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**EUROPE**<sup>®</sup>  
An **SPIE Europe** Event

3–7 April 2006

Palais de la Musique et des Congrès • Strasbourg, France

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Hot Topics

EU Framework News

Photonics Industry  
Programme



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OPERA-2015 Workshop

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3–7 April 2006 Palais de la Musique et des Congrès, Strasbourg, France  
Conferences • Courses • Exhibition

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European Optical Society



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Ottica e Fotonica

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3–7 April 2006 Palais de la Musique et des Congrès, Strasbourg, France

Conferences • Courses • Exhibition

## Welcome!

Photonics Europe brings together different disciplines, technologies, and perspectives from across Europe and around the world. As a participant, you will be among the leaders who are presenting research, developing new contacts, and learning about the latest funding opportunities.

- Photonics Europe is composed of conferences, workshops, seminars, short courses and an exhibition that combine into a dynamic learning environment
- Photonics Europe has programmes and experts on industry and new business development
- Photonics Europe serves as the platform for new information updates on the 7th Research Framework Programme (FP7)
- Photonics Europe begins daily with a comprehensive “hot topics” session, and includes a unique welcoming reception, daily coffee breaks, plus other technical and social events to maximize networking opportunities
- Photonics Europe presents the European Photonics Innovation Village
  - European Photonics Innovation Village will provide a window on creative products developed by universities and research centres.
  - European Photonics Innovation Village will serve as a display for the European initiatives, networks of excellence, integrated projects, and other EC projects that will showcase their consortium as well as their newest breakthroughs.
- The casual ambience of historical Strasbourg provides a backdrop of good food, comfortable facilities and quick and easy transportation.

The leadership of Photonics Europe 2006 has selected many of the toughest issues facing optical and photonics technologies today as the basis for their program. These current research issues will drive the development of new products for years to come.

*At Photonics Europe 2006 you are among the leaders!*

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**Ian H. White**, Univ. of Cambridge (United Kingdom)  
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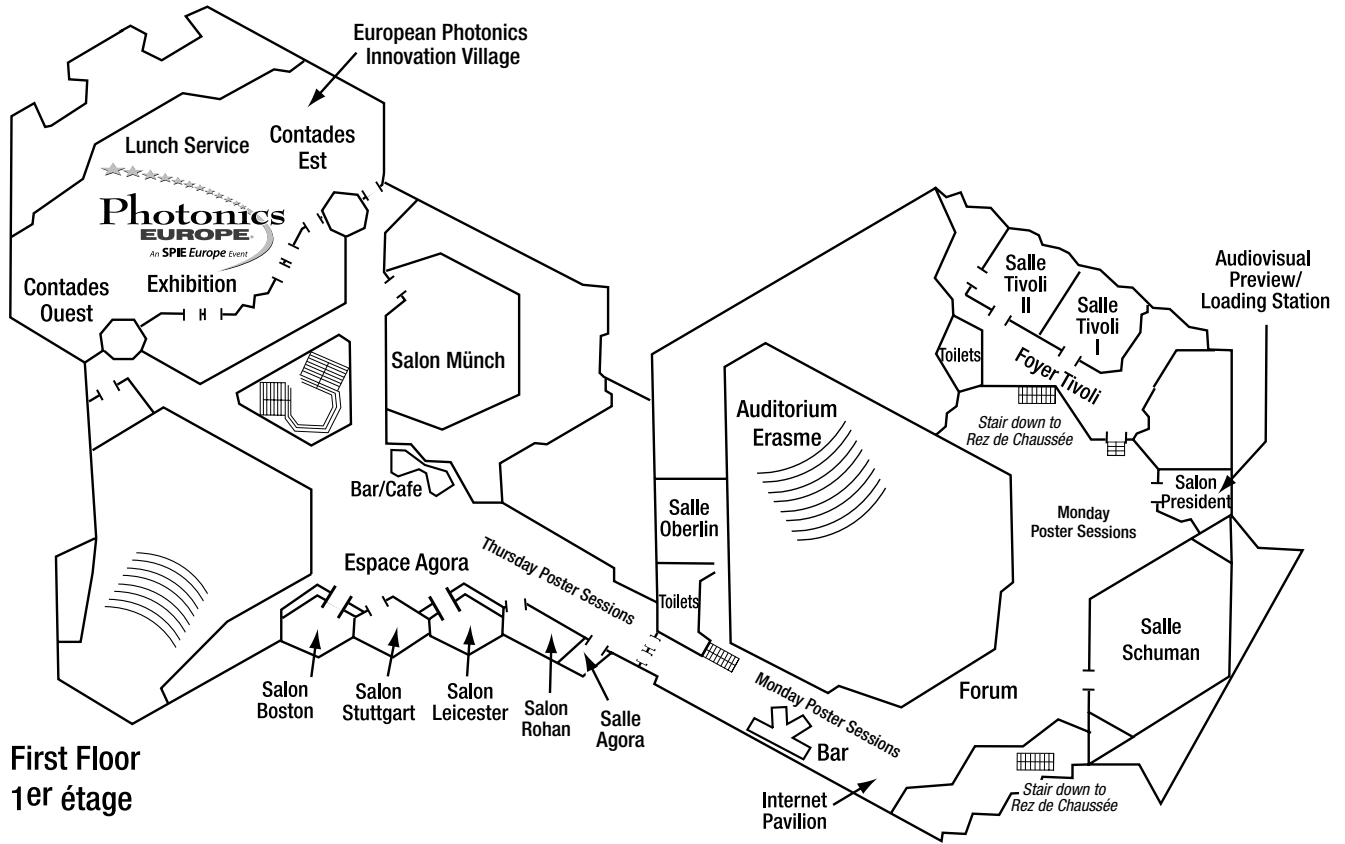
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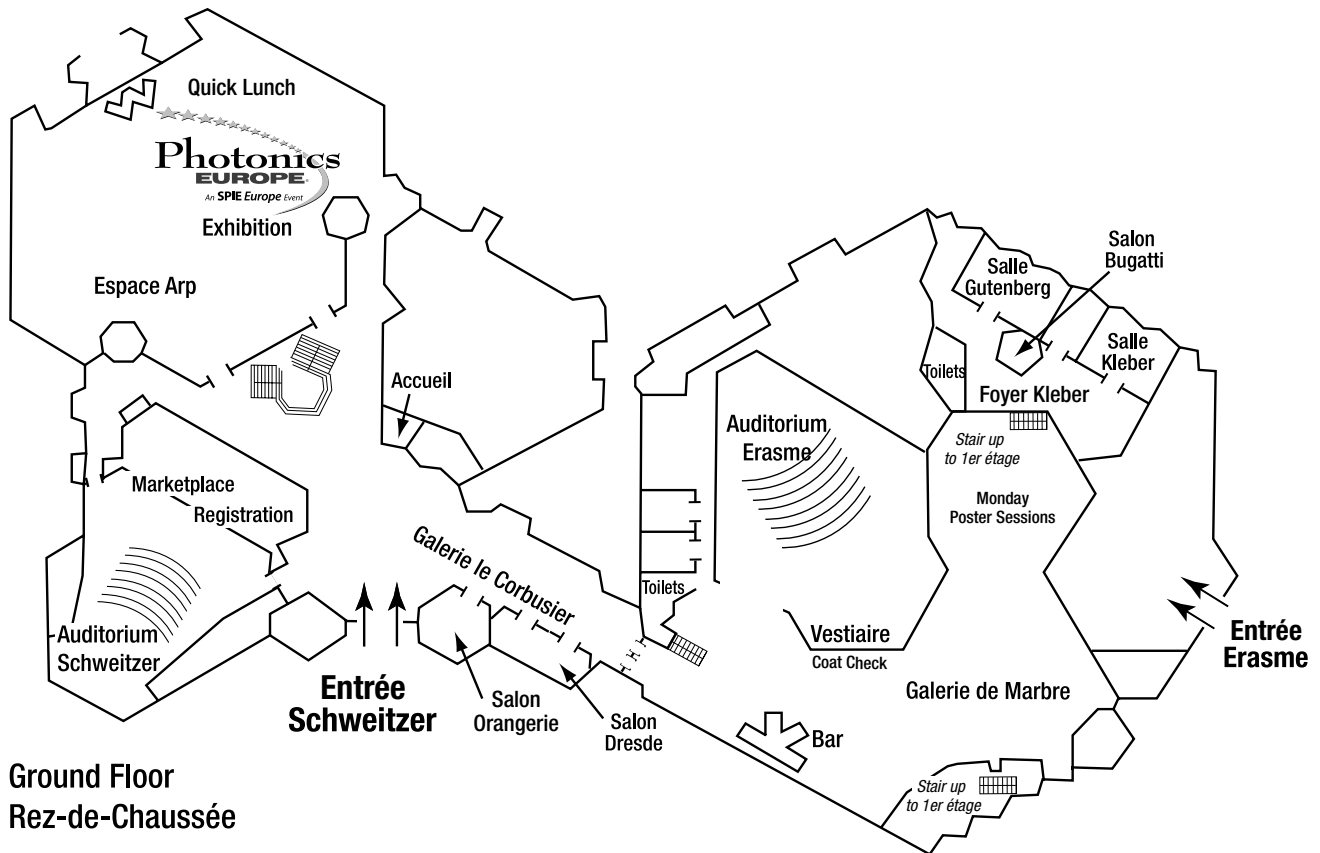
This programme is designed to provide attendees with critical content that bridges research and industry, and which can be directly applied to real-world problems.

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# Palais de la Musique et des Congrès



**First Floor  
1er étage**



**Ground Floor  
Rez-de-Chaussée**

Monday 3 April	Tuesday 4 April	Wednesday 5 April	Thursday 6 April	Friday 7 April	
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<b>SC787 Digital Diffractive Optics: A Powerful Tool To Address Emerging Optical Markets</b> , €190 / €220, 8.30 to 12.30					
<b>WS611 Technical Writing for Physical Scientists and Engineers</b> , €45 / €85, 13.30 to 17.30					
<b>Students save 50% on courses!</b>					
<b>Register at the registration desk.</b>					

## Special Events

### Interactive Poster Sessions and Receptions

Included with Symposium Registration.

Galerie de Marbre and Forum Hall

Monday 3 April ..... 18.00 to 20.30  
Thursday 6 April ..... 18.00 to 20.00

Interactive poster sessions will be held on Monday 3 April from 18.00 to 20.30 and Thursday 6 April from 18.00 to 20.00. See page for details regarding poster set up.

### Welcome Reception

L'Orangerie - Le Pavillon Josephine

Tuesday 4 April ..... 20.30 to 22.30

A reception is being arranged for all symposium participants for Tuesday evening at Le Pavillon Josephine. All Photonics Europe attendees are invited to this reception as a chance to meet and renew relationships with colleagues.

Buses will begin loading at 19.45 for transportation to the reception. There will not be transportation after the reception. Maps will be available at registration if you are not using the buses. Please wear your attendee badges to facilitate admission and identification.

### Women in Optics Presentation and Reception

Sponsored by  
**SPIE** Women  
in Optics

Room: Rohan

Wednesday 5 April ..... 17.30 to 19.30

Open to all symposium attendees. Please register at the onsite registration desk for this event. Attendance is free.

17.30 Networking Reception



18.00 to 19.00

Join SPIE Fellow **Prof Maria Yzuel** as she discusses her work and career in optics. Yzuel is a member of the Royal Academy of Sciences and Arts of Barcelona, and a former member of the board of Directors of SPIE.

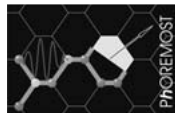


19.00 to 19.30

Ambition without future **Elke van den Brandt**, NEMO This talk presents the preliminary results of an international comparative study addressing the issue: why do women leave their research career? A very lively, entertaining and sometimes funny talk about the situation of Women in Optics in Europe.

## Special Collocated EU Network Meetings

### EU Network of Excellence PHOREMOST



Room: Dresde

Thursday 6 April ..... 16.00 to 18.00  
Friday 7 April ..... 08.30 to 16.00

PHOREMOST ("Nanophotonics to realise molecular scale technology" -www.phoremot.org) integrates the activities in the nanophotonics area of 34 partners from universities, research centres and industry to address the near- and long-term needs of photonic functional components. It builds on the critical mass existing in Europe in this emerging area, rapidly developing as a result of the concomitant progress in nanostructured materials, nanofabrication technologies, nano-scale characterisation techniques, novel concepts linking electromagnetic radiation in electronic and optical systems, recent concepts involving optical properties of non-periodic, fractal and quasi-crystal structures, as well as a better understanding of non-linear properties of molecules. The main driving force behind nanophotonics is the expectation to access the molecular scale dispensing with electrical contacts.

The meeting of PHOREMOST Network will take place on Thursday 6th - Friday 7th April 2006. The purpose of this meeting is to review the scientific progress made at the WP level and to highlight the integration, education and training and dissemination activities.

All 34 partners will have an opportunity to present their research where their team is world class within the scope of PHOREMOST and identify topics, themes, techniques, etc., where they seek partnerships to enhance the added value of joint research at the European level.

### MONA workshop on materials and equipment for nanophotonics

Room: Tivoli II

Friday 7 April ..... 8.30 to 16.30

The goal of the workshop is to identify the key issues related to the manufacturing of nanophotonic devices at industrial scale. It will gather experts from nanoscale materials, equipment and processes as well as applications and devices. The participation to this workshop is by invitation only.

MONA (Merging Optics and Nanotechnologies) is a two-year Specific Support Action aiming at leveraging synergies in photonics and nanotechnologies. MONA will foster collaborations between photonics and nanotechnologies stakeholders and will help preparing future research activities. A major outcome of MONA will be a consolidated scenario (time horizon 5-10 years), setting out development and technology road maps related to materials, equipment and applications (see www.ist-mona.org).

### NEMO

Room: Stuttgart

Thursday 6 April ..... 18.30 to 20.00

"NEMO (Network of Excellence on Micro-Optics) is a networking platform of 30 European partners, that aims at providing Europe with a complete Micro-Optics food-chain by setting up durable service and technology centres for Optical Modelling and Design; Measurement and Instrumentation, Mastering, Prototyping and Replication; Hybrid Integration and Packaging; Reliability and Standardization. NEMO is a 6th FP project that is running since September 1st 2004, and a period of 4 years has been allocated for fulfilling NEMO's goals (see <http://www.micro-optics.org/>).

NEMO-meetings during the Photonics Europe conference:

#### • NEMO Assembly Meeting

Thursday 6th of April, Room: Stuttgart, 18.30 - 20.00

Meeting for the stakeholders and the official representatives of the NEMO partners.

The participation in this meeting is by invitation only.

#### • NEMO WP14 meeting on infrared micro-optics

Friday 7th of April, Room: Stuttgart, 09.00 - 13.00

Meeting to discuss current and future networking activities of WP14. The participation in this meeting is by invitation only."

### OPERA-2015

●●● OPERA<sup>2015</sup>

Room: Tivoli II

Friday 7 April ..... 8.30 to 16.30

OPERA-2015 (Optics and Photonics for the European Research Area) is a two and a half-year Coordination Action that seeks to build the bridge between optics and photonics programmes in FP-6 and those for FP-7. OPERA-2015 has a additional responsibility of promoting the Photonics Technology Platform: Photonics-21. OPERA-2015 is organising symposium throughout the European community of nations to explain the Platform and to encourage participation.(see [www.opera2015.org](http://www.opera2015.org)).

OPERA-2015 network meeting for photonics in FP-7

Friday 7th April, Room: Tivoli II, 8.30 - 16.30

The OPERA-2015 network meeting will focus on issues concerning the presence of photonics in the first calls of framework programme 7 The participation to this workshop is by invitation only.



## Hot Topics I

Salle Schweitzer

Monday 3 April ..... 8.15 to 10.00

8.15 to 8.40

**Opening Remarks & New Agenda****Hugo Thienpont**, Vrije Univ. Brussel, Belgium; **Francis Berghmans**, SCK-CEN, Belgium

8.40 to 9.25

**Competing with incandescence: methods for achieving efficient solid state lighting using organic light-emitting devices****Stephen Forrest**, Univ. of Michigan, USA

A significant challenge facing human kind in the 21st Century is how to address the ever decreasing supply of depletable and renewable energy. One approach to this problem is to decrease our usage. For this reason, considerable attention has been focused on more efficient means for room lighting which currently consumes approximately 20% of the total energy used. Organic light emitting devices (OLEDs) provide a unique opportunity to provide

this high efficiency solid state lighting at very low cost. In this talk, I will discuss several strategies for achieving very high efficiency white light emission at high brightnesses for the next generation of efficient solid state lighting sources based on small molecular weight, vapor deposited OLED structures. Key to our approach is the use of electrophosphorescence as a means for converting all electrical into optical energy. We show that the highest luminance efficiencies can be obtained by a combination of fluorescence and phosphorescence in a unique OLED structure. Furthermore, the highest brightnesses are achieved (without a significant loss in power efficiency) by stacking several fluorescent/phosphorescent elements in a single OLED structure (called a SOLED), with each emitting element in the stack separated by a transparent charge generation layer. Prospects for OLEDs as the next practical generation of interior illumination sources will be reviewed.

**Biography:** **Stephen Forrest** received B.A. Physics in 1972 at the University of California, and MSc and Ph.D. Physics in 1974 and 1979 at the University of Michigan. First at Bell Labs, he investigated photodetectors for optical communications. In 1985, Prof. Forrest joined the Electrical Engineering and Materials Science Departments at USC where worked on optoelectronic integrated circuits, and organic semiconductors. In 1992, Prof. Forrest became the James S. McDonnell Distinguished University Professor of Electrical Engineering at Princeton University. He served as director of the National Center for Integrated Photonic Technology, and as Director of Princeton's Center for Photonics and Optoelectronic Materials (POEM). From 1997-2001, he served as the Chair of the Princeton's Electrical Engineering Department. In 2006, Prof. Forrest joined the faculty of the University of Michigan, Ann Arbor, as Collegiate Professor of Electrical Engineering and Computer Science, and Physics, as well as the Vice President for Research. A Fellow of the IEEE and OSA and a member of the National Academy of Engineering, he received the IEEE/LEOS Distinguished Lecturer Award in 1996-97, and in 1998 he was co-recipient of the IPO National Distinguished Inventor Award as well as the Thomas Alva Edison Award for innovations in organic LEDs. In 1999, Prof. Forrest received the MRS Medal for work on organic thin films. In 2001, he was awarded the IEEE/LEOS William Streifer Scientific Achievement Award for advances made on photodetectors for optical communications systems. Prof. Forrest has authored ~385 papers in refereed journals, and has 135 patents. He is co-founder or founding participant in several companies, including Sensors Unlimited, Epitaxx, Inc., Global Photonic Energy Corp., Universal Display Corp. (NASDAQ: PANL) and Apogee Photonics, Inc.

9.25 to 10.10

**Risk mitigation in spaceborne lasers****Yngve Lien**, European Space Agency/ESTEC, The Netherlands

Spaceborne lidars carry much promise for Earth observation and interplanetary missions to measure atmospheric parameters (wind velocity, optical extinction or species concentrations) and the planet topology. As the first European lidar mission, the European Space Agency is developing a Doppler wind lidar, to be launched on board ADM-Aeolus in 2008. ALADIN will carry a pulsed UV laser, emitting about 120 mJ of pulse

energy. The mission duration is envisaged three-years, which corresponds to several billion emitted pulses, thus imposing very stringent criteria on the longevity of the system. Laser-induced damage is one of the significant issues here, in particular since laser-induced damage in space vacuum is still poorly understood. The European Space Agency has therefore established a test campaign to measure the power handling of all the instrument optics with laboratories in Germany, Italy, the Netherlands and France participating. Measurements are being conducted on all critical optics for all three wavelengths (1064nm, 532nm and 355nm) and with the introduction of several contaminants. The presentation will cover laser-induced damage risk mitigation, the ESA test campaign and the test results.

**Biography:** **Yngve Lien** was born in Trondheim, Norway, on the 26th of October 1974. In 1994 he started his undergraduate degree in Physics at Imperial College in London and graduated with a Master's degree in 1998. Turning his interest to quantum noise in Nd:YVO microchip lasers at the University of Leiden in the Netherlands, he defended his thesis "Intensity dynamics of slow-inversion lasers" in November 2002. Since then he has been working in the Opto-electronics section for the European Space Agency, where he supports the ADM-Aeolus project to launch a spaceborne Doppler wind lidar in 2008. To qualify the optics with respect to their laser-induced damage threshold, he helped to start a test campaign involving laboratories in several European countries. As part of this work, he set up an internal laser-induced test laboratory for ESA at ESTEC.

Continued

## Hot Topics II

Salle Schweitzer

Tuesday 4 April ..... 8.00 to 10.00

8.00 to 8.45

**Silicon-on-insulator microphotonic devices****Laurent Vivien**, Univ. Paris Sud CNRS, France

*Coauthors:* **E. Cassan, D. Marris, S. Maine**, Univ. Paris Sud CNRS (France); **M. Rouvière**, Univ. Paris Sud CNRS and STMicroelectronics (France); **A. Lupu, D. Pascal, X. Le Roux, S. Laval**, Univ. Paris Sud CNRS (France); **J.-F. Damlencourt, J.-M. Fédéli**, GEA-DRT/LETI (France)

Silicon-on-insulator substrates (SOI) have generated an increasing interest in the recent years, for both nanophotonic and nanoelectronic applications. The thin crystalline silicon film which is separated from the silicon substrate by a buried oxide layer constitutes a high quality optical waveguide at telecommunication wavelengths (from 1.3  $\mu\text{m}$  to 1.6  $\mu\text{m}$ ) where silicon is transparent. A very strong light confinement is obtained with SOI structures, due to the large refractive index difference between silicon and its oxide ( $n_{\text{Si}} \approx 3.5$ ,  $n_{\text{SiO}_2} \approx 1.45$ ). This allows the realization of ultra-compact nanophotonic devices and circuits. Monolithic integration of optical functions with microelectronic circuits at the same level will offer new possibilities for low cost and reliable devices. The main forecast applications of silicon nanophotonics are on-chip optical interconnects and optical telecommunications. However, a number of fundamental challenges has to be addressed before this technology can successfully be used either to solve current microelectronic bottlenecks or to compete with III/V semiconductor components. Low loss light distribution and fast integrated optoelectronic devices are required. For telecom applications, additional conditions of polarization insensitivity and low insertion loss with optical fiber have to be fulfilled.

Various geometries of SOI microwaveguides and the associated devices for light distribution (splitters, turns, etc.) will be compared. Light injection in submicron SOI waveguides will be discussed. Emphasis will be put on rib SOI waveguides obtained by shallow etching of the silicon film, which offer advantages for the integration of active devices while fulfilling efficiency and compactness. Propagation losses of such waveguides are one order of magnitude smaller than for single mode strip waveguides. Rib-based compact and low loss optical signal distribution from one input to up to 1024 output points has been demonstrated. The indirect bandgap of silicon is not in favour of light emission and modulation. Realization of silicon sources and high speed and efficient silicon-based modulators is a real challenge. For light detection, germanium can be grown on silicon and Ge photodetectors with acceptable responsivity and bandwidth close to 40 GHz have been demonstrated.

*Biography:* **Laurent Vivien** received his Ph.D. entitled "Nonlinear optical properties of carbon nanotubes for optical limiting" at the Ecole Polytechnique, Palaiseau, France, in July 2001. Since 2001 he has been working at the Institut d'Electronique Fondamentale (IEF, Orsay/France). His activities are devoted to silicon nanophotonics. He is involved in the development of both passive silicon-on-insulator devices (optical couplers, waveguides, splitters and turns) and integrated optoelectronic silicon-based components, in particular optical modulators and Ge on Si photodetectors for optical interconnects and optical fiber communications.

8.45 to 9.30

**Engineering and characterization of ferroelectric microstructures for photonic crystal applications****S. Grilli**, Istituto Nazionale di Ottica Applicata, CNR, Italy

*Coauthors:* **P. Ferraro, L. Sansone, M. Paturzo, D. Alfieri, P. De Natale**, Istituto Nazionale di Ottica Applicata, CNR (Italy); **S. De Nicola, G. Pierattini**, Istituto di Cibernetica "E. Caianiello," CNR (Italy)

Lithium niobate (LN) is a ferroelectric crystal of considerable interest to the optical, laser and communications industry, due to its large values of nonlinear optical, electro-optic, piezoelectric and acousto-optical coefficients. LN is largely used in the field of optics for laser frequency conversion processes by quasi-phase matching approach through the periodic modulation of the nonlinearity while in the microwave or telecommunications sector it is widely used for surface acoustic devices and integrated optical modulators. A wide variety of techniques have been reported in literature for LN micro-machining and microstructuring, including reactive ion etching, laser ablation, or laser assisted chemical etching. Wet etching by hydrofluoric and nitric acid solutions has also been used for many years to reveal reversed ferroelectric domains and defect structures in LN and it has been used recently to intentionally produce ordered microstructures, subsequent to periodic domain inversion. Such microstructuring can find interesting applications for example in the fields of optics and optoelectronics for ridge waveguides, alignment structures, V-grooves, micro-tips but also for Bragg reflectors or photonic bandgap devices. Ferroelectric domain engineering by electric field poling (EFP) technique represents a key process for all of these applications, so that a thorough understanding of material and poling related properties, as well as accurate topography characterization of the fabricated microstructures, are of fundamental importance.

Digital Holography (DH) based techniques are presented here for topography measurements of surface engineered structures and for characterization of LN EFP related properties. In the first case DH technique has been used for wide field amplitude and phase imaging of surface isolated and periodic structures with quantitative information about their topographic features through the two-dimensional (2D) distribution of the optical path difference. A Mach-Zehnder type interferometer in microscope configuration has been used for acquiring holograms of the object that are subsequently subjected to DH numerical calculations which provide amplitude and phase reconstruction of the object wavefield. In case of EFP related properties, in-situ characterization of domain reversal process, during external voltage application, has been carried out by DH reconstruction of the in-focus 2D phase shift distribution experienced by the object beam traversing the sample along the z crystal axis, due to the linear electro-optic and piezoelectric effects. The behaviour of independently growing and merging ferroelectric domains during EFP has been studied to investigate the dynamic characteristics of LN ferroelectric domain switching. Compared to other interferometric methods, DH provides the basic advantage to recover the in-focus phase image of the object by post-process numerical procedure, extremely useful in case of EFP dynamic events. Moreover DH technique has been used for direct investigation and evaluation of the so called internal field, a well known typical property of congruently melted LN material and partially responsible for lack of uniformities in periodic domain engineering. Intrinsic composition related local defects can be detected by DH through electro-optic effect analysis.

Moreover, recent novel results concerning nanoscale periodic surface structuring of congruent LN are shown here. Holographic lithography (HL) is used to obtain sub-micron period 1D and 2D insulating patterns which are transferred into the material as reversed domain patterns by EFP and afterwards as surface structures by subsequent polarity selective wet etching. Moiré beating effect has been used in the HL process to fabricate complicated structures consisting of double period 2D or combination of 1D and 2D geometries. Accurate atomic force microscope (AFM) topographic characterization of the fabricated structures is presented, showing that periods and structure sizes down to 700 nm and 200 nm, respectively, with depths of few microns, have been obtained. The depth compatibility with waveguide implementation allows to foresee possible applications of these structures for Bragg grating or innovative photonic crystal devices, exploiting the additional nonlinear and electro-optic properties typical of LN. Moreover, novel results concerning double-face sub-micron period surface structuring of LN substrates are presented to show the possibility to have twice as many devices on the same chip, thus increasing the integration capability.

*Biography:* **Simonetta Grilli** was born in Naples, Italy, in 1974. She received the degree in Physics (with highest honours) from the University "Federico II" in Naples, Italy, in 1999. From 2000 to 2001 she has worked at the STMicroelectronics company in Catania (Italy) as R&D process engineer in the fabrication of silicon based flash memories. From 2001 to 2004 she has been holder of a Research Grant and from 2005 she has a Researcher position at CNR-INOVA in Naples, Italy. She implemented set-ups and experiments for holographic lithography and electric field induced ferroelectric domain engineering. She has worked at the development of novel interferometric techniques for domain engineering control and for characterization of electro-optic related properties of lithium niobate (LN). Her work includes nanoscale domain patterning in LN for opto-electronic and photonic crystal applications. She is now completing the Ph.D. degree at the Laser Physics Department of the Royal Institute of Technology, Stockholm, Sweden. She has published more than 20 papers on international journals. She has had two patents awarded. Dr. Grilli is a member of the SPIE, IEEE and Optical Society of America.

9.30 to 10.00

### Europe at light speed: A keynote address



**Viviane Reding**, European Commissioner for Information Society and Media

09.30

### Keynote address by Commissioner Viviane Reding

09.50

### Handover of Photonics<sup>21</sup> Strategic Research Agenda to Commissioner Reding by Alexander von Witzleben, CEO of Jenoptik AG, Germany, and President of Photonics<sup>21</sup>

10.00

Main Foyer

### Commissioner Reding will officially open the Photonics Europe Exhibition

The Information Society and Media portfolio represents an economic sector which is crucial for prosperity and quality of life in the European Union.

This portfolio stretches from the underlying communications infrastructures to the content and services they deliver. It encompasses telecommunication networks, broadband internet access and satellite communications, new communications technologies such as '3G' mobile communications and Internet telephony, and digital material as diverse as cinema releases and advanced eHealth services. As Information Society and Media Commissioner, Viviane Reding has a number of important instruments at her disposal to contribute to Europe's competitiveness, including the regulatory framework for electronic communications, the regulation of audiovisual content and the EU's ICT research programme.

*Biography:* Before starting a professional career as a journalist for the leading newspaper in Luxembourg, the Luxemburger Wort, **Viviane Reding** obtained a doctorate in human sciences at the Sorbonne. From 1986 to 1998, she was President of the Luxembourg Union of Journalists.

She started her political career in 1979, as a Member of the Luxembourg Parliament and held the following positions: President of the Social Committee, Member of the Office of the Chamber of Deputies, Member of the Benelux Parliament, Member of the North Atlantic Assembly (leader of Christian Democrat/Conservative group). She then became leader of Luxembourg's European People's Party delegation in the European Parliament from 1989 to 1999. Within the European Parliament, she has held positions as President of the Petitions Committee for about 3 years, and Vice-President of the Social Committee and the Civil Liberties and Internal Affairs Committee for about 2 years each.

From 1999 to 2004, she was appointed Commissioner for Education, Culture, Youth, Media and Sport. In 2004, Commissioner Reding started a second term in the European Commission, now with the enhanced responsibility for Information Society and Media.

She has earned the following prizes and distinctions: 1992-St George's Cross from the Generalitat of Catalunya; 2001-Gold Medal of European Merit; 2004-Doctorate Honoris Causa from the Hu Chen University Taiwan; 2004-Doctorate Honoris Causa from the University of Genoa; 2004-Robert Schuman Medal; 2004-Doctorate Honoris Causa from the University of Torino; 2004-Prince of Asturias International Cooperation Prize; 2005-Officer of the French Legion of Honor; 2005-"Gloria Artis" Medal of Honor from Poland.

### About Photonics<sup>21</sup>



The European Technology Platform Photonics<sup>21</sup> was set up as a result of consultations between high-level representatives of the European photonics industry, Viviane Reding, European Commissioner for Information Society and Media, and the Commissioner for Research, Janez Potočnik. Photonics<sup>21</sup> is based on the vision document "Photonics for the 21st Century", which has been published in spring, 2005 and which proposes a coordinated action plan at the European level to explore the nearly limitless future applications of light and to reap the expected benefits in terms of creating both jobs and wealth.

Through a shared vision between industrial and public actors, it aims to create the critical environment necessary for visionary and industrially relevant R&D in photonic components, systems and applications. The Platform undertakes to establish Europe as a leader in the development and deployment of Photonics in key industrial areas (Information and Communication, Lighting and Displays, Manufacturing, Life Science, and Security) as well as in Education and Training.

Photonics<sup>21</sup> is headed by the chairmen of internationally leading companies like Jenoptik, Bookham, TRUMPF Laser technology, Carl Zeiss, Philips Lighting and SAGEM.

The current president of Photonics<sup>21</sup> is Alexander von Witzleben who is the CEO of Jenoptik and the vice-presidents are Bernd Schulte, President EPIC, CTO Aixtron, Paul Lagasse, IMEC, Director Intec Division and Malgorzata Kujawinska Head of Optical Engineering Division Warsaw University of Technology, and President SPIE 2005.

### The Strategic Research Agenda

The purpose of the Strategic Research Agenda (SRA) is to set out medium- and long-term R&D priorities for Photonics, including measures for enhancing the R&D infrastructure in Europe as well as education and training issues. The detailed work of defining a SRA is undertaken by specialised working groups. The SRA is a living document and will be revised as required.

Following on from the SRA, Photonics<sup>21</sup> has the aim developing a deployment strategy including mechanisms to mobilise the private and public investments which are needed to implement the SRA.

For further information: [www.photonics21.org](http://www.photonics21.org)

Related conference topics:

- Tuesday 13.30: OPERA Forum on FP7 and the Photonics<sup>21</sup> Technology Platform
- Thursday 09.30: Photonics Research: What's Hot in Europe
- Friday: EU Network Meetings

Continued

Hot Topics III

Salle Schweitzer

Tuesday 4 April ..... 17.40 to 19.40

Hot Topics III includes a series of three invited presentations on nanotechnology initiatives across the three economic powerhouses of Europe, the United States and Japan.

Opening Remarks

Hugo Thienpont, Vrije Univ. Brussel, Belgium; Francis Berghmans, SCK-CEN, Belgium

17:40 to 18:20

Nanophotonics: a research agenda from the perspective of the NoE PHOREMOST



Clivia M. Sotomayor Torres, Univ. College Cork, Tyndall National Institute, Ireland

The Network of Excellence "Nanophotonics to realise molecular-scale technologies@ (PHOREMOST) has developed a research agenda during its first year of activities. PHOREMOST addresses the near- and long-term needs of photonic functional components, building on the critical mass existing in Europe in this emerging area. This encompasses progress in nanostructured materials,

nanofabrication technologies, nano-scale characterisation techniques, novel concepts linking electromagnetic radiation in electronic and optical systems, recent concepts involving optical properties of non-periodic, fractal and quasi-crystal structures, as well as a better understanding of non-linear properties of molecules. The main driving force behind nanophotonics is the expectation to access the molecular scale dispensing with electrical contacts. In this talk, the research agenda in nanophotonics, as developed in PHOREMOST will be presented.

*Biography:* Professor Clivia M. Sotomayor Torres obtained her BSc. (Hons.) Physics in 1979 (Southampton University, UK) and her Dr. Phil. in Physics in 1984 (Manchester University, UK). During 1983-1984 she was a research assistant at the University of St. Andrews (UK). This appointment was followed by: 1984-87 Lecturer in Physics, St. Andrews University (UK), 1986-1996 Lecturer and Senior Lecturer in Electrical Engineering at the University Glasgow (UK). Clivia has received three prestigious awards from the Royal Society of Edinburgh, the Nuffield Foundation, and an Amelia Earhart Fellowship from ZONTA International (USA) in 1993, 1990 and 1982, respectively. From August 1996 to February 2004 she was Professor of Materials Sciences in Electronics at the University of Wuppertal, Germany. Since March 2004 she joined the then NMRC, now Tyndall National Institute, at University College Cork as a Research Professor, where she set up a new group on Photonic Nanostructures. Her research group is funded by research grants from the Science Foundation Ireland, the European Commission and the Volkswagen Foundation.

She carries out research in the field of science and engineering of optical nanostructures, especially novel lithography methods for their realisation, such as nanoimprint lithography, light propagation and emission in periodic and quasi-periodic media and more recently confined phonons in silicon-on-insulator thin films and nano-addressing using inorganic nanotubes. She is author of over 260 scientific publications and has edited six books.

She has participated in several EU projects since 1989, including, NANSDEV, PHANTOMS, ECAMI, CERION, NANOTECH, CHANIL and PHOBOS. She currently coordinates PHAT and serves on the Management Board of the Integrated Project "Emerging Nanopatterning Methods" (NaPa) as lead partner on nanoimprint lithography. Clivia is the coordinator of the EU IST Network of Excellence "Nanophotonics to realise molecular-scale technologies" (PHOREMOST).

18:20 to 19:00

The U.S. national nanotechnology infrastructure network and support of photonics research and development



Sandip Tiwari, Cornell Univ., USA

A major challenge in science and engineering research and development at the nano-scale, and particularly for photonics, is the availability of infrastructure that allows easy and quick implementation of structures, devices, or more complex systems necessary for making rigorous measurements, other exploratory directions of interest, and building of assemblies that utilize techniques from multiple disciplines. The experiments connect across length scales -

nanometers and up, employ a variety of materials and techniques of assembly and patterning, and require a complex mix of knowledge that are derived from other research areas and tools that are demanding in skills and are hard to access. The National Nanotechnology Infrastructure Network (NNIN; www.nnin.org) is funded by the National Science Foundation and is a partnership of open shared facilities across the country that enables the national community to pursue research and technology development that can benefit from nanotechnology. The NNIN provides easy hands-on access to external users, remote usage, staff support, low cost usage, knowledge infrastructure, and brings together an extensive coordinated array of instruments for fabrication, synthesis, and characterization together with other infrastructure resources. Particularly relevant to photonics is the ability to combine optical quality materials and fabrication techniques with ultra-sensitive characterization and application to biology, fluidics, and problems of interest in optical and electronic communication. Integration to the smallest length scales through synthesis and electron-beam lithography, growth and deposition of a variety materials with controlled properties, patterning of complex shapes in the three-dimensions, connecting such structures, characterization, and the ability to achieve this quickly and at low cost is essential to successful university research and industrial innovation. NNIN tool resources that span focused-ion beam, electron microscopy, spectroscopic techniques, etc. for characterization; synthesis, growth, deposition, etc. for assembling; ultra-high resolution lithography, etching, etc. for patterning - all enable the researcher to focus on their own research interest by leveraging the NNIN infrastructure. Access of NNIN is designed for ease of use - quick access (typically, 2 weeks), strong support (direct staff and web-based interactions), and remote execution for simple projects.

This talk will emphasize the character and practice within NNIN with reference to examples of academic and industrial research and development in photonics area.

*Biography:* Sandip Tiwari is Professor of Electrical and Computer Engineering and Charles N. Mellowes Professor in Engineering at Cornell University, and the Director of National Nanotechnology Infrastructure Network. His current research interests are in power-adaptive energy-efficient electronics, a path that leads through small devices and their circuits, newer approaches to CMOS structures, three-dimensional integration, ideas and technologies that allow functional integration, and in interesting offshoots of small structures in other areas. Among his contributions and inventions of note have been nanocrystal and quantum-dot low power memories, back-side trapping memories, vertical transistors-based memory approaches and the technology of heterostructure bipolar transistors. His theoretical efforts provided the fundamental understanding of several device phenomena including the electron injection processes in coupled confined systems, frequency limitations of quantum-wire lasers due to gain compression, and high current alloy barrier effects and surface recombination in heterojunction bipolar transistors. Sandip Tiwari has been a Research Staff Member and Manager for Exploratory Devices and Device Modeling at IBM, has held visiting and adjunct faculty appointments at the University of Michigan and Columbia University, is a Fellow of IEEE and APS, and received the Young Scientist Award of 1991 from Institute of Physics and the Distinguished Alumnus Award from IIT Kanpur in 2003. He is author of the text "Compound Semiconductor Device Physics" and is the founding Editor-in-Chief of IEEE Transactions on Nanotechnology.

19:00 to 19:40

### Current nanotechnology policy in Japan and photonic materials research at National Institute for Materials Science (NIMS), Japan



*Speaker and Author:* **Kenji Kitamura**, Director, Opto-Single Crystal Materials Research, National Institute for Materials Science, Japan



*Co-Author:* **Teruo Kishi**, President, National Institute for Materials Science, Japan

In March, 2001, the Second Science and Technology Basic Plan (2001-2005) was decided by the Council for Science and Technology Policy (CSTP). The plan assigns strategic priority in R&D to basic research and four prioritized areas in funding: life sciences, information and telecommunications, environmental sciences, and nanotechnology & materials science/technology. In nanotechnology & materials

science, CSTP exemplified five fields for application: information technology, environment, biotechnology, generic technology, and materials. Following this plan, the government funding for R&D on nanotechnology & materials science has been increased and reached JPY 94 billion in FY 2004.

The Ministry of Education, Culture, Sports, Science and Technology (MEXT) have several highlights of research programs such as the Leading Projects by MEXT, the Nanotechnology Virtual Laboratories by JST, the Focus 21 by METI, and the Nanomaterials and Processing Sub-Program by NEDO. Besides, for the promotion of inter-disciplinary collaboration and industrial application, the Nanotechnology Support Project (NSP) was started by MEXT in April, 2002, and the Nanotechnology Business Creation Initiative (NBCI) was founded with a help of METI in October, 2003. NSP provides informational support and common use facility support, for which the Nanotechnology Researchers Network Centre of Japan (Nanonet) was founded, and NBCI is the consortium of more than 300 private companies. There are also several programs for "clusters", regional industry-university-government networks, and centres of excellence, in which nanotechnology is one of the key technologies.

This talk will introduce the activities of NSP in details and recent research subjects on photonic materials performed in NIMS.

*Biography:* Kenji Kitamura received a Bachelor of Science degree from Faculty of Science, Tokyo University in Geology and Mineralogy in 1972. In 1974 he completed the Graduate school of Science, Tokyo University (Master of science) Major in Geology and Mineralogy. In 1983 Dr. Kitamura completed the Ph.D. studies (Dr. Sc.) at the Tohoku University, Sendai.

Presently Dr. Kitamura holds the position of the Director at the National Institute for Materials Science, Japan; division and subdivision Opto-Single Crystal Group. He is also a professor at the Interdisciplinary Graduate School of Engineering Sciences, Kyushu University, Japan. He is an author of a number of publications on LN defect structure, crystal growth (bulk crystals, thin films), fundamental properties (material constants, optical damage, photorefractive properties, domain switching properties, mechanical properties), and applications (hologram, QPM devices).

Continued

**Hot Topics IV**

Salle Schweitzer

Thursday . . . . . 8.15 to 10.00

8.15 to 9.00

**PV solar electricity: status and future**



**W. Hoffmann**, SCHOTT Solar GmbH (Belgium); European Photovoltaic Industry Association Vice President, Schott Solar (Belgium)

Within the four main market segments of PV solar electricity there are already three areas competitive today. These are off-grid industrial and rural as well as consumer applications. Within the fourth market segment of grid connected systems there has been a profound increase starting in USA in the 80ies, followed

by Japan in the mid 90ies and Europe, in particular Germany, in 2000. The overall growth within the past 6 years was almost 40 % p.a. with a "normal" growth of about 15 % p.a. for the first three market segments whereas the grid connected market increased with an astonishing 60 % p.a. The different growth rates catapulted the contribution of grid connected systems in relation to the total market from about one quarter 6 years ago towards more than three quarters today. The reason for this development is basically due to industry-politically induced market support programs in the aforementioned countries. It is quite important to outline under which boundary conditions grid connected systems will be competitive without support programs like the feed in tariff system in Germany, Spain and some more to come in Europe as well as investment subsidies in Japan, US and some other countries. It will be shown that in a more and more liberalized utility market worldwide electricity produced by PV solar electricity systems will be able to compete with their generating cost against peak power prices from utilities. This situation is most likely to happen within the next 10 years more southern areas (1,500 - 1,800 kWh/kWp) while it may take about 10 years in more in places like Germany (800 - 1,000 kWh/kWp). The point of time for this competitiveness is mainly determined by the following facts:

- Pricedecrease for PV solar electricity systems leading to an equivalent decrease in the generated cost for PV produced kWh
- Development of a truly liberalized electricity market
- Degree of irradiation between times of peak power demand and delivery of PV electricity

The first topic is discussed using price experience curves. Some explanations will be given to correlate the qualitative number of 20 % price decrease for doubling cumulative worldwide sales derived from the historic price experience curve with a more quantitative analysis based on our EPIA-Roadmap (productivity increase and ongoing improvements for existing technologies as well as development of new concepts to broaden the product portfolio in coming years).

The second topic outlines the most likely development of liberalized electricity markets in various regions worldwide. It will be emphasized that in such markets the future prices for electricity will more and more reflect the different cost for bulk and peak power production. This will not only happen for industrial electricity customers - as already today in many countries - but also for private households.

The third topic summarizes the existing data and facts by correlating peak power demand and prices traded in various stock exchange markets with delivered PV kWhs. It will be shown that a high degree of correlation is existent.

Combining the three topics and postulating reverse net metering the competitiveness of PV solar electricity as described is most likely to occur. The described price decrease of modules will also have a very positive impact on off-grid rural applications, mainly in 3rd world countries. It will be shown that this is strongly advanced due to the development of mini-grids starting from solar home systems - with mini grids looking very similar to on-grid applications in weak grid areas of nowadays electricity network.

*Biography:* **Dr. Winfried Hoffmann** graduated in physics - diploma in superconductivity - and did his PhDthesis in biophysics. After a 3 year's senior lectureship at the University of London (laser flash photolysis in biochemistry) he joined the just formed photovoltaic R & D group of NUKEM in 1979 and took over its leadership in 1985.

He initiated the Joint-Venture in the photovoltaic field between NUKEM and Daimler-Benz Aerospace to form "Angewandte Solarenergie - ASE GmbH" in 1994 and in the same year the acquisition of 100 % shares of Mobil Solar. On September 1, 2001 ASE GmbH changed its name into RWE Solar GmbH and one year later on October 1st, 2002 the new joint venture RWE SCHOTT Solar was formed. Dr. Winfried Hoffmann serves as chairman of the Managing Board of RWE SCHOTT Solar and chairman of the Board of Directors of the US subsidiary RWE SCHOTT Solar, Inc.

He is a member of the Board of EPIA (European PV Industry Association) and of BSi (German Solar Industry Association), and a member of the scientific Board of the well-known scientific photovoltaic institutes Fraunhofer-ISE (Freiburg) and ISFH (Hannover/Hameln).

9.00 to 9.30

**European Union's science policy**

Representative of the European Commission; Science and Research

9.30 to 10.00

**Photonics research: what's hot in Europe?**



**Henri Rajbenbach**, European Commission, Directorate General Information Society and Media, Belgium



**Ronan Burgess**, European Commission, Directorate General Information Society and Media, Belgium

The research policy and strategy of the European Commission in the area of Photonics will be presented. The paper will first give an overview of the current portfolio of the R&D photonic projects supported by the European Commission. Perspectives for funding opportunities in the next Framework Programme (2007-2013) will then be discussed, addressing

some major market sectors such as telecommunication, life science and health care, manufacturing, security, displays or lighting. The status of the Technology Platform "Photonics21", an initiative to promote Photonics in the European Research area will be discussed.

*Biography:* **Henri Rajbenbach** is a scientist and eurocrat. He joined the European Commission (EC) in 1997 as a Scientific Officer in the areas of microelectronic integration, sensors, optoelectronics and microsystems. He is currently working in the area of Photonics in the IST programme (Information Society Technologies).

Prior to joining the EC, he has carried out research in Thomson-CSF (now THALES), France (1987-1997) and University of California San Diego, USA (1984-1987). He is author or co-author of some 50 journal publications, 2 text book chapters and few patents in the areas of optical information processing, photorefractive materials, semi-conductor lasers, real-time holography and pattern recognition.

Henri Rajbenbach graduated from the Ecole Supérieure de Physique et Chimie Industrielles, ESPCI (1983) and received his PhD from the Université de Paris VI (1984).

**Ronan Burgess** is currently a Scientific Officer at the European Commission in the area of Photonics in the IST programme (Information Society Technologies).

He graduated with a Masters in Microelectronics from Trinity College, Dublin, Ireland in 1986. From 1986 to 1997 he worked at Philips, The Netherlands as a scientific researcher in the areas of stochastic optimisation and low power circuit design and later as a project manager in the areas of Video on Demand and Digital Broadcasting.

He joined the European Commission in 1997. He has been working in the area of Technology for Disabled and Elderly and later in the area of Microelectronics Design before moving on to the area of Photonics.

# Make time for the Exhibition

The Photonics Europe exhibition attracts the world's key suppliers of optical systems, equipment, instruments, and devices. Don't miss the opportunity to research vendors, establish new contacts, meet with current suppliers, and network with colleagues.

## Exhibition Hours

Tuesday 4 April 2006 . . . . . 10.00 to 17.00  
Wednesday 5 April 2006 . . . . . 10.00 to 17.00  
Thursday 6 April 2006 . . . . . 10.00 to 16.00

See the latest in:

- **Lasers**
- **Fiber optic components and devices**
- **Optical components, coatings, materials, and systems**
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- **Sensors and instrumentation for biomedical application**
- **Micromachining, microsystems and microfabrication**
- **Optomechanical components and devices**
- **Nanotechnology and nanophotonics**
- **Optoelectronics and photonics devices**
- **Software modeling**
- **Optical metrology and testing equipment**



**Viviane Reding**, European Commissioner for Information Society and Media, will officially open the Photonics Europe Exhibition at 10.00 Tuesday.

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## Industry Programme at Photonics Europe

SPIE Europe recognizes the unique high tech R&D and business environment that exists in Europe today. The Photonics Europe symposium addresses this unique atmosphere and is specially designed to provide attendees with critical content that bridges research and industry and which can be directly applied to real-world problems. This content is provided to you throughout this Symposium in several ways:

- through research papers presented in the conference programme
- through industry content provided throughout the week in a new Photonics Industry Programme
- through business interaction with leading optics and photonics companies in the exhibition,
- through courses and workshops for professional development.

If you are not planning on attending the full technical conference (“Symposium Registration” choice on the registration form) programme with associated presentations on scientific discoveries and technology achievements, but prefer a focus on industry, we invite you to register for this special “virtual” Photonics Europe Industry Programme. This Industry Programme is also included in the full Symposium Registration fee.

Registration for the entire Industry Programme provides you with access to these exciting forums and conferences throughout the week at Photonics Europe. See SPIE Cashier to register for the Industry Programme-if you are registering for the technical Symposium, the Industry Programme is included with your fees.

### OPERA Forum on FP-7 and the Photonics<sup>21</sup> Technology Platform

*The OPERA forum is free to and open to everyone; a Symposium badge, Industry Programme, or Exhibition-Only badge is required for admission.*

*Salle Rohan*

Tuesday 4 April . . . . . 13:30 to 17:00

Many key Europeans from academia, research labs, SMEs and major industries have collaborated to write a strategic vision document for photonics in FP-7: Photonics for the 21st Century. This vision paper is the foundation for a Photonics Technology Platform.

Now, at Photonics Europe 2006, we invite the entire European Photonics Community to learn the results of the latest developments in this area and to provide further input to the Technology Platform. Topics that are being considered for the Platform include:

- Communications and Information
- Display and Lighting
- Laser-assisted Manufacturing and Machine Vision
- Life Sciences and Health
- Metrology and Sensors
- Design and Manufacturing of Components and Systems
- Education, Research and Training in Photonics

Presentations that represent a vision for the next decade of developments in photonics will be given by a group of distinguished speakers who have been invited for this occasion.

The main objective of OPERA 2015 is to provide support for the Photonics Technology Platform and its actions.

*Technical Programme Committee:* **Kevin Donnelly**, Enterprise Ireland, Dublin, Ireland; **Eva Garcia**, IdeTra SA, Madrid, Spain; **Tom Glynn**, National Centre for Laser Applications, Galway, Ireland; **James O’Gorman**, Eblana Photonics Ltd., Dublin, Ireland; **Thomas P. Pearsall**, EPIC, Paris, France; **Jorge Julián Sanchez**, SDG-TECEN, Madrid, Spain; **Juan Luis Vadillo**, Aragón Photonics Labs S.L., Zaragoza, Spain;  
*Invited Speakers:*

- 13.30 Introduction, **Thomas P. Pearsall**, EPIC, France
- 13.40 Commission, **Dirk Beernaert** IST, EC, Brussels, Belgium
- 14.00 Photonics<sup>21</sup>, **Bernd Schulte**, AIXTRON, Aachen, Germany
- 14.20 Information and Communication, **John Oberstar**, Cisco Systems, San Jose, CA, USA
- 14.40 Laser-assisted Manufacturing and Machine Vision, **Koji Sugioka**, RIKEN-The Institute of Physical and Chemical Research, Wako-Shi (Saitama-Ken), Japan
- 15.00 Coffee Break
- 15.15 Life Sciences and Health, **Sune Svanberg**, Lunds Universitet, Lund, Sweden
- 15.35 Lighting and Displays, **Bernhard Stapp**, Osram Optical Semiconductors GmbH, Regensburg, Germany
- 15.55 Metrology and Sensors, **Germán Vergara**, Centro de Investigación y Desarrollo de la Armada (CIDA), Madrid, Spain
- 16.15 Design and Manufacture of Components, **James O’Gorman**, Eblana Photonics Ltd, Dublin, Ireland
- 16.35 Educational Issues in Research and Training in Photonics, **Marc Nantel**, Photonics Research Ontario, Toronto, ON, Canada

## Industry Applications: Specialist Optical Coatings Forum

*The Coatings Forum requires an Industry Programme or Symposium registration badge for admission.*

Salle Rohan

Wednesday 5 April . . . . . 10.00 to 12.45

Recent advances in optical coatings technology has seen the increased adoption and application of coatings and finishes within key sectors of aerospace, automotive, medical healthcare as well as other high specification technology engineering. The forum will provide a detailed exploration of the subject and introduce specific industry applications through the speakers own experiences. This forum is intended for anyone having to specify or integrate coatings into their product or activity. It will provide decision-makers with an overview of the latest developments from leading European researchers and corporate leaders in companies and organizations in this field.

### 10.00 Introduction

**Glenn Barrowman**, Photonics Cluster (United Kingdom);  
**Tom Pearsall**, European Photonics Industry Consortium (France)

10.15 **Norbert Kaiser**, Fraunhofer Institut für Optik und Feinmechanik (Germany)

10.45 **Peter Girow**, Thales Optics Ltd. (United Kingdom)

11.15 **Barry Holton**, Plasma Quest Ltd. (United Kingdom)

11.45 **Des Gibson**, Applied Multilayers Ltd. (United Kingdom)

12.15 to 12.45 **Question and Answer Session/Discussion Forum**

## Conference 6198 - Photonics in the Automobile

*Conference 6198 requires an Industry Programme or Symposium registration badge for admission.*

Salon Leicester

Thursday 6 April . . . . . 10.00 to 18.10

See p. 66 for full presentation listing. Automotive design is increasingly multidisciplinary, treating complex systems in which we now find photonics subsystems integrated with mechanical and electronic subsystems. These subsystems are related to lighting (inside and outside of the car), data transfer inside the car, displays of all kinds, sensors, hybrid processors, with optical interconnects, etc.

