Padova (Italy) and CISAS - Ctr. for Studies and Activity for Space (Italy) . . . . . [8896-2]

9:20: **Two-lens designs for modern uncooled and cooled IR imaging devices**, Norbert Schuster, Umicore Electro-Optic Materials (Belgium) . . . . . [8896-3]

9:40: **Narcissus calculation from complicated mechanical structure of IR optical system using blackbody radiation**, Jinsuk Hong, Samsung Thales Co., Ltd. (Korea, Republic of) . . . . . [8896-4]

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

SESSION 2

Room: Konferenz 5 . . . . . Mon 10:30 to 12:20

Active Sensing

Session Chairs: **Armin Schneider,** Technische Univ. München (Germany); **Christopher C. Alexay,** StingRay Optics, LLC (United States)

10:30: **Comparison of flash and accumulation mode in range-gated active imaging** *(Invited Paper)*, Frank Christnacher, Martin Laurenzis, Stéphane Schertzer, Institut Franco-Allemand de Recherches de Saint-Louis (France) . . . . . [8896-5]

11:00: **Advanced range imaging with gated viewing: compressed sensing and coding of range gates**, Martin Laurenzis, Emmanuel Bacher, Stéphane Schertzer, Frank Christnacher, Institut Franco-Allemand de Recherches de Saint-Louis (France) . . . . . [8896-6]

11:20: **Comparison of three methods reducing the beam parameter product of a laser diode stack for long range laser illuminator applications**, Yves Lutz, Jean-Michel Poyet, Nicolas Metzger, Institut Franco-Allemand de Recherches de Saint-Louis (France) . . . . . [8896-7]

11:40: **Surface enhanced vibrational spectroscopy for the detection of explosives**, Hainer Hainer, Christoph Lenth, Sebastian Funke, Lars Gundrum, Frank Rotter, Fritjof Büttner, Jan Hagemann, Mike Wellhausen, Laser-Lab. Göttingen e.V. (Germany) . . . . . [8896-8]

12:00: **A novel Sagnac fiber optic sensor employing time delay estimation for distributed detection and location**, Yuan Wu, Pang Bian, Bo Jia, Qian Xiao, Fudan Univ. (China) . . . . . [8896-9]

Lunch Break . . . . . Mon 12:20 to 13:30

SESSION 3

Room: Konferenz 5 . . . . . Mon 13:30 to 15:10

Detectors

Session Chairs: **Gisele Bennett,** Georgia Institute of Technology (United States); **Rainer Breiter,** AIM INFRAROT-MODULE GmbH (Germany)

13:30: **Large format, small pixel pitch and hot detectors at SOFRADIR**, Yann Reibel, Marie-Lise Bourqui, Michel Vuillermet, David Billon-Lanfrey, SOFRADIR (France); Gérard L. Destéfanis, Olivier Gravrand, CEA-LETI (France) . . . . . [8896-10]

13:50: **InGaAs infrared detector development for SWIR imaging applications**, Frank Rutz, Philipp Kleinow, Rolf Aidam, Wolfgang Bronner, Fraunhofer-Institut für Angewandte Festkörperphysik (Germany); Lutz Kirste, Fraunhofer-IAF (Germany); Martin Walther, Fraunhofer-Institut für Angewandte Festkörperphysik (Germany) . . . . . [8896-11]

14:10: **Semi-metal to semiconductor transition conductivity in infrared detector HgTe/CdTe nanostructure superlattice**, Abdelhakim Nafidi, Aomar Idbaha, Hassan Chaib, Univ. Ibn Zohr (Morocco); Bernabé M. Soucase, Univ. Politècnica de València (Spain) . . . . . [8896-12]

14:30: **Plasmonic absorption nanoantenna for frequency selective mid-Infrared detection**, Yongqian Li, Yongjun Guo, Lei Su, Binbin Wang, Li Man, Northwestern Polytechnical Univ. (China); Zili Zhou, Science and Technology on Metrology and Calibration Laboratory (China) . . . . . [8896-13]

14:50: **Design and simulation of an X-ray detector for pulsar navigation,** Liansheng Li, Jianwu Chen, Fuchang Zuo, Zhiwu Mei, Beijing institute of Control Engineering (China). . . . . [8896-14)

Coffee Break . . . . . Mon 15:10 to 15:40

SESSION 4

Room: Konferenz 5 . . . . . Mon 15:40 to 17:10

Protection and Threat Detection

Session Chairs: **Gérard L. Destéfanis,** CEA-LETI-Minatec (France); **Jan Yngve Andersson,** Acreo Swedish ICT AB (Sweden)

15:40: **Research on laser protection: an overview of 20 years of activities at Fraunhofer IOSB** *(Invited Paper)*, Gunnar Ritt, Bernd Eberle, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung (Germany) . . . . . [8896-15]

16:10: **Gun muzzle flash detection using a CMOS single photon avalanche diode**, Tomer Merhav, Vitali Savuskan, Technion-Israel Institute of Technology (Israel); Yael Nemirovsky, Technion-Israel Institute of Technology (Israel) and Kinneret College on the Sea of Galilee (Israel) . . . . . [8896-16]

16:30: **Multifunctional system for muzzle flash and sniper sight detection utilizing a laser and high frame rate SWIR-camera**, Carl Brannlund, Jonas Tidstrom, Markus Henriksson, Lars J. Sjöqvist, Swedish Defence Research Agency (Sweden) . . . . . [8896-17]

16:50: **Analyzing the effectiveness of flare dispensing programs against pulse width modulation seekers using self-organizing maps**, Mehmet C. Sahingil, Murat S. Aslan, TÜBITAK BILGEM ILTAREN (Turkey) . . . . . [8896-18]

Tuesday 24 September

SESSION 5

Room: Konferenz 5 . . . . . Tue 8:40 to 10:00

Imager Testing, Calibration and Simulation

Session Chairs: **John F. Parsons,** Thales UK Ltd. (United Kingdom); **Jose I. Alonso,** Univ. Politécnica de Madrid (Spain)

8:40: **Image quality testing of assembled IR camera modules**, Daniel Winters, Patrik Erichsen, TRIOPTICS GmbH (Germany) . . . . . [8896-19]

9:00: **Blackbody reference sources with high speed temperature stabilization time**, Catherine Barrat, HGH Systèmes Infrarouges (France) . . . . . [8896-20]

9:20: **Performance simulation model for a MWIR airborne camera for missile plume detection**, Jeeyeon Yoon, LIG Nex1 Co., Ltd. (Korea, Republic of); Dongok Ryu, Sangmin Kim, Sehyun Seong, Yonsei Univ. (Korea, Republic of); Jieun Kim, Agency for Defense Development (Korea, Republic of); Hyunki Lee, LIG Nex1 Co., Ltd. (Korea, Republic of); Woongsup Yoon, Sug-Whan Kim, Yonsei Univ. (Korea, Republic of) . . . . . [8896-21]

9:40: **Research on simulation credibility of space-based optical imaging system**, Yi Han, Huayan Sun, Huichao Guo, Yinchun Li, Lin Du, The Academy of Equipment Command & Technology (China) . . . . . [8896-22]

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

SESSION 6

Room: Konferenz 5 . . . . . Tue 10:30 to 12:40

Imaging Systems

Session Chairs: **Reinhard Ebert,** Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung (Germany); **David A. Huckridge,** Ridgeway Consulting Ltd. (United Kingdom)

10:30: **Results from the electro-optic sensors domain of the materials and components for missiles innovation and technology partnership (phase 1)** *(Invited Paper)*, Mark Bray, Robert Shears, SELEX ES Ltd. (United Kingdom) . . . . . [8896-23]

11:00: **Feature-based automatic configuration of semi-stationary multi-camera components**, Ann-Kristin Grosselfinger, David Muench, Wolfgang Hübner, Michael Arens, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung (Germany) . . . [8896-24]

11:20: **A new long wave IR spectral imager based on uncooled camera and Circular Variable Filter (CVF) for spectral separation**, Dario Cabib, CI Systems (Israel) Ltd. (Israel) . . . . . [8896-25]

11:40: **A Long Wave Infrared (LWIR) spectral imager (7.7 to 13 microns) based on cooled detector array and high resolution Circular Variable Filter (CVF)**, Dario Cabib, Moshe Lavi, Amir Gil, Eran Ohel, Uri Milman, CI Systems (Israel) Ltd. (Israel) . . . . . [8896-26]

12:00: **A novel sampling method for the sparse recovery of infrared sea surveillance images**, Serdar Cakir, Hande Uzeler, Tayfun Aytaç, TÜBITAK BILGEM ILTAREN (Turkey) . . . . . [8896-27]

12:20: **Image generation for single detector IR seekers via compressive sensing**, Hande Uzeler, Serdar Cakir, Tayfun Aytaç, TÜBITAK BILGEM ILTAREN (Turkey) . . . . . [8896-28]

PLENARY SESSION

Room: Konferenz 5 . . . . . Tue 16:00 to 17:50

Security + Defence 2013: Plenary Session

For details, please see page 4-5 in the printed programme or visit http://spie.org/security-defence-europe.xml

POSTER SESSION

Room: Mezzanine Level Exhibition Hall
Tue 17:40 to 19:10

Conference attendees are invited to attend the Remote Sensing Poster Session on Tuesday afternoon. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. 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. Poster authors, view poster presentation guidelines and set-up instructions on page 6 and at http://spie.org/x32234.xml.

A simulation model of vegetation temperature based on physiological characteristics, Wei Lin, Beijing Institute of Technology (China); Ji-Yuan Wang, Yu-hua Chen, Rong-hua Su, Beijing Canbao Architecture Design Institute (China) . . . . . [8896-29]

An calibration method of the multichannel imaging lidar, Weiming Xu, Shanghai Institute of Technical Physics (China); Jun Liu, Information Engineering Univ. (China); Rong Shu, Shanghai Institute of Technical Physics (China) . . . . . [8896-30]

Deformation measurement for satellite antennas by close-range photogrammetry, Shanping Jiang, China Academy of Space Technology (China) . . . . . [8896-31]

Optical design of a large-scale in-door illumination simulating system, Jie Xu Sr., Shanping Jiang, Qingsheng Xiao, Pengsong Zhang, Beijing Institute of Spacecraft Environment Engineering (China) . . . . . [8896-32]

Determination of the microbolometric FPA's responsivity with imaging system's radiometric considerations, Slawomir Gogler, Grzegorz Bieszczad, Michal Krupinski, Military Univ. of Technology (Poland) . . . . . [8896-33]

System for critical infrastructure security based on multispectral observation-detection module, Piotr Trzaskawka, Mieczyslaw Szustakowski, Mariusz Kastek, Rafal Dulski, Marek Zyczkowski, Wieslaw Ciurapinski, Jaroslaw Barela, Military Univ. of Technology (Poland) . . . . . [8896-34]

Determining the range parameters of observation thermal cameras on the basis of laboratory measurements, Jaroslaw Barela, Krzysztof Firmanty, Mariusz Kastek, Piotr Trzaskawka, Military Univ. of Technology (Poland) . . . . . [8896-35]

Test stand for non-uniformity correction of microbolometer focal plane arrays used in thermal cameras, Michal Krupinski, Jaroslaw Barela, Krzysztof Firmanty, Mariusz Kastek, Military Univ. of Technology (Poland) . . . . . [8896-36]

Analysis and design of infrared swing scanning control system, Xinling Tian, Xuli Liu, Mintao Tan, Weihua Wang, Danfeng Li, Beijing Institute of Control Engineering (China) . . . . . [8896-37]

Charge control of electrostatically actuated micromechanical infrared Fabry-Pérot filters, Sebastian Lehmann, Martin Ebermann, Norbert Neumann, InfraTec GmbH (Germany) . . . . . [8896-38]

Ultra-narrow mid-infrared bandpass interference filters for use in stabilized external-cavity QCLs and imaging, Jan F. Kischkat, Mykhaylo P. Semtsiv, W. Ted Masselink, Humboldt-Univ. zu Berlin (Germany) . . . . . [8896-39]

Trends in Infrared Imaging Detecting Technology, Jinxiang Fan, Shanghai Research Institute of mechanical and electrical engineering (China); Jianyu Yang, University of Electronics Science and Technology of China (China) . . . . . [8896-40]

