Advance Technical Programme

SPIE Europe
Optics+ Optoelectronics

20–23 April 2009

Prague Congress Centre
Prague, Czech Republic

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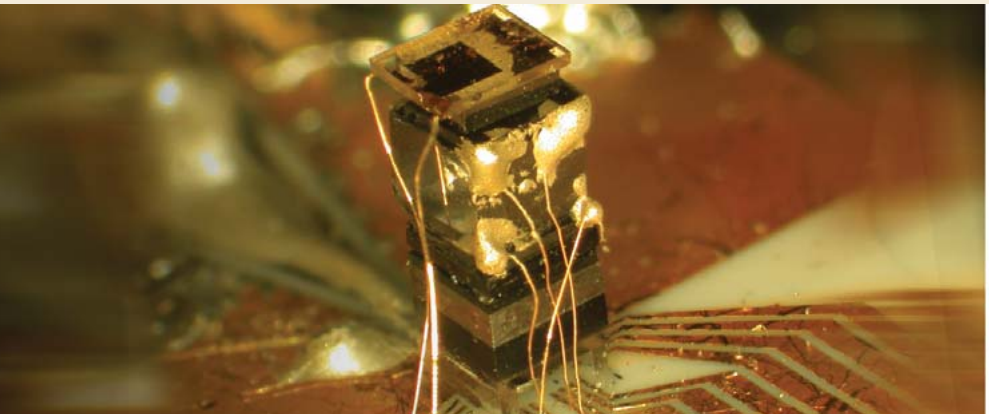

- Metamaterials
- Nonlinear Optics and Its Applications
- Photon Counting Applications
- Quantum Optics and Quantum Information Transfer and Processing
- Optical Sensors
- Photonic Crystal Fibres
- Holography: Advances and Modern Trends
- Harnessing Relativistic Plasma Waves as Novel Radiation Sources from Terahertz to X-rays and Beyond
- EUV and X-ray Optics: Synergy between Laboratory and Space
- Damage to VUV, EUV, and X-ray Optics

Plus

- Hot Topics
- Workshops:
  - Emerging European Laser Facilities: Beyond Petawatt
  - CESLAB: Challenges in Optics and Optoelectronics

SPIE Europe

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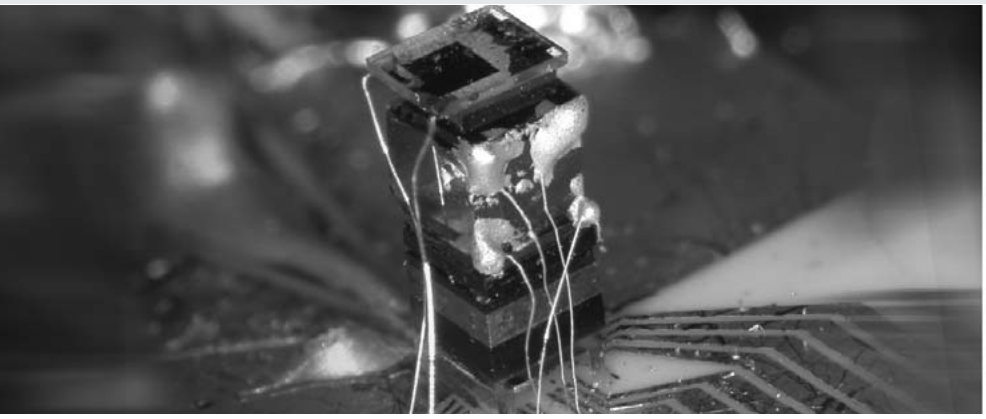

Participate in a cutting-edge regional forum focused on optics and optoelectronics.

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Cooperating Organisations

Fyzikální ústav Akademie věd ČR

Institute of Physics, Academy of Sciences of the Czech Republic

XRL department of x-ray lasers

Institute of Physics

Czech & Slovak Society for Photonics

Photonics Society of Poland

SPIE Connecting minds Advancing light.

Left cover image courtesy of National Institute of Standards and Technology.

Contents

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Plan Now to Attend!