## Forum on Micro-Optics: Benefits to Industry

Salle Orangerie

Friday 7 April . . . . . 9.00 to 16.30

*The Micro-Optics forum requires an Industry Programme or Symposium registration badge for admission.*

**Hugo Thienpont** and **Tomasz Nasilowski**, Vrije Universiteit Brussel;  
**Jürgen Mohr** and **Holger Moritz**, Forschungszentrum Karlsruhe GmbH;  
**Malgorzata Kujawinska**, IMiF, Warsaw University of Technology

This forum aims at introducing the benefits of micro-optics to potential industrial users. It provides the participants with first hand information on micro-optics technologies and components, and their potential applications. Participants will have time to discuss specific questions with experts from all over Europe, in particular with members of the service and technology centres of the EC-Network of Excellence in Micro-optics, NEMO.



### Micro-Optics Forum Program:

9.00 to 9.40

NEMO - a powerful tool for micro-optics in Europe  
NEMO - the European Network on Micro Optics, an overview  
NEMO Industrial User Club (IUC)

9.40 to 10.30

NEMO service centre 1 - capabilities and services to industry  
Centre for modelling of micro-optical components  
Centre for fabrication of micro-optical systems

10.30 to 11.00 . . . Coffee break

11.00 to 12.15

NEMO service centre 2 - capabilities and services to industry  
Centre for characterization of micro optical components and new measurement tools  
Centre for assembly & packaging of micro optics  
Centre for reliability & standardization for micro optics

12.15 to 13.15 . . . Lunch

13.15 to 14.05

Food Chain in Micro Optics 1: Fibre sensors  
Fibre sensors for strain & temperature measurement  
Design, fabrication and characterization of new fibres for sensor applications

14.10 to 15.00

Food Chain in Micro Optics 2: Micro Lenses  
Advantages of using micro lenses in imaging applications  
Design, fabrication and characterization of micro lenses and lens arrays

15.00 to 15.30 . . . Coffee break

15.30 to 16.50

Application fields of micro optics  
Optical interconnects at the PCB level  
Diffractive and sub-wavelength micro-optics for light management  
Infrared micro optics  
Emerging applications in Micro Optics

16.50 to 17.00 . . . Summary & conclusions

### Invited Speakers:

**Hugo Thienpont**, Department of Applied Physics and Photonics, Vrije Univ. (Belgium)

**Malgorzata Kujawinska**, Warsaw Technical Univ., Institute of Micromechanics and Photonics (Poland)

**Jürgen Mohr**, Abteilung Mikrooptik Forschungszentrum Karlsruhe, Institut für Mikrostrukturtechnik (Germany)

**Tomasz Nasilowski**, Department of Applied Physics and Photonics, Vrije Univ. (Belgium)

**Norbert Lindlein**, Chair of optics, Friedrich-Alexander-Univ. Erlangen-Nuernberg (Germany)

**Youri Meuret**, Department of Applied Physics and Photonics, Vrije Univ. (Belgium)

**Mo Taghizadeh**, Optical Interconnects, Heriot-Watt-Univ. (United Kingdom)

**Heidi Ottevaere**, Department of Applied Physics and Photonics, Vrije Univ. (Belgium)

**Peter van Daele**, Univ. Gent, INTEC (Belgium)

**Pentti Karioja**, VTT Electronics/Optoelectronics (Finland)

**Francis Berghmans**, SCK•CEN, Belgian Nuclear Research Ctr. (Belgium)

**Waclaw Urbanczyk**, Institute of Physics, Wroclaw Univ. of Technology (Poland)

**Kenneth Weible**, SUSS MicroOptics SA (Switzerland)

**Marc Schneider**, Abteilung Mikrooptik Forschungszentrum Karlsruhe, Institut für Mikrostrukturtechnik (Germany)

**Markus Rossi**, Heptagon Oy (Finland)

**Andreas Gombert**, Fraunhofer Institute for Solar Energy Systems (Germany)

**Peter Muys**, VDM Laser Optics NV (Belgium)

**Nathalie Vermeulen**, Department of Applied Physics and Photonics, Vrije Univ. (Belgium)

**Olivier Parriaux**, TSI lab, Saint-Etienne Univ. (France)

**Christophe Gorecki**, Lab. d'Optique P.M. Duffieux, Univ. de Franche-Comté (France)

## European Photonics Innovation Village

Contades Est  
Open during Exhibition hours.



Under the Patronage of Henri Rajbenbach and Ronan Burgess, European Commission, Directorate General Information Society and Media, Belgium

### Innovation Village

The European Photonics Innovation Village is organized to support and publicise research teams from universities, nonprofit institutions and research centres working on research, new applications or product development. All participants can be seen at the European Photonics Innovation Village in the upper exhibit hall Contades Est. The Village includes research programmes from around the world and showcases the transfer of optics/photonics research and technology into new and useful products. Plan to attend the finale of the competition, the Innovation Village Awards on Wednesday, 16.30 - 17.00 hrs in the downstairs exhibit hall Arp, Product Demo area.

This will be a judged competition with several awards. See web for complete competition details.

### Innovation Village Judging Panel

**Chair:** Henri Rajbenbach, European Commission, DG Information Society and Media, Belgium

**Members:** Paul McManamon, Air Force Research Lab, USA; Ronan Burgess, European Commission, DG Information Society and Media, Belgium; Hugo Thienpont, Vrije Universiteit, Belgium; Giancarlo Righini, CNR, Italy; Patrick Meyrueis, Univ. Louis Pasteur, France; Paul Smigielski, RhenaPhotonics Alsace President, France; Michel Faupel, NIBR-Novartis and RhenaPhotonics Alsace Vice-president (biophotonics); Bernard Kress (LSP), France; Elmar Wagner, Fraunhofer Institut IPM, Germany (to be confirmed).

### Awards

The Innovation Village Selection Committee will grant awards in specific categories. Awards will be announced on Wednesday evening. Award categories are as follows, both in a European and Non-European category:

- 1) Best overall product
- 2) Best design (based on the design of the technology into the product)
- 3) Best technology (based on the best new use of technology)
- 4) Best marketability (based on the product most likely to sell in the marketplace)
- 5) Best application (based on the proposed solution to a critical problem)

### European Village

The European Village will include displays of literature and information on European photonics initiatives, Networks of Excellence, Integrated Projects and other EC projects that will showcase their consortia as well as recent breakthroughs.

## Lunch with the Experts - A Networking Event

Galerie de Marbre

Wednesday 5 April ..... 12.30 to 13.30 pm

Combine fun, food and networking at this engaging, free event open to all students. Hosted by SPIE Student Services, this event will feature experts willing to share their accumulated wisdom on career paths within the optics and photonics industry. Advance sign-up is required at Registration by Monday at 17.00. Among the experts in attendance will be the Hot Topics speakers.

## Map out your Career

Salon Stuttgart

Thursday 6 April ..... 11.30 to 12.30

### Photonics: A Novel Technology for the 21st Century.



**Hugo Thienpont**, Director of Research, Vrije Univ. Brussels

Learn about emerging technologies and map out your career in the Photonics world. Get insight into navigating possibilities in research and industry, and to European projects.

## Technical Writing for Physical Scientists and Engineers

This course describes how to write clear, easy-to-follow, technical articles and reports that are appropriate for any given audience. Instruction progresses from the basic philosophy of communication and how this affects the core content and style of a document to article structure, paragraph construction, sentence construction, and use of vocabulary and punctuation. As well as teaching the basic rules of technical writing, this course explains the principles that underpin these rules. This deeper understanding will allow attendees to make more informed decisions about which elements of style they must follow, and to make better choices when faced with the many gray areas involved with technical writing. Finally, the course will help scientists and engineers to develop an eye for problems in their own writing and that of their colleagues.

### LEARNING OUTCOMES

This course will enable you to:

- consider the audience at the beginning of the writing process, and use this knowledge to identify the appropriate content and level for the article
- use and design article structures that best relate the content in question
- construct paragraphs and sentences appropriately
- maximize information conveyed, and minimize reader boredom, by avoiding repetition
- consistently use the appropriate style, voice, and tense for a given document
- avoid hype, jargon, clichés, gibberish, mixed metaphors, and poor punctuation

### INTENDED AUDIENCE

This course is intended for anyone who feels their writing needs improvement: from Ph.D. students to consulting engineers to professors. Reasonable fluency in English is required.

### INSTRUCTOR

**Sunny Bains** is a scientist and journalist. She has been writing for the technical and popular science press, including *Laser Focus World*, *Electronic Engineering Times*, *New Scientist*, *Science*, and *The Economist*, for almost 15 years, edits six newsletters related to machine intelligence, imaging, and emerging computing technologies, and consults for the European Commission and the (UK) Engineering and Physical Sciences Research Council. At Imperial College London, she is both the core technical writing lecturer for the Graduate School of Engineering and Physical Sciences and lead tutor in technical communication for the Department of Electrical and Electronic Engineering.

#### Course level: Introductory

Free for students registered for Photonics Europe 2006.

**WS611 CEU .35 €45 / €85 USD**

**Wednesday 13.30 to 17.30**



### Recruiting Services

Bring copies of your open positions to Photonics Europe and post them on the boards provided for this purpose. While at the meeting you will also be able to review any CVs posted by meeting attendees; look for the notebook located near the job posting boards. If you're searching for highly skilled candidates for hard-to-fill positions this is a great place to start.

If you don't find the candidates you need, SPIEWorks, the SPIE employment website can help you target a skilled group of optics and photonics professionals after the meeting. Contact Robert Dentel at +1 360 715 3705 or email [sales@spieworks.com](mailto:sales@spieworks.com). Membership in SPIE is not required to post jobs.

### Employment Opportunities

Plan to stop by these same job boards throughout the meeting and review current employment opportunities.

In addition to our onsite posting boards, SPIEWorks, the SPIE employment website, offers you an online job database, resume posting, and email notification services year round. Visit [www.spieworks.com](http://www.spieworks.com)



### MICOS: Micropositioning and Hexapods

MICOS offers a wide range of positioning systems and optical benches. Linear, rotary and elevator stages as well as multiaxis systems and high resolution controllers are standard products. We also design complete systems, OEM and vacuum products. Competences include semiconductor, telecommunication technologies, laser technology, biotech, sensors and R&D.

#### MICOS GmbH

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D 79427 Eschbach, Germany

Phone: +49/7634/5057-231, Fax: +49/7634/5057-393  
[sales@micos-online.com](mailto:sales@micos-online.com), [www.micos.ws](http://www.micos.ws)

## Photonics Europe

3 to 7 April 2006  
Palais de la Musique et des Congrès  
Place de Bordeaux, Strasbourg, France  
www.strasbourgmeeting.com; Tel: (33) 03 88 37 67 67

## Registration Hours

*Palais de la Musique et des Congrès, Foyer/Galerie le Corbusier*

Sunday 2 April	13.00 to 17.30
Monday 3 April	07.30 to 17.00
Tuesday 4 April	08.00 to 17.00
Wednesday 5 April	08.00 to 17.00
Thursday 6 April	08.00 to 16.00
Friday 7 April	08.00 to 11.00

## Exhibition Hours

*Palais de la Musique et des Congrès  
Espace d'Arp and Contades Ouest  
Use Entrée Schweitzer of the Convention Centre*

Tuesday 4 April	10.00 to 17.00
Wednesday 5 April	10.00 to 17.00
Thursday 6 April	10.00 to 16.00

## Speakers Preview/Load Station

All speakers are asked to check in at the Speaker Preview/Load Station, Salle President, for submittal of presentations, by 16.00 the day prior to the presentation of the paper. Friday speakers please note that you must load before 11.00 on Friday.

Speaker Preview/Load Station hours:

Sunday 2 April	13.00 to 17.30
Monday 3 April	07.00 to 17.00
Tuesday 4 through Thursday 6 April	07.30 to 17.00
Friday 7 April	08.00 to 11.00

## Interactive Poster Sessions and Receptions

*Included with Symposium Registration.*

*Galerie de Marbre and Forum Hall*

Monday 3 April	18.00 to 20.30
Thursday 6 April	18.00 to 20.00

Interactive poster sessions will be held on Monday 3 April from 18.00 to 20.30 and Thursday 6 April from 18.00 to 20.00. The authors will be able to set up their poster papers in the interactive session areas, Galerie de Marbre and Forum Hall (ground and first floors), starting on Monday and Thursday after the morning coffee break. Supplies for posting papers will be available in the interactive session area. Attendees can preview the papers during the day before the formal reception. Interactive paper viewing will culminate in the formal interactive session with light refreshments starting at 19.00. Authors need to be present at their posters for discussion with attendees during the formal session from 18.00 to 20.30 Monday, and 18.00 to 20.00 Thursday. Subsequently, it is each author's responsibility to remove his/her presentation immediately at the end of the session. SPIE Europe assumes no responsibility for presentations left up after this time. Attendees are requested to wear their conference registration badge to gain access to the interactive papers session and reception.

## Video/Digital Recording Policy

For copyright reasons, video or digital recording of any conference session, short course, or poster is strictly prohibited without written prior consent from each specific presenter to be recorded. Individuals not complying with this policy will be asked to leave a given session and to surrender their film or disc. It is the responsibility of the presenter to notify SPIE if consent is given. Consent forms are available at SPIE Registration Desk.

## Coffee Breaks

Monday, Tuesday, Thursday	10.00 to 10.30 and 15.00 to 16.00
Wednesday	10.00 to 11.00 and 15.30 to 16.00
Friday	10.00 to 11.00

Coffee will be served during the morning and afternoon breaks. Please check the individual technical conference listings for exact times. On Tuesday to Thursday, coffee will be served in the Exhibition Hall, Espace d'Arp on the Ground Floor and Contades Ouest on the first floor.

## Desserts

Tuesday, Thursday	15.00 to 15.30
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Complimentary tickets for dessert snacks will be included in attendee registration packets. These dessert snacks will be served in the Exhibition Hall, Espace d'Arp on the Ground Floor and Contades Ouest on the first floor of the convention centre on Tuesday and Thursday from 15.00 to 15.30, during coffee breaks.

## QuickLunch Coupon

Full conference technical registrants will receive one QuickLunch coupon redeemable for a lunch/dejeuner on one of three Exhibition days: Tuesday, Wednesday, or Thursday. Coupons will be accepted from 12.00 to 13.00 each day in the designated Quicklunch area of the Exhibition Halls. Coupons will be accepted each day. Some restrictions apply. Please refer to the coupon you receive in your registration packet.

## Messages for Attendees

Messages for attendees at Photonics Europe can be left by calling the Palais de la Musique et des Congrès at Tel. 33 (0) 3 88 37 67 67, Fax 33 (0) 3 88 35 38 17 and asking for the SPIE conference registration desk. Messages will be taken during registration hours Monday through Friday. Attendees should check the message boards at the message center on a daily basis to receive their messages.

## Internet Access/ WiFi

*Convention Centre, Vestiaire near Auditorium Schweitzer*

Monday to Friday during registration hours.

Several internet access terminals will allow attendees to access their internet e-mail during the conference. There will be a 10-minute time limit per each person's internet session.

Attendees may individually purchase WiFi access. Open browser and follow directions for purchase by credit card from the SWISSCOM EUROSPOT website. Prices include VAT.

2 hours	WIFI2	9,50
24 hours	WIFI24	29,00
7 days	WIFI7	99,00

## SPIE Europe Marketplace

*Near Registration Desk*

Open during registration hours. SPIE publications will be for sale in the Registration area. Take advantage of discounts for Photonics Europe attendees

## Luggage Storage and Coat Check

*Convention Centre, Ground Floor near Entrée Schweitzer.*

Monday-Friday	7.30 to 18.00
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There will be a minimal cost for coat and luggage storage as required by the Convention Centre.

## Child Care

ISIS KIDS, 1 rue de la Hallau, 67400 Illkirch-Graffenstaden  
 Tel: 03 88 55 43 74 or 06 64 17 76 66; Fax: 03 88 65 07 26; Email: isiskids@aol.com

Child sitting is available for a few hours per day, a full day, a night, a weekend, etc., to fit your needs.

Note: SPIE does not imply an endorsement or recommendation of this service. This contact is provided on an information-only basis for your further analysis and decision. Other services may be available.

## Travel by Tram

The Strasbourg public transport network is composed of 23 bus lines and 4 tram lines accessing the whole Strasbourg area. The Relay-Tram parking lots offer parking next to a tram station and access the city center within a few minutes. Information CTS (Company of Strasbourg Transportation) Tel: (33) 03 88 77 70 70 [www.cts-strasbourg.fr](http://www.cts-strasbourg.fr)

To get to Palais de la Musique et des Congrès de Strasbourg from the Strasbourg Airport-Entzheim, take the airport shuttle, leaving every 20 minutes from the "arrivals terminal" to Tram stop Baggersee, where there is a connection to Tram Line A to downtown. Take Tram Line A (towards Hautepierre Maillon) and get off at Tram Stop Homme de Fer. Transfer to Tram Line B (towards Hoenheim Gare) and get off at either Tram Stop Lycée Kléber, which is within walking distance and just before the Palais de la Musique, or Tram Stop Wacken, which is just after the Palais de la Musique.

To get to the airport from the center of Strasbourg, take tram line A (towards Illkirch Lixembuhl) and get off at Baggersee, where there is a shuttle leaving every 20 minutes, arriving at the airport in 12 minutes.

**Airport Shuttle Fare:** One way 4,80 €, Return 8,80 €

## The Relay-Tram Parking Lots

Set up along the tram lines, the Relay-Tram parking lots (P+R) offer the possibility to park your vehicle close to a tram station and travel downtown without worry of traffic or parking. In return for the price of parking for the day, all occupants of the vehicle receive a ticket permitting a round-trip by tram. For parking solutions [www.parcus.com](http://www.parcus.com)

## The Tour Pass & Familipass

The Strasbourg Transportation Company (CTS) offers to tourists a daily ticket, The Tour Pass, @ 3 € for 24 hours usage on buses and trams all year round. The Familipass @ 3,80 € good for 24 hours is for a family of 2 to 5 persons (minimum 1 parent and one child under 18 years old).

## Travel by Rail to Strasbourg

Entzheim Rail Station is only 5 minutes walking distance from the airport terminal. For the train schedule: <http://www.strasbourg.aeroport.fr/E/trains.html> The train runs regularly about every half an hour from 5:34 through 20:42. It is a 14 minute ride from downtown Strasbourg to Entzheim Station at the airport. Railway information Tel: 08 92 35 35 35, [www.sncf.com](http://www.sncf.com)

## Local Attractions and Sightseeing

The historic heart of Strasbourg is located in a curve of the Ill, a tributary of the Rhine. There is an impressive number of architectural treasures including massive medieval towers; neat, half-timbered houses; and prestigious town houses from the 18th Century concentrated in this perimeter of 83 hectares. The best way to tour the town is to stroll from one of the many very lively squares to the next. It is hard to get lost if you simply use the city's landmark, the gigantic silhouette of the cathedral, as a reference point. You should do the tour on foot, since Strasbourg is also the first city in France making a concerted effort to limit automobile traffic downtown with various measures. Through traffic is not permitted downtown, and more parking spaces have been provided on the periphery, while measures have been taken to encourage cooperation between the public transportation system, the futuristically designed tramway, bicyclists and pedestrians. But a visit of the city should not be limited to the downtown area, as picturesque as it might be. Be sure to see the European Quarter, a classic example of very contemporary architecture.

Office de Tourisme de Strasbourg et sa Region  
 17, place de la Cathédrale, 67082 Strasbourg Cedex  
 Tel: 03 88 52 28 28, Fax: 03 88 52 28 29  
[www.ot-strasbourg.fr](http://www.ot-strasbourg.fr); Email: [info@ot-strasbourg.fr](mailto:info@ot-strasbourg.fr)  
 Strasbourg Info: [www.strasbourg.co.uk](http://www.strasbourg.co.uk)

## Car Rental

### Photonics Europe • April 3-7, 2006 • Strasbourg, France

Meet with success the Hertz way Hertz car rental checklist

1. Call the Hertz International Reservation Center at 1-800-654-3001 in the USA or your local Hertz Reservation Center to receive a special discount for the Photonics Europe Meeting. You will receive 10% off qualifying retail rates with Unlimited Mileage in participating locations in France. Be sure to identify yourself as a Photonics Europe attendee. The PC# below must be on your advance reservation to receive this special offer. You must present this coupon at time of rental in order to receive this discount.
2. This special offer is available for rentals from March 15-April 15, 2006



**Photonics Europe**

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Qualifying Retail Rates

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#### Important Rental Information

1. The Photonics Europe Meeting discount is available at participating locations in France.
2. The 10% Discount applies to rentals on Affordable Rates from March 15-April 15, 2006.
3. Reservations must be made at least 24 hours prior to vehicle pickup, using the PC# on the coupon.
4. Minimum rental period is 1 days.
5. Offer includes Compact and above (manuals and automatics)
6. Discount does not apply to taxes, intercity drop charges, insurance or optional services.
7. Certificate has no cash value and may not be combined with any other offer, discount or promotion. Certificate must be presented and surrendered at time of rental.
8. Normal intercity rules and rate restrictions apply.
9. Minimum rental age is 25 (exceptions apply). Hertz standard driver and credit qualifications for the rental location apply. Blackout periods may apply.



# Photonic Crystal Materials and Devices

*Conference Chairs:* **Richard M. De La Rue**, Univ. of Glasgow (United Kingdom); **Pierre Viktorovitch**, École Centrale de Lyon (France); **Ceferino Lopez**, Consejo Superior de Investigaciones Científicas (Spain); **Michele Midrio**, Univ. degli Studi di Udine (Italy)

*Program Committee:* **Roel G. Baets**, Univ. Gent (Belgium); **Roberto Cingolani**, Univ. degli Studi di Lecce (Italy); **Dominique Coquillat**, Univ. Montpellier II (France); **Jean-Michel Gerard**, CEA Grenoble (France); **Klas Hjort**, Uppsala Univ. (Sweden); **Thomas F. Krauss**, Univ. of St. Andrews (United Kingdom); **Ariel Levenson**, Lab. de Photonique et de Nanostructures (France); **Olivier M. Parriaux**, Univ. Jean Monnet Saint-Etienne (France); **Pablo A. Postigo**, Consejo Superior de Investigaciones Científicas/Instituto de Microelectronica (Spain); **Herve Rigneault**, Institut Fresnel (France); **Ulrike Woggon**, Univ. Dortmund (Germany)



**Conference 6182 contains papers funded by and/or related to current EU research projects contained in Framework VI.**

*Paper Numbers:*

1, 6, 7, 14, 21, 23, 24, 28, 29, 32, 37, 40, 50, 51, 56, 59, 62, 63, 64, 65, 69, 86, 89, 90.

## Monday 3 April

### SESSION 1

**Schuman** ..... **Mon. 10.30 to 12.20**

#### Self-assembled Photonic Crystals I

*Chairs:* **Clivia M. Sotomayor Torres**, Tyndall National Institute (Ireland); **Sergei G. Romanov**, Tyndall National Institute (Ireland)

10.30: **Materials synthesis, morphologies, and optical properties of composite opals**, C. López, Consejo Superior de Investigaciones Científicas (Spain) ..... [6182-01]

10.50: **Radiation dynamics of PbSe quantum dots embedded in three-dimensional photonic crystals**, M. J. Ventura, C. Bullen, M. Gu, Swinburne Univ. of Technology (Australia) and Ctr. for Ultrahigh-bandwidth Devices for Optical Systems (CUDOS) (Australia) . [6182-02]

11.10: **Optical effects in artificial opals infiltrated with gold nanoparticles**, D. Comoretto, Univ. degli Studi di Genova (Italy); V. Morandi, F. Marabelli, Univ. degli Studi di Pavia (Italy); V. Amendola, M. Meneghetti, Univ. degli Studi di Padova (Italy) ..... [6182-03]

11.30: **Phase sensitive measurements on 3D opal-based photonic crystals**, J. F. Galisteo-López, Consejo Superior de Investigaciones Científicas (Spain) and Univ. degli Studi di Pavia (Italy); M. Galli, M. Patrini, A. Balestreri, L. C. Andreani, Univ. degli Studi di Pavia (Italy); C. López, Consejo Superior de Investigaciones Científicas (Spain) [6182-04]

11.50: **Full processing of colloidal photonic crystals by spin-coating (Invited Paper)**, H. R. Miguez, A. Mihi, R. Pozas, G. Lozano, M. Ocaña, Instituto de Ciencia de Materiales de Sevilla (Spain) ..... [6182-05]  
Lunch Break ..... 12.20 to 13.20

### SESSION 2

**Schuman** ..... **Mon. 13.20 to 15.20**

#### Self-assembled Photonic Crystals II

*Chair:* **Hernan R. Miguez**, Instituto de Ciencia de Materiales de Sevilla (Spain)

13.20: **Characterisation of opal photonic crystals and hetero-crystals by weak light scattering technique**, S. G. Romanov, C. M. Sotomayor Torres, Tyndall National Institute (Ireland) ..... [6182-06]

13.40: **Light propagation anisotropy in thin film opal photonic crystals**, S. G. Romanov, C. M. Sotomayor Torres, Tyndall National Institute (Ireland); J. Ye, R. Zentel, Johannes Gutenberg Univ. Mainz (Germany); D. N. Chigrin, Univ. Bonn (Germany) ..... [6182-07]

14.00: **Engineered colloidal crystals with tunable optical properties**, S. Ravaine, P. Massé, S. Reculosa, Ctr. de Recherche Paul-Pascal (France) ..... [6182-08]

14.20: **Photonic crystals from inorganic-polymeric hybrid particles**, T. E. Ruhl, P. Spahn, Deutsches Kunststoff Institut (Germany); C. Hermann, C. Jamois, O. G. Hess, Univ. of Surrey (United Kingdom) .... [6182-09]

14.40: **Photonic bandgap response of structurally modified inverse non-close-packed opals by template directed multilayer atomic layer deposition**, E. Graugnard, D. Gaillot, J. S. King, C. J. Summers, Georgia Institute of Technology (USA) ..... [6182-10]

15.00: **Tunable defects in colloidal photonic crystals**, F. Fleischhaker, Univ. of Toronto (Canada) and Johannes Gutenberg Univ. Mainz (Germany) and Instituto de Ciencia de Materiales de Sevilla (Spain); A. Arsenault, N. Tetreault, Z. Wang, V. Kitaev, F. C. Peiris, Univ. of Toronto (Canada); A. Mihi, H. R. Miguez, Instituto de Ciencia de Materiales de Sevilla (Spain); G. von Freymann, Univ. Karlsruhe (Germany); I. Manners, Univ. of Toronto (Canada); R. Zentel, Johannes Gutenberg Univ. Mainz (Germany); G. A. Ozin, Univ. of Toronto (Canada) ..... [6182-11]  
Coffee Break ..... 15.20 to 15.40

### SESSION 3

**Schuman** ..... **Mon. 15.40 to 17.40**

#### Beam Shaping and Steering

*Chairs:* **David Cassagne**, Univ. Montpellier II (France); **Emmanuel Centeno**, Univ. Montpellier II (France)

15.40: **Magneto-optical properties of three-dimensional photonic crystals with a planar magneto-optic defect**, A. Khanikaev, M. Inoue, Toyohashi Univ. of Technology (Japan); A. B. Granovsky, M.V. Lomonosov Moscow State Univ. (Russia) ..... [6182-12]

16.00: **Comparison of polarization splitter devices based on planar photonic crystals**, J. van Look, V. A. Zabelin, R. Houdré, École Polytechnique Fédérale de Lausanne (Switzerland); M. V. Kotlyar, T. F. Krauss, Univ. of St. Andrews (United Kingdom) ..... [6182-14]

16.20: **Photonic crystal lens formed by air-hole array with gradually varied radii**, H. Chien, C. Chen, National Central Univ. (Taiwan) [6182-15]

16.40: **Disorder-induced losses in photonic crystal waveguides and nanocavities**, L. C. Andreani, D. Gerace, Univ. degli Studi di Pavia (Italy) ..... [6182-16]

17.00: **Impedance matching in photonic crystal microcavities**, A. Di Falco, Univ. degli Studi di Roma Tre (Italy); C. Conti, Univ. degli Studi di Roma/La Sapienza (Italy); G. Assanto, Univ. degli Studi di Roma Tre (Italy) ..... [6182-17]

17.20: **Wavelength filter based on photonic crystal cavities for visible wavelengths**, J. Kouba, W. Eberhardt, B. Loechel, BESSY GmbH (Germany) ..... [6182-18]

## Tuesday 4 April

### SESSION 4

**Schuman** ..... **Tues. 10.30 to 12.10**

#### Fabrication and Materials

*Chairs:* **Anand Srinivasan**, Kungliga Tekniska Högskolan (Sweden)

10.30: **3D photonic crystal fabrication by the microexplosion method**, A. F. Matthews, The Australian National Univ. (Australia); G. Zhou, M. Gu, Swinburne Univ. of Technology (Australia); Y. S. Kivshar, The Australian National Univ. (Australia) ..... [6182-19]

10.50: **Laser etching of periodic 1D and 2D submicron relief gratings on pre-structured fused silica surface**, R. Böhme, K. Zimmer, Leibniz-Institut für Oberflächenmodifizierung e.V. (Germany) ..... [6182-20]

- 11.10: **Two-dimensional Bragg reflectors fabricated in IOG-1 phosphate glass using multibeam UV-laser interference**, S. Pissadakis, C. Pappas, Foundation for Research and Technology-Hellas (Greece) ..... [6182-21]
- 11.30: **Design and fabrication of 2D silicon photonic crystal membranes by focused ion-beam processing**, W. Hopman, R. M. de Ridder, C. G. Bostan, S. K. Selvaraja, V. J. Gadgil, Univ. Twente (Netherlands); L. Kuipers, FOM Institute for Atomic and Molecular Physics (Netherlands); A. Driessen, Univ. Twente (Netherlands) ..... [6182-22]
- 11.50: **Compact and efficient fiber-to-waveguide grating couplers in InP-membrane**, F. Van Laere, Univ. Gent (Belgium); M. Ayre, Univ. of St. Andrews (United Kingdom); D. Taillaert, D. Van Thourhout, Univ. Gent (Belgium); T. F. Krauss, Univ. of St. Andrews (United Kingdom); R. G. Baets, Univ. Gent (Belgium) ..... [6182-23]
- Lunch Break ..... 12.10 to 13.20

## SESSION 5

Schuman ..... Tues. 13.20 to 16.20

**Nonlinear, Electro-optic, and Tunable Photonic Crystals**

*Chairs: Michele Midrio*, Univ. degli Studi di Udine (Italy);  
*Concita Sibilila*, Univ. degli Studi di Roma/La Sapienza (Italy)

- 13.20: **Growth of 2D KTP photonic crystals for efficient second order nonlinear optical processes**, S. Di Finizio, J. Martorell, ICFO/Institut de Ciències Fotòniques (Spain); J. J. Carvajal, A. Peña, M. Aguiló, T. Trifonov, J. Pallares, L. F. Marsal, Univ. Rovira i Virgili (Spain); R. Alcubilla, A. Rodriguez, Univ. Politècnica de Catalunya (Spain); F. Diaz, Univ. Rovira i Virgili (Spain) ..... [6182-24]
- 13.40: **Tunable electro-optic photonic crystals fabricated through template directed multilayer atomic layer deposition**, D. Gaillot, E. Graugnard, J. S. King, C. J. Summers, Georgia Institute of Technology (USA) ..... [6182-25]
- 14.00: **Numerical and experimental analysis of lithium niobate photonic crystals waveguides**, M. Roussey, J. Amet, F. I. Baida, M. P. Bernal, N. Courjal, Univ. de Franche-Comté (France) ..... [6182-26]
- 14.20: **Electrooptically tunable photonic crystals**, J. Wülbern, A. Y. Petrov, M. Schmidt, M. Eich, Technische Univ. Hamburg-Harburg (Germany) ..... [6182-27]
- 14.40: **3D photonic crystals based on epitaxial III-V semiconductor structures for nonlinear optical interactions**, H. M. Chong, R. M. De La Rue, Univ. of Glasgow (United Kingdom); L. O'Faolain, T. F. Krauss, Univ. of St. Andrews (United Kingdom); N. Belabas, A. Levenson, F. Raineri, R. Raj, I. Sagnes, Lab. de Photonique et de Nanostructures (France); M. Astic, P. Delaye, P. Lalanne, Institut d'Optique (France); R. Frey, G. Roosen, Institut d'Optique (France) ..... [6182-28]
- 15.00: **Tuneable planar photonic crystals**, R. Ferrini, P. El-Kallassi, École Polytechnique Fédérale de Lausanne (Switzerland); J. Martz, École Polytechnique Fédérale de Lausanne (Switzerland) and Rolic Technologies Ltd. (Switzerland); L. Zuppiroli, B. Wild, L. A. Dunbar, N. Le Thomas, R. Houdré, École Polytechnique Fédérale de Lausanne (Switzerland); P. Strasser, F. Robin, ETH Zürich (Switzerland); A. Talneau, Lab. de Photonique et de Nanostructures (France); A. Berrier, S. Anand, Kungliga Tekniska Högskolan (Sweden) ..... [6182-29]
- Coffee Break ..... 15.20 to 15.40
- 15.40: **Studies of photonic crystal structures infiltrated with planar liquid crystal textures**, E. E. Kriezis, E. P. Kosmidou, Aristotle Univ. of Thessaloniki (Greece) ..... [6182-30]
- 16.00: **Two-dimensional photonic crystals from semiconductor material with polymer filled holes**, R. van der Heijden, C. Kjellander, C. Carlström, J. Snijders, R. W. van der Heijden, C. W. Bastiaansen, D. J. Broer, F. Karouta, R. Nötzel, Technische Univ. Eindhoven (Netherlands); E. van der Drift, Technische Univ. Delft (Netherlands); H. W. Salemink, Technische Univ. Eindhoven (Netherlands) and Technische Univ. Delft (Netherlands) ..... [6182-31]

## SESSION 6

Schuman ..... Tues. 16.40 to 17.30

**Phononic and Terahertz Photonic Structures**

*Chair: Richard M. De La Rue*, Univ. of Glasgow (United Kingdom)

- 16.40: **Elastic bandgaps for surface modes in an ultrasonic lithium niobate phononic crystal (Invited Paper)**, S. Benchabane, A. Khelif, J. Rauch, L. J. Robert, Institut Femto-ST (France); T. Pastureauud, TEMEX SA (France); V. Laude, Institut Femto-ST (France) ..... [6182-33]
- 17.10: **Metallic photonic crystal for THz radiation**, J. Kouba, D. Schondelmaier, U. Schade, W. Eberhardt, B. Loechel, BESSY GmbH (Germany) ..... [6182-34]

## Wednesday 5 April

## SESSION 7

Schuman ..... Wed. 08.10 to 10.40

**Propagation, Dispersion, and Slow Light I**

*Chair: Pierre Viktorovitch*, École Centrale de Lyon (France)

- 08.10: **Transmittance anisotropy of 3D photonic crystals due to Bragg diffraction effects**, A. V. Baryshev, Toyohashi Univ. of Technology (Japan) and A.F. Ioffe Physico-Technical Institute (Russia); M. Inoue, Toyohashi Univ. of Technology (Japan) and CREST, Japan Science and Technology Corp. (Japan); M. F. Limonov, A.F. Ioffe Physico-Technical Institute (Russia); A. V. Sel'kin, A.F. Ioffe Physico-Technical Institute (Russia) and Toyohashi Univ. of Technology (Japan) ..... [6182-35]
- 08.30: **The Sommerfeld precursor in photonic crystals**, R. Uitham, B. J. Hoenders, Univ. of Groningen (Netherlands) and Materials Science Ctr. (Netherlands) ..... [6182-36]
- 08.50: **Plane-wave and cylindrical-wave admittance method for simulation of classical and photonic-crystal-based VCSELs**, M. Dems, T. G. Czystanowski, Politechnika Łódzka (Poland); K. P. Panajotov, Institute of Solid State Physics (Bulgaria) and Vrije Universiteit Brussel (Belgium) ..... [6182-37]
- 09.10: **Slow-light effect using omnidirectional-reflector waveguides**, H. Chiu, S. Lo, C. Chen, National Central Univ. (Taiwan) ..... [6182-38]
- 09.30: **Coherent control of excited atomic states inside a photonic bandgap**, H. Nihei, Polytechnic College Aomori (Japan); A. Okamoto, Hokkaido Univ. (Japan) ..... [6182-39]
- 09.50: **Recursive Green's function technique and its application to surface-state photonic cavities and waveguides**, A. I. Rahachou, I. V. Zozoulenko, Linköping Univ. (Sweden) ..... [6182-40]
- 10.10: **Proposals of inverse designed microscaled scattering optical elements (Invited Paper)**, A. Håkansson, J. Sánchez-Dehesa, Univ. Politècnica de València (Spain) ..... [6182-66]
- Coffee Break ..... 10.40 to 11.00

## SESSION 8

Schuman ..... Wed. 11.00 to 13.00

**Propagation, Dispersion, and Slow Light II**

*Chair: Peter Bienstman*, Univ. Gent and IMEC (Belgium)

- 11.00: **Fundamentals of couplonics**, Y. G. Boucher, Ecole Nationale d'Ingénieurs de Brest (France) ..... [6182-41]
- 11.20: **The (quasi) natural mode description of the scattering process by photonic crystals**, B. J. Hoenders, Univ. of Groningen (Netherlands); M. Bertolotti, Univ. degli Studi di Roma/La Sapienza (Italy) ... [6182-42]
- 11.40: **Exact solution to diffraction on a grating with parallelogramic grooves by the true modal method**, M. Foresti, L. Menez, Saint-Gobain (France); A. V. Tishchenko, Univ. Jean Monnet Saint-Etienne (France) ..... [6182-43]
- 12.00: **Optical mirage in graded photonic crystals (Invited Paper)**, E. Centeno, D. Cassagne, Univ. Montpellier II (France) ..... [6182-44]
- 12.30: **Analysis of superprism effect in silicon on insulator slab photonic crystals (Invited Paper)**, E. Cassan, D. Bernier, A. Lupu, D. Marris, L. Vivien, S. Laval, Univ. Paris-Sud II (France); L. El Melhaoui, P. Lyan, J. Fedeli, CEA-LETI (France) ..... [6182-45]
- Lunch Break ..... 13.00 to 14.10

**SESSION 9**

**Schuman** ..... **Wed. 14.10 to 15.30**  
**Negative Refraction, Left-handed, Metallic Media. and Metamaterials**

*Chair: Yann G. Boucher*, Ecole Nationale d'Ingénieurs de Brest (France)

- 14.10: **Conductivity and permittivity of two-dimensional metallic photonic crystals**, A. Pimenov, A. Loidl, Univ. Augsburg (Germany) ..... [6182-46]
- 14.30: **Ordered bimetallic nanostructures with hierarchical porosity and their applications**, A. Eychmüller, Technische Univ. Dresden (Germany); L. Lu, Kwansai Gakuin (Japan); N. Gaponik, Technische Univ. Dresden (Germany) ..... [6182-47]
- 14.50: **Near-field optical storage system including evanescent wave amplifier metamaterial based on photonic crystal**, S. Mimouni, CEA-LETI (France) ..... [6182-48]
- 15.10: **Negative refraction devices with photonic crystals**, V. Mocola, P. Dardano, Istituto per la Microelettronica e Microsistemi (Italy); L. Moretti, Univ. degli Studi Mediterranea di Reggio Calabria (Italy); I. Rendina, Istituto per la Microelettronica e Microsistemi (Italy) . [6182-49]

**Thursday 6 April**

**SESSION 10**

**Schuman** ..... **Thurs. 10.30 to 11.50**  
**PhCs: Multilayer Planar Structures**

*Chair: Juan Martorell*, Univ. Barcelona, ICFO (Spain)

- 10.30: **Femtosecond pulses chirping compensation by using 1D photonic crystals**, C. Sibilia, A. Belardini, M. Centini, Univ. degli Studi di Roma/La Sapienza (Italy) ..... [6182-50]
- 10.50: **Compact photonic devices based on 1D and 2D photonic crystal broadband reflectors**, S. Boutami, École Centrale de Lyon (France) and Lab. de Photonique et de Nanostructures (France); B. Ben Bakir, J. Leclercq, X. Letartre, P. Rojo-Romeo, M. Garrigues, C. Seassal, P. Viktorovitch, École Centrale de Lyon (France); M. Strassner, L. Le Gratiet, K. Merghem, I. Sagnes, Lab. de Photonique et de Nanostructures (France) ..... [6182-51]
- 11.10: **UV-modulated one-dimensional photonic-crystal resonator for visible lights**, S. Yang, H. Horng, National Taiwan Normal Univ. (Taiwan); C. Hong, Dayeh Univ. (Taiwan); H. Yang, National Taiwan Univ. (Taiwan) ..... [6182-52]
- 11.30: **GaN photonic crystal lasers**, C. Hou, Y. Ting, C. Chen, National Central Univ. (Taiwan) ..... [6182-54]

**SESSION 11**

**Schuman** ..... **Thurs. 11.50 to 12.20**

**Keynote Presentation**

11.50: **Elastic photonic crystals** ..... [6182-92]

Lunch Break ..... 12.20 to 13.20

**SESSION 12**

**Schuman** ..... **Thurs. 13.20 to 15.10**  
**Functionally Enhanced and Controlled Photonic Crystal Structures**

*Chair: Ceferino López*, Consejo Superior de Investigaciones Científicas (Spain)

- 13.20: **Biological photonic crystals: the bioengineering of metamaterials**, T. Fuhrmann-Lieker, M. Kucki, L. Lingys, Univ. Kassel (Germany) ..... [6182-55]
- 13.40: **Interaction of photonic crystals with nanoscopic particles: toward novel (bio-) sensing techniques (Invited Paper)**, M. Barth, O. Benson, Humboldt-Univ. zu Berlin (Germany) ..... [6182-56]
- 14.10: **Crystallization of polymer opals onto patterned silicon wafers**, J. Ye, Johannes Gutenberg Univ. Mainz (Germany) ..... [6182-57]
- 14.30: **Fabrication of large-area two-dimensional photonic crystals using interference lithography and direct writing of defects**, P. P. Baroni, T. Scharf, Univ. de Neuchâtel (Switzerland) ..... [6182-58]
- 14.50: **3D defect engineering in polymer opals**, B. Lange, R. Zentel, Johannes Gutenberg Univ. Mainz (Germany) ..... [6182-59]
- Coffee Break ..... 15.10 to 15.30

**SESSION 13**

**Schuman** ..... **Thurs. 15.30 to 17.50**  
**Photonic Crystal Fibres**

*Chair: Wacław Urbanczyk*, Politechnika Wroclawska (Poland)

- 15.30: **Hollow multimode-interference couplers**, S. Lo, S. Hsu, C. Chen, National Central Univ. (Taiwan) ..... [6182-60]
- 15.50: **Silica-based air-clad fibres: evaluation of drawing parameters**, R. Renner-Erny, L. Di Labio, V. Romano, W. A. Lüthy, T. Feurer, Univ. Bern (Switzerland) ..... [6182-61]
- 16.10: **Optical properties of photonic bandgap fibers made of silicate glass**, R. R. Buczynski, Univ. Warszawski (Poland); D. Pysz, P. Szarniak, R. Stepien, Instytut Technologii Materiałów Elektronicznych (Poland) ..... [6182-62]
- 16.30: **Analysis of light propagation mechanisms in photonic liquid crystal fibers**, K. Szaniawska, Politechnika Warszawska (Poland); T. Nasilowski, Vrije Univ. Brussel (Belgium); T. R. Wolinski, Politechnika Warszawska (Poland); H. Thienpont, Vrije Univ. Brussel (Belgium) ..... [6182-63]
- 16.50: **Susceptibility of highly birefringent doped core PCF to thermal and mechanical perturbations**, T. Nasilowski, Vrije Univ. Brussel (Belgium); G. Statkiewicz, M. Szpulak, J. Olszewski, T. Martynkien, W. Urbanczyk, Politechnika Wroclawska (Poland); P. Mergo, J. Wojcik, Univ. Marii Curie-Skłodowskiej (Poland); J. Van Erps, Vrije Univ. Brussel (Belgium); F. Berghmans, SCK•CEN (Belgium); H. Thienpont, Vrije Univ. Brussel (Belgium) ..... [6182-64]
- 17.10: **Polarization properties of photonic liquid crystal fibers**, T. R. Wolinski, P. Lesiak, S. Ertman, A. W. Domanski, Politechnika Warszawska (Poland); R. S. Dabrowski, E. Nowinowski-Kruszelnicki, Wojskowa Akademia Techniczna (Poland); J. Wójcik, Univ. Marii Curie-Skłodowskiej (Poland) ..... [6182-65]
- 17.30: **Fabrication and optical assessment of sol-gel-derived photonic bandgap dielectric structures**, A. Chiappini, C. Armellini, S. N. B. Bhaktha, A. Chiasera, M. Ferrari, Y. Jestin, M. Mattarelli, M. Montagna, E. Moser, Univ. degli Studi di Trento (Italy); G. Nunzi Conti, S. Pelli, G. C. Righini, Istituto di Fisica Applicata Nello Carrara (Italy); V. M. Sglavo, Univ. degli Studi di Trento (Italy) ..... [6182-13]

### ✓ Interactive Posters—Thursday

An interactive poster session will be held on Thursday 18.00 to 20.00. Posters will be on display after 10.00 Thursday morning in the Conference Centre Galerie de Marbre (ground floor) and Forum Hall (1st floor). An interactive poster session and reception with authors present will be held Thursday evening from 18.00 to 20.00. Light refreshments will be served.

- ✓ **Novel design of wavelength demultiplexer based on photonic crystal platform**, S. Haxha, Univ. of Kent (United Kingdom) [6182-67]
- ✓ **Off-axial laser effect in 1D photonic crystal with active layers**, O. N. Kozina, Saratov Div. of the Institute of Radio-Engineering (Russia); L. A. Melnikov, Saratov State Univ. (Russia) [6182-68]
- ✓ **Linear waveguides in photonic crystals based on periodic arrangement of spheres**, K. Vynck, D. Cassagne, E. Centeno, Univ. Montpellier II (France) [6182-69]
- ✓ **Photonic bandgap crystals on magneto-dielectric substrate for microwave frequency applications**, M. K. Tiwari, Univ. of Delhi (India); H. C. Gupta, D. C. Dube, Indian Institute of Technology Delhi (India) [6182-71]
- ✓ **Transmission parameters of holey fibers fabricated with randomly spaced holes distribution along the cladding**, F. E. Seraji, M. Rashidie, Iran Telecommunication Research Ctr. (Iran) [6182-72]
- ✓ **Prediction and verification of negative refraction in a two-dimensional photonic crystal slab using a rigorous semi-analytical approach**, A. Enayati, K.N. Toosi Univ. of Technology (Iran); M. Shahabadi, Univ. of Tehran (Iran); N. Granpayeh, K.N. Toosi Univ. of Technology (Iran) [6182-73]
- ✓ **Negative refraction of a three-dimensional left-handed metallic photonic crystal in microwave**, A. Mahmoudi, Univ. of Qom (Iran); A. Semnani, K.N. Toosi Univ. of Technology (Iran) [6182-74]
- ✓ **Photonic stop bands in opal films and crystalline liquids**, P. Dolganov, V. Masalov, E. N. Samarov, G. A. Emelchenko, Institute of Solid State Physics (Russia) [6182-75]
- ✓ **Single-mode lasing from ZnO-SiO<sub>2</sub> thin film nanoresonators obtained by magnetron sputtering method**, A. N. Gruzintsev, Institute of Microelectronics Technology (Russia); G. A. Emelchenko, Institute of Solid State Physics (Russia); C. Barthou, P. Benalloul, Univ. Pierre et Marie Curie (France); V. T. Volkov, Institute of Microelectronics Technology (Russia) [6182-76]
- ✓ **Finite-difference time-domain method simulation for tuning properties of H-PDLC film**, V. O. Kubytskyi, V. Y. Reshetnyak, National Taras Shevchenko Univ. of Kyiv (Ukraine); T. V. Galstian, Univ. Laval (Canada) [6182-77]
- ✓ **Nonlinear PBG structures for all-optical signal processing**, E. Y. Glushko, Institute of Semiconductor Physics (Ukraine) [6182-78]
- ✓ **Flexible control of dispersion in index guiding photonic crystal fibers governed by geometrical parameters**, M. Lucki, L. Bohac, Czech Technical Univ. in Prague (Czech Republic) [6182-79]
- ✓ **Experimental and theoretical analysis of dispersion characteristics of two-mode birefringent holey fiber**, P. Hlubina, Technical Univ. of Ostrava (Czech Republic); M. Szpulak, Politechnika Wroclawska (Poland); L. Knyblova, Technical Univ. of Ostrava (Czech Republic); G. Statkiewicz, T. Martynkien, Politechnika Wroclawska (Poland); D. Ciprian, Technical Univ. of Ostrava (Czech Republic); W. Urbanczyk, Politechnika Wroclawska (Poland) [6182-80]
- ✓ **Main factors for effecting photonic bandgap of photonic crystal**, X. Li, Y. Jiang, X. Wei, Beijing Institute of Technology (China) [6182-81]
- ✓ **Band structure calculations of 2D photonic pseudoquasicrystals obtainable by holographic lithography**, Y. V. Miklyaev, P. N. Dyachenko, South Ural State Univ. (Russia) [6182-82]
- ✓ **Optical properties of periodic and quasiperiodic one-dimensional photonic crystals: a comparison**, J. Zaghdoudi, Ecole Nationale d'Ingénieurs de Tunis (Tunisia) [6182-83]
- ✓ **Full vector beam propagation method modeling of dual-core photonic crystal fibre couplers**, R. Cherif, M. Zghal, Ecole Supérieure des Communications de Tunis (Tunisia); F. Bahoul, R. Chatta, Ecole Nationale d'Ingénieurs de Tunis (Tunisia) [6182-84]
- ✓ **Periodic transmission lines for terahertz bioMEMS**, T. Akalin, A. Treizebré, T. Dargent, B. Bocquet, Univ. des Sciences et Technologies de Lille (France) [6182-85]
- ✓ **Generation of light from a 1D random sequence of nonlinear domains**, X. Vidal, J. Martorell, Univ. Politècnica de Catalunya (Spain) and Institut de Ciències Fotòniques (Spain) [6182-86]
- ✓ **Synthesis and luminescence properties of opal-based photonic crystal with HEuEDTA**, A. S. Sinitkii, S. O. Klimonsky, Y. D. Tretyakov, M.V. Lomonosov Moscow State Univ. (Russia); M. Li, J. Li, J. Zhou, Sun Yat-Sen Univ. (China) [6182-87]
- ✓ **Nonlinear photonic crystal fiber with high birefringence made of silicate glass**, P. Szarniak, Instytut Technologii Materiałów Elektronicznych (Poland); M. Foroni, Univ. degli Studi di Parma (Italy); R. R. Buczynski, Univ. Warszawski (Poland); D. Pysz, Instytut Technologii Materiałów Elektronicznych (Poland); P. Wasylczyk, Univ. Warszawski (Poland); P. Gaboardi, F. Poli, S. Selleri, Univ. degli Studi di Parma (Italy); R. Stepien, Instytut Technologii Materiałów Elektronicznych (Poland) [6182-88]
- ✓ **Measurements of hydrostatic pressure and temperature sensitivity in birefringent holey fibers**, T. Martynkien, G. Statkiewicz, W. Urbanczyk, Politechnika Wroclawska (Poland); J. Wójcik, Univ. Marii Curie-Skłodowskiej (Poland) [6182-91]
- ✓ **Development of all-solid photonic crystal fibers**, I. Kujawa, P. Szarniak, Instytut Technologii Materiałów Elektronicznych (Poland); R. R. Buczynski, Univ. Warszawski (Poland); D. Pysz, R. Stepien, Instytut Technologii Materiałów Elektronicznych (Poland) [6182-91]
- ✓ **Femtosecond supercontinuum generation in photonic crystal fibers for transient absorption spectroscopy**, N. Le Cong, J. Léonard, B. Zietz, O. Crégut and S. Haacke, CNRS/IPMCS (France) [6182-93]



# Integrated Optics, Silicon Photonics, and Photonic Integrated Circuits

*Conference Chair:* **Giancarlo C. Righini**, Istituto di Fisica Applicata Nello Carrara (Italy)

*Cochairs:* **Seppo Honkanen**, Optical Sciences Ctr./The Univ. of Arizona (USA); **Suzanne Laval**, CNRS/Univ. Paris-Sud II (France)

*Program Committee:* **Gonçal Badenes**, Institut de Ciències Fotòniques (Spain); **Michel J. F. Digonnet**, Stanford Univ. (USA); **Alfred Driessen**, Univ. Twente (Netherlands); **Jean-Marc Fedeli**, CEA-LETI (France); **Mário F. Ferreira**, Univ. de Aveiro (Portugal); **Bahram Jalali**, Univ. of California/Los Angeles (USA); **Lorenzo Pavesi**, Univ. degli Studi di Trento (Italy); **Stefano Pelli**, Istituto di Fisica Applicata Nello Carrara (Italy); **Juha T. Rantala**, Silecs Oy (Finland); **Graham T. Reed**, Univ. of Surrey (United Kingdom); **Ali Serpengüzel**, Koç Univ. (Turkey); **Toshiaki Suhara**, Osaka Univ. (Japan)



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*Paper Numbers:*  
22, 38, 47, 73, 74.