Reliability-based structural design for infrared cryostat, Songlin Yu, Chunsheng Wang, North China Research Institute of Electro-Optics (China) . . . . . [8896-41]

Application of infrared uncooled cameras in surveillance systems, Rafal Dulski, Jaroslaw Barela, Piotr Trzaskawka, Tadeusz Piatkowski, Military Univ. of Technology (Poland) . . . . . [8896-42]

A new method for discriminating the Moon interference based on CES software, Zhijun Tu, Zhiwu Mei, Jun Yuan, Loulou Deng, Beijing Institute of Control Engineering (China) . . . . . [8896-43]

Electro-Optical Remote Sensing VII

Conference Chairs: **Gary W. Kamerman,** FastMetrix, Inc. (United States); **Ove K. Steinvall,** Swedish Defence Research Agency (Sweden)

Programme Committee: **Robert J. Grasso,** Northrop Grumman Electronic Systems (United States); **Laurent Hespel,** ONERA (France); **Dennis K. Killinger,** Univ. of South Florida (United States); **Martin Laurenzis,** Institut Franco-Allemand de Recherches de Saint-Louis (France); **Peter Lutzmann,** Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung (Germany); **Kenneth J McEwan; Vasyl Molebny,** National Taras Shevchenko Univ. of Kyiv (Ukraine); **Philip St.J. Russell,** Max Planck Institute for the Science of Light (Germany); **Peter N. Randall,** QinetiQ Ltd. (United Kingdom); **Philippe Réfrégier,** Institut Fresnel (France); **Monte D. Turner,** Air Force Research Lab. (United States); **María J. Yzuel,** Univ. Autònoma de Barcelona (Spain)

Tuesday 24 September

POSTER SESSION
Room: Mezzanine Level Exhibition Hall
Tue 17:40 to 19:10

Conference attendees are invited to attend the Remote Sensing Poster Session on Tuesday afternoon. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. 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. Poster authors, view poster presentation guidelines and set-up instructions on page 6 and at http://spie.org/x32234.xml.

Polarization state imaging in long-wave infrared for object detection, Grzegorz Bieszczad, Slawomir Gogler, Michal Krupinski, Military Univ. of Technology (Poland) . . . . . [8897-28]

Wednesday 25 September

OPENING REMARKS
Room: Seminar 1 . . . . . .8:25 to 8:30

SESSION 1
Room: Seminar 1 . . . . . Wed 8:30 to 10:00

Electro-Optical Systems and Applications
Session Chair: **Ove K. Steinvall,**
Swedish Defence Research Agency (Sweden)

8:30: **Future electro-optical sensors and processing in urban operations** *(Invited Paper)*, Piet B. Schwering, TNO Defence, Security and Safety (Netherlands); Christina Grönwall, Swedish Defence Research Agency (Sweden) . . . . . [8897-1]

9:00: **Experiments and models of active and thermal imaging under bad weather conditions**, Erwan Bernard, Sagem SA (France) and ONERA (France); Nicolas Riviere, ONERA (France); Mathieu Renaudat, Sagem SA (France); Emmanuel Zenou, Institut Supérieur de l'Aéronautique et de l'Espace (France) . . . . . [8897-2]

9:20: **Surveillance in long-distance turbulence-degraded videos**, Yitzhak Yitzhaky, Eli Chen, Oren Haik, Ben-Gurion Univ. of the Negev (Israel) . . . . . [8897-3]

9:40: **Measurements and analysis of active and passive multispectral imaging**, Christina Grönwall, Swedish Defence Research Agency (Sweden) and Linköping Univ. (Sweden); Ove K. Steinvall, Håkan Larsson, Swedish Defence Research Agency (Sweden); Dominique Hamoir, ONERA (France); Peter Lutzmann, Endre Repasi, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung (Germany); Laurent Hespel, Olivier Vaudelin, Michel Fracès, Bernard Tanguy, ONERA (France); Benjamin Göhler, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung (Germany) . . . . . [8897-4]

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

SESSION 2
Room: Seminar 1 . . . . . Wed 10:30 to 12:00

Active Systems I
Session Chair: **Gary W. Kamerman,** FastMetrix, Inc. (United States)

10:30: **Non-line of sight active imaging of scattered photons** *(Invited Paper)*, Martin Laurenzis, Institut Franco-Allemand de Recherches de Saint-Louis (France); Andreas Velten, Univ. of Wisconsin-Madison (United States) . . . . . [8897-5]

11:00: **Lidar/DIAL detection of bomb factories**, Luca Fiorani, Adriana Puiu, Olga Rosa, Antonio Palucci, ENEA (Italy) . . . . . [8897-6]

11:20: **Range accuracy of a gated-viewing system as a function of the gate shift step size**, Benjamin Göhler, Peter Lutzmann, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung (Germany) . . . . . [8897-7]

11:40: **Investigation of synthetic aperture ladar for land surveillance applications**, Simon Turbide, Linda Marchese, Marc Terroux, Alain Bergeron, INO (Canada) . . . . . [8897-8]

Lunch/Exhibition Break . . . . . .Wed 12:00 to 13:30

SESSION 3
Room: Seminar 1 . . . . . Wed 13:30 to 15:20

Passive Systems and Processing I
Session Chair: **Kenneth J McEwan**

13:30: **Image processing in aerial surveillance and reconnaissance: from pixels to understanding** *(Invited Paper)*, Judith Dijk, Adam W. van Eekeren, Olga Rajadell Rojas, Gertjan J. Burghouts, Klamer Schutte, TNO Defence, Security and Safety (Netherlands) . . . . . [8897-10]

14:00: **Segmentation and wake removal of seafaring vessels in optical satellite images**, Henri Bouma, Rob J. Dekker, Robin M. Schoemaker, Ali A. Mohamoud, TNO Defence, Security and Safety (Netherlands) . . . . . [8897-11]

14:20: **Geometric calibration of thermal cameras**, Philip Engström, Joakim Rydell, Håkan Larsson, Swedish Defence Research Agency (Sweden) . . . . . [8897-12]

14:40: **Multispectral and hyperspectral advanced characterization of soldier's camouflage equipment**, Mariusz Kastek, Tadeusz Piatkowski, Rafal Dulski, Piotr Trzaskawka, Military Univ. of Technology (Poland); Philippe Lagueux, Martin Chamberland, Vincent Farley, Telops (Canada) . . . . . [8897-13]

15:00: **Characterization of aircraft and flares used in the infrared scene simulation system**, Azwitamisi E. Mudau, Johannes J. Calitz, Cornelius Willers, Alta de Waal, Council for Scientific and Industrial Research (South Africa) . . . . . [8897-14]

Coffee Break . . . . . .Wed 15:20 to 15:50

SESSION 4

Room: Seminar 1 . . . . . Wed 15:50 to 17:30

Passive Systems and Processing II

Session Chair: **Klamer Schutte,** TNO Defence, Security and Safety (Netherlands)

15:50: **Image structural analysis in the tasks of automatic navigation of unmanned vehicles and inspection of Earth surface**, Vadim R. Lutsiv, Igor Malyshev, S.I. Vavilov State Optical Institute (Russian Federation) . . . . . [8897-15]

16:10: **A signal-processing system of digital pixel binning based on bi-cubic filtering algorithm**, Bin Bao, Ning Lei, Beijing Institute of Space Mechanics and Electricity (China); Nina Peng, Institute of spacecraft system engineering CAST (China); Zhixue Han, Beijing Institute of Space Mechanics and Electric (China) . . . . . [8897-16]

16:30: **Optic flow aided navigation and 3D scene reconstruction**, Malcolm P. Rollason, QinetiQ Ltd. (United Kingdom) . . . . . [8897-17]

16:50: **Robust motion filtering as an enabler to video stabilization for a tele-operated mobile robot**, Romain Chereau, Toby P. Breckon, Cranfield Univ. (United Kingdom) . . . . . [8897-18]

17:10: **An automatic geo-spatial object recognition algorithm for high resolution satellite images**, Mustafa Ergül, Aydın A. Alatan, Middle East Technical Univ. (Turkey) . . . . . [8897-19]

Thursday 26 September

SESSION 5

Room: Seminar 1 . . . . . Thu 9:00 to 10:30

Active Systems II

Session Chair: **Robert J. Grasso,** Northrop Grumman Electronic Systems (United States)

9:00: **Real-time imaging DUSPEN lidar for helicopter situational awareness in DVE** *(Invited Paper)*, James T. Murray, Jason Seely, Jeffrey J. Plath, Gregory J. Fetzer, William L. Ryder, Neil R. Van Lieu, Ron Goodwin, Eric Gotfredson, Tyler J. Wagner, Nick Kridler, John R. Engel, Ken Panici, Anthony Mitchell, Arete Associates (United States) . . . . . [8897-20]

9:30: **Image change detection using a SWIR active imaging system**, Armin L. Schneider, Institut Franco-Allemand de Recherches de Saint-Louis (Germany); David Monnin, Martin Laurenzis, Frank Christnacher, Institut Franco-Allemand de Recherches de Saint-Louis (France) . . . . . [8897-21]

9:50: **Questions about using of atmospheric attenuation calculating the nominal ocular hazard distance**, Ove K. S. Gustafsson, Swedish Defence Research Agency (Sweden) . . [8897-23]

10:10: **On-the-fly adaptable spatial resolution real-time imaging lidar system**, Jordi Riu Gras, Santiago Royo Royo, Univ. Politècnica de Catalunya (Spain) . . . . . [8897-24]

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

SESSION 6

Room: Seminar 1 . . . . . Thu 11:00 to 12:00

Active Systems and New Technologies

Session Chair: **Gary W. Kamerman,** FastMetrix, Inc. (United States)

11:00: **Investigation of LTR analysis for detection of multiple concealed objects**, Simon J. Hutchinson, Michael J. Fernando, David A. Andrews, Nicholas J. Bowring, Manchester Metropolitan Univ. (United Kingdom). . . . . [8897-25]

11:20: **High-power multi-beam diode laser transmitter for a flash imaging lidar**, Christer Holmlund, Petteri Aitta, Sini Kivi, VTT Technical Research Ctr. of Finland (Finland); Risto Mitikka, VTT Elektronikka (Finland); Lauri Tyni, Veli Heikkinen, VTT Technical Research Ctr. of Finland (Finland) . . . . . [8897-26]

11:40: **Digital colour management system for colour parameters reconstruction**, Karol Grudzinski, Piotr Lasmanowicz, Military Institute of Engineer Technology (Poland); Agnieszka Pawlicka, University of São Paulo, São Carlos Institute of Chemistry (IQSC) (Brazil); Adam Januszko, Military Institute of Engineer Technology (Poland) . . . . . [8897-29]

Military Applications in Hyperspectral Imaging and High Spatial Resolution Sensing

Conference Chairs: **Gary J. Bishop,** BAE Systems (United Kingdom); **John D. Gonglewski,** European Office of Aerospace Research and Development (United Kingdom)

Programme Committee: **David C. Dayton,** Applied Technology Associates (United States); **Detlev M. Even,** NovaSol (United States); **Andrey V. Kanaev,** U.S. Naval Research Lab. (United States); **Ainsley Killey,** BAE Systems (United Kingdom); **Michael M. Myers,** Air Force Research Lab. (United States); **Jorge E. Pezoa Nunez,** Univ. de Concepción (Chile); **Michael F. Reiley; Stanley R. Rotman,** Ben-Gurion Univ. of the Negev (Israel)

Tuesday 24 September

OPENING REMARKS

Room: Seminar 2 . . . . . .13:00 to 13:05

SESSION 7

Room: Seminar 2 . . . . . Tue 13:05 to 15:05

Military Applications in Hyperspectral Imaging and High Spatial Resolution Sensing

Session Chairs: **John D. Gonglewski,** European Office of Aerospace Research and Development (United Kingdom); **Ainsley Killey,** BAE Systems (United Kingdom)

13:05: **Snapshot imaging Mueller Matrix instrument**, Michael W. Kudenov, Michael J. Escuti, North Carolina State Univ. (United States); Eustace L. Dereniak, Nathan Hagan, College of Optical Sciences, The Univ. of Arizona (United States); Kazuhiko Oka, Hokkaido Univ. (Japan) . . . . . [8897-30]