Participants from countries all over the world are invited to attend SPIE *Europe* Optics + Optoelectronics to be held in Prague, Czech Republic, April 20-23, 2009. Following the success and excellent feedback for its 2007 Prague debut, Optics + Optoelectronics has returned to the Czech Republic in 2009.

This Central European conference series has become a networking platform enabling exchange of recent research advances in optics and optoelectronics, stimulate discussion about novel concepts and fields of applications; promote dissemination of scientific results; and offer opportunities to ask questions, support discussions, and enable networking among fellow researchers.

The event will bring forward the latest advances in instruments and devices development: from x-ray optics, photonic manufacturing, to emerging nanotechnologies—among many other cutting-edge topics. The event will begin with a comprehensive "hot topics" session, and will feature workshops discussing the latest European effort and advances in Emerging High-Power European Laser Facilities as well as the new Central European Synchrotron Laboratory project.

We invite all researchers, scientists, engineers, and application and product developers to join their colleagues and share results related to the conference topics described here. Visit the city of hundred spires; the magical city of bridges, cathedrals, gold-tipped towers and church domes. We welcome you to feel at home in Czech Republic. Please come and join us for this exciting meeting in Prague!

General Chairs:

Pavel Tomanek, Brno Univ. of Technology, Czech Republic

Alan Michette, King's College London, United Kingdom

Bahaa Saleh, Boston Univ., USA

Honorary Chair:

Jan Perina, Sr., Palacky Univ., Czech Republic

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Plenary Presentation: **Quantum Free Electron Laser** *(Bonifacio),* 10.35 to 11.20, p. 5				
Plenary Presentation: **Meopta–optika, s.r.o.: Manufacturer of High-Tech Products** *(Rausnitz),* 11.20 to 12.05, p. 5				
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		Conf. 7361: **Damage to VUV, EUV, and X-ray Optics II** (XDam2) *(Juha, Bajt),* p. 23		

Hot Topics Plenary Session

Monday 20 April . . . . . 8.30 to 12.05

Optics+Optoelectronics will begin with a Hot Topic Session. The Hot Topics will feature Europe's leading scientists discussing the most recent scientific breakthroughs. The session will also serve as a platform for new information updates on the European Commission's Framework 7 programme.

8.30 to 8.50

Welcome and Introduction

8.50 to 9.20

Photonics: The European Vision

John Magan, Deputy Head of Photonics Unit, European Commission, Information Society and Media Directorate-General, Belgium

9.20 to 10.05

Photon Physics: From Wave Mechanics to Quantum Electronics

Ole Keller, Institute of Physics and Nanotechnology Aalborg Univ., Denmark

10.35 to 11.20

Quantum Free Electron Laser

Rodolfo Bonifacio, Instituto Nationale Fisica Nucleare (INFN), Univ. degli Studi di Milano, Italy; visiting professor, Univ. of Strathclyde, UK

11.20 to 12.05

Meopta-optika, s.r.o.: Manufacturer of High-Tech Products

Gerry Rausnitz, CEO and President, Meopta-optika a.s., Czech Republic and President, Meopta U.S.A. Inc., USA

Welcome Reception

Strahov Monastery Brewery

Monday 20 April . . . . . 18.30 to 20.30

All attendees are invited to attend the Welcome Reception which will be held at the Strahov Monastery Brewery near the Prague castle. Relax, socialize, and enjoy light refreshments. Please remember to wear your conference registration badges. Dress is casual. For details on how to get to the venue, please check with the registration desk.

Poster Session and Reception

Conference Area Hallway

Tuesday 21 April . . . . . 17.45 to 19.15

All symposium attendees are invited to attend the Tuesday 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.

Poster presenters may post their papers starting at 10.00 hrs on Tuesday in the Conference Area Hallway. Any papers left on the boards following the end time of the poster session will be considered unwanted and will be discarded. SPIE *Europe* assumes no responsibility for posters left up after the end of the poster session. Poster authors should be at their papers from 17.45 to 19.15 hrs to answer questions from attendees. Attendees are requested to wear their conference registration badges to the poster sessions.

