

SPIE

Optical Systems Design

Co-located with Optical Complex Systems 2011

5-8 September 2011

Technical Programme

Connecting minds for global solutions

Conference dates

5-8 September 2011

Exhibition dates

6-7 September 2011

World Trade Centre/Hotel Mercure

Marseille, France

www.spie.org/osd



SPIE

Optical Systems Design

Conferences: 5–8 September 2011

Exhibition: 6–7 September 2011

World Trade Centre | Hotel Mècure

Marseille, France

Sponsored by



Co-Organiser



POLE OPTIQUE & PHOTONIQUE

Cooperating Organisation

SCHOTT
glass made of ideas

Welcome!

On behalf of SPIE, welcome to Marseille and to SPIE Optical Systems Design 2011. This week, you will hear the latest research on the design and manufacturing in optical technologies, ranging from imaging to defence to space to laser fusion. This symposium gives you numerous opportunities to develop your career by networking with engineers, researchers, and developers from Europe and beyond, both in the conference rooms and on the exhibition floor. We hope you enjoy your time here at SPIE Optical Systems Design 2011, the premier European optical design and instrumentation symposium, and we look forward to seeing you this week.

Symposium Chair



Michel Lequime, Institut FRESNEL and Ecole Centrale, Marseille (France)

Symposium Co-Chairs



David M. Williamson, West Malvern (United Kingdom); NRCA Fellow, Nikon Research Corporation of America (USA)



Andreas Tünnermann, Fraunhofer-Institut für Angewandte Optik und Feinmechanik (Germany)



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In addition to providing membership services, SPIE Europe Ltd. organises and manages internationally recognised conferences, education programmes, and technical exhibitions featuring emerging technologies in optics and photonics.

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2SA. **Tel:** +44 29 2089 4747.
Fax: +44 29 2089 4750. info@spieeurope.org

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SPIE would like to express its deepest appreciation to the symposium chairs, conference chairs, programme committees, session chairs, and authors who have so generously given their time and advice to make this symposium possible.

The symposium, like our other conferences and activities, would not be possible without the dedicated contribution of our participants and members. This programme is based on commitments received up to the time of publication and is subject to change without notice.

SPIE 
Optical Systems
Design

www.spie.org/osd

Daily Schedule

| MONDAY | TUESDAY | WEDNESDAY | THURSDAY |
|---|--|---------------------|----------|
| Conferences | | | |
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| 8168 Advances in Optical Thin Films IV (Lequime, Macleod, Ristau) p. 14 | | | |
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| Exhibition Hours | | | |
| | 10.00 to 17.00 | 10.00 to 16.00 | |
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| | SYNOPSIS Reception p. 3 | | |



www.spie.org/osd

Technical Committee

Gérard Berginc, Thales (France)
 Stuart David, Optical Research Associates (United States)
 Angela Duparré, Fraunhofer-Institut für Angewandte Optik und Feinmechanik (Germany)
 Andreas Erdmann, Fraunhofer-Institut für Integrierte System und Bauelementetechnologie (Germany)
 Roland Geyl, Sagem SA (France)

Tina E. Kidger, Kidger Optics Associates (United Kingdom)
 Michel Lequime, Institut Fresnel (France)
 H. Angus Macleod, Thin Film Center, Inc. (United States)
 Laurent Mazuray, EADS Astrium (France)
 Jeffrey M. Raynor, STMicroelectronics (R&D) Ltd. (United Kingdom)

Detlev Ristau, Laser Zentrum Hannover e.V. (Germany)
 Daniel G. Smith, Nikon Research Corp. of America (United States)
 Jean-Luc M. Tissot, ULIS (France)
 Andreas Tünnermann, Fraunhofer-Institut für Angewandte Optik und Feinmechanik (Germany)

Rolf Wartmann, Carl Zeiss MicroImaging GmbH (Germany)
 Andrew P. Wood, Qioptiq Ltd. (United Kingdom)
 David M. Williamson, West Malvern (United Kingdom); NRCA Fellow, Nikon Research Corporation of America (United States)
 Frank Wyrowski, Friedrich-Schiller-Univ. Jena (Germany)



Welcome Reception

Location: Le Marseillois

Monday 5 September 18.00 to 20.00
 Vieux-Port de Marseille, Quai du Port (Face à l'Hôtel de Ville), 13002
 MARSEILLE, Tél. : 04 91 90 72 52

The "Marseillois" is a sailing barque in the port of Marseille, anchored opposite the Town Hall. To get there, refer to map on the right. All Attendees are invited to relax, socialize, and enjoy light refreshments. Please remember to wear your conference registration badges. Dress is casual.

SCHOTT User Workshop

Location: Room Asie

Tuesday 6 September 09.00 to 17.00

SCHOTT Workshop will offer in-depth information and the latest news about optical materials and components. Attendance is free to all registered symposium participants. Please sign up at the registration desk to attend.



Exhibition

Location: Room Friou/Riou/Planier (Hotel Mercure)

Tuesday 6 September 10.00 to 17.00
 Wednesday 7 September 10.00 to 16.00

PopSud B2B Networking Sessions

*Location: Room Raimu/Pagnol
 (Hotel Mercure, opposite the Exhibition)*

PopSud invites interested companies to participate in Business-to-Business networking sessions:

Tuesday 6 September 10.00 to 17.00
 Wednesday 7 September 10.00 to 16.00

PopSud/Optitec are organizing B2B meetings within the Optical Systems Design Event. The objective of this initiative is to allow international exchanges to develop both technological and economic partnership in the area of optics and photonics. The meetings will be made on the basis of a preliminary selection. The duration of a meeting is fixed to approximately 30 minutes.

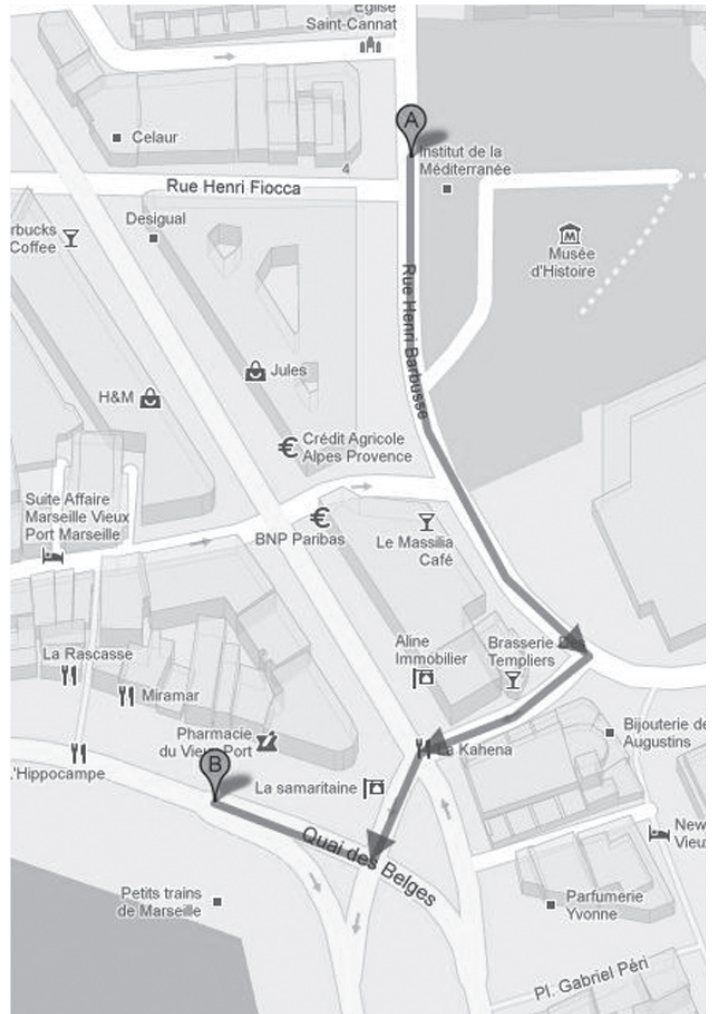


SYNOPSIS Reception

Location: Novotel Marseille Vieux port, on the terrace

Tuesday 6 September 19.00 to 23.00

Marvelous view on the "Vieux Port". <http://www.accorhotels.com/fr/hotel-0911-novotel-marseille-vieux-port/index.shtml>. It is 15 min walking from the Conference location. For further information, please contact the SYNOPSIS stand in the Exhibition.

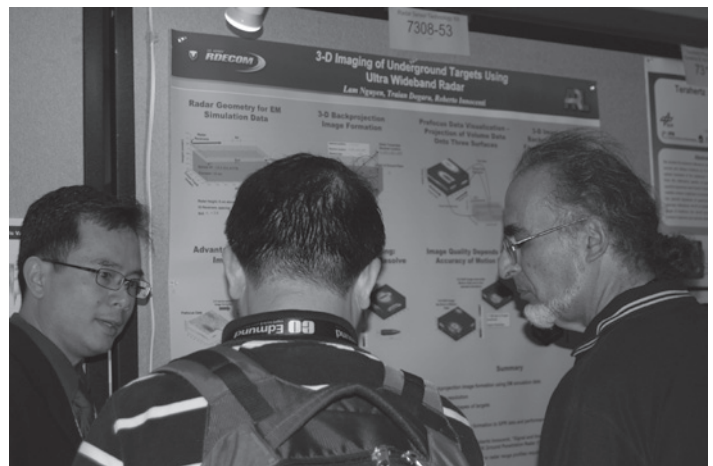


Poster Session

Location: Registration Foyer (World Trade Centre)

Wednesday 7 September 17.30 to 19.00

All registered symposium attendees are invited to attend the Wednesday poster session provided as an opportunity to enjoy networking and refreshments while reviewing poster papers. The interactive poster sessions are designed to promote opportunities for networking with colleagues in your field. Attendees are encouraged to review the high quality papers that are presented in this alternate format and to interact with the poster authors. Posters will be on display after 10.00 Wednesday morning in the Conference Area Hallway. An interactive poster session and reception with authors present will be held on Wednesday 17.30 to 19.00. Light refreshments will be served.



Plenary Session

Monday 5 September

8.45 to 12.10 | Room: Europe 57

8.45 to 9.00

Welcome and Introduction



David M. Williamson, West Malvern (United Kingdom);
NRCA Fellow, Nikon Research Corporation of America
(USA)

9.00 to 9.10

Local Welcome



Eugène Caselli, President, Communauté Urbaine
Marseille Provence Métropole, France

9.10 to 9.50

Optical Tools for Biophotonic Applications



Hervé Rigneault, Research Director, CNRS; Head of the
Mosaic Group, Institut Fresnel, France

Unravelling bio-molecular interactions that take place into living systems such as cells and tissues is becoming the major goal of current biology. Optical tools present key advantages as being able to investigate living samples in physiological conditions. In this talk, we will present the

basic and more advanced contrast mechanisms that reveal molecule in cells and tissues together with their associated optical tools. Although fluorescence and phase imaging can be implemented in a relative simple way, nonlinear interaction can image specific molecular bonds such as in coherent Raman (CARS/SRS) but requires more complex ultra-fast optical sources. We will review in a comprehensive way these topics with emphasis on their practical and instrumental implementation.

Biography: After getting his optical engineer diploma from the “Ecole Nationale Supérieure de Physique de Marseille” in 1991, *Hervé Rigneault* joined the “Centre Nationale de la Recherche Scientifique - CNRS” in 1994 working in the field of optical thin films and microcavities.

Since 2006 he is a CNRS Research Director and leads the Mosaic group at the Fresnel Institute - Marseille - France (www.fresnel.fr/mosaic), working in the field of Bio-Photonics. His research interests are in Bio-Imaging, NanoBio Photonics, Nonlinear Optics and ultra-fast laser interaction with bio-samples. He is the author of 100 publications in peer review journals, 4 book chapters and the editor of a book in Nanophotonics (ISTE 2006).

Coffee Break 9.50 to 10.20

10.20 to 11.05

Atmospheric Coherent Pulsed Doppler 1.5µm Wind Lidar: Optimization of System Design to Reach a Variety of Measurement Performances and Address Different Needs



Rémy Parmentier, Head of the Development Department, LEOSPHERE, France

Atmospheric coherent pulsed Doppler 1.5µm wind Lidar: optimization of system design to reach a variety of measurement performances and address different needs Leosphere has developed a range of turnkey Atmospheric Pulsed Doppler 1.5µm Lidar which measure the

3D wind profile up to a few hundred meters to several kilometers above ground level.

Starting from common physics and MOPA (Master Oscillator Power Amplifier) optoelectronic architecture, some key parameters are tuned to reach a variety of specifications and allow us to address different applications and markets.

The presentation will describe how we have focused our efforts on the development of specific components and how we have designed our products to come to turnkey products that are operating under harsh conditions in the field.

Biography: **Remy Parmentier** owns a PhD in Physics; he is currently Products development Manager at Leosphere, Paris, France. He has previously lead the development of the Windcube 7, a coherent pulsed Doppler Lidar dedicated to wind profiling for the wind energy market. Before that, he worked in the field of fiber optic sensors and optical fiber communication systems.

11.05 to 11.50

Freeform Surfaces: Hype or Handy Design Tool?



Wilhelm Ulrich, Senior Director: Optical Design, Carl Zeiss AG Corporate Research and Technology, Germany

Are freeform surfaces mere hype, just a niche area of technology or even a total waste of time?

Freeform surfaces open up new degrees of freedom to the optical designer, adding more options to his tool kit.

In actual fact, optical designers have been well aware of the benefits of freeform surfaces for many decades now, to which early commercial products like the Polaroid SX-70 folding single lens reflex camera or widely-used freeform progressive eyeglass lenses clearly testify. These days freeform components are well established in many different kinds of illumination systems, but there are also beneficial applications for imaging optics, e.g. correction of oblique aberrations in (unobscured) off-axis (mirror) systems, folding optical systems into extremely compact and low-weight three-dimensional packages and integrating several different features on one single surface to minimize the number of elements for certain reasons.

Freeform surfaces are more difficult and expensive to manufacture than rotationally symmetric surfaces. In addition, increasing system complexity increases the risk of failure at all points of the product generation process. For this reason, lens designers have to ensure the unconditional need for using such surfaces to solve the given problem. The “keep it simple” approach must always be the lens designer’s first priority strategy. Fortunately, recent advances in optical manufacturing have significantly increased the ability to fabricate such optics with high surface quality at reasonable cost. Further progress in manufacturing, metrology as well as effective and efficient adjustment strategies can be expected within the next few years.

To gain the full benefit of this freeform technology, optical designers need an appropriate mathematical description of freeform surfaces and much faster optimization algorithms with better convergence??, and they also need plausible analysis tools. The departure from symmetry for optical surfaces is making the paraxial design approach and Seidel or Zernike analysis of optical systems invalid or unsuitable - on the other hand, good starting systems are essential to obtain best-suited and tolerance-insensitive design solutions, a basis for cost-effective products. Therefore, we must consider new paradigms for optical design such as developing an analytical aberration theory to describe not only the new kinds of aberrations, but also the effect of each system component on these aberrations, therefore indicating to the optical designer what to do and what not to do.

Last but not least, stable data handling and data exchange between all interfaces within the whole product generation process is an important prerequisite. Working on all these topics continuously will make freeform surfaces a handy design tool for selective design tasks.

Biography: **Wilhelm Ulrich** received his engineering degree from the University for Applied Science in Hamburg. In 1980 he joined the mathematical department for optical design at Carl Zeiss and has worked on various advanced optical design projects for several business units. Between 1997 and 2009 he was head of optical design for leading-edge microlithography systems at Carl Zeiss SMT AG. During this period, lens designers of Carl Zeiss SMT developed highly innovative design concepts for projection lenses, ensuring the outstanding success of the SIA microlithography roadmap. Since July 2009 he has been in charge of optical design at Corporate Research and Technology at Carl Zeiss AG with locations in Oberkochen and Jena. His team provides advanced concepts and design solutions for different application and customer requirements. Wilhelm Ulrich has given several presentations at international optics and design conferences, is the author of miscellaneous papers and book chapters about optical system design using modern technologies and holds a lot of patents, mainly for lithography applications. As a member of SPIE, OSA and DGaO he is regularly engaged in different program and organization committees.

11.50 to 12.05

Kidger Scholarship Award

The 2011 awardee of the Michael Kidger Memorial Scholarship is Kyle Fuerschbach, currently a 3rd year PhD student at the Institute of Optics, The University of Rochester under the tutelage of Professor Jannick Roland, Brian J. Thompson Professor of Optical Engineering. Kyle’s planned thesis topic is: “A New Class of Optical Design Forms based on Non-Symmetric and Freeform Surfaces.” Kyle has a B.S. in Optical Engineering from the University of Arizona with a 4.0 GPA where he also completed a minor in mathematics.



The Kidger Scholarship Award will be presented by **Tina E Kidger**

The Michael Kidger Memorial Scholarship was established in 1998 to honour Michael John Kidger, a well-respected educator, design software developer and member of the optical science and engineering community. The 2011 award is anticipated to consist of a study grant of \$5,000.



PopSud B2B Networking Sessions

Room: Raimu/Pagnol

Tuesday 6 September 10.00 to 17.00
 Wednesday 7 September 10.00 to 16.00

PopSud/Optitec are organizing B2B meetings within the Optical Systems Design Event. The objective of this initiative is to allow international exchanges to develop both technological and economic partnership in the area of optics and photonics. The meetings will be made on the basis of a preliminary selection. The duration of a meeting is fixed to approximately 30 minutes.

This event required preregistration by 26 July.

Afternoon Company Visits

Thursday 8 September

Pole Optique & Photonique, POPSud, the co-organizer of Optical Complex Systems 2011 Conference, invites you to take part in visiting the regional optics/photonics companies and labs. These visits will allow you to interact with major optics/photonics players of Region of Provence-Alpes-Côte d'Azur. Companies and laboratories will show you their know-how, the last lines of R&D, and the latest products on the market in the fields of optics and photonics.

See page 25 for schedule and sign-up information.

SCHOTT User Workshop

Room: Asie

Tuesday 6 September 09.00 to 17.00

See page 3 for sign-up information.

9.00: **SCHOTT Advanced Optics and its Production Sites**

SCHOTT General Presentation

9.20 to 10.20: **Optical Glass**

Definition, glass types program, eco-classical-, low Tg and high transmittance glass types
 New glass type development trends, new glass types
 Strategic relevance, future availability, positive list
 Production process: melting and annealing

Coffee Break: 10.20 to 10.40

10.40 to 11.20: **Optical Glass**

Properties (refractive index, dispersion, homogeneity, inclusions, striae, ...) tolerances
 Measurement methods: interferometry, spectrometry, ...
 Standardization - status and outlook

11.20 to 12.00: **Optical Glass Types**

Special optical glass types
 Radiation resistant, low fluorescent, IR transmitting, for digital projection
 Optical Material Components: overview of SCHOTT products
 Data and information on Internet website

Lunch/Exhibition Break: 12.00 to 13.30

13.30 to 14.15: **Zerodur**

Properties CTE, CTE homogeneity
 Cryogenic properties
 Production process: melting, ceramization and shaping

14.15 to 15.00: **Zerodur**

Application examples and recent developments
 Lightweight structures, strength, CTE tailoring

Coffee Break: 15.00 to 15.20

15.20 to 16.00: **Optical Colored Glass Filters**

Program, characteristics, applications
 Filter calculation program

Break: 16.00 to 16.15

16.15 to 17.00: **Optical Coated Glass Filters**

Program, characteristics, applications
 Comparison between colored glass and coated filters

17.00: **Closing Remarks**

SCHOTT
 glass made of ideas



Exhibition dates

6–7 September 2011

World Trade Centre/Hotel Mercure
Marseille, France

Exhibitor Index

| Company Name | Booth # |
|--|---------|
| Alphanov | #13 |
| CILAS | #24 |
| HORIBA Jobin Yvon S.A.S..... | #15 |
| Laser 2000 SAS..... | #1 |
| LightTrans GmbH | #11 |
| Ohara GmbH | #21 |
| optics.org | #20 |
| OptiLayer Ltd. | #9 |
| Optima Research Ltd..... | #19 |
| Optiwave | #7 |
| Poggissoftware | #3 |
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| SHAKTIWARE | #5 |
| SILIOS | #27 |
| STIL (Sciences et Techniques Industrielles de la Lumière) | #26 |
| Symétrie | #23 |
| Synopsys, Inc..... | #22 |

SPIE Optical Systems Design

See the latest in:

- Optical design and engineering
- Advances in optical thin films
- Detectors and associated signal processing
- Optical fabrication, testing, and metrology
- Illumination optics
- Physical optics
- Optical complex systems
- And more



Exhibitor Listing

ALPhANOV #13

351 Cours de la Libération, Optical And Laser Technological Ctr
Talence Cedex France
www.alphanov.com/uk/index.php

ALPhANOV is the technology center of the competitiveness cluster "Route des Lasers" based in the Bordeaux region. With the help of the Aquitaine Regional Authority and in collaboration with the CEA CESTA, the CNRS and Bordeaux universities, Alphanov contributes technically to innovative projects to create new activities and jobs. With around 750m² of lab space, Alphanov employs more than 24 engineers and doctors specialized in optics and lasers. With more than 1000 contracts realized to date, and contribution to tens of national and European collaborative projects, Alphanov is now a reference for R&D transfer in optics and lasers.