13:25: **Efficient implementations of hyperspectral chemical-detection algorithms**, Cory J. C. Brett, Northeastern Univ. (United States); Robert S. DiPietro, Dimitris G. Manolakis, MIT Lincoln Lab. (United States); Vinay K. Ingle, Northeastern Univ. (United States) . . . . . [8897-31]

13:45: **Combined airborne sensors in urban environment**, Alwin Dimmeler, Hendrik Schilling, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung (Germany); Michal Shimoni, Royal Belgian Military Academy (Belgium); Dimitri Bulatov, Wolfgang Middelmann, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung (Germany) . . . . . [8897-32]

14:05: **Concept and integration of an on-line quasi-operational airborne hyperspectral remote sensing system**, Hendrik Schilling, Andreas Lenz, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung (Germany); Dominik Perpeet, Sebastian Wuttke, Fraunhofer IOSB (Germany); Wolfgang Middelmann, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung (Germany) . . . . . [8897-33]

14:25: **Effects of radiometric accuracy and extended spectral range on hyperspectral imaging applications**, Florent M. Prel, Louis Moreau, Nicolas Ho, Robert Bouchard, Christian A. Vallieres, Claude B. Roy, ABB Analytical Measurement (Canada) . . . . . [8897-35]

14:45: **Real time intelligent image dissemination using hyperspectral information**, Gary J. Bishop, Ainsley Killey, BAE Systems (United Kingdom) . . . . . [8897-36]

Coffee Break . . . . . Tue 15:05 to 16:00

PLENARY SESSION

Room: Konferenz 5 . . . . . Tue 16:00 to 17:50

Security + Defence 2013: Plenary Session

For details, please see page 4-5 in the printed programme or visit http://spie.org/security-defence-europe.xml

Technologies for Optical Countermeasures X

Conference Chairs: **David H. Titterton,** Defence Science and Technology Lab. (United Kingdom); **Mark A. Richardson,** Cranfield Univ. (United Kingdom); **Robert J. Grasso,** Northrop Grumman Electronic Systems (United States)

Programme Committee: **Zahir Daya,** Defence Research and Development Canada, Atlantic (Canada); **Brian Butters,** Meon Technology Ltd. (United Kingdom); **Marc Eichhorn,** Institut Franco-Allemand de Recherches de Saint-Louis (France); **Ian F. Elder,** SELEX Galileo Ltd. (United Kingdom); **Helena Jelínková,** Czech Technical Univ. in Prague (Czech Republic); **Stephen P. McGeoch,** Thales Optronics Ltd. (United Kingdom); **Espen Lippert,** Norwegian Defence Research Establishment (Norway); **Ric H. Schleijpen,** TNO Defence, Security and Safety (Netherlands); **Dirk Peter Seiffer,** Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung (Germany); **Ove K. Steinvall,** Swedish Defence Research Agency (Sweden); **Hans Dieter Tholl,** Diehl BGT Defence GmbH & Co. KG (Germany); **Maria S. Willers,** Denel Dynamics (South Africa); **Cornelius Johannes Willers,** Council for Scientific and Industrial Research (South Africa)

Wednesday 25 September

OPENING REMARKS

Room: Konferenz 1 . . . . . .8:25 to 8:30

SESSION 1

Room: Konferenz 1 . . . . . Wed 8:30 to 10:30

Keynote Session

Session Chair: **Robert J. Grasso,**
Northrop Grumman Electronic Systems (United States)

8:30: **Quantum cascade lasers and their advanced capabilities for defense and security** *(Keynote Presentation)*, Timothy O. Day, Daylight Solutions Inc. (United States) . . . . . [8898-1]

9:10: **Thulium fiber lasers: increasing 2 micron power for defense and industry** *(Invited Paper)*, Eric Park, Q-Peak (United States) . . . . . [8898-2]

9:50: **Fiber laser-based, mid-IR and novel wavelength lasers** *(Keynote Presentation)*, Robert Afzal, Angus J. Henderson, Lockheed Martin Aculight (United States) . . . . . [8898-3]

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

SESSION 2

Room: Konferenz 1 . . . . . Wed 11:00 to 12:30

Quantum Cascade and High-Power Diode Lasers

Session Chair: **Hans Dieter Tholl,**
Diehl BGT Defence GmbH & Co. KG (Germany)

11:00: **Design issues and physics for high-performance quantum-cascade lasers** *(Invited Paper)*, W. Ted Masselink, Mykhaylo P. Semtsiv, Mikaela Elagin, Yuri V. Flores, Grygorii Monastyrskyi, Sergii Kurlov, Jan F. Kischkat, Humboldt-Univ. zu Berlin (Germany) . [8898-4]

11:30: **Advances in quantum cascade laser technology to meet the needs of defense applications** *(Invited Paper)*, C. Kumar N. Patel, Pranalytica, Inc. (United States) . . . . . [8898-5]

12:00: **Progress in efficiency-optimized high power diode lasers** *(Invited Paper)*, Agnieszka Pietrzak, Ralf Hülsewede, Martin Zorn, Olaf Hirsekorn, JENOPTIK Diode Lab GmbH (Germany); Jens Meusel, JENOPTIK Optical Systems GmbH (Germany); Petra Hennig, JENOPTIK Laser GmbH (Germany); Jürgen Sebastian, JENOPTIK Diode Lab GmbH (Germany); Paul Crump, Hans Wenzel, Steffen Knigge, Andre Maassdorf, Frank Bugge, Götz Erbert, Ferdinand-Braun-Institut (Germany) . . . . . [8898-6]

Lunch/Exhibition Break . . . . . .Wed 12:30 to 13:40

SESSION 3

Room: Konferenz 1 . . . . . Wed 13:40 to 15:00

Two Micron

Session Chair: **Ian F. Elder,** SELEX Galileo Ltd. (United Kingdom)

13:40: **Mid-IR (1 - 5 µm) supercontinuum generation in ultra-low loss, dispersion-zero shifted tellurite glass fiber** *(Invited Paper)*, Rajesh Thapa, NP Photonics Inc (United States); Dan L. Rhonehouse, Dan Trung Nguyen, Jie Zong, Arturo Chavez-Pirson, NP Photonics, Inc. (United States) . . . . . [8898-7]

14:10: **Compact high-power/high-energy 2 µm and mid-infrared laser sources for OCM** *(Invited Paper)*, Marc Eichhorn, Christelle Kieleck, Anne Hildenbrand, Martin Schellhorn, Georg Stoeppler, Institut Franco-Allemand de Recherches de Saint-Louis (France) . . . . . [8898-8]

14:40: **Average power and pulse energy scaling of 1.6 µm resonantly-diode-pumped erbium lasers**, Lukasz Galecki, Marc Eichhorn, Institut Franco-Allemand de Recherches de Saint-Louis (France); Waldemar Zendzian, Military Univ. of Technology (Poland) . . . . . [8898-10]

Coffee Break . . . . . .Wed 15:00 to 15:30

PANEL DISCUSSION

Room: Konferenz 1 . . . . . .Wed 15:30 to 16:45

Panel Discussion: Attaining Closed Loop Countermeasures

Moderators: **Robert Grasso**, Northrop Grumman,
Mark Richardson, Cranfield University

This debate is open to all symposium attendees, and will cover topics such as:

- What source technology is relevant
- How does the atmosphere limit attaining closed loop
- What timelines and processing limitations exist
- What does and doesn't work

Join with us and share your experience, knowledge, and insight. If you might be involved in the future, join us and get an insight from practitioners in the area.

Thursday 26 September

SESSION 4

Room: Konferenz 1 . . . . . Thu 8:40 to 10:00

Mid IR Transmission Fibres

Session Chair: **Marc Eichhorn,** Institut Franco-Allemand de Recherches de Saint-Louis (France)

8:40: **Advancing the applications of chalcogenide glass for infrared power transmission** *(Invited Paper)*, Daniel W. Hewak, Chris Craig, Khouler Khan, Edwin Weatherby, Paul Bastcock, Univ. of Southampton (United Kingdom) . . . . . [8898-11]

9:10: **Maximizing the bandwidth while minimizing the spectral fluctuations using supercontinuum generation in photonic crystal chalcogenide fibers** *(Invited Paper)*, Curtis R. Menyuk, R. Joseph Weiblen, Univ. of Maryland, Baltimore County (United States); Jonathan Hu, Baylor Univ. (United States); Ishwar D. Aggarwal, Sotera Defense Solutions, Inc. (United States); Brandon Shaw, Jasbinder S. Sanghera, U.S. Naval Research Lab. (United States) . . . . . [8898-12]

9:40: **Low loss, wide transparency, robust tellurite glass fibers for mid-IR (2 - 5 µm) applications**, Dan L. Rhonehouse, Jie Zong, Arturo Chavez-Pirson, NP Photonics, Inc. (United States) . . . . . [8898-13]

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

SESSION 5

Room: Konferenz 1 . . . . . Thu 10:30 to 11:10

Modelling and Simulation

Session Chair: **Cornelius Willers,** Council for Scientific and Industrial Research (South Africa)

10:30: **Simulation of laser propagation through jet plumes using computational fluid dynamics**, Markus Henriksson, Henrik Edefur, Oskar Parmhed, Shia-Hui Peng, Lars J. Sjöqvist, Jonas Tidström, Stefan Wallin, Swedish Defence Research Agency (Sweden) . . . . . [8898-14]

10:50: **Comparison of MODTRAN5 to measured data in the UV band**, Leon Smith, Mark Richardson, Cranfield Univ. (United Kingdom); Roy Walmsley, Chemring Countermeasures Ltd. (United Kingdom) . . . . . [8898-15]

SESSION 6

Room: Konferenz 1 . . . . . Thu 11:10 to 12:20

Laser Effects

Session Chair: **David H. Titterton,** Defence Science and Technology Lab. (United Kingdom)

11:10: **Non-lethal laser dazzling as a personnel countermeasure** *(Invited Paper)*, David Shannon, Consultant (United States) . . [8898-16]

11:40: **Laser dazzling effects on car driver performance**, Ove K. Steinvall, Stig Sandberg, Ulf Hörberg, Rolf Persson, Folke Berglund, Kjell Karslsson, Johan Öhgren, Swedish Defence Research Agency (Sweden); Per G. Söderberg, Uppsala Univ. (Sweden) . . . . . [8898-17]

12:00: **Effects of high power illuminators on vision through windscreens and driving behavior**, Alexander Toet, Johan W. A. M. Alferdinck, TNO Defence, Security and Safety (Netherlands) . . . . . [8898-18]

Lunch Break . . . . . Thu 12:20 to 13:40

SESSION 7

Room: Konferenz 1 . . . . . Thu 13:40 to 15:20

Threat Detection and Discrimination

Session Chair: **Ove K. Steinvall,** Swedish Defence Research Agency (Sweden)

13:40: **Detection of dim targets in multiple environments** *(Invited Paper)*, Grace Mirsky, Northrop Grumman Corp. (United States); Matthew Woods, Northrop Grumann Corp. (United States) . . [8898-19]

14:10: **Target discrimination strategies in optics detection** *(Invited Paper)*, Lars J. Sjöqvist, Lars Allard, Markus Henriksson, Per Jonsson, Magnus Pettersson, Swedish Defence Research Agency (Sweden) . . . . . [8898-20]

14:40: **Optical countermeasures against CLOS weapon systems**, Alexander Toet, TNO Defence, Security and Safety (Netherlands); Koen W. Benoist, TNO (Netherlands); Joost N. J. van Lingen, Ric H. Schleijpen, TNO Defence, Security and Safety (Netherlands) . . . . . [8898-21]

15:00: **Laser irradiation delayed nonlinear response of IR matrix detectors**, Yuri A. Rezunkov, Research Institute for Complex Testing of Optoelectronic Devices and Systems (Russian Federation) . . . . . [8898-22]

High-Power Lasers 2013: Technology and Systems

Conference Chairs: **Harro Ackermann,** High Energy Laser Joint Technology Office (United States); **Willy L. Bohn,** BohnLaser Consult (Germany)

Monday 23 September

OPENING REMARKS

Room: Seminar 3-4 . . . . . .8:55 to 9:00

SESSION 8

Room: Seminar 3-4 . . . . . Mon 9:00 to 10:20

Demonstrations and Systems

Session Chair: **Willy L. Bohn,** BohnLaser Consult (Germany)