Exhibition

Congress Hall Foyer B - 1st Floor

Tuesday 21 April . . . . . 10.00 to 17.00

Wednesday 22 April . . . . . 10.00 to 16.00

Optics+Optoelectronics brings together exhibitors, from both the local region and the international optics and photonics community, to showcase a wide range of products and services.

Workshops

Emerging European Laser Facilities: Beyond Petawatt (WK01)

Tuesday 21 April . . . . . 9.00 to 17.00

Chairs: **Luis Roso,** Univ. de Salamanca (Spain): **Bedrich Rus,** Institute of Physics, Academy of Sciences of the Czech Republic

The Emerging European Laser Facilities: Beyond Petawatt Workshop focuses on the present status and progress reports of the transnational projects such as HiPER, ELI, and XFEL. Invited lectures by the leading scientists and industry players will provide overview of these new High-Power Laser facilities as well as their user communities. The Workshop will serve as a forum to explore further posibilities for transnational collaborations and to discuss the future of multilateral initiatives of such large size.

9.00 to 9.10: **Welcome and Introduction**
Luis Roso, Univ. de Salamanca (Spain); **Bedrich Rus,** Institute of Physics, Academy of Sciences of the Czech Republic

9.10 to 9.40: **Introduction to ESFRI Roadmap**
Maria Douka, European Commission (Belgium)

9.40 to 10.10: **High-Power Lasers**
François Gounand, CEA (France); Former Chaiman ESFRI Commission on High Power Lasers

10.10 to 10.40: **Coffee Break**

10.40 to 11.10: **Extreme Light Infrastructure (ELI)**
Gerard Mourou, Laboratoire d' Optique Appliquée, Ecole Nationale Supérieure de Technique Avancée and Ecole Polytechnique (France), Coordinator of ELI Preparatory Phase

11.10 to 11.50: **HiPER, European High Power laser Energy Research Facility**
Mike Dunne, Central Laser Facility, Rutherford Appleton Lab. (United Kingdom), Coordinator of HIPER Preparatory Phase

11.50 to 12.30: **XFEL-Paving the way: SWOT (Weaknesses, Threats, Strengths, Opportunities) Analysis of the High-Power Laser Roadmap**
Speaker to be announced, Deutsches Elektronen-Synchrotron (Germany)

12.30 to 14.00: **Lunch Break**

14.00 to 15.00 **Large Laser Facilities as an Industrial Engine**

15.00 to 15.30: **Coffee Break**

15.30 to 17.00: **Round Table Discussion**: **Emerging European Laser Facilities: Beyond Petawatt**
Moderator: **Luis Roso,** Univ. de Salamanca (Spain)

CESLAB: Challenges in Optics and Optoelectronics (WK02)

Thursday 23 April . . . . . 8.30 to 16.30

Chairs: **Jaromir Hrdy,** Institute of Physics, Academy of Sciences of the Czech Republic; **Petr Mikulik,** Masaryk Univ., Czech Republic

The Central European Synchrotron Laboratory, CESLAB, will be a modern third-generation electron synchrotron facility with energy of 3 GeV, scheduled to launch its service to Central Europe in 2015. The facility will not only serve the needs of the Czech science, research and industry, but also the Central European partners from Slovakia, Austria, Hungary, and others.

Currently, preparation work is underway on more than 10 beamlines dedicated to structural biology, imaging techniques, biomedicine, structural chemistry, material sciences, nanotechnologies, and the environmental research.

The CESLAB Challenges in Optics and Optoelectronics Workshop will feature invited presentations by skilled experts, and will be followed by a Panel Discussion Forum. The workshop will provide a platform to discuss the potential effects of the Central European Synchrotron Laboratory (CESLAB) on the future advances in Optics and Optoelectronics.