## Monday 3 April

### SESSION 1

**Tivoli II** ..... Mon. 10.30 to 12.20

#### Photonic Integrated Circuits

*Chair:* **Giancarlo C. Righini**, Istituto di Fisica Applicata Nello Carrara (Italy)

10.30: **Micro/nano-scale design, fabrication, and integration of generic and application-specific optical printed circuit boards (O-PCB) and VLSI photonic integrated circuits (Invited Paper)**, E. Lee, Inha Univ. (South Korea) ..... [6183-01]

11.00: **A generic lightwave integrated chip (GLIC) for fast high-resolution wavelength monitoring**, J. A. Ging, A. G. Larkin, R. F. O'Dowd, National Univ. of Ireland/Dublin (Ireland); H. Ou, K. Rottwitt, Danmarks Tekniske Univ. (Denmark) ..... [6183-02]

11.20: **Novel GaP-based dilute nitride Ga(NAsP)/GaP laser material system for the integration of optoelectronics on silicon**, B. Kunert, K. Volz, J. Koch, T. Torunski, S. Reinhard, W. Stolz, Philipps-Univ. Marburg (Germany) ..... [6183-03]

11.40: **Ultracompact optical link made in amorphous silicon waveguide**, R. Orobtcouk, Institut National des Sciences Appliquées de Lyon (France); S. Jeannot, STMicroelectronics (France); T. Benyattou, Institut National des Sciences Appliquées de Lyon (France); J. Fédéli, P. Mur, CEA-LETI (France) ..... [6183-04]

12.00: **Cascaded AWGS for future WDM access networks**, F. I. El-Nahal, The Islamic Univ. of Gaza (Palestinian Territory (Occupied)) and Univ. of Cambridge (United Kingdom); R. J. Mears, Univ. of Cambridge (United Kingdom) ..... [6183-05]

Lunch Break ..... 12.20 to 13.30

### SESSION 2

**Tivoli II** ..... Mon. 13.30 to 15.20

#### Optical Waveguide and Integrated Optics

*Chair:* **Seppo Honkanen**, College of Optical Sciences/The Univ. of Arizona (USA)

13.30: **Active micro- and nano-structured glass fiber and waveguide devices (Invited Paper)**, A. Schulzgen, College of Optical Sciences/The Univ. of Arizona (USA) ..... [6183-06]

14.00: **Novel polymer waveguides consisting of an alicyclic methacrylate copolymer**, Y. Ichihashi, P. Henzi, M. Bruendel, D. G. Rabus, A. Welle, J. Mohr, Forschungszentrum Karlsruhe (Germany) ..... [6183-07]

14.20: **Adaptable integrated optical phase modulator array using liquid crystals**, K. Kaur, M. Schmiedchen, T. T. Tschudi, Technische Univ. Darmstadt (Germany) ..... [6183-08]

14.40: **Optical and acoustical ridge waveguides based on piezoelectric semiconductors for novel integrated acoustooptic components**, J. Brückner, U. Geyer, G. Bastian, B. Daniel, M. Hetterich, Univ. Karlsruhe (Germany) ..... [6183-09]

15.00: **Photonic integrated circuits based on novel glass waveguides and devices**, Y. Zhang, W. Pan, D. Zhang, T. M. Benson, P. Sewell, D. Furniss, A. B. Seddon, The Univ. of Nottingham (United Kingdom) ..... [6183-10]

Coffee Break ..... 15.20 to 15.50

### SESSION 3

**Tivoli II** ..... Mon. 15.50 to 18.00

#### Design and Testing of Photonic Devices

*Chair:* **Gonçal Badenes**, Institut de Ciències Fotòniques (Spain)

15.50: **Application of the RCWA to the vectorial analysis of aperiodic photonic devices in integrated optics (Invited Paper)**, P. Lalanne, J. Hugonin, Institut d'Optique (France) ..... [6183-11]

16.20: **Electromagnetic modal approach to analyzing microcavities**, T. H. Vallius, J. Tervo, P. Vahimaa, J. P. Turunen, Joensuu Yliopisto (Finland) [6183-12]

16.40: **Variational approach to dispersion-managed solitons**, M. F. Ferreira, M. H. Sousa, Univ. de Aveiro (Portugal) ..... [6183-13]

17.00: **Design optimization of SiGe/Si: modulation-doped multiple quantum well modulator for high-speed operation**, S. B. Maine, D. Marris-Morini, L. Vivien, D. Pascal, E. Cassan, S. C. Laval, Univ. Paris-Sud II (France) ..... [6183-14]

17.20: **Design and fabrication of high-performance multimode interference couplers in silicon-on-insulator**, F. P. Payne, Univ. of Oxford (United Kingdom) ..... [6183-15]

17.40: **New characterization dynamic methods for Er/Yb codoped phosphate glass waveguides**, J. A. Valles, M. A. Rebolledo, J. Used, Univ. of Zaragoza (Spain) ..... [6183-16]

### ✓ Interactive Posters—Monday

An interactive poster session will be held on Monday 18.00 to 20.30.

Posters will be on display after 10.00 Monday morning in the Conference Centre Galerie de Marbre (ground floor) and Forum Hall (1st floor). An interactive poster session and reception with authors present will be held Monday evening from 18.00 to 20.30. Light refreshments will be served.

✓ **Time-domain modeling and filtering behaviour of guided-wave optics by Hertzian potentials**, A. Massaro, L. Pierantoni, T. Rozzi, Univ. Politecnica delle Marche (Italy) ..... [6183-49]

✓ **Large-diameter optical receivers into optical receivers with large-diameter photodiodes**, R. Swoboda, Technische Univ. Wien (Austria) and A3PICs Electronics Development GmbH (Austria); K. Schneider, H. Zimmermann, Technische Univ. Wien (Austria) ..... [6183-50]

✓ **Novel polarization-independent guided-mode resonator using single-layer silica microspheres**, F. Hsiao, C. Huang, National Central Univ. (Taiwan); C. Chan, Asia Vision Chemical Materials Tech. Co., Ltd. (Taiwan); C. Chen, National Central Univ. (Taiwan) ..... [6183-51]

✓ **Design of the semiconductor polarization controller based on the electrooptic effect**, S. Haxha, F. AbdelMalek, Univ. of Kent at Canterbury (United Kingdom); A. B. M. Rahman, City Univ. (United Kingdom) ..... [6183-52]

- ✓ **Polymeric variable optical attenuator based on surface plasmon polariton**, S. Park, Y. Eom, Electronics and Telecommunications Research Institute (South Korea); H. S. Won, S. H. Song, Hanyang Univ. (South Korea) ..... [6183-53]
- ✓ **Polymer optical circuits technology for large-scale integration of passive functions**, A. Maalouf, F. Henrio, S. Haesaert, D. Bosc, École Nationale Supérieure des Sciences Appliquées et de Technologie (France) ..... [6183-54]
- ✓ **Ultrahigh-speed germanium on silicon photodetectors at 1.3-1.55  $\mu\text{m}$** , M. Rouvière, L. Vivien, E. Cassan, S. C. Laval, D. Pascal, X. Le Roux, J. Mangeney, P. Crozat, D. Marris-Morini, Univ. Paris-Sud II (France); J. Damlencourt, J. M. Féféli, CEA-LETI (France); S. Kolev, AdvEOTec (France) ..... [6183-55]
- ✓ **Complex coupled distributed feedback laser monolithically integrated with electroabsorption modulator and semiconductor optical amplifier at 1.3-micrometer wavelength**, P. Gerlach, Univ. Ulm (Germany) and Infineon Technologies AG (Germany); M. Peschke, Univ. Ulm (Germany); T. Wenger, B. K. Saravanan, C. Hanke, Infineon Technologies AG (Germany); R. Michalzik, Univ. Ulm (Germany) ..... [6183-56]
- ✓ **A multiple regrowth process for monolithically integrated InP-based mode-locked laser diodes with uni-travelling carrier absorber**, H. Lohe, R. Scollo, F. Robin, H. Jäckel, W. Vogt, E. Gini, R. Harbers, D. Erni, ETH Zürich (Switzerland) ..... [6183-57]
- ✓ **Application of PVD technique to the fabrication of erbium doped ZrF<sub>4</sub>-based glass ceramic for optical amplification**, B. Boulard, O. Péron, Univ. du Maine (France); A. Chiasera, M. Ferrari, Y. Jestin, Univ. degli Studi di Trento (Italy) ..... [6183-58]
- ✓ **Large area Si light emitting device for the mid-wave and long-wave infrared bands**, V. K. Malyutenko, S. S. Bolgov, A. A. Avdeev, Institute of Semiconductor Physics (Ukraine) ..... [6183-59]
- ✓ **Analysis of the electric field on the refractive-index change of an optical waveguide**, I. E. Zaldivar, M. Garcia, V. Grimalky, Instituto Nacional de Astrofísica, Óptica y Electrónica (Mexico) .... [6183-60]
- ✓ **FLC-SLM dynamic improvement with temporal multiplexing: application to optical image processing**, M. Madec, Institut d'Electronique du Solide et des Systemes (France) and Micromodule (France); W. Uhring, Institut d'Electronique du Solide et des Systemes (France); J. Fasquel, IRCAD (France); P. Y. Joffre, Micromodule (France); Y. Herve, Institut d'Electronique du Solide et des Systemes (France) ..... [6183-62]
- ✓ **VHDL-AMS models of FLC for light modulator virtual prototyping**, M. Madec, Institut d'Electronique du Solide et des Systemes (France) and Micromodule (France); Y. Herve, Institut d'Electronique du Solide et des Systemes (France) and Systems'VIP (France); W. Uhring, Institut d'Electronique du Solide et des Systemes (France); O. Rolland, Systems'VIP (France) ..... [6183-63]
- ✓ **Determination of the Er excitable fraction in SiO<sub>x</sub>:Er waveguides**, C. Garcia, P. Pellegrino, Y. Lebour, B. Garrido, Univ. de Barcelona (Spain); F. Gourbilleau, R. Rizk, ENSICAEN (France); N. Daldosso, D. Navarro-Urrios, L. Pavesi, Univ. degli Studi di Trento (Italy) . [6183-64]
- ✓ **Optical transformer of superhigh frequencies**, A. V. Osadchuk, V. S. Osadchuk, Vinnitsa State Technical Univ. (Ukraine) ..... [6183-65]
- ✓ **Group delay-compensated Bragg grating filters for high-speed DWDM systems**, L. Wosinski, Kungliga Tekniska Högskolan (Sweden); M. Swillo, Phoxtal Communications AB (Sweden); M. Dainese, Replisaurus Technologies AB (Sweden) ..... [6183-66]
- ✓ **A concept of new integrated optical components with fast operative control of the spectral response**, A. V. Shamray, A. Kozlov, I. Ilichev, M. P. Petrov, A.F. Ioffe Physico-Technical Institute (Russia) ..... [6183-67]
- ✓ **Raman amplification in porous silicon at 1.5  $\mu\text{m}$** , M. A. Ferrara, L. Sirlito, L. Rotiroli, I. Rendina, Istituto per la Microelettronica e Microsistemi (Italy) ..... [6183-68]
- ✓ **Investigation of thermo-optic effect in SOI waveguide arrays**, F. Magno, F. De Leonardis, V. M. N. Passaro, Politecnico di Bari (Italy) ..... [6183-69]
- ✓ **Er<sup>3+</sup> activated silica-hafnia glass-ceramics planar waveguides**, Y. Jestin, N. Affy, C. Armellini, Univ. degli Studi di Trento (Italy); S. Berneschi, Istituto di Fisica Applicata Nello Carrara (Italy); S. N. B. Bhaktha, Univ. degli Studi di Trento (Italy) and Univ. of Hyderabad (India); B. Boulard, Univ. du Maine (France); A. Chiappini, A. Chiasera, G. Dalba, Univ. degli Studi di Trento (Italy); C. Duverger, Univ. du Maine (France); M. Ferrari, C. E. Goyes Lopez, M. Mattarelli, M. Montagna, E. Moser, Univ. degli Studi di Trento (Italy); G. Nunzi Conti, S. Pelli, G. C. Righini, Istituto di Fisica Applicata Nello Carrara (Italy); F. Rocca, Univ. degli Studi di Trento (Italy) ..... [6183-70]
- ✓ **Evaluation of optical birefringence at ferroelectric domain wall in LiNbO<sub>3</sub>**, P. Ferraro II, L. Aiello, F. Pignatiello, M. Paturzo, S. Grilli, P. De Natale, S. M. De Nicola, Consiglio Nazionale delle Ricerche (Italy) ..... [6183-71]
- ✓ **Resonant cavity enhanced silicon photodetector at 1.55 micron in waveguides structure based on internal photoemission effect**, M. Casalino, L. Sirlito, L. Moretti, G. Coppola, S. Libertino, I. Rendina, Consiglio Nazionale delle Ricerche (Italy) ..... [6183-72]
- ✓ **Liquid crystal orientation in photonic SOI devices**, H. J. Desmet, K. Neyts, R. G. Baets, Univ. Gent (Belgium) ..... [6183-73]
- ✓ **Diffraction gratings written inside on LiNbO<sub>3</sub> crystals by means of femtosecond laser pulses**, G. A. Torchia, C. Méndez, D. Delgado, J. Rodriguez, I. Arias, Univ. de Salamanca (Spain) ..... [6183-74]
- ✓ **Waveguide photodetectors in polycrystalline germanium on silicon**, L. Colace, G. Masini, G. Assanto, Univ. degli Studi di Roma Tre (Italy) ..... [6183-75]
- ✓ **Multicolor variable LED linear modules**, L. Wang, M. Riemeijer, Philips Lighting, Central Development Lighting (Netherlands); G. Calon, Philips Lighting, Central Development Lighting (USA); E. van Lier, P. Deurenberg, T. Treurniet, J. Ansems, O. Chao, V. Mercier, Philips Lighting, Central Development Lighting (Netherlands); K. van Os, G. Lijten, Philips Applied Technologies (Netherlands) ..... [6183-76]
- ✓ **Novel type of microchip laser radiation**, A. Dmitryuk, L. Maksimov, G. Petrovsky, V. Savostyanov, Research and Technological Institute of Optical Material Science (Russia) ..... [6183-77]

## Tuesday 4 April

### SESSION 4

Tivoli II ..... Tues. 10.30 to 12.30

#### Optical Microcavities

Chair: Michel J. F. Digonnet, Stanford Univ. (USA)

- 10.30: **Characteristics of rib waveguide racetrack resonators in SOI (Invited Paper)**, G. T. Reed, W. R. Headley, B. Timotijevic, F. Gardes, Univ. of Surrey (United Kingdom) ..... [6183-17]
- 11.00: **Silicon photonics with microspheres**, A. Serpengüzel, A. Kurt, Koç Univ. (Turkey) ..... [6183-18]
- 11.20: **Ultrahigh-quality factor silicon on insulator microdisk resonator characterized by optical near-field**, I. Stefanon, S. Blaize, G. Lerondel, P. Royer, Univ. de Technologie de Troyes (France); B. Martin, K. Phan Huy, D. Amans, A. Morand, P. M. Benech, École Nationale Supérieure d'Electronique et de Radioélectrique de Grenoble (France); J. Verbert, E. Hadji, CEA Grenoble (France); J. Fédéli, CEA-LETI (France) ..... [6183-19]
- 11.40: **Polymer-based microcavity photonics (Invited Paper)**, I. N. Ledoux-Rak, M. Lebental, J. Lauret, A. Q. Le Quang, R. Hierle, J. Zyss, École Normale Supérieure de Cachan (France) ..... [6183-20]
- 12.10: **Photonic bandgap properties of microcavity ring resonator arrays**, M. Chin, L. Y. Tobing, Nanyang Technological Univ. (Singapore) ..... [6183-21]
- Lunch Break ..... 12.30 to 13.30

### SESSION 5

Tivoli II ..... Tues. 13.30 to 15.00

#### Photonic Materials and Technologies I

Chair: Lorenzo Pavesi, Univ. degli Studi di Trento (Italy)

- 13.30: **Advance nanostructured materials for integrated optics (Invited Paper)**, C. N. Afonso Rodriguez, Consejo Superior de Investigaciones Científicas (Spain) ..... [6183-22]
- 14.00: **Silver film ion-exchanged Er-doped waveguide lasers and photowritten waveguide gratings in phosphate glass**, S. E. Yliniemi, College of Optical Sciences/The Univ. of Arizona (USA); J. Albert, A. Laronche, Carleton Univ. (Canada); Q. Wang, S. Honkanen, College of Optical Sciences/The Univ. of Arizona (USA) ..... [6183-23]
- 14.20: **Raman scattering technique in characterisation of glasses containing nanoparticles for integrated optoelectronics**, M. Ivanda, S. Music, M. Ristic, U. V. Desnica, M. Buljan, Institut Ruder Boškovic (Croatia); M. Montagna, M. Ferrari, Univ. degli Studi di Trento (Italy); G. C. Righini, Istituto di Fisica Applicata Nello Carrara (Italy) ..... [6183-24]

14.40: **Er<sup>3+</sup>/Yb<sup>3+</sup> activated silica-hafnia planar waveguides for photonics fabricated by RF sputtering**, A. Chiasera, Univ. degli Studi di Trento (Italy); S. N. B. Bhaktha, Univ. degli Studi di Trento (Italy) and Univ. of Hyderabad (India); M. Brenci, Istituto di Fisica Applicata Nello Carrara (Italy); A. Chiappini, M. Ferrari, Univ. degli Studi di Trento (Italy); V. Foglietti, Istituto di Fotonica e Nanotecnologie (Italy); R. R. Gonçalves, Univ. de São Paulo (Brazil); Y. Jestin, Univ. degli Studi di Trento (Italy); A. Minotti, Istituto di Fotonica e Nanotecnologie (Italy); M. Montagna, E. Moser, Univ. degli Studi di Trento (Italy); S. Pelli, G. C. Righini, Istituto di Fisica Applicata Nello Carrara (Italy); C. Tosello, Univ. degli Studi di Trento (Italy); K. Chaitanya Vishnubhatla, Univ. degli Studi di Trento (Italy) and Univ. of Hyderabad (India) ..... [6183-25]  
 Coffee Break ..... 15.00 to 15.20

**SESSION 6**

**Tivoli II ..... Tues. 15.20 to 17.30**

**Photonic Materials and Technologies II**

*Chair: Mário F. S. Ferreira, Univ. de Aveiro (Portugal)*

15.20: **Homogeneous and nanocomposite rare-earth-activated glasses for photonic devices (Invited Paper)**, M. Ferrari, C. Armellini, Univ. degli Studi di Trento (Italy); S. Berneschi, M. Brenci, Istituto di Fisica Applicata Nello Carrara (Italy); A. Chiappini, A. Chiasera, Y. Jestin, M. Mattarelli, M. Montagna, E. Moser, Univ. degli Studi di Trento (Italy); G. Nunzi Conti, S. Pelli, G. C. Righini, Istituto di Fisica Applicata Nello Carrara (Italy); C. Tosello, Univ. degli Studi di Trento (Italy) ... [6183-26]  
 15.50: **Femtosecond inscription of wavelength specific features in passive and active optical waveguide structures**, G. D. Marshall, M. Ams, M. J. Withford, Macquarie Univ. (Australia) ..... [6183-27]  
 16.10: **Sol-gel ormosil-on-silicon channel waveguides with low loss at 1.55 µm**, P. J. Moreira, Instituto de Engenharia de Sistemas e Computadores do Porto (Portugal) and Univ. do Porto (Portugal); P. V. Marques, Univ. do Porto (Portugal) and Instituto de Engenharia de Sistemas e Computadores do Porto (Portugal); A. P. Leite, Univ. do Porto (Portugal) ..... [6183-28]  
 16.30: **Comparative study of the strength of Er indirect optical pumping in silicate glasses codoped with Si clusters and Er<sup>3+</sup> ions**, Y. Lebour, P. Pellegrino, C. Garcia, J. A. Moreno, B. Garrido, Univ. de Barcelona (Spain) ..... [6183-29]  
 16.50: **Highly stable and low-loss electro-optic polymer waveguides for high-speed modulators using photodefinition technique**, M. Balakrishnan, M. B. J. Diemeer, A. Driessen, M. Faccini, W. Verboom, D. Reinhoud, Univ. Twente (Netherlands); A. Leinse, Lionix BV (Netherlands) ..... [6183-30]  
 17.10: **Advancement of IC on the space robot based on photonics**, V. K. Chitlangi, Poornima College of Engineering (India) ..... [6183-31]

**Wednesday 5 April**

**SESSION 7**

**Tivoli II ..... Wed. 08.00 to 10.00**

**Photonic Components and Devices**

*Chair: Jean-Marc Fédéli, CEA-LETI (France)*

08.00: **Optimal design, fabrication, and characterisation of GeO<sub>2</sub>-SiO<sub>2</sub> doped silica multimode-interference couplers**, H. N. J. Fernando, M. J. Hayden, P. J. Hughes, National Univ. of Ireland/Cork (Ireland) ..... [6183-32]  
 08.20: **Ultralow-loss optical distribution for on-chip optical interconnects**, D. Marris-Morini, L. Vivien, E. Cassan, A. Lupu, S. C. Laval, D. Pascal, Univ. Paris-Sud II (France); L. El Melhaoui, J. Fédéli, CEA-LETI (France) ..... [6183-33]  
 08.40: **Temperature sensing in EMD environment with periodically poled lithium niobate devices**, G. Margheri, Consiglio Nazionale delle Ricerche (Italy); M. De Sario, Politecnico di Bari (Italy); D. Grandò, Univ. degli Studi di Pavia (Italy) ..... [6183-34]  
 09.00: **An integrated optic biosensor of high sensitivity**, E. Arace, N. Yurt, S. Honkanen, S. B. Mendes, N. N. Peyghambarian, College of Optical Sciences/The Univ. of Arizona (USA) ..... [6183-35]

09.20: **Characterization and operation of a broadband all-optical vertical cavity semiconductor wavelength converter**, C. Porzi, Scuola Superiore Sant'Anna (Italy); L. Poti, A. Bogoni, Consorzio Nazionale Interuniv. per le Telecomunicazioni (Italy); M. Guina, O. G. Okhotnikov, Tampereen Teknillinen Yliopisto (Finland) ..... [6183-36]  
 09.40: **Novel multimode-interference coupler structured by SHOW-ODR**, S. Lo, C. Chen, National Central Univ. (Taiwan) ..... [6183-37]  
 Coffee Break ..... 10.00 to 10.30

**SESSION 8**

**Tivoli II ..... Wed. 10.30 to 12.30**

**Silicon Photonics**

*Chair: Suzanne C. Laval, CNRS/Univ. Paris-Sud II (France)*

10.30: **Silicon nanophotonics (Invited Paper)**, L. Pavesi, Univ. degli Studi di Trento (Italy) ..... [6183-38]  
 11.00: **Tuning the wavelength emission of patterned porous silicon using high-energy helium irradiation**, E. J. Teo, M. B. H. Breese, A. A. Bettiol, D. Mangaiyarkarasi, National Univ. of Singapore (Singapore) ..... [6183-39]  
 11.20: **SOI-based monolithic integration of SiON and Si planar optical circuits**, O. Cohen, Intel Corp. (Israel); R. Jones, Intel Corp. (USA); D. Rubin, Intel Corp. (Israel); A. Fang, Intel Corp. (USA); N. Izhaky, Intel Corp. (Israel); M. J. Paniccia, Intel Corp. (USA) ..... [6183-40]  
 11.40: **3D integration of nanophotonics with CMOS electronics (Invited Paper)**, B. Jalali, T. K. Indukuri, P. Koonath, Univ. of California/Los Angeles (USA) ..... [6183-41]  
 12.10: **Recent advances in silicon-based optical switching devices**, B. Li, Sun Yat-Sen Univ. (China) ..... [6183-42]  
 Lunch Break ..... 12.30 to 13.40

**SESSION 9**

**Tivoli II ..... Wed. 13.40 to 15.50**

**Nonlinear Photonic Devices**

*Chair: Ali Serpengüzel, Koç Univ. (Turkey)*

13.40: **Discrete light propagation in voltage-tunable photonic lattices (Invited Paper)**, G. Assanto, Univ. degli Studi di Roma Tre (Italy) [6183-43]  
 14.10: **Parametric downconversion of photons at 1550 nm by laboratory prototype periodically poled lithium niobate bulk and waveguide: a route to single photon source and photon entanglement**, S. A. Castelletto, I. P. Degiovanni, V. Schettini, Istituto Elettrotecnico Nazionale Galileo Ferraris (Italy); T. Del Rosso, G. Margheri, S. Sottini, Consiglio Nazionale delle Ricerche (Italy) ..... [6183-44]  
 14.30: **Optimal design parameters research for novel monolithically integrated non-linear all-optical loop mirror for signal regeneration**, E. Moll, K. A. Williams, R. V. Pentyl, I. H. White, Univ. of Cambridge (United Kingdom) ..... [6183-45]  
 14.50: **Photorefractive bright soliton in erbium doped lithium niobate**, F. Pettazzi, M. Alonzo, Univ. degli Studi di Roma/La Sapienza (Italy); C. Sada, M. Bazzan, N. Argiolas, P. Mazzoldi, Univ. degli Studi di Padova (Italy); V. I. Vlad, A. Petris, Institutul National pentru Fizica Laserilor, Plasmei si Radiatiei (Romania); E. Fazio, Univ. degli Studi di Roma/La Sapienza (Italy) ..... [6183-46]  
 15.10: **Nonlinear effects in ultrasmall silicon-on-insulator ring resonators**, G. Priem, P. Dumon, W. Bogaerts, D. Van Thourhout, G. Morthier, R. G. Baets, Univ. Gent (Belgium) ..... [6183-47]  
 15.30: **Extended transfer function of nonlinear active semiconductor microring resonators**, Y. G. Boucher, Ecole Nationale d'Ingénieurs de Brest (France); Y. Dumeige, L. Ghisa, P. Féron, Ecole Nationale Supérieure des Sciences Appliquées et de Technologie (France) ..... [6183-48]

# Semiconductor Lasers and Laser Dynamics II

*Conference Chairs:* **Daan Lenstra**, Vrije Univ. Amsterdam and Technische Univ. Eindhoven (Netherlands); **Markus Pessa**, Tampereen Teknillinen Yliopisto (Finland); **Ian H. White**, Univ. of Cambridge (United Kingdom)

*Program Committee:* **Salvador Balle**, Institut Mediterrani d'Estudis Avançats (Spain); **Guido Giuliani**, Univ. degli Studi di Pavia (Italy); **Ortwin G. Hess**, Univ. of Surrey (United Kingdom); **Guillaume Huyet**, National Univ. of Ireland/Cork (Ireland); **Michel M. Krakowski**, Thales Research & Technology (France); **Oleg G. Okhotnikov**, Tampereen Teknillinen Yliopisto (Finland); **Krassimir P. Panayotov**, Vrije Univ. (Belgium); **Judy M. Rorison**, Univ. of Bristol (United Kingdom); **Marc Sciamanna**, Supelec (France); **Herbert Venghaus**, Heinrich-Hertz-Institut Berlin GmbH (Germany)



**Conference 6184 contains papers funded by and/or related to current EU research projects contained in Framework VI.**

*Paper Numbers:*  
11, 16, 17, 24, 25, 37, 38, 39,  
41, 42, 49, 51, 53, 54, 71, 76,  
82, 84, 86.

## Monday 3 April

### SESSION 1

**Tivoli I ..... Mon. 10.30 to 12.00**

#### High-power Lasers

*Chair:* **Herbert Venghaus**, Heinrich-Hertz-Institut für Nachrichtentechnik Berlin GmbH (Germany)

- 10.30: **High-power single-mode 980-nm DBR tapered diode lasers with integrated 6th-order surface gratings based on simplified fabrication process (Invited Paper)**, K. Paschke, J. Fricke, G. Erbert, H. Wenzel, Ferdinand-Braun-Institut für Höchstfrequenztechnik (Germany) ..... [6184-01]
- 11.00: **Influence of thermal effects on the performance of high-power semiconductor lasers and pump-laser modules**, N. Matuschek, T. Pliska, J. Troger, S. Mohrdiek, B. E. Schmidt, Bookham AG (Switzerland) ..... [6184-28]
- 11.20: **High-power-gain switched laser diodes using a novel compact picosecond switch based on a GaAs bipolar junction transistor structure for pumping**, S. N. Vainshtein, J. T. Kostamovaara, Univ. of Oulu (Finland) ..... [6184-03]
- 11.40: **Design of an ultrahigh-power multisection tunable laser with a semiconductor optical amplifier**, Y. Zhang, T. M. Benson, The Univ. of Nottingham (United Kingdom) ..... [6184-04]
- Lunch Break ..... 12.00 to 13.30

### SESSION 2

**Tivoli I ..... Mon. 13.30 to 15.10**

#### Coupled-mode Operation

*Chair:* **Guillaume Huyet**, Tyndall National Institute (Ireland)

- 13.30: **Two-mode dynamics in different semiconductor laser structures (Invited Paper)**, A. Scire, P. Colet, Univ. de les Illes Balears (Spain); M. Sorel, Univ. of Glasgow (United Kingdom); C. J. Tessone, C. R. Mirasso, M. San Miguel, Univ. de les Illes Balears (Spain) ..... [6184-05]
- 14.00: **Laterally coupled dual-wavelength distributed feedback lasers (Invited Paper)**, F. Pozzi, R. M. De La Rue, M. Sorel, Univ. of Glasgow (United Kingdom) ..... [6184-06]
- 14.30: **Stability of locking in mutually delay-coupled semiconductor lasers**, H. H. Erzgräber, D. Lenstra, Vrije Univ. Amsterdam (Netherlands); B. Krauskopf, Univ. of Bristol (United Kingdom) ..... [6184-07]
- 14.50: **All-optical two-mode switching in semiconductor ring lasers**, A. Scire, Institut Mediterrani d'Estudis Avançats (Spain) ..... [6184-08]
- Coffee Break ..... 15.10 to 15.40

## SESSION 3

**Tivoli I ..... Mon. 15.40 to 17.30**

#### High-performance Lasers

*Chair:* **Ian H. White**, Univ. of Cambridge (United Kingdom)

- 15.40: **High-gain new InGaAsN/GaAs heterostructure**, C. Peng, J. Kontinen, T. Jouhti, M. Pessa, Tampereen Teknillinen Yliopisto (Finland) ..... [6184-09]
- 16.00: **Al-free active region InGaAsP/GaAs (lambda = 852-nm) DFB diodes for atomic clocks and interferometry applications**, F. Vermersch, V. Ligeret, M. Lecomte, M. Calligaro, O. Parillaud, S. Bansropun, M. M. Krakowski, Thales Research & Technology (France) ..... [6184-10]
- 16.20: **Improvements in GaInNAs/GaAs quantum-well lasers using focused ion-beam post-processing**, J. Pozo, J. M. Rorison, Univ. of Bristol (United Kingdom); M. Saarinen, J. Kontinen, T. Jouhti, M. Pessa, Tampereen Teknillinen Yliopisto (Finland) ..... [6184-11]
- 16.40: **High-brightness 1310 and 1550-nm grating outcoupled surface-emitting semiconductor lasers**, S. McWilliams, T. Masood, V. Amarasinghe, Photodigm Inc. (USA); G. A. Evans, Southern Methodist Univ. (USA) ..... [6184-12]
- 17.00: **Dilute nitride-based 1.3-µm high-performance lasers (Invited Paper)**, P. Navaretti, H. Liu, W. M. Soong, J. P. R. David, G. Hill, M. Hopkinson, The Univ. of Sheffield (United Kingdom) ..... [6184-13]

## Tuesday 4 April

### SESSION 4

**Tivoli I ..... Tues. 10.30 to 12.00**

#### Blue Lasers

*Chair:* **Markus Pessa**, Tampereen Teknillinen Yliopisto (Finland)

- 10.30: **Simulation and design of optical gain in In(Al)GaIn/GaN short wavelength lasers (Invited Paper)**, B. Witzigmann, V. Laino, M. Luisier, F. Römer, ETH Zürich (Switzerland); G. Feicht, U. T. Schwarz, Univ. Regensburg (Germany) ..... [6184-14]
- 11.00: **600-mW optical output power at 488 nm from a high-power hybrid laser diode system and PPLN bulk crystal**, S. Schwerfeger, M. Maiwald, R. Güther, B. Sumpf, K. Paschke, C. Dzionk, G. Erbert, G. Tränkle, Ferdinand-Braun-Institut für Höchstfrequenztechnik (Germany) ..... [6184-15]
- 11.20: **Reliability of InGaIn laser diodes grown on low dislocation density bulk GaN substrates**, L. Marona, P. Wisniewski, Instytut Wysokich Cisnien (Poland); M. Leszczynski, P. Prystawko, I. Grzegory, T. Suski, S. A. Porowski, TopGaN Ltd. (Poland); R. Czernecki, Instytut Wysokich Cisnien (Poland); P. Perlin, TopGaN Ltd. (Poland); T. Riemann, J. Christen, Otto-von-Guericke-Univ. Magdeburg (Germany) ... [6184-16]
- 11.40: **Load dislocation-density broad-area high-power CW-operated InGaIn laser diodes**, P. Perlin, P. Wisniewski, R. Czernecki, P. Prystawko, M. Leszczynski, T. Suski, I. Grzegory, S. A. Porowski, Instytut Wysokich Cisnien (Poland) ..... [6184-17]
- Lunch Break ..... 12.00 to 13.20

**SESSION 5**

**Tivoli I ..... Tues. 13.20 to 15.00**

**Optical Injection and Dynamics**

*Chair: Salvador Balle, Institut Mediterrani d'Estudis Avançats (Spain)*

13.20: **Theoretical analysis of forward and backward optical injection locking configurations in semiconductor Fabry-Perot and DFB lasers**, F. Kéfélian, P. B. Gallion, École Nationale Supérieure des Télécommunications (France) and Consultant (France) ..... [6184-18]

13.40: **Model simulations of a reflective semiconductor optical amplifier**, M. van Iersel, D. Lenstra, K. Allaart, Vrije Univ. Amsterdam (Netherlands) ..... [6184-19]

14.00: **Time-resolved scanning near-field microscopy of InGaN laser diode dynamics**, U. T. Schwarz, C. Lauterbach, Univ. Regensburg (Germany); M. O. Schillgalies, C. Rumbolz, M. Furtsch, A. Lell, V. K. Härle, OSRAM Opto Semiconductors GmbH (Germany) ..... [6184-20]

14.20: **Delay time identification in chaotic optical systems with two delays**, A. Locquet, Georgia Tech Lorraine (France); S. Ortin, Univ. de Cantabria (Spain); V. S. Udaltsov, Georgia Tech Lorraine (France); L. Larger, Univ. de Franche-Comté (France); D. S. Citrin, Georgia Tech Lorraine (France); L. Pesquera, A. A. Valle, Univ. de Cantabria (Spain) ..... [6184-21]

14.40: **Coherent generation and control of long-lived ultrashort transients in a semiconductor laser**, C. O'Rourke, J. Allam, D. Baxter, K. Boehringer, A. Klaedtke, J. Hamm, O. G. Hess, Univ. of Surrey (United Kingdom) ..... [6184-22]

Coffee Break ..... 15.00 to 15.20

**SESSION 6**

**Tivoli I ..... Tues. 15.20 to 17.40**

**High-performance Lasers and Systems**

*Chair: Judy M. Rorison, Univ. of Bristol (United Kingdom)*

15.20: **2-2.7- $\mu$ m single-frequency tunable Sb-based lasers in cw at RT (Invited Paper)**, A. Garnache, A. Ouvrard, L. Cerutti, J. Angellier, A. Vicet, D. Barat, Y. Rouillard, F. Genty, Univ. Montpellier II (France); D. Romanini, Univ. Joseph Fourier (France) ..... [6184-23]

15.50: **High-brightness clarinet lasers with an Al-free active region at 915 nm**, I. Hassiaoui, N. Michel, M. Calligaro, M. Lecomte, O. Parillaud, M. M. Krakowski, Thales Research & Technology (France); I. Esquivias, L. Borruel, J. Garcia-Tijero, Univ. Politécnica de Madrid (Spain); S. Sujecki, E. C. Larkins, The Univ. of Nottingham (United Kingdom) ..... [6184-24]

16.10: **Reduced risk of catastrophic optical mirror damage in high-power tapered lasers using intra-cavity diverging lens**, C. W. Tee, F. K. Lau, X. Zhao, R. V. Penty, I. H. White, Univ. of Cambridge (United Kingdom); N. Michel, M. M. Krakowski, M. Calligaro, M. Lecomte, O. Parillaud, Thales Research & Technology (France) ..... [6184-25]

16.30: **IPDR improvement and gain reduction in a beam holding SOA**, J. Ha, K. A. Williams, R. V. Penty, I. H. White, Univ. of Cambridge (United Kingdom) ..... [6184-26]

16.50: **Technological challenges for CW operation of small-radius semiconductor ring lasers**, M. Sorel, Univ. of Glasgow (United Kingdom); A. Scirè, Univ. de les Illes Balears (Spain); G. Giuliani, Univ. degli Studi di Pavia (Italy); S. Furst, Univ. of Glasgow (United Kingdom); S. Yu, Univ. of Bristol (United Kingdom) ..... [6184-27]

17.10: **High output power and nearly diffraction-limited beam quality at 2.3  $\mu$ m from a GaSb-based optically pumped VCSEL (Invited Paper)**, N. Schulz, M. Rattunde, C. Manz, K. Köhler, C. Wild, J. Wagner, Fraunhofer-Institut für Angewandte Festkörperphysik (Germany); S. S. Beyertt, U. Brauch, T. Kübler, A. Giesen, Univ. Stuttgart (Germany) ..... [6184-02]

**Wednesday 5 April**

**SESSION 7**

**Tivoli I ..... Wed. 08.00 to 10.00**

**External Feedback**

*Chair: Krassimir P. Panayotov, Vrije Univ. (Belgium)*

08.00: **Square-wave oscillations in edge-emitting diode lasers with polarization-rotated optical feedback (Invited Paper)**, A. Gavrielides, Air Force Research Lab. (USA); D. W. Sukow, Washington and Lee Univ. (USA); T. Erneux, Univ. Libre de Bruxelles (Belgium) ..... [6184-29]

08.30: **Analysis of the external filtered modes of a semiconductor laser with filtered optical feedback (Invited Paper)**, K. Green, B. Krauskopf, Univ. of Bristol (United Kingdom) ..... [6184-30]

09.00: **Dynamics of semiconductor lasers with filtered optical feedback**, B. Krauskopf, Univ. of Bristol (United Kingdom); H. H. Erzgräber, D. Lenstra, Vrije Univ. Amsterdam (Netherlands) ... [6184-31]

09.20: **Optical frequency dynamics and relaxation oscillations of a semiconductor laser subject to filtered optical feedback**, M. Nizette, T. Erneux, Univ. Libre de Bruxelles (Belgium) ..... [6184-32]

09.40: **External cavity modes in Lang-Kobayashi and traveling wave models**, M. Radziunas, M. Wolfrum, Weierstrass-Institut für Angewandte Analysis und Stochastik (Germany); B. Krauskopf, Univ. of Bristol (United Kingdom); H. Wuensche, Humboldt-Univ. zu Berlin (Germany) [6184-33]

Coffee Break ..... 10.00 to 10.30

**Joint Session I ..... Wed. 10.30 to 12.10**

**VCSELS: Stability Control and High Performance**

**Joint Event with Conference 6185**

*Chair: Marc Sciamanna, SupElec (France)*

10.30: **Spin-controlled vertical cavity surface-emitting lasers (Invited Paper)**, S. H'vel, N. C. Gerhardt, C. Brenner, M. R. Hofmann, F. Lo, D. Reuter, A. D. Wieck, Ruhr-Univ. Bochum (Germany); E. Schuster, W. Keune, Univ. Duisburg-Essen (Germany) ..... [6184-34]

11.00: **Nonmodal emission characteristics of boad-area vertical-cavity surface-emitting lasers (Invited Paper)**, M. L. Peeters, G. Verschaffelt, I. Fischer, Vrije Univ. Brussel (Belgium); S. K. Mandre, Technische Univ. Darmstadt (Germany); J. Danckaert, H. Thienpont, Vrije Univ. Brussel (Belgium) ..... [6184-35]

11.30: **Optimization of polarization-stable single- and multimode surface grating VCSELS towards high fabrication tolerance and superior performance**, J. M. Ostermann, Univ. Ulm (Germany) and Politecnico di Torino (Italy); P. Debernardi, Politecnico di Torino (Italy); R. Michalzik, Univ. Ulm (Germany) ..... [6184-36]

11.50: **VCSELS optical modeling using the plane wave admittance method**, T. Cyszczanowski, Vrije Univ. (Belgium) and Technical Univ. Lodz (Poland); M. Technical Univ. Lodz (Poland); H. Thienpont Vrije Univ. (Belgium); K. Panajotov Vrije Univ. (Belgium) and Institute of Solid State Physics (Bulgaria) ..... [6185-36]

Lunch Break ..... 12.10 to 13.30

**Joint Session II ..... Wed. 13.30 to 15.30**

**VCSELS: Polarisation Bistability and Switching**

**Joint Event with Conference 6185**

*Chair: Ortwin G. Hess, Univ. of Surrey (United Kingdom)*

13.30: **Nonlinear dynamics and polarization bistability in optically injected VCSELS**, I. Gatara, Ecole Supérieure d'Electricité (France) and Vrije Univ. Brussel (Belgium); J. Buesa, H. Thienpont, K. P. Panajotov, Vrije Univ. Brussel (Belgium); M. Sciamanna, Ecole Supérieure d'Electricité (France) ..... [6184-37]

13.50: **The influence of current noise on polarisation mode hopping in VCSELS**, M. Cornelles Soriano, G. Verschaffelt, G. Van der Sande, M. L. Peeters, Vrije Univ. Brussel (Belgium); D. Lenstra, Vrije Univ. Amsterdam (Netherlands) and COBRA Research Institute (Netherlands); M. Yousefi, Technische Univ. Eindhoven (Netherlands); J. Danckaert, Vrije Univ. Brussel (Belgium) ..... [6184-38]

14.10: **Polarization switching dynamics and bistability in mutually coupled vertical-cavity surface-emitting lasers**, R. Vicente, Univ. de les Illes Balears (Spain); J. Mulet, Institut Mediterrani d'Estudis Avançats (Spain); C. R. Mirasso, Univ. de les Illes Balears (Spain); M. Sciamanna, SupElec (France) ..... [6184-39]

14.30: **Dynamics of vertical-cavity surface-emitting lasers in the short external cavity regime: pulse packages and polarization mode competition**, A. R. Tabaka, Vrije Univ. Brussel (Belgium); M. Peil, Technische Univ. Darmstadt (Germany); M. Sciamanna, SupElec (France); I. Fischer, Vrije Univ. Brussel (Belgium); W. E. Elsässer, Technische Univ. Darmstadt (Germany); H. Thienpont, I. P. Veretennicoff, K. P. Panayotov, Vrije Univ. Brussel (Belgium) ..... [6184 41]

14.50: **Investigation of polarization properties of VCSELs subject to optical feedback from an extremely short external cavity**, M. M. Arizaleta, Vrije Univ. Brussel (Belgium) and Univ. Publica de Navarra (Spain); H. J. Unold, ETH Zürich (Switzerland); J. M. Ostermann, R. Michalzik, Univ. Ulm (Germany); H. Thienpont, Vrije Univ. Brussel (Belgium); M. Lúpez-Amo, Univ. Pública de Navarra (Spain); K. P. Panajotov, Vrije Univ. Brussel (Belgium) ..... [6185 37]

15.10: **Switching phenomena in a VCSEL with frequency-selective optical feedback**, A. Naumenko, N. A. Loiko, B.I. Stepanov Institute of Physics (Belarus); M. Sondermann, Albert-Ludwigs-Univ. Freiburg (Germany); K. Jentsch, Univ. Muenster (Germany); T. Ackemann, Univ. of Strathclyde (United Kingdom) ..... [6184 40]

## Thursday 6 April

### SESSION 10

**Tivoli I** ..... Thurs. 10.30 to 12.20  
**Quantum Dot and Quantum Well Devices**

*Chair: Oleg G. Okhotnikov, Tampereen Teknillinen Yliopisto (Finland)*

10.30: **Phase-amplitude coupling of quantum dot lasers (Invited Paper)**, S. P. Hegarty, S. Melnik, G. Huyet, Tyndall National Institute (Ireland) ..... [6184-42]

11.00: **High-performance 3-layer 1.3- $\mu\text{m}$  InAs/GaAs quantum-dot lasers with very low continuous-wave room-temperature threshold currents**, H. Liu, M. Hopkinson, The Univ. of Sheffield (United Kingdom) ..... [6184-43]

11.20: **Temperature characteristics of quantum-dot superluminescent LEDs**, M. Rossetti, L. Li, A. Markus, A. Fiore, École Polytechnique Fédérale de Lausanne (Switzerland); L. Occhi, C. Vézex, Exalos AG (Switzerland) ..... [6184-44]

11.40: **1.32- $\mu\text{m}$  InAs/InGaAs/GaAs quantum-dot lasers operating at room temperature with low-threshold current density**, A. Salhi, V. Tasco, L. Martiradonna, G. Visimberga, M. De Giorgi, M. De Vittorio, R. Cingolani, A. Passaseo, Univ. degli Studi di Lecce (Italy) ..... [6184-45]

12.00: **1.32- $\mu\text{m}$  InAs/InGaAs/GaAs quantum-dot lasers operating at room temperature with low-threshold current density**, M. S. Wartak, P. C. Weetman, Wilfrid Laurier Univ. (Canada) ..... [6184-46]

Lunch Break ..... 12.20 to 13.40

### SESSION 11

**Tivoli I** ..... Thurs. 13.40 to 15.20  
**Mode-locking Dynamics and Self-phase Modulation**

*Chair: Michel M. Krakowski, Thales Research & Technology (France)*

13.40: **Modeling and optimization of vertical-external cavity (Invited Paper)**, J. Mulet, S. Balle, Institut Mediterrani d'Estudis Avançats (Spain) ..... [6184-47]

14.10: **Observation of nonlinear dynamics and chaos in InGaAsP/InP based integrated semiconductor lasers**, M. Yousefi, Y. Barbarin, S. Beri, E. A. Bente, D. Lenstra, M. K. Smit, Technische Univ. Eindhoven (Netherlands) ..... [6184-48]

14.30: **Measurement of linewidth enhancement factor of different semiconductor lasers in operating conditions**, G. Giuliani, S. Donati, Univ. degli Studi di Pavia (Italy); W. E. Elsässer, Technische Univ. Darmstadt (Germany) ..... [6184-49]

14.50: **Measurement of the linewidth enhancement factor of quantum cascade lasers by the self-mixing technique (Invited Paper)**, J. von Staden, T. Gensty, M. Peil, W. E. Elsässer, Technische Univ. Darmstadt (Germany); G. Giuliani, Univ. degli Studi di Pavia (Italy); C. Mann, Fraunhofer-Institut für Angewandte Festkörperphysik (Germany) [6184-50]  
 Coffee Break ..... 15.20 to 15.40

### SESSION 12

**Tivoli I** ..... Thurs. 15.40 to 17.20

#### Mode-locked Lasers

*Chair: Guido Giuliani, Univ. degli Studi di Pavia (Italy)*

15.40: **Absorber length optimisation for sub-picosecond pulse generation in 1.3- $\mu\text{m}$  quantum-dot mode-locked laser diodes (Invited Paper)**, A. R. Rae, M. G. Thompson, C. Marinelli, R. L. Sellin, R. V. Pentyl, I. H. White, Univ. of Cambridge (United Kingdom); A. R. Kovsh, S. S. Mikhrin, D. A. Livshits, I. L. Krestnikov, Nanosemiconductor GmbH (Germany) ..... [6184-51]

16.10: **Characterization of an ultrafast uni-traveling-carrier absorber for monolithically integrated InGaAsP/InP mode-locked laser diodes (Invited Paper)**, R. Scollo, H. Lohe, F. Robin, D. Erni, E. Gini, W. Vogt, H. Jäckel, ETH Zürich (Switzerland) ..... [6184-52]

16.40: **Study of monolithically integrated Bragg gratings in InGaAsP/InP materials as chirped mode-locked pulse compressors**, D. Gallego, H. Lamela, G. Carpintero, Univ. Carlos III de Madrid (Spain) ..... [6184-53]

17.00: **Integrable directional couplers pulse compressors in mode-locking laser devices**, M. Lopez Garcia, H. Lamela, G. Carpintero, Univ. Carlos III de Madrid (Spain) ..... [6184-54]

#### ✓ Interactive Posters—Thursday

*An interactive poster session will be held on Thursday 18.00 to 20.00.*

*Posters will be on display after 10.00 Thursday morning in the Conference Centre Galerie de Marbre (ground floor) and Forum Hall (1st floor). An interactive poster session and reception with authors present will be held Thursday evening from 18.00 to 20.00. Light refreshments will be served.*

✓ **Facet phase effects on the coherence collapse threshold of distributed-feedback semiconductor lasers**, F. Grillot, Institut National des Sciences Appliquées de Rennes (USA) ..... [6184-56]

✓ **Enhancement of electron capture efficiency in MQW structures**, I. M. Safonov, M. V. Klymenko, National Univ. of Radio Electronics (Ukraine); I. A. Sukhoivanov, National Univ. of Radio Electronics (Ukraine) and Univ. Guanajuato/Dept de Electronica/FIMEE (Mexico) ..... [6184-57]

✓ **Surface-state charge fluctuations on the carrier dynamics in InGaN/GaN blue light-emitting diodes with multiquantum barriers**, T. Nee, P. Lin, C. Shen, J. Wang, R. Lin, Chang Gung Univ. (Taiwan) ..... [6184-58]

✓ **Generation of linearly chirped signal utilizing the instability region of an optically injected semiconductor laser**, F. Lin, J. Chen, National Tsing Hua Univ. (Taiwan) ..... [6184-59]

✓ **Transverse mode selection and dynamic behavior of vertical-cavity surface-emitting lasers subject to optical injection**, A. A. Valle, B. Casal, Univ. de Cantabria (Spain) ..... [6184-63]

✓ **DFB laser dynamics and noise characterization by high-resolution and high-dynamic range measurements of its CW optical spectrum**, A. Villafranca, J. A. Lazaro, J. Lasobras, I. Garces, Univ. de Zaragoza (Spain) ..... [6184-64]

✓ **Comparisons between quantum well laser and VCSELs based on the InGaAs-InAlGaAs and InGaAs/InGaAsP**, R. Houaria, Univ. des Sciences et de la Technologie d'Oran (Algeria) ..... [6184-65]

✓ **High-efficiency high-power diode laser beam shaping and focusing with constant optical-path length equalization**, S. Bonora, P. Villorosi, Univ. degli Studi di Padova (Italy) and Istituto Nazionale per la Fisica della Materia (Italy) ..... [6184-66]

✓ **Actively mode-locked semiconductor lasers using fibre Bragg grating external cavities: importance of apodization on performances**, C. Guignard, Dublin City Univ. (Ireland); P. Besnard, M. Thual, J. Simon, École Nationale Supérieure des Sciences Appliquées et de Technologie (France) ..... [6184-67]

✓ **Stabilized semiconductor laser master oscillator for a power pulsed laser**, P. Jedlicka, O. Cip, J. Lazar, Institute of Scientific Instruments (Czech Republic) ..... [6184-68]

✓ **High-power semiconductor lasers optimized for optical pumping of Rb**, Z. Buchtá, J. Rychnovsky, J. Lazar, Institute of Scientific Instruments (Czech Republic) ..... [6184-69]

✓ **Self Q-switching and mode locking in broad-area lasers subject to transverse-mode selective feedback**, C. Doering, D. Xiao, S. Wolff, Univ. Kaiserslautern (Germany); A. Y. Rodionov, V. E. Sherstobitov, Research Institute for Laser Physics (Russia); H. Fouckhardt, Univ. Kaiserslautern (Germany) ..... [6184-70]


- ✓ **Polarization switching in Nd:YAG lasers by means of modulating the pump polarization**, G. Verschaffelt, G. Van der Sande, J. Danckaert, Vrije Univ. Brussel (Belgium); T. Erneux, Univ. Libre de Bruxelles (Belgium); B. Ségard, P. A. Glorieux, Univ. des Sciences et Technologies de Lille (France) ..... [6184-71]
- ✓ **Phonon-assisted anisotropy of lasing: prediction for (0001) CdS**, U. V. Zubrytski, PRG Fanon and B.I. Stepanov Institute of Physics (Belarus) ..... [6184-72]
- ✓ **Single-frequency high-power continuous-wave oscillation at 1003 nm of an optically pumped semiconductor laser**, M. Jacquemet, M. Domenech, G. Lucas-Leclin, P. M. Georges, Univ. Paris-Sud II (France); I. Sagnes, J. Dion, M. Strassner, Lab. de Photonique et de Nanostructures (France); A. Garnache, Univ. Montpellier II (France) ..... [6184-73]
- ✓ **Stabilization of semiconductor lasers by fiber Bragg gratings for absolute laser interferometry**, B. Mikel, O. Cip, J. Lazar, Institute of Scientific Instruments (Czech Republic); R. Helan, Brno Univ. of Technology (Czech Republic) ..... [6184-74]
- ✓ **Investigation of tunability in microring semiconductor structures**, A. Kapsalis, Univ. of Athens (Greece) and Fraunhofer-Institut für Nachrichtentechnik Heinrich-Hertz-Institut (Germany); D. Alexandropoulos, H. A. Simos, S. S. Mikroulis, A. Argyris, D. Syvridis, Univ. of Athens (Greece); M. Hamacher, U. Troppenz, H. Heidrich, Fraunhofer-Institut für Nachrichtentechnik Heinrich-Hertz-Institut (Germany) ..... [6184-75]
- ✓ **Numerical investigations of dynamical and static characteristics of vertical-cavity surface-emitting lasers incorporating two-dimensional photonic crystal**, P. S. Ivanov, J. M. Rorison, M. J. Cryan, M. Dragas, Univ. of Bristol (United Kingdom) ..... [6184-76]
- ✓ **Laser feedback noise measurement with close-loop servo control for the optical information storage system**, H. Shih, D. Hsu, National Chung Hsing Univ. (Taiwan) ..... [6184-77]
- ✓ **Accurate modeling of VCSEL distributed Bragg reflectors by Floquet-Bloch theory**, F. De Leonardis, F. Magno, A. Rizzato, V. M. Passaro, Politecnico di Bari (Italy) ..... [6184-81]
- ✓ **Polarization switching in vertical-cavity surface-emitting lasers: the effects of stress, temperature, and spin flips**, G. Van der Sande, M. L. Peeters, G. Verschaffelt, I. P. Veretennicoff, J. Danckaert, Vrije Univ. Brussel (Belgium); S. Balle, Institut Mediterrani d'Estudis Avançats (Spain) ..... [6184-82]
- ✓ **Zero-lag synchronization in bidirectionally coupled semiconductor lasers**, R. Vicente, Univ. de les Illes Balears (Spain); J. Buldu, Univ. Politècnica de Catalunya (Spain); M. Peil, Technische Univ. Darmstadt (Germany); C. R. Mirasso, Univ. de les Illes Balears (Spain); M. C. Torrent, J. García-Ojalvo, Univ. Politècnica de Catalunya (Spain); I. Fischer, Vrije Univ. Brussel (Belgium) ..... [6184-83]
- ✓ **Noise influence in integrated nonlinear optical loop mirror compression performance**, C. de Dios Fernández, H. Lamela, Univ. Carlos III de Madrid (Spain) ..... [6184-84]
- ✓ **Birefringence-induced spectrum beating in semiconductor amplifiers and superluminescent diodes**, G. S. Zhou, Concordia Univ. (Canada) ..... [6184-85]
- ✓ **Investigation of the dynamic behaviour of laterally coupled diode lasers by studying the noise spectrum and the small signal response**, R. Santos, H. Lamela, P. Acedo, Univ. Carlos III de Madrid (Spain) ..... [6184-86]
- ✓ **On spectral line broadening in quantum-well heterostructure lasers**, A. A. Afonenko, Belarusian State Univ. (Belarus); V. K. Kononenko, B.I. Stepanov Institute of Physics (Belarus); A. F. Joullie, Univ. Montpellier II (France) ..... [6184-87]
- ✓ **Linewidth of monolithic semiconductor ring lasers**, G. Giuliani, Univ. degli Studi di Pavia (Italy); A. Scirè, Univ. de les Illes Balears (Spain); M. Sorel, Univ. of Glasgow (United Kingdom); S. Donati, Univ. degli Studi di Pavia (Italy) ..... [6184-88]
- ✓ **Green's function approach to modelling quantum well semiconductor lasers**, M. S. Wartak, P. C. Weetman, Wilfrid Laurier Univ. (Canada) ..... [6184-89]



# Micro-Optics, VCSELs, and Photonic Interconnects: Fabrication, Packaging, and Integration

**Conference Chairs:** **Hugo Thienpont**, Vrije Univ. Brussel (Belgium); **Mohammad R. Taghizadeh**, Heriot-Watt Univ. (United Kingdom); **Peter Van Daele**, Univ. Gent (Belgium); **Jürgen Mohr**, Forschungszentrum Karlsruhe (Germany)

**Program Committee:** **Arne G. Alping**, Ericsson Microwave Systems AB (Sweden); **Robert Brunner**, Carl Zeiss Jena GmbH (Germany); **Allen M. Earman**, Finisar Corp. (USA); **Pietro Ferraro II**, Consiglio Nazionale delle Ricerche (Italy); **Dietmar Fey**, Friedrich-Schiller-Univ. Jena (Germany); **Ulrich H. P. Fischer**, Hochschule Harz (Germany); **Alexei L. Glebov**, Fujitsu Labs. of America (USA); **Matthias Hammar**, Kungliga Tekniska Högskolan (Sweden); **Michael W. Haney**, Univ. of Delaware (USA); **Juergen Jahns**, Fernuniv. Hagen (Germany); **Pentti Karioja**, VTT Elektronikka (Finland); **Francois Marion**, Commissariat à l'Energie Atomique (France); **Rainer Michalzik**, Univ. Ulm (Germany); **Krassimir P. Panayotov**, Vrije Univ. (Belgium)



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**Paper Numbers:**  
3, 6, 7, 11, 14, 21, 22, 23, 24, 27, 40, 42, 44, 48, 51, 52.