9:00: **50 kW Laser Weapon Demonstrator of Rheinmetall Waffe Munition** *(Invited Paper)*, Markus Jung, Klaus Ludewigt, Thomas Riesbeck, Alexander Graf, Rheinmetall Waffe Munition GmbH (Germany) . . . . . [8898-25]

9:30: **Latest developments on the Er^{3+}:YAG solid state heat-capacity laser** *(Invited Paper)*, Stefano Bigotta, Thierry Ibach, Marc Eichhorn, Institut Franco-Allemand de Recherches de Saint-Louis (France) . . . . . [8898-26]

10:00: **Recent developments in high power thin disk lasers at TRUMPF Laser**, Vincent Kuhn, Tina Gottwald, Christian Stolzenburg, Sven-Silvius Schad, Alexander Killi, TRUMPF Laser GmbH & Co. KG (Germany) . . . . . [8898-27]

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

SESSION 9

Room: Seminar 3-4 . . . . . Mon 10:50 to 12:40

Fiber and Semiconductor Laser Technology

Session Chair: **Bryce N. Samson,** Nufern (United States)

10:50: **New fiber developments for amplifiers operating at 1µm and 2µm** *(Invited Paper)*, Bryce N. Samson, Adrian L. Carter, Kanishka Tankala, Imtiaz Majid, Liang Dong, Nufern (United States); Alexander V. Hemming, Defence Science and Technology Organisation (Australia). . . . . [8898-29]

11:20: **Recent advances in passive phase locking of fiber lasers thanks to intracavity phase contrast filtering**, David Sabourdy, Jean-Eucher Montagne, CILAS (France); François Jeux, EADS Astrium (France); Agnès Desfarges-Berthelemot, XLIM Institut de Recherche (France); Vincent Kermène, Alain Barthelemy, Univ. de Limoges (France) . . . . . [8898-30]

11:40: **Single-element beam shaper for conversion of a fiber laser beam into a near-diffraction-limited dark hollow beam**, Haotong Ma, Haojun Hu, Wenke Xie, Guangwen Jiang, Xiaojun Xu, National Univ. of Defense Technology (China) . . . . . [8898-31]

12:00: **High power fiber isolator for 1 micron fiber lasers**, Shibin Jiang, AdValue Photonics, Inc. (United States). . . . . [8898-32]

12:20: **High-power diode lasers between 1.8µm and 3.0µm for military applications**, Sascha A. Hilzensauer, Marc Kelemen, m2k-laser GmbH (Germany) . . . . . [8898-33]

Lunch Break . . . . . Mon 12:40 to 13:40

SESSION 10

Room: Seminar 3-4 . . . . . Mon 13:40 to 14:50

Advanced Gas Lasers

Session Chair: **Salman Rosenwaks,** Ben-Gurion Univ. of the Negev (Israel)

13:40: **DPAL: historical perspective and summary of achievements** *(Invited Paper)*, Boris V. Zhdanov, Randall Knize, U.S. Air Force Academy (United States). . . . . [8898-34]

14:10: **Model calculations of kinetic and fluid dynamic processes in diode pumped alkali lasers**, Boris D. Barmashenko, Salman Rosenwaks, Karol Waichman, Ben-Gurion Univ. of the Negev (Israel) . . . . . [8898-36]

14:30: **What can we gain from supersonic operation of diode pumped alkali lasers: model calculations**, Salman Rosenwaks, Boris D. Barmashenko, Karol Waichman, Ben-Gurion Univ. of the Negev (Israel) . . . . . [8898-35]

SESSION 11

Room: Seminar 3-4 . . . . . Mon 14:50 to 15:40

Laser-Induced Plasma Effects

Session Chair: **Andrey A. Ionin,** P.N. Lebedev Physical Institute (Russian Federation)

14:50: **Laser-induced thermal breakdown of optical coatings** *(Invited Paper)*, Joseph J. Talghader, Univ. of Minnesota, Twin Cities (United States). . . . . [8898-37]

15:20: **Controlling plasma channels through ultrashort laser pulse filamentation**, Andrey A. Ionin, P.N. Lebedev Physical Institute (Russian Federation) . . . . . [8898-38]

Coffee Break . . . . . Mon 15:40 to 16:00

Tuesday 24 September

POSTER SESSION

Room: Mezzanine Level Exhibition Hall
Tue 17:40 to 19:10

Conference attendees are invited to attend the Remote Sensing Poster Session on Tuesday afternoon. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. 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. Poster authors, view poster presentation guidelines and set-up instructions on page 6 and at http://spie.org/x32234.xml.

Advanced cooling system for space high-power solid-state laser, Yue Zhang, Zheng Wang, Beijing Institute of Space Mechanics and Electricity (China). . . . . [8898-28]

Emerging Technologies

Conference Chairs: **Keith L. Lewis,** Sciovis Ltd. (United Kingdom); **Richard C. Hollins,** Defence Science and Technology Lab. (United Kingdom); **Thomas J. Merlet,** Thales Air Systems S.A. (France)

Programme Committee: **Tibor Berceli,** Budapest Univ. of Technology and Economics (Hungary); **Gerald S. Buller,** Heriot-Watt Univ. (United Kingdom); **Béatrice Cabon,** Institut National Polytechnique de Grenoble (France); **John P. R. David,** The Univ. of Sheffield (United Kingdom); **Didier Decoster,** Univ. des Sciences et Technologies de Lille (France); **Daniel Dolfi,** Thales Research & Technology (France); **Hugh D. Griffiths,** Univ. College London (United Kingdom); **Dominique Hamoir,** ONERA (France); **Andrew R. Harvey,** Univ. of Glasgow (United Kingdom); **Steven R. Jost,** BAE Systems (United States); **Robert A. Lamb,** SELEX Galileo Ltd. (United Kingdom); **Javier Marti-Sendra,** Univ. Politècnica de València (Spain); **Stephen P. McGeoch,** Thales Optronics Ltd. (United Kingdom); **Miguel A. Piqueras,** DAS Photonics (Spain); **Julien Poette; Ian K. Proudler,** Malvern Innovations (United Kingdom); **Robert H. Rehm,** Fraunhofer-Institut für Angewandte Festkörperphysik (Germany); **Andreas Stöhr,** Univ. Duisburg-Essen (Germany); **Kevin Ridley,** Malvern Innovations (United Kingdom); **Béla Szentpáli,** Research Institute for Technical Physics and Materials Science (Hungary); **Mauro G. Varasi,** Finmeccanica (Italy); **Jean-Pierre Vilcot,** Univ. des Sciences et Technologies de Lille (France)

Wednesday 25 September

OPENING REMARKS

Room: Konferenz 5 . . . . . .8:55 to 9:00

SESSION 1

Room: Konferenz 5 . . . . . Wed 9:00 to 10:40

Imaging and Biometrics I

Session Chairs: **Keith L. Lewis,** Sciovis Ltd. (United Kingdom); **Richard C. Hollins,** Defence Science and Technology Lab. (United Kingdom)

9:00: **3D computational ghost imaging** *(Invited Paper)*, Miles J. Padgett, Univ. of Glasgow (United Kingdom) . . . . . [8899-1]

9:40: **Multimodal biometric encryption and its management architecture**, Obaidul Malek, Anastasios Venetsanopoulos, Ryerson Univ. (Canada) . . . . . [8899-2]

10:00: **Multidimensional compressive imaging** *(Keynote Presentation)*, Bahram Javidi, Univ. of Connecticut (United States); Abhijit Mahalanobis, Lockheed Martin Missiles and Fire Control (United States); Xiao Xiao, Univ. of Connecticut (United States); Yair Rivenson, Ben-Gurion Univ. of the Negev (Israel); Ryoichi Horisaki, Osaka Univ. (Japan); Adrian Stern, Ben-Gurion Univ. of the Negev (Israel); Pedro Latorre Carmona, Jaume I Univ. (Spain); Manuel Martinez, Univ. de València (Spain); Filiberto Pla, Univ. Jaume I (Spain); Jun Tanida, Osaka Univ. (Japan). . . . . [8899-3]

Coffee Break . . . . . .Wed 10:40 to 11:00

SESSION 2

Room: Konferenz 5 . . . . . Wed 11:00 to 12:50

Imaging and Biometrics II

Session Chairs: **Keith L. Lewis,** Sciovis Ltd. (United Kingdom); **Richard C. Hollins,** Defence Science and Technology Lab. (United Kingdom)

11:00: **Infrared imaging: ready for prime time?** *(Invited Paper)*, Sanjay Krishna, The Univ. of New Mexico (United States) . . . . [8899-4]

11:40: **Uncooled MWIR InAs/GaSb type-ii superlattice grown on a GaAs substrate**, Matthew J. Hobbs, Faebian Bastiman, Chee Hing Tan, John J. P. David, The Univ. of Sheffield (United Kingdom); Sanjay Krishna, Elena Plis, The Univ. of New Mexico (United States) . [8899-5]

12:00: **Compact camera technologies for real-time false-color imaging in the SWIR band** *(Invited Paper)*, John Dougherty, Pixelteq, Inc. (United States) . . . . . [8899-6]

12:30: **Performance modeling of mid-nfrared Cr^{2+}: ZnSe thin disk laser**, Vishal Saxena, The Univ. of Southern California (United States) . . . . . [8899-7]

Lunch/Exhibition Break . . . . . .Wed 12:50 to 14:00

SESSION 3

Room: Konferenz 5 . . . . . Wed 14:00 to 17:00

Photonic Devices and Systems

Session Chairs: **Thomas J. Merlet,** Thales Optronique S.A.S. (France); **Keith L. Lewis,** Sciovis Ltd. (United Kingdom)

14:00: **Future directions in photonic integrated circuits for wireless communication and sensing** *(Invited Paper)*, Andreas Stöhr, Univ. Duisburg-Essen (Germany) . . . . . [8899-8]

14:40: **Arbitrary waveform generation using optical direct digital synthesis** *(Invited Paper)*, John E Chester-Parsons, EW Simulation Technology (United Kingdom). . . . . [8899-9]

Coffee Break . . . . . .Wed 15:10 to 15:40

15:40: **Advances in AlGaInN laser diode technology for defence applications**, Stephen P. Najda, Piotr Perlin, Tadek Suski, Lucia Marona, Michal Bo?kowski, Mike Leszczy?ski, P. Wisniewski, Robert Czernecki, TopGaN Ltd. (Poland); Robert Kucharski, Ammono Sp. z o.o. (Poland); George Targowski, TopGaN Ltd. (Poland); Scott Watson, Anthony E. Kelly, Univ. of Glasgow (United Kingdom) . . . . . [8899-10]

16:00: **Patterned resistive sheet for infrared microbolometers**, Dean P. Neikirk, Hoo Kim, Jong Yeon Park, The Univ. of Texas at Austin (United States); Joo-Yun Jung, Korea Institute of Machinery and Materials (Korea, Republic of) . . . . . [8899-11]

16:20: **MiSPiA: Microelectronic single-photon 3D imaging arrays for low-light high-speed safety and security applications** *(Invited Paper)*, Alberto Tosi, Franco Zappa, Politecnico di Milano (Italy) . . . . . [8899-12]

Thursday 26 September

SESSION 4

Room: Konferenz 5 . . . . . Thu 8:50 to 10:40

Optical Systems and Components

Session Chairs: **Keith L. Lewis,** Sciovis Ltd. (United Kingdom); **Thomas J. Merlet,** Thales Optronique S.A.S. (France)

8:50: **Emerging active electro-optics** *(Invited Paper)*, Gary W. Kamerman, FastMetrix, Inc. (United States) . . . . . [8899-13]

9:30: **Technologies for blue-green underwater optical communications** *(Invited Paper)*, Richard C. Hollins, Defence Science and Technology Lab. (United Kingdom) . . . . . [8899-14]

10:00: **Design of high sensitivity detector for underwater communication system**, Jeng Shiuh Cheong, The Univ. of Sheffield (United Kingdom); Jennifer S. Ong, Univ. Malaysia Perlis (Malaysia); Jo Shien Ng, Andrey B. Krysa, Faebian Bastiman, John J. P. David, The Univ. of Sheffield (United Kingdom) . . . . . [8899-15]