CILAS #24

ave de la Roche Fourcade
ZI St Mitre, Aubagne, France
www.cilas.com

For more than 40 years, CILAS makes a success of high technologies, thanks to its expertise in Lasers and Optronics CILAS develops and manufactures a wide range of Optronics and Opto mechanical products and systems for Defense, Space, Astronomy, Scientific equipment and Industry markets.

HORIBA Jobin Yvon S.A.S. #15

16-18 rue du Canal, Longjumeau Cedex, 91165 France
+33 1 64 54 13 00; fax +33 1 69 09 07 21
info@jobinyvon.fr; www.jobinyvon.fr

Laser 2000 SAS #1

3 rue de la Plaine, Parc d'Affaires, Saint Nom la Breteche, 78860 France
33 1 30 80 00 60; fax 33 1 30 30 00 40
info@laser2000.fr; www.laser2000.fr/

Exhibitor Listing

LightTrans GmbH

#11

Wildenbruchstr 15, Jena, Germany
www.lighttrans.com

Featured Product: LightTrans VirtualLab 5 - the new generation of our optical modeling and design software

The field tracer provides suitable modeling and design techniques based on unified optical modeling. New: the Lighting Toolbox for the design and simulation of non-paraxial optical systems, e.g. setups using LED's or other highly divergent partially coherent sources. Also: several optimization strategies, as parametric methods and the iterative Fourier transform algorithm, supporting the design of optical systems and components incl. aspherical lenses, beam shapers, diffusers, gratings.

Ohara GmbH

#21

Nordring 30 A, Optisches Glas, Hofheim, 65719 Germany
+49 61 9296 5050
info@ohara-gmbh.com; www.ohara-gmbh.com

optics.org

#20

Ffordd Pengam, 2 Alexandra Gate, Cardiff, CF24 2SA
United Kingdom
44 29 2089 4747; fax 44 29 2089 4750
sales@optics.org; www.optics.org

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

OptiLayer Ltd.

#9

Stroitelei St 5-1-56, Moscow, 119311 Russian Federation
+7 499 1319035; fax +7 495 9382136
trub@srcc.msu.su; www.optilayer.com

Optima Research Ltd.

#19

Stoney Common Rd, 8 Riverside Business Park,
Stansted, CM24 8PL United Kingdom
+44 1279 810911; fax +44 1279 810912
info@optima-research.com; www.optima-research.com

**Featured Product: ZEMAX - Optical System Design Software
OpticsFile - Project management for ZEMAX**

Optima Research is the European supplier of the ZEMAX optical design software. ZEMAX is a comprehensive optical design software which helps you design classical optical systems, illumination systems, fiber coupling systems and physical optics. ZEMAX is powerful, fast, flexible and easy to use.

Optima Research also provides comprehensive technical support and training in the use of ZEMAX. We offer both public courses in the UK and specially tailored private training courses. Contact: Leo Chen, Optical Engineer, info@optima-research.com;

Optiwave

#7

Hyères - France
+33 494 08 27 97
audrey.lelay@optiwave.com; www.optiwave.com

Optiwave develops a suite of comprehensive engineering software design tools which benefits photonic, bio-photonic, and optical telecommunication system design engineers with a comprehensive and powerful design environment.

Poggissoftware

#3

Marseille, France
Poggissoftware develop Film Scatter software for solving complex optical modeling problems like specular reflection, transmission and absorption. Bidirectional reflection density function and total integrated Scattering from surface roughness or volume inhomogeneity.
Film scatter software is managed by Dr Dominique Endelega.

POPSUD

#25

Pôle Optique et Photonique sud, 38 rue Frédéric Joliot Curie
c/o OAMP Technopôle de Chateau-Gombert, Marseille Cedex 13 France
www.popsud.org

POPsud/OPTITEC is the optics/photonics cluster of the South of France, working to coordinate and promote the optics/photonics sector in the South of France. The POPSud association is today a community with 180 members, focused on industrial development, research and higher education in optics, photonics and image processing in the Provence-Alpes-Côte d'Azur region and more broadly throughout the south of France.

Sciences et Techniques Industrielles de la Lumière

#26

595 rue Pierre Berthier, Domaine de Saint Hilaire, Aix en Provence Cedex 3 France

Since January 1993, STIL (Sciences et Techniques Industrielles de la Lumière) proposes its skills and its know-how in high-performance optical instrumentation.

Inventor of chromatic confocal imaging and world leader in the domain of chromatic confocal distance sensors, STIL has designed two families of point sensors (CHR and CCS) and a family of line-sensor (MPLS) based on this innovative concept.

Shaktiware

#5

27 Boulevard Charles Moretti, 13014 Marseille, France
+33 (0)4 91 10 19 30, Fax: +33 (0)4 91 10 19 34

SHAKTIWARE has been created in 2000 and was originally specialised in the fields of adaptative optics and of real time calculator.

In close collaboration with the research world, SHAKTIWARE has contributed to obtain exceptionally high quality astronomical images. This performance has been reached using land telescopes with compensation of the atmospherical perturbations (adaptative optics). Since these collaborations SHAKTIWARE has been in close link with research in the field of image processing.

SHAKTIWARE designs and sells systems combining optics, electronics and computing to provide flow management tools for site operations with vehicles (cars, trucks, motorbike, train, container, ...).

Silios Technologies

#27

rue Gaston Imbert prolongée, ZI Peynier-Rousset, Peynier, France
www.silios.com/

Featured Product: Color Shades compact spectrometer for visible range; Micro-optics for astronomy and lasers;

SILIOS Technologies is an SME specialized in design and manufacturing of micro-optics, miniaturized spectrometers and colorimeters, diffractive optics and optical instrumentation. SILIOS core business is micro-optical components and systems for astronomy and lasers as well as instrumentation for the chemical, medical, agro-food, microelectronics and water industries. To this aim SILIOS owns a 600 m² clean room and electronic lab for production of prototypes to small and medium size series.

Symétrie

#23

10 Allee Charles Babbage, Nimes, 30000 France
+334 66 29 4388; fax +334 66 29 5447
info@symetrie.fr; www.symetrie.fr

Featured Product: SYMETRIE is specialised in hexapods, which are 6-axis precision positioning systems.

SYMETRIE designs and manufactures high accuracy positioning and measurement opto-mechanical systems. The kinematics of hexapods enable an extremely precise motion with the best guarantees of resolution and stiffness. SYMETRIE has a 10-year experience in providing complete ready-to-use systems with an ergonomic control software.

SYMETRIE's realizations can be adapted to industrials, laboratories and R&D departments of the following fields: optics, spatial, defense, universities and synchrotrons. Contact: Olivier Lapierre, CEO, info@symetrie.fr; Anne Duget, Marketing & Sales Manager, anne.duget@symetrie.fr.

Synopsys, Inc.

#22

SPIE Corporate Member 1

3280 E Foothill Blvd Ste 300, Pasadena, CA, 91107
United States
+1 626 795 9101; fax +1 626 795 9102
info@opticalres.com; www.opticalres.com

Featured Product: LightTools 7.2 delivers leading-edge illumination analysis

Synopsys' Optical Solutions Group, formerly Optical Research Associates, will exhibit CODE™, LightTools™, and engineering services. CODE V supports optimization, analysis, and tolerancing of image-forming optical systems and free-space photonic devices.

LightTools supports design, analysis, optimization and photorealistic renderings of illumination systems. Contact: Yan Cornil, Sales, sales@lighttec.fr; Rainer Födisch, Sales, info@oec.net. Contact: Yan Cornil, Sales, sales@lighttec.fr; Rainer Födisch, Sales, info@oec.net.

Product Categories

Astronomy

Optima Research Ltd.
Symétrie

Basic Research, Science

Optima Research Ltd.

Consulting Services

Synopsys, Inc.

Detectors, Sensors

LightTrans GmbH
Symétrie

Education and Training

LightTrans GmbH
Optima Research Ltd.

Lasers and Systems

LightTrans GmbH

LED, OLED, non-laser Light Sources

LightTrans GmbH
Synopsys, Inc.

Lighting and Illumination

LightTrans GmbH
Optima Research Ltd.

Materials, Abrasives, Chemicals

Symétrie

Nanotechnology products

LightTrans GmbH

Optical Design and Engineering

LightTrans GmbH
Optima Research Ltd.
Synopsys, Inc.

Optics Manufacturing

LightTrans GmbH

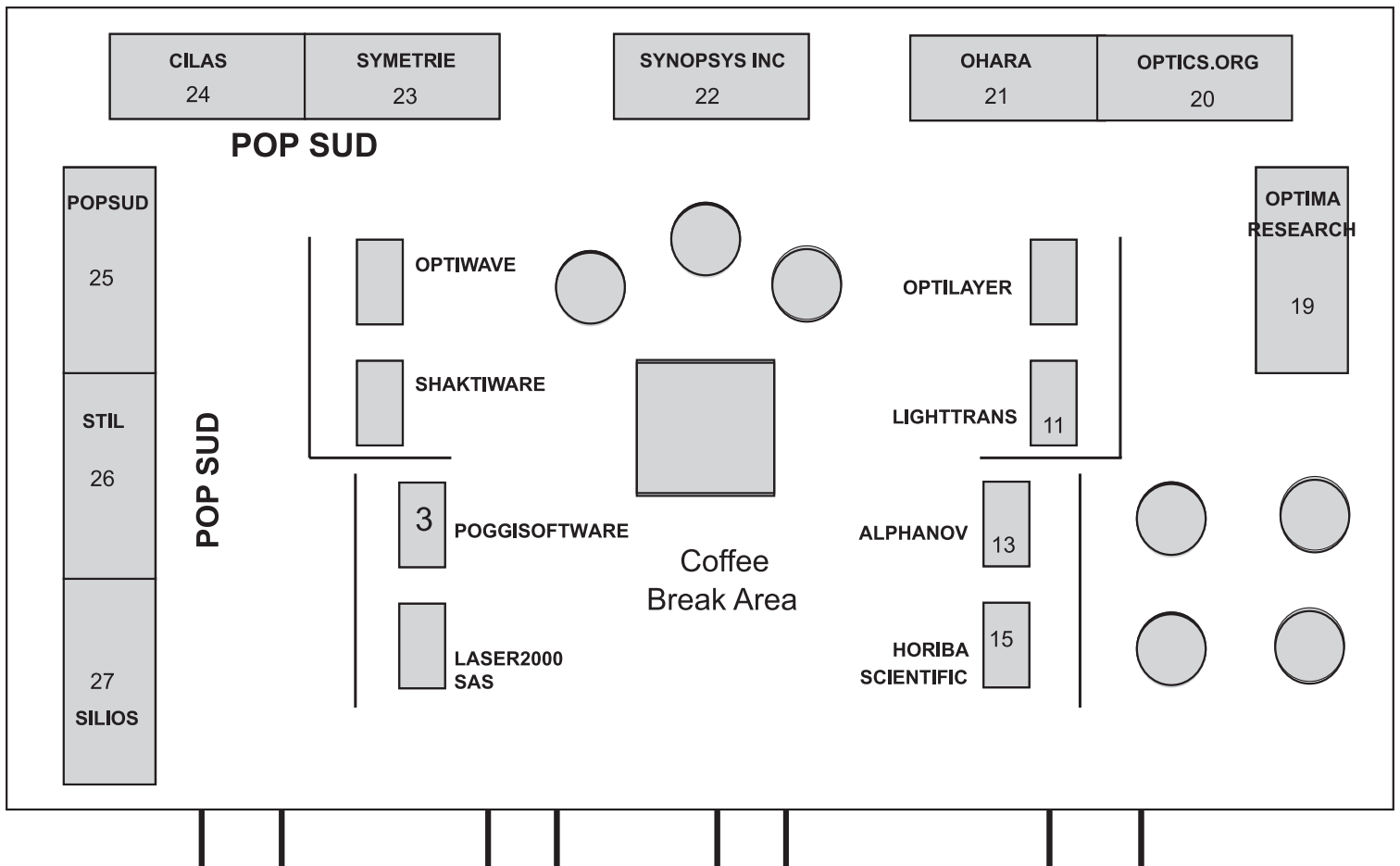
Software

LightTrans GmbH
Optima Research Ltd.
Synopsys, Inc.

Test and Measurement, Metrology

Symétrie

SPIE – Optical System Design Exhibition Frioul/Riou/Planier 1st Floor, Hotel Mercure, Marseille 6-7 September 2011



Optical Design and Engineering IV

Conference Chairs: **Laurent Mazuray**, EADS Astrium (France); **Rolf Wartmann**, Carl Zeiss Microlmaging GmbH (Germany); **Andrew Wood**, Qioptiq Ltd. (United Kingdom)

Programme Committee: **Francoise M. Cau**, Sagem Defense Securite (France); **Andres F. Cifuentes**, SECPhO (Spain); **Andrew J. Court**, TNO (Netherlands); **Mike A. Cutter**, Surrey Satellite Technology Ltd. (United Kingdom); **Michael R. Duparré**, Friedrich-Schiller-Univ. Jena (Germany); **Edgar Fischer**, RUAG Space AG (Switzerland); **Ullrich Krüger**, JENOPTIK Optical Systems GmbH (Germany); **Demetrio Labate**, SELEX Galileo S.p.A. (Italy); **Patrick Maine**, Quantel USA (United States); **Kevin F. Middleton**, Rutherford Appleton Lab. (United Kingdom); **Takao Nakagawa**, Japan Aerospace Exploration Agency (Japan); **Iain A. Neil**, ScotOptix (Switzerland); **Krzysztof A.R.B. Pietraszewski**, IC Optical Systems Ltd. (United Kingdom); **Jérôme Primot**, ONERA (France); **Jannick P. Rolland**, Univ. of Rochester (United States); **Joël Rollin**, Thales Angénieux S.A. (France); **Simon Thibault**, Univ. Laval (Canada); **Kevin P. Thompson**, Optical Research Associates (United States); **Wilhelm Ulrich**, Carl Zeiss AG (Germany); **Min Wang**, Institut National d'Optique (Canada); **Richard N. Youngworth**, Light Capture, Inc. (United States); **Maria Josefa Yzuel**, Univ. Autònoma de Barcelona (Spain)

Tuesday 6 September

Opening Remarks

Room: Europe 93 **Tues. 08.30 to 08.40**
Laurent Mazuray, EADS Astrium (France); **Rolf Wartmann**, Carl Zeiss Microlmaging GmbH (Germany); **Andrew Wood**, Qioptiq Ltd. (United Kingdom)

SESSION 1

Room: Europe 93 **Tues. 08.40 to 10.10**
Design Theory and Techniques I

Session Chair: **Rolf Wartmann**, Carl Zeiss Microlmaging GmbH (Germany)

08.40: **Optical glass: dispersion in the near infrared** (*Invited Paper*), Peter Hartmann, SCHOTT AG (Germany) [8167A-01]

09.10: **Method to allocate freeform surfaces in axially asymmetric optical systems**, Akira Yabe, Consultant (Germany) [8167A-02]

09.30: **Design rules for simple imaging systems**, Florence de la Barrière, Guillaume Druart, Nicolas Guéroux, ONERA (France); Jean Taboury, Institut d'Optique Graduate School (France) [8167A-03]

09.50: **An opto-mechanical model of the accommodating and aging human eye**, Katharina Frey, Martin Palme, Thomas Peschel, Stefan Riehemann, Gunther Notni, Fraunhofer-Institut für Angewandte Optik und Feinmechanik (Germany) [8167A-04]

Coffee Break 10.10 to 10.40

SESSION 2

Room: Europe 93 **Tues. 10.40 to 12.20**
Design Theory and Techniques II

Session Chair: **Rolf Wartmann**, Carl Zeiss Microlmaging GmbH (Germany)

10.40: **Discussing the importance of pupil coordinate from the view point of the sine-condition in the presence of spherical aberration**, Masato Shibuya, Tokyo Polytechnic Univ. (Japan) [8167A-05]

11.00: **Freeform lens for an efficient wall washer**, Rolf Wester, Fraunhofer-Institut für Lasertechnik (Germany); Axel Bäuerle, RWTH Aachen (Germany) and Fraunhofer-Institut für Lasertechnik (Germany); Adrien Bruneton, RWTH Aachen (Germany); Jochen Stollenwerk, Peter Loosen, RWTH Aachen (Germany) and Fraunhofer-Institut für Lasertechnik (Germany) [8167A-06]

11.20: **Design and simulation of diffractive optical components in fast optical imaging systems**, Alois M. Herkommer, Rene M. Reichle, Christof Pruss, Matthias Häfner, Univ. Stuttgart (Germany) [8167A-07]

11.40: **Analysis of the diffraction efficiency of reflection and transmission holographic gratings by means of a parallel FDTD approach**, Jorge Francés Monllor, Sergio Bleda, Sergi Gallego, Cristian Neipp, Andrés Márquez, Inmaculada Pascual, Augusto Beléndez, Univ. de Alicante (Spain) [8167A-08]

12.00: **The use of the Zernike polynomials in optical systems design**, Sergey N. Bezdikho, Open Joint-Stock Co. Research-and-Production Corp. (Russian Federation); Elena I. Morosova, House of Optics Scientific Ctr. (Russian Federation) [8167A-09]

Lunch/Exhibition Break 12.20 to 13.40

SESSION 3

Room: Europe 93 **Tues. 13.40 to 15.00**
Design Theory and Techniques III

Session Chair: **Andrew P. Wood**, Qioptiq Ltd. (United Kingdom)

13.40: **Modeling highly aspherical optical surfaces using a new polynomial formalism into Zemax**, Sébastien Vivès, Sandrine Pascal, Observatoire Astronomique de Marseille-Provence (France); Aurelia Secroun, Univ. Paris 13 (France); Morgan Gray, David Le Mignant, Jean-Gabriel Cuby, Marc Ferrari, Observatoire Astronomique de Marseille-Provence (France) [8167A-10]

14.00: **Parametrical synthesis of three-mirrors optical systems**, Irina L. Livshits, Vladimir N. Vasilyev, Victor A. Zverev, National Research Univ. of Information Technologies, Mechanics and Optics (Russian Federation) [8167A-11]

14.20: **Distortion properties and correction abilities of axis-symmetric aspherical surfaces of arbitrary shape**, Boian A. Hristov, Institute of Optical Materials and Technology BAS (Bulgaria) [8167A-12]

14.40: **Development of optical design algorithms on the base of the exact (all orders) geometrical aberration theory**, Boian A. Hristov, Institute of Optical Materials and Technology BAS (Bulgaria) [8167A-13]

Coffee Break 15.00 to 15.30

SESSION 4

Room: Europe 93 **Tues. 15.30 to 16.20**

Tutorial

Session Chair: **Andrew P. Wood**, Qioptiq Ltd. (United Kingdom)

15.30: **The role of aberration analysis in modern optical design (Tutorial)** (*Invited Paper*), Julie Bentley, Univ. of Rochester (United States) . . [8167A-14]