## Monday 3 April

### SESSION 1

**Gutenberg Mon. 10.30 to 12.20**

#### Photonic Interconnects at the PCB Level I

*Chair: Hugo Thienpont, Vrije Univ. Brussel (Belgium)*

- 10.30: **Integration technologies for board-level optical interconnects (Invited Paper)**, A. L. Glebov, M. G. Lee, K. Yokouchi, Fujitsu Labs. of America (USA) ..... [6185-01]
- 11.00: **Photonic integrated polymer components and Circuits by UV-induced refractive index modification (Invited Paper)**, P. Henzi, D. G. Rabus, Y. Ichihashi, M. Bruendel, J. Mohr, Forschungszentrum Karlsruhe (Germany) ..... [6185-02]
- 11.30: **Laser-ablated coupling structures for stacked optical interconnections on PCBs**, N. Hendrickx, G. Van Steenberge, P. Geerinck, P. Van Daele, Univ. Gent (Belgium) ..... [6185-03]
- 11.50: **Prototyping micro-optical components with integrated out-of-plane coupling structures using deep lithography with protons (Invited Paper)**, J. Van Erps, L. Bogaert, B. Volckaerts, H. Thienpont, Vrije Univ. Brussel (Belgium) ..... [6185-04]
- Lunch Break ..... 12.20 to 13.30

### SESSION 2

**Gutenberg Mon. 13.30 to 15.20**

#### Photonic Interconnects at the PCB Level II

*Chair: Alexei L. Glebov, Fujitsu Labs. of America (USA)*

- 13.30: **Organic devices for micro-optical applications (Invited Paper)**, M. Punke, S. Mozer, M. Stroisch, M. Gerken, G. Bastian, U. Lemmer, Univ. Karlsruhe (Germany); D. G. Rabus, P. Henzi, Forschungszentrum Karlsruhe (Germany) ..... [6185-05]
- 14.00: **Optical connections on flexible substrates**, E. Bosman, P. Geerinck, W. Christiaens, G. Van Steenberge, J. M. Vanfleteren, P. Van Daele, Univ. Gent (Belgium) ..... [6185-06]
- 14.20: **Development of a technology for fabricating low-cost parallel optical interconnects**, G. V. Steenberge, N. Hendrickx, P. Geerinck, E. Bosman, S. Van Put, P. Van Daele, Univ. Gent (Belgium) ..... [6185-07]
- 14.40: **Replication of optical rib waveguide structures using nickel shims**, M. Bruendel, P. Henzi, D. G. Rabus, Forschungszentrum Karlsruhe (Germany) ..... [6185-08]
- 15.00: **Microoptics soldering on multifunctional system platforms**, R. Eberhardt, H. Banse, E. Beckert, Fraunhofer-Institut für Angewandte Optik und Feinmechanik (Germany) ..... [6185-09]
- Coffee Break ..... 15.20 to 15.40

## SESSION 3

**Gutenberg Mon. 15.40 to 17.40**

### Micro-optic Components

*Chair: Jürgen Mohr, Forschungszentrum Karlsruhe (Germany)*

- 15.40: **Micro-optical systems for sensor applications (Invited Paper)**, L. Ross, R. Göring, D. Samiec, IOtech GmbH (Germany) .... [6185-15]
- 16.10: **Fabrication and replication of micro-optical components for educational purposes within the Network of Excellence in Micro-Optics (NEMO)**, A. J. Waddie, M. R. Taghizadeh, Heriot-Watt Univ. (United Kingdom); J. Mohr, Forschungszentrum Karlsruhe (Germany); E. W. Stijns, H. Thienpont, Vrije Univ. Brussel (Belgium) ..... [6185-11]
- 16.30: **Comparative performance analysis of 100% fill-factor microlens arrays: fabricated by various methods**, A. Akatay, Koç Univ. (Turkey); H. Suyal, A. J. Waddie, M. R. Taghizadeh, Heriot-Watt Univ. (United Kingdom); H. Ürey, Koç Univ. (Turkey) ..... [6185-13]
- 16.50: **Genetic algorithm for the design of high-frequency diffraction gratings for high-power laser applications**, M. J. Thomson, A. J. Waddie, M. R. Taghizadeh, Heriot-Watt Univ. (United Kingdom) [6185-14]
- 17.10: **Microreactors: a look inside (Invited Paper)**, M. A. Liauw, RWTH Aachen (Germany) ..... [6185-10]

### ✓ Interactive Posters—Monday

*An interactive poster session will be held on Monday 18.00 to 20.30.*

*Posters will be on display after 10.00 Monday morning in the Conference Centre Galerie de Marbre (ground floor) and Forum Hall (1st floor). An interactive poster session and reception with authors present will be held Monday evening from 18.00 to 20.30. Light refreshments will be served.*

- ✓ **Design and fabrication of integrated polymer microlenses for VCSELs**, V. Bardinal, E. Daran, C. Vergnenegre, T. Camps, L. Gavin-Djiddina, Lab. d'Analyse et d'Architecture des Systèmes (France); Y. Segui, Univ. Paul Sabatier (France); P. Belaubre, Lab. d'Analyse et d'Architecture des Systèmes (France); M. Guirardel, Rhodia Europe (France) ..... [6185-12]
- ✓ **Integrated optical mode field adapters for multimode 40-Gbit/s optical Ethernet systems**, U. H. Fischer, T. Windel, Hochschule Harz (Germany); S. Hemrungrote, King Mongkut's Univ. of Technology (Thailand) ..... [6185-38]
- ✓ **Development of 3D out-of-plane SU-8 microlenses using modified micromolding in capillaries (MIMIC) technology**, A. Llobera, Ctr. Nacional de Microelectrónica (Spain); R. Wilke, Technische Univ. Braunschweig (Germany); D. W. Johnson, Microchem Corp. (USA); S. Büttgenbach, Technische Univ. Braunschweig (Germany) .. [6185-39]
- ✓ **Design, fabrication, and characterization of a low-cost lens-based fiber connector for passive optical networks**, C. Ruwisch, Y. Meuret, B. Volckaerts, J. Van Erps, H. Thienpont, Vrije Univ. Brussel (Belgium); J. A. Watté, Tyco Electronics Corp. (Belgium) ..... [6185-40]

- ✓ **Achromatic microlenses**, P. Ruffieux, T. Scharf, Univ. de Neuchâtel (Switzerland); R. Voelkel, K. J. Weible, SUSS MicroOptics SA (Switzerland) ..... [6185-41]
- ✓ **Light propagation in a GRIN microlens with gain or loss and comparison with lossless case**, C. C. Gomez-Reino, M. T. Flores-Arias, A. Castelo, Univ. de Santiago de Compostela (Spain); Y. Meuret, C. Ruwisch, H. Thienpont, Vrije Univ. Brussel (Belgium); N. Lindelein, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany) .. [6185-42]
- ✓ **Rectangular microlens array having high sag for multichip LED packaging**, C. Lim, W. Jeung, S. Choi, Y. Oh, SAMSUNG Electro-Mechanics Co., Ltd. (South Korea) ..... [6185-43]
- ✓ **Cylindrical microlenses fabricated by deep lithography with protons**, V. Gomez, B. Volckaerts, H. Ottevaere, H. Thienpont, Vrije Univ. Brussel (Belgium) ..... [6185-44]
- ✓ **Fast free-space photonic switch based on a ferroelectric liquid crystal**, Y. Semenova, G. Farrell, Q. Wang, Dublin Institute of Technology (Ireland) ..... [6185-45]
- ✓ **Development of micro-electro-optical devices: new methods and new results**, N. P. Eisenberg, M. Manevich, Jerusalem College of Technology (Israel); A. Arsh, M. Klebanov, V. Lyubin, Ben-Gurion Univ. of the Negev (Israel) ..... [6185-46]
- ✓ **Nonlinear frequency tuning of long-wavelength VCSELs: phenomenological description**, A. P. Lytkine, W. Jäger, J. Tulip, Univ. of Alberta (Canada) ..... [6185-47]
- ✓ **Temperature dependence of laser backwriting process on glass**, A. Castelo, D. Nieto, M. T. Flores-Arias, C. Bao, M. V. Perez, C. C. Gomez-Reino, Univ. de Santiago de Compostela (Spain); C. I. Lopez-Gascon, G. de la Fuente, Univ. de Zaragoza (Spain) ..... [6185-48]
- ✓ **Direct laser-writing of complex photopolymer structures using diffractive optical elements**, H. Suyal, A. J. Waddie, M. R. Taghizadeh, A. McCarthy, A. C. Walker, Heriot-Watt Univ. (United Kingdom) ..... [6185-49]
- ✓ **2D lithium niobate microstructures: fabrication, characterization, and applications**, M. Paturzo, P. Ferraro II, P. De Natale, Istituto Nazionale di Ottica Applicata (Italy); A. Finizio, Istituto di Cibernetica (Italy); M. Gioffre, G. Coppola, M. Iodice, Istituto per la Microelettronica e Microsistemi (Italy); S. Mailis, Univ. of Southampton (United Kingdom) ..... [6185-50]
- ✓ **Roughness measurements on coupling structures for optical interconnections integrated on a printed circuit board**, N. Hendrickx, Univ. Gent (Belgium); J. Van Erps, Vrije Univ. Brussel (Belgium); H. Suyal, Heriot-Watt Univ. (United Kingdom); G. Van Steenberge, Univ. Gent (Belgium); A. McCarthy, M. R. Taghizadeh, Heriot-Watt Univ. (United Kingdom); H. Thienpont, Vrije Univ. Brussel (Belgium); P. Van Daele, Univ. Gent (Belgium) ..... [6185-51]
- ✓ **High-efficiency diffraction grating coupler**, J. Franc, Univ. Jean Monnet Saint-Etienne (France); A. Last, Forschungszentrum Karlsruhe (Germany); N. Destouches, D. Blanc, Univ. Jean Monnet Saint-Etienne (France); N. Hendrickx, G. Van Steenberge, Univ. Gent (Belgium); O. M. Parriaux, Univ. Jean Monnet Saint-Etienne (France) ..... [6185-52]
- ✓ **2.5 dimension structures in deep-proton lithography**, R. Kasztelan, Univ. Warszawski (Poland) ..... [6185-53]

**Tuesday 4 April**

**SESSION 4**

**Gutenberg ..... Tues. 10.30 to 12.00**

**Computer Architectures and Photonic Interconnects**

*Chair: Juergen Jahns, Fernuniv. Hagen (Germany)*

10.30: **Challenges for the introduction of printed circuit boards with optical layers into product development roadmaps (Invited Paper)**, C. Berger, B. J. Offrein, M. L. Schmatz, IBM Research (Switzerland)[6185-16]

11.00: **Multiplex-processor architectures for 3D optoelectronic stacked computing circuits**, A. Loos, M. Schmidt, Friedrich-Schiller-Univ. Jena (Germany); A. Graupner, Technische Univ. Dresden (Germany); D. Fey, Friedrich-Schiller-Univ. Jena (Germany); R. Schüffny, Technische Univ. Dresden (Germany) ..... [6185-17]

11.20: **Modeling an optically interconnected FPGA for reconfigurable computing architectures**, G. A. Russell, C. J. Moir, J. F. Snowdon, Heriot-Watt Univ. (United Kingdom) ..... [6185-18]

11.40: **Selective optical broadcasting in reconfigurable multiprocessor interconnects**, I. Artundo, Vrije Univ. Brussel (Belgium); W. Heirman, Univ. Gent (Belgium); C. Debaes, Vrije Univ. Brussel (Belgium); J. Dambre, J. M. Van Campenhout, Univ. Gent (Belgium); H. Thienpont, Vrije Univ. Brussel (Belgium) ..... [6185-19]

Lunch Break ..... 12.00 to 13.10

**SESSION 5**

**Gutenberg ..... Tues. 13.10 to 15.00**

**Photonic Interconnect Demonstrators: Packaging Aspects I**

*Chair: Peter Van Daele, Univ. Gent (Belgium)*

13.10: **Integration of generic and application-specific optical printed circuit boards and VLSI photonic integrated circuits (Invited Paper)**, E. Lee, Inha Univ. (South Korea) ..... [6185-20]

13.40: **Optical interconnects on printed circuit boards using embedded optical fibers**, M. Schneider, T. Kühner, Forschungszentrum Karlsruhe (Germany) ..... [6185-21]

14.00: **Low-cost packaging of a reflective electroabsorption modulator/detector with optimized spurious free dynamic range**, S. Karlsson, Kungliga Tekniska Högskolan (Sweden); C. Liu, Univ. College London (United Kingdom); Y. Yu, O. Kjebon, R. Schatz, Kungliga Tekniska Högskolan (Sweden); C. Chuang, Univ. College London (United Kingdom); U. Westergren, Kungliga Tekniska Högskolan (Sweden); A. Krysa, J. S. Roberts, The Univ. of Sheffield (United Kingdom); A. J. Seeds, Univ. College London (United Kingdom) ..... [6185-22]

14.20: **Hermetic fiber pigtailed laser module utilizing passive device alignment on an LTCC substrate**, K. Keranen, J. Ollila, J. Mäkinen, K. Kautio, P. Korhonen, V. Heikkinen, VTT Elektronikka (Finland); O. Väättäinen, J. Heilala, VTT Tuotteet ja Tuotanto (Finland); P. Karioja, VTT Elektronikka (Finland) ..... [6185-23]

14.40: **Parallel optical interconnect between surface-mounted devices on FR-4 printed wiring board using embedded waveguides and passive optical alignments**, M. Karppinen, T. Alajoki, A. Tanskanen, K. J. Kataja, VTT Elektronikka (Finland); M. Immonen, Aspocomp Oy (Finland) and Helsinki Univ. of Technology (Finland); J. K. Kivilahti, Helsinki Univ. of Technology (Finland); P. Karioja, VTT Electronikka (Finland) ..... [6185-24]

Coffee Break ..... 15.00 to 15.20

## SESSION 6

Gutenberg ..... Tues. 15.20 to 16.30

**Photonic Interconnect Demonstrators:  
Packaging Aspects II***Chair: Allen M. Earman, Finisar Corp. (USA)*

15.20: **Packaging a free-space intra-chip optical interconnect module: Monte Carlo tolerance study and assembly results (Invited Paper)**, M. Vervaeke, Vrije Univ. (Belgium); M. Lahti, M. Karppinen, VTT Elektronikka (Finland); C. Debaes, B. Volckaerts Vrije Univ. (Belgium); P. Karioja VTT Elektronikka (Finland); H. Thienpont Vrije Univ. (Belgium) ..... [6185-27]

15.50: **Monolithically integrated transceiver chips for bidirectional optical interconnection**, M. Stach, M. Chandran, F. Rinaldi, R. Michalzik, Univ. Ulm (Germany) ..... [6185-28]

16.10: **Point-to-point VCSEL-based free-space optical data link for board-to-board communications**, V. Foucal, F. Quentel, M. M. Pez, C. Claudepierre, G. Barbary, C. Hartmann, D-Lightsys (France); P. J. Twardowski, Ecole Nationale Supérieure de Physique de Strasbourg (France); P. P. Meyrueis, Univ. Louis Pasteur (France) ..... [6185-29]

## Wednesday 5 April

## SESSION 7

Gutenberg ..... Wed. 08.00 to 10.00

**VCSELS for Photonic Interconnects***Chair: Rainer Michalzik, Univ. Ulm (Germany)*

08.00: **An analytical simulation model for VCSELS to support signal integrity analysis of optical interconnects**, G. Clarici, E. Griese, Univ. Siegen (Germany) ..... [6185-30]

08.20: **Semiautomatic characterization and simulation of VCSEL devices for high-speed VSR communications**, S. Pellevrault, A. Destrez, Z. Toffano, Ecole Supérieure d'Electricité (France); M. M. Pez, F. Quentel, D-Lightsys (France) ..... [6185-31]

08.40: **Experimental characteristics and analysis of transverse modes in 1.3- $\mu\text{m}$  strained InGaAs quantum-well VCSELS**, E. Pougeoise, P. Gilet, P. Grosse, S. Poncet, A. Chelnokov, J. Gérard, Commissariat à l'Energie Atomique (France); G. Bourgeois, R. Stevens, R. R. Hamelin, IntexyS Photonics (France); M. Hammar, J. Berggren, P. Sundgren, Kungliga Tekniska Högskolan (Sweden) ..... [6185-32]

09.00: **Toward more efficient fabrication of high-density 2D VCSEL arrays for spatial redundancy and/or multilevel signal communication**, H. R. Roscher, P. Gerlach, F. N. Khan, A. Weigl, R. Michalzik, Univ. Ulm (Germany) ..... [6185-33]

09.20: **1.55- $\mu\text{m}$  optically pumped tunable VCSEL based on a nanopolymer dispersive liquid crystal phase modulator**, C. Levallois, Institut National des Sciences Appliquées de Rennes (France); V. Verbrugge, L. Dupont, J. L. de Bougrenet de la Tocnaye, B. Caillaud, École Nationale Supérieure des Télécommunications (France); A. Le Corre, O. Dehaese, H. Folliot, S. Loualiche, Institut National des Sciences Appliquées de Rennes (France) ..... [6185-34]

09.40: **760-nm high-performance VCSEL growth and characterization**, F. Rinaldi, J. M. Ostermann, A. Kroner, M. C. Riedl, R. Michalzik, Univ. Ulm (Germany) ..... [6185-35]

Coffee Break ..... 10.00 to 10.30

Joint Session I ..... Wed. 10.30 to 12.10

**VCSELS: Stability Control and High Performance****Joint Event with Conference 6184***Chair: Marc Sciamanna, SupElec (France)*

10.30: **Spin-controlled vertical cavity surface-emitting lasers (Invited Paper)**, S. H'vel, N. C. Gerhardt, C. Brenner, M. R. Hofmann, F. Lo, D. Reuter, A. D. Wieck, Ruhr-Univ. Bochum (Germany); E. Schuster, W. Keune, Univ. Duisburg-Essen (Germany) ..... [6184 34]

11.00: **Nonmodal emission characteristics of boad-area vertical-cavity surface-emitting lasers (Invited Paper)**, M. L. Peeters, G. Verschaffelt, I. Fischer, Vrije Univ. Brussel (Belgium); S. K. Mandre, Technische Univ. Darmstadt (Germany); J. Danckaert, H. Thienpont, Vrije Univ. Brussel (Belgium) ..... [6184 35]

11.30: **Optimization of polarization-stable single- and multimode surface grating VCSELS towards high fabrication tolerance and superior performance**, J. M. Ostermann, Univ. Ulm (Germany) and Politecnico di Torino (Italy); P. Debernardi, Politecnico di Torino (Italy); R. Michalzik, Univ. Ulm (Germany) ..... [6184 36]

11.50: **VCSELS optical modeling using the plane wave admittance method**, T. Czeszanowski, Vrije Univ. (Belgium) and Technical Univ. Lodz (Poland); M. Technical Univ. Lodz (Poland); H. Thienpont Vrije Univ. (Belgium); K. Panajotov Vrije Univ. (Belgium) and Institute of Solid State Physics (Bulgaria) ..... [6185 36]

Lunch Break ..... 12.10 to 13.30

Joint Session II ..... Wed. 13.30 to 15.30

**VCSELS: Polarisation Bistability and Switching****Joint Event with Conference 6184***Chair: Ortwin G. Hess, Univ. of Surrey (United Kingdom)*

13.30: **Nonlinear dynamics and polarization bistability in optically injected VCSELS**, I. Gatara, Ecole Supérieure d'Electricité (France) and Vrije Univ. Brussel (Belgium); J. Buesa, H. Thienpont, K. P. Panajotov, Vrije Univ. Brussel (Belgium); M. Sciamanna, Ecole Supérieure d'Electricité (France) ..... [6184 37]

13.50: **The influence of current noise on polarisation mode hopping in VCSELS**, M. Cornelles Soriano, G. Verschaffelt, G. Van der Sande, M. L. Peeters, Vrije Univ. Brussel (Belgium); D. Lenstra, Vrije Univ. Amsterdam (Netherlands) and COBRA Research Institute (Netherlands); M. Yousefi, Technische Univ. Eindhoven (Netherlands); J. Danckaert, Vrije Univ. Brussel (Belgium) ..... [6184 38]

14.10: **Polarization switching dynamics and bistability in mutually coupled vertical-cavity surface-emitting lasers**, R. Vicente, Univ. de les Illes Balears (Spain); J. Mulet, Institut Mediterrani d'Estudis Avançats (Spain); C. R. Mirasso, Univ. de les Illes Balears (Spain); M. Sciamanna, SupElec (France) ..... [6184 39]

14.30: **Dynamics of vertical-cavity surface-emitting lasers in the short external cavity regime: pulse packages and polarization mode competition**, A. R. Tabaka, Vrije Univ. Brussel (Belgium); M. Peil, Technische Univ. Darmstadt (Germany); M. Sciamanna, SupElec (France); I. Fischer, Vrije Univ. Brussel (Belgium); W. E. Elsasser, Technische Univ. Darmstadt (Germany); H. Thienpont, I. P. Veretennicoff, K. P. Panajotov, Vrije Univ. Brussel (Belgium) ..... [6184 41]

14.50: **Investigation of polarization properties of VCSELS subject to optical feedback from an extremely short external cavity**, M. M. Arizaleta, Vrije Univ. Brussel (Belgium) and Univ. Publica de Navarra (Spain); H. J. Unold, ETH Zürich (Switzerland); J. M. Ostermann, R. Michalzik, Univ. Ulm (Germany); H. Thienpont, Vrije Univ. Brussel (Belgium); M. LÚpez-Amo, Univ. P'blica de Navarra (Spain); K. P. Panajotov, Vrije Univ. Brussel (Belgium) ..... [6185 37]

15.10: **Switching phenomena in a VCSEL with frequency-selective optical feedback**, A. Naumenko, N. A. Loiko, B.I. Stepanov Institute of Physics (Belarus); M. Sondermann, Albert-Ludwigs-Univ. Freiburg (Germany); K. Jentsch, Univ. Muenster (Germany); T. Ackemann, Univ. of Strathclyde (United Kingdom) ..... [6184 40]



# MEMS, MOEMS, and Micromachining II

Conference Chairs: **Hakan Urey**, Koç Univ. (Turkey); **Ayman El-Fatraty**, BAE Systems plc (United Kingdom)

Program Committee: **Dan C. Dascalu**, National Institute of Microtechnologies (Romania); **Hans Peter Herzig**, Univ. de Neuchâtel (Switzerland); **Pdraig J. Hughes**, Tyndall National Institute (Ireland); **Marc J. Madou**, Univ. of California/Irvine (USA); **Hiroshi Miyajima**, Olympus Corp. (Japan); **Yael Nemirovsky**, Technion - Israel Institute of Technology (Israel); **Russell A. Noble**, QinetiQ (United Kingdom); **Patric R. Salomon**, 4M2C PATRIC SALOMON GmbH (Germany); **Minoru Sasaki**, Tohoku Univ. (Japan); **Harald Schenk**, Fraunhofer-Institut für Photonische Mikrosysteme (Germany); **Ion G. Stiharu**, Concordia Univ. (Canada); **Henne van Heeren**, Enabling M3 (Netherlands); **James S. Wilkinson**, Univ. of Southampton (United Kingdom)



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3, 7, 26, 27.

## Monday 3 April

### SESSION 1

**Munch** ..... **Mon. 10.30 to 12.10**

#### Display and Imaging

Chair: **Hakan Urey**, Koç Univ. (Turkey)

- 10.30: **Active focusing device based on MOEMS technology**, U. Mescheder, Fachhochschule Furtwangen (Germany) ..... [6186-01]
- 10.50: **New generation of fully integrated optical microscopes on-chip: application to confocal microscope**, S. Bargiel, L. Nieradko, M. Jozwik, C. Gorecki, Univ. de Franche-Comté (France); J. Dziuban, Politechnika Wroclawska (Poland) ..... [6186-02]
- 11.10: **A 2D MEMS stage for optical applications**, C. Ataman, Koç Univ. (Turkey); Y. Petremand, W. Noell, Univ. de Neuchâtel (Switzerland); H. Urey, Koç Univ. (Turkey); N. F. de Rooij, Univ. de Neuchâtel (Switzerland) ..... [6186-03]
- 11.30: **A large deflection translatory actuator for optical path length modulation**, H. Schenk, C. Drabe, T. Klose, A. Wolter, H. K. Lakner, Fraunhofer-Institut für Photonische Mikrosysteme (Germany) . [6186-04]
- 11.50: **MEMS microdisplays: overview and markets 2005-2009**, J. Bouchaud, Wicht Technologie Consulting (Germany) ..... [6186-05]
- Lunch Break ..... 12.10 to 13.30

### SESSION 2

**Munch** ..... **Mon. 13.30 to 15.10**

#### Microsystems/Sensors

Chair: **Harald Schenk**, Fraunhofer-Institut für Photonische Mikrosysteme (Germany)

- 13.30: **Compact triangulation sensor realized by bending wafer with metal hinge**, M. Sasaki, M. Fujishima, S. Endou, K. Hane, Tohoku Univ. (Japan) ..... [6186-06]
- 13.50: **Butt-coupled microcantilever in sensing applications**, K. Zinoviev, J. A. Plaza, V. J. Cadarso, L. M. Lechuga, C. Dominguez, Ctr. Nacional de Microelectrónica (Spain) ..... [6186-07]
- 14.10: **Development of tuneable monolithic infrared microfilters operating in 3 to 5-mm range**, J. Antoszewski, A. J. Keating, K. J. Winchester, T. H. Nguyen, D. K. Silva, C. A. Musca, J. M. Dell, L. Faraone, The Univ. of Western Australia (Australia) ..... [6186-08]
- 14.30: **Application of a micromachined translatory actuator to an optical FTIR spectrometer**, A. Kenda, Carinthian Tech Research AG (Austria); C. Drabe, H. Schenk, Fraunhofer-Institut für Photonische Mikrosysteme (Germany); A. Frank, W. Scherf, Carinthian Tech Research AG (Austria) ..... [6186-09]
- 14.50: **Voltage noise in MgB<sub>2</sub> thin film: a candidate material for future space based thermal sensors**, B. Lakew, NASA Goddard Space Flight Ctr. (USA); S. Aslam, Muniz Engineering, Inc. (USA); H. H. Jones, NASA Goddard Space Flight Ctr. (USA); B. Moeckly, Superconductor Technologies Inc. (USA); J. C. Brasunas, D. E. Franz, NASA Goddard Space Flight Ctr. (USA) ..... [6186-10]
- Coffee Break ..... 15.10 to 15.40

### SESSION 3

**Munch** ..... **Mon. 15.40 to 16.40**

#### Microsystems/Sensors

Chair: **Minoru Sasaki**, Tohoku Univ. (Japan)

- 15.40: **Array of atomic force microscopy with optical heterodyne detection method**, L. Chantada, Univ. de Santiago de Compostela (Spain); M. Kim, O. Manzardo, R. Dändliker, H. P. Herzig, L. Aeschimann, U. Stauer, Univ. de Neuchâtel (Switzerland); P. Vettiger, F. Lustenberg, Ctr. Suisse d'Electronique et de Microtechnique SA (Switzerland) . [6186-11]
- 16.00: **A Fourier transform spectrometer using resonant vertical comb actuators**, C. Ataman, H. Urey, S. Isikman, Koç Univ. (Turkey); A. Wolter, Fraunhofer-Institut für Photonische Mikrosysteme (Germany) ..... [6186-12]
- 16.20: **Appearance of a Moore's law in MEMS?**, H. van Heeren, EnablingMNT (Netherlands) ..... [6186-13]

### SESSION 4

**Munch** ..... **Mon. 16.40 to 17.40**

#### Bio-MEMS

Chair: **Pdraig J. Hughes**, National Univ. of Ireland/Cork (Ireland)

- 16.40: **Microspectroscopy with terahertz bioMEMS**, T. Akalin, A. Treizebré, B. Bocquet, Univ. des Sciences et Technologies de Lille (France) ..... [6186-14]
- 17.00: **Integrating photonic and microfluidic structures on a device fabricated using proton beam writing**, A. A. Bettiol, K. Ansari, S. Peige, J. A. van Kan, T. Wohland, F. Watt, National Univ. of Singapore (Singapore) ..... [6186-15]
- 17.20: **MEMS-based sensor and method for optical detection of the peptides bio-reaction time**, A. Jeetender, I. G. Stiharu, M. Packirisamy, Concordia Univ. (Canada); V. Nerguizian, Univ. du Québec (Canada) ..... [6186-36]

### ✓ Interactive Posters—Monday

An interactive poster session will be held on Monday 18.00 to 20.30. Posters will be on display after 10.00 Monday morning in the Conference Centre Galerie de Marbre (ground floor) and Forum Hall (1st floor). An interactive poster session and reception with authors present will be held Monday evening from 18.00 to 20.30. Light refreshments will be served.

- ✓ **The influences of thickness on piezoresistive properties of poly-Si nanofilms**, X. Liu, R. Chuai, M. Song, H. Pan, X. Xu, Harbin Institute of Technology (China) ..... [6186-32]
- ✓ **The PDMS micro-/nanovalve driven by PZT piezoelectric actuator on the silicon wafer**, T. Li, W. Wei, X. Liu, X. Wang, Z. Bao, Harbin Institute of Technology (China) ..... [6186-33]
- ✓ **Study of capillary electrophoresis chip with conductivity detection**, W. Wei, T. Li, X. Liu, X. Lei, Harbin Institute of Technology (China) ..... [6186-34]
- ✓ **Tunable Bragg grating based on MOEMS technology**, R. Kasztelan, A. Zychewicz, W. M. Saj, R. R. Buczynski, Univ. Warszawski (Poland) ..... [6186-35]
- ✓ **Microresonator band-pass filter design using genetic optimization**, H. E. Ibrahim, Arab Academy for Science & Technology (Egypt) ..... [6186-37]

### Tuesday 4 April

#### SESSION 5

**Munch** ..... **Tues. 10.30 to 12.20**

##### Telecom

*Chair: Henne van Heeren, EnablingM3 (Netherlands)*

- 10.30: **Compact and stress-released piston tip-tilt mirror (Invited Paper)**, W. Noell, T. Overstolz, Univ. de Neuchâtel (Switzerland); R. P. Stanley, Ctr. Suisse d'Electronique et de Microtechnique SA (Switzerland); N. F. de Rooij, Univ. de Neuchâtel (Switzerland) ..... [6186-16]
- 11.00: **Tunable InP/air MOEMS filter with record breaking selectivity**, M. Garrigues, J. Danglot, J. Leclercq, École Centrale de Lyon (France) ..... [6186-17]
- 11.20: **Low-power high-extinction electrothermal MEMS iris VOA**, H. Veladi, R. R. Syms, H. Zou, Imperial College London (United Kingdom) ..... [6186-18]
- 11.40: **Tunable mechanical resonator with aluminium nitride piezoelectric actuation**, J. Olivares, J. Malo, S. González, I. Izpura, M. Clement, A. Sanz-Hervás, E. Iborra, Univ. Politécnica de Madrid (Spain); J. L. Sánchez-Rojas, P. Sanz, Univ. de Castilla-La Mancha (Spain) ..... [6186-19]
- 12.00: **Novel polymer actuator for variable-optical attenuator**, S. K. Mondal, P. Huges, Tyndall National Institute (Ireland); A. M. Lyons, Lucent Technologies/Bell Labs. (Ireland); G. M. Jordan, The Univ. of Dublin, Trinity College (Ireland) and Lucent Technologies/Bell Labs. (Ireland) [6186-20]
- Lunch Brak ..... 12.20 to 13.40

### SESSION 6

**Munch** ..... **Tues. 13.40 to 15.10**

#### Testing and Reliability

*Chair: Ion G. Stiharu, Concordia Univ. (Canada)*

- 13.40: **Optical probing of nanoelectromechanical systems (NEMS) (Invited Paper)**, K. L. Ekinci, Boston Univ. (USA) ..... [6186-21]
- 14.10: **Digital holography microscopy (DHM) for metrology and characterization of MEMS and MOEMS**, Y. Emery, F. Marquet, E. Cuhe, N. Aspert, P. Marquet, Lyncée Tec SA (Switzerland); J. Kuehn, M. Botkine, C. D. Depeursinge, École Polytechnique Fédérale de Lausanne (Switzerland) ..... [6186-22]
- 14.30: **The distorted helix: thin film extraction from scanning white light interferometry**, D. I. Mansfield, Taylor Hobson Ltd. (United Kingdom) ..... [6186-23]
- 14.50: **Optical MEMS reliability in Space environment**, S. Rigaud, G. Quadri, O. Gilard, J. Nicot, Ctr. National d'Études Spatiales (France) ..... [6186-24]
- Coffee Break ..... 15.10 to 15.40

### SESSION 7

**Munch** ..... **Tues. 15.40 to 17.20**

#### Fabrication

- 15.40: **Submicrometer patterning of gold conductors employing the fountain-pen principle**, C. P. Dockendorf, T. Choi, D. Poulidakos, ETH Zürich (Switzerland) ..... [6186-25]
- 16.00: **Fabrication of Fresnel lenses in the medium infrared by silicon micromachining: efficiency/quantization trade-offs**, J. Fonollosa Magrinyà, Univ. de Barcelona (Spain); S. Hartwig, Fraunhofer-Institut für Physikalische Messtechnik (Germany); R. Rubio, Ctr. Nacional de Microelectrónica (Spain); J. Hildenbrand, Fraunhofer-Institut für Physikalische Messtechnik (Germany); J. Santander, L. Fonseca, Ctr. Nacional de Microelectrónica (Spain); M. Moreno Sereno, S. Marco Colás, Univ. de Barcelona (Spain); J. Woellenstein, Fraunhofer-Institut für Physikalische Messtechnik (Germany) ..... [6186-26]
- 16.20: **Management and verification for MEMS fabrication processes**, K. Hahn, A. Wagener, J. Popp, T. Schmidt, R. Brueck, Univ. Siegen (Germany); D. Orloff, Cavendish Kinetics B.V. (Netherlands) .. [6186-27]
- 16.40: **MEMS-based microdirect methanol fuel cell using microfabrication technology**, X. Liu, C. Suo, Harbin Institute of Technology (China) ..... [6186-28]
- 17.00: **Design of a silicon-based direct methanol fuel cell**, X. Liu, Y. Zhang, C. Suo, X. Lu, Harbin Institute of Technology (China) . [6186-29]



# Photon Management II

*Conference Chairs:* **John T. Sheridan**, National Univ. of Ireland/Dublin (Ireland); **Frank Wyrowski**, Friedrich-Schiller-Univ. Jena (Germany)

*Program Committee:* **Pierre Ambs**, Univ. de Haute Alsaces (France); **Takeji Arai**, Chuo Univ. (Japan); **Luis M. Bernardo**, Univ. do Porto (Portugal); **Juan-Manuel Campos**, Ecole Supérieure d'Electricite (Supelec) (France); **Yeong-Ho Ha**, Kyungpook National Univ. (South Korea); **Joachim Hein**, Friedrich-Schiller-Univ. Jena (Germany); **Zbigniew Jaroszewicz**, Instytut Optyki Stosowanej (Poland); **Norbert Lindlein**, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); **M. G. Moharam**, College of Optics and Photonics/Univ. of Central Florida (USA); **Thomas J. Naughton**, National Univ. of Ireland/Maynooth (Ireland); **Cristian Neipp**, Univ. de Alicante (Spain); **Vladimir S. Pavelyev**, Image Processing Systems Institute (Russia); **Stefano Pelli**, Istituto di Fisica Applicata Nello Carrara (Italy); **Peeter M. Saari**, Instytut Fizyki (Estonia); **Hagen Schimmel**, LightTrans GmbH (Germany); **Colin J. R. Sheppard**, National Univ. of Singapore (Singapore); **Boris Spektor**, Technion - Israel Institute of Technology (Israel); **Jani Tervo**, LightTrans GmbH (Germany); **Jari P. Turunen**, Univ. of Joensuu (Finland)



**Conference 6187 contains papers funded by and/or related to current EU research projects contained in Framework VI.**

*Paper Numbers:*  
3, 4, 11, 17, 20, 48, 52.

## Monday 3 April

### SESSION 1

**Kleber ..... Mon. 10.30 to 13.00**

#### Holographic Media and Storage

*Chair:* **Frank Wyrowski**, Friedrich-Schiller-Univ. Jena (Germany)

10.30: **High-density recording storage system by collinear holography (Invited Paper)**, H. Horimai, X. Tan, Y. Aoki, OPTWARE Corp. (Japan) ..... [6187-01]

11.00: **Volume holographic recording in multicomponent photopolymers with hyperbranched polymers as organic nanoparticles (Invited Paper)**, Y. Tomita, K. Furushima, Y. Endoh, Univ. of Electro-Communications (Japan); M. Hidaka, K. Ohmori, K. Chikama, Nissan Chemical Industries, Ltd. (Japan) ..... [6187-02]

11.30: **Microholographic data storage: multilayers at the optical resolution limit (Invited Paper)**, S. Orlic, Technische Univ. Berlin (Germany); E. Dietz, Technische Univ. Berlin (Germany); S. Frohmann, J. Gortner, B. Heimke, R. Henze, C. Müller, Technische Univ. Berlin (Germany) ..... [6187-03]

12.00: **Analysis of the temporal effects on grating evolution in photopolymer**, J. V. Kelly, M. R. Gleeson, C. E. Close, F. T. O'Neill, J. T. Sheridan, National Univ. of Ireland/Dublin (Ireland); S. Gallego, C. Neipp, Univ. de Alicante (Spain) ..... [6187-04]

12.20: **Photopolymerizable hybrid sol-gel glasses as holographic recording media**, C. Crouté-Barghorn, M. Feuillade, C. Carre, D. Lougnot, École Nationale Supérieure de Chimie de Mulhouse (France) ..... [6187-05]

12.40: **Quasi in situ microscopic study of hologram build-up in LiNbO3 crystal**, G. Mandula, I. Banyasz, Magyar Tudományos Akadémia Szilárdtestfizikai és Optikai (Hungary) ..... [6187-06]

Lunch Break ..... 13.00 to 14.00

### SESSION 2

**Kleber ..... Mon. 14.00 to 15.40**

#### Materials and Devices

*Chair:* **Horimai Hideyoshi**, Optware Co. (Japan)

14.00: **Polarization properties of long-period gratings prepared by high-intensity femtosecond 352-nm laser pulses**, D. N. Nikogosyan, National Univ. of Ireland/Cork (Ireland) ..... [6187-07]

14.20: **Spectral characterisation of erbium-doped heavy-metal fluoride microspherical lasers**, B. J. Shortt, J. Ward, S. G. Nic Chormaic, Cork Institute of Technology (Ireland) ..... [6187-08]

14.40: **Development of a metrology to characterize an EUV optic at 13.5 nm**, M. Vongehr, P. Predehl, G. Hasinger, Max-Planck-Institut für extraterrestrische Physik (Germany) ..... [6187-09]

15.00: **Group delay control of picosecond optical pulses in superstructured fiber Bragg gratings**, D. Janner, D. Gatti, G. Galzerano, G. Della Valle, P. Laporta, S. Longhi, Politecnico di Milano (Italy) [6187-10]

15.20: **Integrating a lossless polarizing function in multilayer laser mirrors by means of a resonant grating**, O. M. Parriaux, A. V. Tishchenko, F. Pigeon, Univ. Jean Monnet Saint-Etienne (France) ..... [6187-11]

Coffee Break ..... 15.40 to 16.00

### SESSION 3

**Kleber ..... Mon. 16.00 to 18.00**

#### Components and Devices

*Chair:* **Susanna Orlic**, Technische Univ. Berlin (Germany)

16.00: **Comparing identically designed grayscale (50 phase level) and binary (5 phase levels) splitters: actual versus modeled performance**, T. E. Lizotte, O. P. Ohar, R. L. Rosenberg, Hitachi Via Mechanics USA, Inc. (USA) ..... [6187-12]

16.20: **Polarization diffractive elements displayed with liquid crystal spatial light modulators**, I. S. Moreno, Univ. Miguel Hernández de Elche (Spain); C. C. Lemmi, Univ. de Buenos Aires (Argentina); A. A. Vargas, Univ. de la Frontera (Chile); J. Campos, M. J. Yzuel, Univ. Autònoma de Barcelona (Spain) ..... [6187-13]

16.40: **Two applications of liquid crystal displays in diffractive optics under polychromatic illumination**, A. Márquez, Univ. de Alicante (Spain); C. C. Lemmi, Univ. de Buenos Aires (Argentina); J. Campos, J. C. Escalera, M. J. Yzuel, Univ. Autònoma de Barcelona (Spain) .. [6187-14]

17.00: **Adaptive temporal and spatial shaping of coherent soft x-rays**, C. Winterfeldt, R. Kemmer, A. Paulus, T. Pfeifer, R. Spitzenpfeil, D. Walter, G. Gerber, C. Spielmann, Univ. Würzburg (Germany) ..... [6187-56]

17.20: **Simulation of light propagation through a DOE using the FDTD method**, D. L. Golovashkin, Image Processing Systems Institute (Russia) ..... [6187-16]

17.40: **Low loss polarizing beam splitter using the long range plasmon mode along a continuous metal film**, Y. Jourlin, E. Gamet, S. Tonchev, A. V. Tishchenko, O. M. Parriaux, Univ. Jean Monnet Saint-Etienne (France); A. Last, Forschungszentrum Karlsruhe (Germany) ..... [6187-17]

## ✓ Interactive Posters—Monday

An interactive poster session will be held on Monday 18.00 to 20.30. Posters will be on display after 10.00 Monday morning in the Conference Centre Galerie de Marbre (ground floor) and Forum Hall (1st floor). An interactive poster session and reception with authors present will be held Monday evening from 18.00 to 20.30. Light refreshments will be served.

- ✓ **Optical holographic encrypted data storage using lenticular lens array phase-coded multiplexing**, C. Chang, G. L. Chen, P. J. Deng, W. K. Young, Chung Cheng Institute of Technology (Taiwan) [6187-35]
- ✓ **E-field control of the optical properties of liquid micro-optical elements**, F. T. O'Neill, L. Liu, A. J. Carr, J. T. Sheridan, National Univ. of Ireland/Dublin (Ireland) [6187-36]
- ✓ **Multiplexing holograms in an acrylamide photopolymer**, E. Fernandez Varo, M. Ortuño Sanchez, S. Gallego Rico, A. Marquez Ruiz, I. Pascual Villalobos, Univ. de Alicante (Spain) [6187-37]
- ✓ **Applications of fast algorithms for the numerical calculation of optical signal transforms**, J. J. Healy, J. T. Sheridan, National Univ. of Ireland/Dublin (Ireland) [6187-38]
- ✓ **3D analysis of holographic memories based on photopolymers using finite differences method**, S. Gallego, M. Ortuno, C. Neipp, A. Márquez, A. Beléndez, E. Fernández, Univ. de Alicante (Spain); J. V. Kelly, J. T. Sheridan, National Univ. of Ireland/Dublin (Ireland) [6187-39]
- ✓ **Optical intersatellite data transmission with phase conjugate mirror for formation flying**, T. Shiratori, A. Okamoto, Hokkaido Univ. (Japan); Y. Takayama, Japan Aerospace Exploration Agency (Japan); T. Ito, Hokkaido Univ. (Japan) [6187-40]
- ✓ **Reduction of speckle in digital holograms of three-dimensional objects using independent component analysis**, J. W. Maycock, C. P. Mc Elhinney, J. B. McDonald, T. J. Naughton, National Univ. of Ireland/Maynooth (Ireland); B. Javidi, Univ. of Connecticut (USA) [6187-41]
- ✓ **Study of non-soliton blue-green radiation generated in mm-long photonic crystal fibres**, A. A. Amorim, Instituto Politécnico do Porto (Portugal); H. M. Crespo, L. M. Bernardo, Univ. do Porto (Portugal) [6187-42]
- ✓ **Phase effects in Fabry-Perot filters with multilayer mirrors**, J. Cos Corcoles, M. d. M. Sánchez-López, Univ. Miguel Hernández de Elche (Spain); J. A. Davis, San Diego State Univ. (USA); I. S. Moreno, Univ. Miguel Hernández de Elche (Spain) [6187-43]
- ✓ **Iterative and noniterative nonuniform quantisation techniques in digital holography**, A. E. Shortt, T. J. Naughton, National Univ. of Ireland/Maynooth (Ireland); B. Javidi, Univ. of Connecticut (USA) [6187-44]
- ✓ **Spatial soliton dynamics in optically induced photonic lattices**, I. A. Tsopelas, Y. Kominis, K. Hizanidis, S. Droulias, N. Moshonas, L. Halastanis, National Technical Univ. of Athens (Greece) [6187-45]
- ✓ **Variational approach of spatial soliton formation in slab nematic liquid crystal cells**, L. S. Halastanis, G. Papazisimos, M. Manousakis, K. Hizanidis, S. Droulias, N. Moshonas, I. A. Tsopelas, National Technical Univ. of Athens (Greece) [6187-46]
- ✓ **Modification of chain length and determination of diffusion rates in acrylamide-based photopolymer material**, C. E. Close, M. R. Gleeson, J. V. Kelly, F. T. O'Neill, D. Mooney, J. T. Sheridan, National Univ. of Ireland/Dublin (Ireland) [6187-47]
- ✓ **Photochemical effects during fabrication of holographic gratings in acrylamide-based photopolymer materials**, M. R. Gleeson, J. V. Kelly, F. T. O'Neill, J. T. Sheridan, National Univ. of Ireland/Dublin (Ireland) [6187-48]
- ✓ **Efficient diffractive collimator for edge-emitting laser diodes**, Z. Jaroszewicz, Instytut Optyki Stosowanej (Poland); A. Kowalik, K. Gora, G. Adamkiewicz, Instytut Technologii Materiałów Elektronicznych (Poland); G. Mikula, A. Kolodziejczyk, Politechnika Warszawska (Poland) [6187-49]
- ✓ **Optical micromanipulation using DOEs matched with optical vortices**, S. N. Khonina, R. V. Skidanov, V. V. Kotlyar, V. A. Soifer, Image Processing Systems Institute (Russia) [6187-50]
- ✓ **Width of the apodization area in the case of diffractive optical elements with variable efficiency**, Z. Jaroszewicz, Instytut Optyki Stosowanej (Poland); T. Osuch, Instytut Łączności (Poland); A. Kolodziejczyk, Politechnika Warszawska (Poland) [6187-51]
- ✓ **Application of the light sword optical element in a case of presbyopia**, A. Kolodziejczyk, Politechnika Warszawska (Poland); Z. Jaroszewicz, Instytut Optyki Stosowanej (Poland) and Instytut Łączności (Poland); M. Makowski, G. Mikula, I. Pawlak, K. Petelczyc, M. Sypek, Politechnika Warszawska (Poland) [6187-52]
- ✓ **Resonant grating pulse compression element with 99% flat top efficiency for high average-power femtosecond laser machining**, M. Flury, Univ. Jean Monnet Saint-Etienne (France); N. M. Lyndin, General Physics Institute (Russia); R. Fechner, A. Schindler, Leibniz-Institut für Oberflächenmodifizierung e.V. (Germany); S. H. Tonchev, Institute of Solid State Physics (Bulgaria); M. Spajer, Univ. de Franche-Comté (France); Y. Ouerdane, N. Destouches, D. Pietroy, S. Reynaud, O. M. Parriaux, Univ. Jean Monnet Saint-Etienne (France) [6187-53]
- ✓ **Three-dimensional monochromatic light field synthesis with a deflectable mirror array device**, E. Ulusoy, L. Onural, H. M. Ozaktas, Bilkent Univ. (Turkey); V. I. Uzunov, A. P. Gotchev, Tampereen Teknillinen Yliopisto (Finland) [6187-54]
- ✓ **Partial coherent light propagation on the base of a lateral harmonic field decomposition**, T. Paul, H. Schimmel, LightTrans GmbH (Germany); F. Wyrowski, Friedrich-Schiller-Univ. Jena (Germany) [6187-55]
- ✓ **Elimination of phase errors in planar-integrated diffractive optical Fourier transformation setups**, M. Gruber, FernUniv. in Hagen (Germany) [6187-15]
- ✓ **Holographic compensation of amplitude non uniformities of photopolymer chirped gratings**, E. A. Dovolnov, S. N. Sharangovich, Tomsk State Univ. (Russia) [6187-57]
- ✓ **Nonlinear waves in ferroelectrics**, E. V. Kazantseva, Univ. de Bourgogne (France); A. I. Maimistov, Moscow Engineering Physics Institute (Russia); J. Caputo, Institut National des Sciences Appliquées (France) [6187-58]
- ✓ **Capabilities of a new spatiotemporal CMOS imager for nanosecond low power pulse detection**, F. Morel, C. Zint, W. Uhring, Univ. Louis Pasteur (France) and Ctr. National de la Recherche Scientifique (France); J. Le Normand, Univ. Louis Pasteur (France) and Ctr. National de la Recherche Scientifique (France); Y. Hu, Univ. Louis Pasteur (France) and Ctr. National de la Recherche Scientifique (France) [6187-59]
- ✓ **The optical switching formed with the organic solution filled between a grating and a polymer plate**, Y. Zhang, T. Sun, P. Yuan, Harbin Institute of Technology (China) [6187-60]

## Tuesday 4 April

### SESSION 4

**Kleber** ..... Tues. 10.30 to 12.20

#### Design and Simulation I

*Chairs:* **John T. Sheridan**, National Univ. of Ireland/Dublin (Ireland); **Cristian Neipp**, Univ. de Alicante (Spain)

10.30: **Deterministic diffusers for LED illumination systems (Invited Paper)**, H. Schimmel, T. Paul, LightTrans GmbH (Germany); F. Wyrowski, Friedrich-Schiller-Univ. Jena (Germany) [6187-18]

11.00: **Wave-optical analysis of ball lens fiber coupling systems using VirtualLab**, H. Schimmel, T. Paul, LightTrans GmbH (Germany); F. Wyrowski, Friedrich-Schiller-Univ. Jena (Germany) [6187-19]

11.20: **Theoretical model for the analysis of diffractive optical elements composed of a progressive variation of subwavelength features**, C. Ribot, Thales Research & Technology (France); P. Lalanne, Univ. Paris-Sud II (France); M. L. Lee, B. Loiseaux, J. Huignard, Thales Research & Technology (France) [6187-20]

11.40: **Supercontinuum generation based lightwave management applied to multiplexing format conversion**, H. Sotobayashi, National Institute of Information and Communications Technology (Japan) [6187-21]

12.00: **Generation of Femtosecond pulse sequences in the ultraviolet by spectral phase modulation**, P. Nuernberger, G. Vogt, R. Selle, S. Fechner, T. Brixner, G. Gerber, Univ. Würzburg (Germany) [6187-22]

Lunch Break ..... 12.20 to 13.20

**SESSION 5**

**Kleber ..... Tues. 13.20 to 15.20**

**Design and Simulation II**

*Chair: Yasuo Tomita, Univ. of Electro-Communications (Japan)*

- 13.20: **Grayscale fabrication errors and their impact on beam shaper performance**, T. E. Lizotte, Hitachi Via Mechanics USA, Inc. (USA) ..... [6187-23]
- 13.40: **Simulation of pulse propagation in focal regions**, H. Schimmel, LightTrans GmbH (Germany); F. Wyrowski, Friedrich-Schiller-Univ. Jena (Germany); T. Paul, LightTrans GmbH (Germany) ..... [6187-24]
- 14.00: **A novel finite element method for the modeling of multiple reflections in photonic integrated circuits**, J. A. Ging, R. F. O'Dowd, National Univ. of Ireland/Dublin (Ireland) ..... [6187-25]
- 14.20: **Fast self-induced waveguides in photorefractive semiconductor InP:Fe for reconfigurable optical switching**, D. Wolfersberger, N. Khelifaoui, G. Kugel, N. Fressengeas, Supélec (France); M. Chauvet, Univ. de Franche-Comté (France) ..... [6187-26]
- 14.40: **Light bottle generated by Bragg volume grating**, B. Spektor, Technion - Israel Institute of Technology (Israel) ..... [6187-29]
- 15.00: **On-fiber diffractive microrelief design for efficient control of the waveguiding beam**, V. S. Pavelyev, Samara Institute of Image Processing Systems (Russia) ..... [6187-28]
- Coffee Break ..... 15.20 to 15.40

**SESSION 6**

**Kleber ..... Tues. 15.40 to 17.40**

**Optical Signal Processing**

*Chair: Hagen Schimmel, LightTrans GmbH (Germany)*

- 15.40: **An overview of the holographic display related tasks within the European 3DTV Project**, L. Onural, H. M. Ozaktas, Bilkent Univ. (Turkey); A. P. Gotchev, Tampereen Teknillinen Yliopisto (Finland); J. Watson, Univ. of Aberdeen (United Kingdom); T. M. Kreis, Bremer Institut für Angewandte Strahltechnik (Germany); E. V. Stoykova, Central Lab. of Optical Storage and Processing of Information (Bulgaria) .... [6187-28]
- 16.00: **Performance analysis of different multi-user optical passive networks for quantum cryptography applications**, F. Garzia, P. Curtacci, R. Cusani, E. Baccarelli, Univ. degli Studi di Roma/La Sapienza (Italy) ..... [6187-30]
- 16.20: **Three-dimensional scene reconstruction of partially occluded objects using digital holograms**, J. W. Maycock, C. P. Mc Elhinney, T. J. Naughton, J. B. McDonald, National Univ. of Ireland/Maynooth (Ireland); B. Javidi, Univ. of Connecticut (USA) ..... [6187-31]
- 16.40: **Speckle-based metrology systems and linear canonical transforms photography in mixed domains**, D. P. Kelly, J. E. Ward, R. F. Patten, B. M. Hennelly, Y. Liu, J. T. Sheridan, National Univ. of Ireland/Dublin (Ireland) ..... [6187-32]
- 17.00: **Numerical analysis of systematic errors in an optical encryption system**, D. S. Monaghan, U. Gopinathan, D. P. Kelly, National Univ. of Ireland/Dublin (Ireland); T. J. Naughton, National Univ. of Ireland/Maynooth (Ireland); J. T. Sheridan, National Univ. of Ireland/Dublin (Ireland) ..... [6187-33]
- 17.20: **Compression of phase-shifting digital holography interference patterns**, E. Darakis, J. J. Soraghan, Univ. of Strathclyde (United Kingdom) ..... [6187-34]



# Optical Micro- and Nanometrology in Microsystems Technology

*Conference Chair:* **Christophe Gorecki**, Univ. de Franche-Comté (France)

*Cochairs:* **Anand K. Asundi**, Nanyang Technological Univ. (Singapore); **Wolfgang Osten**, Univ. Stuttgart (Germany)

*Program Committee:* **Francis Berghmans**, SCK•CEN (Belgium); **Alain Bosseboeuf**, Univ. Paris-Sud II (France); **Peter J. de Groot**, Zygo Corp. (USA); **Pietro Ferraro, Jr.**, Istituto Nazionale di Ottica Applicata (Italy); **Malgorzata Kujawinska**, Warsaw Univ. of Technology (Poland); **Paul C. Montgomery**, Univ. Louis Pasteur (France); **Yoshiharu Morimoto**, Wakayama Univ. (Japan); **Günter Wilkening**, Physikalisch-Technische Bundesanstalt (Germany); **Xiaoping Wu**, Univ. of Science and Technology of China (China); **Huimin Xie**, Tsinghua Univ. (China)



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*Paper Numbers:*  
8, 12, 18, 20, 28, 30, 34, 35, 43, 44, 46, 47, 48, 49, 51, 54, 58.