10:20: **Stretchable optics**, Luca Ravagnan, WISE S.r.l. (Italy); Cristian Ghisleri, WISE S.r.l. (Italy) and Univ. degli Studi di Milano (Italy); Marco A. C. Potenza, Mirko Siano, Univ. degli Studi di Milano (Italy); Paolo Milani, WISE S.r.l. (Italy) and Univ. degli Studi di Milano (Italy) . . . . . [8899-16]

Monday - Tuesday 23–24 September 2013 • Proceedings of SPIE Vol. 8899

Quantum-Physics-Based Information Security II

Conference Chairs: **Mark T. Gruneisen,** Air Force Research Lab. (United States); **Miloslav Dusek,** Palacky Univ. Olomouc (Czech Republic); **John G. Rarity,** Univ. of Bristol (United Kingdom)

Programme Committee: **Jan Bouda,** Masaryk Univ. (Czech Republic); **Robert W. Boyd,** Univ. of Ottawa (Canada); **Gerald S. Buller,** Heriot-Watt Univ. (United Kingdom); **John D. Gonglewski,** European Office of Aerospace Research and Development (United Kingdom); **Richard J. Hughes,** Los Alamos National Lab. (United States); **Gregory S. Kanter,** NuCrypt LLC (United States); **Prem Kumar,** Northwestern Univ. (United States); **Norbert Lütenhaus,** Univ. of Waterloo (Canada); **Vadim V. Makarov,** Univ. of Waterloo (Canada); **Ronald E. Meyers,** U.S. Army Research Lab. (United States); **Jane E. Nordholt,** Los Alamos National Lab. (United States); **Miles J. Padgett,** Univ. of Glasgow (United Kingdom); **Momtchil Peev,** Austrian Research Ctrs. GmbH (Austria); **Renato Renner,** ETH Zurich (Switzerland); **Andrew J. Shields,** Toshiba Research Europe Ltd. (United Kingdom); **Rupert Ursin,** Austrian Academy of Sciences/Institute for Quantum Optics and Quantum Information (Austria)

Monday 23 September

OPENING REMARKS

Room: Seminar 1 . . . . . .13:30 to 13:40

SESSION 5

Room: Seminar 1 . . . . . Mon 13:40 to 17:10

How Secure is Quantum Cryptography? Security Proofs and Quantum Hacking

13:40: **How secure is quantum cryptography?** *(Invited Paper)*, Renato Renner, ETH Zurich (Switzerland) . . . . . [8899-20]

14:30: **Essential elements lacking in security proofs for quantum key distribution** *(Invited Paper)*, Horace P. Yuen, Northwestern Univ. (United States) . . . . . [8899-21]

15:00: **Hacking attacks on quantum cryptography** *(Invited Paper)*, Vadim Makarov, Inst. for Quantum Computing, Univ. of Waterloo (Canada) . . . . . [8899-22]

Coffee Break . . . . . Mon 15:30 to 16:00

16:00: **Quantum key distribution: vulnerable if imperfectly implemented** *(Invited Paper)*, Gerd Leuchs, Friedrich-Alexander-Univ Erlangen-Nürnberg (Germany) . . . . . [8899-23]

16:30: **Polarity inversion attack prevention by physical properties of Y-00 quantum stream cipher**, Takehisa Iwakoshi, Osamu Hirota, Tamagawa Univ. (Japan) . . . . . [8899-24]

16:50: **Saturation attack on continuous variable quantum key distribution system**, Hao Qin, Rupesh Kumarps, Romain Alléaume, Telecom ParisTech (France) . . . . . [8899-25]

Tuesday 24 September

SESSION 6

Room: Seminar 1 . . . . . Tue 9:00 to 11:40

Practical Quantum Communication: Robust Implementation and Component Development

9:00: **Practical QKD** *(Invited Paper)*, Andreas Poppe, AIT Austrian Institute of Technology GmbH (Austria) . . . . . [8899-26]

9:30: **Continuous QKD and high speed data encryption** *(Invited Paper)*, Hugo Zbinden, Univ. of Geneva (Switzerland) . . . . . [8899-27]

10:00: **Semiconductor sources of photon pairs** *(Invited Paper)*, Gregor Weihs, Daniel Föger, Tobias Huber, Harishankar Jayakumar, Thomas Kauten, Ana Predojevic, Univ. Innsbruck (Austria); Glenn S. Solomon, Joint Quantum Institute (United States); Rolf T. Horn, Thomas D. Jennewein, Univ. of Waterloo (Canada); Piotr L. Kolenderski, Nicolaus Copernicus Univ. (Poland) and Univ. of Waterloo (Canada); Payam Abolghasem, Dongpeng Kang, Amr S. Helmy, Univ. of Toronto (Canada) . . . . . [8899-28]

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

11:00: **Towards a high-speed quantum random number generator**, Damien Stucki, id Quantique SA (Switzerland); Samuel Burri, Edoardo Charbon, Ecole Polytechnique Fédérale de Lausanne (Switzerland); Christopher J. Chunnilall, National Physical Lab. (United Kingdom); Alessio Meneghetti, Univ. degli Studi di Trento (Italy); Francesco Regazzoni, Technische Univ. Delft (Netherlands) . . . . . [8899-29]

11:20: **A practical approach to true quantum randomness generation**, Daniela Frauchiger, Renato Renner, ETH Zurich (Switzerland) . . . . . [8899-30]

Lunch/Exhibition Break . . . . . Tue 11:40 to 13:00

SESSION 7

Room: Seminar 1 . . . . . Tue 13:00 to 15:10

Quantum Communication over Networks, Long-Distance Fiber Links, and Atmospheric Channels

13:00: **QKD over long distances with trusted and untrusted repeater nodes** *(Invited Paper)*, Norbert Lütkenhaus, Will Stacey, Razieh Annabestani, Univ of Waterloo (Canada); Xiongfeng Ma, Center for Quantum Information, Institute for Interdisciplinary Information Sciences, Tsinghua Unive (China) . . . . . [8899-31]

13:30: **Protocols and prospects for building a quantum repeater** *(Invited Paper)*, Peter van Loock, Johannes Gutenberg Univ. Mainz (Germany) . . . . . [8899-32]

14:00: **Quantum access networks** *(Invited Paper)*, Zhiliang L. Yuan, Bernd Froehlich, James F. Dynes, Marco Lucamarini, Andrew W. Sharpe, Andrew J. Shields, Toshiba Research Europe Ltd. (United Kingdom) . . . . . [8899-33]

14:30: **Towards continuous-variable quantum key distribution in atmospheric channels**, Vladyslav C. Usenko, Palack? Univ. Olomouc (Czech Republic) . . . . . [8899-34]

14:50: **Unambiguous state discrimination approach to experimental photonic quantum digital signatures in fiber**, Ross J. Donaldson, Robert J. Collins, Heriot-Watt Univ. (United Kingdom); Vedran Dunjko, Edinburgh Univ. (United Kingdom); Partick J. Clarke, Erika Andersson, Heriot-Watt Univ. (United Kingdom); John Jeffers, Univ. of Strathclyde (United Kingdom); Gerald S. Buller, Heriot-Watt Univ. (United Kingdom) . . . . . [8899-35]

Coffee Break . . . . . Tue 15:30 to 16:00

PLENARY SESSION

Room: Konferenz 5 . . . . . Tue 16:00 to 17:50

Security + Defence 2013: Plenary Session

For details, please see page 4-5 in the printed programme or visit http://spie.org/security-defence-europe.xml

POSTER SESSION
Room: Mezzanine Level Exhibition Hall
Tue 17:40 to 19:10

Conference attendees are invited to attend the Remote Sensing Poster Session on Tuesday afternoon. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. 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. Poster authors, view poster presentation guidelines and set-up instructions on page 6 and at http://spie.org/x32234.xml.

Unmanned/Unattended Sensors and Sensor Networks X

Conference Chair: **Edward M. Carapezza,** General Atomics (United States)

Programme Committee: **Mehdi F. Anwar,** Univ. of Connecticut (United States); **Mark E. Campbell,** Cornell Univ. (United States); **Pierre J. Corriveau,** Naval Undersea Warfare Ctr. (United States); **Sachi V. Desai,** U.S. Army Armament Research, Development and Engineering Ctr. (United States); **John M. Dolan,** Carnegie Mellon Univ. (United States); **Grant R. Gerhart; Todd M. Hintz,** Space and Naval Warfare Systems Command (United States); **Myron E. Hohil,** U.S. Army Armament Research, Development and Engineering Ctr. (United States); **Ivan Kadar,** Interlink Systems Sciences, Inc. (United States); **Tariq Manzur,** Naval Undersea Warfare Ctr. (United States); **George C. McNamara,** Naval Undersea Warfare Ctr. (United States); **Nino Srour,** U.S. Army Research Lab. (United States); **Huub A.J.M. van Hoof,** TNO Defence, Security and Safety (Netherlands); **Andre Samberg,** Sec-Control Finland Ltd. (Finland)

Monday 23 September

OPENING REMARKS

Room: Konferenz 3 . . . . . .8:55 to 9:00

SESSION 8

Room: Konferenz 3 . . . . . Mon 9:00 to 10:20

Unattended and Unmanned Technologies and Systems I

9:00: **Meeting performance and sensing-cost requirements for detection and recognition systems**, Christopher J. Willis, BAE Systems (United Kingdom) . . . . . [8899-41]

9:20: **Multi-modal target detection for autonomous wide area search and surveillance**, Toby P. Breckon, Anna Gaszczak, Ji W. Han, Marcin L. Eichner, Stuart E. Barnes, Cranfield Univ. (United Kingdom) . . . . . [8899-42]

9:40: **FMCW radar for the sense function of sense and avoid systems onboard UAVs**, Eric Itcia, Jean-Philippe Wasselin, Sébastien Mazuel, Rockwell Collins France (France); Matern Otten, Albert G. Huizing, TNO Defence, Security and Safety (Netherlands) . . . [8899-43]

10:00: **Utilizing wide area maritime domain awareness (MDA) data to cue a remote surveillance system**, Anthony W. Isenor, Richard Cross, Sean Webb, Anna-Liesa S. Lapinski, Defence Research and Development Canada, Atlantic (Canada) . . . . . [8899-44]

SESSION 9

Room: Konferenz 3 . . . . . Mon 10:50 to 12:10

Unattended and Unmanned Technologies and Systems II

10:50: **Automated generation of high-quality training data for appearance-based object models**, Stefan Becker, Arno Voelker, Hilke Kieritz, Wolfgang Hübner, Michael Arens, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung (Germany) . . . [8899-45]

11:10: **Image super-resolution applied to moving targets in high dynamics scenes**, Olegs Mise, GE Intelligent Platforms (United States); Toby P. Breckon, Cranfield Univ. (United Kingdom) . [8899-46]

11:30: **Microradar sensor technology**, Pavlo A. Molchanov, Naval Air Warfare Ctr. Aircraft Div. (United States). . . . . [8899-47]

11:50: **Management of unmanned moving sensors through human decision layers: a bi-level optimization process with call to costly sub-processes**, Frederic Dambreville, Ecole Nationale Supérieure de Techniques Avancées (France) . . . . . [8899-48]

Lunch Break . . . . . Mon 12:10 to 13:20

SESSION 10

Room: Konferenz 3 . . . . . Mon 13:20 to 15:20

Unattended and Unmanned Technologies and Systems III

13:20: **High precision object geo-localization and visualization in sensor networks**, Simon Lemaire, Christoph Bodensteiner, Michael Arens, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung (Germany) . . . . . [8899-49]

13:40: **Optical system components for navigation grade fiber optic gyroscopes**, Marcus Heimann, Technische Univ. Berlin (Germany); Maximilian Liesegang, Fraunhofer-Institut für Zuverlässigkeit und Mikrointegration (Germany); Norbert Arndt-Staufenbiel, Technische Univ. Berlin (Germany); Henning Schroeder, Fraunhofer-Institut für Zuverlässigkeit und Mikrointegration (Germany); Klaus-Dieter Lang, Technische Univ. Berlin (Germany) . . . . . [8899-50]

14:00: **An object-oriented modeling and simulation framework for bearings-only multitarget tracking using an unattended acoustic sensor network**, Murat S. Aslan, TÜBITAK BILGEM ILTAREN (Turkey) . . . . . [8899-51]

14:20: **Position determination of disturbance along a modified saganac interferometer**, Pang Bian, Yuan Wu, Qian Xiao, Bo Jia, Fudan Univ. (China) . . . . . [8899-52]

14:40: **Lower bound on number and sizes of telescopes in an optical array receiver for deep space optical communication**, Ali J. Hashmi, National Univ. of Sciences and Technology (Pakistan); Ali A. Eftekhar, Ali Adibi, Georgia Institute of Technology (United States); Farid Amoozegar, Jet Propulsion Lab. (United States) . . . . . [8899-53]

15:00: **Space security and defense of GEO satellites**, Enyu Gao, China Academy of Space Technology (China) . . . . . [8899-55]

Tuesday 24 September

POSTER SESSION

Room: Mezzanine Level Exhibition Hall
Tue 17:40 to 19:10

Conference attendees are invited to attend the Remote Sensing Poster Session on Tuesday afternoon. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. 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. Poster authors, view poster presentation guidelines and set-up instructions on page 6 and at http://spie.org/x32234.xml.