SESSION 5

Room: Europe 93 **Tues. 16.20 to 17.40**
Design Solutions and Applications I

Session Chair: **Andrew P. Wood**, Qioptiq Ltd. (United Kingdom)

16.20: **Evaluation and analysis of chromatic aberrations in images**, Vladan Blahnik, Dietmar Gängler, Johannes-Maria P. Kaltenbach, Carl Zeiss AG (Germany) [8167A-17]

16.40: **Monolithic optical freeform element for an IR line camera**, Stefan Riehemann, Martin Palme, Ralf Steinkopf, Peter Munzert, Gunther Notni, Fraunhofer-Institut für Angewandte Optik und Feinmechanik (Germany); Juergen Krieg, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung (Germany) [8167A-15]

17.00: **Freeform Fresnel RXI-RR Köhler design with spectrum-splitting for photovoltaics**, Marina Buljan, Univ. Politécnica de Madrid (Spain); Pablo Benitez, Light Prescriptions Innovators, LLC (United States); Rubén Mohedano, Light Prescriptions Innovators Europe, S. L. (Spain); Juan Carlos Miñano Domínguez, Light Prescriptions Innovators Europe, S. L. (United States) [8167A-16]

17.20: **Common path optical design for 2D inspection system with the capability of autofocusing**, Wei Cheng Wang, Chun-Chieh Wang, Shih-Hsuan Kuo, Leh-Rong Chang, Hau-Wei Wang, Industrial Technology Research Institute (Taiwan) [8167A-72]

Wednesday 7 September

SESSION 6

Room: Europe 93. Wed. 08.40 to 10.10
Design Solutions and Applications II

Session Chair: Min Wang, INO (Canada)

- 08.40: **Design of a compact objective for SWIR applications** (*Invited Paper*), Jose M. Infante Herrero, Indra Sistemas, S.A. (Spain); Wang Lin, Juan Carlos Miñano Dominguez, Pablo Benítez, Univ. Politécnica de Madrid (Spain); Marta C. de la Fuente, Indra Sistemas, S.A. (Spain); Guillermo Biot, Hamed Ahmadpanahi, Univ. Politécnica de Madrid (Spain); Andres F. Cifuentes, SECPhO (Spain) [8167A-18]
- 09.10: **Imaging systems application of multichannel configurations**, Jose M. Infante Herrero, Indra Sistemas, S.A. (Spain); Juan Carlos Miñano Dominguez, Pablo Benítez, Guillermo Biot, Hamed Ahmadpanahi, Wang Lin, Jiayao Liu, Univ. Politécnica de Madrid (Spain); Julio C. Chaves, Light Prescriptions Innovators Europe, S. L. (Spain); Marta C. de la Fuente, Indra Sistemas, S.A. (Spain) [8167A-19]
- 09.30: **Advances in SMS design method for imaging optics**, Wang Lin, Pablo Benítez, Juan Carlos Miñano Dominguez, Jose M. Infante Herrero, Guillermo Biot, Univ. Politécnica de Madrid (Spain) [8167A-20]
- 09.50: **Portable virtual display system design with a wide eye motion box for a Motor vehicle**, Sung Chul Shin, Yongseok Chi, Tae-Jeong Ahn, Sang Sik Jeong, Seung-Gyu Lee, Kwang-Yeol Choi, LG Electronics Inc. (Korea, Republic of) [8167A-21]
- Coffee Break 10.10 to 10.40

SESSION 7

Room: Europe 93. Wed. 10.40 to 12.10
Design Solutions and Applications III

Session Chair: Min Wang, INO (Canada)

- 10.40: **Solid catadioptric telephoto lens design with SMS method** (*Invited Paper*), Lin Wang, Univ. Politécnica de Madrid (Spain); Pablo Benítez, Juan Carlos Miñano Dominguez, Univ. Politécnica de Madrid (Spain) and LPI-LLC (United States); Jose M. Infante Herrero, Univ. Politécnica de Madrid (Spain); Marta C. de la Fuente, Indra Sistemas, S.A. (Spain); Guillermo Biot, Univ. Politécnica de Madrid (Spain) [8167A-22]
- 11.10: **Recent developments in wafer-level fabrication of micro-optical multi-aperture imaging systems**, Robert Leitel, Peter Dannberg, Andreas Brückner, Andreas Bräuer, Fraunhofer-Institut für Angewandte Optik und Feinmechanik (Germany) [8167A-23]
- 11.30: **Metrology system based on bidirectional microdisplays**, Constanze Grossmann, Franziska Perske, Susanne Zwick, Fraunhofer-Institut für Angewandte Optik und Feinmechanik (Germany); Judith Baumgarten, Fraunhofer-Institut für Photonische Mikrosysteme (Germany); Bernd Richter, Stefan Riehemann, Fraunhofer-Institut für Angewandte Optik und Feinmechanik (Germany); Uwe Vogel, Fraunhofer-Institut für Photonische Mikrosysteme (Germany); Gunther Notni, Fraunhofer-Institut für Angewandte Optik und Feinmechanik (Germany); Andreas Tünnermann, Friedrich-Schiller-Univ. Jena (Germany) [8167A-24]
- 11.50: **A study of optical design for optics of high-contrast projector**, Chih-Ta Yen, National Formosa Univ. (Taiwan); Yi-Chin Fang, Chen-Mu Tsai, National Kaohsiung First Univ. of Science and Technology (Taiwan) [8167A-25]
- Lunch/Exhibition Break 12.10 to 13.30

SESSION 8

Room: Europe 93. Wed. 13.30 to 15.00
Design Solutions and Applications IV

Session Chair: Laurent Mazuray, EADS Astrium (France)

Chairman's Introduction to the Session

13.30 to 13.40: **Technology Readiness Level: from innovation to optical system development**, Laurent Mazuray, EADS Astrium (France)

- 13.30: **Design of a handheld confocal fluorescence microscope for clinical dermatologic applications** (*Invited Paper*), Christin Bechtel, Technische Univ. Dresden (Germany); Jens Knobbe, Heinrich Grüger, Hubert K. Lakner, Fraunhofer-Institut für Photonische Mikrosysteme (Germany) [8167A-26]
- 14.00: **Zoom-chirped DOW interference system for micro- and nano-lithography**, Min Wang, INO (Canada) [8167A-28]
- 14.20: **Simulation tools for advanced mask aligner lithography**, Arianna Bramati, Uwe Vogler, SUSS MicroOptics SA (Switzerland); Balint Meliorisz, GeniSys GmbH (Germany); Kristian Motzek, Fraunhofer-Institut für Integrierte System und Bauelementetechnologie (Germany); Michael Hornung, SUSS MicroTec Lithography GmbH (Germany); Reinhard Voelkel, SUSS MicroOptics SA (Switzerland) [8167A-29]
- 14.40: **Refractive x-ray condenser optics for use in microscopes with x-ray tube sources**, Harald Vogt, Markus Simon, Vladimir P. Nazmov, Arndt Last, Jürgen Mohr, Karlsruher Institut für Technologie (Germany) [8167A-30]
- Coffee Break 15.00 to 16.00

SESSION 9

Room: Europe 93. Wed. 15.30 to 16.50
Design Solutions and Applications V

Session Chair: Laurent Mazuray, EADS Astrium (France)

- 15.30: **Compact optical design solutions using focus tunable lenses**, Mark Blum, Michael Büeler, Étienne Labaume, Optotune AG (Switzerland) . [8167A-31]
- 15.50: **Integral imaging system with 33 mega-pixel imaging devices using the pixel-offset method**, Jun Arai, Masahiro Kawakita, Takayuki Yamashita, Fumio Okano, NHK Science & Technical Research Labs. (Japan); Yasuyuki Haino, Masahito Sato, JVC KENWOOD Holdings, Inc. (Japan); Makoto Okui, NHK Science & Technical Research Labs. (Japan) [8167A-32]
- 16.10: **Optical designing method to shorten the nearest object distance and its application for head-mount 3D display**, Shunsuke Hase, Masato Shibuya, Kazuhisa Maehara, Mikio Oka, Suezou Nakadate, Tokyo Polytechnic Univ. (Japan) [8167A-33]
- 16.30: **Designing with Phi-polynomial surfaces**, Kyle H. Fuerschbach, Univ. of Rochester (United States) [8167A-78]

Posters

Registration Foyer, World Trade Centre Wed. 17.30 to 19.00

Conference attendees are invited to attend the Optical Systems Design Poster Session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster session.

- A new software tool is developed to evaluate the measured/simulated transmission characteristics of optical multilexers/demultilexers**, Dana Seyringer, Patrick Schmid, Fachhochschule Vorarlberg (Austria) [8167A-48]
- An all-spheric unobstructed optical terminal for free-space quantum communication**, Claudio Pernechele, Istituto Nazionale di Astrofisica (Italy); Fabrizio Tamburini, Univ. degli Studi di Padova (Italy); Thomas Jennewein, Univ. of Waterloo (Canada); Anton Zeilinger, Univ. Wien (Austria) [8167A-49]
- Compact holographic optical interconnections using nematic liquid crystal spatial light modulators**, Tianxin Lu, Neil Collings, Univ. of Cambridge (United Kingdom) [8167A-50]
- The study of toxic and hazardous gas(Methane)effects on human life through monitoring with chirped fiber Bragg grating**, Jaikaran Singh, Anubhuti Khare, Univ. Institute of Technology, RGPV (India) [8167A-51]
- The optimization design of broadband mid-IR grating**, Shuwei Fan, Liang Bai, Xi'an Jiaotong Univ. (China) [8167A-52]
- Experimental validation of opto-thermo-elastic modelling in Oofelie MultiPhysics**, Alexandra Mazzoli, Univ. de Liège (Belgium); Philippe Saint-Georges, Open Engineering S.A. (Belgium); Anne Orban, Univ. de Liège (Belgium); Jean-Sébastien Ruess, GDTech S.A. (Belgium); Christian Barbier, Yvan Stockman, Marc Georges, Univ. de Liège (Belgium); Philippe Nachtergaele, Stéphane Paquay, Pascal De Vincenzo, Open Engineering S.A. (Belgium) [8167A-53]
- Novel optimized spatial filter collimator for laser indicators and range finders**, Junewen Chen, Chung-Hua Univ. (Taiwan) [8167A-56]
- Active optics: vase form multimode deformable mirror for in-flight aberrations correction**, Marie Laslandes, Marc Ferrari, Emmanuel Hugot, Gérard R. Lemaître, Observatoire Astronomique de Marseille-Provence (France) [8167A-57]
- Telescope for lidar system implementing holographic optical elements**, Olha Asmolova, Pavlo A. Molchanov, Ampac Inc. (United States) [8167A-58]
- Athermalization of catadioptric infrared camera under uniform thermal distribution**, Ramin Khoei, Islamic Azad Univ. (Iran, Islamic Republic of)[8167A-59]
- The research of optical window used in aircraft sensor systems**, Li Yan, Zhou Feng, Beijing Institute of Space Mechanics and Electricity (China) [8167A-60]
- Optical characterization of proton irradiated diamond**, Anna Sytchkova, ENEA (Italy); Stefano Lagomarsino, Univ. degli Studi di Firenze (Italy) and Istituto Nazionale di Fisica Nucleare di Firenze (Italy); Maurizio M. Vannoni, Istituto Nazionale di Ottica (Italy); Silvia Calusi, Univ. degli Studi di Firenze (Italy); Paolo Olivero, Univ. degli Studi di Torino (Italy) and Istituto Nazionale di Fisica Nucleare di Torino (Italy) [8167A-62]
- Monochromatic and chromatic aberrations of thin refractive variable-focus lens**, Antonin Miks, Jiri Novák, Pavel Novak, Czech Technical Univ. in Prague (Czech Republic) [8167A-64]
- The thermal baffling of SPHERE IFS**, Raffaele G. Gratton, Riccardo U. Claudi, Enrico Giro, Umberto Anselmi, Dino Mesa, Luigi Lessio, INAF - Osservatorio Astronomico di Padova (Italy); Vincenzo De Caprio, Enrico Mattaini, Salvo Incorvaia, Enrico Santambrogio, INAF-IASF Milano (Italy); Salvo Scuderi, INAF - Osservatorio Astrofisico di Catania (Italy); Jean Luc Beuzit, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); Kjetil Dohlen, Lab. d'Astrophysique de Marseille (France); Pascal Puget, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); Jean Louis Lizon, Reinhold J. Dorn, Markus Kasper, European Southern Observatory (Germany) [8167A-65]
- The S4I prototype: a beam-slicer dedicated to the new-generation multichannel subtractive double pass for EST imaging spectropolarimetry**, Frédéric N. Sayède, Pierre Mein, Jean-Philippe Amans, Jacques Moity, Observatoire de Paris à Meudon (France) [8167A-66]

Optical design and test of the BIGRE-based IFS of SPHERE, Riccardo U. Claudi, Enrico Giro, Umberto Anselmi, Jacopo Antichi, Raffaele G. Gratton, Silvano Desidera, INAF - Osservatorio Astronomico di Padova (Italy); Vincenzo De Caprio, INAF - IASF Milano (Italy); Luigi Lessio, INAF - Osservatorio Astronomico di Padova (Italy); Salvatore Scuderi, Pietro Bruno, INAF - Osservatorio Astrofisico di Catania (Italy); Daniela Fantinel, Bernardo Salasnich, INAF - Osservatorio Astronomico di Padova (Italy); Enrico Cascone, INAF - Osservatorio Astronomico di Capodimonte (Italy); Jean Luc Beuzit, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); Kjetil Dohlen, Lab. d'Astrophysique de Marseille (France); Pascal Puget, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); Markus Kasper, European Southern Observatory (Germany) [8167A-67]

A compact and portable catadioptric telescope with all spherical optics, Rinaldo Sperotto, Quasar di Sperotto & Dal Grande srl (Italy); Claudio Pernechele, Sergio Poppi, INAF - Osservatorio Astronomico di Cagliari (Italy) [8167A-68]

Ghost images determination for the stereoscopic imaging channel of SIMBIOSYS for the BepiColombo ESA Mission, Vania Da Deppo, Consiglio Nazionale delle Ricerche (Italy); Gabriele Cremonese, INAF - Osservatorio Astronomico di Padova (Italy); Giampiero Naletto, Univ. degli Studi di Padova (Italy) [8167A-69]

Parallel hardware-oriented relaxation method for solving the inverse aim, Iryna V. Musiichuk, Natalia I. Zabolotna, Vinnytsia National Technical Univ. (Ukraine) [8167A-70]

Optimizing the APPROXv1 algorithm for coping with diffraction effects in protein-based volumetric memories, Dragos Trinca, Sanguthevar Rajasekaran, Univ. of Connecticut (United States) [8167A-71]

High-range laser bandwidth tuning for focus drilling, Alena Andryzhyieuskaya, John van Keulen, Tom van der Hoeff, Jeroen J. H. M. Linders, Bart Smits, Marieke van Veen, Pablo Gabolde, ASML Netherlands B.V. (Netherlands); Takahito Kumazaki, Satoshi Tanaka, Hiroshi Tanaka, Junichi Fujimoto, Gigaphoton Inc. (Japan) [8167A-73]

Multiplex coding for real-time optical image processing, Sonia Elwardi, SUP'COM (Tunisia) and Telecom SudParis (France); Badr-Eddine Benkelfat, TELECOM SudParis (France); Mourad Zghal, SUP'COM (Tunisia) [8167A-74]

A novel structure design and angle algorithm of imaging polarization sensor for navigation, Kaichun Zhao, Zheng You, Tsinghua Univ. (China) [8167A-75]

Simulation of 3D LADAR imaging system using fast target response generation approach, Ali Adnan Al-Temeemy, Joe W. Spencer, Univ. of Liverpool (United Kingdom) [8167A-76]

Three-dimensional LADAR imaging system using AR-4000LV laser range-finder, Ali Adnan Al-Temeemy, Joe W. Spencer, Univ. of Liverpool (United Kingdom) [8167A-77]

Design of the coronagraph with large FOV and the stray light suppressing, Hongxin Zhang, Zhenwu Lu, Hua Liu, Changchun Institute of Optics, Fine Mechanics and Physics (China) [8167A-79]

Thursday 8 September

SESSION 10

Room: Europe 93. Thurs. 09.00 to 10.10
Space Applications and Spectroscopy I

Session Chair: Mike A. Cutler,
Surrey Satellite Technology Ltd. (United Kingdom)

09.00: **Cryogenic lens design for astronomical and space applications** (*Invited Paper*), Simon Thibault, Univ. Laval (Canada) [8167A-34]

09.30: **Development status of the telescope for the Ingenio/SEOSAT mission primary payload**, Carlos Miravet, SENER Ingeniería y Sistemas S.A. (Spain); Demetrio Zorita, José Ignacio Bueno, Luis Pascual, SENER Ingeniería y Sistemas S.A. (Spain); Andrea E. Marini, European Space Research and Technology Ctr. (Netherlands) [8167A-36]

09.50: **Integrated optical and IR Earth albedo monitor design and laboratory performance measurement**, Sehyun Seong, Sug-Whan Kim, Yonsei Univ. (Korea, Republic of); Michael Lockwood, Univ. of Reading (United Kingdom) . [8167A-37]

Coffee Break 10.10 to 10.40

SESSION 11

Room: Europe 93. Thurs. 10.40 to 12.20
Space Applications and Spectroscopy II

Session Chair: Mike A. Cutler,
Surrey Satellite Technology Ltd. (United Kingdom)

10.40: **Space active optics: toward optimized correcting mirrors for future large spaceborne observatories**, Marie Laslandes, Emmanuel Hugot, Marc Ferrari, Observatoire Astronomique de Marseille-Provence (France) . . [8167A-38]

11.00: **Membrane photon sieve telescope**, Geoff P. Andersen, U.S. Air Force Academy (United States) [8167A-39]

11.20: **Design and first results of a Fourier transform imaging spectrometer in the 3-5 μm range**, Noura Matallah, Hervé Sauer, Jean Taboury, Pierre H. Chavel, François Goudail, Institut d'Optique Graduate School (France); Jean-Claude L. Fontanella, Thales Optronique S.A. (France); Yann Ferrec, ONERA (France) [8167A-40]

11.40: **Optical design of the VLT/MUSE instrument**, Johan Kosmalksi, Observatoire de Lyon (France); Laurent Parès, Institut de Recherche en Astrophysique et Planétologie (France); Walter Seifert, Landessternwarte Heidelberg (Germany); Wenli Xu, Optical System Engineering (Germany); Jean-Christophe Olaya, Astrophysikalisches Institut Potsdam (Germany); Bernard Delabre, European Southern Observatory (Germany) [8167A-41]

12.00: **Optical architecture of the MICROCARB spectrometer**, Jacques Loesel, Christian Buil, Ctr. National d'Études Spatiales (France) [8167A-42]

Lunch Break 12.20 to 13.40

SESSION 12

Room: Europe 93. Thurs. 13.40 to 15.20
Space Applications and Spectroscopy III

Session Chair: Laurent Mazuray, EADS Astrium (France)

13.40: **Design of a hybrid-integrated MEMS scanning grating spectrometer**, Heinrich Gröger, Tino Pügner, Jens Knobbe, Harald Schenk, Fraunhofer-Institut für Photonische Mikrosysteme (Germany) [8167A-43]

14.00: **Stray light measurements of immersed gratings for high resolution spectroscopy in the Near Infra-red**, Juan A. Fernandez-Saldivar, Ianjit Bhatti, Dan R. Lobb, Surrey Satellite Technology Ltd. (United Kingdom); Benedikt J. Guldemann, European Space Agency (Netherlands) [8167A-44]

14.20: **Design and development of the high-resolution spectrograph HERMES and the unique volume phase holographic gratings**, Jeroen Heijmans, Australian Astronomical Observatory (Australia) [8167A-45]

14.40: **MUSE splitting and relay optics: a fan-shaped bridge for 24 spectrographs**, Wenli Xu, Optical System Engineering (Germany); Harald E. Nicklas, Georg-August-Univ. Göttingen (Germany); Walter Seifert, Landessternwarte Heidelberg (Germany); Heiko Anwand, Georg-August-Univ. Göttingen (Germany) [8167A-46]