In addition to the invited lectures and panel discussion, the workshop will accept submissions addressing the most recent advances in optics for synchrotron radiation. 250-500 word summaries should be sent to RNDr. Jaromir Hrdy, DrSc. at hrdy@fzu.cz

Plenary Sessions

Monday 20 April . . . . . 8.30 to 12.05

8.30 to 8.50

Welcome and Introduction

2009 Symposium Chairs: **Pavel Tomanek,** Brno Univ. of Technology, Czech Republic; **Alan Michette,** King's College London, United Kingdom

2009 SPIE President: **Maria Yzuel,** University Autònoma de Barcelona, Spain

8.50 to 9.20

Photonics : The European Vision

John Magan, Deputy Head of Photonics Unit, European Commission, Information Society and Media Directorate-General, Belgium

The speaker will present an overview of the relevant developments in Photonics research in Europe, including the opportunities for funding research at European level as well as some new initiatives at national level. The future opportunities will be placed in the global context of European strengths and upcoming developments in the photonics market. The speaker will also address the many challenges which face the innovator, such as fragmentation of research effort, adequate financing, access to research infrastructure as well as the supply of the skilled people needed to grow the photonics industry.

Biography: **John Magan** received a Ph.D. in laser physics from Trinity College Dublin in 1989. After working for Hoechst AG in Germany from 1989 to 1992, where he was responsible for setting up an industrial laser lab, he joined the European Commission where he has worked in research funding in the Community's Information and Communication Technologies programmes. In 2007 he was appointed deputy head of the photonics unit on its creation.

9.20 to 10.05

Photon Physics: From Wave Mechanics to Quantum Electronics

Ole Keller, Institute of Physics and Nanotechnology Aalborg University, Denmark

The birth of quantum field radiation theory, developed in the years 1925-30, did not mean that the particle concept of light was given up. Beautiful wave mechanical theories for the photon were established by Landau and Peierls [1930], and by Oppenheimer[1931]. Over the years physicists interest in photon wave mechanics has waxed and waned, but never fallen to rest. The wave mechanical theory of the photon (a first-quantized theory based on a reinterpretation of the microscopic Maxwell-Lorentz equations) can be extended to the QED-level, and in the modern formulation the theory has given us valuable new insight in subjects such as spatial photon localization, single-photon wave packet emission from atoms, the near-field photon concept, transverse photon mass and eikonal theory, photon tunnelling, rim zone causality, and the photon position operator problem.

Biography: **Ole Keller** is a physical optics theorist. In recent years he has worked on fundamental aspects of the microscopic electrodynamics of mesoscopic systems, nonlinear optics of BCS-superconductors, the quantum theory of near-field optics, photon tunnelling, spatial photon localization, and photon wave mechanics. He has a Doctor of Science degree from the University of Århus, and a Ph.D degree from the Technical University of Denmark in Copenhagen He is a fellow of the Optical Society of America, in recognition of his contributions to microscopic optical theories of mesoscopic media.

10.05 to 10.35: Coffee Break

10.35 to 11.20

Quantum Free Electron Laser

Rodolfo Bonifacio, Instituto Nationale Fisica Nucleare (INFN), Univ. degli Studi di Milano, Italy; visiting professor, Univ. of Strathclyde, UK

Co-authors: N. Piovella, Univ. di Milano, Italy; G. Robb, Dino Jaroszynski, Univ. of Strathclyde, United Kingdom

We propose a new quantum description of the electron beam, described as the Quantum FEL (QFEL) regime. In this QFEL regime the interaction must be treated quantum mechanically, analogous to a two-level atomic system, which results in the prediction of intrinsic coherence that results in a linewidth three to four orders of magnitude smaller than the corresponding classical SASE linewidth. Conceptually, this is a novel macroscopic quantum coherence effect. This can be realised very compactly by Compton backscattering a laser pulse from a cold electron beam. The QFEL can provide an ultra compact source of coherent radiation also below the Angstrom region.