Analysis of rain effects on free space optical communication based on data measured in the Libyan climate, Mahmud M. Badi, Adam F. Adam, Al-Fateh Univ. (Libyan Arab Jamahiriya); Mohammed Twati, Tripoli University (Libyan Arab Jamahiriya). . . . . [8899-54]

Millimetre Wave and Terahertz Sensors and Technology VI

Conference Chairs: **Neil Anthony Salmon,** MMW Sensors Ltd. (United Kingdom); **Eddie L. Jacobs,** Univ. of Memphis (United States)

Programme Committee: **Amir Abramovich,** Ariel Univ. Ctr. of Samaria (Israel); **Nicholas J. Bowring,** Manchester Metropolitan Univ. (United Kingdom); **Markus Peichl,** Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany); **Douglas T. Petkie,** Wright State Univ. (United States); **Christopher A. Schuetz,** Phase Sensitive Innovations, Inc. (United States)

Tuesday 24 September

OPENING REMARKS

Room: Seminar 3-4 . . . . . .8:25 to 8:30

SESSION 1

Room: Seminar 3-4 . . . . . Tue 8:30 to 10:20

Operational Systems I

Session Chairs: **Markus Peichl,** Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany); **Neil Anthony Salmon,** MMW Sensors Ltd. (United Kingdom)

8:30: **Reflect-array based mm-wave people screening system** *(Invited Paper)*, Brendan N. Lyons, Emil Entchev, Michael K. Crowley, Smiths Detection Ireland Ltd. (Ireland) . . . . . [8900-1]

9:00: **A fast imaging MMW radiometer system for security and safety applications**, Stephan Dill, Markus Peichl, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany) . . . . . [8900-2]

9:20: **A large (1.6 m) 35 GHz security screening portal imager is re-commissioned with upgraded software for reduced fixed pattern noise and higher sensitivities**, Neil A. Salmon, MMW Sensors Ltd. (United Kingdom) and Manchester Metopolitan Univ. (United Kingdom); Nicholas J. Bowring, Manchester Metropolitan Univ. (United Kingdom) . . . . . [8900-3]

9:40: **A feasibility study into the screening and imaging of hand luggage for threat items at 35 GHz using an active large aperture (1.6 m) security screening imager**, Nicholas J. Bowring, Neil A. Salmon, David A. Andrews, Nacer D. Rezgui, Stuart W. Harmer, Manchester Metropolitan Univ. (United Kingdom) . . . . . [8900-4]

10:00: **History and challenges of passive millimeter wave imaging**, Albert N. Pergande, Lockheed Martin Missiles and Fire Control (United States) . . . . . [8900-30]

Coffee Break . . . . . Tue 10:20 to 10:40

SESSION 2

Room: Seminar 3-4 . . . . . Tue 10:40 to 12:30

Operational Systems II

Session Chairs: **Amir Abramovich,** Ariel Univ. Ctr. of Samaria (Israel); **Eddie L. Jacobs,** Univ. of Memphis (United States)

10:40: **Motion effects in multistatic millimeter-wave imaging systems** *(Invited Paper)*, Andreas Schiessl, Sherif S. Ahmed, Rohde & Schwarz GmbH & Co. KG (Germany); Lorenz-Peter Schmidt, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany) . . . . . [8900-5]

11:10: **A W-band passive imaging system implemented with rotating diffraction antenna technology**, Sergiy Shylo, Yuriy Sydorenko, Usikov Institute of Radiophysics and Electronics (Ukraine); Dana Wheeler, Radio Physics Solutions, Inc. (United States); Douglas Dundonald, Radio Physics Solutions, Ltd. (United Kingdom). . [8900-6]

11:30: **Review of the characteristics of 384x288 pixel THz camera for see-through imaging**, Linda Marchese, Marc Terroux, Francis Genereux, Bruno Tremblay, Martin Bolduc, Alain Bergeron, INO (Canada) . . . . . [8900-7]

11:50: **Development of an ultra-wide band microwave radar-based footwear scanning system**, Nacer D. Rezgui, Nicholas J. Bowring, David A. Andrews, Stuart W. Harmer, Matthew J. Southgate, Dean R. O'Reilly, Manchester Metropolitan Univ. (United Kingdom) . . . [8900-8]

12:10: **Passive video imaging at 350 GHz with 251 transition edge sensor bolometers**, Daniel T. Becker, National Institute of Standards and Technology (United States); Cale M. Gentry, The Univ. of Colorado (United States); James A. Beall, Hsiao-Mei Cho, William D. Duncan, Dale Li, Gene C. Hilton, Kent D. Irwin, Nicholas G. Paulter Jr., Carl D. Reintsema, Robert E. Schwall, National Institute of Standards and Technology (United States); Peter A. Ade, Carole E. Tucker, Cardiff Univ. (United Kingdom); Simon R. Dicker, Univ. of Pennsylvania (United States); Mark Halpern, The Univ. of British Columbia (Canada) . . . . . [8900-31]

Lunch/Exhibition Break . . . . . Tue 12:30 to 13:30

SESSION 3

Room: Seminar 3-4 . . . . . Tue 13:30 to 15:40

Image Processing and Techniques

Session Chairs: **Eddie L. Jacobs,** Univ. of Memphis (United States); **Douglas T. Petkie,** Wright State Univ. (United States)

13:30: **Automated detection and identification of illegal drugs and explosives using terahertz time domain spectroscopy** *(Invited Paper)*, Rene Beigang, Fraunhofer-Institut für Physikalische Messtechnik (Germany) and Univ. of Kaiserslautern (Germany); Frank Ellrich, Daniel Molter, Joachim Jonuscheit, Fraunhofer-Institut für Physikalische Messtechnik (Germany); Frank Platte, Kostantinos Nalpantidis, IANUS Simulation GmbH (Germany); Thorsten Sprenger, Daniel Hübsch, Tobias Würschmidt, Hübner GmbH (Germany) . . . . . [8900-9]

14:00: **Target decomposition and polarimetric radar applied to concealed threat detection**, Dean R. O'Reilly, Nicholas J. Bowring, Manchester Metropolitan Univ. (United Kingdom) . . . . . [8900-10]

14:20: **A calibration concept for passive MW imaging using beam steering by frequency shift and aperture synthesis**, Eric Schreiber, Markus Peichl, Matthias Jirousek, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany) . . . . . [8900-11]

14:40: **Multispectral THz-VIS passive imaging system for hidden threats visualization**, Marcin Kowalski, Norbert Pa?ka, Marek Piszczek, Mieczyslaw Szustakowski, Military Univ. of Technology (Poland) . . . . . [8900-12]

15:00: **Expanded opportunities of THz passive camera for the detection of concealed objects**, Vyacheslav A. Trofimov, Vladislav V. Trofimov, Igor E. Kuchik, Lomonosov Moscow State Univ. (Russian Federation) . . . . . [8900-13]

15:20: **Terahertz time-domain spectroscopy for distinguishing different kinds of gunpowder**, Tomas Gavenda, Vojtech Kresalek, Tomas Bata Univ. of Zlin (Czech Republic). . . . . [8900-14]

Coffee Break . . . . . Tue 15:40 to 16:00

PLENARY SESSION

Room: Konferenz 5 . . . . . Tue 16:00 to 17:50

Security + Defence 2013: Plenary Session

For details, please see page 4-5 in the printed programme or visit http://spie.org/security-defence-europe.xml

POSTER SESSION
Room: Mezzanine Level Exhibition Hall
Tue 17:40 to 19:10

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The evaluation of THz-VIS fused images, Marcin Kowalski, Norbert Pa?ka, Marek Piszczek, Mieczyslaw Szustkowski, Military Univ. of Technology (Poland) . . . . . [8900-26]

Detection of the THz waves from the 5m distance, Norbert Pa?ka, Michal Walczakowski, Mieczyslaw Szustakowski, Military Univ. of Technology (Poland); Adam Czerwinski, Maciej Sypek, Warsaw Univ. of Technology (Poland) . . . . . [8900-27]

THz devices evaluation in a time domain spectroscopy system at 1.55 µm pulse excitation, Ioannis Kostakis, The Univ. of Manchester (United Kingdom); Daryoosh Saeedkia, TeTechS Inc. (Canada); Mohamed Missous, The Univ. of Manchester (United Kingdom) . . . . . [8900-28]

Polarization contrast techniques for THz imaging applications, Piotr Garbat, Warsaw Univ. of Technology (Poland); Norbert Pa?ka, Janusz Parka, Military Univ. of Technology (Poland) . . . . . [8900-29]

Wednesday 25 September

SESSION 4
Room: Seminar 3-4 . . . . . Wed 8:30 to 10:00

Medical and Biological Sensors
Session Chairs: **Nicholas J. Bowring,** Manchester Metropolitan Univ. (United Kingdom); **Neil Anthony Salmon,** MMW Sensors Ltd. (United Kingdom)

8:30: **Biomedical applications of Terahertz technology** *(Invited Paper)*, Vincent P. Wallace, The Univ. of Western Australia (Australia) . . . . . [8900-15]

9:00: **Terahertz technology for medical applications**, Joo-Hiuk Son, The Univ. of Seoul (Korea, Republic of) . . . . . [8900-16]

9:20: **Ultra-compact THz spectrometer for biomolecule detection**, Martin Muthee, Sigfrid K. Yngvesson, Univ. of Massachusetts Amherst (United States) . . . . . [8900-17]

9:40: **Imaging with a single frequency Terahertz system for breast cancer margin detection**, Benjamin St. Peter, Kan Fu, Paul R. Siqueira, Patrick A. Kelly, Sigfrid K. Yngvesson, Univ. of Massachusetts Amherst (United States); Ashraf Khan, Stephen J. Glick, Andrew Karellas, Univ. of Massachusetts Medical School (United States) . . . . . [8900-18]

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

SESSION 5
Room: Seminar 3-4 . . . . . Wed 10:30 to 12:20

Emerging Systems
Session Chairs: **Nicholas J. Bowring,** Manchester Metropolitan Univ. (United Kingdom); **Christopher A. Schuetz,** Phase Sensitive Innovations, Inc. (United States)

10:30: **T-Sense a millimeter wave scanner for letters** *(Invited Paper)*, Dirk Nuessler, Sven Heinen, Fraunhofer FHR (Germany); Thorsten Sprenger, Daniel Hübsch, Hübner GmbH (Germany) . . . . . [8900-19]

11:00: **Performance simulations of near-field aperture synthesis imaging systems**, Neil A. Salmon, MMW Sensors Ltd. (United Kingdom) . . . . . [8900-20]

11:20: **Impulse radar imaging system for concealed object detection**, Frank J. W. Podd, Marcus David, Gohar Iqbal, F. Hussain, David Morris, Efosa Osakue, Yit Yeow, Saquib Zahir, David W. Armitage, Anthony J. Peyton, The Univ. of Manchester (United Kingdom) . . . . . [8900-21]

11:40: **THz remote sensing with µm resolution**, Janez Trontelj, Janez Trontelj, Aleksander Sešek, Andrej Švigelj, Univ. of Ljubljana (Slovenia) . . . . . [8900-22]