15.00: **Optical properties and thermal performance of 100-mm space telescope**, Ki-Beom Ahn, Yonsei Univ. (Korea, Republic of); Soomin Jeong, Ewha Womans Univ. (Korea, Republic of); Sug-Whan Kim, Yonsei Univ. (Korea, Republic of); Jiwoo Nam, Il H. Park, Ewha Womans Univ. (Korea, Republic of) . [8167A-47]

Detectors and Associated Signal Processing IV

Conference Chairs: **Jean-Luc M. Tissot**, ULIS (France); **Jeffrey M. Raynor**, STMicroelectronics (R&D) Ltd. (United Kingdom)

Programme Committee: **Wolfgang A. Cabanski**, AIM INFRAROT-MODULE GmbH (Germany); **Peter N. Dennis**, QinetiQ Ltd. (United Kingdom); **Hai-mei Gong**, Shanghai Institute of Technical Physics (China); **Ernest Grimberg**, Opgal Optronics Industries Ltd. (Israel); **Pierre Magnan**, Institut Supérieur de l'Aéronautique et de l'Espace (France); **Trevor Martin**, QinetiQ Ltd. (United Kingdom); **Peter Pool**, e2v technologies plc (United Kingdom); **Pierre Potet**, New Imaging Technologies (France); **Piotr Pregowski**, Pregowski Infrared Services (Poland); **Steffen R. Schmidt**, JENOPTIK Optical Systems GmbH (Germany); **Peter Markus Seitz**, Ctr. Suisse d'Electronique et de Microtechnique SA (Switzerland); **Fiodor F. Sizov**, V. Lashkaryov Institute of Semiconductor Physics (Ukraine)

Monday 5 September

Opening Remarks

Room: Asie **Mon. 13.15 to 13.20**
Jean-Luc M. Tissot, ULIS (France); **Jeffrey M. Raynor**, STMicroelectronics (R&D) Ltd. (United Kingdom)

SESSION 13

Room: Asie **Mon. 13.20 to 15.30**
Detectors and Associated Signal Processing I

Session Chair: **Patrick Robert**, ULIS (France)

- 13.20: **Improvements in NDIR multiple gas monitoring within the same gas chamber** (*Invited Paper*), Juan Carlos Martinez-Anton, Manuel Silva Lopez, Univ. Complutense de Madrid (Spain) [8167B-80]
- 13.50: **DUVEX a versatile EUV-X detector**, André Jean-Michel, Karine Le Guen, Philippe Jonnard, Univ. Pierre et Marie Curie (France); Yves Menesguen, Ctr. National de la Recherche Scientifique (France) [8167B-81]
- 14.10: **A multispectral, high-speed, low-cost, single-element detector in the UV-MWIR spectral range**, Thomas Svensson, Roland Lindell, Swedish Defence Research Agency (Sweden) [8167B-82]
- 14.30: **A new design of the laser range finding system using the synchronized single photon counting (SSPC) method**, Min-Gu Lee, Seong-Ho Baeg, Korea Institute of Industrial Technology (Korea, Republic of); Jae-Hyung Jang, Gwangju Institute of Science and Technology (Korea, Republic of) [8167B-83]
- 14.50: **Velocity and size estimation of nanoparticles down to 75nm with nano-LDA**, Lénárd Vámos, Research Institute for Solid State Physics and Optics (Hungary); Peter Jani, Reserach Institute for Solid State Physics and Optics (Hungary) [8167B-84]
- 15.10: **Multispectral MCT detectors for THz/sub-THz region**, Fiodor F. Sizov, Vyacheslav Zabudsky, Zinovia Tsybrii, V. Lashkaryov Institute of Semiconductor Physics (Ukraine); Nikolay Mikhailov, Vasilii Varavin, A.V. Rzhanov Institute of Semiconductor Physics (Russian Federation) [8167B-85]
- Coffee Break 15.30 to 16.00

SESSION 14

Room: Asie **Mon. 16.00 to 17.30**
Detectors and Associated Signal Processing II

Session Chair: **Jeffrey M. Raynor**, STMicroelectronics (R&D) Ltd. (United Kingdom)

- 16.00: **Specifications of an analog-to-digital converter for uncooled infrared readout circuits** (*Invited Paper*), Patrick Robert, ULIS (France) [8167B-86]
- 16.30: **Object detection system using SPAD proximity detectors**, Laurence Stark, The Univ. of Edinburgh (United Kingdom) and STMicroelectronics (R&D) Ltd. (United Kingdom); Jeffrey M. Raynor, STMicroelectronics (R&D) Ltd. (United Kingdom); Robert K. Henderson, The Univ. of Edinburgh (United Kingdom) [8167B-87]
- 16.50: **The PLATO Mission Instrument Control Unit's digital signal processing**, Mauro Focardi, Maurizio Pancrazzi, Emanuele Pace, Univ. degli Studi di Firenze (Italy); Rosario Cosentino, Fundación Galileo Galilei - INAF (Spain); Stefano Pezzuto, Anna Di Giorgio, Istituto di Fisica dello Spazio Interplanetario (Italy); Roland Ottensamer, A. Luntzer, Univ. Wien (Austria) [8167B-88]
- 17.10: **The Solar Orbiter METIS Coronagraph data signal processing chain**, Maurizio Pancrazzi, Mauro Focardi, Univ. degli Studi di Firenze (Italy); Gianalfredo Nicolini, INAF - Osservatorio Astronomico di Torino (Italy); Enrico Magli, Politecnico di Torino (Italy); Lucia Abbo, INAF - Osservatorio Astronomico di Torino (Italy); Marco Romoli, Univ. degli Studi di Firenze (Italy) [8167B-89]

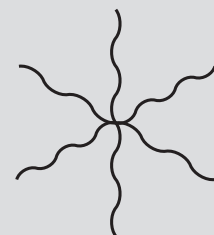
Wednesday 7 September

Posters

Registration Foyer, World Trade Centre **Wed. 17.30 to 19.00**
Conference attendees are invited to attend the Optical Systems Design Poster Session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster session.

Dual cavity refractive index sensor based on a photonic crystals 90° waveguide splitter, Martina De Laurentis, Andrea Irace, Giovanni Breglio, Univ. degli Studi di Napoli Federico II (Italy) [8167B-90]

Hardware implementation of fuzzy logic for image stabilization, Ehsan Koohestani, Safir Informatics (Iran, Islamic Republic of) [8167B-92]



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Advances in Optical Thin Films IV

Conference Chairs: **Michel Lequime**, Institut Fresnel (France); **H. Angus Macleod**, Thin Film Center, Inc. (United States); **Detlev Ristau**, Laser Zentrum Hannover e.V. (Germany)

Programme Committee: **Claude Amra**, Institut Fresnel (France); **Bertrand G. Bovard**, Teledyne Scientific Co. (United States); **Mireille Commandré**, Institut Fresnel (France); **Franck Delmotte**, Lab. Charles Fabry, Institut d'Optique (France); **Angela Duparré**, Fraunhofer-Institut für Angewandte Optik und Feinmechanik (Germany); **Norbert Kaiser**, Fraunhofer-Institut für Angewandte Optik und Feinmechanik (Germany); **Juan Ignacio Larruquert**, Consejo Superior de Investigaciones Científicas, Instituto de Óptica (Spain); **Xu Liu**, Zhejiang Univ. (China); **Ludvik Martinu**, Ecole Polytechnique de Montréal (Canada); **Angela M. Piegari**, ENEA (Italy); **Frank Placido**, Univ. of the West of Scotland (United Kingdom); **Carl G. Ribbing**, Uppsala Univ. (Sweden); **Ulrike Schulz**, Fraunhofer-Institut für Angewandte Optik und Feinmechanik (Germany); **Christopher J. Stolz**, Lawrence Livermore National Lab. (United States); **Alexander V. Tikhonravov**, Lomonosov Moscow State Univ. (Russian Federation); **Hrvoje Zorc**, Institut Ruder Boškovic (Croatia)

Monday 5 September

SESSION 1

Room: Oceanie Australie Mon. 13.00 to 13.45
Opening Session

Session Chair: **Detlev Ristau**, Laser Zentrum Hannover e.V. (Germany)

13.00 to 13.20: Opening Remarks and Welcome, **H. Angus Macleod**, Thin Film Center, Inc. (United States); **Detlev Ristau**, Laser Zentrum Hannover e.V. (Germany)

13.20: **Progress in optical coatings** (*Invited Paper*), H. Angus Macleod, Thin Film Center, Inc. (United States) [8168-01]

SESSION 2

Room: Oceanie Australie Mon. 13.45 to 15.10
Antireflective Coatings

Session Chairs: **H. Angus Macleod**, Thin Film Center, Inc. (United States); **Detlev Ristau**, Laser Zentrum Hannover e.V. (Germany)

13.45: **Ultra-low-reflectance, high-uniformity, multilayer-antireflection coatings on large substrates deposited using an ion-beam sputtering system with a customized planetary rotation stage** (*Invited Paper*), Svetlana Dilgatch, Mark Gross, Anatoli Chtanov, Commonwealth Scientific and Industrial Research Organisation (Australia) [8168-02]

14.10: **Protective infrared antireflection coating based on sputtered Germanium carbide**, Desmond R. Gibson, Ewan M. Waddell, Thin Film Solutions Ltd. (United Kingdom); Frank Placido, Univ. of the West of Scotland (United Kingdom) [8168-03]

14.25: **Comparison of different deposition technologies for the post-coating of commercial CCD detectors**, Christophe Hecquet, Stéphane Sorce, Cihan Koc, Michel Lequime, Institut Fresnel (France) [8168-04]

14.40: **Design and development of broadband antireflection coatings on silicon and GaAs substrates for solar cell applications**, Narasimha Rao Kolli, V. Tamilselvan, Indian Institute of Science (India); N. Raghu, M. Sudhakar, ISRO Satellite Ctr. (India) [8168-05]

14.55: **Design and fabrication of low-polarization antireflection coating at 248nm**, Yanghui Li, Xu Liu, Weidong Shen, Zhejiang Univ. (China) [8168-06]
Coffee Break 15.10 to 15.40

SESSION 3

Room: Oceanie Australie Mon. 15.40 to 17.45
Coating Design and Analysis

Session Chairs: **Alexander V. Tikhonravov**, Lomonosov Moscow State Univ. (Russian Federation); **Bertrand G. Bovard**, Teledyne Scientific Co. (United States)

15.40: **Giant field over-intensity in optical coatings under total internal reflection** (*Invited Paper*), Claude Amra, Institut Fresnel (France) [8168-07]

16.05: **Design of multilayer coatings containing metal island films**, Tatiana V. Amochkina, Lomonosov Moscow State Univ. (Russian Federation); Jordi Sancho-Parramon, Vesna Janicki, Institut Ruder Boškovic (Croatia); Michael K. Trubetskov, Lomonosov Moscow State Univ. (Russian Federation); Hrvoje Zorc, Institut Ruder Boškovic (Croatia); Alexander V. Tikhonravov, Lomonosov Moscow State Univ. (Russian Federation) [8168-08]

16.20: **Investigation of manufacturing processes by numerical sensitivity analysis**, Olivier Vasseur, ONERA (France); Michel Cathelinaud, Ctr. National de la Recherche Scientifique (France) [8168-09]

16.35: **Application of global optimization algorithms for optical thin film index determination from spectro-photometric analysis**, Lihong Gao, Fabien Lemarchand, Michel Lequime, Institut Fresnel (France) [8168-10]

16.50: **Effect of substrate index of refraction on the design of antireflection coatings**, Ronald R. Willey, Willey Optical, Consultants (United States) [8168-11]

17.05: **Angular and spectral light scattering from complex multielectric coatings**, Catherine M. Grèzes-Besset, Didier Torricini, Hélène T. Krol, CILAS (France); Myriam Zerrad, Michel Lequime, Claude Amra, Institut Fresnel (France) [8168-12]

17.20: **Design and production of robust dispersive mirrors** (*Invited Paper*), Vladimir Pervak, Ludwig-Maximilians-Univ. München (Germany); Mikhail K. Trubetskov, Alexander V. Tikhonravov, Lomonosov Moscow State Univ. (Russian Federation) [8168-13]

Tuesday 6 September

SESSION 4

Room: Oceanie Australie Tues. 08.35 to 10.00
Applications

Session Chairs: **Mireille Commandré**, Institut Fresnel (France); **Angela Duparré**, Fraunhofer-Institut für Angewandte Optik und Feinmechanik (Germany)

08.35: **Optical coatings in space** (*Invited Paper*), Denny Wernham, European Space Research and Technology Ctr. (Netherlands) [8168-14]

09.00: **Colour control and selectivity in TiAlN solar-thermal absorbers**, Shuxi Zhao, Uppsala Univ. (Sweden); Dechun Shu, Hefei Univ. of Technology (China); Carl G. Ribbing, Uppsala Univ. (Sweden) [8168-15]

09.15: **Research on low-polarizing x-plate for LED projector using green phosphors**, Meng-Chi Li, Chien-Cheng Kuo, National Central Univ. (Taiwan); June-Jei Huang, Delta Electronics, Inc. (Taiwan); Cheng-Chung Lee, National Central Univ. (Taiwan) [8168-16]

09.30: **Optical filters with controlled porosity for security and gas sensing applications**, Bill Baloukas, Richard Vernhes, Ecole Polytechnique de Montréal (Canada); Jiri Houska, Univ. of West Bohemia (Czech Republic); Jolanta E. Klemberg-Sapieha, Ludvik Martinu, Ecole Polytechnique de Montréal (Canada) [8168-17]

09.45: **Coatings for thin disk laser systems**, Stefan Günster, Detlev Ristau, Laser Zentrum Hannover e.V. (Germany); Birgit Weichelt, Andreas Voss, Univ. Stuttgart (Germany) [8168-18]

Coffee Break 10.00 to 10.30

SESSION 5

Room: Oceanie Australie Tues. 10.30 to 12.10
Deposition Processes

Session Chairs: **Angela M. Piegari**, ENEA (Italy); **Juan Ignacio Larruquert**, Consejo Superior de Investigaciones Científicas (Spain)

10.30: **Atomic layer deposition of optical thin films** (*Invited Paper*), Adriana V. Szeghalmi, Friedrich-Schiller-Univ. Jena (Germany); Markus Arnold, Technische Univ. Chemnitz (Germany); Andreas Berger, Mato Knez, Max-Planck-Institut für Mikrostrukturphysik (Germany); Ernst B. Kley, Friedrich-Schiller-Univ. Jena (Germany); Dietrich R. T. Zahn, Technische Univ. Chemnitz (Germany); Andreas Tünnermann, Friedrich-Schiller-Univ. Jena (Germany) [8168-19]

10.55: **Plasma and optical thin film technologies**, Norbert Kaiser, Fraunhofer-Institut für Angewandte Optik und Feinmechanik (Germany); Peter Awakowicz, Ralf P. Brinkmann, Ruhr-Univ. Bochum (Germany); Thomas Frauenheim, Univ. Bremen (Germany); Andreas Ohl, INP Greifswald e.V. (Germany); Detlev Ristau, Laser Zentrum Hannover e.V. (Germany); Olaf Stenzel, Fraunhofer-Institut für Angewandte Optik und Feinmechanik (Germany) [8168-20]

11.10: **Systems and processes for producing low-loss interference coatings**, Harro Hagedorn, Walter Lehnert, Juergen Pistner, Holger Reus, Michael Scherer, Alfons Zoeller, Leybold Optics GmbH (Germany) [8168-21]

11.25: **Optical and thin film properties of mixed oxides deposited by pulsed reactive magnetron sputtering**, Stefan Bruns, Michael Vergöhl, Fraunhofer-Institut für Schicht- und Oberflächentechnik (Germany) [8168-22]

11.40: **New sputtering concept for optical precision coatings**, Daniel Rademacher, Günter Bräuer, Michael Vergöhl, Benjamin Fritz, Tobias Zickenrott, Fraunhofer-Institut für Schicht- und Oberflächentechnik (Germany) [8168-23]

11.55: **PACA2M: magnetron sputtering for 2-meter optics**, Grégory Chauveau, Didier Torricini, Catherine M. Grèzes-Besset, CILAS (France); Dragan Stojcevski, Michel Lequime, Institut Fresnel (France) [8168-24]

Lunch/Exhibition Break 12.10 to 13.40

SESSION 6

Room: Oceania Australie Tues. 13.40 to 15.35
Thin-film Materials*Session Chairs: Xu Liu, Zhejiang Univ. (China);***Christopher J. Stolz**, Lawrence Livermore National Lab. (United States)

- 13.40: **Organic small molecule-based optical coatings** (*Invited Paper*), Ulrike Schulz, Norbert Kaiser, Fraunhofer-Institut für Angewandte Optik und Feinmechanik (Germany) [8168-25]
- 14.05: **Tailored TCOs**, Astrid Bingel, Kevin Füchsel, Friedrich-Schiller-Univ. Jena (Germany); Norbert Kaiser, Andreas Tünnermann, Fraunhofer-Institut für Angewandte Optik und Feinmechanik (Germany) [8168-26]
- 14.20: **Spectral density analysis of the optical properties of Ni-Al₂O₃ nano-composite films**, Gunnar A. Niklasson, Uppsala Univ. (Sweden); Tobias K. Boström, Norut Teknologi (Norway); Enis Tuncer, GE Global Research Ctr. (United States) [8168-27]
- 14.35: **Organic materials for the use in optical layer systems**, Thomas Neubert, Arne Gaida, Wojtek Huwer, Michael Vergöhl, Fraunhofer-Institut für Schicht- und Oberflächentechnik (Germany) [8168-28]
- 14.50: **Machinable thick silicon coatings for the manufacture of ultra-precise optical components**, Mark Schürmann, Paul Johannes Jobst, Norbert Kaiser, Sandra Müller, Andreas Kolbmüller, Andreas Gebhardt, Stefan Risse, Ramona Eberhardt, Fraunhofer-Institut für Angewandte Optik und Feinmechanik (Germany) [8168-29]
- 15.05: **An investigation into the effects of Ar/O₂ ratio and annealing on the crystalline phase and electrochromism of niobia sputtered from metal and conductive oxide targets**, Matthew K. Neeves, Frank Placido, Univ. of the West of Scotland (United Kingdom) [8168-30]
- 15.20: **Experimental research on the surface morphology analysis and light scattering properties of ZnO/TiO₂ composite thin films**, Ji Cui, Liyong Jiang, Huan Fu, Ye Liu, Anzi He, Nanjing Univ. of Science & Technology (China) [8168-31]
- Coffee Break 15.35 to 16.00

SESSION 7

Room: Oceania Australie Tues. 16.00 to 17.40
Filters and Manufacturing*Session Chairs: Francis Placido, Univ. of the West of Scotland (United Kingdom); Ludvik Martinu, Ecole Polytechnique de Montréal (Canada)*

- 16.00: **IRDIS filters: from design to qualification** (*Invited Paper*), Héléne T. Krol, Nathalie Valette, Didier Torricini, Catherine M. Grèzes-Besset, CILAS (France); Kjetil Dohlen, David Le Mignant, Michel Saisse, Gabriel Moreaux, Maud P. Langlois, Claire Moutou, Arthur Vigan, Observatoire Astronomique de Marseille-Provence (France); Frédéric Lemarquais, Institut Fresnel (France) [8168-32]
- 16.25: **Exclusive examples of high-performance thin-film optical filters for fluorescence spectroscopy made by plasma-assisted reactive magnetron sputtering**, Marc Lappschies, Uwe B. Schallenberg, Stefan Jakobs, Optics Balzers Jena GmbH (Germany) [8168-33]
- 16.40: **Manufacturing and characterizing of all-dielectric band-pass filters for the short-wave infrared region**, Thomas Bauer, Marc Lappschies, Uwe B. Schallenberg, Optics Balzers Jena GmbH (Germany) [8168-34]
- 16.55: **The challenges of 3D-NTT Fabry Perot plates coating**, Didier Torricini, Grégory Chauveau, Catherine M. Grèzes-Besset, CILAS (France); Dragan Stojcevski, Laëtitia Abel-Tibérini, Fabien Lemarchand, Michel Lequime, Institut Fresnel (France); Jean-Luc Gach, Michel Marcellin, Observatoire Astronomique de Marseille-Provence (France) [8168-35]
- 17.10: **Development of infrared polarizing beam-splitters for the 7 to 13mm spectral region**, Li Li, National Research Council Canada (Canada); Jean-Marc Thériault, Defence Research and Development Canada (Canada); Yanen Guo, National Research Council Canada (Canada) [8168-36]
- 17.25: **Design, manufacturing, and characterization of an 8-channel optical chip for low cost and fine color measurement**, Stephane Tisserand, Marc Hubert, Sophie Gautier, Aurélien Faiola, Julie Ganne, Vincent Sauget, Thierry Berthou, Laurent Roux, Silios Technologies (France) [8168-37]