## Wednesday 5 April

**Welcome** ..... **Wed. 08.00 to 08.05**  
**Christophe Gorecki**, Univ. de Franche-Comté (France)

### SESSION 1

**Kleber** ..... **Wed. 08.05 to 10.15**  
**Digital Holographic Microscopy**

*Chair:* **Wolfgang Osten**, Univ. Stuttgart (Germany)

08.05: **Scalable optoelectronic methodologies for characterization of surface shape and deformation in electronic packaging (Invited Paper)**, C. Furlong, Worcester Polytechnic Institute (USA); P. J. de Groot, Zygo Corp. (USA) ..... [6188-01]

08.35: **Submicron optical tomography by multiple-wavelength digital holographic microscopy**, F. Montfort, T. Colomb, F. Charrière, J. Kuehn, École Polytechnique Fédérale de Lausanne (Switzerland); E. Cuche, Lycée Tec SA (Switzerland); C. D. Depeursinge, École Polytechnique Fédérale de Lausanne (Switzerland) ..... [6188-02]

08.55: **Digital in-line holography for dynamic micrometrology**, V. R. Singh, Nanyang Technological Univ. (Singapore); G. Hedge, Ngee Ann Polytechnic (Singapore); A. K. Asundi, Nanyang Technological Univ. (Singapore) ..... [6188-03]

09.15: **Measurements of corner cubes microstructures by high-magnification digital holographic microscopy**, J. G. Kühn, École Polytechnique Fédérale de Lausanne (Switzerland); E. Cuche, Y. Emery, Lycée Tec SA (Switzerland); T. Colomb, F. Charrière, F. Montfort, A. M. Marian, École Polytechnique Fédérale de Lausanne (Switzerland); M. Botkine, N. Aspert, Lycée Tec SA (Switzerland); C. D. Depeursinge, École Polytechnique Fédérale de Lausanne (Switzerland) ..... [6188-04]

09.35: **Automatic procedure for aberrations compensation in digital holographic microscopy**, T. Colomb, École Polytechnique Fédérale de Lausanne (Switzerland); J. Kuehn, École Polytechnique Fédérale de Lausanne (Switzerland); E. Cuche, Lycée Tec SA (Switzerland); F. Charrière, F. Montfort, A. M. Marian, École Polytechnique Fédérale de Lausanne (Switzerland); N. Aspert, Lycée Tec SA (Switzerland); C. D. Depeursinge, École Polytechnique Fédérale de Lausanne (Switzerland) ..... [6188-05]

09.55: **Miniaturized low-cost digital holographic interferometer**, A. Michalkiewicz, M. Kujawinska, Politechnika Warszawska (Poland); P. Marc, L. R. Jaroszewicz, Wojskowa Akademia Techniczna (Poland) ..... [6188-06]

Coffee Break ..... 10.15 to 10.45

## SESSION 2

**Kleber** ..... **Wed. 10.45 to 12.05**  
**Gratings and Nanostructures**

*Chair:* **Anand K. Asundi**, Nanyang Technological Univ. (Singapore)

10.45: **Fabrication technique of nanograting using AFM**, H. Xie, M. Zhang, Z. Liu, Tsinghua Univ. (China); A. K. Asundi, Nanyang Technological Univ. (Singapore) ..... [6188-07]

11.05: **Continuous writing technique of long gratings for metrological applications**, E. Gamet, Y. Jourlin, S. Pelissier, S. Reynaud, C. Veillas, J. Pommier, O. M. Parriaux, Univ. Jean Monnet Saint-Etienne (France) ..... [6188-08]

11.25: **Pulsed-force mode AFM characterization of photopatterned polymer films for holographic data storage application**, O. Soppera, S. Jradi, C. P. Carre, École Nationale Supérieure de Chimie de Mulhouse (France) ..... [6188-09]

11.45: **An integrated approach for photonic crystals inspection and characterization**, B. Tiribilli, P. Ferraro II, S. Grilli, G. Molesini, M. M. V. Vannoni, M. Vassalli, Consiglio Nazionale delle Ricerche (Italy) ..... [6188-10]

Lunch Break ..... 12.05 to 13.30

## SESSION 3

**Kleber** ..... **Wed. 13.30 to 15.30**  
**Surface Inspection**

*Chair:* **Huimin Xie**, Tsinghua Univ. (China)

13.30: **A comparison of surface metrology techniques**, J. Armstrong, M. Conroy, Taylor Hobson Ltd. (United Kingdom) ..... [6188-11]

13.50: **Interferometric and confocal techniques for testing of silicon wafers**, D. Litwin, J. Galas, S. Sitarek, Instytut Optyki Stosowanej (Poland); B. Surma, A. Miros, Instytut Technologii Materiałów Elektronicznych (Poland) ..... [6188-12]

14.10: **An optical differential probe for measurement of MEMS topography**, Z. Li, K. Herrmann, F. Pohlentz, Physikalisch-Technische Bundesanstalt (Germany) ..... [6188-13]

14.30: **One shot line-profiling white-light interferometer with spatial phase shift for measuring rough surfaces**, M. Hering, Robert Bosch GmbH (Germany) and Ruprecht-Karls-Univ. Heidelberg (Germany); S. Herrmann, Robert Bosch GmbH (Germany); K. Körner, Univ. Stuttgart (Germany); B. Jähne, Ruprecht-Karls-Univ. Heidelberg (Germany) ..... [6188-14]

14.50: **Automated variable wavelength interferometry in reflected light mode**, D. Litwin, J. Galas, Instytut Optyki Stosowanej (Poland) ..... [6188-15]

15.10: **Optical control of monocrystalline films**, O. V. Angelsky, A. P. Maksimyak, P. P. Maksimyak, Yuriy Fedkovych Chernivtsi National Univ. (Ukraine) ..... [6188-16]

Coffee Break ..... 15.30 to 16.00

**SESSION 4**

**Kleber** ..... **Wed. 16.00 to 17.20**

**Optical Tomography**

*Chair: Malgorzata Kujawska, Politechnika Warszawska (Poland)*

16.00: **Application of photoelastic tomography to measurement of refractive indices in optical anisotropic microelements**, P. Kniazewski, T. Kozacki, M. Kujawska, Politechnika Warszawska (Poland) [6188-18]

16.20: **Discussion of the finite element method in optical diffraction tomography**, J. Lobera, J. M. Coupland, Loughborough Univ. (United Kingdom) ..... [6188-19]

16.40: **Design, modeling, and prototyping of microinterferometric tomography system for optical fiber inspection**, R. Krajewski, Politechnika Warszawska (Poland) and Vrije Univ. Brussel (Belgium); B. Volckaerts, Y. Meuret, Vrije Univ. Brussel (Belgium); M. Kujawska, Politechnika Warszawska (Poland); H. Thienpont, Vrije Univ. Brussel (Belgium) ..... [6188-20]

17.00: **Experimental proof-of-principle 3D measurements of micro-objects by digital holographic tomography**, A. Jozwicka, M. Kujawska, Politechnika Warszawska (Poland) ..... [6188-21]

**Thursday 6 April**

**SESSION 5**

**Kleber** ..... **Thurs. 10.30 to 11.50**

**High-resolution Metrology**

*Chair: Pietro Ferraro, CNR-INOVA (Italy)*

10.30: **Metrological scanning probe microscope**, N. Dorozhovets, T. Hausotte, E. Manske, G. Jäger, N. Hofmann, Technische Univ. Ilmenau (Germany) ..... [6188-22]

10.50: **VCSEL-based feedback detection for new generation of fully integrated optical microscopes**, C. Gorecki, H. Dominique, B. Romain, Univ. de Franche-Comté (France) ..... [6188-23]

11.10: **High-stability heterodyne interferometry and its application in measuring complex refractive indices of magnetic fluid films under external magnetic fields**, S. Yang, J. J. Hsieh, H. Horng, National Taiwan Normal Univ. (Taiwan); C. Hong, Dayeh Univ. (Taiwan); H. Yang, National Taiwan Univ. (Taiwan) ..... [6188-24]

11.30: **Interferometric measurement of thermal expansion coefficient and refractive index in ferroelectric crystals**, F. Pignatiello, M. De Rosa, P. Ferraro II, S. Grilli, Consiglio Nazionale delle Ricerche (Italy); A. Arie, Tel-Aviv Univ. (Israel); S. M. De Nicola, P. De Natale, Consiglio Nazionale delle Ricerche (Italy) ..... [6188-26]

Lunch Break ..... 11.50 to 13.30

**SESSION 6**

**Kleber** ..... **Thurs. 13.30 to 15.40**

**Inspection of MEMS**

*Chair: Christophe Gorecki, Univ. de Franche-Comté (France)*

13.30: **High-resolution stress measurements for microsystem and semiconductor applications (Invited Paper)**, D. W. Vogel, J. Keller, B. Michel, Fraunhofer-Institut für Zuverlässigkeit und Mikrointegration (Germany) ..... [6188-27]

14.00: **Measurement of thermal expansion of MEMS and electronic components**, H. R. Schubach, Dantec Dynamics GmbH (Germany) ..... [6188-28]

14.20: **Interferometric measurement of thickness of silicon nitride layer in bi-morph silicon MEMS**, P. Ferraro II, S. M. De Nicola, A. Finizio, G. Pierattini, G. Coppola, M. Iodice, V. Striano, M. Gagliardi, Consiglio Nazionale delle Ricerche (Italy) ..... [6188-29]

14.40: **AIN driven actuators: technology and characterisation**, L. Nieradko, M. Józwick, K. Krupa, C. Gorecki, Univ. de Franche-Comté (France); J. Kacperski, A. R. Styk, M. Kujawska, L. A. Salbut, Politechnika Warszawska (Poland) ..... [6188-30]

15.00: **Nanometrology for MEMS: combination of optical interference, atomic force microscopy, and nanoindenter-based actuator**, M. Jobin, P. A. Passeraub, R. Foschia, Ecole d'Ingénieurs (Switzerland) . [6188-31]

15.20: **High-resolution AFM Moire interferometry technique for assessment of strain in chips with Cu/low-k BEoL stack**, A. V. Vairagar, P. Huebler, AMD Saxony Manufacturing GmbH (Germany); A. K. Asundi, Nanyang Technological Univ. (Singapore); E. Zschech, AMD Saxony Manufacturing GmbH (Germany) ..... [6188-32]

Coffee Break ..... 15.40 to 16.00

**SESSION 7**

**Kleber** ..... **Thurs. 16.00 to 17.50**

**Specialised Techniques**

*Chair: Anand K. Asundi, Nanyang Technological Univ. (Singapore)*

16.00: **Novel nanotechnology implements based on MEMS (Invited Paper)**, K. Kakushima, H. Fujita, The Univ. of Tokyo (Japan) .. [6188-33]

16.30: **Local protein/gene density measurements using SMI microscopy**, U. J. Birk, D. Baddeley, C. G. Cremer, Ruprecht-Karls-Universität Heidelberg (Germany) ..... [6188-34]

16.50: **Use of x-ray diffraction for the optical microsystems technology**, G. G. Berti, Univ. di Pisa (Italy) ..... [6188-35]

17.10: **Influence of the physico-chemical and photonic parameters on mechanical and optical properties of end-of-fiber polymer tips**, S. Jradi, O. Soppera, C. P. Carre, École Nationale Supérieure de Chimie de Mulhouse (France); R. J. Bachelot, Univ. de Technologie de Troyes (France) ..... [6188-36]

17.30: **In-process 3D assessment of micromoulding features**, B. R. Whiteside, R. Spares, P. D. Coates, Univ. of Bradford (United Kingdom) ..... [6188-37]

**✓ Interactive Posters—Thursday**

*An interactive poster session will be held on Thursday 18.00 to 20.00.*

*Posters will be on display after 10.00 Thursday morning in the Conference Centre Galerie de Marbre (ground floor) and Forum Hall (1st floor). An interactive poster session and reception with authors present will be held Thursday evening from 18.00 to 20.00. Light refreshments will be served.*

✓ **Comparison of various optical characterization techniques for the surface analysis of optical-grade germanium infrared materials**, H. Ottevaere, Vrije Univ. Brussel (Belgium); A. Szpak, Politechnika Warszawska (Poland); I. Romandic, J. Van Nysten, H. Vercammen, D. Vyncke, Umicore Laser Optics (Belgium); M. Kujawska, Politechnika Warszawska (Poland); H. Thienpont, Vrije Univ. Brussel (Belgium) ..... [6188-51]

✓ **Thermal characterization of power transistors by close infrared thermography method**, S. Dhokkar, Ecole Nationale Supérieure de Mécanique et d'Aérot (France); B. Serio, Ecole Nationale Supérieure de Physique de Strasbourg (France); J. Hunsinger, Univ. de Technologie de Belfort-Montbéliard (France); P. Lagonotte, Ecole Nationale Supérieure de Mécanique et d'Aérot (France) ..... [6188-52]

✓ **Fast wavelength-scanning interferometry technique with derivative detection of quadrature signals**, O. Cip, B. Mikel, J. Lazar, Institute of Scientific Instruments (Czech Republic) ..... [6188-53]

✓ **Characterization of dents and grooves on polymer films using scanning white-light interferometry**, I. Kassamakov, Univ. of Helsinki (Finland); K. Ojala, Nokia Research Ctr. (Finland); A. Salmi, E. Hæggström, J. P. Aaltonen, Univ. of Helsinki (Finland); A. Huber, Nokia Research Ctr. (Finland); H. Saarikko, M. Österberg, M. J. Oinonen, Univ. of Helsinki (Finland) ..... [6188-54]

✓ **Methods of particle contamination characterization for optical application**, I. Tovenà-Pecault, S. Garcia, S. Palmier, P. Manac'h, CEA Cesta (France); C. Labrugeres, Institut de Chimie de la Matière Condensée de Bordeaux (France) ..... [6188-55]

✓ **A novel optical detection system for chromatography applications**, W. Meulebroeck, H. Ottevaere, K. Scheir, D. Clieq, G. Desmet, H. Thienpont, Vrije Univ. Brussel (Belgium) ..... [6188-56]

✓ **Generation of higher-order optical vortices**, Y. V. Izdebskaya, V. G. Shvedov, Vernadskiy Tavricheskiy National Univ. (Ukraine) . [6188-57]

- ✓ **AFM benchmark for the profile characterisation of subwavelength diffractive elements within the EC Network of Excellence on Micro-Optics NEMO**, N. Destouches, Univ. Jean Monnet Saint-Etienne (France); H. P. Herzog, Univ. de Neuchâtel (Switzerland); Y. Jourlin, Univ. Jean Monnet Saint-Etienne (France); W. Nakagawa, Univ. de Neuchâtel (Switzerland); H. Ottevaere, Vrije Univ. Brussel (Belgium); O. M. Parriaux, Univ. Jean Monnet Saint-Etienne (France); J. Pietarinen, Joensuu Yliopisto (Finland); S. Reynaud, Univ. Jean Monnet Saint-Etienne (France); J. Tervo, J. Turunen, Joensuu Yliopisto (Finland); J. Van Erps, Vrije Univ. Brussel (Belgium); M. Kujawinska, Politechnika Warszawska (Poland) ..... [6188-58]
- ✓ **Optical correlation techniques for characterizing rough surfaces**, O. V. Angelsky, P. P. Maksimyak, Yuriy Fedkovych Chernivtsi National Univ. (Ukraine) ..... [6188-59]
- ✓ **Study of rough surfaces parameters by polychromatic light**, M. Dashtdar, M. T. Tavassoli, Institute for Advanced Studies in Basic Sciences (Iran) ..... [6188-60]
- ✓ **Optical system for weld-piece distortion measurement during pulsed laser welding**, A. Gorkic, M. Jezeršek, J. I. Molina, J. Diaci, Univ. v Ljubljana (Slovenia) ..... [6188-61]
- ✓ **Real-time surface deformations control during laser processing**, M. Jezersek, J. Diaci, J. I. Molina, Univ. v Ljubljana (Slovenia) [6188-62]
- ✓ **Water waves analysis with image space scale decomposition tools: wavelets edge detection and the two-dimensional Huang Hilbert transform**, A. P. Zeris, Aristotle Univ. of Thessaloniki (Greece) ..... [6188-63]
- ✓ **Holographic video**, D. Enkh-Amgalan, Narantuu Trade Co., Ltd. (Mongolia) ..... [6188-64]
- ✓ **Diffusion coefficient measurement as a function of concentration by moire technique**, H. Mohammad Pour, Institute for Advanced Studies in Basic Sciences (Iran) ..... [6188-65]

### Friday 7 April

#### SESSION 8

#### Kleber ..... Fri. 08.10 to 10.00 3D Imaging, Image Reconstruction, and Signal Processing

*Chair: Peter J. de Groot, DSM Research (Netherlands)*

- 08.10: **3D optics for 3D imaging: physics, fabrication, and computation (Invited Paper)**, G. Barbastathis, Massachusetts Institute of Technology (USA) ..... [6188-38]
- 08.40: **Systematic effects in coherence peak and phase evaluation of signals obtained with a vertical scanning white-light Mirau interferometer**, P. H. Lehmann, Mahr GmbH (Germany) ..... [6188-39]
- 09.00: **Image formation in digital holography**, F. Zhang, G. Pedrini, W. Osten, Univ. Stuttgart (Germany) ..... [6188-40]
- 09.20: **3D amplitude point spread function determination by digital holography**, A. Marian, Ecole Polytechnique Fédérale de Lausanne (Switzerland); F. Charrière, Ecole Polytechnique Fédérale de Lausanne (Switzerland); F. Montfort, J. G. Kühn, T. Colomb, Ecole Polytechnique Fédérale de Lausanne (Switzerland); E. Cuche, Lycée Tec SA (Switzerland); P. P. Marquet, Univ. de Lausanne (Switzerland); C. D. Depeursinge, Ecole Polytechnique Fédérale de Lausanne (Switzerland) ..... [6188-41]
- 09.40: **Aberration-free reconstruction algorithm for high-numerical aperture digital hologram**, F. Zhang, G. Pedrini, W. Osten, Univ. Stuttgart (Germany) ..... [6188-42]
- Coffee Break ..... 10.00 to 10.20

#### SESSION 9

#### Kleber ..... Fri. 10.20 to 13.10

##### New Micro-components and Sensors

*Chair: Francis Berghmans, SCK•CEN (Belgium)*

- 10.20: **Reliability engineering: basics and applications for opto-electronic components and systems (Invited Paper)**, M. Held, EMPA (Switzerland) ..... [6188-43]
- 10.50: **Characterization of cylindrical microlenses in transmitted light and with grazing incidence interferometry in reflected light**, J. Schwider, J. Lamprecht, Friedrich-Alexander Univ. Erlangen-Nürnberg (Germany); N. Lindlein, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany) ..... [6188-44]
- 11.10: **Laser beam shaping using kinoforms with low-quantization levels**, S. Yang, H. Takajo, Kyushu Institute of Technology (Japan) ..... [6188-45]
- 11.30: **Optical characterization of spherical microlenses: a round robin experiment within the EC Network of Excellence on Micro-Optics NEMO**, H. Ottevaere, Vrije Univ. Brussel (Belgium); J. Schwider, J. Lamprecht, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); J. Kacperski, A. Szpak, Politechnika Warszawska (Poland); L. Steinbock, Forschungszentrum Karlsruhe (Germany); K. J. Weible, SUSS MicroOptics SA (Switzerland); H. Thienpont, Vrije Univ. Brussel (Belgium) ..... [6188-46]
- 11.50: **Benchmarking instrumentation tools for the characterization of micro-optics within the EC Network of Excellence on Micro-Optics NEMO**, H. Ottevaere, Vrije Univ. Brussel (Belgium); N. Destouches, Univ. Jean Monnet Saint-Etienne (France); C. Gorecki, Univ. de Franche-Comté (France); T. Kossek, Instytut Lacnosci (Poland); S. Pelli, Istituto di Fisica Applicata Nello Carrara (Italy); R. Piramidowicz, Politechnika Wroclawska (Poland); P. Szczepanski, Instytut Lacnosci (Poland); M. Kujawinska, Politechnika Warszawska (Poland) ..... [6188-47]
- 12.10: **A new fiber optic modular sensing system**, P. Lesiak, T. R. Wolinski, S. Ertman, A. W. Domanski, Politechnika Warszawska (Poland) ..... [6188-48]
- 12.30: **A new wireless and miniaturised high-resolution optical displacement sensor**, Y. Jourlin, O. M. Parriaux, S. Reynaud, J. C. Pommier, Univ. Jean Monnet Saint-Etienne (France); M. Johnson, Instrumentation Design Ltd. (United Kingdom) ..... [6188-49]
- 12.50: **LCOS as a reference element in Twyman-Green laser interferometer**, J. M. Kacperski, M. Kujawinska, Politechnika Warszawska (Poland); M. Jozwik, Univ. de Franche-Comté (France) ..... [6188-50]

#### Closing Remarks

**Wolfgang Osten**, Univ. Stuttgart (Germany)



# Optical Sensing II

*Conference Chairs:* **Brian Culshaw**, Univ. of Strathclyde (United Kingdom); **Anna G. Mignani**, Istituto di Fisica Applicata Nello Carrara (Italy); **Hartmut Bartelt**, Institut für Physikalische Hochtechnologie e.V. (Germany); **Leszek R. Jaroszewicz**, Wojskowa Akademia Techniczna (Poland)



**Conference 6189 contains papers funded by and/or related to current EU research projects contained in Framework VI.**

*Paper Numbers:*  
1, 2, 6, 10, 16, 24, 25, 30, 43, 52, 69, 81, 84, 85, 88, 97

## Monday 3 April

**Opening Remarks** ..... **Mon. 10.30 to 10.40**  
**Brian Culshaw**, Univ. of Strathclyde (United Kingdom)

### SESSION 1

**Boston** ..... **Mon. 10.40 to 12.10**  
**Optical Fiber-based Sensors I**

*Chair:* **Brian Culshaw**, Univ. of Strathclyde (United Kingdom)

10.40: **Grating-based devices in polymer optical fibre (Invited Paper)**, H. Dobb, K. Carroll, D. J. Webb, Aston Univ. (United Kingdom); K. Kalli, Higher Technical Institute (Cyprus); M. Komodromos, C. Themistos, Frederick Institute of Technology (Cyprus); G. D. Peng, Univ. of New South Wales (Australia); A. Argyros, M. C. J. Large, M. A. van Eijkelenborg, The Univ. of Sydney (Australia); Q. Fang, I. W. Boyd, Univ. College London (United Kingdom) ..... [6189-01]

11.10: **Technology of high-birefringent photonic crystal fibers for sensing applications**, J. Wójcik, P. Mergo, K. Poturaj, K. Skorupski, Univ. Marii Curie-Skłodowskiej (Poland); W. Urbanczyk, M. Szpulak, T. Martynkien, Politechnika Wroclawska (Poland); H. Thienpont, T. Nasilowski, Vrije Univ. Brussel (Belgium); F. Berghmans, SCK•CEN (Belgium) ..... [6189-02]

11.30: **A novel cavity ring-down long-period fiber grating strain sensor**, N. Ni, J. Chan, X. Dong, Nanyang Technological Univ. (Singapore) ..... [6189-03]

11.50: **Optimization of composite structure processes: fiber optics sensors applied in aeronautic resin transfer molding**, X. Aduriz, Univ. de Nantes (France) and Consultant (France); C. Lupi, J. Bailleul, V. Sobotka, N. Lefevre, D. Leduc, X. Chapeleau, C. Le Bozec, D. Delaunay, C. Y. Boisrobert, Univ. de Nantes (France) ..... [6189-77]

Lunch Break ..... 12.10 to 13.30

### SESSION 2

**Boston** ..... **Mon. 13.30 to 15.00**  
**Interferometers and Polarimeters**

*Chair:* **Tomasz R. Wolinski**, Politechnika Warszawska (Poland)

13.30: **Hybrid sensors using laser targeting (Invited Paper)**, N. A. Riza, Nuonics, Inc. (USA) and College of Optics and Photonics/Univ. of Central Florida (USA); F. N. Ghauri, College of Optics and Photonics/Univ. of Central Florida (USA); F. Perez, Nuonics, Inc. (USA) ..... [6189-04]

14.00: **Modal interferometer made of tapered microstructured optical fibres for multiparameter sensing**, J. Villatoro, V. P. Minkovich, D. Monzón-Hernández, Ctr. de Investigaciones en Óptica, A.C. (Mexico) ..... [6189-05]

14.20: **High-sensitivity wave tilt measurements with optical vortex interferometer**, A. P. Masajada, M. Borwinska, Politechnika Wroclawska (Poland) ..... [6189-06]

14.40: **Fibre optic Sagnac interferometer as sensor of the SOP changes**, P. Marc, L. R. Jaroszewicz, Wojskowa Akademia Techniczna (Poland) ..... [6189-07]

Coffee Break ..... 15.00 to 15.30

## SESSION 3

**Boston** ..... **Mon. 15.30 to 17.00**  
**New Devices for Optical Sensing I**

*Chair:* **Leszek R. Jaroszewicz**, Wojskowa Akademia Techniczna (Poland)

15.30: **Robust spectral sensors for analytics, in-line process analysis, and point-of-care diagnostics (Invited Paper)**, S. Schoenfelder, H. S. Bartos, R. Peters, STEAG microParts GmbH (Germany) ..... [6189-08]

16.00: **A new CMOS electrooptical modulator based on the charge pumping phenomenon**, N. Massari, M. Gottardi, Istituto Trentino di Cultura (Italy) ..... [6189-09]

16.20: **Microstructured low and high-birefringence four-core fibers for sensing applications**, J. Wójcik, M. Makara, P. Mergo, B. Janoszczyk, J. Klimek, Univ. Marii Curie-Skłodowskiej (Poland) [6189-10]

16.40: **Wavelength locking of double FBG and its application in fiber sensing system**, M. Shih, Y. Chen, Y. Shiu, Y. Shen, T. Shei, National Kaohsiung Normal Univ. (Taiwan) ..... [6189-11]

### ✓ Interactive Posters—Monday

*An interactive poster session will be held on Monday 18.00 to 20.30. Posters will be on display after 10.00 Monday morning in the Conference Centre Galerie de Marbre (ground floor) and Forum Hall (1st floor). An interactive poster session and reception with authors present will be held Monday evening from 18.00 to 20.30. Light refreshments will be served.*

✓ **Absolute distance measurement using heterodyne optical feedback on Yb:Er glass laser (Invited Paper)**, L. Keruevan, S. Girard, H. Gilles, M. Laroche, Ecole Nationale Supérieure d'Ingenieurs de Caen (France) ..... [6189-50]

✓ **Biosensor**, M. Sundararajan, Bharath Institute of Higher Education & Research (India) ..... [6189-51]

✓ **Optical detection techniques for laser sorting machines**, W. Meulebroeck, H. Thienpont, Vrije Univ. Brussel (Belgium) .. [6189-53]

✓ **Quasi single-mode fiber as a temperature sensor**, V. Vasinek, Technical Univ. of Ostrava (Czech Republic) ..... [6189-55]

✓ **Spectral-domain analysis of white-light propagation in new sensor configuration comprising birefringent fiber**, P. Hlubina, D. Ciprian, L. Knyblova, Technical Univ. of Ostrava (Czech Republic) .... [6189-56]

✓ **Performance simulation of photoelectric imaging system**, L. Liu, B. Chang, Nanjing Univ. of Science & Technology (China) .... [6189-57]

✓ **Numerical model of a typical adaptive optics system**, N. A. Makenova, Institute of Atmospheric Optics (Russia); N. A. Atepaeva, Tomsk Polytechnic Univ. (Russia); F. Y. Kanev, Institute of Atmospheric Optics (Russia) ..... [6189-58]

✓ **Algorithms of adaptive control: operation rate, stability, efficiency**, N. A. Atepaeva, Tomsk Polytechnic Univ. (Russia); N. A. Makenova, F. Y. Kanev, Institute of Atmospheric Optics (Russia) ..... [6189-59]

✓ **The system of monitoring falling stones on highway by means of an optical interferometer**, Y. Lin, M. Chen, National Sun Yat-Sen Univ. (Taiwan); W. Lin, Ta Jen Univ. (Taiwan) ..... [6189-60]

✓ **Modified motion-based detection algorithm for dim targets in IR image sequences**, H. B. Srivastava, R. Saran, A. Kumar, Instruments Research and Development Establishment (India) ..... [6189-61]

- ✓ **Numerical investigation of multimode interference in a multimode fiber and its applications in optical sensing**, Q. Wang, G. Farrell, Dublin Institute of Technology (Ireland) ..... [6189-63]
- ✓ **Red blood cell optical parameters in single and multiple light scattering models**, J. Mroczka, D. Wysoczanski, Politechnika Wroclawska (Poland) ..... [6189-64]
- ✓ **Light scattering maps analysis to determine particles placement and concentration**, J. Mroczka, D. Wysoczanski, Politechnika Wroclawska (Poland) ..... [6189-65]
- ✓ **The enhancement of contrast of laser plasma emission spectra in the interaction field of plasma fronts**, I. G. Nagorny, V.I. Il'ichev Pacific Oceanological Institute (Russia) ..... [6189-66]
- ✓ **Dielectric annular core optical fiber**, P. Solarik, Z. Burian, Czech Technical Univ. in Prague (Czech Republic); I. Kasik, Institute of Radio Engineering and Electronics (Czech Republic) ..... [6189-67]
- ✓ **The polarization effect in the optical vortex interferometer**, E. Fraczek, Politechnika Wroclawska (Poland) ..... [6189-68]
- ✓ **The impact of hydrogenation conditions on the temperature and strain discrimination of Type I and Type IA Bragg grating sensors**, K. Kalli, Higher Technical Institute (Cyprus); G. Simpson, K. Zhou, L. Zhang, I. Bennion, Aston Univ. (United Kingdom) ..... [6189-69]
- ✓ **Mid-IR LEDs for portable and fibre optic sensors**, B. A. Matveev, A.F. Ioffe Physico-Technical Institute (Russia) ..... [6189-70]
- ✓ **Capacitive modulation in high-speed photodetectors**, P. A. Molchanov, National Technical Univ. of Ukraine (Ukraine); V. M. Contarino, Naval Air Systems Command (USA); O. V. Asmolova, National Technical Univ. of Ukraine (Ukraine); Y. Y. Podobna, Vinnitsya State Technical Univ. (Ukraine); I. M. Petrosyuk, National Technical Univ. of Ukraine (Ukraine) ..... [6189-71]
- ✓ **Time characterization of a thermal lens using a differential interferometric technique**, R. A. Escalona, L. Rodriguez, Univ. Simon Bolivar (Venezuela) ..... [6189-72]
- ✓ **Phase extraction in two-mode birefringent optical fiber and its application in quasi-distributed strain sensing**, S. K. Ghorai, D. Kumar, S. Sidhishwari, Birla Institute of Technology & Science (India) ..... [6189-74]
- ✓ **Size factor of a fast film photodetector based on the optical rectification effect**, G. M. Mikheev, Institute of Theoretical and Applied Mechanics (Russia); R. G. Zonov, Institute of Applied Mechanics (Russia); A. N. Obratsov, M.V. Lomonosov Moscow State Univ. (Russia) ..... [6189-75]
- ✓ **Optimising grating-coupled evanescent field excitation**, K. P. Kolari, A. P. Hokkanen, P. Heimala, VTT Elektronikka (Finland); M. Kuittinen, J. Simonen, Univ. of Joensuu (Finland) ..... [6189-76]
- ✓ **Modeling of parameter fluctuations with applications to real-time testing of sensors' performance**, H. J. Kadim, Liverpool John Moores Univ. (United Kingdom) ..... [6189-78]
- ✓ **Acousto-optic Bragg polarization separator based on single or dual acoustic frequency carriers**, J. Kastelik, Univ. de Valenciennes et du Hainaut-Cambrésis (France) and Consultant (France); H. Benaissa, S. Dupont, Univ. de Valenciennes et du Hainaut-Cambrésis (France) ..... [6189-80]
- ✓ **Use of the polarization properties of fiber Bragg gratings for sensing purposes**, C. Caucheteur, S. Bette, Faculté Polytechnique de Mons (Belgium); R. Garcia Olcina, Univ. Politècnica de València (Spain); H. Ottevaere, Vrije Univ. Brussel (Belgium); S. M. Sales, Univ. Politècnica de València (Spain); M. Wuilpart, Faculté Polytechnique de Mons (Belgium); F. Berghmans, Vrije Univ. Brussel (Belgium); J. Capmany, Univ. Politècnica de València (Spain); H. Thienpont, Vrije Univ. Brussel (Belgium); P. Mégret, Faculté Polytechnique de Mons (Belgium) ..... [6189-81]
- ✓ **A novel fiber optic interferometer of hydrophone based on Mach-Zehnder hybrid configuration**, K. Chiang, M. Chen, National Sun Yat-Sen Univ. (Taiwan); W. Lin, Ta Jen Institute of Technology (Taiwan); S. Liu, National Sun Yat-Sen Univ. (Taiwan) ..... [6189-82]
- ✓ **Isotopic resolution of carbon monoxide and carbon dioxide by NIR diode laser spectroscopy**, S. Lau, K. Salfner, H. Löhmannsröben, Univ. Potsdam (Germany) ..... [6189-83]
- ✓ **High-precision parallel glass plate test with the use of the optical vortex interferometer**, W. Froczek, E. Froczek, J. Mroczka, Politechnika Wroclawska (Poland) ..... [6189-84]
- ✓ **The polarization effect in the optical vortex interferometer**, E. Fraczek, W. Wozniak, Politechnika Wroclawska (Poland) .. [6189-85]
- ✓ **Low-cost level and pressure plastic optical fiber sensor**, M. Foroni, M. Bottacini, F. Poli, A. Cucinotta, S. Selleri, Univ. degli Studi di Parma (Italy) ..... [6189-86]
- ✓ **Design of symmetric nonlinear homogenous waveguide sensors**, M. M. Shabat, S. Taya, The Islamic Univ. of Gaza (Palestinian Territory (Occupied)); D. Jäger, Univ. Duisburg-Essen (Germany) ... [6189-87]
- ✓ **Novel ray-optical technique for testing of aspheric reflecting surfaces**, J. Bähr, SMOS-Smart Microoptical Solutions (Germany); U. W. Krackhardt, UK-System Ucke and Co GmbH (Germany); D. Dietrich, Univ. Mannheim (Germany) ..... [6189-88]
- ✓ **Distributed fiber optical DR Vis spectroscopy with a blue gel model system**, M. A. Liauw, S. Eichholz, RWTH Aachen (Germany) ..... [6189-89]
- ✓ **MCT infrared photodiodes on the basis of graded gap P-p heterojunction grown by MBE**, V. V. Vasiliev, A. V. Predein, S. A. Dvoretzky, V. S. Varavin, N. N. Mikhailov, Y. G. Sidorov, A. O. Suslyakov, A. L. Aseev, Institute of Semiconductor Physics (Russia) ..... [6189-91]
- ✓ **Infrared sensor based on nanostructure of vanadium dioxide**, Y. Zhu, J. Lai, S. Chen, H. Ma, X. Yi, Huazhong Univ. of Science and Technology (China) ..... [6189-92]
- ✓ **Application of neural network for fiber optic color sensor**, M. W. Sierakowski, A. W. Domanski, Politechnika Warszawska (Poland) ..... [6189-93]
- ✓ **A portable fluorometer for rapid screening of aflatoxin M1 in milk**, A. G. Mignani, C. Cucci, Istituto di Fisica Applicata Nello Carrara (Italy); C. Dall'Asta, G. Galaverna, A. Dossena, M. Marchelli, Univ. degli Studi di Parma (Italy) ..... [6189-94]
- ✓ **Belgian beer mapping and digital fingerprinting by means of color and turbidity assessment**, A. G. Mignani, L. Ciaccheri, Istituto di Fisica Applicata Nello Carrara (Italy); P. R. Smith, Loughborough Univ. (United Kingdom) ..... [6189-96]
- ✓ **Extra virgin olive oil quality monitoring by an optical sensor**, A. G. Mignani, L. Ciaccheri, Istituto di Fisica Applicata Nello Carrara (Italy); R. Paolesse, C. Di Natale, Univ. degli Studi di Roma/Tor Vergata (Italy); M. A. Del Nobile, A. Benedetto, A. Mentana, Univ. di Foggia (Italy) ..... [6189-97]
- ✓ **Monitoring of inhomogeneous flow distributions using fibre-optic Bragg grating temperature sensor arrays**, I. Latka, Institut für Physikalische Hochtechnologie e.V. (Germany); T. Bosselmann, Siemens AG (Germany); W. Ecke, Institut für Physikalische Hochtechnologie e.V. (Germany); M. Willsch, Siemens AG (Germany) ..... [6189-98]
- ✓ **Super resolution enhancement and restoration of a single image from blurred image sequence**, Z. Wang, Changchun Institute of Optics, Fine Mechanics and Physics, Chinese Academy of Sciences (China) and Graduate School of Sciences Academy of China (China); g. Jln, q. a. Li, x. w. Sun, Changchun Institute of Optics, Fine Mechanics and Physics, Chinese Academy of Sciences (China) ..... [6189-99]
- ✓ **Space qualified laser sources**, F. Heine, Tesat-Spacecom GmbH & Co. KG (Germany); T. Schwander, Tesat-Spacecom GmbH & Co. KG (Germany); R. Lange, B. Smutny, Tesat-Spacecom GmbH & Co. KG (Germany) ..... [6189-100]

**Tuesday 4 April**

**SESSION 4**

**Boston** ..... **Tues. 10.30 to 12.00**

**New Devices for Optical Sensing II**

*Chair: Leszek R. Jaroszewicz, Wojskowa Akademia Techniczna (Poland)*

- 10.30: **CMOS: a promising technology for future single photon detection applications (Invited Paper)**, A. Rochas, A. Pauchard, L. Monat, O. Guinnard, A. Matteo, G. Ribordy, id Quantique SA (Switzerland) ..... [6189-12]
- 11.00: **Dynamic response of AlGaIn-based sensors under excimer laser irradiation**, G. Mazzeo, Univ. degli Studi di Roma Tre (Italy); J. Reverchon, Thales Research & Technology (France); G. Conte, Univ. degli Studi di Roma Tre (Italy); A. Dussaigne, J. Duboz, Ctr. National de la Recherche Scientifique (France) ..... [6189-13]
- 11.20: **Development of an electro-optic step-by-step sampling system for IC's close electro-magnetic field measurement**, L. Rossi, G. Breglio, Univ. degli Studi di Napoli Federico II (Italy) ..... [6189-14]
- 11.40: **CMOS imagers behavioral modeling using VHDL-AMS**, O. Schiertz, P. Magnan, École Nationale Supérieure de l'Aéronautique et de l'Espace (France) ..... [6189-15]
- Lunch Break ..... 12.00 to 13.30

**SESSION 5**

**Boston** ..... **Tues. 13.30 to 17.10**

**Profilometry and Distance Measurements**

*Chair: Bruno Tiribilli, Consiglio Nazionale delle Ricerche (Italy)*

- 13.30: **Conoscopic holography based profilometers for defect inspection: improvements in speed, resolution and noise reduction (Invited Paper)**, I. Alvarez, J. M. Enguita, C. Fraga Bobis, J. Marina, Y. Fernandez, R. Garcia, Univ. de Oviedo (Spain) ..... [6189-16]
- 14.00: **Multitarget range finder with continuous optical frequency modulation**, L. Perret, P. Pfeiffer, A. Chakari, Univ. Louis Pasteur (France) ..... [6189-17]
- 14.20: **Rotationally symmetric triangulation sensor with integrated object imaging using only one 2D detector**, J. Eckstein, Fachhochschule Heilbronn (Germany) and Hefei Univ. of Technology (China); W. Lei, Hefei Univ. of Technology (China); J. R. Becker, Fachhochschule Heilbronn (Germany); G. Jun, Hefei Univ. of Technology (China); P. Ott, Fachhochschule Heilbronn (Germany) ..... [6189-18]
- 14.40: **Thin-film silicon position sensors made using laser scribing**, L. Urbina, CIEMAT (Spain) and Univ. Politécnica de Madrid (Spain); J. J. Gandia, J. Cárabe, CIEMAT (Spain); S. Lauzurica, C. L. Molpeceres, J. L. Ocaña, Univ. Politécnica de Madrid (Spain) ..... [6189-19]
- Coffee Break ..... 15.00 to 15.30
- 15.30: **New concept of low intrusion quasi-distributed optical fibre extensometer**, A. Courteville, M. Delaveau, Fogale nanotech (France); S. Delepine-Lesoille, E. Merliot, Lab. Central des Ponts et Chaussées (France); L. Quétel, IDIL Fibres Optiques (France) ..... [6189-20]
- 15.50: **Full-field spectral multidirectional 4D measurement system**, R. Sitnik, Politechnika Warszawska (Poland) ..... [6189-21]
- 16.10: **Polarimetric measurements for fabric surface state characterization**, M. Tournonias, M. Bueno, M. Renner, L. Bigué, Univ. de Haute Alsace (France) ..... [6189-22]
- 16.30: **High-sensitivity cryogenic temperature sensors using pressurized fiber Bragg gratings**, M. Wu, NASA Langley Research Ctr. (USA) ..... [6189-23]
- 16.50: **Structural monitoring on a commercial ship using FBG sensors**, A. Giovannozzi, Univ. degli Studi di Roma/La Sapienza (Italy) ..... [6189-24]

**Wednesday 5 April**

**SESSION 6**

**Boston** ..... **Wed. 08.20 to 10.30**

**Chemical Sensors**

*Chair: Anna G. Mignani, Istituto di Fisica Applicata Nello Carrara (Italy)*

- 08.20: **Metal oxide nanowires for optical gas sensing (Invited Paper)**, C. Baratto, S. Bianchi, E. Comini, G. Faglia, M. Ferroni, M. Picinelli, G. Sberveglieri, Univ. degli Studi di Brescia (Italy) ..... [6189-25]
- 08.50: **Gas correlation systems to detect ground level methane**, O. Chapman, M. Hilton, Univ. of Reading (United Kingdom); G. Hunt, R. Williams, Spectral Surveys (United Kingdom) ..... [6189-26]
- 09.10: **Micro/nanophotonic biosensor based on integrated Mach-Zehnder interferometers for ultrasensitive DNA detections**, J. Sánchez del Río, B. Sepúlveda, A. Calle, A. Llobera, C. Domínguez, L. M. Lechuga, Ctr. Nacional de Microelectrónica (Spain) ..... [6189-27]
- 09.30: **Diamond-like carbon films deposited onto optical fibres and waveguides: application in chemical sensing**, M. Smietana, J. Szmidi, Politechnika Warszawska (Poland); J. Grabarczyk, Politechnika Łódzka (Poland) ..... [6189-28]
- 09.50: **Porous silicon based optical waveguide sensor for NH3 detection**, A. Chaillou, J. Charrier, P. Pirasteh, M. Sarret, M. L. Haji, P. Joubert, Univ. de Rennes I (France) ..... [6189-29]
- 10.10: **Detection of nitro-aromatic compounds by optical gas sensors based on sensitive or photoluminescent polymers**, T. Lamarque, P. L. Le Barny, E. Obert, Thales Research & Technology (France) .. [6189-30]
- Coffee Break ..... 10.30 to 10.50

**SESSION 7**

**Boston** ..... **Wed. 10.50 to 12.40**

**UV in Mid-Infrared Sensors**

*Chair: Hartmut Bartelt, Institut für Physikalische Hochtechnologie e.V. (Germany)*

- 10.50: **Future UV detectors for space applications (Invited Paper)**, M. P. Ulmer, Northwestern Univ. (USA) ..... [6189-31]
- 11.20: **Photoacoustic CO2 Detection at 2.7 μm**, M. Wolff, Hamburg Univ. of Applied Sciences (Germany); H. G. Groninga, PAS-Tech GmbH (Germany); H. H. Harde, Helmut-Schmidt Univ. (Germany) ... [6189-32]
- 11.40: **Seebeck infrared photodetectors: an ultrawide dynamic range of design possibilities**, J. H. Stiens, Vrije Univ. Brussel (Belgium); G. N. Shkerdin, V. M. Kotov, Institute of Radio-engineering and Electronics (Russia); W. Vandermeiren, C. De Tandt, Vrije Univ. Brussel (Belgium); G. Borghs, IMEC (Belgium); R. A. Vounckx, Vrije Univ. Brussel (Belgium) ..... [6189-34]
- 12.00: **Miniaturized InSb photovoltaic infrared sensor operating at room temperature**, E. G. Camargo, N. Kuze, K. Ueno, Y. Kawakami, Y. Moriyasu, K. Nagase, M. Satou, H. Endo, K. Ishibashi, M. Ozaki, Asahi Kasei Corp. (Japan) ..... [6189-35]
- 12.20: **Diamond deep-UV position sensitive detectors**, G. Conte, G. Mazzeo, G. Prestopino, S. Salvatori, Univ. degli Studi di Roma Tre (Italy) ..... [6189-36]

## Thursday 6 April

### SESSION 8

**Boston** ..... **Thurs. 10.30 to 12.20**

#### Imaging

*Chair: Anna G. Mignani, Istituto di Fisica Applicata Nello Carrara (Italy)*

- 10.30: **Three generations of the airborne imaging spectrometer AVIS: expectations, applications, results (*Invited Paper*)**, N. M. Oppelt, R. Efinger, W. Mauser, Ludwig-Maximilians-Univ. München (Germany) ..... [6189-37]
- 11.00: **Implementation of a high-speed imaging polarimeter using a liquid crystal ferroelectric modulator**, A. Jaulin, L. Bigué, P. Ambis, Univ. de Haute Alsace (France) ..... [6189-38]
- 11.20: **Chromatic spectral interferometry with phase retrieval**, E. Papastathopoulos, K. Koerner, W. Osten, Univ. Stuttgart (Germany) ..... [6189-39]
- 11.40: **Development and characterization of fiber optic hydrophone coils for the detection of ultrasonic signals within power transformers**, C. Macia-Sanahuja, H. Lamela, Univ. Carlos III de Madrid (Spain) ..... [6189-33]
- Lunch Break ..... 12.20 to 13.40

### SESSION 9

**Boston** ..... **Thurs. 13.40 to 15.20**

#### Innovative Optical Measuring Techniques

*Chair: Brian Culshaw, Univ. of Strathclyde (United Kingdom)*

- 13.40: **Measuring system for radiation pulses from gas-puff plasma-laser source**, J. Mikołajczyk, Z. Bielecki, R. Rakowski, J. Wojtas, Wojskowa Akademia Techniczna (Poland) ..... [6189-42]
- 14.00: **Semi-derivative real filter for quality measurement of microlenses array**, R. Kasztelanic, L. Nowakowski, R. R. Buczynski, Univ. Warszawski (Poland) ..... [6189-43]
- 14.20: **Spectroscopic ellipsometry diagnostics of shape-memory metal alloys**, Y. V. Filipov, V. S. Staschuk, National Taras Shevchenko Univ. of Kyiv (Ukraine) ..... [6189-44]
- 14.40: **A novel low-coherence fibre optic interferometer for position and thickness measurements with unattained accuracy**, R. C. Wilhelm, A. Courteville, F. Garcia, Fogale nanotech (France) .. [6189-45]
- 15.00: **Monitoring technique for multiple power splitter-passive optical networks using a tunable OTDR and FBGs**, S. Hann, Gwangju Institute of Science and Technology (South Korea); D. Kim, Korea Photonics Technology Institute (South Korea); C. Park, Gwangju Institute of Science and Technology (South Korea) ..... [6189-46]
- Coffee Break ..... 15.20 to 15.50

### SESSION 10

**Boston** ..... **Thurs. 15.50 to 17.00**

#### Velocity and Vibration Measurements

*Chair: Leszek R. Jaroszewicz, Wojskowa Akademia Techniczna (Poland)*

- 15.50: **Optical spatial filtering velocimetry sensor for real-time in-plane vibration control (*Invited Paper*)**, M. L. Jakobsen, H. E. Larsen, S. G. Hanson, Risø National Lab. (Denmark) ..... [6189-47]
- 16.20: **Model of light scattering on spheroidal particle with the use of three beam phase Doppler system**, J. Mroccka, T. Wojtaszek, Politechnika Wroclawska (Poland) ..... [6189-48]
- 16.40: **Fiber optic vibration sensors for integrated tuning of axis control in high-performance automated systems**, G. D'Emilia, E. Natale, Univ. degli Studi dell'Aquila (Italy) ..... [6189-49]



# Solid State Lasers and Amplifiers II

Conference Chair: **Alphan Sennaroglu**, Koç Univ. (Turkey)

Cochairs: **James G. Fujimoto**, Massachusetts Institute of Technology (USA); **Jonathan A. C. Terry**, Univ. of St. Andrews (United Kingdom)

Program Committee: **Arnaud Brignon**, Thales Research and Technology (France); **Timothy J. Carrig**, Coherent Technologies, Inc. (USA); **Giulio Cerullo**, Politecnico di Milano (Italy); **Efstratios Georgiou**, Technological Education Institute-Crete (Greece); **Thomas Graf**, Univ. Stuttgart (Germany); **Helena Jelinkova**, Czech Technical Univ. in Prague (Czech Republic); **Nikolay V. Kuleshov**, International Laser Ctr. (Belarus); **Fredrik Laurell**, Kungliga Tekniska högskolan (Sweden); **Uwe Morgner**, Max-Planck-Institut für Kernphysik (Germany); **Yehoshua Shimony**, Soreq Nuclear Research Ctr. (Israel)



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## Wednesday 5 April

### SESSION 1

Oberlin ..... Wed. 08.00 to 10.10

#### 1-micron Solid-state Lasers

Chair: **Alphan Sennaroglu**, Koç Univ. (Turkey)