12:00: **Design and operation of ACTPol, a millimeter wavelength, polarization sensitive receiver for the Atacama Cosmology Telescope**, Benjamin L. Schmitt, Univ. of Pennsylvania (United States); ACTPol Collaboration, Princeton University (United States) . . . . . [8900-23]

SESSION 6
Room: Seminar 3-4 . . . . . Wed 12:20 to 13:10

Devices
Session Chairs: **Amir Abramovich,** Ariel Univ. Ctr. of Samaria (Israel); **Markus Peichl,** Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany)

12:20: **Broadband THz detection and homodyne mixing using GaAs high electron mobility transistor rectifiers** *(Invited Paper)*, Stefan Regensburger, Stefan Malzer, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); Hong Lu, Arthur C. Gossard, Univ. of California, Santa Barbara (United States); Heiko B. Weber, Sascha Preu, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); Sangwoo Kim, Tanner Research, Inc. (United States); M. Mittendorff, Stephan F. Winnerl, Helmholtz-Zentrum Dresden-Rossendorf e. V. (Germany); Mark S. Sherwin, Univ. of California, Santa Barbara (United States) . . . . . [8900-24]

12:50: **Preliminary Fabrication and Characterization of Low-Leakage Hybrid Coaxial Cable**, Arkady Rudnitsky, David Elbaz, Zeev Zalevsky, Bar-Ilan Univ. (Israel) . . . . . [8900-25]

Optics and Photonics for Counterterrorism, Crime Fighting and Defence IX

Conference Chairs: **Douglas Burgess,** Burgess Consulting (United Kingdom); **Gari Owen,** Annwvyn Solutions (United Kingdom)

Programme Committee: **Benedicte Bascle,** Thales Optronique S.A.S. (France); **Richard R. Botten,** Ministry of Defence (United Kingdom); **David J. Clarke,** Placing Value Co.,Ltd. (Thailand); **Giovanni Cocca,** SELEX Galileo Ltd. (United Kingdom); **Howard J. Cummins,** Her Majesty's Government Communications Ctr. (United Kingdom); **Brian E. Foulger,** Ministry of Defence (United Kingdom); **Gillian F. Marshall,** QinetiQ Ltd. (United Kingdom); **Niamh Nic Daeid,** Univ. of Strathclyde (United Kingdom); **Harbinder S. Rana,** Defence Science and Technology Lab. (United Kingdom); **Salman Rosenwaks,** Ben-Gurion Univ. of the Negev (Israel); **Andrew M. Scott,** QinetiQ Ltd. (United Kingdom); **Neil C. Shand,** Defence Science and Technology Lab. (United Kingdom); **Robert Stokes,** NanoInk, Inc. (United States); **Mauro G. Varasi,** Finmeccanica (Italy); **Peter W. Yuen,** Cranfield Univ. (United Kingdom)

Monday 23 September

OPENING REMARKS

Room: Konferenz 1 . . . . . .13:20 to 13:30

WELCOME AND INTRODUCTION

Douglas Burgess, Burgess Consulting (United Kingdom)
Gari Owen, Annwvyn Solutions (United Kingdom)

2013 Conference Chairs

IN MEMORIAM OF COLIN LEWIS

2004-2012 Chair of the Optics and Photonics for Counter-terrorism and Crime Fighting Conference

Please visit http://spie.org/x93590.xml

SESSION 1

Room: Konferenz 1 . . . . . Mon 13:30 to 15:10

Detection and Recognition of Dangerous Materials I

Session Chair: **Douglas Burgess,**
Burgess Consulting (United Kingdom)

13:30: **Raman spectroscopy for the detection of explosives and their precursors on clothing in fingerprint concentration: a reliable technique for security and counterterrorism issues**, Salvatore Almaviva, Sabina Botti, Luciano Cantarini, Antonio Palucci, Adriana Puiu, ENEA (Italy); Frank Schnürer, Wenka Schweikert, Fraunhofer-Institut für Chemische Technologie (Germany); Francesco S. Romolo, Univ. de Lausanne (Switzerland) . . . . . [8901-1]

13:50: **Detection of bottled liquid explosives by near infrared**, Hideo Itozaki, Hideo Sato-Akaba, Osaka Univ. (Japan) . . . . . [8901-2]

14:10: **Spatially offset Raman spectroscopy for explosives detection through difficult (opaque) containers**, Guy T. Maskall, Cobalt Light Systems Ltd. (United Kingdom) . . . . . [8901-3]

14:30: **Characterization of optically compressing diode array for spectroscopic applications**, Steven T. Griffin, Univ. of Memphis (United States) . . . . . [8901-4]

14:50: **Effective criteria for the identification of substance using the spectral lines dynamics of reflected THz signal**, Vyacheslav A. Trofimov, Nikolay V. Peskov, Svetlana A. Varentsova, Lomonosov Moscow State Univ. (Russian Federation) . . . . . [8901-5]

Coffee Break . . . . . Mon 15:10 to 15:40

SESSION 2

Room: Konferenz 1 . . . . . Mon 15:40 to 17:00

Detection and Recognition of Dangerous Materials II

Session Chair: **Douglas Burgess,**
Burgess Consulting (United Kingdom)

15:40: **Spectroscopic studies of the several isomers of UO_3**, Lucas E. Sweet, Dallas D. Reilly, Thomas A. Blake, James E. Szecsody, David E. Meier, Yin-Fong Su, Carolyn S. Brauer, Edgar Buck, Timothy J. Johnson, Pacific Northwest National Lab. (United States) . . [8901-6]

16:00: **Evaluation of adaptive algorithms for detection and classification of fluorescent aerosols in the atmosphere**, Pierre Lahaie, Jean-Robert Simard, Sylvie Buteau, Defence Research and Development Canada, Valcartier (Canada) . . . . . [8901-7]

16:20: **Experimental realization of SDA-method for the detection of substance at long distance**, Vyacheslav A. Trofimov, Lomonosov Moscow State Univ. (Russian Federation) . . . . . [8901-8]

16:40: **Standoff detection of bioaerosols over wide area using a newly developed sensor combining a cloud mapper and a spectrometric LIF lidar**, Sylvie Buteau, Jean-Robert Simard, Gilles Roy, Pierre Lahaie, Defence Research and Development Canada, Valcartier (Canada) . . . . . [8901-9]

Tuesday 24 September

WELCOME AND INTRODUCTION

Room: Konferenz 1 . . . . . .8:25 to 8:30

SESSION 3

Room: Konferenz 1 . . . . . Tue 8:30 to 10:10

Identifying Suspicious Activity I

Session Chair: **Gari Owen,** Annwvyn Solutions (United Kingdom)

8:30: **Radon transform based automatic metal artefacts generation for 3D threat image projection**, Najla Megherbi, Toby P. Breckon, Greg Flitton, Andre Mouton, Cranfield Univ. (United Kingdom) . . . . . [8901-10]

8:50: **Defining human contrast sensitivity and contrast discrimination from complex imagery**, Sophie Triantaphillidou, John Jarvis, Gaurav Gupta, Univ. of Westminster (United Kingdom); Harbinder Rana, Defence Science and Technology Lab. (United Kingdom) . . . . . [8901-11]

9:10: **Particle swarm optimization on low dimensional pose manifolds for monocular human pose estimation**, Jürgen Brauer, Wolfgang Hübner, Michael Arens, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung (Germany) . . . . . [8901-12]

9:30: **Human pose classification within the context of near-IR imagery tracking**, Ji W. Han, Anna Gaszczak, Ryszard Maciol, Stuart E. Barnes, Toby P. Breckon, Cranfield Univ. (United Kingdom) . . . . . [8901-13]

9:50: **Learning transmodal person detectors from single spectral training sets**, Hilke Kieritz, Wolfgang Hübner, Michael Arens, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung (Germany) . . . . . [8901-14]

Coffee Break . . . . . Tue 10:10 to 10:30

SESSION 4

Room: Konferenz 1 . . . . . Tue 10:30 to 11:50

Identifying Suspicious Activity II

Session Chair: **Gari Owen,** Annwvyn Solutions (United Kingdom)

10:30: **Gait patterns for crime fighting: statistical evaluation**, Katerina Sulovska, Sylvie Belaskova, Tomas Bata Univ. of Zlin (Czech Republic); Jan Jadrny, Univ. Hospital Brno (Czech Republic) . . . . . [8901-15]

10:50: **WPSS: watching people security services**, Henri Bouma, TNO Defence, Security and Safety (Netherlands); Jan Baan, Technisch Physische Dienst-TNO (Netherlands); Sander Borsboom, Cameramanager.com B.V. (Netherlands); Kasper van Zon, Xinghan Luo, VicarVision (Netherlands); Ben Loke, Noldus Information Technology BV (Netherlands); Bram Stoeller, Eagle Vision Systems B.V. (Netherlands); Hans van Kuilenburg, VicarVision (Netherlands); Judith Dijk, TNO Defence, Security and Safety (Netherlands) [8901-16]

11:10: **Usage of cornea and sclera back reflected images captured in security cameras for forensic and card games applications**, Zeev Zalevsky, Asaf Ilovitsh, Bar-Ilan Univ. (Israel); Yevgeny Beiderman, Bar-Ilan Univ (Israel). . . . . [8901-18]

11:30: **Recent developments in automatic lip-reading**, Richard Bowden, Univ. of Surrey (United Kingdom); Stephen Cox, Richard Harvey, Yuxuan Lan, Univ. of East Anglia (United Kingdom); Jon Ong, Univ. of Surrey (United Kingdom); Barry-John Theobald, Univ. of East Anglia (United Kingdom); Gari Owen, Annwvyn Solutions (United Kingdom) . . . . . [8901-19]

PANEL DISCUSSION

Room: Konferenz 1 . . . . . Tue 11:50 to 12:50

What identifies a terrorist - recognising their faces or understanding what they are doing?

Open Discussion on the developments of imaging hardware and of software approaches to this problem

Moderator: **Doug Burgess,** Burgess Consulting (United Kingdom)

Two different approaches to the problem of identifying terrorism from imagery are emerging. The first is concerned with improving the quality of optics, cameras and image processing algorithms so as to be able to identify individuals from a single or a few frames of video. The alternative, a major theme of this year's conference, involves interpreting the actions of people from the way they move, and then identifying behaviour that might be threatening.

This open discussion is an opportunity for conference delegates to compare and contrast these two approaches, to discuss hardware and software advances, and to debate where future investment might best be applied.

PLENARY SESSION

Room: Konferenz 5 . . . . . Tue 16:00 to 17:50

Security + Defence 2013: Plenary Session

For details, please see page 4-5 in the printed programme or visit http://spie.org/security-defence-europe.xml

POSTER SESSION

Room: Mezzanine Level Exhibition Hall
Tue 17:40 to 19:10

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Ammonia detection using optical reflectance from porous silicon formed by metal-assisted chemical etching, Igor Iatsunskyi, Valentyn Smyntyna, Nickolay Pavlenko, Yuliia Kirik, Olga Kanevska, Valeryi Myndrul, Odessa I.I. Mechnikov National Univ. (Ukraine) . . . . . [8901-20]

Investigating existing medical CT segmentation techniques within automated baggage and package inspection, Najla Megherbi, Toby P. Breckon, Greg Flitton, Cranfield Univ. (United Kingdom) . . [8901-21]

Ultra-long range surveillance camera for critical infrastructure protection research range, Marek Zyczkowski, Mieczyslaw Szustakowski, Mateusz Karol, Rafal Dulski, Jaroslaw Barela, Mariusz Kastek, Military Univ. of Technology (Poland). . . . . [8901-22]

The use of fiber optic sensors for the direct, physical protection of museums and cultural heritages, Marek Zyczkowski, Military Univ. of Technology (Poland) . . . . . [8901-23]

Passive automatic anti-piracy defense system of ships, Marek Zyczkowski, Mieczyslaw Szustakowski, Mateusz Karol, Wieslaw Ciurapinski, Mariusz Kastek, Military Univ. of Technology (Poland); Ryszard Stachowiak, Intermet Sp. z o. o. (Poland). . . . . [8901-24]

Detection of explosive liquid mixtures by spatially offset raman spectroscopy, Qiaoyun Wang, Northeastern Univ. at Qinhuangdao (China) . . . . . [8901-25]