Wednesday 7 September

SESSION 8

Room: Oceania Australie Wed. 08.50 to 10.00
Characterization*Session Chairs: Norbert Kaiser, Fraunhofer-Institut für Angewandte Optik und Feinmechanik (Germany); Franck Delmotte, Institut d'Optique Graduate School (France)*

- 08.50: **Mechanical and tribological properties of optical coatings** (*Invited Paper*), Jolanta E. Klemberg-Sapieha, Ecole Polytechnique de Montréal (Canada) [8168-38]
- 09.15: **Optical performance of narrow-band transmittance filters under low- and high-energy proton irradiation**, Angela M. Piegari, Ilaria Di Sarcina, Maria Luisa Grilli, Salvatore Scaglione, Anna Sytchkova, ENEA (Italy) [8168-39]

- 09.30: **Study of the laser matter interaction in femtosecond regime: application to the analysis of the laser damage phenomena in optical thin films**, Benoit Mangote, Xinghai Fu, Laurent Gallais, Myriam Zerrad, Mireille Commandré, Lihong Gao, Fabien Lemarchand, Michel Lequime, Institut Fresnel (France); Andrius Melnikaitis, Julius Mirauskas, Maksim Jeskevicius, Valdas Sirutkaitis, Vilnius Univ. (Lithuania); Mathias Mende, Lars O. Jensen, Henrik Ehlers, Detlev Ristau, Laser Zentrum Hannover e.V. (Germany) [8168-40]

- 09.45: **Using monodisperse SiO₂ spheres to study laser-induced damage of nodules in HfO₂/SiO₂ high reflectors**, Xinbin Cheng, Zhengxiang Shen, Hongfei Jiao, Jinlong Zhang, Bin Ma, Tao Ding, Wenyan He, Xiaowen Ye, Zhanshan Wang, Tongji Univ. (China) [8168-42]

Coffee Break 10.00 to 10.30

SESSION 9

Room: Oceania Australie Wed. 10.30 to 12.10
Soft X-ray/EUV/DUV/VUV Coatings*Session Chairs: Hrvoje Zorc, Institut Ruder Boškovic (Croatia);***Ulrike Schulz**, Fraunhofer-Institut für Angewandte Optik und Feinmechanik (Germany)

- 10.30: **Design, deposition and characterization of multilayer mirrors for ultrashort pulses in the attosecond domain** (*Invited Paper*), Sébastien de Rossi, Lab. Charles Fabry, Institut d'Optique (France) [8168-43]
- 10.55: **Optical, chemical, depth, and magnetic characterization of Mg/co-based nanometric periodic multilayers**, Karine Le Guen, Min-Hui Hu, Jean-Michel André, Philippe Jonnard, Univ. Pierre et Marie Curie (France); Sika Zhou, Haochuan Li, Jingtao Zhu, Zhanshan Wang, Tongji Univ. (China); Nicola Mahne, Angelo Giglia, Stefano Nannarone, Adriano Verna, Lab. Nazionale TASC (Italy); Christian Meny, Institut de Physique et Chimie des Matériaux de Strasbourg (France); Anouk Galtayries, Ecole Nationale Supérieure de Chimie de Paris (France); Michael Walls, Univ. Paris-Sud 11 (France) [8168-44]
- 11.10: **EUV reflectivity and stability of tri-component Al-based multilayers**, Evgueni Meltchakov, Ahmed Ziani, Sebastien De Rossi, Charles Bourassin-Bouchet, Françoise Bridou, Arnaud Jérôme, Fadi Choueikani, Françoise Varnière, Institut d'Optique Graduate School (France); Frédéric Auchère, Xueyan Zhang, Institut d'Astrophysique Spatiale (France); Marc Roullay, L'Institut des Sciences Moléculaires d'Orsay (France); Franck Delmotte, Institut d'Optique Graduate School (France) [8168-45]
- 11.25: **Interface-engineered multilayer mirrors with enhanced reflectivity**, Viatcheslav V. Nesterenko, Sergiy A. Yulin, Torsten Feigl, Norbert Kaiser, Fraunhofer-Institut für Angewandte Optik und Feinmechanik (Germany) . [8168-46]
- 11.40: **Coating development for the far- and extreme-ultraviolet based on material characterization**, Juan I. Larruquert, Luis Rodríguez-de Marcos, Sergio García-Cortés, Manuela Vidal-Dasilva, Antonio Pablo Pérez-Marín, José Antonio Aznárez, José Antonio Méndez, Consejo Superior de Investigaciones Científicas (Spain) [8168-47]
- 11.55: **Mg-based multilayers and their thermal stabilities for EUV range**, Jingtao Zhu, Sika Zhou, Haochuan Li, Qiushi Huang, Li Jiang, Zhanshan Wang, Tongji Univ. (China) [8168-48]
- Lunch/Exhibition Break 12.10 to 13.30

SESSION 10

Room: Oceania Australie Wed. 13.30 to 15.25
Process Control and Monitoring*Session Chairs: Claude Amra, Institut Fresnel (France);***Carl G. Ribbing**, Uppsala Univ. (Sweden)

- 13.30: **Broadband monitoring simulation with massively parallel processors** (*Invited Paper*), Mikhail K. Trubetskov, Tatiana V. Amochkina, Alexander V. Tikhonravov, Lomonosov Moscow State Univ. (Russian Federation) . . . [8168-49]
- 13.55: **Online re-optimization as a powerful part of enhanced strategies in optical broadband monitoring**, Sebastian Schlichting, Carsten Schmitz, Henrik Ehlers, Detlev Ristau, Laser Zentrum Hannover e.V. (Germany) [8168-50]
- 14.10: **From independent thickness monitoring to adaptive manufacturing: advanced deposition control of complex optical coatings**, Henrik Ehlers, Sebastian Schlichting, Carsten Schmitz, Detlev Ristau, Laser Zentrum Hannover e.V. (Germany) [8168-51]
- 14.25: **Broadband optical monitoring for a 2-meter optics magnetron sputtering deposition machine**, Dragan Stojcevski, Michel Lequime, Institut Fresnel (France); Didier Torricini, Grégory Chauveau, Catherine M. Grèzes-Besset, CILAS (France) [8168-52]
- 14.40: **Optimization of ion-assisted ITO films by design of experiment**, Silvia Schwyn Thöny, Jürgen Buchholz, Evatec Ltd. (Switzerland) [8168-53]
- 14.55: **Modelling and optimization of film thickness variation for plasma-enhanced chemical vapour deposition processes**, Desmond R. Gibson, Ewan M. Waddell, Thin Film Solutions Ltd. (United Kingdom); Xiuhua Fu, Changchun Univ. of Science and Technology (China) [8168-54]
- 15.10: **Testglass changer for direct optical monitoring**, Alfons Zoeller, Harro Hagedorn, Werner Weinrich, Eckhard Wirth, Leybold Optics GmbH (Germany) [8168-55]
- Coffee Break 15.25 to 15.50

SESSION 11

Room: Oceania Australie Wed. 15.50 to 17.30
1D Photonic Crystals and Metamaterials

*Session Chairs: H. Angus Macleod, Thin Film Center, Inc. (United States);
 Detlev Ristau, Laser Zentrum Hannover e.V. (Germany)*

- 15.50: **New phenomena in plasmonics and metamaterials** (*Invited Paper*), Min Qiu, KTH Royal Institute of Technology (Sweden) [8168-56]
 16.15: **Omnidirectional bandgaps in ternary and quaternary 1D photonic crystals**, Gregory V. Morozov, Frank Placido, Univ. of the West of Scotland (United Kingdom) [8168-57]
 16.30: **Re-definition of effective refractive index of thin film buried quantum dots**, Yu-Jen Chen, Cheng-Chung Lee, National Central Univ. (Taiwan) . [8168-58]
 16.45: **Nanostructures versus thin films in the design of antireflection coatings**, Uwe B. Schallenberg, Optics Balzers Jena GmbH (Germany) . [8168-59]
 17.00: **Zero dispersive narrowband pass filter design using negative refraction index materials**, Sheng-Hui Chen, Jung-Lieh Tsai, Cheng-Chung Lee, National Central Univ. (Taiwan) [8168-60]
 17.15: **Two waves interaction in layered photonic structure at big phase mismatching**, Vyacheslav A. Trofimov, Tatiana M. Lysak, Lomonosov Moscow State Univ. (Russian Federation) [8168-61]

Poster Presentations Preview and Closing Remarks

Room: Oceania Australie Wed. 17.30
Detlev Ristau, Laser Zentrum Hannover e.V. (Germany)

Posters

Registration Foyer, World Trade Centre Wed. 17.30 to 19.00
Conference attendees are invited to attend the Optical Systems Design Poster Session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster session.

- Thickness uniformity improvements on large diameter for the advanced gravitational waves interferometers**, Benoit Sassolas, Raffaele Flaminio, Daniele Forest, Aline Lacoudre, Christophe Michel, Jean-Luc Montorio, Nazario Morgado, Laurent Pinard, Institut National de Physique Nucléaire et de Physique des Particules (France) [8168-62]
Magnetron sputtered multilayer mirrors for x-rays and EUV, Franck Delmotte, Fadi Choueikani, Ahmed Ziani, Charles Bourassin-Bouchet, Evgueni Meltchakov, Sébastien de Rossi, Françoise Bridou, Arnaud Jérôme, Françoise Varnière, Lab. Charles Fabry (France) [8168-63]
Multilayers systems-based aluminum synthesized by ion beam sputtering for extreme UV, Ahmed Ziani, Institut d'Optique Graduate School (France) and Ctr. National d'Études Spatiales (France); Franck Delmotte, Institut d'Optique Graduate School (France); Claire Le Paven-Thivet, Institut d'Electronique et Télécommunications de Rennes (France); Evgueni Meltchakov, Françoise Bridou, Arnaud Jérôme, Institut d'Optique Graduate School (France); Marc Roulliy, L'Institut des Sciences Moléculaires d'Orsay (France); Karine Gasc, Ctr. National d'Études Spatiales (France) [8168-64]

- Frequency selected optical feedback CRD technique for high-reflectivity measurement**, Zhechao Qu, Bincheng Li, Institute of Optics and Electronics (China) [8168-65]
Energy logistics in an all-optical binary adder based on a 1D porous silicon photonic crystal, Eugene Y. Glushko, V. Lashkaryov Institute of Semiconductor Physics (Ukraine) [8168-66]
Interface plasmonic properties of silver coated by ultrathin metal oxides, Anna Sytchkova, Danilo Zola, Angela M. Piegari, ENEA (Italy); Ming Fang, Hongbo He, Janda Shao, Shanghai Institute of Optics and Fine Mechanics (China) . . [8168-67]
Optical and mechanical properties of oxide UV coatings, prepared by PVD techniques, Olaf Stenzel, Mark Schürmann, Steffen Wilbrandt, Norbert Kaiser, Andreas Tünnermann, Fraunhofer-Institut für Angewandte Optik und Feinmechanik (Germany); Mathias Mende, Henrik Ehlers, Detlev Ristau, Laser Zentrum Hannover e.V. (Germany); Stefan Bruns, Michael Vergöhl, Fraunhofer-Institut für Schicht- und Oberflächentechnik (Germany); Werner Riggers, Laseroptik GmbH (Germany); Martin Bischoff, Qioptiq Photonics GmbH & Co. KG (Germany); Mario Held, Bte Bedampfungstechnik GmbH (Germany) [8168-68]
Coating technology for the deposition of structurable chromium films with reduced reflection, Paul Johannes Jobst, Mark Schürmann, Norbert Kaiser, Fraunhofer-Institut für Angewandte Optik und Feinmechanik (Germany); Frank-Ulrich Luck, Bernd Beier, Michael Thaut, POG Präzisionsoptik Gera GmbH (Germany) [8168-69]
Band-pass and OH-suppression filters for the E-ELT: design and prototyping, Stefan Günster, Detlev Ristau, Laser Zentrum Hannover e.V. (Germany); Richard I. Davies, Max-Planck-Institut für extraterrestrische Physik (Germany) . . . [8168-70]
Investigation of the optical property and structure of WO3 thin films with different sputtering depositions, Hsi-Chao Chen, Chien-Han Chen, National Yunlin Univ. of Science and Technology (Taiwan); Der-Jun Jan, Institute of Nuclear Energy Research (Taiwan); Kuo-Ting Huang, Yen-Ming Lo, National Yunlin Univ. of Science and Technology (Taiwan); Sheng-Hui Chen, National Central Univ. (Taiwan) [8168-71]
Residual stress analysis for oxide thin film deposition on flexible substrate using finite element method, Hsi-Chao Chen, Chen-Yu Huang, Ssu-Fan Lin, National Yunlin Univ. of Science and Technology (Taiwan); Sheng-Hui Chen, National Central Univ. (Taiwan) [8168-72]
Laser-induced damage of pure and mixture material high reflectors for 355-nm and 1064-nm wavelength, Mathias Mende, Lars O. Jensen, Holger Blaschke, Henrik Ehlers, Laser Zentrum Hannover e.V. (Germany); Werner Riggers, Laseroptik GmbH (Germany); Detlev Ristau, Laser Zentrum Hannover e.V. (Germany) and Ctr. of Quantum Engineering and Space-Time Research (Germany) [8168-73]
Resonances determination in microstructured films embedded in multilayered stacks, Benjamin Vial, Institut Fresnel (France) and Silios Technologies (France); Frédéric Zolla, André Nicolet, Mireille Commandré, Institut Fresnel (France); Stephane Tisserand, Silios Technologies (France) [8168-74]
Design and properties of dispersion compensation mirrors for ultra-fast lasers, Hailiang Niu, Yueguang Zhang, Weidong Shen, Zhejiang Univ. (China) [8168-75]
Study on advanced process control and development of high-precision optics with adaptive manufacturing, Carsten Schmitz, Henrik Ehlers, Sebastian Schlichting, Detlev Ristau, Laser Zentrum Hannover e.V. (Germany) . . . [8168-76]
Investigation and correlations of ion beam and coating material properties vs. layer properties, Marco Jupé, D. Scharrenbach, S. Malobabic, Laser Zentrum Hannover e.V. (Germany); Hartmut Steffen, INP Greifswald e.V. (Germany); Detlev Ristau, Laser Zentrum Hannover e.V. (Germany) [8168-77]



Optical Fabrication, Testing, and Metrology IV

Conference Chairs: **Angela Duparré**, Fraunhofer-Institut für Angewandte Optik und Feinmechanik (Germany); **Roland Geyl**, Sagem SA (France)

Programme Committee: **Genevieve M. Chabassier**, Commissariat à l'Énergie Atomique (France); **Svetlana Dligatch**, Commonwealth Scientific and Industrial Research Organisation (Australia); **Sead Doric**, Doric Lenses Inc. (Canada); **James E. Harvey**, CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States); **Raymond F. Mercier**, Institut d'Optique Graduate School (France); **Manfred Pranti**, Alicona Imaging GmbH (Germany); **Alon Regev**, Rafael Advanced Defense Systems Ltd. (Israel); **Joanna Schmit**, Bruker Corp. (United States); **Theo Tschudi**, Technische Univ. Darmstadt (Germany); **Reinhard Völkel**, SUSS MicroOptics SA (Switzerland); **Lingli Wang**, Jos. Schneider Optische Werke GmbH (Germany)

Wednesday 7 September

Opening Remarks

Room: Afrique Wed. 08.25 to 08.30
Angela Duparré, Fraunhofer-Institut für Angewandte Optik und Feinmechanik (Germany); **Roland Geyl**, Sagem SA (France)

SESSION 1

Room: Afrique Wed. 08.30 to 10.20
Conventional Optics: Manufacturing and Testing I
Session Chair: Genevieve M. Chabassier, Commissariat à l'Énergie Atomique (France)

- 08.30: **MRF with adjustable pH** (*Invited Paper*), Stephen D. Jacobs, Univ. of Rochester (United States) [8169-01]
- 09.00: **Stress polishing of ELT segments at LAM: full-scale demonstrator status**, Emmanuel Hugot, Marc Ferrari, Gérard R. Lemaître, Johan Floriot, Marie Laslandes, Observatoire Astronomique de Marseille-Provence (France) [8169-02]
- 09.20: **Manufacturing and testing of large lenses for dark energy survey (DES) at SESO**, Denis Fappani, Société Européenne de Systèmes Optiques (France); Peter Doel, David Brooks, Univ. College London (United Kingdom); Brenna L. Flaughner, Fermi National Accelerator Lab. (United States) [8169-03]
- 09.40: **Sagem contribution to ALOS-3 multispectral and hyperspectral imagers**, Roland Geyl, Jacques F. Rodolfo, Sagem SA (France) [8169-04]
- 10.00: **Fused silica long-term stability: case studies**, Maurizio Vannoni, Andrea Sordini, Giuseppe Molesini, Istituto Nazionale di Ottica (Italy) [8169-05]
- Coffee Break 10.20 to 10.40

SESSION 2

Room: Afrique Wed. 10.40 to 11.40
Conventional Optics: Manufacturing and Testing II

- 10.40: **Metrology for an imaging Fourier transform spectrometer working in the far-UV (IFTSUV)**, Claudia Ruiz de Galarreta Fanjul, Anne Philippon, Jean-Claude Vial, Univ. Paris-Sud 11 (France); Jean-Pierre Maillard, Institut d'Astrophysique de Paris (France); Thierry Appourchaux, Univ. Paris-Sud 11 (France) [8169-06]
- 11.00: **Static gradient and birefringence error detection and removal in the interferometric measurements of large optical surfaces**, Donald A. Pearson II, Engineering Synthesis Design, Inc. (United States) [8169-08]
- 11.20: **Experimental Determination of Aberration in Lithographic lens by Aerial Image**, Lifeng Duan, Shanghai Micro Electronics Equipment Co., Ltd. (China); Xiangzhao Wang, Bo Peng, Shanghai Institute of Optics and Fine Mechanics (China); Anatoly Bourov, Shanghai Micro Electronics Equipment Co., Ltd. (China) [8169-09]
- Lunch/Exhibition Break 11.40 to 13.20

SESSION 3

Room: Afrique Wed. 13.20 to 14.00
Conventional Optics: Manufacturing and Testing III
Session Chair: Jacques Mangin, Univ. de Bourgogne (France)

- 13.20: **Wavefront reconstruction and piston measurement using Ronchi test**, Dayana H. Penalver, Fermin-Solomon Granados-Agustin, David L. Romero-Antequera, Instituto Nacional de Astrofísica, Óptica y Electrónica (Mexico) [8169-10]
- 13.40: **The difficult material processing by using an exotic quasiparticles from laser-produced plasma**, Vladimir A. Skvortsov, Moscow Institute for Physics and Technology (Russian Federation); Nadeshda I. Vogel, Technische Univ. Chemnitz (Germany) [8169-11]

SESSION 4

Room: Afrique Wed. 14.00 to 15.00
Microoptics and Microstructures I
Session Chair: Angela Duparré, Fraunhofer-Institut für Angewandte Optik und Feinmechanik (Germany)

- 14.00: **Wafer-level micro-optics: trends in manufacturing, testing, and packaging** (*Invited Paper*), Reinhard Voelkel, Kenneth J. Weible, Martin Eisner, SUSS MicroOptics SA (Switzerland) [8169-12]
- 14.30: **Fabrication and testing of highly efficient resonance domain diffractive optical elements** (*Invited Paper*), Michael A. Golub, Tel Aviv Univ. (Israel) [8169-13]
- Coffee Break 15.00 to 15.20

SESSION 5

Room: Afrique Wed. 15.20 to 17.20
Microoptics and Microstructures II
Session Chair: Reinhard Völkel, SUSS MicroOptics SA (Switzerland)

- 15.20: **Method for the characterization of Fresnel lens flux transfer performance**, Juan Carlos Martinez-Anton, Daniel Vazquez Molini, Antonio Alvarez Fernandez-Balbuena, Javier Muñoz de Luna, Jose Antonio Gomez Pedrero, Univ. Complutense de Madrid (Spain) [8169-14]
- 15.40: **Fabrication and analysis of self-organized nano-channel array**, Chun-Ko Chen, Sheng-Hui Chen, National Central Univ. (Taiwan) [8169-16]
- 16.00: **Manufacturing, testing, and metrology of axi-symmetric circular phase masks for stellar coronagraphy**, Mamadou N'Diaye, Kjetil Dohlen, Observatoire Astronomique de Marseille-Provence (France); Stéphane Tisserand, Silius Technologies (France); Kacem El Hadi, Gabriel Moreaux, Observatoire Astronomique de Marseille-Provence (France); Rémi Soummer, Space Telescope Science Institute (United States); Salvador Cuevas, Celia A. Sánchez Pérez, Univ. Nacional Autónoma de México (Mexico) [8169-17]
- 16.20: **Fabrication of bilayer wire-grid polarizer using replicated polymer nanograting**, Seok-Min Kim, Euihyeon Byeon, Jwasun Kim, Chung-Ang Univ. (Korea, Republic of) [8169-18]
- 16.40: **Nonlinear-optical spatially periodic structures for micro-optics**, Vitaly A. Smirnov, Liubov I. Vostrikova, A.V. Rzhzanov Institute of Semiconductor Physics (Russian Federation) [8169-19]
- 17.00: **Dispersion compensator for optical communication using chirped fiber Bragg grating**, Jaikaran Singh, Sri Satya Sai Institute of Science and Technology, Sehore (India); Anubhuti Khare, Univ. Institute of Technology, RGVPT (India) [8169-20]

Posters

Registration Foyer, World Trade Centre Wed. 17.30 to 19.00
Conference attendees are invited to attend the Optical Systems Design Poster Session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster session.