In this study we describe the basic physics of a novel macroscopic quantum coherence phenomena: the Quantum Free Electron Laser (QFEL). Unlike the classical FEL, where the momentum spread is larger than the emitted photon momentum hk, in QFEL the energy spread is smaller, so that the discreteness of the momentum quantization plays a fundamental role. In the self-amplified spontaneous emission (SASE) mode operation a quantum coherence effect takes place. Whereas in the classical situation the spectrum of the emitted radiation is formed by many incoherent random spikes, in the quantum regime the system radiates coherently a single Superradiant spike whose spectrum is a single very narrow line. The current international XFEL programmes attempting to reach the 1 Angstrom region of the spectrum are based on this classical theory of SASE. Despite the high average radiation power (~10GW), they produce radiation pulses with relatively poor temporal coherence. We show that the quantum FEL can be described using quantum fluid equations which in the classical limit reduce to well known equations in plasma physics. The QFEL requires a laser wiggler and a cold electron beam, so it can be realized as a very convenient table-top source in the Angstrom region. Towards this end, the possibility of using a laser-plasma wakefield accelerator and a plasma channel to guide the FEL radiation will be briefly discussed.

Biography: In 1984 **Rodolfo Bonifacio** laid down the foundations for the high gain free-electron laser (FEL) starting from noise, the so-called Self-Amplified Spontaneous Emission (SASE) FEL which is now central to several billion dollar X-ray FEL (XFEL) programmes around the world. In 1994 he developed a complete theory of SASE radiation which predicted the temporal structure and spectrum. Rodolfo Bonifacio is a recipient of a number of scientific awards that — among others — include the Michelson Medal of the Franklin Institute for his theoretical studies of Optical Bistability and the Einstein Medal of the Society for Quantum Optics and Quantum Electronics for his work on the free-electron laser. Recently, Professor Bonifacio and colleagues have proposed a quantum description of the electron beam, which predicts a completely new regime for the FEL: the Quantum FEL (QFEL) regime.

11.20 to 12.05

Meopta–optika, s.r.o.: Manufacturer of High-Tech Products

Gerry Rausnitz, CEO and President, Meopta-optika a.s., Czech Republic and President, Meopta U.S.A. Inc., USA

The presentation will discuss Meopta as a successful business enterprise with a wide range of diversified, high-tech manufacture as well as its own research and development in numerous areas of optics, mechanics, and optoelectronics. Company portfolio includes products of sports and military optics, such as day and night vision observation and spotting binoculars. Meopta's optics systems for radiologic video displays and subsystems for analyzing body fluids using luminescence represents company's contributions to the medical industry; and dispersion prism systems used by DLP projectors also belong to the line of digital projection techniques developed and distributed by Meopta. Other high-tech ventures include Meopta's cooperation with companies as a developer and manufacturer of testing subsystems for semiconductor elements based on reflection and dispersion of ultraviolet radiation.

In order to retain its high technical level, cooperation with universities and scientific institutions is of great importance to the company. Based on this cooperation Meopta has carried out a number of experiments in the field of micromanipulation using optical traps, forming and controlling of luminous beam using stereometric modulators and diffraction optical elements. Development of modules using light forceps for microelements, which usage is expected in medical and microbiological area, has accounted as one of the accomplishments of this cooperation.

Biography: **Gerry Rausnitz** is the CEO and President of Meopta Optika in Prerov, Czech Republic. With over 2,500 employees, Meopta is a world leader in research and production of optical, optronic, and opto-electrical products for aerospace, military, medical, industrial, and other applications.

Following his 30 years as the President of Tyrolit Co. Inc., manufacturer of fine optical products for industrial and military applications, Gerry joined the Board of Directors at Meopta in 1996, and started establishing a vision for the future of the company. Since 2003, as the CEO and President of Meopta, Gerry has introduced modern technologies and business practices thus enabling the company to compete in world markets. Gerry is also the President of Meopta U.S.A., Meopta's U.S. affiliate.