Photoacoustic detection by means of a differential double resonator cell applied to security and defence, Arturo S. Vallespi, Instituto de Investigaciones Científicas y Técnicas para la Defensa (Argentina); Veronica Slezak, Alejandro L. Peuriot, Francisco Gonzalez, Andrea Pereyra, CEILAP-CITEDEF (Argentina); Guillermo D. Santiago, Univ. de Buenos Aires (Argentina). . . . . [8901-26]

Optical Materials and Biomaterials in Security and Defence Systems Technology X

Conference Chairs: **Roberto Zamboni,** Istituto per la Sintesi Organica e la Fotoreattività (Italy); **Francois Kajzar,** Univ. Politehnica of Bucharest (Romania); **Attila A. Szep,** Air Force Research Lab. (United States)

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Wednesday 25 September

OPENING REMARKS

Room: Konferenz 4 . . . . . .8:25 to 8:30

SESSION 5

Room: Konferenz 4 . . . . . Wed 8:30 to 10:20

Biomaterials

Session Chair: **Roberto Zamboni,** Istituto per la Sintesi Organica e la Fotoreattività (Italy)

8:30: **Lasing and random lasing based on organic molecules** *(Invited Paper)*, Jaroslaw Mysliwiec, Lech Sznitko, Adam Szukalski, Konrad Cyprych, Andrzej Miniewicz, Wroclaw Univ. of Technology (Poland) . . . . . [8901-30]

9:00: **Matrix influence on photoluminescence of organic dyes in solid medium** *(Invited Paper)*, Ileana Rau, Univ. Politehnica of Bucharest (Romania); Aurelia Meghea, Univ Politehnica of Bucharest (Romania); Alexandrina Tane, François Kajzar, Roxana Zgarian, Gratiela Tihan, Univ. Politehnica of Bucharest (Romania). . . . [8901-31]

9:30: **Preparation, linear and NLO properties of DNA-CTMA-SBE complexes**, Ana-Maria Manea, Ileana Rau, François Kajzar, Aurelia Meghea, Univ. Politehnica of Bucharest (Romania) . . . . . [8901-32]

9:50: **Speed and direction sensing with a patterned bacteriorhodopsin film** *(Invited Paper)*, Yoshiko Okada-Shudo, The Univ. of Electro-Communications (Japan). . . . . [8901-33]

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

SESSION 6

Room: Konferenz 4 . . . . . Wed 10:50 to 12:00

Security Applications

Session Chair: **Ileana Rau,** Univ. Politehnica of Bucharest (Romania)

10:50: **Polymer laser vapour sensors for explosives** *(Invited Paper)*, Graham A. Turnbull, Yue Wang, Ying Yang, P. Morawska, Ifor D. W. Samuel, Univ. of St. Andrews (United Kingdom). . . . . [8901-34]

11:20: **Detection of explosive vapours with Diketopyrrolopyrrole thin films: exploring the role of structural order and morphology on thin film properties and fluorescence quenching efficiency**, Callum J. McHugh, Andrew McLean, Monika M. Warzecha, Jesus Calvo, Univ. of the West of Scotland (United Kingdom); Alan R. Kennedy, Univ. of Strathclyde (United Kingdom) . . . . . [8901-35]

11:40: **Nanovectors as a complex solution for optical securing**, Artur Bednarkiewicz, Dariusz Hreniak, Wieslaw Strek, Nanovectors Ltd. (Poland) . . . . . [8901-36]

Lunch/Exhibition Break . . . . . .Wed 12:00 to 13:30

SESSION 7

Room: Konferenz 4 . . . . . Wed 13:30 to 15:00

Polymers and Applications

Session Chair: **Jaroslaw Mysliwiec,** Wroclaw Univ. of Technology (Poland)

13:30: **High- and low-index superhybrid materials for photonic device applications** *(Invited Paper)*, Okihiro Sugihara, Tohoku Univ. (Japan). . . . . [8901-37]

14:00: **Nanoscopic actuators in light-induced deformation of glassy azo-polymers**, Marina Saphiannikova Grenzer, Vladimir P. Toshchevikov, Leibniz-Institut für Polymerforschung Dresdene e.V. (Germany); Jaroslav Ilnytskyi, Institute for Condensed Matter Physics (Ukraine) . . . . . [8901-38]

14:20: **Surface roughness induced random lasing in organic media**, Lech Sznitko, Adam Szukalski, Konrad Cyprych, Andrzej Miniewicz, Jaroslaw Mysliwiec, Wroclaw Univ. of Technology (Poland) . . . . . [8901-39]

14:40: **Electro-optic properties of azobenzene polymers**, Oksana Krupka, Vitalyj Smokal, Sergei Studzinsky, Nikolay A. Davidenko, National Taras Shevchenko Univ. of Kyiv (Ukraine); François Kajzar, Univ. Politehnica of Bucharest (Romania) . . . . . [8901-40]

Coffee Break . . . . . .Wed 15:00 to 15:30

SESSION 8

Room: Konferenz 4 . . . . . Wed 15:30 to 17:00

Modelling and Photonic Applications

Session Chair: **François Kajzar,** Univ. Politehnica of Bucharest (Romania)

15:30: **Switching between negative and positive refraction in nanosphere dispersed liquid crystal driven by electric field** *(Invited Paper)*, Grzegorz Pawlik, Wroclaw Univ. of Technology (Poland); Wiktor Walasik, Institut Fresnel (France); Antoni C. Mitus, Wroclaw Univ. of Technology (Poland); Iam Choon Khoo, The Pennsylvania State Univ. (United States) . . . . . [8901-41]

16:00: **Semiconductor alloys for optoelectronic applications: ab initio modeling**, Pawel P. Scharoch, Wroclaw Univ. of Technology (Poland); Maciej Winiarski, Institute of Low Temperature and Structure Research (Poland); Maciej Polak, Wroclaw Univ. of Technology (Poland) . . . . . [8901-42]

16:20: **Gold nanoparticles as optical limiting materials against cw lasers** *(Invited Paper)*, Maria Chiara Frare, Raffaella Signorini, Verena Weber, Renato Bozio, Univ. degli Studi di Padova (Italy) . . . . [8901-43]

16:40: **Fuel cell based on hydrogenized nanocrystalline film for MEMS applications**, Dmitry E. Milovzorov, Fluens Technology Group Ltd. (Russian Federation) . . . . . [8901-44]

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Registration

Onsite Registration and Badge Pick-Up Hours

Exhibition/Plenary Foyer

Sunday 22 September . . . . . 15:00 to 17:00 hrs
Monday 23 September . . . . . 7:30 to 17:00 hrs
Tuesday 24 September . . . . . 8:00 to 17:00 hrs
Wednesday 25 September . . . . . 8:00 to 17:00 hrs
Thursday 26 September . . . . . 8:00 to 16:00 hrs

Security + Defence Exhibition Hours

Tuesday 24 September . . . . . 10:00 – 17:00 hrs
Wednesday 25 September . . . . . 10:00 – 16:00 hrs

Conference Registration

Includes admission to all conference sessions, plenaries, panels, and poster sessions, admission to the Exhibition, Welcome Reception, coffee breaks, and a choice of proceedings. Student pricing does not include proceedings.

Exhibition Registration

Exhibition-Only visitor registration is complimentary.

Early Registration Pricing and Dates

Conference registration prices increase by EUR120 after 16 September 2013. The online form will automatically display the increased prices.

SPIE Member, SPIE Student Member, and Student Pricing

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If you are paying by cash or cheque as part of your onsite registration, wish to add a course, workshop, or special event requiring payment, or have questions regarding your registration, visit the SPIE Cashier.

Receipts and Certificate of Attendance

Preregistered attendees who did not receive a receipt or attendees who need a Certificate of Attendance may obtain those from the SPIE Cashier.

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Badge corrections can be made by the SPIE Cashier. Please have your badge removed from the badge holder and marked with your changes before approaching the counter.

Refund Information

There is a EUR35 service charge for processing refunds. Requests for refunds must be received by 11 September 2013; all registration fees will be forfeited after this date. Membership dues, reception tickets, and SPIE Digital Library subscriptions are not refundable.

Author / Presenter Information

Speaker Check-In and Preview Station

All conference rooms have a computer workstation, projector, screen, lapel microphone, and laser pointer. All presenters are requested to come to their conference room during the breaks with their memory devices or laptops to confirm their presentation display settings.

Poster Setup Instructions

Mezzanine Level Exhibition Hall
Poster presenters may begin posting their poster papers starting at 10.00 hrs on Monday in the designated Conference Area. **Posters will be on display Monday through Thursday noon.** Each poster presenter is provided a space 0.95 x 1.20m in which to display a summary of the paper. Poster authors are requested to attend the official poster session and should be at their papers on Tuesday from 17.40 to 19.10 hrs to answer questions from attendees. Poster presenters who have not set up by 17.40 on Tuesday will be considered a "no show" and their manuscript will not be published. The posters space will be available through Thursday noon. At that time all posters must be removed. SPIE assumes no responsibility for posters left up after 12:00 pm on Thursday. Any papers left on the boards at that time will be considered unwanted and will be discarded. Attendees are requested to wear their conference registration badges to the poster sessions.

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On Monday and Thursday, coffee will be served near the conference rooms. On Tuesday/Wednesday, the coffee breaks will be served in the exhibition area Halls 4-5.

Complimentary coffee will be served twice daily, at 10:00 and 15:00 hrs. Check individual conference listings for exact times and locations.

Food and Refreshments for Purchase

Maritim Hotel Restaurant
During Lunch Breaks

The Maritim Hotel will offer congress attendees a buffet lunch for purchase at the main restaurant of the hotel. The cost is EU 25 for the full buffet, EU 13.50 for a main course, or EU 8.50 for a salad only course.

Travel to Dresden

About Dresden

Dresden carries visitors away with a synthesis of the arts: fascinating buildings and art treasures, impressive museums, as well as orchestras and choirs of worldwide reputation.

The city offers attractions in great variety and combines three aspects which complement one another: notable art treasure, architectural sights and a charming landscape. Magnificent promenades on the bank of the Elbe, interesting museums and institutions, industrial monuments, charming details. A trip to Dresden is always a great experience. Learn about the many faces of the city and discover her secrets.

It is also the seat of the German microelectronics industry and is home to a number of research institutes.

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Dresden Airport (DRS)
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Flughafenstrasse
01109 Dresden
Tel: 0049 351 88 13 36 0
http://www.dresden-airport.de/en/reisende_und_besucher/flugziele_und_flugplan/flugziele.html
Airport Code: DRS

Nearest alternative airports:

Altenburg (121Km)
Leipzig (129Km)
Flights from all major airports (Frankfurt, Düsseldorf, Köln/Bonn, Stuttgart, etc.) in Germany fly directly into Dresden on a daily basis. For orientation, flights from Frankfurt to Dresden take about one hour. Alternatively, fly into Leipzig, which receives direct flights from London Stansted, Moscow, Vienna and others.

Transportation from the Airport

S-Bahn line S2 connects Dresden Airport with Dresden's two biggest stations, Dresden Neustadt and Dresden Central Station. It also runs services to Heidenau and Pirna on Mondays to Fridays.
Dresden Airport station - Saxony's only underground S-Bahn station - is on the lower ground floor of the terminal building. Modern double-decker trains run every 30 minutes.

A single ticket in the Dresden fare zone costs €2 (valid on S-Bahn, tram and bus). This makes the S2 one of the cheapest airport shuttle services in Germany. Tickets can be obtained at the ticket machine at the station and from the airport information desk on the Arrivals level in the terminal.

For the current S2 timetable, visit the travel to Dresden page at www.spie.org/rsconf

Bus and tram

The bus stops for bus routes 77 and 80 are located just outside the entrance to the Dresden Airport Terminal.

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The taxi journey between the airport and Dresden city centre costs approximately €20. The taxi stands are directly in front of the terminal entrances and exits.

To contact one of the taxi companies before arrival, please use this http://www.dresden-airport.de/homepage/passengers-and-visitors/to-and-from-the-airport-parking/taxi-transfer-car-rental.html. This will also give you information on pick-up services from the hotels.

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SPIE Remote Sensing

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14–17 April 2014

Exhibition
15–16 April 2014

Location
Square Brussels Meeting Centre
Brussels, Belgium