- Metrology challenges in testing a 45-degree 50/50 beam-splitter coating**, Anatoli Chtanov, Mark Gross, Svetlana Dligatch, Commonwealth Scientific and Industrial Research Organisation (Australia) [8169-07]
- Extremely aspheric surfaces**, Zalpha Challita, Emmanuel Hugot, Marc Ferrari, David Le Mignant, Sébastien Vives, Jean-Gabriel Cuby, Observatoire Astronomique de Marseille-Provence (France) [8169-38]
- Two-dimensional thickness measurement of a dielectric thin layer on a metal by use of surface-plasmon-resonance-based ellipsometry**, Tetsuo Iwata, Yusuke Wada, Kentaro Nishigaki, Yasuhiro Mizutani, Univ. of Tokushima (Japan) [8169-40]
- Wavefront instabilities in mirrors with a ground backside**, Stéphane Bouillet, Thomas Lantermier, Eric Lavastre, Christian Chappuis, Francois Macias, Commissariat à l'Énergie Atomique (France) [8169-41]
- Absolute calibration of three reference flats based on an iterative algorithm: study and implementation**, Chloé Morin, Stéphane Bouillet, Commissariat à l'Énergie Atomique (France) [8169-42]
- Functional test of aspheric beam shaping components for LEDs by experimental raytracing**, Ufuk Ceyhan, David Hilbig, Friedrich Fleischmann, Thomas Henning, Hochschule Bremen Univ. of Applied Sciences (Germany); Dietmar Knipp, Jacobs Univ. Bremen (Germany) [8169-43]

Measurement of the angular diameter of the sun by the Moiré technique, Fatemeh Jafariyani, Mohammad T. Tavassoly, Univ. of Tehran (Iran, Islamic Republic of)[8169-44]

Ellipsometric characterization of CdTe(111) surfaces subjected to laser irradiation, Dmytro V. Gnatyuk, Leonid V. Poperenko, Iryna V. Yurgelevych, National Taras Shevchenko Univ. of Kyiv (Ukraine); Toru Aoki, Shizuoka Univ. (Japan)[8169-45]

Thursday 8 September

SESSION 6

Room: Afrique Thurs. 08.30 to 10.00
Scattering and Photometry I

Session Chair: Angela Duparré, Fraunhofer-Institut für Angewandte Optik und Feinmechanik (Germany)

08.30: **Multimodal high-sensitivity ARS set-up (Invited Paper),** Myriam Zerrad, Michel Lequime, Claude Amra, Institut Fresnel (France)[8169-21]

09.00: **Symmetry and anisotropy ARS analysis of optical components,** Alexander von Finck, Tobias Herfurth, Matthias Hauptvogel, Angela Duparré, Fraunhofer-Institut für Angewandte Optik und Feinmechanik (Germany)[8169-22]

09.20: **Light scattering based roughness sensor,** Tobias Herfurth, Matthias Hauptvogel, Sven Schröder, Angela Duparré, Andreas Tünnermann, Fraunhofer-Institut für Angewandte Optik und Feinmechanik (Germany)[8169-23]

09.40: **Spectrophotometric bench dedicated to the characterization of micro-patterned optical coatings,** Stéphane Sorce, Laëtitia Abel-Tibérini, Michel Lequime, Institut Fresnel (France)[8169-24]

Coffee Break 10.00 to 10.30

SESSION 7

Room: Afrique Thurs. 10.30 to 11.50
Scattering and Photometry II

Session Chair: Hendrik Rothe, Helmut-Schmidt Univ. (Germany)

10.30: **SCPEM-based polarization modulation ellipsometry in the NIR,** Ferdinand Bammer, Technische Univ. Wien (Austria); Rok Petkovsek, Univ. of Ljubljana (Slovenia)[8169-25]

10.50: **Roughness characterization of large EUV mirror optics by laser light scattering,** Marcus Trost, Sven Schröder, Torsten Feigl, Angela Duparré, Andreas Tünnermann, Fraunhofer-Institut für Angewandte Optik und Feinmechanik (Germany)[8169-26]

11.10: **3D features measurement using YieldStar: an angle resolved polarized scatterometer,** Philippe J. Leray, Anne-Laure Charley, Koen D'havé, Shaunee Y. Cheng, IMEC (Belgium)[8169-27]

11.30: **Impact of surface roughness on the scatter losses and the scattering distribution of surfaces and thin film coatings,** Sven Schröder, Tobias Herfurth, Angela Duparré, Fraunhofer-Institut für Angewandte Optik und Feinmechanik (Germany); James E. Harvey, CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States)[8169-28]

Lunch Break 11.50 to 13.10

SESSION 8

Room: Afrique Thurs. 13.10 to 15.10
Surface Profile Measurement I

Session Chair: Stephen D. Jacobs, Univ. of Rochester (United States)

13.10: **Large scans without stitching: the nanometer coordinate (Invited Paper),** Hendrik Rothe, Helmut-Schmidt Univ. (Germany)[8169-29]

13.40: **Measurement & analysis of large ultra-precision parts with the Isara 400 CMM (Invited Paper),** Ivo Widdershoven, Henny Spaan, IBS Precision Engineering bv (Netherlands)[8169-30]

14.10: **Advanced PSD-analysis of optical surfaces by mid- and high-spatial frequency metrology,** Luisa Coriand, Angela Duparré, Andreas Tünnermann, Fraunhofer-Institut für Angewandte Optik und Feinmechanik (Germany)[8169-31]

14.30: **Non-contact measurement of aspherical and freeform optics with a new confocal tracking profiler,** Agusti Pinto, Sensofar-Tech, S.L. (Spain); Ferran Laguarda, Roger Artigas, Cristina Cadevall, Univ. Politècnica de Catalunya (Spain)[8169-32]

14.50: **Phase-shifting fringe projection system using freeform optics,** Susanne Zwick, Peter Kühmstedt, Gunther Notni, Fraunhofer-Institut für Angewandte Optik und Feinmechanik (Germany)[8169-33]

Coffee Break 15.10 to 15.40

SESSION 9

Room: Afrique Thurs. 15.40 to 17.00
Surface Profile Measurement II

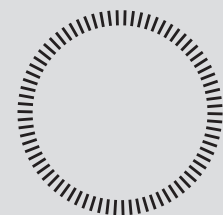
Session Chair: Roland Geyl, Sagem SA (France)

15.40: **Data handling and representation of freeform surfaces,** Ralf Steinkopf, Andreas Gebhardt, Fraunhofer-Institut für Angewandte Optik und Feinmechanik (Germany); Lars Dick, JENOPTIK Polymer Systems GmbH (Germany); Tino Kopf, Stefan Risse, Ramona Eberhardt, Fraunhofer-Institut für Angewandte Optik und Feinmechanik (Germany)[8169-34]

16.00: **Adaptive two-beam interferometer for testing optical surfaces,** Jiri Novak, Pavel Novak, Antonin Miks, Czech Technical Univ. in Prague (Czech Republic)[8169-35]

16.20: **Adaptive null test system using a ferrofluid deformable mirror,** Daniel B. Landry, Denis Brousseau, Simon Thibault, Ermanno F. Borra, Univ. Laval (Canada)[8169-36]

16.40: **Optical method for the surface topographic characterization of Fresnel lenses,** Juan Carlos Martinez-Anton, José Alonso Fernandez, Jose Antonio Gomez Pedrero, Juan Antonio Quiroga, Univ. Complutense de Madrid (Spain)[8169-37]



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Conference 8170 • Room: Asie

Wednesday-Thursday 7-8 September 2011 • Proceedings of SPIE Vol. 8170

Illumination Optics II

Conference Chairs: **Tina E. Kidger**, Kidger Optics Associates (United Kingdom); **Stuart David**, Optical Research Associates (United States)

Programme Committee: **Pablo Benitez**, Univ. Politécnica de Madrid (Spain); **William J. Cassarly**, Optical Research Associates (United States); **Joshua M. Cobb**, Corning Tropol Corp. (United States); **Florian R. Fournier**, Optical Research Associates (United States); **R. John Koschel**, Photon Engineering LLC (United States); **Juan C. Miñano**, Univ. Politécnica de Madrid (Spain); **Julius A. Muschaweck**, OSRAM Opto Semiconductors GmbH (Germany); **Jannick P. Rolland**, Univ. of Rochester (United States); **Andreas L. Timinger**, OEC AG (Germany); **Teus W. Tukker**, Philips Lighting B.V. (Netherlands)

Wednesday 7 September

Opening Remarks

Room: Asie **Wed. 08.45 to 08.50**
Tina E. Kidger, Kidger Optics Associates (United Kingdom)

SESSION 1

Room: Asie **Wed. 08.50 to 10.40**
Design of Freeform Surfaces

Session Chair: **Florian R. Fournier**, Synopsys, Inc. (United States)

- 08.50: **Boundary conditions for balancing light in tailoring freeform surfaces** (*Invited Paper*), Harald Ries, OEC AG (Germany) [8170-01]
09.20: **Field method for dielectric concentrator design**, Angel Garcia Botella, Univ. Politécnica de Madrid (Spain); Antonio Alvarez Fernandez-Balbuena, Daniel Vázquez-Molini, Univ. Complutense de Madrid (Spain) [8170-02]
09.40: **New iterative flux-based design strategy for freeform surfaces generation in led-lighting systems**, Josep Arasa Marti, Esther Oteo, Jose Fernandez-Dorado, Univ. Politécnica de Catalunya (Spain); Patricia Blanco, SnellOptics (Spain); Carles Pizarro, Univ. Politécnica de Catalunya (Spain); Jose Antonio Diaz, Univ. de Granada (Spain) [8170-03]
10.00: **Spiral optical designs for nonimaging applications**, Pablo Zamora, Pablo Benítez, Juan Carlos Miñano Dominguez, Univ. Politécnica de Madrid (Spain); Juan F. Vilaplana, Light Prescriptions Innovators Europe, S. L. (Spain) [8170-05]
10.20: **Tolerancing free-form optics for illumination**, Andreas L. Timinger, Simon Junginger, Julia Unterhinninghofen, OEC AG (Germany) [8170-32]
Coffee Break 10.40 to 11.00

SESSION 2

Room: Asie **Wed. 11.00 to 12.20**
Freeform Application

Session Chair: **William J. Cassarly**, Synopsys, Inc. (United States)

- 11.00: **A review of beam shaping strategies for LED lighting**, Florian R. Fournier, Synopsys, Inc. (United States) [8170-06]
11.20: **Automotive headlamp concepts with low-beam and high-beam out of a single LED**, Peter Brick, Tobias Schmid, OSRAM Opto Semiconductors GmbH (Germany) [8170-07]
11.40: **Design of high-efficient freeform LED lens for road illumination**, Mikhail A. Moiseev, Leonid L. Doskolovich, Nikolay L. Kazanskiy, Image Processing Systems Institute (Russian Federation) [8170-09]
12.00: **Optical design of adaptive automotive headlight system with digital micro-mirror device**, Cheng-Mu Tsai, Kun Shan Univ. (Taiwan); Yi-Chin Fang, National Kaohsiung First Univ. of Science and Technology (Taiwan) [8170-10]
Lunch/Exhibition Break 12.20 to 14.10

SESSION 3

Room: Asie **Wed. 14.10 to 15.30**
Laser and Projection

Session Chair: **Joshua M. Cobb**, Corning Tropol Corp. (United States)

- 14.10: **Design of extreme anamorphic laser illumination systems**, Alois M. Herkommer, Univ. Stuttgart (Germany); Holger Münz, Carl Zeiss Laser Optics GmbH (Germany); Rene M. Reichle, Univ. Stuttgart (Germany) [8170-11]
14.30: **Near-infrared laser illuminator for very long-range flash active imaging applications**, Yves Lutz, Nicolas Metzger, Institut Franco-Allemand de Recherches de Saint-Louis (France) [8170-12]
14.50: **A laser speckle reduction system**, Joshua M. Cobb, Paul F. Michalowski, Corning Tropol Corp. (United States) [8170-13]
15.10: **Mask aligner process enhancement by spatial filtering**, Uwe Vogler, Andreas Bich, SUSS MicroOptics SA (Switzerland); Lorenz Stürzebecher, Uwe D. Zeitner, Fraunhofer-Institut für Angewandte Optik und Feinmechanik (Germany); Reinhad Voelkel, SUSS MicroOptics SA (Switzerland); Michael Hornung, SUSS MicroTec Lithography GmbH (Germany) [8170-15]
Coffee Break 15.30 to 16.00

SESSION 4

Room: Asie **Wed. 16.00 to 17.00**
LED Coupling I

Session Chair: **Julius A. Muschaweck**, OSRAM GmbH (Germany)

- 16.00: **Optics detailed analysis of an improved collimation system for LED light sources**, Daniel Vázquez-Molini, Mario González Montes, Antonio Alvarez Fernandez-Balbuena, Univ. Complutense de Madrid (Spain); Angel Garcia-Botella, Univ. Politécnica de Madrid (Spain); Eusebio Bernabeu Martinez, Univ. Complutense de Madrid (Spain) [8170-16]
16.20: **Metal-less V-groove RXI collimator**, Dejan Grabovickic, Univ. Politécnica de Madrid (Spain); Juan Carlos Miñano Dominguez, Pablo Benítez, Light Prescriptions Innovators Europe, S. L. (United States); Jesús López, Univ. Politécnica de Madrid (Spain); Juan F. Vilaplana, Light Prescriptions Innovators Europe, S. L. (Spain); Guillermo Biot Mari, Marina Buljan, Univ. Politécnica de Madrid (Spain) [8170-17]
16.40: **LED collimation using high-index glass**, Ralf Biertümpfel, Steffen Reichel, SCHOTT AG (Germany) [8170-18]

Posters

Registration Foyer, World Trade Centre **Wed. 17.30 to 19.00**

Conference attendees are invited to attend the Optical Systems Design Poster Session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster session.

Methods for color mixing, Stefan Hadrath, OSRAM GmbH (Germany) [8170-23]

An application of low-discrepancy sequences to evaluation of illumination optical systems, Shuhei Yoshida, Shuma Horiuchi, Zenta Ushiyama, Kenta Yoshidome, Manabu Yamamoto, Tokyo Univ. of Science (Japan) [8170-28]

Smooth light extraction in lighting optical fiber, Antonio Alvarez Fernandez-Balbuena, Daniel Vazquez-Molini, Univ. Complutense de Madrid (Spain); Angel Garcia-Botella, Univ. Politécnica de Madrid (Spain); Juan Carlos Martinez-Anton, Eusebio Bernabeu Martinez, Univ. Complutense de Madrid (Spain) [8170-29]

Lighting quality for aluminum and prismatic light guides, Berta Garcia-Fernandez, Daniel Vazquez-Molini, Antonio Alvarez Fernandez-Balbuena, Univ. Complutense de Madrid (Spain) [8170-30]

Ultra-slim collimator with an inverse design, Emil Aslanov, Nikolay Petrov, Alexey Borodulin, Georgy Tananaev, LG Electronics Inc. (Russian Federation) [8170-33]

Thursday 8 September

SESSION 5

Room: Asie **Thurs. 09.00 to 10.00**
LED Coupling II

Session Chair: **Julius A. Muschaweck**, OSRAM GmbH (Germany)

09.00: **Dielectric multilayer angular filters for coupling LEDs to thin light guides**, Cong Mu, Hugo J. Cornelissen, Philips Research Nederland B.V. (Netherlands); Florian Bociort, Technische Univ. Delft (Netherlands) [8170-19]

09.20: **Optical design of a self-disinfecting operation interface powered by UV(A) LEDs**, Lynchao Ye, Paola Belloni, Knut Möller, Hochschule Furtwangen Univ. (Germany) [8170-20]

09.40: **A study of optical design of backlight module with external illuminance**, Chih-Ta Yen, National Formosa Univ. (Taiwan); Yi-Chin Fang, Cheng-Hsien Huang, National Kaohsiung First Univ. of Science and Technology (Taiwan) [8170-21]

Coffee Break 10.00 to 10.30

SESSION 6

Room: Asie. Thurs. 10.30 to 12.40

Optical Modeling

Session Chair: Stuart David, Synopsys, Inc. (United States)

- 10.30: **Using the on-axis BSDF at a dielectric surface to model the BSDF at off-axis angles** (*Invited Paper*), William J. Cassarly, Synopsys, Inc. (United States) [8170-22]
- 11.00: **Optics designs for an innovative LED lamp family system**, Herbert Weiss, OSRAM GmbH (Germany) [8170-31]
- 11.20: **What's in a ray set: moving toward a unified ray set format**, Julius A. Muschaweck, OSRAM GmbH (Germany) [8170-24]
- 11.40: **Optical model for LED with ceramic converter**, Alexander Linkov, Dominik Eisert, Matthias Sabathil, OSRAM Opto Semiconductors GmbH (Germany); Krister Bergenek, OSRAM GmbH (Germany); Madis Raukas, John Kelso, George C. Wei, Nathan Zink, OSRAM SYLVANIA Inc. (United States) [8170-25]
- 12.00: **Illumination design for an LED based projection display for flight instrument simulation**, Mike Thorpe, Kristy Dalzell, Chris Reimer, Stefan Atalick, Raytheon ELCAN Optical Technologies (Canada) [8170-26]
- 12.20: **Laser dark-field illumination system modeling for semiconductor inspection applications**, Wei Zhou, Darcy Hart, Rajiv Roy, Rudolph Technologies, Inc. (United States) [8170-27]

Conference 8171 • Room: Afrique

Monday-Tuesday 5-6 September 2011 • Proceedings of SPIE Vol. 8171

Physical Optics

Conference Chairs: **Daniel G. Smith**, Nikon Research Corp. of America (United States); **Frank Wyrowski**, Friedrich-Schiller-Univ. Jena (Germany); **Andreas Erdmann**, Fraunhofer-Institut für Integrierte Systeme und Bauelementetechnologie (Germany)