Conference 7353

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Metamaterials IV

Conference Chairs: **Vladimir Kuzmiak,** Institute of Photonics and Electronics (Czech Republic); **Peter Markos,** Slovak Univ. of Technology (Slovakia); **Tomasz Szoplik,** Warsaw Univ. (Poland)

Programme Committee: **Nader Engheta,** Univ. of Pennsylvania (USA); **Didier Felbacq,** Univ. Montpellier II (France); **Francisco Javier García de Abajo,** Consejo Superior de Investigaciones Científicas (Spain); **Nigel P. Johnson,** Univ. of Glasgow (United Kingdom); **Maria Kafesaki,** Institute of Electronic Structure and Laser of the Foundation for Research and Technology-Hellas (Greece); **Yuri S. Kivshar,** The Australian National Univ. (Australia); **Didier Lippens,** Institut d'Electronique de Microélectronique et de Nanotechnologie (France); **Ekmel Özbay,** Bilkent Univ. (Turkey); **Dorota A. Pawlak,** Instytut Technologii Materialów Elektronicznych (Poland); **Concita Sibilia,** Univ. degli Studi di Roma, La Sapienza (Italy); **Costas M. Soukoulis,** Iowa State Univ. (USA); **Sergei Tretyakov,** Helsinki Univ. of Technology (Finland); **Martin Wegener,** Univ. Karlsruhe (Germany); **Nikolay I. Zheludev,** Univ. of Southampton (United Kingdom); **Richard W. Ziolkowski,** The Univ. of Arizona (USA)

Monday 20 April

Opening Remarks . . . . . Mon. 13.30 to 13.40

Vladimir Kuzmiak, Institute of Photonics and Electronics (Czech Republic); **Peter Markos,** Slovak Univ. of Technology (Slovakia); **Tomasz Szoplik,** Warsaw Univ. (Poland)

SESSION 1 . . . . . Mon. 13.40 to 15.10

Metamaterials I

Session Chair: **Kurt Busch,** Univ. Karlsruhe (Germany)

Spatial dispersion in a wire mesh metamaterial *(Invited Paper)*, Didier Felbacq, Univ. Montpellier II (France); Guy Bouchitte, Univ. de Toulon et du var (France); Brahim Guizal, Univ. Montpellier II (France) . . . . . .[7353-01]

Low-loss infrared metallo-dielectric metamaterials: theory and applications, Boubacar Kante, André de Lustrac, Jean Michel Lourtioz, Univ. Paris-Sud (France) . . . . . .[7353-02]

Negative and imaginary permittivity in 2D photonic macroporous silicon structures, Lyudmila A. Karachevtseva, Vitaliy I. Ivanov, Volodimyr F. Onishchenko, Olena J. Stronska, V. Lashkariov Institute of Semiconductor Physics (Ukraine) . . . . . .[7353-03]

Negative effective permeability of multilayers of ordered arrays of metal-dielectric nanosandwiches, Christos Tserkezis, Nikolaos Stefanou, Georgios Gantzounis, Univ. of Athens (Greece); Nikolaos Papanikolaou, National Ctr. for Scientific Research Demokritos (Greece) . . . . . .[7353-04]

SESSION 2 . . . . . Mon. 15.30 to 17.40

Metamaterials II

Session Chair: **Peter Markos,** Slovak Univ. of Technology (Slovakia)

2D metamaterials: from simple to complex--coupling matters! *(Invited Paper)*, Harald W. Giessen, Univ. Stuttgart (Germany) . . . . . .[7353-05]

Kramers-Kronig relations in one-dimensional dispersive photonic crystals, Michael Bergmair, Ulrich Dobramysl, Kurt Hingerl, Johannes Kepler Univ. Linz (Austria) . . . . . .[7353-06]

Metamaterial absorber with wide angular and frequency bandwidth, Alessandro Toscano, Lucio Vegni, Univ. degli Studi di Roma Tre (Italy)[7353-07]

Infrared metamaterials and plasmons engineering, Boubacar Kante, André de Lustrac, Jean Michel Lourtioz, Univ. Paris-Sud (France) . . . . . .[7353-08]

Propagation and tunneling of electromagnetic waves through uniaxial metamaterials at arbitrary orientations of the optical axis, Evgenii G. Starodubtsev, Gomel State Technical Univ. (Belarus) . . . . . .[7353-09]

Optics of metamaterials based on channelled mirror structures, Eugene Y. Glushko, Institute of Semiconductor Physics (Ukraine) . . . . . .[7353-10]