- 08.00: **47 fs in diode-pumped Yb:CaGdAlO<sub>4</sub> (Invited Paper)**, Y. Zaouter, J. Didierjean, F. P. Druon, F. Balembos, P. M. Georges, Univ. Paris-Sud II (France); J. Petit, B. Viana, P. Goldner, École Nationale Supérieure de Chimie de Paris (France) ..... [6190-01]
- 08.30: **Highly efficient one-micron laser emission under 885-nm diode laser pumping in Nd:YAG crystals with an extended range of concentrations**, V. Lupei, N. Pavel, Institute of Atomic Physics (Romania) ..... [6190-02]
- 08.50: **Quest of athermal solid state laser: case of Yb:CaGdAlO<sub>4</sub>**, J. Petit, B. Viana, P. Goldner, École Nationale Supérieure de Chimie de Paris (France); J. Didierjean, F. P. Druon, F. Balembos, P. M. Georges, Univ. Paris-Sud II (France) ..... [6190-03]
- 09.10: **Investigation of new Nd-doped crystals designed for laser operation at short wavelengths along the 4F<sub>3/2</sub>→4I<sub>9/2</sub> channel around 900 nm**, C. Varona, P. Loiseau, G. Aka, École Nationale Supérieure de Chimie de Paris (France); B. Ferrand, CEA-LETI (France) ..... [6190-04]
- 09.30: **184-W diode side-pumped ceramic Nd:YAG laser with a diffusive optical pump cavity**, J. Zhou, Q. Lou, Shanghai Institute of Optics and Fine Mechanics (China) ..... [6190-05]
- 09.50: **Broadband tunable integrated optical ratch-reel ring laser in doped aluminium oxide**, G. Schoer, M. Mahnke, A. Herrmann, Technische Univ. Hamburg-Harburg (Germany); J. Müller, Technische Univ. Hamburg-Harburg (USA) ..... [6190-06]
- Coffee Break ..... 10.10 to 10.40

### SESSION 2

Oberlin ..... Wed. 10.40 to 12.30

#### Infrared Lasers

Chair: **Jonathan A. C. Terry**, Univ. of St. Andrews (United Kingdom)

- 10.40: **Extractable energy from ytterbium-doped high-energy pulsed fiber amplifiers and lasers (Invited Paper)**, Y. Sintov, O. Katz, Y. Glick, Y. Nafcha, R. Lavi, Soreq Nuclear Research Ctr. (Israel) ..... [6190-07]
- 11.10: **Continuously tuneable diode-pumped Tm:YAP laser**, P. Cerny, Institute of Physics (Czech Republic); J. Sulc, H. Jelinkova, Czech Technical Univ. in Prague (Czech Republic) ..... [6190-08]
- 11.30: **Free-running and Q-switched performance of a diode-pumped Er:Yb:YAG laser emitting at 1.65 µm**, E. Georgiou, Technological Educational Institute of Crete (Greece); O. Musset, J. Boquillon, Univ. de Bourgogne (France) ..... [6190-09]
- 11.50: **Continuous-wave fiber-pumped Cr:ZnSe laser**, U. Demirbas, A. Sennaroglu, Koç Univ. (Turkey); N. Vermeulen, H. Ottevaere, H. Thienpont, Vrije Univ. Brussel (Belgium) ..... [6190-10]
- 12.10: **Nd:YAG/V:YAG microchip laser**, J. Sulc, H. Jelinkova, Czech Technical Univ. in Prague (Czech Republic); K. Nejezchleb, V. Kodá, Crytur, Ltd. (Czech Republic) ..... [6190-11]
- Lunch Break ..... 12.30 to 13.50

## SESSION 3

Oberlin ..... Wed. 13.50 to 16.00

### UV and Visible Lasers

Chair: **Thomas Graf**, Univ. Stuttgart (Germany)

- 13.50: **White light generation in tapered fibers: basic research and applications (Invited Paper)**, H. W. Giessen, J. Teipel, D. Törke, R. Zhang, Univ. Bonn (Germany) ..... [6190-12]
- 14.20: **CW blue laser emission by second harmonic generation of 900-nm oscillation of Nd-doped strontium and lanthanum aluminate (ASL)**, C. Varona, École Nationale Supérieure de Chimie de Paris (France) and CEA-LETI (France); P. Loiseau, G. Aka, École Nationale Supérieure de Chimie de Paris (France); B. Ferrand, CEA-LETI (France); V. Lupei, Institute of Atomic Physics (Romania) ..... [6190-13]
- 14.40: **Diode-pumped milliwatt-scale single-frequency CW 355-nm intra-cavity frequency tripled laser**, T. Georges, N. Aubert, C. Chauzat, Oxxius SA (France); P. Féron, École Nationale Supérieure des Sciences Appliquées et de Technologie (France) ..... [6190-14]
- 15.00: **100-mW of blue light at 405 nm from intracavity doubling of CW Ti:sapphire laser utilising BiBO-crystal**, M. Thorhauge, J. L. Mortensen, P. Tidemand-Lichtenberg, P. Buchhave, J. R. Rasmussen, Danmarks Tekniske Univ. (Denmark) ..... [6190-15]
- 15.20: **Three-colour operation of a diode-pumped broadband Yb-doped fibre laser**, A. E. El-Taher, Y. H. Tsang, D. J. Binks, The Univ. of Manchester (United Kingdom) ..... [6190-16]
- 15.40: **Research, growth, and optical properties of new borate-based NLO crystals for generation of visible and UV light**, K. Xu, École Nationale Supérieure de Chimie de Paris (France) ..... [6190-17]

## Thursday 6 April

### SESSION 4

Oberlin ..... Thurs. 10.30 to 12.20

### Fiber Lasers

Chair: **Efstratios Georgiou**, Technological Education Institute-Crete (Greece)

- 10.30: **Novel concepts for high-power fibre lasers (Invited Paper)**, P. Wang, W. A. Clarkson, D. Y. Shen, L. J. Cooper, J. K. Sahu, Univ. of Southampton (United Kingdom) ..... [6190-18]
- 11.00: **Efficient 2.96 micron dysprosium-doped ZBLAN fibre laser pumped at 1.3 micron**, Y. H. Tsang, A. E. El-Taher, T. A. King, The Univ. of Manchester (United Kingdom); S. D. Jackson, The Univ. of Sydney (Australia) ..... [6190-19]
- 11.20: **From S- to C-band amplification in a depressed-cladding EDFA**, F. Matteo, F. Poli, L. Ruggeri, S. Selleri, A. Cucinotta, Univ. degli Studi di Parma (Italy); P. Vavassori, Petroceramics S.r.l. (Italy) ..... [6190-20]
- 11.40: **Double-clad fibre numerical optimization with a simplex method**, I. Dritsas, T. Sun, K. T. V. Grattan, City Univ. London (United Kingdom) ..... [6190-21]
- 12.00: **Pulsed-fiber laser with average output power of 133 watts**, Q. Lou, J. Zhou, L. K. Kong, D. Xue, Z. Wang, Shanghai Institute of Optics and Fine Mechanics (China) ..... [6190-22]
- Lunch Break ..... 12.20 to 13.40

## SESSION 5

Oberlin ..... Thurs. 13.40 to 15.30

## Nonlinear Sources and Devices

Chair: **Helena Jelínková**, Czech Technical Univ. in Prague (Czech Republic)13.40: **New Raman crystals and lasers (Invited Paper)**, T. T. Basiev, General Physics Institute (Russia) ..... [6190-23]14.10: **Frequency locking in a degenerate polarization mixing optical parametric oscillator**, P. Blau, S. Pearl, Soreq Nuclear Research Ctr. (Israel); G. Kalmani, A. Arie, Tel-Aviv Univ. (Israel) ..... [6190-24]14.30: **Critical study of pulsed parametric oscillators with intracavity optical parametric amplification**, J. Melkonian, A. Godard, M. Lefebvre, ONERA (France); E. Rosencher, ONERA (France) and Ecole Polytechnique (France) ..... [6190-25]14.50: **Iterative resonator model describing the continuous-wave operation of a Raman laser**, N. Vermeulen, Vrije Univ. Brussel (Belgium); A. A. Fotiadi, Faculté Polytechnique de Mons (Belgium) and Ioffe Physico-Technical Institute (Russia); K. Panajotov, C. Debaes, H. Thienpont, Vrije Univ. Brussel (Belgium) ..... [6190-26]15.10: **Two-photon absorption enhancement using photonic jets**, S. S. Lecler, Univ. Louis Pasteur (France); O. Crégut, S. Haacke, J. Rehspringer, Institut de Physique et Chimie des Matériaux de Strasbourg (France); P. Meyrueis, Univ. Louis Pasteur (France); C. Hirlimann, Institut de Physique et Chimie des Matériaux de Strasbourg (France) [6190-27]

Coffee Break ..... 15.30 to 16.00

## SESSION 6

Oberlin ..... Thurs. 16.00 to 18.10

## Pulsed Solid-state Lasers

Chair: **Giulio Cerullo**, Politecnico di Milano (Italy)16.00: **Compact and efficient femtosecond lasers (Invited Paper)**, T. Brown, M. Cataluna, B. Agate, K. Dholakia, A. A. Lagatsky, C. G. Leburn, A. McWilliam, Univ. of St. Andrews (United Kingdom); E. Rafilov, Univ. of Dundee (United Kingdom); A. Sarmini, D. J. Stevenson, W. Sibbett, Univ. of St. Andrews (United Kingdom); Y. J. Chai, Univ. of Cambridge (United Kingdom); P. Jiang, JDS Uniphase Corp. (USA); K. Tan, R. V. Pentyl, I. H. White, Univ. of Cambridge (United Kingdom) ..... [6190-28]16.30: **Widely tunable single- and multiple-pulse Er-doped passively mode-locked fiber laser exploiting two semiconductor saturable absorber mirrors**, A. Malacarne, C. Porzi, Scuola Superiore Sant'Anna (Italy); J. Zhang, Tsinghua Univ. (China); A. Bogoni, L. Poti, Consorzio Nazionale Interuniv. per le Telecomunicazioni (Italy) ..... [6190-29]16.50: **Nanosecond pulse generation in a passively Q-switched Yb-doped fiber laser by combination of saturable absorber and SBS**, M. Laroche, H. Gilles, S. Girard, N. Passilly, K. Ait-Ameur, Ecole Nationale Supérieure d'Ingenieurs de Caen (France) ..... [6190-30]17.10: **Experimental and theoretical study of the laser micromachining of glass using high-repetition-rate ultrafast laser**, Y. M. Yashkir, Q. Liu, Univ. of Toronto (Canada) ..... [6190-31]17.30: **Dispersion-managed soliton operation of Ti:sapphire laser oscillators**, M. V. Tognetti, Univ. do Porto (Portugal) ..... [6190-32]17.50: **Numerical simulation of multiple modes in solid state lasers**, C. Pflaum, B. Heubeck, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany) ..... [6190-33]

## ✓ Interactive Posters—Thursday

*An interactive poster session will be held on Thursday 18.00 to 20.00.**Posters will be on display after 10.00 Thursday morning in the Conference Centre Galerie de Marbre (ground floor) and Forum Hall (1st floor). An interactive poster session and reception with authors present will be held Thursday evening from 18.00 to 20.00. Light refreshments will be served.*✓ **Temperature measurements on Nd-doped vanadate crystals: bulk crystals (Nd:GdVO<sub>4</sub> and Nd:YVO<sub>4</sub>) and composite rods**, J. Didierjean, F. Balembois, F. P. Druon, P. M. Georges, Univ. Paris-Sud II (France); J. Petit, P. Goldner, B. Viana, École Nationale Supérieure de Chimie de Paris (France) ..... [6190-34]✓ **Growth and noncritical phase matching second harmonic generation of Gd<sub>x</sub>RxCa<sub>3</sub>O(BO<sub>3</sub>)<sub>3</sub> (R=Sc or Lu) nonlinear crystals**, L. Gheorghie, Institute of Atomic Physics (Romania); P. Loiseau, G. Aka, École Nationale Supérieure de Chimie de Paris (France); T. Taira, Institute for Molecular Science (Japan); V. Lupei, Institute of Atomic Physics (Romania) ..... [6190-35]✓ **High-energy laser pulse compression using gas-filled fibres**, J. L. Silva, H. Crespo, M. Miranda, L. M. Bernardo, Univ. do Porto (Portugal) ..... [6190-36]✓ **Spectroscopic properties and highly efficient 900-nm laser emission of Nd<sup>3+</sup> in strontium lanthanum hexa-aluminate: relation to composition and structure**, A. Lupei, V. Lupei, C. Gheorghie, L. Gheorghie, Institute of Atomic Physics (Romania); G. Aka, D. Vivien, École Nationale Supérieure de Chimie de Paris (France) ... [6190-37]✓ **Growth and optical properties of Er,Yb-codoped crystals for 1.5-µm solid state lasers application**, C. Varona, École Nationale Supérieure de Chimie de Paris (France) and CEA-LETI (France); P. Loiseau, G. Aka, École Nationale Supérieure de Chimie de Paris (France); B. Ferrand, CEA-LETI (France) ..... [6190-38]✓ **Experimental and theoretical investigation of gain-switched Tm<sup>3+</sup>-doped double-clad silica fiber lasers**, Y. Wang, Y. Zhang, Harbin Institute of Technology (China) ..... [6190-39]✓ **Evolution of spectral coherence of self-frequency shifted solitons in an optical fiber**, A. E. Korolev, St.-Petersburg State Polytechnical Univ. (Russia); V. N. Nazarov, St.-Petersburg State Univ. of Information Technologies, Mechanics and Optics (Russia) ..... [6190-40]✓ **Comparative high-resolution spectroscopic investigation of single-crystal and ceramic laser materials**, V. Lupei, A. Lupei, Institute of Atomic Physics (Romania); A. Ikesue, Poly-Techno Co., Ltd. (Japan); Y. Sato, T. Taira, Institute of Molecular Sciences (Japan) ..... [6190-41]✓ **Generation of powerful 3-microns radiation and its delivery**, M. Cech, M. Nemeč, P. Koranda, H. Jelínková, Czech Technical Univ. in Prague (Czech Republic); M. Miyagi, Sendai National College of Technology (Japan); Y. Shi, Y. Matsuura, Tohoku Univ. (Japan) [6190-42]✓ **Infrared and Raman studies of Yb:YSO thin films**, A. M. Denoyer, S. Jandl, Univ. de Sherbrooke (Canada); B. Viana, O. Guillot-Noël, P. Goldner, École Nationale Supérieure de Chimie de Paris (France); D. Pelenc, F. Thibault, CEA Grenoble (France) ..... [6190-43]✓ **Pulse shape control in a dual cavity laser: numerical modeling**, Y. M. Yashkir, Univ. of Toronto (Canada) ..... [6190-44]✓ **Thermo-chemical strengthening of Nd:YAG**, R. Feldman, Y. Shimony, S. Jackel, I. Levi, Soreq Nuclear Research Ctr. (Israel) ..... [6190-45]✓ **Numerical modeling of the phase-conjugate laser with an intracavity stimulated Brillouin scattering mirror: Q-switching mode**, Y. M. Yashkir, Univ. of Toronto (Canada) ..... [6190-46]✓ **Laser micromachining of hybrid sol-gels: application to fabrication of microoptical elements**, E. Clauss, Lab. des Systèmes Photoniques (France) ..... [6190-47]✓ **Measuring of intracavity phase changes by use of bidirectional ring diode-pumped mode-locked Nd:YVO<sub>4</sub> laser**, V. Kubeček, Czech Technical Univ. in Prague (Czech Republic); J. Diels, The Univ. of New Mexico (USA); M. Cech, P. Hirs, Czech Technical Univ. in Prague (Czech Republic); V. Skoda, Crytur, Ltd. (Czech Republic) . [6190-48]✓ **Influence of iodine impurities onto optical frequency precision of iodine-stabilized lasers**, J. Lazar, P. Jedlicka, F. Petru, O. Cip, Institute of Scientific Instruments (Czech Republic) ..... [6190-49]✓ **50 W commercial solid-state sodium guidestar laser system for the Gemini South Telescope**, C. A. Lopez, G. Moule, A. K. Hankla, A. J. Tracy, I. Lee, E. C. Andrews, J. Bartholomew, J. R. Unterhahr, Coherent Technologies, Inc. (USA); C. d'Orgeville, K. Grace, Gemini Observatory (USA) ..... [6190-50]✓ **ZnSe:Cr<sup>2+</sup> laser coherently pumped by Er:YAP 1.66 µm laser or Tm:YAP 1.97 µm laser**, Maxim Doroshenko, General Physics Institute (Russia); P. Koranda, H. Jelínková, J. ulc, Czech Technical Univ. (Czech Republic); T. T. Basiev General Physics Institute (Russia); V. K. Komar, Myron B. Kosmyna, Institute of Single Crystals (Ukraine) ..... [6190-51]

# Biophotonics and New Therapy Frontiers

Conference Chair: **Romualda Grzymala**, Rhenaphotonics Alsace (France)

Cochair: **Olivier Haeberlé**, Univ. de Haute-Alsace (France)

Program Committee: **Albert C. Boccara**, École Supérieure de Physique et de Chimie Industrielles (France); **Albrecht Brandenburg**, Fraunhofer-Institut für Physikalische Messtechnik (Germany); **Michel D. Faupel**, Novartis Pharma AG (Switzerland); **Stefan W. Hell**, Max-Planck-Institut für biophysikalische Chemie (Germany); **Patrick P. Meyrueis**, Univ. Louis Pasteur (France); **Luc Soler**, IRCAD (France)



**Conference 6191 contains papers funded by and/or related to current EU research projects contained in Framework VI.**

Paper Numbers:  
14, 17, 32, 33, 41, 46, 63.

## Sunday 3 April

Opening Remarks ..... Mon. 10.30  
Romualda Grzymala, Rhenaphotonics Alsace (France)

## Monday 3 April

Dresde ..... Mon. 10.30 to 11.10

### Keynote Presentation

10.30: **Virtual reality, augmented reality and robotic applied to digestive operative procedures: from in vivo animal preclinical studies to clinical use (Invited Paper)**, L. Soler, J. Marescaux, IRCAD (France) ..... [6191-01]

## SESSION 1

Dresde ..... Mon. 11.10 to 13.10

### Laser Interaction with Tissues

Chair: **Patrick P. Meyrueis**, Univ. Louis Pasteur (France)

- 11.10: **Histological observation on dental hard tissue irradiated by ultrashort-pulsed laser**, K. Awazu, T. Uchizono, Osaka Univ. (Japan); A. Igarashi, J. Kato, Y. Hirai, Tokyo Dental College (Japan) ..... [6191-02]
- 11.30: **Laser welding of biological tissue: applications in ophthalmology**, R. Pini, F. Rossi, Univ. degli Studi di Firenze (Italy); L. Menabuoni, Unità Operativa Oculistica (Italy) ..... [6191-03]
- 11.50: **Effect of 655-nm laser different powers on dog sperm motility parameters**, M. Corral-Baqués, Univ. Rovira i Virgili (Spain) .. [6191-04]
- 12.10: **Risk estimation of skin damage due to ultrashort-pulsed focused NIR laser irradiation**, F. F. Fischer, Beiersdorf AG (Germany); B. Volkmer, Dermatologisches Zentrum Buxtehude (Germany); S. Puschmann, Beiersdorf AG (Germany); R. Greinert, W. Breitbart, Dermatologisches Zentrum Buxtehude (Germany); J. Kiefer, Justus-Liebig-Universität Giessen (Germany); R. Wepf, Beiersdorf AG (Germany) ..... [6191-05]
- 12.30: **Efficient combination of multiple high-power semiconductor laser sources for photoacoustic signal generation in biomedical phantoms**, V. B. Cunningham, H. Lamela, Univ. Carlos III de Madrid (Spain) ..... [6191-06]
- 12.50: **Characterizing the effects of laser irradiance beam distributions in treatments of vascular lesions: analytically and experimentally**, S. Saghafi, Islamic-Azad Univ. (Iran); M. Withford, Macquarie Univ. (Australia); R. Ghaderi, Birjand Univ. of Medical Sciences (Iran); S. Maleki, Shaheed Beheshti Univ. of Medical Sciences & Health Services (Iran) ..... [6191-07]
- Lunch Break ..... 13.10 to 14.10

## SESSION 2

Dresde ..... Mon. 14.10 to 17.40

### Microscopic Techniques

Chair: **Olivier Haeberlé**, Univ. de Haute Alsace (France)

- 14.10: **Using a continuum of light in STED confocal microscopy**, C. Courvoisier, R. Giust, T. Gharbi, Univ. de Franche-Comté (France) ..... [6191-08]
- 14.30: **Microspectrofluorometry and polarisation microscopy of membrane dynamics in living cells**, M. Wagner, P. Weber, H. Schneckenburger, Fachhochschule Aalen (Germany) ..... [6191-09]
- 14.50: **Total internal reflection (TIR) and energy transfer (FRET) microscopy for measuring focal adhesions in living cells**, H. Schneckenburger, Fachhochschule Aalen (Germany); H. Steuer, Eberhard Karls Univ. Tübingen (Germany); M. Wagner, P. Weber, H. Baumann, Fachhochschule Aalen (Germany); B. Angres, Eberhard Karls Univ. Tübingen (Germany) ..... [6191-10]
- 15.10: **New optical geometries for spatial fluorescence cross-correlation spectroscopy**, A. Delon, Y. Blanquaert, J. Derouard, R. Jaffiol, Univ. Joseph Fourier (France) ..... [6191-11]
- Coffee Break ..... 15.30 to 16.00
- 16.00: **Measurement of surface concentration of fluorophores using fluorescence fluctuation spectroscopy**, J. Derouard, A. Delon, Univ. Joseph Fourier (France); R. Jaffiol, Univ. de Technologie de Troyes (France); C. Vézy, Univ. Joseph Fourier (France) ..... [6191-12]
- 16.20: **Optical trapping, poration, and transfection of mammalian cells using a femtosecond pulsed laser**, D. J. Stevenson, B. Agate, L. Paterson, T. Lake, M. Comrie, T. Brown, A. C. Riches, P. Bryant, W. Sibbett, F. Gunn-Moore, K. Dholakia, Univ. of St. Andrews (United Kingdom) ..... [6191-13]
- 16.40: **An intravital two-photon microscopy method for imaging mouse brain tissues**, J. Vial, Univ. Joseph Fourier (France) and CNRS (France); P. Verant, R. Serduc, C. Remy, B. van der Sanden, Univ. Joseph Fourier (France) ..... [6191-14]
- 17.00: **Active locking of adaptive optics for improved microscopy**, A. J. Wright, Univ. of Strathclyde (United Kingdom); G. M. Gibson, Univ. of Glasgow (United Kingdom); S. Poland, B. A. Patterson, Univ. of Strathclyde (United Kingdom); M. J. Padgett, Univ. of Glasgow (United Kingdom); J. M. Girkin, Univ. of Strathclyde (United Kingdom) [6191-15]
- 17.20: **Contribution of data pre-processing to deconvolution of 3D fluorescence microscopy images**, A. De Meyer, B. Colicchio, Univ. de Haute Alsace (France); J. De Mey, Ecole Supérieure de Biotechnologie de Strasbourg (France); G. Jung, Ctr. Hospitalier de Mulhouse (France); A. Dieterlen, O. Haeberlé, S. Jacquy, Univ. de Haute Alsace (France) ..... [6191-16]

## ✓ Interactive Posters—Monday

An interactive poster session will be held on Monday 18.00 to 20.30. Posters will be on display after 10.00 Monday morning in the Conference Centre Galerie de Marbre (ground floor) and Forum Hall (1st floor). An interactive poster session and reception with authors present will be held Monday evening from 18.00 to 20.30. Light refreshments will be served.

- ✓ **Protease-activated quantum-dot probes**, E. Y. Chang, J. S. Miller, J. Sun, W. W. Yu, V. L. Colvin, R. A. Drezek, J. L. West, Rice Univ. (USA) ..... [6191-51]
- ✓ **A multimodal system for in vivo tumor imaging in mice**, G. Roberti, M. Autiero, L. Celentano, R. Cozzolino, P. Laccetti, M. Marotta, G. Mettievier, M. C. Montesi, P. Riccio, P. Russo, Univ. degli Studi di Napoli Federico II (Italy) ..... [6191-53]
- ✓ **Study of polycations' effect on the erythrocyte agglutination mediated by anti-glycophorines using microscopic image digital analysis**, B. D. Riquelme, Univ. Nacional de Rosario (Argentina); D. Dumas, Univ. Henry Poincaré (France); A. Fontana, A. Alessi, P. Foresto, Univ. Nacional de Rosario (Argentina); C. Grandfils, Univ. de Liège (Belgium); J. F. Stoltz, Univ. Henry Poincaré (France); J. R. Valverde, Univ. Nacional de Rosario (Argentina) ..... [6191-54]
- ✓ **Validity study by Monte Carlo method of an analytical theory for photon correlation diffusion in multilayered media**, B. Luo, Zhejiang Univ. (China); J. Li, Univ. Konstanz (Germany) ..... [6191-55]
- ✓ **Effects induced by XeCl laser radiation and germicidal lamp radiation on E. coli strains survival and mutability**, F. Belloni, P. Alfano, A. Lorusso, C. Monaco, V. Nassisi, A. Talà, M. Tredici, Univ. degli Studi di Lecce (Italy) ..... [6191-56]
- ✓ **Dose-dependent effect of new porphyrins in vitro and in vivo**, G. Gyulkhandanyan, S. Ghambaryan, G. Amelyan, Institute of Biotechnology (Armenia); R. Ghazaryan, Yerevan State Medical Univ. (Armenia); A. Gyulkhandanyan, G. Gasparyan, Yerevan State Univ. (Armenia) ..... [6191-57]
- ✓ **Localization of laser energy conversion by metal nanoparticles: basic effects and applications**, A. Csaki, Institut für Physikalische Hochtechnologie e.V. (Germany); F. Garwe, JenLab GmbH (Germany); A. Steinbrück, Institut für Physikalische Hochtechnologie e.V. (Germany); K. Koenig, JenLab GmbH (Germany); A. Weise, Friedrich-Schiller-Univ. Jena (Germany); W. Fritzsche, Institut für Physikalische Hochtechnologie e.V. (Germany) ..... [6191-58]
- ✓ **Neuron growth engineering on a photoinduced surface relief grating: a tool for plastic neuroelectronics**, R. Barille, Univ. d'Angers (France) ..... [6191-59]
- ✓ **Optical grating biosensors for bacterial detection in water**, N. Darwish, I. Bernat Ubiaga, M. Moreno Sereno, Univ. de Barcelona (Spain); F. J. Muñoz Pascual, R. Mas Colomina, Ctr. Nacional de Microelectrónica (Spain) ..... [6191-60]
- ✓ **The study of the mechanisms of the different phenotypical manifestations in patients with reciprocal translocations**, R. Y. Lozynskiy, Lviv National Medical Univ. (Ukraine) ..... [6191-61]
- ✓ **Detection of singlet oxygen that uses fluorescence probe APF**, K. Awazu, Osaka Univ. (Japan) ..... [6191-62]
- ✓ **Neuron growth engineering on a photoinduced surface relief grating: a tool for plastic neuroelectronics**, R. Barille, S. Ahmadi Kandjani, S. Dabos-Seignon, J. Nunzi, F. Letournel, Univ. d'Angers (France); E. Ortyl, S. Kucharski, Politechnika Wroclawska (Poland) ..... [6191-63]
- ✓ **Image quality in time-resolved laser transillumination by time-correlated single-photon counting**, M. Lepore, A. Daniele, M. Mormile, R. Esposito, P. L. Indovina, Univ. degli Studi di Napoli Federico II (Italy) ..... [6191-64]
- ✓ **Conceiving a specific holographic combiner for an augmented reality HMD dedicated to surgical applications**, G. Sittler, P. Twardowski, Lab. des Systèmes Photoniques (France); J. Fasquel, Institut de Recherche contre les Cancers de l'Appareil Digestif (France); J. Fontaine, Lab. des Systèmes Photoniques (France) ..... [6191-65]

## Tuesday 4 April

### SESSION 3

Dresde ..... Tues. 10.30 to 12.30

#### In Vivo Applications

Chair: **Luc Soler**, IRCAD (France)

- 10.30: **4D measurement system for automatic location of anatomical structures**, M. Witkowski, R. Sitnik, M. Kujawinska, Politechnika Warszawska (Poland); W. Rapp, Univ. Tübingen (Germany); M. Kowalski, Smarttech Sp. (USA); B. Haex, Katholieke Univ. Leuven (Belgium); S. Mooshake, DIERS International GmbH (Germany) ..... [6191-17]
- 10.50: **Using Flim-biopsy to probe skin physiological change after LBA treatment**, P. Xu, M. Q. Man, T. M. Mauro, Univ. of California/San Francisco (USA) ..... [6191-18]
- 11.10: **Three-dimensional multiphoton autofluorescence spectral imaging of live tissues**, J. A. Palero, Univ. Utrecht (Netherlands); H. S. de Bruijn, A. van der Ploeg van den Heuvel, H. J. Sterenborg, Univ. Medisch Ctr. Rotterdam (Netherlands); H. C. Gerritsen, Univ. Utrecht (Netherlands) ..... [6191-19]
- 11.30: **Time-resolved fluorescence spectra provide information on the size of fluorescent objects embedded in biological tissues**, J. L'Huillier, École Nationale Supérieure d'Arts et Métiers (France); A. Humeau, Institut Supérieur (France) ..... [6191-20]
- 11.50: **Combined bioengineering and neurophysiological in vivo technologies allow studying rat brain metabolism and neuronal activities in vivo in real time**, F. M. Crespi, GlaxoSmithKline (Italy); M. Donini, A. Bandera, Univ. degli Studi di Modena (Italy); F. Congestri, C. A. Heidbreder, GlaxoSmithKline (Italy); L. L. Rovati, Univ. degli Studi di Modena (Italy) ..... [6191-21]
- 12.10: **Detection of colorectal cancer using time-resolved autofluorescence spectrometer**, S. Fu, L. C. Kwek, T. C. Chia, Nanyang Technological Univ. (Singapore) ..... [6191-23]
- Lunch Break ..... 12.30 to 13.50

### SESSION 4

Dresde ..... Tues. 13.50 to 17.20

#### Holography, Coherence, and Polarisation

Chair: **Albrecht Brandenburg**, Fraunhofer-Institut für Physikalische Messtechnik (Germany)

- 13.50: **Real-time optical coherence spectrometry: proof of principle**, L. Froehly, Univ. de Franche-Comté (France); G. Petitjean, Univ. de Saint-Etienne (France); M. Ouadour, P. Sandoz, T. Gharbi, Univ. de Franche-Comté (France); P. Leproux, G. Huss, V. Couderc, Univ. de Limoges (France) ..... [6191-24]
- 14.10: **Use of digital holographic microscopy in tomography**, F. Charrière, F. Montfort, J. G. Kühn, T. Colomb, A. M. Marian, École Polytechnique Fédérale de Lausanne (Switzerland); E. Cuhe, Lycée Tec SA (Switzerland); P. P. Marquet, Univ. de Lausanne (Switzerland); C. D. Depeursing, École Polytechnique Fédérale de Lausanne (Switzerland) ..... [6191-25]
- 14.30: **Comparison between two interferometric sensors: Mach-Zehnder versus Fabry-Perot for ultrasound biomedical applications**, H. Lamela, A. Garcja-Diaz, Univ. Carlos III de Madrid (Spain); C. Macia-Sanahuja, J. A. Garcia-Souto, Univ. Carlos III de Madrid (USA); V. Cunningham, Univ. Carlos III de Madrid (Spain) ..... [6191-26]
- 14.50: **Correlation processing of biological tissues coherent images: complex degree of mutual polarization**, O. V. Angelsky, A. G. Ushenko, Y. G. Ushenko, Yuriy Fedkovych Chernivtsi National Univ. (Ukraine) ..... [6191-27]
- 15.10: **Polarization singularities of the object field of skin surface**, O. V. Angelsky, A. G. Ushenko, Y. A. Ushenko, Yuriy Fedkovych Chernivtsi National Univ. (Ukraine) ..... [6191-28]
- Coffee Break ..... 15.30 to 16.00

- 16.00: **Three-dimensional shift-invariant pattern recognition in digital holographic microscopy**, N. Wu, N. A. Halliwell, J. M. Coupland, Loughborough Univ. (United Kingdom) ..... [6191-29]
- 16.20: **Modular digital holographic microscopy system for marker free quantitative phase contrast imaging of living cells**, B. Kemper, D. D. Carl, A. Hoeink, G. von Bally, Univ. Muenster (Germany) ... [6191-30]
- 16.40: **Digital holographic microscopy: a new optical imaging technique to investigate cellular dynamics**, P. P. Marquet, Lausanne Hospital (Switzerland); P. Magistretti, B. Rappaz, École Polytechnique Fédérale de Lausanne (Switzerland); E. Cuche, E. Yves, Lycée Tec SA (Switzerland); C. D. Depeursinge, École Polytechnique Fédérale de Lausanne (Switzerland) ..... [6191-31]
- 17.00: **Fluorescence lifetime and anisotropy screening of cell membranes**, T. Bruns, Fachhochschule Aalen (Germany); W. S. Strauss, R. Sailer, Univ. Ulm (Germany); H. Schneckenburger, Fachhochschule Aalen (Germany) ..... [6191-47]

**Wednesday 5 April**

**SESSION 5**

**Dresde ..... Wed. 08.00 to 10.20**

**News Materials and Sensors for Biophotonics**

*Chair: Romualda Grzymala, Rhenaphotonics Alsace (France)*

- 08.00: **Quantum dots as resonance energy transfer acceptors for monitoring biological interactions**, N. Hildebrandt, Univ. Potsdam (Germany); L. Charbonnière, R. Ziessel, Univ. Louis Pasteur (France); H. Löhmannsröben, Univ. Potsdam (Germany) ..... [6191-32]
- 08.20: **Quantum dots as acceptors in FRET-assays containing serum**, M. Beck, N. Hildebrandt, H. Löhmannsröben, Univ. Potsdam (Germany) ..... [6191-33]
- 08.40: **Toward new biocompatible nanostructured biomarkers by femtosecond laser ablation in liquid environment**, L. Sajti, A. Said, S. Giorgio, W. I. Marine, Ctr. de Recherche en Matière Condensée et Nanosciences (France) ..... [6191-34]
- 09.00: **Distributive tactile sensing using fibre Bragg grating sensors**, B. M. Cowie, D. J. Webb, B. Tam, P. Slack, P. N. Brett, Aston Univ. (United Kingdom) ..... [6191-35]
- 09.20: **Glass-based fluorescence reference materials used**, A. Engel, C. Ottermann, Schott AG (Germany); U. Resch-Genger, Bundesanstalt für Materialforschung und -prüfung (Germany); J. Spaeth, S. Schweizer, J. Selling, Univ. Paderborn (Germany); K. Hoffmann, Bundesanstalt für Materialforschung und prüfung (Germany); V. Rupertus, Schott AG (Germany) ..... [6191-36]
- 09.40: **Fiber optical sensor for noninvasive optical reflective and thermal emission spectroscopic measurements of blood content in cutaneous tissue**, V. A. Saetchnikov, E. A. Tcherniavskaja, Belarusian State Univ. (Belarus); G. O. Schiffner, Ruhr-Univ. Bochum (Germany) ..... [6191-37]
- 10.00: **Novel concepts of vertical-cavity laser-based optical traps for biomedical applications**, A. Kroner, J. F. May, I. Kardosh, F. Rinaldi, R. Michalzik, Univ. Ulm (Germany) ..... [6191-48]
- Coffee Break ..... 10.20 to 10.40

**SESSION 6**

**Dresde ..... Wed. 10.40 to 12.40**

**Light Interaction with Scattering Media I**

*Chair: Olivier Haeberlé, Univ. de Haute Alsace (France)*

- 10.40: **Role of speckles in laser Doppler perfusion imaging: an investigation on particle suspensions**, V. Rajan, B. Varghese, T. G. Van Leeuwen, W. Steenbergen, Univ. Twente (Netherlands) ..... [6191-38]
- 11.00: **Space-time modeling of the diffusion of photons in a model with 3 layers: application to the study of muscular oxygenation**, C. Mansouri, ISAIP-ESAIP (France); J. P. L'Huillier, École Nationale Supérieure d'Arts et Métiers (France); A. Humeau, ISAIP-ESAIP (France) ..... [6191-39]
- 11.20: **Comparison between finite element method and Monte Carlo results in spectroscopy studies for multilayered biomedical tissues**, M. Kervella, Institut Supérieur (France); J. P. L'Huillier, Ecole Nationale Supérieure d'Arts et Métiers (France); A. Humeau, Institut Supérieur (France) ..... [6191-40]
- 11.40: **Diffusing-wave spectroscopy beyond the diffusive regime**, R. Carminati, R. Pierrat, J. Greffet, École Centrale Paris (France); F. Scheffold, Univ. Fribourg (Switzerland) ..... [6191-41]
- 12.00: **Flow measurements through scattering samples using self-mixing interferometry with a laser diode**, C. M. Zakian, M. R. Dickinson, The Univ. of Manchester (United Kingdom) ..... [6191-49]
- 12.20: **Optical inspection system for implants**, B. Denkena, W. Acker, Univ. Hannover (Germany) ..... [6191-50]
- Lunch Break ..... 12.40 to 13.50

**SESSION 7**

**Dresde ..... Wed. 13.50 to 15.30**

**Light Interaction with Scattering Media II**

*Chair: Olivier Haeberlé, Univ. de Haute Alsace (France)*

- 13.50: **Path length resolved Doppler measurements of multiple scattered photons in turbid media for various absorption and flow velocities using low-coherence interferometry**, B. Varghese, V. Rajan, T. G. van Leeuwen, W. Steenbergen, Univ. Twente (Netherlands) [6191-42]
- 14.10: **Object localization in tissue models using early-detected photons: comparison between time-resolved fluorescence and time-gated data**, J. L'Huillier, V. Piron, École Nationale Supérieure d'Arts et Métiers (USA) ..... [6191-43]
- 14.30: **Measuring transient tissue dynamics with time-resolved diffusing-wave spectroscopy**, J. Li, F. Jaillon, G. Dietsche, G. Maret, T. Gisler, B. Rockstroh, T. Elbert, Univ. Konstanz (Germany) .... [6191-44]
- 14.50: **Estimation of biomedical optical properties by simultaneous use of diffuse reflectometry and photothermal radiometry**, E. S. R. Fonseca, M. E. P. de Jesus, Univ. da Beira Interior (Portugal) . [6191-45]
- 15.10: **Spatial coherence of diffuse light in scattering media**, R. Pierrat, J. Greffet, École Centrale Paris (France); R. Elaloufi, Univ. College London (United Kingdom); R. Carminati, École Centrale Paris (France) ..... [6191-46]

# Organic Optoelectronics and Photonics II



**Conference Chairs:** **Paul L. Heremans**, IMEC (Belgium); **Michele Muccini**, CNR-Istituto per lo Studio dei Materiali Nanostrutturati (Italy); **Eric A. Meulenkaamp**, Philips Research Labs. (Netherlands)

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## Monday 3 April

### SESSION 1

**Schweitzer . . . . . Mon. 10.30 to 12.05**

#### OLED Technology

**Chair: Eric A. Meulenkaamp**, Philips Research Labs. (Netherlands)  
 Introduction by the Session Chair . . . . . 10.30 to 10.35  
 10.35: **Low cost manufacturing challenges for small molecule OLEDs (Invited Paper)**, P. E. Burrows, Pacific Northwest National Lab. (USA) . . . . . [6192-01]  
 11.05: **Novel silicone materials for LED packaging and optoelectronics devices**, E. Vanlathem, Dow Corning Corp. (Belgium); A. W. Norris, M. Bahadur, Dow Corning Corp. (USA); M. Yoshitake, Dow Corning Corp. (Japan); J. V. Degroot, Jr., Dow Corning Corp. (USA) . . . . . [6192-02]  
 11.25: **Inline deposition of high-efficiency p-i-n organic light-emitting devices**, M. Toerker, J. Amelung, M. Eritt, D. Hill, C. Lubber, F. Löffler, C. May, C. Zschippang, Fraunhofer-Institut für Photonische Mikrosysteme (Germany); K. Leo, Technische Univ. Dresden (Germany) . . . . . [6192-03]  
 11.45: **Manufacturing of polymer light-emitting device structures**, M. Tuomikoski, R. Suhonen, M. Välimäki, T. Maaninen, A. Maaninen, VTT Elektronikka (Finland); M. Sauer, P. Rogin, S. Heusing, Institut für Neue Materialien GmbH (Germany) . . . . . [6192-04]  
 Lunch Break . . . . . 12.05 to 13.30

### SESSION 2

**Schweitzer . . . . . Mon. 13.30 to 15.05**

#### Photophysics: Lasing and Ultrafast Processes

**Chair: John M. Lupton**, Ludwig-Maximilians-Univ. München (Germany)

Introduction by the Session Chair . . . . . 13.30 to 13.35  
 13.35: **Low-threshold organic semiconductor lasers (Invited Paper)**, U. Lemmer, Univ. Karlsruhe (Germany) . . . . . [6192-05]  
 14.05: **Real-time investigation of the intermolecular breathing mode in TMTTF+ dimers and its coupling to electronic transitions**, L. Lüer, C. Manzoni, G. Cerullo, G. Lanzani, Politecnico di Milano (Italy); M. Meneghetti, Univ. degli Studi di Padova (Italy) . . . . . [6192-06]  
 14.25: **Probing ultrafast conformational dynamics of conjugated polymers**, S. Westenhoff, A. Yartsev, V. Sundstrom, University of Lund (USA); W. J. Beenken, Technical University of Ilmenau (Germany); C. Silva, University of Montreal (Canada); R. H. Friend, N. C. Greenham, University of Cambridge (United Kingdom) . . . . . [6192-07]  
 14.45: **Up-conversion fluorescence: noncoherent excitation by sunlight**, S. Balushev, Max-Planck-Institut für Polymerforschung (Germany); T. Miteva, G. B. Nelles, A. Yasuda, Sony Deutschland GmbH (Germany); G. Wegner, Max-Planck-Institut für Polymerforschung (Germany) . . . . . [6192-08]  
 Coffee Break . . . . . 15.05 to 15.35

## SESSION 3

**Schweitzer . . . . . Mon. 15.35 to 17.30**

### Photovoltaic Devices and Physics

**Chair: Rene A. J. Janssen**, Technische Univ. Eindhoven (Netherlands)

Introduction by the Session Chair . . . . . 15.35 to 15.40  
 15.40: **Self-organization of donor and acceptor molecules on electrodes for molecular photonic devices (Invited Paper)**, H. Imahori, Kyoto Univ. (Japan) . . . . . [6192-09]  
 16.10: **Charge transport and photocurrent generation in poly(3-hexylthiophene):methanofullerene bulk-heterojunction solar cells**, V. D. Mihailetschi, L. J. A. Koster, B. de Boer, P. W. Blom, Rijksuniv. Groningen (Netherlands) . . . . . [6192-10]  
 16.30: **Mobility and recombination kinetics in bulk heterojunction solar-cells versus composition of the donor-acceptor blend**, G. Dennler, Johannes Kepler Univ. Linz (Austria); A. Mozer, Osaka Univ. (Japan); A. Pivrikas, Åbo Akademi Univ. (Finland); G. Juska, Vilnius Univ. (Lithuania); R. Osterbacka, Åbo Akademi Univ. (Finland); H. Neugebauer, S. N. Sariciftci, Johannes Kepler Univ. Linz (Austria) . . . . . [6192-11]  
 16.50: **Efficient heterojunction organic solar cells with high photovoltages containing low-bandgap oligothiophene and fullerene C60**, K. Schulze, C. L. Uhrich, R. Schüppel, K. Leo, M. P. Pfeiffer, Technische Univ. Dresden (Germany); E. Brier, P. Bäuerle, Univ. Ulm (Germany) . . . . . [6192-12]  
 17.10: **Solution-processed organic tandem solar cells**, A. Hadjipour, B. de Boer, P. W. Blom, Rijksuniv. Groningen (Netherlands); M. G. Turbiez, M. M. Wienk, R. A. Janssen, Technische Univ. Eindhoven (Netherlands) . . . . . [6192-13]  
 Break . . . . . 17.30 to 17.40

### Session of Related Interest

**Conference 6197: Photonics for Solar Energy Systems**

**Session 3, Organic Solar Cells**

**Wednesday, 5 April . . . . . 13.40 o 15.40**

## SESSION 3a

Schweitzer ..... Mon. 17.40 to 18.25

## Late News

Chair: Paul L. Heremans, IMEC (Belgium)

17.40: **Ink-jet printed conjugated polymer light emitting devices**, G. Mauthner, Technische Univ. Graz (Austria); K. Landfester, MPI fuer Kolloid- und Grenzflaechenforschung (Germany); S. Psutka, Technische Univ. Graz (Austria); A. Koeck, Wr. Neustaedter Bildungs- und Forschungsg.m.b.H (Austria); C. Stepper, Infineon Technologies AG (Germany); E. J. List, Technische Univ. Graz (Austria) ..... [6192-128]

17.55: **THz oscillations from organic microcavity laser emission**, M. Swoboda, R. Gehlhaar, M. Sudzius, V. G. Lyssenko, M. Hoffmann, K. Leo, Technische Univ. Dresden (Germany) ..... [6192-131]

18.10: **Field-dependent ultrafast photoexcitation dynamics in light emitting devices based on (ethyl-hexyl)-polyfluorenes**, F. Grasse, M. Graf, Technische Univ. Graz (Austria); S. Perissinotto, M. Zavelani-Rossi, Politecnico di Milano (Italy); F. Galbrecht, U. Scherf, Bergische Univ.-Gesamthochschule Wuppertal (Germany); E. J. List, Technische Univ. Graz (Austria); C. Gadermaier, Politecnico di Milano (Italy) ... [6192-52]

## ✓ Interactive Posters—Monday

Chair: Paul L. Heremans, IMEC (Belgium)

*An interactive poster session will be held on Monday 18.00 to 20.30. The following posters will be on display after 10.00 Monday morning in the Conference Centre Galerie de Marbre (ground floor) and Forum Hall (1st floor). An interactive poster session and reception with authors present will be held Monday evening from 18.00 to 20.30. Light refreshments will be served.*

✓ **Blue and white organic light-emitting devices employing dimeric trimeric phenylvinylene derivative as single-emitting component**, Y. Duan, W. Jiang, Jilin Univ. (China) ..... [6192-55]

✓ **Light responsive ambipolar organic field-effect transistor based on amorphous thin films of spiro-linked compound**, T. P. Saragi, I. Suske, K. Onken, T. Fuhrmann-Lieker, J. Salbeck, Univ. Kassel (Germany) ..... [6192-56]

✓ **Applications of admittance spectroscopy in determining carrier mobilities and transport parameters in organic electronic materials**, S. K. So, S. W. Tsang, Hong Kong Baptist Univ. (Hong Kong China) ..... [6192-59]

✓ **Elaboration of transparent conductive oxide films for flexible organic electroluminescent devices**, B. Lucas, Univ. de Limoges (France) ..... [6192-63]

✓ **Observation of significant electron mobility in NPB**, S. Tse, S. So, Hong Kong Baptist Univ. (Hong Kong China) ..... [6192-69]

✓ **Dopant effect on the charge injection, transportation, and device efficiency in electrophosphorescent polymeric light-emitting device**, H. A. Al Attar, A. P. Monkman, Univ. of Durham (United Kingdom) ..... [6192-70]

✓ **A green organic light-emitting diode based on a rare-earth terbium complex**, A. M. C. Ng, A. B. Djuricic, C. H. Cheung, W. K. Chan, The Univ. of Hong Kong (Hong Kong China) ..... [6192-72]

✓ **Study on carrier transport of thick OLEDs**, Y. Cheng, National Tsing Hua Univ. (Taiwan) ..... [6192-74]

✓ **Highly efficient blue phosphorescent OLEDs using large bandgap host materials**, K. Wong, F. Fang, National Taiwan Univ. (Taiwan) ..... [6192-75]

✓ **Organic solar cells with low molecular weight molecules showing high-temperature stability**, R. Lessmann, M. Pfeiffer, K. Leo, Technische Univ. Dresden (Germany) ..... [6192-77]

✓ **Low-bandgap poly(thienylene vinylene) for organic solar cells: photophysics and photovoltaic performance**, L. H. Nguyen, S. Günes, H. Neugebauer, N. S. Sariciftci, Johannes Kepler Univ. Linz (Austria); F. Banishoeb, Univ. Hasselt (Belgium); A. Henckens, L. J. Lutsen, IMEC (Belgium); D. J. M. Vanderzande, Univ. Hasselt (Belgium) and IMEC, IMOMEC division (Belgium) ..... [6192-83]

✓ **Polymer-based devices with adaptable infrared reflection and transmission**, C. M. Nilsson, E. H. Karlsson, H. M. Kariis, Swedish Defence Research Agency (Sweden) ..... [6192-84]

✓ **The influence of doping on the performance of organic bulk heterojunction solar cells**, M. J. Glatthaar, Albert-Ludwigs-Univ. Freiburg (Germany); N. Mingirulli, Fraunhofer-Institut für Solare Energiesysteme (Germany); B. Zimmermann, Albert-Ludwigs-Univ. Freiburg (Germany); F. Clement, Fraunhofer-Institut für Solare Energiesysteme (Germany); M. K. Riede, Albert-Ludwigs-Univ. Freiburg (Germany); B. van der Wiel, M. Niggemann, A. Gombert, Fraunhofer-Institut für Solare Energiesysteme (Germany) ..... [6192-86]

✓ **Electroabsorption studies on working organic semiconductor devices with various intermediate layers**, C. Lungenschmied, G. Dennler, Johannes Kepler Univ. Linz (Austria); E. A. Ehrenfreund, Technion - Israel Institute of Technology (Israel); H. Neugebauer, S. N. Sariciftci, Johannes Kepler Univ. Linz (Austria) ..... [6192-87]

✓ **Influence of solvents and substrates on the morphology and performance of low-bandgap polyfluorene: PCBM photovoltaic devices**, C. M. Björström, S. Nilsson, K. O. Magnusson, E. Moons, Karlstad Univ. (Sweden); A. Bernasik, AGH Univ. of Science and Technology (Poland); J. Rysz, A. Budkowski, Jagiellonski Univ. (Poland); F. Zhang, O. Inganäs, Linköpings Univ. (Sweden); M. R. Andersson, Chalmers Tekniska Högskola (Sweden) ..... [6192-88]

✓ **Comparative studies on solar cell structures from Zn-Phthalocyanine and Fullerenes**, M. Egginger, R. Koeppel, F. Meghdadi, Johannes Kepler Univ. Linz (Austria); P. Troshin, R. Lyubovskaya, Institute of Chemical Physics (Russia); D. Meissner, S. N. Sariciftci, Johannes Kepler Univ. Linz (Austria) ..... [6192-90]

✓ **Highly efficient OLEDs on ITO-free polymeric substrates**, K. Fehse, K. Walzer, G. He, M. P. Pfeiffer, K. Leo, Technische Univ. Dresden (Germany); A. Elschner, W. Lövenich, H.C. Starck Inc. (Germany) ..... [6192-92]

✓ **Optimization of electron transport and cathode materials for efficient organic solar cells**, A. Colmann, J. Junge, T. Wellinger, C. Kayser, U. Lemmer, Univ. Karlsruhe (Germany) ..... [6192-95]

✓ **Comparative study of optoelectronic properties of various Europium complexes used in organic electroluminescent structures**, M. Chakaroun, R. Antony, Univ. de Limoges (France); R. Demadrille, CEA Grenoble (France); A. Moliton, Univ. de Limoges (France) ..... [6192-97]

✓ **Organic solar cell encapsulation by vapor deposition polymerization of parylene**, B. Brousse, CEA Saclay (France); W. Hojeij, R. Radbeh, B. Ratier, A. Moliton, Univ. de Limoges (France) ..... [6192-98]

✓ **Photovoltaic properties dependence on the active layer morphology of small molecule organic solar cells**, B. Brousse, CEA Saclay (France); W. Hojeij, R. Radbeh, B. Ratier, A. Moliton, Univ. de Limoges (France) ..... [6192-99]

✓ **Optical properties of cross-linkable fluorene copolymers**, J. Morgado, A. Charas, H. Alves, L. Alcacer, Instituto Superior Técnico (Portugal); O. Fenwick, F. Cacialli, Univ. College London (United Kingdom) ..... [6192-100]

✓ **How stable are polymer/PCBM bulk heterojunction solar cells?**, S. Bertho, I. Haeldermans, A. Swinnen, J. D'Haen, J. V. Manca, D. J. M. Vanderzande, Univ. Hasselt (Belgium) ..... [6192-101]

✓ **UV sensors based on liquid crystals mixtures**, A. Chanishvili, G. Petriashvili, G. S. Chilaya, Georgian Academy of Sciences (Georgia); R. Barberi, M. P. De Santo, M. A. Matranga, F. Ciuchi, Univ. della Calabria (Italy) ..... [6192-103]

✓ **High-brightness polymer light-emitting devices with thermally conductive substrates**, S. h. Choi, H. k. Baik, Yonsei Univ. (South Korea) ..... [6192-106]

✓ **Energy level alignment of C60/Co using x-ray and UV photoelectron spectroscopy**, J. Seo, S. J. Kang, C. Y. Kim, S. W. Cho, C. N. Whang, Yonsei Univ. (South Korea) ..... [6192-107]

✓ **Low-operating voltage organic thin-film transistors with multilayer as gate dielectric materials**, K. Changsu, K. W. Jin, J. S. Jin, H. k. Baik, Yonsei Univ. (South Korea) ..... [6192-109]

✓ **Charge carriers mobility in CBP films doped with Ir(ppy)<sub>3</sub>**, M. Parshin, M. Van der Auweraer, Katholieke Univ. Leuven (Belgium) ..... [6192-111]

✓ **Growth and characterisation of all-organic heterostructures**, M. Campione, S. Caprioli, M. Moret, S. Tavazzi, A. Sassella, Univ. degli Studi di Milano-Bicocca (Italy) ..... [6192-113]