Programme Committee: **Donis G. Flagello**, Nikon Research Corp. of America (United States); **Ari T. Friberg**, Kista Photonics Research Ctr. (Sweden); **Hans Peter Herzig**, Ecole Polytechnique Fédérale de Lausanne (Switzerland); **Olivier J. F. Martin**, Ecole Polytechnique Fédérale de Lausanne (Switzerland); **Ivan Richter**, Czech Technical Univ. in Prague (Czech Republic); **Jani Tervo**, Univ. of Eastern Finland (Finland); **Peter Török**, Imperial College London (United Kingdom); **Michael Totzeck**, Carl Zeiss SMT AG (Germany); **Hendrik Paul Urbach**, Technische Univ. Delft (Netherlands); **Wei Wang**, Heriot-Watt Univ. (United Kingdom)

Monday 5 September

Opening Remarks

Room: Afrique **Mon. 13.15 to 13.20**
Tina E. Kidger, Optics Associates (United Kingdom);

SESSION 1

Room: Afrique **Mon. 13.20 to 15.30**
Polarization and Coherence I

Session Chair: **Daniel G. Smith**,
Nikon Research Corp. of America (United States)

13.20: **Temporal and spectral degrees of polarization of light** (*Invited Paper*), Philippe Réfrégier, Institut Fresnel (France); Tero Setälä, Aalto Univ. School of Science and Technology (Finland); Ari T. Friberg, Kista Photonics Research Ctr. (Sweden) [8171-01]

13.50: **Random media confer high-polarization degree to natural light**, Myriam Zerrad, Jacques Sorrentini, Gabriel Soriano, Claude Amra, Institut Fresnel (France) [8171-02]

14.10: **Evolution of vortex density in a nondiffracting speckle field with its continuous-phase removed**, Mingzhou Chen, Chris Dainty, National Univ. of Ireland, Galway (Ireland) [8171-03]

14.30: **Electromagnetic Hanbury Brown-Twiss phenomenon**, Timo Hassinen, Jani Tervo, Univ. of Eastern Finland (Finland); Tero Setälä, Aalto Univ. School of Science and Technology (Finland); Ari T. Friberg, Kista Photonics Research Ctr. (Sweden) [8171-04]

14.50: **Farther discussion of Huygens-Fresnel principle**, Zhiqiang Liu, Kiyoshi Uchikawa, Nikon Corp. (Japan) [8171-05]

15.10: **Physical property of structural color in butterflies**, Mei-Ling Lo, Cheng-Chung Lee, National Central Univ. (Taiwan) [8171-06]

Coffee Break 03.30 to 04.00

SESSION 2

Room: Afrique **Mon. 16.00 to 17.00**
Polarization and Coherence II

Session Chair: **Andreas Erdmann**, Fraunhofer-Institut für Integrierte System und Bauelementetechnologie (Germany)

16.00: **The nature of light coherence: photons**, Petro O. Demyanenko, Kostiantyn Demianenko, Fedir Demianenko, Yuri Zinkovskiy, National Technical Univ. of Ukraine (Ukraine) [8171-07]

16.20: **Analysis of intrinsic perturbation by thermal stress birefringence**, Chandrakant M. Jadhao, G.S. College of Khamgaon (India); Deepak S. Dhote, Brijlal Biyani Science College of Amravati (India) [8171-08]

16.40: **Polarization modeling in square ring resonators with the consideration of output mirror's stress effect**, Jie Yuan, Xingwu Long, Pengfei Zhang, Yu Wang, Meixiong Chen, Haodong Yang, Zhenglong Kang, National Univ. of Defense Technology (China) [8171-09]

Tuesday 6 September

SESSION 3

Room: Afrique **Tues. 08.50 to 09.50**
Polarization and Coherence III

Session Chair: **Kristian Motzek**, Fraunhofer-Institut für Integrierte System und Bauelementetechnologie (Germany)

08.50: **The minimum spanning tree method applied to the study of optical speckle fields: spatial characterization of a Gaussian transition and its phase singularities**, Olivier Vasseur, Debajyoti Upadhyay, Isabelle Bergoënd, Xavier Orlik, ONERA (France) [8171-10]

09.10: **Multiscale spatial depolarization: electromagnetism versus statistical optics**, Myriam Zerrad, Jacques Sorrentini, Gabriel Soriano, Claude Amra, Institut Fresnel (France) [8171-11]

09.30: **The observation of multiplication effect on space diffraction grating in laser-produced plasma**, Vladimir A. Skvortsov, Moscow Institute for Physics and Technology (Russian Federation); Nadeshda I. Vogel, Technische Univ. Chemnitz (Germany) [8171-12]

Coffee Break 10.00 to 10.30

SESSION 4

Room: Afrique **Tues. 10.30 to 12.50**
Beam Propagation

Session Chair: **Daniel G. Smith**,
Nikon Research Corp. of America (United States)

10.30: **Tests for assessing beam propagation algorithms** (*Invited Paper*), Bryan D. Stone, Synopsys, Inc. (United States) [8171-13]

11.00: **Efficient use of grating theories with partially coherent illumination** (*Invited Paper*), Jani Tervo, Univ. of Eastern Finland (Finland) [8171-14]

11.30: **Vectorial geometrical optics propagation using multi-scale boundary operators**, Michael Kuhn, LightTrans GmbH (Germany); Frank Wyrowski, Friedrich-Schiller-Univ. Jena (Germany) [8171-15]

11.50: **Gaussian beam mode analysis of optical pulses**, Ronan J. Mahon, Anthony Murphy, National Univ. of Ireland, Maynooth (Ireland) [8171-16]

12.10: **Non-sequential field tracing methods**, Michael Kuhn, LightTrans GmbH (Germany); Frank Wyrowski, Friedrich-Schiller-Univ. Jena (Germany) [8171-17]

12.30: **Low-splice loss design of DS and DF single-mode fibers**, Chandrakant M. Jadhao, G.S. College of Khamgaon (India); Deepak S. Dhote, Brijlal Biyani Science College of Amravati (India) [8171-18]

Lunch Break 12.50 to 14.10

SESSION 5

Room: Afrique **Tues. 14.10 to 17.00**
Topics in Microlithography

Session Chair: **Donis G. Flagello**,
Nikon Research Corp. of America (United States)

14.10: **Numerical optimization of illumination and mask layout for the enlargement of process windows and for the control of photoresist profiles in proximity printing** (*Invited Paper*), Kristian Motzek, Andreas Erdmann, Fraunhofer-Institut für Integrierte System und Bauelementetechnologie (Germany) [8171-19]

14.40: **Illumination pupilgram prediction and control method in advanced optical lithography**, Tomoyuki Matsuyama, Naonori Kita, Nikon Corp. (Japan); Daniel G. Smith, Nikon Research Corp. of America (United States) [8171-20]

15.00: **Predictive modeling of EUV-lithography: the role of mask, optics, and photoresist effects** (*Invited Paper*), Andreas Erdmann, Peter Evanschitzky, Feng Shao, Tim Fühner, Fraunhofer-Institut für Integrierte System und Bauelementetechnologie (Germany); Eric Hendrickx, Gian Lorusso, Anne-Marie Goethals, Rik Jonckheere, IMEC (Belgium); Tristan Bret, Thorsten Hofmann, Carl Zeiss SMS GmbH (Germany) [8171-21]

Coffee Break 15.30 to 16.00

16.00: **Analytical model for EUV mask diffraction field calculation**, Yuting Cao, Xiangzhao Wang, Shanghai Institute of Optics and Fine Mechanics (China) and Graduate School of the Chinese Academy of Sciences (China); Andreas Erdmann, Fraunhofer-Institut für Integrierte System und Bauelementetechnologie (Germany); Peng Bu, Yang Bu, Shanghai Institute of Optics and Fine Mechanics (China) and Graduate School of the Chinese Academy of Sciences (China) [8171-22]

Conference 8171

16.20: **Influence of geometry variations and defects on the near field optical properties of pulsed compression gratings**, Jianpeng Wang, Andreas Erdmann, Shijie Liu, Jianda Shao, Yunxia Jin, Hongbo He, Kui Yi, Shanghai Institute of Optics and Fine Mechanics (China) [8171-23]

16.40: **A ridge waveguide quantum well ALGAAS/GAAS laser beam design**, Marziyeh Nazari, Islamic Azad Univ. (Iran, Islamic Republic of) [8171-24]

Wednesday 7 September

Posters

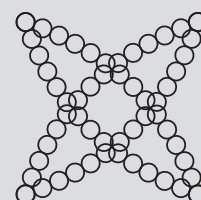
Registration Foyer, World Trade Centre Wed. 17.30 to 19.00

Conference attendees are invited to attend the Optical Systems Design Poster Session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster session.

Higher-order ghost imaging with partially polarized classical light, Henri Kellok, Tero Setälä, Aalto Univ. School of Science and Technology (Finland); Tomohiro Shirai, National Institute of Advanced Industrial Science and Technology (Japan); Ari T. Friberg, Aalto Univ. School of Science and Technology (Finland) [8171-26]

Corrected coupled-wave theory for non-slanted reflection gratings, L. Alberto Estepa, Cristian Neipp López, Jorge Francés Monllor, Andrés Márquez, Sergio Bleda, Manuel Pérez-Molina, Manuel Ortuño, Sergi Gallego, Univ. de Alicante (Spain) [8171-27]

Self-disappearance of the frequency doubling of light in germanium-silicate patterns, Vitaly A. Smirnov, Liubov I. Vostrikova, V. Lashkaryov Institute of Semiconductor Physics (Russian Federation) [8171-28]



Nanophotonics

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Optical Complex Systems: OCS11

Conference Chair: **G rard Berginc**, Thales (France)

Programme Committee: **Antoine Bourelly**, PELLENC Selective Technologies (France); **Marc P. De Micheli**, Univ. de Nice Sophia Antipolis, Lab. Physique de la Mati re Condens e (France); **Jean-Michel Decaudin**, Light Technologies (France); **Aristide C. Dogariu**, CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States); **Marc Ferrari**, Observatoire Astronomique de Marseille-Provence (France); **Fran ois R. Flory**, Ecole Centrale de Marseille (France); **Greg Gbur**, The Univ. of North Carolina at Charlotte (United States); **Hughes Giovannini**, Institut Fresnel (France); **Danhong Huang**, Air Force Research Lab. (United States); **Alexander V. Kildishev**, Purdue Univ. (United States); **Demetrio Labate**, SELEX Galileo S.p.A. (Italy); **Paul Lecoq**, CERN (Switzerland); **Kai Lenfert**, Kayser-Threde GmbH (Germany); **Alexei A. Maradudin**, Univ. of California, Irvine (United States); **Eugenio R. M endez**, Ctr. de Investigaci n Cient fica y de Educaci n Superior de Ensenada (United States); **Vasilis Ntziachristos**, Helmholtz Zentrum M nchen GmbH, IBMI (Germany); **Angela M. Piegari**, ENEA (Italy); **Alexander B. Shvartsburg**, Russian Academy of Sciences (Russian Federation); **Igor I. Smolyaninov**, BAE Systems (United States); **Sebastien Tanzilli**, Univ. de Nice Sophia Antipolis, Lab. Physique de la Mati re Condens e (France); **Jean-Marcel Traverre**, Commissariat   l' nergie Atomique (France); **Katia Mirochnitchenko**, P le Optique et Photonique sud (France); **Marjorie Maunier**, P le Optique et Photonique sud (France)

Monday 5 September

Opening Remarks

Room: Europe 57 Mon. 13.50 to 14.00
G rard Berginc, Thales (France)

SESSION 1

Room: Europe 57 Mon. 14.00 to 17.30
Biophotonics and Biomedical Optics
Session Chair: **Paul Lecoq**, CERN (Switzerland)

Introduction of the Keynote Speaker, Paul Lecoq, CERN (Switzerland)

14.00: **Illuminating biomedical discovery with advanced optical and opto-acoustic imaging** (*Keynote Presentation*), Vasilis Ntziachristos, Helmholtz Zentrum M nchen GmbH (Germany) [8172-01]

15.00: **Micrometer scale resolution images of human corneal graft using full-field optical coherence tomography (FF-OCT): link with the scattered intensity**, Olivier Casadessus, Ga lle Georges, Laure Siozade Lamoine, Carole Deumi , Institut Fresnel (France); Louis Hoffart, John Conrath, H pital de la Timone (France) [8172-02]

Coffee Break 15.20 to 15.50

15.50: **Optical system for monitoring the internal image of foods and human body**, Nur Aisha, Li Fugang, Tsuneaki Genta, Kenzo Yamaguchi, Mitsuo Fukuda, Toyohashi Univ. of Technology (Japan) [8172-03]

16.10: **Depth selectivity in biological tissues by polarization analysis of backscattered light**, Carole Deumi -Raviol, Anabela da Silva, Institut Fresnel (France) [8172-04]

16.30: **Snapshot Mueller polarimetry for biomedical diagnostic related to human liver fibrosis: evaluation of the method for biomedical assessments**, Philippe Babilotte, Matthieu Dubreuil, Sylvain Rivet, Yves Lijour, David Sevrain, Loic Martin, Guy Le Brun, Yann Le Grand, Bernard Le Jeune, Univ. de Bretagne Occidentale (France) [8172-05]

16.50: **Biomedical implications of dental-ceramic defects investigated by numerical simulation, radiographic, microcomputer tomography, and time-domain optical coherence tomography**, Cosmin G. H. Sinescu, Meda L. Negrutiu, Univ. de Medicina si Farmacie Victor Babes, Timisoara (Romania); Ciprian Ionita, Univ. at Buffalo (United States); Liviu Marsavina, Politehnica Univ. Timisoara (Romania); Adrian G. Podoleanu, Univ. of Kent (United Kingdom) [8172-06]

17.10: **Ceramic and polymeric dental onlays evaluated by photo-elasticity, optical coherence tomography, and micro-computed tomography**, Cosmin G. H. Sinescu, Univ. de Medicina si Farmacie Victor Babes, Timisoara (Romania); Adrian G. Podoleanu, Univ. of Kent (United Kingdom) [8172-07]

Tuesday 6 September

SESSION 2

Room: Europe 57 Tues. 08.50 to 12.00
Photonics for Safety, Security and Environment: Modeling and Simulation

Session Chair: **G rard Berginc**, Thales Optronique S.A. (France)

8.50 to 9.00: **Introduction of the Keynote Speaker**

09.00: **The scattering of light from two-dimensional randomly rough surfaces** (*Keynote Presentation*), Alexei A. Maradudin, Univ. of California, Irvine (United States) [8172-08]

Coffee Break 10.00 to 10.30

10.30: **Nonlinear modeling of active or passive optical Lamellar nanostructures** (*Invited Paper*), Alexander V. Kildishev, Xingjie Ni, Purdue Univ. (United States); Ludmila J. Prokopeva, Institute of Computational Technologies (United States) [8172-09]

11.00: **Numerical modeling of an active plasmonic metamaterial**, Ludmila J. Prokopeva, Institute of Computational Technologies (Russian Federation); Jan Trieschmann, Ruhr-Univ. Bochum (Germany); Thomas A. Klar, Johannes Kepler Univ. Linz (Austria); Alexander V. Kildishev, Purdue Univ. (United States) [8172-10]

11.20: **Light scattering from photofabricated random rough surfaces**, Gabriel Soriano, Lab. d'Optique des Surfaces Couches Minces (France); Guillaume Maire, Institut Mat riaux Micro lectronique Nanosciences de Provence (France); Hugues Giovannini, Institut Fresnel (France); Vincent Brissonneau, Thales Optronique S.A. (France); Fran ois Flory, Ecole Centrale Marseille (France); Ludovic Escoubas, Institut Mat riaux Micro lectronique Nanosciences de Provence (France); G rard Berginc, Thales Optronique S.A. (France) [8172-11]

11.40: **Optical properties and modeling of thin film including quantum dots: examples of CdSe/ZnS and ZnO in PMMA layers**, HungJu Lin, Yu-Jen Chen, National Central Univ. (Taiwan); Judika l Le Rouzo, Institut Mat riaux Micro lectronique Nanosciences de Provence (France); Sheng-Hui Chen, National Central Univ. (Taiwan); Fran ois Flory, Institut Mat riaux Micro lectronique Nanosciences de Provence (France) and Ecole Centrale Marseille (France); Cheng-Chung Lee, National Central Univ. (Taiwan) [8172-12]

Lunch/Exhibition Break 12.00 to 13.20

SESSION 3

Room: Europe 57 Tues. 13.20 to 17.40
Photonics for Safety, Security and Environment: Nano- and Metamaterials

Session Chair: **Fran ois R. Flory**, Institut Mat riaux Micro lectronique Nanosciences de Provence (France)

13:20 to 13:30: **Introduction of the Keynote Speakers**, G rard Berginc, Thales (France)

13.30: **Active plasmonic metamaterials: numerical modeling and optical characterization** (*Keynote Presentation*), Alexander V. Kildishev, Vladimir P. Drachev, Shumin Xiao, Xingjie Ni, Vladimir M. Shalaev, Purdue Univ. (United States) [8172-13]

14.30: **Tunneling of ultrashort EM wave pulses in gradient metamaterials: paradoxes and perspectives** (*Keynote Presentation*), Alexander B. Shvartsburg, Joint Institute for High Temperatures (Russian Federation) [8172-14]

Coffee Break 15.30 to 16.00

16.00: **Surface plasmon effect on metallic nanoparticles integrated in organic solar cells**, Sylvain Vedraine, Institut Mat riaux Micro lectronique Nanosciences de Provence (France); Veronique Gernigon, Institut d'Electronique du Solide et des Syst mes (France); Philippe Torchio, Institut Mat riaux Micro lectronique Nanosciences de Provence (France); Fran ois Flory, Ecole Centrale Marseille (France); Thomas Heiser, Patrick L v que, Institut d'Electronique du Solide et des Syst mes (France); Ludovic Escoubas, Institut Mat riaux Micro lectronique Nanosciences de Provence (France) [8172-15]

Conference 8172

16.20: **Random rough-surface photofabrication**, Vincent Brissonneau, Thales Optronique S.A. (France); François Flory, Ecole Centrale Marseille (France) and Institut Matériaux Microélectronique Nanosciences de Provence (France); Ludovic Escoubas, Institut Matériaux Microélectronique Nanosciences de Provence (France); Gérard Berginc, Thales Optronique S.A. (France); Gabriel Soriano, Guillaume Maire, Institut Matériaux Microélectronique Nanosciences de Provence (France); Hugues Giovannini, Institut Fresnel (France) [8172-16]

16.40: **Wavelength and temperature dispersion of refractive index of thin films**, Thomas M. Wood, Judikaël Le Rouzo, Institut Matériaux Microélectronique Nanosciences de Provence (France); François Flory, Ecole Centrale Marseille (France); Ludovic Escoubas, Institut Matériaux Microélectronique Nanosciences de Provence (France) [8172-17]

17.00: **Opto-electronic properties of photovoltaic solar cells including silicon nanowires**, Mingxuan Zhu, Judikaël Le Rouzo, Institut Matériaux Microélectronique Nanosciences de Provence (France); François Flory, Ecole Centrale Marseille (France); Vincent Brissonneau, Jean-Jacques Simon, Ludovic Escoubas, Institut Matériaux Microélectronique Nanosciences de Provence (France) [8172-18]

17.20: **Polarized light in nanogradient metamaterials**, Anatoly I. Kuzmichev, National Technical Univ. of Ukraine (Ukraine); Alexander B. Shvartsburg, Joint Institute for High Temperature (Russian Federation); Oleg D. Volpian, Yuriy A. Obod, Petr P. Yakovlev, M.F. Stelmakh Polyus Research and Development Institute (Russian Federation) [8172-51]

Wednesday 7 September

SESSION 4

Room: Europe 57 Wed. 08.50 to 12.30
Quantum Communication and Processing, Systems and Components

Session Chair: Marc P. De Micheli, Univ. de Nice-Sophia-Antipolis, Lab. Physique de la Matière Condensée (France)