✓ **Deposition of organic molecules with vinyl group on hydrogen-terminated Si(100)**, S. Trabattoni, M. Campione, M. Moret, A. Papagni, Univ. degli Studi di Milano-Bicocca (Italy) ..... [6192-114]

- ✓ **Degradation of organic light-emitting diode**, S. Caria, R. Zamboni, M. Murgia, Istituto per lo Studio dei Materiali Nanostrutturati (Italy); P. Melpignano, V. Biondo, Ctr. Ricerche Plast-Optica (Italy); L. Gregoratti, M. Kiskinova, A. Barinov, Sincrotrone Trieste S.C.p.A. (Italy) [6192-115]
- ✓ **Thickness dependence of the efficiency of MDMO-PPV:PCBM solar cells**, M. Lenas, V. D. Mihailetchi, P. W. Blom, Rijksuniv. Groningen (Netherlands) [6192-120]
- ✓ **Tuning electron-hole mobility and electroluminescence in ambipolar organic light-emitting transistors by bulk hetero-junction engineering**, M. A. Loi, Istituto per lo Studio dei Materiali Nanostrutturati (Italy); C. Rost-Bietsch, IBM Zürich Research Lab. (Switzerland); M. Murgia, Istituto per lo Studio dei Materiali Nanostrutturati (Italy); S. Karg, W. Riess, IBM Zürich Research Lab. (Switzerland); M. Muccini, Istituto per lo Studio dei Materiali Nanostrutturati (Italy) [6192-121]
- ✓ **Light intensity dependence of open-circuit voltage and short-circuit current of polymer/fullerene solar cells**, L. J. A. Koster, V. D. Mihailetchi, R. Ramaker, H. Xie, P. W. Blom, Rijksuniv. Groningen (Netherlands) [6192-122]
- ✓ **Charge transport in white-light-emitting polymers**, H. Nicolai, Univ. of Groningen (Netherlands) [6192-124]
- ✓ **White light electroluminescence and temperature dependence of photoluminescence and electroluminescence defect emission intensity in polyfluorenes**, M. Graf, F. Grasse, E. J. List, Technische Univ. Graz (Austria); F. Galbrecht, U. Scherf, Bergische Univ.-Gesamthochschule Wuppertal (Germany) [6192-129]

## Tuesday 4 April

### SESSION 4

Schweitzer ..... Tues. 10.30 to 12.05

#### Light-emitting Transistors

*Chair: Michele Muccini*, Istituto per lo Studio dei Materiali Nanostrutturati (Italy)

- Introduction by the Session Chair ..... 10.30 to 10.35
- 10.35: **Spatial control of the recombination zone in ambipolar light-emitting polymer transistors (Invited Paper)**, J. Zaumseil, C. L. Donley, J. Kim, R. H. Friend, H. Sirringhaus, Univ. of Cambridge (United Kingdom) [6192-14]
- 11.05: **High ambipolar mobility in organic light-emitting transistors**, F. Dinelli, R. Capelli, M. A. Loi, M. Murgia, M. Muccini, Istituto per lo Studio dei Materiali Nanostrutturati (Italy); A. F. Facchetti, T. J. Marks, Northwestern Univ. (USA) [6192-15]
- 11.25: **Light-emitting organic field-effect transistors using an organic heterostructure inside the transistor channel**, S. De Vusser, S. Steudel, S. Verlaak, J. Genoe, IMEC (Belgium); W. Oosterbaan, L. J. Lutsen, D. J. Vanderzande, Univ. Hasselt (Belgium); P. L. Heremans, IMEC (Belgium) [6192-16]
- 11.45: **Study of vertical-type organic light-emitting transistor using ZnO**, H. Iechi, Ricoh Co., Ltd. (Japan); Y. Watanabe, Optoelectronic Industry and Technology Development Association (Japan); K. Kudo, Chiba Univ. (Japan) [6192-17]
- Lunch Break ..... 12.05 to 13.30

### SESSION 5

Schweitzer ..... Tues. 13.30 to 15.05

#### Photophysics: Theory

*Chair: Herbert Boerner*, Philips Research Labs. (Germany)

- Introduction by the Session Chair ..... 13.30 to 13.35
- 13.35: **Nature and dynamics of electronic excitations in conjugated polymers (Invited Paper)**, D. Beljonne, Univ. de Mons-Hainaut (USA) [6192-18]
- 14.05: **Exciton quenching and charge photogeneration in doped conjugated polymers**, V. I. Arkhipov, P. L. Heremans, IMEC (Belgium); E. V. Emelianova, Katholieke Univ. Leuven (Belgium); H. Baessler, Philipps-Univ. Marburg (Germany) [6192-19]
- 14.25: **Charge transport in conjugated materials: from the molecular to the macroscopic vision**, Y. Olivier, J. P. Cornil, Univ. de Mons-Hainaut (Belgium) [6192-20]
- 14.45: **Measurement and modeling of carrier transport and exciton formation in blue polymer light-emitting diodes**, R. Coehoorn, Philips Research Labs. (Netherlands) and Eindhoven University of Technology (Netherlands); S. Vulto, S. van Mensfoort, J. Billen, M. Bartzel, Philips Research Labs. (Netherlands) [6192-21]
- Coffee Break ..... 15.05 to 15.35

### SESSION 6

Schweitzer ..... Tues. 15.35 to 17.30

#### OLED Physics, Materials, and Devices I

*Chair: Reinder Coehoorn*, Philips Research Labs. (Netherlands)

- Introduction by the Session Chair ..... 15.35 to 15.40
- 15.40: **Highly efficient OLED for displays and lighting (Invited Paper)**, K. Leo, Technische Univ. Dresden (Germany) [6192-22]
- 16.10: **High-efficiency white organic-light-emitting devices combining fluorescent and phosphorescent emitter systems**, G. Schwartz, K. Walzer, M. P. Pfeiffer, K. Leo, Technische Univ. Dresden (Germany) [6192-23]
- 16.30: **The dynamics of the triplet exciton transfer between conjugated host polymers and phosphorescent iridium (III) guest emitters**, C. Rothe, A. P. Monkman, S. M. King, Univ. of Durham (United Kingdom) [6192-24]
- 16.50: **Measurement of the triplet-singlet exciton formation ratio in a working polymer light emitting diode**, A. P. Monkman, C. Rothe, S. M. King, Univ. of Durham (United Kingdom) [6192-25]
- 17.10: **Novel triplet host materials with high-energy gap and thermal stability for organic electrophosphorescent devices**, J. Qiao, L. D. Wang, Y. Qiu, Tsinghua Univ. (China) [6192-26]

## Wednesday 5 April

### SESSION 7

Schweitzer ..... Wed. 08.40 to 10.05

#### OLED Applications

*Chair: Eric A. Meulenkaamp*, Philips Research Labs. (Netherlands)

- Introduction by the Session Chair ..... 08.40 to 08.45
- 08.45: **OLEDs for lighting (Invited Paper)**, H. Boerner, Philips Research Labs. (Germany) [6192-27]
- 09.15: **Light extraction and customized optical distribution from plastic micro-optics integrated OLEDs (Invited Paper)**, P. Melpignano, G. Rotaris, V. Biondo, S. Sinesi, Ctr. Ricerche Plast-Optica (Italy); M. T. Gale, S. Westenhöfer, Ctr. Suisse d'Electronique et de Microtechnique SA (Switzerland); M. Murgia, S. Caria, C. Zamboni, Istituto per lo Studio dei Materiali Nanostrutturati (Italy) [6192-28]
- 09.45: **Polymer light-emitting devices for large-area lighting**, C. Gärditz, D. Buchhauser, R. Pätzold, O. Weiss, Siemens AG (Germany); A. Winnacker, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); J. Wecker, Siemens AG (Germany) [6192-29]
- Coffee Break ..... 10.05 to 10.35

**SESSION 8**

**Schweitzer** ..... **Wed. 10.35 to 12.30**

**OLED Physics, Materials, and Devices II**

*Chair: Karl Leo, Technische Univ. Dresden (Germany)*

- Introduction by the Session Chair ..... 10.35 to 10.40
- 10.40: **Formation of organic interface barriers: the message from non-metallic contacts (Invited Paper)**, A. L. Kahn, Princeton Univ. (USA) ..... [6192-30]
- 11.10: **Al/LiF contacts in organic optoelectronics**, S. K. Jönsson, International Univ. Bremen GmbH (Germany); W. R. Salaneck, M. Fahlman, Linköpings Univ. (Sweden) ..... [6192-31]
- 11.30: **Electronic structure at the organic/metal interface**, P. Sehati, C. Tengstedt, W. Osikowicz, W. R. Salaneck, M. Fahlman, Linköpings Univ. (Sweden) ..... [6192-32]
- 11.50: **Effect of ionic charge density on charge injection in solution processable OLED devices**, H. J. Bolink, E. Coronado, I. Recalde, L. Cappelli, Univ. de València (Spain) ..... [6192-33]
- 12.10: **Large Magnetoresistance in OLEDs and its Application in Displays**, M. Wohlgenannt, O. Mermer, G. Veeraraghavan, The Univ. of Iowa (USA); T. L. Francis, OMR Sensors, Inc. (USA); Y. Sheng, D. T. Nguyen, The Univ. of Iowa (USA) ..... [6192-34]
- Lunch Break ..... 12.30 to 14.00

**SESSION 9**

**Schweitzer** ..... **Wed. 14.00 to 15.35**

**Nonlinear optics**

*Chair: Michele Muccini, Istituto per lo Studio dei Materiali Nanostrutturati (Italy)*

- Introduction by the Session Chair ..... 14.00 to 14.05
- 14.05: **Organic nonlinear Kerr materials for ultrafast all-optical switching (Invited Paper)**, S. Jochim, N. Moll, A. Jebali, S. T. Gulde, R. F. Mahrt, B. J. Offrein, IBM Zürich Research Lab. (Switzerland); M. Murgia, R. Zamboni, Istituto per lo Studio dei Materiali Nanostrutturati (Italy) ..... [6192-35]
- 14.35: **Electrooptic microwave antenna using organic poled polymers**, A. Gardelein, E. Tanguy, Univ. de Nantes (France); N. Breuil, Thales (France); T. Razban, Univ. de Nantes (France) ..... [6192-36]
- 14.55: **Fluorinated polymers for quadratic nonlinear optics**, J. A. Delaire, M. K. Aljoumaa, E. Ishow, École Normale Supérieure de Cachan (France); J. Ding, M. Day, National Research Council Canada (Canada) ..... [6192-37]
- 15.15: **Imaging by second-harmonic generation and fluorescence for the development of optical devices based on functionalized organic materials**, A. Barsella, D. Gindre, S. Klein, G. Taupier, J. Vola, K. D. Dorkenoo, A. F. Fort, Institut de Physique et Chimie des Matériaux de Strasbourg (France) ..... [6192-38]

**Thursday 6 April**

**SESSION 10**

**Schweitzer** ..... **Thurs. 10.30 to 12.05**

**Photophysics: Nanocomposites**

*Chair: Selim Jochim, IBM Zürich Research Lab. (Switzerland)*

- Introduction by the Session Chair ..... 10.30 to 10.35
- 10.35: **Light-harvesting host-guest antenna materials for photonic devices (Invited Paper)**, G. A. Calzaferrì, Univ. Bern (Switzerland) ..... [6192-39]
- 11.05: **Energy transfer in dye-loaded zeolite L host-guest materials**, K. Lutkouskaya, G. A. Calzaferrì, Univ. Bern (Switzerland) ..... [6192-40]
- 11.25: **Organic nanofibers as new media for lasing, waveguiding, and field enhancement**, F. Quochi, F. Cordella, A. Mura, G. Bongiovanni, Univ. degli Studi di Cagliari (Italy); V. G. Bordo, General Physics Institute (Russia); R. Frese, H. Rubahn, Syddansk Univ. (Denmark) ..... [6192-41]
- 11.45: **Long-lived charged states in single-walled carbon nanotubes**, C. Gadermaier, Politecnico di Milano (Italy); E. Menna, M. Meneghetti, Univ. degli Studi di Padova (Italy); J. W. Kennedy, V. Z. Vardeny, Univ. of Utah (USA); G. Lanzani, Politecnico di Milano (Italy) ..... [6192-42]
- Lunch Break ..... 12.05 to 13.30

**SESSION 11**

**Schweitzer** ..... **Thurs. 13.30 to 14.45**

**Photophysics: Excitonic Processes**

*Chair: Uli Lemmer, Univ. Karlsruhe (Germany)*

- Introduction by the Session Chair ..... 13.30 to 13.35
- 13.35: **Pinpointing single excitons in polymeric semiconductors (Invited Paper)**, J. M. Lupton, Ludwig-Maximilians-Univ. München (Germany) ..... [6192-43]
- 14.05: **Exciton dispersion in pentacene**, M. Knupfer, Fraunhofer-Institut für Werkstoff- und Strahltechnik (Germany); H. Berger, École Polytechnique Fédérale de Lausanne (Switzerland) ..... [6192-44]
- 14.25: **J-aggregation in alpha-sexithiophene sub-monolayer films on silicon dioxide**, E. Da Como, M. A. Loi, F. Dinelli, M. Murgia, R. Zamboni, M. Muccini, Istituto per lo Studio dei Materiali Nanostrutturati (Italy) ..... [6192-45]

**SESSION 12**

**Schweitzer** ..... **Thurs. 14.45 to 17.30**

**Optical Sensors and Data Storage**

*Chair: Paul L. Heremans III, IMEC (Belgium)*

- Introduction by the Session Chair ..... 14.45 to 14.50
- 14.50: **Organic thin-film optoelectronics devices**, T. B. Singh, N. Marjanovic, H. Neugebauer, N. S. Sariciftci, R. Schroediauer, S. Bauer, A. M. Ramil, H. Sitter, Johannes Kepler Univ. Linz (Austria); A. Y. Andreev, Montan Univ. Leoben (Austria) ..... [6192-46]
- Coffee Break ..... 15.10 to 15.40
- 15.40: **A perspective on organic thin-film transistors for molecular assay (Invited Paper)**, L. Torsi, Univ. degli Studi di Bari (Italy) ..... [6192-47]
- 16.10: **Pentacene organic field-effect phototransistor with memory effect**, M. Debucquoy, S. Verlaak, S. Steudel, S. De Vusser, J. Genoe, P. L. Heremans, IMEC (Belgium) ..... [6192-48]
- 16.30: **Photo-fluids as optical sensors and data storage materials**, P. Karageorgiev, Ctr. of Advanced European Studies and Research (Germany) and Univ. Potsdam (Germany); D. Neher, B. Schulz, Univ. Potsdam (Germany); M. Giersig, Ctr. of Advanced European Studies and Research (Germany) ..... [6192-49]
- 16.50: **3D optical data storage with multilayer two-dimensional arrays of organic nanocrystals**, P. L. Baldeck, Univ. Joseph Fourier (France); E. Botzung-Appert, N. Sanz, A. Ibanez, Ctr. National de la Recherche Scientifique (France) ..... [6192-50]
- 17.10: **Organic nanocrystals grown in sol-gel thin films for ultrabright chemical and biological sensors**, V. Monnier, N. Sanz, Ctr. National de la Recherche Scientifique (France); R. Pansu, École Normale Supérieure de Cachan (France); A. Ibanez, Ctr. National de la Recherche Scientifique (France) ..... [6192-51]

**✓ Interactive Posters—Thursday**

*Chair: Paul L. Heremans, IMEC (Belgium)*

*An interactive poster session will be held on Thursday 18.00 to 20.00. The following posters will be on display after 10.00 Thursday morning in the Conference Centre Galerie de Marbre (ground floor) and Forum Hall (1st floor). An interactive poster session and reception with authors present will be held Thursday evening from 18.00 to 20.00. Light refreshments will be served.*

- ✓ **Connections of the laser-pump-induced stimulated emission and transitions of reabsorption spectra and with of the spectral-luminescence properties of singlet and triplet excited states in the laser-active molecules**, A. E. Obukhov, Sr., Moscow Mining Institute (Russia) ..... [6192-54]
- ✓ **Polymer chain conformation and chromophores in MEH-PPV: a theoretical picture**, C. De Leener, D. Beljonne, Univ. de Mons-Hainaut (Belgium) ..... [6192-57]
- ✓ **Synthesis and electrochemical investigation of novel ambipolar organic semiconductors based on spiro-linked compounds**, I. Suske, K. Onken, M. Fetten, T. P. Saragi, T. Fuhrmann-Lieker, J. Salbeck, Univ. Kassel (Germany) ..... [6192-60]

- ✓ **Polymer poling characterization using second harmonic generation (SHG)**, G. Tellier, D. Averty, C. Y. Boisrobert, H. Gundel, D. Leduc, S. Le-Tacon, C. Lupi, R. Seveno, Univ. de Nantes (France) ..... [6192-61]
- ✓ **Indolyl-based high-optical-gain photorefractive glass films having indefinitely long shelf-life**, A. Colligiani, A. Romano, Univ. degli Studi di Napoli Federico II (Italy); F. Ciardelli, F. Greco, G. Ruggeri, Univ. di Pisa (Italy); M. Angiuli, E. Tombari, Istituto per i Processi Chimico-Fisici (Italy) ..... [6192-62]
- ✓ **Photoemission studies on CuPc:C60 blend film for photovoltaic solar cells**, L. Lozzi, S. Picozzi, M. Simeoni, Univ. degli Studi dell'Aquila (Italy); S. La Rosa, Sincrotrone Trieste S.C.p.A. (Italy); S. Santucci, Univ. degli Studi dell'Aquila (Italy) ..... [6192-64]
- ✓ **Dynamic studies of the orientation induced by all-optical poling in polymer and hybrid organic-inorganic thin films**, A. Quatela, Univ. degli Studi di Roma/Tor Vergata (Italy); W. Chan, J. Nunzi, Univ. d'Angers (France); M. Casalboni, Univ. degli Studi di Roma/Tor Vergata (Italy) ..... [6192-65]
- ✓ **Trap formation and energy transfer in pheophorbide a-DAB-dendrimers and pyropheophorbide a-fullerene C60 hexaadduct molecular systems**, B. Röder, E. A. Ermilov, S. Hackbarth, Humboldt-Universität zu Berlin (Germany); M. Helmreich, N. Jux, Friedrich-Alexander-Universität Erlangen-Nürnberg (Germany) ..... [6192-66]
- ✓ **Studies of temporal stability of poled nonlinear optical polymer films**, F. De Matteis, A. Quatela, Univ. degli Studi di Roma/Tor Vergata (Italy); M. Colombo, A. Zaopo, Pirelli Cable Corp. (Italy); S. Schutzmann, M. Casalboni, Univ. degli Studi di Roma/Tor Vergata (Italy) ..... [6192-67]
- ✓ **Novel second-order nonlinear optical polymer materials containing indandione derivatives as a chromophores**, M. A. Rutkis, A. Vembris, V. Zauls, A. Tokmakovs, E. Fonavs, Latvijas Univ. (Latvia); V. Kampars, Riga Technical Univ. (Latvia) ..... [6192-68]
- ✓ **Polar photochromic monomeric glasses as efficient SRG-forming materials: cross structural and photophysical studies**, E. Ishow, L. Galmiche, K. Nakatani, École Normale Supérieure de Cachan (France); Y. He, X. Wang, Tsinghua Univ. (China) ..... [6192-73]
- ✓ **Synthesis and characterization of iridium(III) phenyl-triazole complexes with different phosphorescence emission**, K. Wong, T. Hwu, National Taiwan Univ. (Taiwan) ..... [6192-76]
- ✓ **Combined quantum chemical DFT, spectroscopic Raman, and UV-Vis-NIR study of fused a-oligothiophenes with five and seven rings**, R. Malavé Osuna, R. Ponce Ortiz, M. Ruiz Delgado, V. Hernández Jolin, J. T. López Navarrete, Univ. de Málaga (Spain); X. Zhang, A. J. Matzger, Univ. of Michigan (USA) ..... [6192-78]
- ✓ **Excited-state dynamics and energy transfer in conjugated polymer systems**, S. M. King, C. Rothe, D. Dai, A. P. Monkman, Univ. of Durham (United Kingdom) ..... [6192-79]
- ✓ **Polymer-dye complexes: supramolecular route toward functional optical materials**, A. Priimagi, Helsinki Univ. of Technology (Finland); S. Cattaneo, Tampereen Teknillinen Yliopisto (Finland); R. H. A. Ras, S. Valkama, O. Ikkala, Helsinki Univ. of Technology (Finland); M. Kauranen, Tampereen Teknillinen Yliopisto (Finland) ..... [6192-80]
- ✓ **Perfluorination of tetracene: effects on the optical gap and electron-acceptor properties: an electrochemical, theoretical DFT, and Raman spectroscopic study**, R. Ponce Ortiz, R. Malavé Osuna, M. Ruiz Delgado, J. Casado Cordon, V. Hernández Jolin, J. T. López Navarrete, Univ. de Málaga (Spain); Y. Sakamoto, T. Suzuki, Institute for Molecular Science (Japan) ..... [6192-81]
- ✓ **Photoinduced switching of electrical properties in thin films of polar indandione type organic molecules**, I. Muzikante, E. Fonavs, Latvijas Univ. (Latvia); L. Brehmer, B. Stiller, Univ. Potsdam (Germany) ..... [6192-82]
- ✓ **Evidence of refractive index anisotropy in hybrid sol-gel slab waveguides deposited by spin-coating technique**, P. Proposito, S. Schutzmann, C. Palazzesi, M. Casalboni, Univ. degli Studi di Roma/Tor Vergata (Italy) ..... [6192-85]
- ✓ **Planar polymeric multilayer structure for electrooptic applications**, A. D. Udvar, M. Casalboni, F. De Matteis, P. Proposito, A. Quatela, S. Schutzmann, Univ. degli Studi di Roma/Tor Vergata (Italy); S. Simon, Univ. Babeş-Bolyai (Romania) ..... [6192-89]
- ✓ **STM-induced electroluminescence in polyfluorene-based conjugated polymer blends**, S. Selci, L. Ferrari, G. Latini, Consiglio Nazionale delle Ricerche (Italy); L. J. Parrott, F. Cacialli, Univ. College London (United Kingdom) ..... [6192-91]
- ✓ **Photoexcitation dynamics in long-chain polyenes**, M. R. Antognazza, M. Bendin, D. Polli, Politecnico di Milano (Italy); R. L. Christensen, Bowdoin College (USA); G. Cerullo, G. Lanzani, Politecnico di Milano (Italy) ..... [6192-93]
- ✓ **Luminescence quenching by oxygen of a ruthenium (II) complex attached to a channel of zeolite L**, R. Q. Albuquerque, A. Z. Ruiz, G. A. Calzaferri, Univ. Bern (Switzerland); L. De Cola, Univ. van Amsterdam (Netherlands) ..... [6192-94]
- ✓ **Amplified spontaneous emission in TPD-based waveguides: thickness and TPD concentration dependence**, E. M. Calzado Estepa, J. M. Villalvilla, P. G. Boj, J. A. Quintana, M. A. Diaz-Garcia, Univ. de Alicante (Spain) ..... [6192-96]
- ✓ **Basic synthesis of 3-glycidioxypropyltrimethoxysilane-TiO<sub>2</sub> UV-sensitive waveguides**, G. Della Giustina, G. Brusatin, M. Guglielmi, Univ. degli Studi di Padova (Italy); S. Gardin, R. Signorini, Univ. degli Studi di Padova (Italy); R. Bozio, Univ. degli Studi di Padova (Italy) ..... [6192-102]
- ✓ **Fabrication of quasi-phase-matched structures for frequency conversion in photopolymers doped with push-pull chromophores**, J. Bombenger, L. Mager, Institut de Physique et Chimie des Matériaux de Strasbourg (France) ..... [6192-104]
- ✓ **Sterically hindered pyridinium phenolates as new chromophores for quadratic optics**, V. Diemer, H. Chaumeil, A. Defoin, Univ. de Haute Alsace (France); A. J. Boeglin, A. F. Fort, Institut de Physique et Chimie des Matériaux de Strasbourg (France); P. Jacques, C. P. Carre, Univ. de Haute Alsace (France) ..... [6192-105]
- ✓ **Supramolecular organization of conjugated polymers: relationship between the microscopic morphology and the optoelectronic properties**, M. Surin, P. E. Leclère, Univ. de Mons-Hainaut (Belgium); A. C. Grimsdale, K. Müllen, Max-Planck-Institut für Polymerforschung (Germany); D. A. Moses, A. J. Heeger, Univ. of California/Santa Barbara (USA); R. Lazzaroni, Univ. de Mons-Hainaut (Belgium) ... [6192-110]
- ✓ **Refraction and self-waveguided light propagation in anisotropic molecular solids**, S. Tavazzi, M. Laicini, L. Raimondo, Univ. degli Studi di Milano-Bicocca (Italy); P. Spearman, Kingston Univ. (United Kingdom) ..... [6192-112]
- ✓ **Light scattering processes in nematic liquid crystals without alignment control**, M. Lepore, Seconda Univ. degli Studi di Napoli (Italy); B. Piccirillo, E. Santamato, Univ. degli Studi di Napoli Federico II (Italy) ..... [6192-116]
- ✓ **Tuning light emission colour of AIQ3 through oligothiophene substituents**, F. Rodriguez, A. Yassar, G. Horowitz, J. Fave, Univ. Paris 7-Denis Diderot (France) ..... [6192-118]
- ✓ **Vibronic structure of electroabsorption spectra in conjugated systems (Stand-by Oral Presentation)**, E. A. Ehrenfreund, B. Shapiro, Technion - Israel Institute of Technology (Israel); Z. V. Vardeny, Univ. of Utah (USA) ..... [6192-119]
- ✓ **Correlation of fluorescence lifetime/yields with structural parameters for novel conjugated polymers**, L. A. O'Neill, P. Lynch, M. McNamara, H. J. Byrne, Dublin Institute of Technology (Ireland) ..... [6192-123]
- ✓ **New family of silole derivatives: relation between molecular arrangements, efficiency, and colour emission**, P. Gerbier, L. Aubouy, Univ. Montpellier II (France); N. Huby, Univ. Bordeaux 1 (France); G. Wantz, École Nationale Supérieure de Chimie et de Physique de Bordeaux (France); L. Hirsch, Univ. Bordeaux 1 (France); L. Vignau, École Nationale Supérieure de Chimie et de Physique de Bordeaux (France) ..... [6192-125]
- ✓ **Efficient second harmonic generation from a new class of V-shaped benzo-thiophene based organic molecules**, I. Räu, P. Chollet, P. Armatys, F. Kajzar, CEA Saclay (France); G. Barbarella, L. Favaretto, Istituto per la Sintesi Organica e la Fotoreattivi (Italy); S. Caria, E. Da Como, M. Muccini, M. Murgia, R. Zamboni, Istituto per lo Studio dei Materiali Nanostrutturati (Italy) ..... [6192-127]
- ✓ **Nonlinear absorption and refraction process of Fluorene-based molecules via picosecond and femtosecond measuring methods**, R. Gvishi, L. A. Padilha, J. Fu, D. J. Hagan, E. W. Van Stryland, College of Optics and Photonics/Univ. of Central Florida (USA); S. Yao, K. D. Belfield, Univ. of Central Florida (USA) ..... [6192-130]



# Reliability of Optical Fiber Components, Devices, Systems, and Networks III



*Conference Chairs:* **Hans G. Limberger**, École Polytechnique Fédérale de Lausanne (Switzerland); **M. John Matthewson**, Rutgers Univ. (USA)

*Program Committee:* **Francis Berghmans**, SCK•CEN (Belgium); **Gilberto M. Camilo**, Federal Univ. of Goias (Brazil); **Wilson K. Chiu**, Univ. of Connecticut (USA); **Andrea F. Fumagalli**, The Univ. of Texas at Dallas (USA); **Osman S. Gebizlioglu**, Telcordia Technologies, Inc. (USA); **G. Scott Glaesemann**, Corning Inc. (USA); **Wolfgang R. Habel**, Bundesanstalt für Materialforschung und -prüfung (Germany); **Marcel Held**, Swiss Federal Laboratories for Materials Testing and Research (Switzerland); **Kyriacos Kalli**, Higher Technical Institute (Cyprus); **SriRaman Kannan**, Lucent Technologies/Bell Labs. (USA); **Stephen N. Kukureka**, The Univ. of Birmingham (United Kingdom); **Charles R. Kurkjian**, Rutgers Univ. (USA); **Marian Marciniak**, National Institute of Telecommunications (Poland); **Sergei L. Semjonov**, General Physics Institute (Russia); **Ed S. Sikora**, BT Exact (United Kingdom); **Tarja T. Volotinen**, OFCON Optical Fiber Consultants AB (Sweden); **Lena Wosinska**, Kungliga Tekniska högskolan (Sweden)



**Conference 6193 contains papers funded by and/or related to current EU research projects contained in Framework VI.**

*Paper Numbers:*  
3, 8, 13, 14, 16, 24, 27, 37, 44.

## Monday 3 April

### Opening Remarks ..... Mon. 10.30

**Hans G. Limberger**, École Polytechnique Fédérale de Lausanne (Switzerland); **M. John Matthewson**, Rutgers Univ. (USA)

### SESSION 1

#### Leicester ..... Mon. 10.30 to 12.30

##### Fibers and Gamma Radiation

*Chair:* **Kyriacos Kalli**, Higher Technical Institute (Cyprus)

10.30: **Strength-Probability-Time Diagrams using Power-Law and Exponential Kinetics Models for Fatigue**, M. J. Matthewson, Rutgers Univ. (USA) ..... [6193-01]

10.50: **The mechanical reliability of optical fibre for long-term applications**, Y. M. El Shazly, S. N. Kukureka, The Univ. of Birmingham (United Kingdom) ..... [6193-02]

11.10: **Mechanical reliability studies of optical fibres under high-dose gamma radiation**, M. Van Uffelen, SCK•CEN (Belgium); S. N. Kukureka, Y. M. El Shazly, The Univ. of Birmingham (United Kingdom); P. Matthijsse, G. Kuyt, Draka Comteq Fibre B.V. (Netherlands); F. Berghmans, SCK•CEN (Belgium) and Vrije Univ. Brussel (Belgium) ..... [6193-03]

11.30: **Effect of loading mode on the measurement of fatigue parameters in optical fibers**, Y. M. El Shazly, S. N. Kukureka, The Univ. of Birmingham (United Kingdom) ..... [6193-04]

11.50: **Strength after proof-testing: an impact of diffusion-limited and thermo-fluctuation regions of the crack growth**, S. L. Semjonov, General Physics Institute (Russia) ..... [6193-05]

12.10: **Silica optical fibres' behaviour at chemical etching in hydrofluoric acid vapours**, I. V. Severin, Univ. Politehnica Bucuresti (Romania); M. Poulain, R. El Abdi, Univ. de Rennes I (France) . [6193-06]

Lunch Break ..... 12.30 to 13.30

### SESSION 2

#### Leicester ..... Mon. 13.30 to 15.30

##### Novel Fibers, Fiber Components, and Qualification

*Chair:* **M. John Matthewson**, Rutgers Univ. (USA)

13.30: **Space Flight Requirements for Optical Fiber Components; Qualification Testing and Lessons Learned (Invited Paper)**, M. N. Ott, NASA Goddard Space Flight Center (USA) ..... [6193-07]

14.00: **Reliability studies of micro-optical components in NEMO**, F. Berghmans, SCK•CEN (Belgium) and Vrije Univ. Brussel (Belgium); S. Eve, Forschungszentrum Karlsruhe (Germany); C. Gorecki, Univ. de Franche-Comté (France); N. Huber, Forschungszentrum Karlsruhe (Germany); P. Kniazewski, Politechnika Warszawska (Poland); O. Kraft, Forschungszentrum Karlsruhe (Germany); M. Kujawinska, Politechnika Warszawska (Poland); M. Jozwik, L. Nieradko, Univ. de Franche-Comté (France); L. A. Salbut, Politechnika Warszawska (Poland); M. Van Uffelen, SCK•CEN (Belgium) ..... [6193-08]

14.20: **Strength prediction of microstructured optical fibers**, S. S. Chakravorthy, W. K. S. Chiu, Univ. of Connecticut (USA) ..... [6193-09]

14.40: **Strength and fatigue of microstructured optical fibers**, A. Kosolapov, S. L. Semjonov, General Physics Institute (Russia) [6193-10]

15.00: **Overview of Fiber-to-the-premises (FTTP) product requirements and qualification programs (Invited Paper)**, O. S. Gebizlioglu, Telcordia Technologies, Inc. (USA) ..... [6193-11]

Coffee Break ..... 15.30 to 16.00

### SESSION 3

#### Leicester ..... Mon. 16.00 to 17.30

##### Fibers and Gratings

*Chair:* **Francis Berghmans**, SCK•CEN (Belgium)

16.00: **Passive component reliability analysis of issues relating to stoichiometric defects in glass (Invited Paper)**, S. Kannan, Lucent Technologies/Bell Labs. (USA) ..... [6193-12]

16.30: **Annealing and temperature coefficient study of Type IA fibre Bragg gratings inscribed under strain and no strain: implications to optical fibre component reliability**, K. Kalli, Higher Technical Institute (Cyprus); H. Dobb, G. Simpson, Aston Univ. (United Kingdom); M. Komodromos, Frederick Institute of Technology (Cyprus); D. J. Webb, I. Bennion, Aston Univ. (United Kingdom) ..... [6193-13]

16.50: **A comparison of the spectral properties of high-temperature annealed long-period gratings inscribed by femtosecond laser, UV, and fusion-arc**, T. D. Allsop, H. Dobb, A. S. Main, A. Martinez, M. Dubov, Aston Univ. (United Kingdom); K. Kalli, Higher Technical Institute (Cyprus); D. J. Webb, I. Bennion, Aston Univ. (United Kingdom) ..... [6193-14]

17.10: **Optical fibre performance in hydrogen atmosphere at high temperature**, S. L. Semjonov, V. A. Bogatyrev, A. F. Kosolapov, A. S. Biryukov, General Physics Institute (Russia); I. V. Nikolin, Schlumberger Research & Development, Inc. (Russia); R. T. Ramos, V. Vaynshteyn, A. H. Hartog, Schlumberger Sensa (United Kingdom) ..... [6193-15]

### ✓ Interactive Posters—Monday

*An interactive poster session will be held on Monday 18.00 to 20.30. Posters will be on display after 10.00 Monday morning in the Conference Centre Galerie de Marbre (ground floor) and Forum Hall (1st floor). An interactive poster session and reception with authors present will be held Monday evening from 18.00 to 20.30. Light refreshments will be served.*

✓ **Influence of fibre parameters on the performance of SCM QPSK transmission systems**, M. J. Pontes, Instituto Militar de Engenharia (Brazil); A. P. Togneri, M. E. V. Segatto, Univ. Federal do Espirito Santo (Brazil); M. T. M. R. Giraldo, Instituto Militar de Engenharia (Brazil); J. C. W. A. Costa, Univ. Federal do Para (Brazil) ..... [6193-31]

✓ **Thermal and chemical removal of hermetic carbon coatings from silica optical fiber**, C. R. Kurkjian, Rutgers Univ. (USA) ... [6193-18]

- ✓ **Comparative study of the irradiation-induced degradation in large diameter optical fibers**, D. G. Sporea, A. Sporea, National Institute for Lasers, Plasma and Radiation Physics (Romania) ..... [6193-33]
- ✓ **Effect of the coating on the fatigue of optical fibres**, Y. M. El Shazly, S. N. Kukureka, The Univ. of Birmingham (United Kingdom) [6193-34]
- ✓ **Weibull fracture probability of hollow optical fibers**, G. M. Camilo, Univ. Federal de Goias (Brazil) ..... [6193-35]
- ✓ **Optimal design for narrowband low-dispersion fiber Bragg grating based filter by local particle swarm optimization algorithm**, Y. Liu, Z. Yu, Jr., Beijing Univ. of Posts and Telecommunications (China) ..... [6193-36]
- ✓ **Analysis and fabrication by electric-arc technique of high-performance bandpass filters based on phase-shifted long period fiber gratings**, A. Malki, Univ. de Rouen (France); G. J. Humbert, Univ. of Bath (United Kingdom) ..... [6193-37]
- ✓ **Fiber optics combinational system for transmission of high-power laser radiation**, Y. V. Sorokin, V. V. Valuev, State Unitary Enterprise (Russia) ..... [6193-39]
- ✓ **Efficient pump beam coupling in EDFA with two mutually phase conjugate mirrors**, S. Kano, A. Okamoto, Hokkaido Univ. (Japan); Y. Takayama, Japan Aerospace Exploration Agency (Japan); K. Sato, Hokkai-Gakuen Univ. (Japan); H. Kaseda, Hokkaido Univ. (Japan) ..... [6193-40]
- ✓ **Internal defect localization in 980-nm ridge waveguide lasers**, L. C. Diaz, H. J. Eichler, Technische Univ. Berlin (Germany); K. D. Weich, Siemens AG (Germany); A. Klehr, U. Zeimer, Ferdinand-Braun-Institut für Höchstfrequenztechnik (Germany) ..... [6193-41]
- ✓ **A novel dynamic grooming model using immune operators for IP over ASON network**, T. Xie, Univ. of International Business and Economics (China) ..... [6193-42]
- ✓ **Configure GMPLS with shared protection in survivable IP over optical networks**, T. Xie, Univ. of International Business and Economics (China) ..... [6193-43]
- ✓ **The analysis of reliability problem in multi-failure case**, X. Lu, Z. Wang, L. Wosinska, Kungliga Tekniska Högskolan (Sweden) [6193-44]
- ✓ **Evaluation of higher order PMD effects using Jones matrix analytical models: a comparative study**, M. F. Ferreira, Univ. de Aveiro (Portugal) ..... [6193-45]
- ✓ **Upgrading the transmission capacity of local area networks by improving the receiver performance**, D. N. L. Fortes, M. J. Pontes, M. T. M. R. Giraldo, Instituto Militar de Engenharia (Brazil) .. [6193-46]
- ✓ **Hybrid approaches for the design of mesh and hierarchical ring optical networks**, M. E. Segatto, M. O. Lima, R. T. R. Almeida, E. Oliveira, Univ. Federal do Espírito Santo (Brazil) ..... [6193-47]
- ✓ **Improving the response of a SOA wavelength converter in the counter propagating mode using a fiber Bragg grating**, M. Pinho Alho, Jr., M. T. M. R. Giraldo, Instituto Militar de Engenharia (Brazil) ..... [6193-48]
- ✓ **Improvement of radiation resistance of multimode silica-core holey fibers**, A. F. Kosolapov, S. L. Semjonov, A. L. Tomashuk, General Physics Institute (Russia) ..... [6193-49]
- ✓ **Radiation-induced loss predictions for pure silica core, polarization-maintaining fibers**, M. J. LuValle, OFS Fitel Lab (USA); F. V. DiMarcello, Lucent Technologies (USA); E. M. Monberg, Lucent Technologies/Bell Labs. (USA); P. W. Wisk, Lucent Technologies (USA); M. F. Yan, OFS Labs. (USA) ..... [6193-50]

## Tuesday 4 April

### SESSION 4

Leicester ..... Tues. 10.30 to 12.20

#### Plastic Optical Fiber and Fiber Coatings

*Chair: Sergei L. Semjonov, General Physics Institute (Russia)*

- 10.30: **Reliability of fibre Bragg gratings in polymer optical fibre (Invited Paper)**, H. Dobb, K. Carroll, D. J. Webb, Aston Univ. (United Kingdom); K. Kalli, Higher Technical Institute (Cyprus); M. Komodromos, C. Themistos, Frederick Institute of Technology (Cyprus); G. D. Peng, Univ. of New South Wales (Australia); A. Argyros, M. C. J. Large, M. A. van Eijkelenborg, The Univ. of Sydney (Australia) ..... [6193-16]
- 11.00: **Effect of optical fiber coating abrasion on aging behavior**, E. A. Lindholm, OFS Fitel, LLC (USA) ..... [6193-17]

- 11.20: **Recovery of strength of weak fibers by HF etching**, C. R. Kurkjian, M. J. Matthewson, K. T. Castelino, Rutgers Univ. (USA); S. L. Semjonov, General Physics Institute (Russia) ..... [6193-32]

- 11.40: **Hybrid glass coatings for optical fibers: effect of coating thickness on strength and dynamic fatigue characteristics of silica fibers**, A. B. Wojcik, Hybrid Glass Technologies, Inc. (USA); J. Wojcik, A. Walewski, Univ. Marii Curie-Sklodowskiej (Poland); M. J. Matthewson, Rutgers Univ. (USA) ..... [6193-19]

- 12.00: **Reliability of hard plastic clad silica fibers**, B. J. Skutnik, CeramOptec Industries, Inc. (USA); S. B. Spaniol, CeramOptec GmbH (Germany) ..... [6193-20]

Lunch Break ..... 12.20 to 13.20

### SESSION 5

Leicester ..... Tues. 13.20 to 15.40

#### Effects of High Optical Power

*Chair: Hans G. Limberger, École Polytechnique Fédérale de Lausanne (Switzerland)*

- 13.20: **Improved understanding of high-power damage phenomena at fibre bends through analytical temperature mapping (Invited Paper)**, J. V. Wright, E. Sikora, D. J. McCartney, K. Farrow, BT Exact Co. (United Kingdom) ..... [6193-21]

- 13.50: **Optical discharge in silica-based fibers: high-speed propagation under kW-range laser radiation (Invited Paper)**, A. A. Frolov, I. A. Bufetov, General Physics Institute (Russia); V. P. Efremov, Institute for High Energy Densities (Russia); M. Y. Schelev, V. I. Lozovoy, General Physics Institute (Russia); V. E. Fortov, Institute for High Energy Densities (Russia); E. M. Dianov, General Physics Institute (Russia) ..... [6193-22]

- 14.20: **Single-mode fiber for high-power applications with small bend radii**, G. S. Glaesemann, M. J. Wunningham, S. R. Bickham, Corning Inc. (USA) ..... [6193-23]

- 14.40: **Spectral modification of type IA fibre Bragg gratings by high-power near infra-red lasers**, K. Kalli, Higher Technical Institute (Cyprus); G. Simpson, K. Zhou, L. Zhang, D. Birkin, T. Ellingham, I. Bennion, Aston Univ. (United Kingdom) ..... [6193-24]

- 15.00: **Implications of losses at high optical powers in Bragg gratings written by femtosecond laser pulses in coated fibre**, K. T. O'Mahoney, Waterford Institute of Technology (Ireland); A. S. Main, A. Martinez, D. J. Webb, Aston Univ. (United Kingdom); D. A. Flavin, Waterford Institute of Technology (Ireland) ..... [6193-25]

- 15.20: **Power transmission limits of different glass fibers with antireflective coating**, S. Meister, C. Theiss, C. Scharfenorth, H. J. Eichler, Technische Univ. Berlin (Germany) ..... [6193-26]

Coffee Break ..... 15.40 to 16.00

### SESSION 6

Leicester ..... Tues. 16.00 to 17.20

#### Systems and Networks

*Chair: Marian Marciniak, National Institute of Telecommunications (Poland)*

- 16.00: **Optimization of path availability of span-restorable optical networks**, L. Zhou, M. Held, EMPA (Switzerland) ..... [6193-27]

- 16.20: **Performance and reliability predictions of 1550-nm WDM optical transmission links using a system simulator**, L. Bechou, L. Mendizabal, Univ. Bordeaux 1 (France); C. Aupetit-Berthelemot, Ecole Nationale Supérieure d'Ingénieurs de Limoges (France); Y. Deshayes, Univ. Bordeaux 1 (France); J. Dumas, Ecole Nationale Supérieure d'Ingénieurs de Limoges (France); D. Laffitte, J. Goudard, Avanex France S.A. (France); Y. Danto, Univ. Bordeaux 1 (France) ..... [6193-28]

- 16.40: **Improving restoration time in optical networks**, A. Muchanga, L. Wosinska, F. Orava, Kungliga Tekniska Högskolan (Sweden) . . [6193-29]

- 17.00: **Necessity of optical power in the fiber optics ring networks**, C. M. Jadhao, G.S. College of Khamgaon (India); D. Dhote, Brijlal Biyani Science College of Amravati (India) ..... [6193-30]



# Millimeter-Wave and Terahertz Photonics

*Conference Chairs:* **Dieter Jäger**, Univ. Duisburg-Essen, OpTech-Net e.V. (Germany); **Andreas Stöhr**, Univ. Duisburg-Essen (Germany)

*Program Committee:* **Béatrice Cabon**, École Nationale Supérieure d'Electronique et de Radioélectrique de Grenoble (France); **Stephane Formont**, THALES Airborne Systems (France); **M. Hofman**, Ruhr-Univ. Bochum (Germany); **Alwyn J. Seeds**, Univ. College London (United Kingdom)



**Conference 6194 contains a paper funded by and/or related to current EU research projects contained in Framework VI.**  
Paper Numbers: 1, 10.

## Wednesday 5 April

### SESSION 1

**Orangerie** ..... **Wed. 13.30 to 15.10**

#### RF Photonics

*Chair:* **John E. Mitchell**, Univ. College London (United Kingdom)

- 13.30: **Joint European research projects in millimetre-wave and THz photonics, ISIS and IPHOBAC**, B. Cabon, École Nationale Supérieure d'Electronique et de Radioélectrique de Grenoble (France); A. Stöhr, Univ. Duisburg-Essen (Germany) ..... [6194-01]
- 13.50: **Demonstration of overlay UMTS signal transmission on a gigabit passive optical network**, H. Le Bras, D. Schumacher, M. Moignard, France Télécom (France) ..... [6194-02]
- 14.10: **Microwave photonic cross-connect repeater for telecommunication satellites**, B. Benazet, Alcatel Alenia Space (France); M. Sotom, Alcatel Alenia space (France); M. Maignan, Alcatel Alenia Space (France); J. M. Perdigues Armengol, European Space Research and Technology Ctr. (Netherlands) ..... [6194-03]
- 14.30: **Data transmission using a spectrum sliced radio over fibre link**, J. E. Mitchell, Univ. College London (United Kingdom) .. [6194-04]
- 14.50: **Optical carrier processor of microwave/millimeter-wave photonic signals by using a fiber Bragg grating in transmission**, M. J. Erro, R. Hernández, A. Loayssa, Univ. Pública de Navarra (Spain); J. Mora, Univ. Politècnica de València (Spain); D. Benito, Univ. Pública de Navarra (Spain) ..... [6194-05]

## Thursday 6 April

### SESSION 2

**Orangerie** ..... **Thurs. 10.30 to 12.40**

#### Mm-wave and THz: Spectroscopy and Imaging

*Chair:* **Johan H. Stiens**, Vrije Univ. Brussel (Belgium)

- 10.30: **Applications of semiconductor terahertz lasers in biomolecular spectroscopy and imaging (Invited Paper)**, E. Bruendermann, M. Havenith, Ruhr-Univ. Bochum (Germany) . [6194-06]
- 11.00: **Investigation of water and soot contamination in petroleum products via terahertz transmission spectroscopy**, S. Gorenflo, U. Tauer, I. Hinkov, A. Lambrecht, Fraunhofer-Institut für Physikalische Messtechnik (Germany); H. Helm, Albert-Ludwigs-Univ. Freiburg (Germany) ..... [6194-07]
- 11.20: **Terahertz time-domain spectroscopy and spectrochronography of amino acids and polypeptides**, A. P. Shkurinov, A. Chikishev, S. Shkelnyuk, M. Nazarov, D. Sapozhnikov, I. Smirnov, M.V. Lomonosov Moscow State Univ. (Russia); O. Okhotnikov, Tampereen Teknillinen Yliopisto (Finland) ..... [6194-08]
- 11.40: **Characterization of speckle/despeckling in active millimeter wave imaging systems using a first-order 1.5D model**, I. Ocket, B. Nauwelaers, Katholieke Univ. Leuven (Belgium); L. Meert, F. Olyslager, Ghent Univ. (Belgium); G. Koers, J. H. Stiens, R. A. Vounckx, I. Jager, Vrije Univ. Brussel (Belgium) ..... [6194-09]
- 12.00: **Semi-confocal imaging with a THz gas laser**, M. A. Salhi, M. Koch, Technische Univ. Braunschweig (Germany) ..... [6194-10]
- 12.20: **Speckle reduction in THz imaging systems with multiple phase patterns**, I. Jager, J. H. Stiens, R. A. Vounckx, G. Koers, G. Poesen, Vrije Univ. Brussel (Belgium) ..... [6194-11]
- Lunch Break ..... 12.40 to 13.50

## SESSION 3

**Orangerie** ..... **Thurs. 13.50 to 15.40**

#### Mm-wave and THz: Photomixer

*Chair:* **Dieter Jäger**, Univ. Duisburg-Essen (Germany)

- 13.50: **High-responsibility, broadband waveguide uni-travelling carrier photodiode (Invited Paper)**, C. C. Renaud, Univ. College London (United Kingdom); M. Robertson, D. Rogers, R. Firth, P. J. Cannard, R. Moore, Ctr. for Integrated Photonics Ltd. (United Kingdom); A. J. Seeds, Univ. College London (United Kingdom) ..... [6194-14]
- 14.20: **THz Photomixers: an overview**, A. Stöhr, D. Jäger, Univ. Duisburg-Essen (Germany) ..... [6194-15]
- 14.40: **Total field-emission properties of terahertz radiations by plasmon-resonant photomixer**, Y. M. Meziani, Tohoku Univ. (Japan) ..... [6194-12]
- 15.00: **Highly collimated and directed (cw) THz emission by photomixing in semiconductor device arrays**, S. Malzer, S. Preu, G. H. Döhler, Z. Lu, J. Zhang, L. Wang, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany) ..... [6194-13]
- 15.20: **A numerical study of photoconductive dipole antennas: the real emission frequency and an improved antenna design**, K. Ezdi, M. N. Islam, A. N. R. Yerrappareddy, C. Jördens, A. Enders, M. Koch, Technische Univ. Braunschweig (Germany) ..... [6194-16]
- Coffee Break ..... 15.40 to 16.00

## SESSION 4

**Orangerie** ..... **Thurs. 16.00 to 17.40**

#### Mm-wave and THz: Optical Sources, Detectors, and Filters

*Chair:* **Erik Bründermann**, Ruhr-Univ. Bochum (Germany)

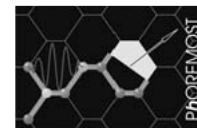
- 16.00: **Room-temperature terahertz generation with semiconductor lasers**, C. Brenner, T. N. Le, S. Hoffmann, M. R. Hofmann, Ruhr-Univ. Bochum (Germany) ..... [6194-17]
- 16.20: **InN as THz emitter excited at 1060 nm**, B. Pradarutti, C. Brückner, S. Riehemann, G. Notni, A. Tünnermann, Fraunhofer-Institut für Angewandte Optik und Feinmechanik (Germany); G. Matthäus, S. Nolte, Friedrich-Schiller-Univ. Jena (Germany); V. Cimalla, O. Ambacher, Technische Univ. Ilmenau (Germany) ..... [6194-18]
- 16.40: **Two-mode operation of four-section semiconductor laser for THz generation by photomixing**, A. Akwoue Ondo, J. Torres, C. Palermo, L. Chusseau, Univ. Montpellier II (France); J. Jacquet, Supélec (France); M. Thual, École Nationale Supérieure des Sciences Appliquées et de Technologie (France) ..... [6194-19]
- 17.00: **Femtosecond electron gun for diffraction experiments**, E. E. Fill, A. A. Apolonskiy, F. Krausz, Max-Planck-Institut für Quantenoptik (Germany) ..... [6194-26]
- 17.20: **Improved dielectric mirrors for the THz frequency range**, F. Rutz, N. Krumbholz, Technische Univ. Braunschweig (Germany); L. Micele, G. De Portu, Consiglio Nazionale delle Ricerche (Italy); D. M. Mittleman, Rice Univ. (USA); M. Koch, Technische Univ. Braunschweig (Germany) ..... [6194-20]

### ✓ Interactive Posters—Thursday

*An interactive poster session will be held on Thursday 18.00 to 20.00. Posters will be on display after 10.00 Thursday morning in the Conference Centre Galerie de Marbre (ground floor) and Forum Hall (1st floor). An interactive poster session and reception with authors present will be held Thursday evening from 18.00 to 20.00. Light refreshments will be served.*

- ✓ **Terahertz pulse plasmon interaction with metal grating**, M. Nazarov, M.V. Lomonosov Moscow State Univ. (Russia); L. Mukina, M.V. Lomonosov Moscow State Univ (Russia); A. P. Shkurinov, M.V. Lomonosov Moscow State Univ. (Russia) ..... [6194-21]
- ✓ **Moth-eye structures for reduction of Fresnel losses at THz components**, C. Brückner, S. Riehemann, G. Notni, A. Tünnermann, Fraunhofer-Institut für Angewandte Optik und Feinmechanik (Germany) ..... [6194-22]
- ✓ **THz semiconductor hot electron bolometer (SHEB)**, V. Dobrovolski, F. F. Sizov, Institute of Semiconductor Physics (Ukraine) ... [6194-23]
- ✓ **Sub-ps resolution optical sampler based on FWM effect in highly nonlinear fibre**, G. Meloni, Scuola Superiore Sant'Anna (Italy); A. Bogoni, L. Pot, Consorzio Nazionale Interuniv. per le Telecomunicazioni (Italy) ..... [6194-24]
- ✓ **Effective reflectance in millimeter-wave range**, V. I. Kislenco, A. D. Lomakin, R. Yaroshenko, National Taras Shevchenko Univ. of Kyiv (Ukraine) ..... [6194-25]


# Nanophotonics



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

Cochairs: **Jean-Michel Nunzi**, Univ. d'Angers (France); **Andreas Ostendorf**, Laser Zentrum Hannover e.V. (Germany)

Program Committee: **Fabrice Charra**, CEA Saclay (France); **Alain Deureux**, Lab. d'Optique Submicromique (France); **Aleksandra Djurisik**, The Univ. of Hong Kong (Hong Kong China); **Satoshi Kawata**, Osaka Univ. (Japan); **Karsten König**, Fraunhofer-Institut für Biomedizinische Technik (Germany); **Manijeh Razeghi**, Northwestern Univ. (USA); **Anatoly V. Zayats**, Queen's Univ. Belfast (United Kingdom)



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Paper Numbers: 2, 6, 7, 8, 9, 16, 25, 29, 33, 37, 38, 45, 46, 49, 52, 59, 63.

## Monday 3 April

### SESSION 1

Orangerie ..... Mon. 10.20 to 12.10

#### Nonlinear Optical Processes

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

10.20: **Optical properties of metallic nanostructures fabricated by two-photon induced photoreduction (Invited Paper)**, P. L. Baldeck, J. Bosson, A. Mihut, M. Pierre, O. Stephan, Univ. Joseph Fourier (France) ..... [6195-01]

10.50: **Local field spectroscopy of metallic dimers by TPL microscopy**, R. Quidant, D. ten Bloemendal, I. G. Cormack, S. Enoch, P. Loza, G. Badenes, Institut de Ciències Fotòniques (Spain) ... [6195-02]

11.10: **Second-order optical characterization of gold nanoparticle arrays**, B. K. Canfield, S. Kujala, K. Laiho, H. Husu, M. Kauranen, Tampereen Teknillinen Yliopisto (Finland); K. Jefimovs, Paul Scherrer Institut (Switzerland) and Joensuu Yliopisto (Finland); Y. Svirko, J. P. Turunen, Joensuu Yliopisto (Finland) ..... [6195-03]

11.30: **Probing of nanoparticles with third harmonic Rayleigh scattering**, V. I. Shcheslavskiy, Univ. of Southampton (United Kingdom); S. M. Saltiel, G. I. Petrov, Sofia Univ. (Bulgaria); V. V. Yakovlev, Univ. of Wisconsin/Milwaukee (USA) ..... [6195-04]

11.50: **Cubic and quadratic nonlinear magneto-optical Kerr effect in magnetic nanogranular films**, T. V. Murzina, J. M. Kim, O. A. Aktsipetrov, A. F. Kravets, M.V. Lomonosov Moscow State Univ. (Russia) . [6195-05]

Lunch Break ..... 12.10 to 13.10

Orangerie ..... Mon. 13.10 to 13.40

#### Keynote Presentation

Chair: **Alain Deureux**, Lab. d'Optique Submicronique (France)

13.10: **Nanotechnology at the European Patent Office: the photonics approach (Invited Paper)**, Y. Verbandt, M. Scheu, A. Trepp, European Patent Office (Netherlands); W. Förster, European Patent Office (Germany) ..... [6195-06]

### SESSION 2

Orangerie ..... Mon. 13.40 to 15.20

#### Optical Nanomanipulation

Chair: **Alain Deureux**, Lab. d'Optique Submicronique (France)

13.40: **Non-diffracting beam synthesis used for optical trapping and delivery of submicron objects**, T. Cizmar, Institute of Scientific Instruments (Czech Republic); V. Kollarova, Palacky Univ. (Czech Republic); M. Jiler, P. Jakl, Institute of Scientific Instruments (Czech Republic); Z. Bouchal, Palacky Univ. (Czech Republic); V. G. Garcés-Chávez, K. Dholakia, Univ. of St. Andrews (United Kingdom); P. Zemanek, Institute of Scientific Instruments (Czech Republic) ..... [6195-07]

14.00: **2D multiforce optical tweezers to investigate cell adhesion strengthening in living cells**, V. Emiliani, Institut Jacques Monod (France) and Univ. René Descartes (France); D. Sanvitto, Institut Jacques Monod (France) and The Univ. of Sheffield (United Kingdom); M. Coppey-Moisan, C. Durieux, Institut Jacques Monod (France) ..... [6195-08]

14.20: **Optical binding: comparison of experiments with theory**, V. Karasek, T. Cizmar, M. Siler, P. Zemanek, Institute of Scientific Instruments (Czech Republic); K. Metzger, K. Dholakia, Univ. of St. Andrews (United Kingdom); E. M. Wright, College of Optical Sciences/The Univ. of Arizona (USA) ..... [6195-09]

14.40: **Two-photon microfabrication and optical-tweezer manipulation of polymer microsensors**, P. L. Baldeck, C. Lin, Univ. Joseph Fourier (France) ..... [6195-10]

15.00: **Design of a trapping potential for detection of a single-atom by a microdisk resonator on a chip**, M. Rosenblit, Y. Japha, Ben-Gurion Univ. of the Negev (Israel); P. Horak, Univ. of Southampton (United Kingdom); R. Folman, Ben-Gurion Univ. of the Negev (Israel) . [6195-11]

Coffee Break ..... 15.20 to 15.40

### SESSION 3

Orangerie ..... Mon. 15.40 to 18.10

#### Nano-optics

Chair: **Jean-Michel Nunzi**, Univ. d'Angers (France)

15.40: **Advanced FEM analysis of nano-optical devices (Invited Paper)**, S. Burger, A. Schaedle, L. W. Zschiedrich, F. Schmidt, Zuse Institute Berlin (Germany) ..... [6195-12]

16.10: **Finite element analysis of tip-enhanced Raman scattering**, A. R. Downes, A. Elfick, Univ. of Edinburgh (United Kingdom) . . . [6195-13]

16.30: **Efficiency of emission in some basic waveguides**, G. Lecamp, J. Hugonin, P. Lalanne, Institut d'Optique (France) ..... [6195-14]

16.50: **Toward femtosecond laser lithography**, J. Koch, E. Fadeeva, A. Ostendorf, B. N. Chichkov, Laser Zentrum Hannover e.V. (Germany) ..... [6195-15]

17.10: **Engineering the spectral properties of metallic nanoparticles periodic arrangements**, J. Cesario, R. Quidant, Institut de Ciències Fotòniques (Spain); S. Enoch, Institut Fresnel (France); G. Badenes, Institut de Ciències Fotòniques (Spain) ..... [6195-16]

17.30: **Configurations of elongated gold nanostructures on silica as metamaterials: theory, optical properties, and technology**, F. Garwe, U. Huebner, J. Bergmann, Institut für Physikalische Hochtechnologie e.V. (Germany); R. Carsten, C. Etrich, F. Setzpfandt, Friedrich-Schiller-Univ. Jena (Germany); U. Bauerschaefer, GMBU e.V. (Germany); T. Pertsch, U. Peschel, Friedrich-Schiller-Univ. Jena (Germany) ..... [6195-17]

17.50: **Mesoscopic magnetism in metamaterials**, D. Felbacq, Univ. Montpellier II (France) ..... [6195-18]

#### ✓ Interactive Posters—Monday

An interactive poster session will be held on Monday 18.00 to 20.30. Posters will be on display after 10.00 Monday morning in the Conference Centre Galerie de Marbre (ground floor) and Forum Hall (1st floor). An interactive poster session and reception with authors present will be held Monday evening from 18.00 to 20.30. Light refreshments will be served.

✓ **Optical spectra and structure of CdP4 nanoclusters fabricated by incorporation into zeolite and laser ablation**, O. Yeshchenko, I. Dmitruk, M. Galak, S. Koryakov, National Taras Shevchenko Univ. of Kyiv (Ukraine) ..... [6195-55]

Tuesday 4 April

Orangerie ..... Tues. 10.20 to 10.50

## Keynote Presentation

Chair: **Karsten König**, Fraunhofer-Institut BMT (Germany)10.20: **Photoluminescence instrumentation for nanophotonics applications (Invited Paper)**, A. M. Gilmore, HORIBA Jobin Yvon (USA) ..... [6195-19]

## SESSION 4

Orangerie ..... Tues. 10.50 to 12.10

## Photoemission

Chair: **Karsten König**, Fraunhofer-Institut für Biomedizinische Technik (Germany)10.50: **Temperature-shifted photoluminescence in nanocrystals**, H. C. Gardner, D. E. Gallardo, C. Bertoni, S. C. Dunn, Cranfield Univ. (United Kingdom) ..... [6195-20]11.10: **Surface-enhanced fluorescence near small nanoparticles: a microscopic approach**, T. V. Shahbazyan, V. N. Pustovit, Jackson State Univ. (USA) ..... [6195-21]11.30: **Light reveals single-molecule fluctuations in a tunnel junction**, F. Charra, K. Perronet, G. Schull, CEA Saclay (France) ..... [6195-22]11.50: **Coherent detection of second harmonic generation in nonlinear optics**, D. Chauvat, École Normale Supérieure de Cachan (France) and Laboratoire d'Electronique Quantique - Physique des Lasers, UMR CNRS 6627 (France); L. Le Xuan, École Normale Supérieure de Cachan (France); F. Marquier, École Centrale Paris (France); S. Brasselet, F. Treussart, J. Roch, École Normale Supérieure de Cachan (France) ..... [6195-23]

Lunch Break ..... 12.10 to 13.10

## SESSION 5

Orangerie ..... Tues. 13.10 to 16.20

## Plasmonics

Chair: **Andreas Ostendorf**, Laser Zentrum Hannover e.V. (Germany)13.10: **Plasmonic heterostructures for addressable nanophotonics (Invited Paper)**, G. P. Wiederrecht, Argonne National Lab. (USA)[6195-24]13.40: **2D and 3D photonic and plasmonic structures fabricated by two-photon polymerization**, S. Passinger, C. Reinhardt, B. N. Chichkov, Laser Zentrum Hannover e.V. (Germany) ..... [6195-25]14.00: **Silver-doped nanocomposite glass as a base material for fine metallodielectric microstructuring**, A. Abdolvand, A. V. Podlipensky, Martin-Luther Univ. Halle-Wittenberg (Germany); S. Matthias, Max-Planck-Institut für Mikrostrukturphysik (Germany); F. Syrowatka, G. Seifert, H. Graener, Martin-Luther Univ. Halle-Wittenberg (Germany) ..... [6195-26]14.20: **Optical bistability observed in surface plasmonic crystals**, G. A. Wurtz, J. S. Elliott, R. Pollard, A. V. Zayats, Queen's Univ. Belfast (United Kingdom); L. Salomon, Univ. de Bourgogne (France) . [6195-27]14.40: **Fabrication and characterization of nanoparticle-based plasmonic nanostructures**, W. Fritzsche, A. Steinbrueck, Institut für Physikalische Hochtechnologie e.V. (Germany); T. Glaser, Jenoptik L.O.S. GmbH (Germany); S. Schroeter, A. Csaki, Institut für Physikalische Hochtechnologie e.V. (Germany) ..... [6195-28]15.00: **Plasmon modes in strongly coupled nanoparticles**, J. Aizpurua, I. Romero, F. J. Garcia de Abajo, Donostia International Physics Ctr. (Spain); G. W. Bryant, National Institute of Standards and Technology (USA) ..... [6195-29]

Coffee Break ..... 15.20 to 15.40

15.40: **Probing plasmon dynamics at nanometer resolution**, M. Bauer, C. Wiemann, J. Lange, D. Bayer, M. Rohmer, O. Gaier, M. Aeschlimann, Univ. Kaiserslautern (Germany) ..... [6195-30]16.00: **Design of apertureless tips with very high plasmon field enhancement**, I. Tsukerman, F. Cajko, A. Kisliuk, A. P. Sokolov, Univ. of Akron (USA) ..... [6195-31]

- ✓ **Simulation of light scattering for surfaces with statistically distributed subwavelength cavities**, D. Mader, Hochschule Bremen (Germany); A. Tausendfreund, Univ. Bremen (Germany); S. Simon, Hochschule Bremen (Germany); S. Patzelt, G. Goch, Univ. Bremen (Germany) ..... [6195-56]
- ✓ **Free-standing Si/SiO<sub>2</sub> superlattices: fabrication procedures and optical, structural, and light-emitting properties**, S. V. Novikov, L. Khriachtchev, M. Räsänen, Helsinki Univ. of Technology (Finland) ..... [6195-57]
- ✓ **Photoluminescence properties of terbium-doped mesoporous materials**, C. Tiseanu, National Institute for Lasers, Plasma and Radiation Physics (Romania) ..... [6195-58]
- ✓ **Wavefront engineering microscopy to study 3D mechanotransduction in living cells**, V. Emiliani, Institut Jacques Monod (France) and Institut Saint Peres (France); D. Cojoc, E. Ferrari, V. Garbin, Istituto Nazionale per la Fisica della Materia (Italy); C. Durieux, M. Coppey-Moisand, Institut Jacques Monod (France); E. Di Fabrizio, Istituto Nazionale per la Fisica della Materia (Italy) [6195-59]
- ✓ **Laser-assisted deformation and dissolution of silver nanoparticles in glass**, A. V. Podlipensky, A. Abdolvand, H. Graener, Martin-Luther Univ. Halle-Wittenberg (Germany) ..... [6195-60]
- ✓ **Designing plasmonic structures: Bi-metallic core-shell nanoparticles**, W. Fritzsche, A. Steinbrueck, A. Csaki, G. Festag, Institut für Physikalische Hochtechnologie e.V. (Germany) . [6195-61]
- ✓ **Light-controlled reversible modulation of CdTe nanocrystals photoluminescence**, Y. P. Rakovich, J. F. Donegan, The Univ. of Dublin, Trinity College (Ireland); A. Shavel, Univ. Hamburg (Germany); N. Gaponik, A. Eychmueller, Technische Univ. Dresden (Germany) ..... [6195-62]
- ✓ **Time-resolved reflectivity of low-temperature grown InAs/GaAs quantum dots**, D. Sreenivasan, J. E. Haverkort, H. Zhan, T. Eijkemans, R. Nötzel, Technische Univ. Eindhoven (Netherlands) ..... [6195-63]
- ✓ **Electron(hole)-lattice coupling in self-organized CdZnTe quantum dots**, M. Gallart, S. Cronenberger, O. Crégut, B. H. Hönerlage, P. Gilliot, Institut de Physique et Chimie des Matériaux de Strasbourg (France); K. Kheng, H. Mariette, Univ. Joseph Fourier (France)[6195-65]
- ✓ **Energy pooling in molecular assemblies: the characterization and differentiation of two-photon mechanisms**, D. S. Bradshaw, D. L. Andrews, Univ. of East Anglia Norwich (United Kingdom) .. [6195-66]
- ✓ **Optoelectronic switching device based on GaP**, T. A. Laperashvili, Georgian Academy of Sciences (Georgia) ..... [6195-67]
- ✓ **Simulation of light scattering from surfaces containing spherical and elliptical nanoparticles**, A. Tausendfreund, S. Patzelt, Univ. Bremen (Germany); D. Mader, S. Simon, Hochschule Bremen (Germany); G. Goch, Univ. Bremen (Germany) ..... [6195-68]
- ✓ **Surface modification of nanosized zinc oxide tetrapods by layer-by-layer deposition method and their optical properties**, W. K. Chan, C. W. Tse, A. B. Djuricic, Y. H. Leung, K. H. Tam, The Univ. of Hong Kong (Hong Kong China) ..... [6195-69]
- ✓ **Linear electronic and optical processes in Fullerene thin films**, N. Brant, Dublin Institute of Technology (Ireland) ..... [6195-70]
- ✓ **Magnetic photonic crystals with simple cubic lattice: group theoretical analysis**, V. Dmitriev, Univ. Federal do Para (Brazil) ..... [6195-71]
- ✓ **Self-consistent calculations of the energy and tunable emission spectra of doping superlattices**, V. K. Kononenko, B.I. Stepanov Institute of Physics (Belarus); D. V. Ushakov, I. S. Manak, Belarusian State Univ. (Belarus); A. F. Joulie, Univ. Montpellier II (France)[6195-72]
- ✓ **Study of Si/SiO<sub>2</sub> nanoparticles produced by laser ablation**, C. Grigoriu, I. Nicolae, National Institute for Lasers, Plasma and Radiation Physics (Romania); K. Muray, K. Suwa, M. Hirai, H. Suematsu, Nagaoka Univ. of Technology (Japan); G. Prodan, V. Ciupina, Univ. Ovidius Constanta (Romania) ..... [6195-73]
- ✓ **Recycling losses and tapered microcavities on SOI**, V. V. Philippe, D. Peyrade, CEA Grenoble (France); J. C. Rodier, Institut d'Optique (France); E. Hadji, CEA Grenoble (France); P. Lalanne, Institut d'Optique (France) ..... [6195-74]
- ✓ **Inconsistency of standard k·p band parameters**, M. Serre, G. Fishman, Univ. Paris-Sud II (France); H. M. Drouhin, École Polytechnique (France) ..... [6195-75]
- ✓ **Cross-polarization coupling of Laguerre-Gaussian beam modes at isotropic interfaces**, W. Nasalski, Y. Pagani, Institute of Fundamental Technological Research (Poland) ..... [6195-77]

**SESSION 6**

**Orangerie . . . . . Tues. 16.20 to 17.10**

**Nanomaterials**

*Chair: Aleksandra B. Djuricic*, The Univ. of Hong Kong (Hong Kong China)

16.20: **White-light and near-infrared electroluminescence of furnace or CO2 laser annealed Si-rich SiO2 with structural defects and Si nanocrystals (Invited Paper)**, G. Lin, National Chiao Tung Univ. (Taiwan) . . . . . [6195-32]

16.50: **Surface modifications of transparent fluorite and spinel oxides by heavy ion implantation**, G. Baldinozzi, École Centrale Paris (France) . . . . . [6195-33]

**Wednesday 5 April**

**SESSION 7**

**Orangerie . . . . . Wed. 08.00 to 10.10**

**Molecular Nanophotonics**

*Chair: Fabrice Charra*, CEA Saclay (France)

08.00: **Solid-liquid phase transition activated by optically driven molecular motors (Invited Paper)**, P. Karageorgiev, Ctr. of Advanced European Studies and Research (Germany) and Univ. Potsdam (Germany); B. Schulz, D. Neher, Univ. Potsdam (Germany); M. Giersig, Ctr. of Advanced European Studies and Research (Germany) . . . . [6195-36]

08.30: **Shedding incoherent light on walking and talking molecules**, J. Nunzi, S. Ahmadi, R. Barille, S. Dabos, Univ. d'Angers (France); E. Ortyl, S. Kucharski, Politechnika Wroclawska (Poland) . . . . . [6195-37]

08.50: **Near-field Raman spectroscopy using the tetrahedral SNOM tip**, S. Klein, U. C. Fischer, J. Reichert, H. Fuchs, Westfälische Wilhelms- Univ. Münster (Germany); M. Hietschold, Technische Univ. Chemnitz (Germany) . . . . . [6195-38]

09.10: **Electronic excitation energy transfer from dye-loaded zeolite L monolayers to a semiconductor**, H. Li, A. Devaux, A. Zabala Ruiz, G. A. Calzaferrri, Univ. Bern (Switzerland) . . . . . [6195-39]

09.30: **Fluorescence enhancement and energy transfer near a metal tip**, F. M. Huang, F. Festy, D. R. Richards, King's College London (United Kingdom) . . . . . [6195-40]

09.50: **Optical switching in nano-arrays: transistor action through directed energy transfer**, R. G. Crisp, D. L. Andrews, Univ. of East Anglia Norwich (United Kingdom) . . . . . [6195-41]

Coffee Break . . . . . 10.10 to 10.30

**SESSION 8**

**Orangerie . . . . . Wed. 10.30 to 12.40**

**Layers and Gratings**

*Chair: Manijeh Razeghi*, Northwestern Univ. (USA)

10.30: **Complex transmittance gratings based on subwavelength metallic structures (Invited Paper)**, G. Vincent, R. Haidar, ONERA (France); S. S. Collin, Lab. de Photonique et de Nanostructures (France); J. Primot, ONERA (France); J. Pelouard, F. Pardo, Lab. de Photonique et de Nanostructures (France) . . . . . [6195-42]

11.00: **Measuring the near-field of extraordinary transmission through a periodic hole array**, M. Docter, T. Young, Y. Garini, P. F. Alkemade, A. Bossche, O. Piciu, P. M. van den Berg, Technische Univ. Delft (Netherlands) . . . . . [6195-43]

11.20: **Enhancement transmission of light through metallic coaxial nanostructures: optical far-field and near-field results**, Y. Poujet, J. Salvi, F. I. Baida, D. Van Labeke, Univ. de Franche-Comté (France); A. Perentes, C. Santschi, P. Hoffmann, École Polytechnique Fédérale de Lausanne (Switzerland) . . . . . [6195-44]

11.40: **Photoinduced surface relief multigrating on thin azopolymer films**, R. Barille, S. Ahmadi Kandjani, S. Dabos-Seignon, J. Nunzi, Univ. d'Angers (France); E. Ortyl, S. Kucharski, Politechnika Wroclawska (Poland) . . . . . [6195-45]

12.00: **Nanoscale control of oxides by laser ablation: design and applications**, W. Prellier, ENSICAEN (France) . . . . . [6195-46]

12.20: **"W" diode, interband cascade, and quantum cascade lasers for the mid-IR**, J. R. Meyer, C. L. Canedy, C. Kim, W. W. Bewley, M. Kim, J. R. Lindle, I. Vurgaftman, Naval Research Lab. (USA); J. Nguyen, A. J. Evans, J. Yu, S. R. Darvish, S. Slivken, M. Razeghi, Northwestern Univ. (USA) . . . . . [6195-47]

Lunch Break . . . . . 12.40 to 13.40

**SESSION 9**

**Boston . . . . . Wed. 13.40 to 15.50**

**Nanodots and Nanowires**

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

13.40: **Quantum dots and nanowires for optoelectronic device applications (Invited Paper)**, H. H. Tan, K. Sears, S. Mokkaapati, S. Barik, G. Jolley, Q. Gao, L. Fu, J. Wong-Leung, M. Buda, Y. Kim, C. Jagadish, The Australian National Univ. (Australia) . . . . . [6195-48]

14.10: **Novel nanoscale electro-optical materials for photonic applications**, P. Repetto, N. Li Pira, M. Paderi, R. Monferino, V. Lambertini, S. Bernard, Ctr. Ricerche Fiat (Italy) . . . . . [6195-49]

14.30: **Extraordinary optical properties of ZnO nanowires caused by cavity confined exciton-polaritons**, S. Ruhle, Univ. Utrecht (Netherlands); L. K. van Vugt, Univ. Utrecht (USA); R. Prasanth, Univ. Utrecht (Netherlands); K. Kuipers, FOM Institute for Atomic and Molecular Physics (Netherlands); H. C. Gerritsen, D. A. Vanmaekelbergh, Univ. Utrecht (Netherlands) . . . . . [6195-50]

14.50: **Self-assembled Ni nanodot on SiO2 film: a novel reactive ion etching mask for Si nanopillar formation on Si substrate**, H. Lin, C. Kao, C. Lin, G. Lin, H. Kuo, S. Wang, National Chiao Tung Univ. (Taiwan) . . . . . [6195-51]

15.10: **Nanostructured II-VI semiconductors for light-emitting devices**, D. E. Gallardo, C. Bertoni, S. C. Dunn, Cranfield Univ. (United Kingdom) . . . . . [6195-52]

15.30: **Metallic nanowires and their polymer composites: optical spectroscopy toward nonlinear optical device design**, W. Dickson, P. R. Evans, G. A. Wurtz, R. Pollard, A. V. Zayats, Queen's Univ. Belfast (United Kingdom) . . . . . [6195-53]

# Photonics in Multimedia

*Conference Chairs:* **Ari Tervonen**, Nokia Research Ctr. (Finland); **Malgorzata Kujawinska**, Warsaw Univ. of Technology (Poland); **Wilbert IJzerman**, Philips Research Labs. (Netherlands); **Herbert De Smet**, Ghent Univ. (Belgium)

*Program Committee:* **Janne K. Aikio**, VTT Elektronikka (Finland); **Jan T. Bosiers**, DALSA Corp. (Netherlands); **Jacques W. Duparré**, Fraunhofer-Institut für Angewandte Optik und Feinmechanik (Germany); **Martin Schrader**, Nokia Research Ctr. (Finland)



**Conference 6196 contains papers funded by and/or related to current EU research projects contained in Framework VI.**  
Paper Numbers: 7, 14, 26, 27.

## Wednesday 5 April

**Opening Remarks** ..... **Wed. 13.30 to 13.40**

**Malgorzata Kujawinska**, Warsaw Univ. of Technology (Poland)

### SESSION 1

**Gutenberg** ..... **Wed. 13.40 to 15.30**

#### LED Projectors

*Chair:* **Janne K. Aikio**, VTT Elektronikka (Finland)

13.40: **Meeting of the challenges of developing LED-based projection displays (Invited Paper)**, B. A. Moffat, E. Geissler, T. Hennig, A. Leitl, M. Schulz, M. Strehle, A. Troelsch, Carl Zeiss Jena GmbH (Germany) ..... [6196-01]

14.10: **LED-based mini-projectors**, M. P. Krijn, B. A. Salters, Philips Research Labs. (Netherlands) ..... [6196-02]

14.30: **Design of axisymmetrical tailored concentrators for LED light source applications**, B. Van Giel, Y. Meuret, H. Thienpont, Vrije Univ. Brussel (Belgium) ..... [6196-03]

14.50: **Design of new collection systems for multi LED light engines**, H. Murat, Univ. Gent (Belgium); D. Cuyppers, IMEC (Belgium); H. De Smet, IMEC (Belgium) and Univ. Gent (Belgium) ..... [6196-04]

15.10: **Efficient illumination in LED-based projection systems using lenslet integrators**, Y. Meuret, B. Van Giel, F. Christiaens, H. Thienpont, Vrije Univ. Brussel (Belgium) ..... [6196-05]

## Thursday 6 April

### SESSION 2

**Gutenberg** ..... **Thurs. 10.30 to 12.10**

#### Miniature Cameras: Image Forming

*Chair:* **Martin Schrader**, Nokia Research Ctr. (Finland)

10.30: **Imagers for digital still photography (Invited Paper)**, J. T. Bosiers, B. G. M. Dillen, C. Draijer, E. Manoury, L. Meessen, I. Peters, DALSA Professional Imaging (Netherlands) ..... [6196-06]

11.00: **Novel optics/micro-optics for miniature imaging systems (Invited Paper)**, J. W. Duparré, Fraunhofer-Institut für Angewandte Optik und Feinmechanik (Germany); R. Völkel, SUSS MicroOptics SA (Switzerland) ..... [6196-07]

11.30: **Featuring in CCD imagers**, J. T. Bosiers, I. Peters, C. Draijer, DALSA Professional Imaging (Netherlands) ..... [6196-08]

11.50: **New camera module with thin structure, high resolution, and capability of distance detection**, M. Nagashima, M. Suzuki, T. Korenaga, K. Imada, T. Iijima, S. Tamaki, I. Oyama, T. Hirasawa, M. Tagome, T. Suenaga, S. Nishiwaki, T. Ishikawa, A. Takai, Matsushita Electric Industrial Co., Ltd (Japan) ..... [6196-09]

Lunch Break ..... 12.10 to 13.20

### SESSION 3

**Gutenberg** ..... **Thurs. 13.20 to 15.00**

#### Miniature Camera Technologies

*Chair:* **Jan T. Bosiers**, DALSA Professional Imaging (Netherlands)

13.20: **Cameras in mobile phones (Invited Paper)**, J. Viinikanoja, Nokia Research Ctr. (Finland) ..... [6196-10]

13.50: **Single snap-shot double-field optical zoom and axially super-resolved imaging system (Invited Paper)**, Z. Zalevsky, A. Zlotnik, A. Shemer, Bar-Ilan Univ. (Israel) ..... [6196-11]

14.20: **Optical design of digital camera zoom lenses using plastic lens elements**, H. Sato, S. Yamaguchi, Konica Minolta Opto, Inc. (Japan) ..... [6196-12]

14.40: **Image sensor characterisation using SMIA standard**, R. Nicol, STMicroelectronics (United Kingdom) ..... [6196-13]

Coffee Break ..... 15.00 to 15.20

### SESSION 4

**Gutenberg** ..... **Thurs. 15.20 to 17.50**

#### Micro-optics and Displays

*Chair:* **Jacques W. Duparré**, Fraunhofer-Institut für Angewandte Optik und Feinmechanik (Germany)

15.20: **Replicated micro-optics for multimedia products (Invited Paper)**, M. Rossi, Heptagon Oy (Switzerland) ..... [6196-14]

15.50: **Microstructured optical components for display applications (Invited Paper)**, H. Bitzer, J. Zosel, M. Gebhardt, M. Stier, Fresnel Optics GmbH (Germany) ..... [6196-15]

16.20: **2D/3D switchable displays (Invited Paper)**, O. Willemsen, Philips Research Labs. (Netherlands) ..... [6196-16]

16.50: **Residual lens effects in 2D mode of 2D/3D switchable displays**, M. Sluijter, W. L. IJzerman, D. K. de Boer, T. Dekker, Philips Research Labs. (Netherlands) ..... [6196-17]

17.10: **3D visualization of true variable in time objects based on data from optical measurement system**, P. Garbat, M. Kujawinska, Politechnika Warszawska (Poland) ..... [6196-18]

17.30: **Distributed system of wireless signs using gyrycon electronic paper displays**, R. A. Sprague, Gyrycon LLC (USA) ..... [6196-19]

### ✓ Interactive Posters—Thursday

*An interactive poster session will be held on Thursday 18.00 to 20.00.*

*Posters will be on display after 10.00 Thursday morning in the Conference Centre Galerie de Marbre (ground floor) and Forum Hall (1st floor). An interactive poster session and reception with authors present will be held Thursday evening from 18.00 to 20.00. Light refreshments will be served.*

✓ **Integrated measurement system for miniature camera modules**, A. Tervonen, I. Nivala, P. R. Ryytty, H. Saari, H. J. Ojanen, J. Viinikanoja, Nokia Research Ctr. (Finland) ..... [6196-20]

✓ **Design of a light-guide used for the real-time monitoring of LCD displays**, W. Meulebroeck, C. Ruwisch, Y. Meuret, Vrije Univ. Brussel (Belgium); T. R. L. Kimpe, P. R. Vandenberghe, Barco N.V. (Belgium); H. Thienpont, Vrije Univ. Brussel (Belgium) ..... [6196-21]

✓ **Design of a novel LED lens cap and optimization of LED placement in a large-area direct backlight for LCD-TVs**, P. C. Chao, L. Liao, C. Chiu, Chung Yuan Christian Univ. (Taiwan) ..... [6196-23]

✓ **Feasibility of optical wireless communication link using high-brightness illumination LEDs**, C. Lee, Korea Photonics Technology Institute (South Korea); C. S. Park, Gwangju Institute of Science and Technology (South Korea); J. Kim, D. Kim, Korea Photonics Technology Institute (South Korea) ..... [6196-24]

✓ **Microoptics for homogeneous LED illumination**, P. Schreiber, S. V. Kudaev, Fraunhofer-Institut für Angewandte Optik und Feinmechanik (Germany) ..... [6196-25]

✓ **Virtual reality data visualisation on and via mobile phones**, M. Feisst, Fachhochschule Offenburg (Germany); T. Blandet, Univ. Louis Pasteur (France); A. Christ, Fachhochschule Offenburg (Germany); J. Fontaine, Univ. Louis Pasteur (France) ..... [6196-26]

✓ **Diffractive grating structures for colour-separating backlights**, D. K. de Boer, H. J. Cornelissen, R. Caputo, Philips Research Labs. (Netherlands) ..... [6196-27]



# Photonics for Solar Energy Systems

Conference Chair: **Andreas Gombert**, Fraunhofer-Institut für Solare Energiesysteme (Germany)

Program Committee: **Christoph J. Brabec**, Konarka Technologies GmbH (Germany); **Gion Calzaferri**, Univ. of Berne (Switzerland); **Claes-Göran Granqvist, Sr.**, Uppsala Univ. (Sweden); **Olle Inganäs**, Linköpings Univ. (Sweden); **Zbigniew T. Kuznicki**, Ctr. National de la Recherche Scientifique (France); **Yunosuke Makita**, Japan Science & Technology Corp. (Japan); **Martin P. Pfeiffer**, Technische Univ. Dresden (Germany); **Geoffrey B. Smith**, Univ. of Technology/Sydney (Australia); **Ralf B. Wehrspohn**, Univ. Paderborn (Germany); **Hiiro Yugami**, Tohoku Univ. (Japan)



**Conference 6197 contains papers funded by and/or related to current EU research projects contained in Framework VI.**

*Paper Numbers:* 5, 7, 10, 11, 12, 18, 20, 38, 40.

## Wednesday 5 April

Opening Remarks ..... Wed. 08.00 to 08.10

### SESSION 1

Munch ..... Wed. 08.10 to 10.10

#### Optical Elements in PV Cells

Chair: **Ralf B. Wehrspohn**, Univ. Paderborn (Germany)

08.10: **Light trapping in thin-film silicon solar cells by nanotextured interfaces**, H. Stiebig, M. Schulte, C. Zahren, C. S. Haase, B. Rech, Forschungszentrum Jülich (Germany); P. Lechner, RWE Schott Solar GmbH (Germany) ..... [6197-01]

08.30: **Potential of optical design in tandem micromorph silicon solar cells**, J. Krc, A. Campa, F. Smole, M. Topic, Univ. v Ljubljana (Slovenia) ..... [6197-02]

08.50: **Silicon nitride for solar cells**, M. Kunst, Hahn-Meitner-Institut Berlin (Germany) ..... [6197-03]

09.10: **Dispersive elements for spectrum splitting in solar cell applications**, A. Bielawny, P. T. Miclea, A. von Rhein, R. B. Wehrspohn, Univ. Paderborn (Germany); S. van Riesen, S. Glunz, Fraunhofer-Institut für Solare Energiesysteme (Germany) ..... [6197-04]

09.30: **Fundamental optical simulations of light trapping in microcrystalline silicon thin-film solar cells**, C. S. Haase, H. Stiebig, Forschungszentrum Jülich (Germany) ..... [6197-05]

09.50: **Characterization of UV laser ablation for microprocessing of a-Si:H thin films**, C. L. Molpeceres Alvarez, S. Lauzurica, J. L. Ocaña, Univ. Politécnica de Madrid (Spain); J. J. Gandía, L. Urbina, J. Cárabe, CIEMAT (Spain); F. Villar, J. Escarré, J. Bertomeu, J. Andreu, Univ. de Barcelona (Spain) ..... [6197-06]

Coffee Break ..... 10.10 to 10.40

### SESSION 2

Munch ..... Wed. 10.40 to 12.20

#### Nano-structured PV Cells

Chair: **Gion A. Calzaferri**, Univ. Bern (Switzerland)

10.40: **Observation of efficient multiexciton generation by single solar photons in semiconductor nanocrystals: progress toward generation III photovoltaics**, R. D. Schaller, V. I. Klimov, Los Alamos National Lab. (USA) ..... [6197-07]

11.00: **Light-harvesting host-guest antenna materials for photonic devices**, G. A. Calzaferri, Univ. Bern (Switzerland) ..... [6197-08]

11.20: **Photon harvesting using directed energy transfer between nanostructures**, R. Koeppel, A. Fuchsbaumer, S. Lu, N. S. Sariciftci, Johannes Kepler Univ. Linz (Austria) ..... [6197-09]

11.40: **Nonlinear collection efficiency of Si solar cells containing nanoscale Si-layered systems**, Z. T. Kuznicki, P. P. Meyrueis, Univ. Louis Pasteur (France); G. Sarraayrouse, LAAS-CNRS (France) ... [6197-10]

12.00: **Supramolecularly organized dyes in monolayers of zolite L for solar-energy devices**, A. Zabala Ruiz, H. Li, G. A. Calzaferri, Univ. Bern (Switzerland) ..... [6197-11]

Lunch Break ..... 12.20 to 13.40

## SESSION 3

Munch ..... Wed. 13.40 to 15.40

### Organic Solar Cells

Chair: **Martin P. Pfeiffer**, Technische Univ. Dresden (Germany)

13.40: **Light confinement in thin-film organic photovoltaic cells**, K. Tvingstedt, O. Inganäs, Linköpings Univ. (Sweden); M. Tormen, L. Businaro, Lab. Nazionale TASC/INFM (Italy) ..... [6197-12]

14.00: **Optical near-field phenomena in planar and structured organic solar cells**, M. Niggemann, Fraunhofer-Institut für Solare Energiesysteme (Germany); M. J. Glatthaar, Albert-Ludwigs-Univ. Freiburg (Germany); M. K. Riede, T. Ziegler, Fraunhofer-Institut für Solare Energiesysteme (Germany); B. Zimmermann, Albert-Ludwigs-Univ. Freiburg (Germany); A. Gombert, Fraunhofer-Institut für Solare Energiesysteme (Germany) ..... [6197-13]

14.20: **Size effects on the performance of rubrene/C60 heterojunction solar cells**, A. K. Pandey, J. Nunzi, Univ. d'Angers (France) ..... [6197-14]

14.40: **Organic tandem solar cells: from evaporation to solution processing**, H. Prall, R. Koeppel, R. Autengruber, G. Dennler, N. S. Sariciftci, Johannes Kepler Univ. Linz (Austria) ..... [6197-15]

15.00: **Organic solar cells with inverted layer sequence incorporating optical spacers: simulation and experiment**, B. Zimmermann, Albert-Ludwigs-Univ. Freiburg (Germany) and Fraunhofer-Institut für Solare Energiesysteme (Germany); M. J. Glatthaar, Albert-Ludwigs-Univ. Freiburg (Germany); M. Niggemann, Fraunhofer-Institut für Solare Energiesysteme (Germany) and Albert-Ludwigs-Univ. Freiburg (Germany); M. K. Riede, T. Ziegler, A. Gombert, Fraunhofer-Institut für Solare Energiesysteme (Germany) ..... [6197-16]

15.20: **Datamining and analysis of the key parameters in organic solar cells**, M. K. Riede, A. W. Liehr, M. J. Glatthaar, Albert-Ludwigs-Univ. Freiburg (Germany); M. Niggemann, T. Ziegler, Fraunhofer-Institut für Solare Energiesysteme (Germany); B. Zimmermann, Albert-Ludwigs-Univ. Freiburg (Germany); A. Gombert, G. Willeke, Fraunhofer-Institut für Solare Energiesysteme (Germany) ..... [6197-17]

### Session of Related Interest

**Conference 6192: Organic Optoelectronics and Photonics II**

**Session 3, Photovoltaic Devices and Physics**

**Monday, 3 April ..... 15.35 to 17.30**

## Thursday 6 April

## SESSION 4

Munch ..... Thurs. 10.30 to 12.10

## Solar Concentration

Chair: **Andreas Gombert**, Fraunhofer-Institut für Solare Energiesysteme (Germany)

- 10.30: **Industrialization of 1000X concentration photovoltaic modules**, J. L. Alvarez Rico, V. Diaz, C. Mateos, N. Montoya, J. Alonso, Isofoton (Spain); G. Sala, I. Anton, C. Dominguez, Univ. Politécnica de Madrid (Spain) ..... [6197-18]
- 10.50: **Modeling the operating conditions of solar concentrator systems**, G. Gregory, R. J. Koshel, Lambda Research Corp. (USA) ..... [6197-19]
- 11.10: **The luminescent concentrator illuminated**, L. H. Slooff, R. Kinderman, T. Burgers, J. van Roosmalen, Energy Research Ctr. of the Netherlands (Netherlands); A. Büchtemann, R. Danz, Fraunhofer-Institut für Angewandte Polymerforschung (Germany); A. Chatten, D. Farell, Energy Research Ctr. of the Netherlands (Netherlands); K. Barnham, Imperial College London (United Kingdom); M. Schleusener, Fraunhofer-Institut für Angewandte Polymerforschung (Germany) ..... [6197-20]
- 11.30: **Collection and conversion properties of photovoltaic fluorescent collectors with photonic band stop filters**, G. C. Glaeser, U. Rau, Univ. Stuttgart (Germany) ..... [6197-21]
- 11.50: **Review of the technology for the manufacturing of HOEs in DCG with predetermined spectral characteristics for solar applications**, C. G. Stojanoff, Holotec GmbH (Germany) and RWTH Aachen (Germany) ..... [6197-22]
- Lunch Break ..... 12.10 to 13.40

## SESSION 5

Munch ..... Thurs. 13.40 to 15.20

## Beta-iron Disilicide and Dye-sensitized Solar Cells

Chair: **Yunosuke Makita**, National Institute of Advanced Industrial Science and Technology (Japan)

- 13.40: **Characterization of  $\beta$ -FeSi<sub>2</sub> films as a novel solar cell semiconductor**, Y. Fukuzawa, Kankyo Semiconductors Co., Ltd. (Japan); T. Ootsuka, Tateyama Kagaku Ind. Co., Ltd. (Japan); N. Otagawa, Kankyo Semiconductors Co., Ltd. (Japan); Y. Abe, Tateyama Kagaku Ind. Co., Ltd. (Japan); Y. Nakayama, Kankyo Semiconductors Co., Ltd. (Japan); Y. Makita, Tateyama Kagaku Ind. Co., Ltd. (Japan) ..... [6197-23]
- 14.00:  **$\beta$ -FeSi<sub>2</sub> as a Kankyo (environmentally friendly) semiconductor for solar cells in the space application**, Y. Makita, Tateyama Kagaku Ind. Co., Ltd. (Japan) and Kankyo Semiconductors Co., Ltd. (Japan); T. Ootsuka, Tateyama Kagaku Ind. Co., Ltd. (Japan); Y. Fukuzawa, N. Otagawa, Kankyo Semiconductors Co., Ltd. (Japan); H. Abe, Tateyama Kagaku Ind. Co., Ltd. (Japan); Y. Nakayama, Kankyo Semiconductors Co., Ltd. (Japan) ..... [6197-24]
- 14.20: **Application of correction algorithms for obtaining high-resolution LBIC maps of dye-sensitized solar cells**, J. Martín, C. Fernández-Lorenzo, R. Alcántara, J. A. Poce, Univ. de Cádiz (Spain); J. A. Anta, Univ. Pablo de Olavide (Spain); F. Casanueva, Univ. Pablo de Olavide (Spain); G. Oskam, Ctr. de Investigación y de Estudios Avanzados (Mexico) ..... [6197-25]
- 14.40: **Origin of enhanced light harvesting in colloidal-crystal-based dye-sensitized solar cells**, H. R. Miguez, A. Mihi, F. J. Lopez Alcaraz, Instituto de Ciencia de Materiales de Sevilla (Spain) ..... [6197-26]
- 15.00: **Scanning electrochemical microscopy approach to study dye-sensitized nanostructured solar cells**, B. M. Bozic, E. Figgemeier, Univ. Basel (Switzerland) ..... [6197-27]
- Coffee Break ..... 15.20 to 15.50

## SESSION 6

Munch ..... Thurs. 15.50 to 17.30

## Optical Components for Lighting and Solar Thermal Applications

Chair: **Geoffrey B. Smith**, Univ. of Technology/Sydney (Australia)

- 15.50: **Design and evaluation of novel hybrid solar lighting systems**, J. D. Muhs, Oak Ridge National Lab. (USA) ..... [6197-28]
- 16.10: **Tuning plasma frequency for improved solar control glazing**, G. B. Smith, A. I. Maarroof, A. R. Gentile, M. B. Cortie, Univ. of Technology/Sydney (Australia) ..... [6197-29]

16.30: **Reasons for specific kinetics of switchable mirrors based on magnesium nickel films**, J. Ell, Freiburger Zentrum für Datenanalyse und Modellbild (Germany) ..... [6197-30]

16.50: **Development of solar selective absorbers and sky radiators based on two-dimensional diffractive grating surfaces**, M. Hasumi, H. Yugami, Tohoku Univ. (Japan) ..... [6197-31]

17.10: **Influence of temperature-dependent refractive index on thermal radiation from surface gratings**, H. Yugami, T. Kamikawa, Tohoku Univ. (Japan) ..... [6197-32]

## ✓ Interactive Posters—Thursday

An interactive poster session will be held on Thursday 18.00 to 20.00. Posters will be on display after 10.00 Thursday morning in the Conference Centre Galerie de Marbre (ground floor) and Forum Hall (1st floor). An interactive poster session and reception with authors present will be held Thursday evening from 18.00 to 20.00. Light refreshments will be served.

- ✓ **Energy transfer from dye-loaded zeolite L antenna crystals to silicon**, S. Huber, A. Zabala Ruiz, G. A. Calzaferri, Univ. Bern (Switzerland) ..... [6197-33]
- ✓ **Design of ZnO:Al-films with optimized surface texture for thin-film solar cells**, M. Berginski, B. Rech, J. Hüpkens, H. Stiebig, Forschungszentrum Jülich (Germany); M. Wuttig, RWTH Aachen (Germany) ..... [6197-34]
- ✓ **Rigorous validation of the lateral Goos-Hänchen shift in microstructured sun shading systems**, G. Walze, P. Nitz, A. Gombert, B. Benedikt, Fraunhofer-Institut für Solare Energiesysteme (Germany) ..... [6197-35]
- ✓ **Application of diamond-like carbon/porous silicon double-layer constructions as antireflection coatings for silicon solar cells**, K. Martirosyan, V. M. Aroutiounian, Yerevan State Univ. (Armenia); P. Soukiassian, Commissariat à l'Energie Atomique (France) ..... [6197-36]
- ✓ **Functionalized surfaces for energy conversion studied by electrochemical and scanning probe techniques**, E. Figgemeier, B. M. Bozic, Univ. Basel (Switzerland) ..... [6197-37]
- ✓ **Flexible encapsulation for organic solar cells**, G. Dennler, C. Lungenschmied, H. Neugebauer, N. S. Sariciftci, Johannes Kepler Univ. Linz (Austria); G. Czeremuzskin, M. Latreche, NOVA-PLASMA Inc. (Canada); M. R. Wertheimer, École Polytechnique de Montréal (Canada) ..... [6197-38]
- ✓ **Polymerisation of thiophene with {Ru(terpy)<sub>2</sub>}<sup>2+</sup> dyes**, W. H. Kylberg, E. Figgemeier, E. C. Constable, C. Housecroft, Univ. Basel (Switzerland) ..... [6197-39]
- ✓ **Investigation of hybrid solar cells with incorporated nanoparticles**, S. Günes, S. Hofer, H. Neugebauer, N. S. Sariciftci, Johannes Kepler Univ. Linz (Austria) ..... [6197-40]
- ✓ **Superficial photoluminescence and photovoltaic conversion of nanoscale Si-layered systems at 400-nm wavelength**, Z. T. Kuznicki, Univ. Louis Pasteur (France) ..... [6197-41]
- ✓ **Solar light induced opacity of MIND cells**, Z. T. Kuznicki, Univ. Louis Pasteur (France) ..... [6197-42]
- ✓ **Laser applications in crystalline silicon solar cell production**, A. Grohe, R. Preu, S. W. Glunz, G. Willeke, Fraunhofer-Institut für Solare Energiesysteme (Germany) ..... [6197-43]
- ✓ **Growth of beta-iron disilicide ( $\beta$ -FeSi<sub>2</sub>) on flexible metal sheet substrates for solar-cell application**, Y. Nakayama, Kankyo Semiconductors Co., Ltd. (Japan); Z. Liu, National Institute of Advanced Industrial Science and Technology (Japan); M. Osamura, Kankyo Semiconductors Co., Ltd. (Japan); T. Ootsuka, Tateyama Kagaku Ind. Co., Ltd. (Japan); Y. Fukuzawa, N. Otagawa, Kankyo Semiconductors Co., Ltd. (Japan); Y. Abe, Tateyama Kagaku Ind. Co., Ltd. (Japan); Y. Makita, Kankyo Semiconductors Co., Ltd. (Japan) and Tateyama Kagaku Ind. Co., Ltd. (Japan) ..... [6197-44]
- ✓ **Surface modifications of transparent Fluorite and Spinel oxides by heavy ion implantation**, G. Baldinozzi, École Centrale Paris (France) and CEA Saclay (France); D. Simeone, D. Gosset, M. Dollé, CEA Saclay (France) and Ecole Centrale Paris (France) ..... [6197-45]
- ✓ **Improvement of radiation resistance of multimode silica-core holey fibers**, A. F. Kosolapov, S. L. Semjonov, A. L. Tomashuk, General Physics Institute (Russia) ..... [6197-49]

# Photonics in the Automobile

*Conference Chairs:* **Patrick P. Meyrueis**, Univ. Louis Pasteur (France); **Thomas P. Pearsall**, European Photonics Industry Consortium (France)

*Program Committee:* **M. Eckerle**, Siemens AG (Germany); **Thomas Graf**, Univ. Stuttgart (Germany); **Wolfgang Knapp**, Cooperation Laser Franco Allemande (France); **Markus Kreuzer**, DaimlerChrysler AG (Germany); **J. F. Lonchamp**, Robert Bosch GmbH (Germany); **F. Quentel**, D-Light Co. (USA); **L. Tupinier**, Delphi Corp. (USA); **D. Wallaschek**, L. Labs (USA)



**Conference 6198 contains papers funded by and/or related to current EU research projects contained in Framework VI.**

*Paper Numbers:* 6, 7.

## Thursday 6 April

### SESSION 1

**Leicester** ..... **Thurs. 10.30 to 12.10**

#### Photonic Methods and Systems for Car Manufacture

*Chair:* **M. Eckerle**, Siemens AG (Germany)

10.30: **Surface inspection system for carriage parts**, B. Denkena, W. Acker, Univ. Hannover (Germany) ..... [6198-01]

10.50: **REFLET scatterometer for 3D scattered light measurements to improve design and simulations in the automotive industry**, A. Le Lay, Light Tec (France) ..... [6198-02]

11.10: **New concept of fast hybrid contact and no-contact measurement for automotive industry (Invited Paper)**, R. Sitnik, Politechnika Warszawska (Poland); J. Sladek, M. Kupiec, Politechnika Krakowska (Poland); M. Kujawinska, P. Blaszczyk, Politechnika Warszawska (Poland) ..... [6198-03]

11.40: **A technology roadmap for photonics in the automobile (Invited Paper)**, S. Berlitz, Audi AG (Germany); J. Charret, Valeo (France); K. Eichhorn, Hella KGaA Hueck & Co. (Germany); T. P. Pearsall, European Photonics Industry Consortium (France); J. Reill, OSRAM Opto Semiconductors GmbH (Germany); P. Repetto, Ctr. Ricerche Fiat (Italy); L. Tupinier, Delphi Corp. (USA) ..... [6198-04]

Lunch Break ..... 12.10 to 13.20

### SESSION 2

**Leicester** ..... **Thurs. 13.20 to 16.40**

#### Photonic Sensors and Photonic Data Transfer in the Car

*Chair:* **Thomas P. Pearsall**, European Photonics Industry Consortium (France)

13.20: **Low-cost sensor for online detection of harmful diesel combustion gases in UV-VIS region**, M. Degner, H. Ewald, Univ. Rostock (Germany); G. Bramann, S. I. Lochmann, Hochschule Wismar (Germany) ..... [6198-05]

13.40: **UV-based pollutant quantification in automotive exhausts**, E. P. Hawe, G. Dooly, C. Fitzpatrick, E. Lewis, Univ. of Limerick (Ireland) ..... [6198-06]

14.00: **Monitoring of harmful gaseous emissions from land transport vehicles using a mid-infrared optical fibre sensor**, J. F. Mulrooney, J. Clifford, C. Fitzpatrick, E. Lewis, Univ. of Limerick (Ireland) ... [6198-07]

14.20: **Fulfilling the Pedestrian Protection Directive using a long-wavelength infrared camera designed to meet the performance and cost targets (Invited Paper)**, J. O. Källhammer, H. Pettersson, D. Eriksson, Autoliv Development AB (Sweden); S. Junique, S. Savage, V. Christian, J. Y. Andersson, Acreo AB (Sweden); F. Niklaus, G. Stemme, Kungliga Tekniska Högskolan (Sweden) ..... [6198-08]

14.40: **Thermal management in pyrometer modules for automotive applications**, M. Liess, M. Hausner, H. Ernst, H. Karagozoglu, J. Schilz, PerkinElmer Optoelectronics GmbH (Germany) ..... [6198-09]

15.00: **Optimized heat transfer and homogeneous color converting for ultrahigh-brightness LED package**, R. C. Jordan, J. Bauer, H. Oppermann, Fraunhofer-Institut für Zuverlässigkeit und Mikrointegration (Germany) ..... [6198-10]

Coffee Break ..... 15.20 to 15.40

15.40: **Sources and levels of crosstalk in a bi-directional plastic optical fibre data transmission link**, G. Farrell, C. Gao, Dublin Institute of Technology (Ireland) ..... [6198-11]

16.00: **Absolute low-cost diffractive angular encoder for steer by wire in automotive**, P. P. Meyrueis, M. Ndao, B. Kress, Univ. Louis Pasteur (France); L. Tupinier, O. Marroux, Société Delphi Recherche France (France) ..... [6198-12]

16.20: **Multimode gyroscopes using the Sagnac effect: applications for automobile.**, C. Riedinger, S. S. Lecler, Photonic Systems Lab. (France) ..... [6198-13]

### SESSION 3

**Leicester** ..... **Thurs. 16.40 to 18.10**

#### Innovative Lighting Inside and Outside the Car

*Chair:* **Francois Quentel**, D-Lightsys (France)

16.40: **Night vision: requirements and possible roadmap of FIR and NIR systems**, J. O. Kallhammer, Autoliv Development AB (Sweden) ..... [6198-14]

17.00: **New technologies for night vision**, K. D. Klinger, S. Schellinger, D. Koo, K. Manz, U. Lemmer, Univ. Karlsruhe (Germany) ..... [6198-15]

17.20: **On the relative efficiency of projection systems with triaxial ellipsoidal reflectors (Invited Paper)**, G. Kloos, Hella KGaA Hueck & Co. (Germany) ..... [6198-16]

17.50: **LED encapsulation: a new approach of rear light design**, S. Preuss, K. Lischka, T. Preuss, D. Potthoff, Univ. Paderborn (Germany) ..... [6198-17]

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✓ **One step marking process with fiber laser and diffractive optical elements**, E. Clauss, Lab. des Systèmes Photoniques (France); M. Flury, Lab. Traitement du Signal et Instrumentation (France); J. Fontaine, Lab. des Systèmes Photoniques (France); E. Fogarassy, IREPA LASER (France) ..... [6198-18]

✓ **Advantages of ambient interior lighting for drivers contrast vision**, S. Schellinger, D. Franzke, U. Lemmer, Univ. Karlsruhe (Germany) ..... [6198-19]

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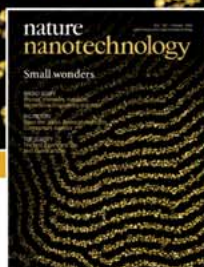
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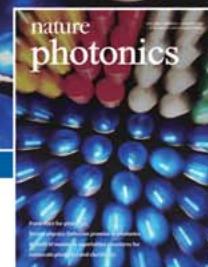
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