8.50 to 09.00: **Introduction of the Keynote Speaker**

09.00: **Required Devices for Future Quantum Communications** (*Keynote Presentation*), Nicolas Sangouard, Univ. of Geneva, Group of Applied Physics, Optiq (Switzerland) [8172-19]

10.00: **Enabling quantum communication using integrated nonlinear optics** (*Invited Paper*), Virginia D'Auria, Friedemann Kaiser, Anthony Martin, Laurent Labonté, Marc P. De Micheli, Daniel B. Ostrowsky, Olivier Alibart, Sébastien Tanzilli, Univ. de Nice Sophia Antipolis, Lab. de Physique de la Matière Condensée (France) [8172-20]

Coffee Break 10.30 to 11.00

11.00: **Integrated quantum photonics for quantum information processing** (*Invited Paper*), Mark G. Thompson, Univ. of Bristol, Ctr. for Quantum Photonics (United Kingdom) [8172-21]

11.30: **Quantum memory for light in rare earth ion doped crystals** (*Invited Paper*), M. Bonarota, V. Damon, R. C. Tongning, M. F. Pascual-Winter, Anne Louchet-Chauvet, Thierry Chanelière, Lab. Aimé Cotton (France); Jean-Louis Le Gouet, Univ. Paris-Sud 11 (France) [8172-22]

12.00: **Development of superconducting single photon detectors for integrated quantum photonics applications** (*Invited Paper*), Roberto Leoni, Alessandro Gaggero, Istituto di Fotonica e Nanotecnologie (Italy); J. P. Sprengers, Technische Univ. Eindhoven (Netherlands); Francesco Mattioli, Istituto di Fotonica e Nanotecnologie (Italy); D. Sahin, S. J. Nejad, Technische Univ. Eindhoven (Netherlands); J. Beetz, Matthias Lerner, Martin Kamp, Sven Hoefling, Julius-Maximilians-Univ. Würzburg (Germany); Andrea Fiore, Technische Univ. Eindhoven (Netherlands) [8172-23]

Lunch/Exhibition Break 12.30 to 13.30

SESSION 5

Room: Europe 57 Wed. 13.30 to 14.30
Optical Systems for Sciences of the Universe

Session Chair: Marc Ferrari, Observatoire Astronomique de Marseille-Provence (France)

13.30: **Adaptive optics for large astronomical telescopes: a typical example of optical complex systems** (*Keynote Presentation*), Thierry Fusco, ONERA (France) [8172-24]

SESSION 6

Room: Europe 57 Wed. 14.30 to 15.30
Optical Systems for Science of the Universe: Adaptive Optics

Session Chair: Marc Ferrari, Observatoire Astronomique de Marseille-Provence (France)

14.30: **Comparison between analytical and "end-to-end" numerical modeling of astronomical adaptive optics systems**, Marcel Carbillat, Univ. de Nice Sophia Antipolis (France); Laurent Jollissaint, aquIAOptics (Switzerland) [8172-25]

14.50: **Experimental comparison of Wide Field AO control schemes for future AO-assisted systems on Extremely Large Telescopes**, Thierry Fusco, Amélie Parisot, Cyril Petit, ONERA (France) [8172-26]

15.10: **SAXO, the VLT-SPHERE extreme AO system, design, performance and experimental validation**, Cyril Petit, Thierry Fusco, Jean-Francois Sauvage, ONERA (France); Arnaud Sevin, Observatoire de Paris (France); Marcos Suarez, European Southern Observatory (Germany) [8172-27]

Coffee Break 15.30 to 16.00

SESSION 7

Room: Europe 57 Wed. 16.00 to 17.20
Optical Systems for Sciences of the Universe: New Concepts for Spectro-Imaging

Session Chair: Marc Ferrari, Observatoire Astronomique de Marseille-Provence (France)

16.00: **MAIA: a multispectral instrument for asteroseismology observations of hot subdwarf stars**, Jeroen Vandersteen, Gert Raskin, Steven Bloemen, Johan Morren, Roy Oestensen, Wim Pessemer, Saskia Prins, Jan Swevers, Hans Van Winckel, Conny Aerts, Katholieke Univ. Leuven (Belgium) [8172-28]

16.20: **DSI (Doppler Spectro-Imager): a new instrumental concept of imaging tachometer for the space mission EJSM**, Laurence Soulat, Lab. Fizeau (France); François-Xavier Schmider, Univ. de Nice Sophia Antipolis (France); Thierry Appourchaux, Institut d'Astrophysique Spatiale (France); Yves Bresson, Jean Gay, Observatoire de la Côte d'Azur (France); Jean-Baptiste Daban, Carole Gouvret, Sylvie Robbe-Dubois, Univ. de Nice Sophia Antipolis (France); Patrick Gaulme, Institut d'Astrophysique Spatiale (France) [8172-29]

16.40: **Imaging optimization and deconvolution techniques with a hypertelescope or a dense aperture masking (DAM)**, Fabien Patru, European Southern Observatory (Chile); Anthony Schutz, Marcel Carbillat, Lab. Fizeau (France); Jacopo Antichi, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); Julien Girard, European Southern Observatory (Chile) [8172-30]

17.00: **The Hypertelescope at work with a BIGRE-oriented integral field unit**, Jacopo Antichi, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); Fabien Patru, European Southern Observatory (Chile); Patrick Rabou, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); Enrico Giro, INAF - Osservatorio Astronomico di Padova (Italy); Julien Girard, European Southern Observatory (Chile); Denis Mourard, Observatoire de la Côte d'Azur (France) [8172-31]

Posters

Registration Foyer, World Trade Centre Wed. 17.30 to 19.00
Conference attendees are invited to attend the Optical Systems Design Poster Session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster session.

OCT and Rx validation of metal-ceramic crowns repaired with ceramic materials, Emanuela L. Petrescu, Univ. de Medicina si Farmacie Victor Babes, Timisoara (Romania) [8172-39]

The assessment of orthodontic bonding defects: optical coherence tomography followed by three-dimensional reconstruction, Roxana O. Rominu, Univ. de Medicina si Farmacie Victor Babes, Timisoara (Romania) [8172-40]

A new approach of en-face time-domain optical coherence tomography (C Scan OCT): dynamic aspects regarding ethyl acetate effects on cross-linked acrylic teeth, Adelina Elena Stoia, Univ. de Medicina si Farmacie Victor Babes, Timisoara (Romania); Adrian G. Podoleanu, Univ. of Kent (United Kingdom) [8172-41]

Optical investigations of various polymeric materials used in dental technology, Meda L. Negrutiu, Cosmin G. H. Sinescu, Florin Ionel Topala, Univ. de Medicina si Farmacie Victor Babes, Timisoara (Romania); Ciprian Ionita, Univ. at Buffalo (United States); Luciana Goguta, Corina Marcautuanu, Mihai Rominu, Univ. de Medicina si Farmacie Victor Babes, Timisoara (Romania); Adrian G. Podoleanu, Univ. of Kent (United Kingdom) [8172-42]

A new basis of polynomials for off-axis highly aspheric surfaces modelisation, Morgan Gray, Marc Ferrari, Sébastien Vives, Observatoire Astronomique de Marseille-Provence (France) [8172-43]

Fast catadioptric telescopes for CCD observation of transient events and space surveillance, Alexey N. Yudin, Anatoly V. Sankovitch, Santel Ltd. (Russian Federation) [8172-44]

Design of the optics for an imaging classic mount multi-etalon spectro-polarimeter for the next generation of ground-based solar telescopes, Vincenzo Greco, Istituto Nazionale di Ottica (Italy); Fabio Cavallini, INAF - Osservatorio Astrofisico di Arcetri (Italy) [8172-45]

Active optics: variable curvature mirrors for ELT laser guide star refocusing systems, Zalpha Challita, Emmanuel Hugot, Fabrice Madec, Marc Ferrari, David Le Mignant, Jean-Gabriel Cuby, Observatoire Astronomique de Marseille-Provence (France) [8172-46]

Compact imaging spectrometer with visible-infrared variable filters for Earth and planet observation, Angela M. Piegari, Anna Sytchkova, ENEA (Italy); Jiri Bulir, Institute of Physics of the ASCR, v.v.i. (Czech Republic); Michele Dami, Gianluca Aroldi, SELEX Galileo S.p.A. (Italy); Bernd Harnisch, European Space Research and Technology Ctr. (Netherlands) [8172-47]

Disturbance rejection analysis of LQG control for an adaptive optics system, Jean-Pierre Folcher, Univ. de Nice Sophia Antipolis (France) [8172-48]

Optical system to extract reflection coefficients and optical admittances of a thin film stack and its application in coating monitoring, Cheng-Chung Lee, Kai Wu, Yu-Jen Chen, Chien-Cheng Kuo, National Central Univ. (Taiwan) [8172-49]

Thursday 8 September

SESSION 8

Room: Europe 57 Thurs. 09.00 to 10.00
Photonics for Safety, Security and Environment:
Applications, Optical Coatings, Thin Films

Session Chair: François R. Flory, Institut Matériaux Microélectronique
 Nanosciences de Provence (France)

09.00: **Reflection coefficients and optical admittances loci monitoring for thin film coatings and its applications to optical systems** (*Keynote Presentation*), Cheng-Chung Lee, National Central Univ. (Taiwan) [8172-32]
 Coffee Break 10.00 to 10.30

SESSION 9

Room: Europe 57 Thurs. 10.30 to 11.30
Photonics for Safety, Security and Environment:
Applications, Identification, Detection

Session Chair: François R. Flory, Institut Matériaux Microélectronique
 Nanosciences de Provence (France)

10.30: **Advanced algorithms for identifying targets from a three-dimensional reconstruction of sparse 3D ladar data**, Ion Berechet, SISPIA (France); Gérard Berginc, Thales Optronique S.A. (France) [8172-33]
 11.10: **Wide field-of-view all-reflective objectives designed for multispectral image acquisition in photogrammetric applications**, Kristof Seidl, Technische Univ. Dresden (Germany) and Fraunhofer-Institut für Photonische Mikrosysteme (Germany); Jens Knobbe, Fraunhofer-Institut für Photonische Mikrosysteme (Germany); Katja Apelt, Hans-Gerd Maas, Technische Univ. Dresden (Germany) [8172-34]

SESSION 10

Room: Europe 57 Thurs. 11.30 to 12.10
Photonics for Safety, Security and Environment:
Applications of Photonics

Session Chair: François R. Flory, Institut Matériaux Microélectronique
 Nanosciences de Provence (France)

11.30: **A study of blue-ray pickup head optical system with liquid-crystal optics module**, Chih-Ta Yen, National Formosa Univ. (Taiwan); Yi-Chin Fang, Chen-Mu Tsai, National Kaohsiung First Univ. of Science and Technology (Taiwan) [8172-35]
 11.50: **Application of visible spectroscopy in waste sorting**, Philippe Spiga, Antoine Bourelly, PELLENC Selective Technologies (France) [8172-36]

Closing Remarks

Room: Europe 57 Thurs. 12.10 to 12.30

Afternoon Company Visits
Thursday 8 September

Pole Optique & Photonique, POPSud, the co-organizer of Optical Complex Systems 2011 Conference, invites you to take part in visiting the regional optics/ photonics companies and labs. This company visit is scheduled for Thursday, 8 September.

These visits will allow you to interact with major optics/photonics players of Region of Provence-Alpes-Côte d'Azur. Companies and laboratories will show you their know-how, the last lines of R&D, and the latest products on the market in the fields of optics and photonics.

Three separate visits will be organized:

A visit to the Fresnel Institute (<http://www.fresnel.fr/>), and the **Laboratoire d'Astrophysique de Marseille** (<http://lam.oamp.fr/>). (Both institutes are located in Marseille)

SCHEDULE:

- Departure from the Congress Ctr.: 13.40
- Institut Fresnel: 14.30 to 16.00
- Laboratoire d'Astrophysique de Marseille: 16.45 to 17.45
- Technoptic hotel (<http://www.popsud.org/fr/territoire/hotel-technoptique>)
- Return to the Congress Ctr: 18.30

A visit to two companies in Aix-en-Provence: PellencST(<http://www.pellencst.com/en/>), **Thalès SESO** (<http://www.seso.com/uk/index.htm>).

SCHEDULE:

- Departure from the Congress Ctr.: 12.30
- Pellenc ST: 13.45 to 14.45
- Thalès SESO: 15.40 to 16.40
- Return to the Congress Ctr: 18.00

A visit to two companies: CILAS (www.cilas.com) and **STIL** (www.stil.com).

SCHEDULE:

- Departure from the Congress Ctr.: 13.00
- CILAS: 14.00 to 15.30
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- Return to the Congress Ctr: 18.30

Space is limited to 20 people, and you must register to attend.
 Please check at the registration desk to see if space is available.



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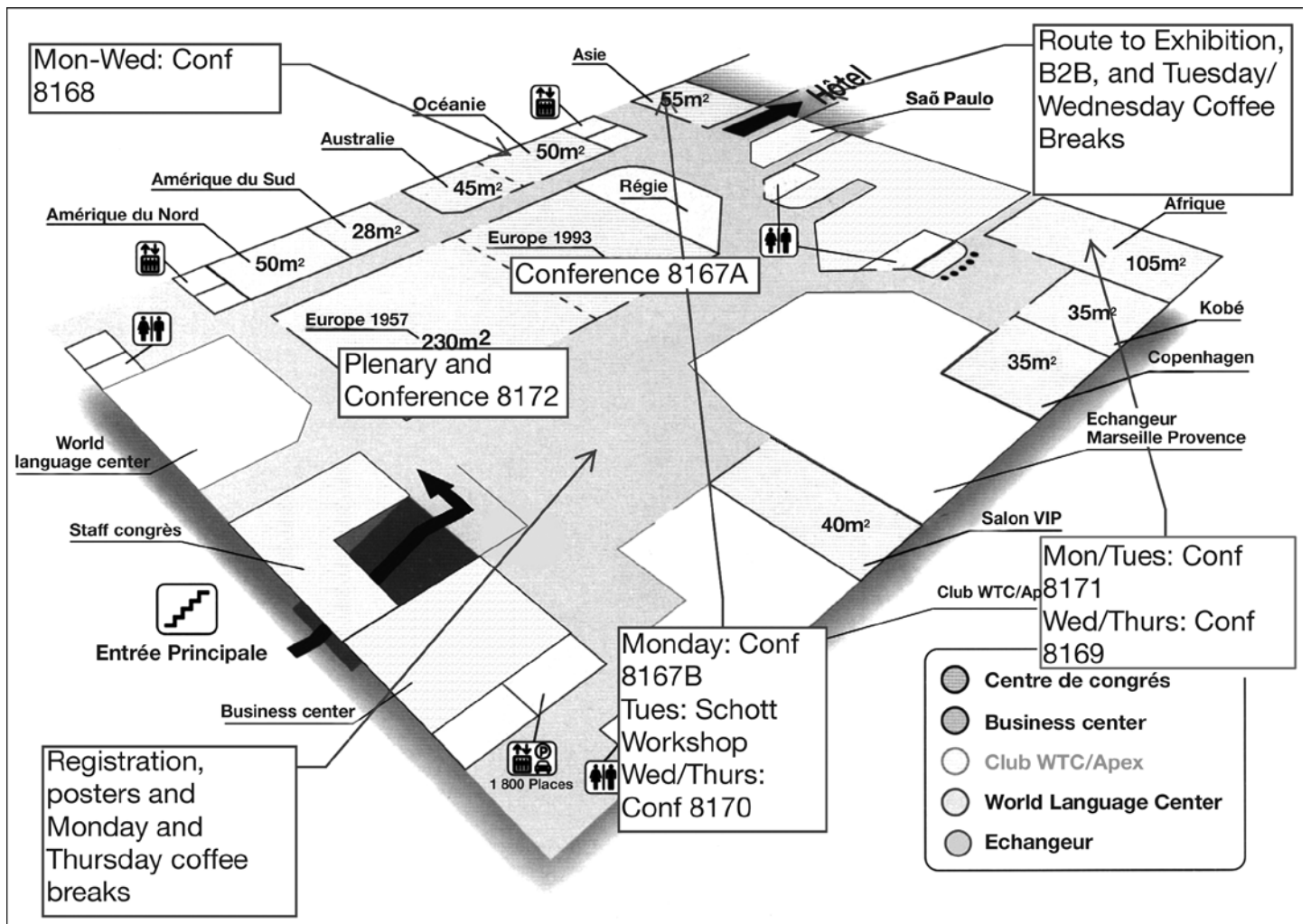


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| | |
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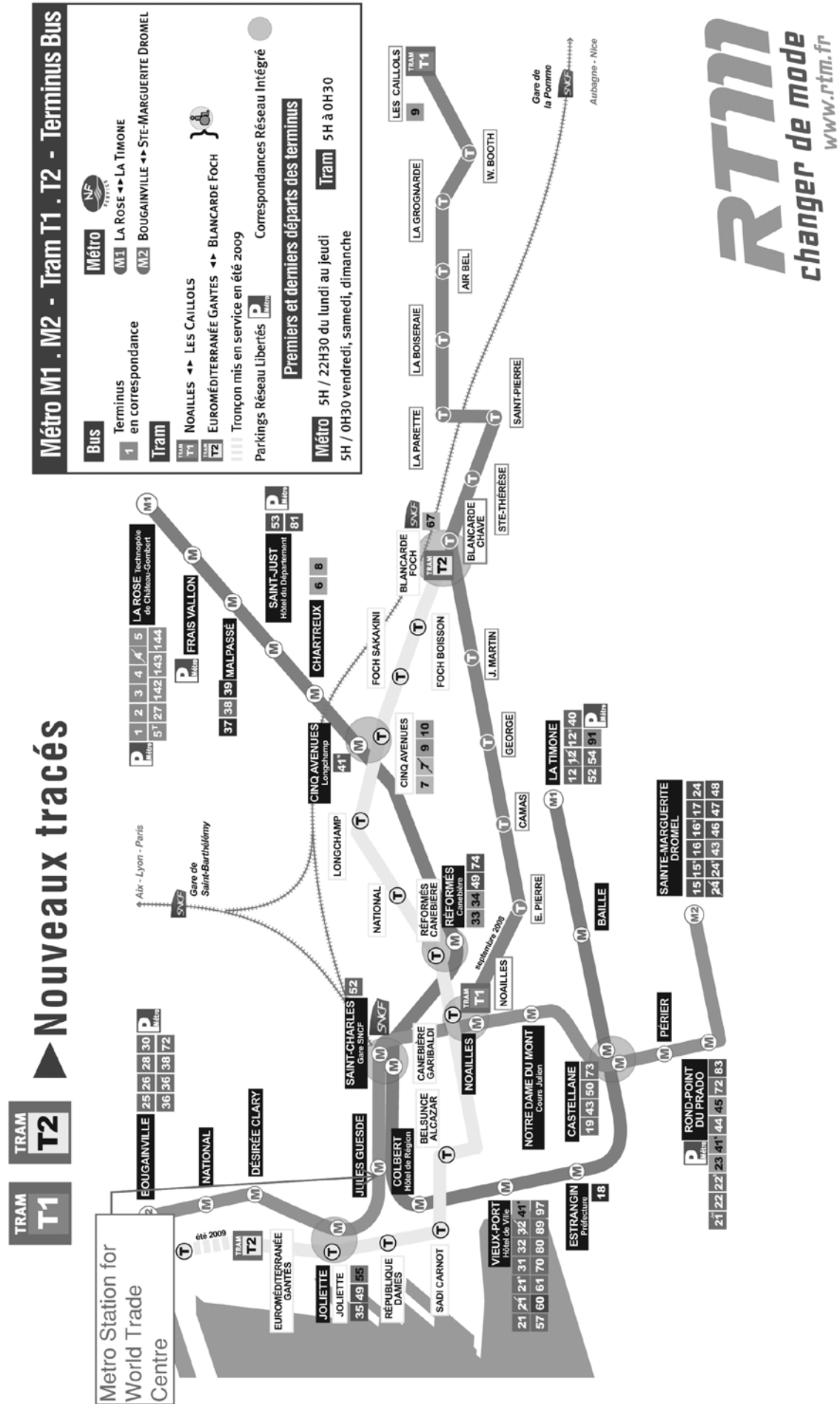
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