Tuesday 21 April

SESSION 3 . . . . . Tues. 09.00 to 12.00

Modelling of Metamaterials

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

Analysis of metallic nanostructures via a discontinuous-Galerkin time-domain approach *(Invited Paper)*, Kurt Busch, Univ. Karlsruhe (Germany) . . . . . .[7353-11]

Analytical modelling of linear and nonlinear properties of metamaterials based on multipole expansion, Arkadi Chipouline, Jörg Petschulat, Ekaterina Pshenay-Severin, Friedrich-Schiller-Univ. Jena (Germany); Andreas Tünnermann, Fraunhofer-Institut für Angewandte Optik und Feinmechanik (Germany); Thomas Pertsch, Christoph Menzel, Thomas Paul, Falk L. Lederer, Friedrich-Schiller-Univ. Jena (Germany) . . . . . .[7353-12]

Monte Carlo analysis of local distribution of negative refractive index in nanosphere-doped liquid crystal metamaterial, Grzegorz Pawlik, Michal Jarema, Wiktor T. Walasik, Antoni C. Mitus, Warsaw Univ. of Technology (Poland) . . . . . .[7353-13]

Magneto-optical response enhancement in 1D and 2D magnetoplasmonic crystals, Andrey A. Fedyanin, Alexander G. Zhdanov, Andrey Grunin, Boris B. Tsema, Alexander A. Ezhov, Tatyana V. Dolgova, Elena Ganshina, Lomonosov Moscow State Univ. (Russian Federation) . . . . . .[7353-14]

An all-purpose three-dimensional finite element model for bigratings, Guillaume Demésy, Frederic Zolla, André Nicolet, Mireille Commandré, Caroline Fossati, Institut Fresnel (France); Olivier Gagliano, Brendan Dunne, STMicroelectronics (France) . . . . . .[7353-15]

A genetic algorithm based procedure to retrieve effective parameters of planar metamaterial samples, Simone Tricarico, Filiberto Bilotti, Lucio Vegni, Univ. degli Studi di Roma Tre (Italy) . . . . . .[7353-16]

Evolution of nonlinear two-dimensional pulses and bullets in metamaterials, Yuriy G. Rapoport, Allan D. Boardman, Rhiannon R. C. Mitchell-Thomas, Univ. of Salford (United Kingdom) . . . . . .[7353-17]

Lunch/Exhibition Break. . . . . .12.00 to 13.20

SESSION 4 . . . . . Tues. 13.20 to 15.30

Plasmonics I

Session Chair: **Tomasz Szoplik,** Univ. Warszawski (Poland)

Conquering loss and stimulated emission in nanoplasmonic systems *(Invited Paper)*, Mikhail A. Noginov, Norfolk State Univ. (United States)[7353-18]

Propagation of surface plasmons through surface interfaces, Tomas Vary, Peter Markos, Slovak Univ. of Technology (Slovakia) . . . . . .[7353-19]

Interaction of a surface plasmon polariton beam with chain of nanoparticles, Andrey L. Stepanov, Andrey B. Evlyukhin, Roman Kiyan, Boris N. Chichkov, Laser Zentrum Hannover e.V. (Germany) . . . . . .[7353-20]

Confined modes in planar particle arrays, Xesus M. Bendaña, F. Javier García de Abajo, Consejo Superior de Investigaciones Científicas (Spain) . . .[7353-21]

Gap plasmons in neighboring metal wires, Alejandro Manjavacas, F. Javier García de Abajo, Consejo Superior de Investigaciones Científicas (Spain) . . . . . .[7353-22]

The negative refractive index materials as the aggregate of the spherical particles or porous in the different ambient medium, Martha Tagviashvili, V. I. Berezhiani, Georgian Academy of Sciences (Georgia) . . . . . .[7353-23]

SESSION 5 . . . . . Tues. 15.50 to 17.40

Plasmonics II

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

All-dielectric sub-diffraction optical circuitry with man-made surface plasmons *(Invited Paper)*, Stavroula Foteinopoulou, Eleftherios N. Economou, Maria Kafesaki, Costas M. Soukoulis, Foundation for Research and Technology-Hellas (Greece) . . . . . .[7353-24]

Modelling the optical response of metal nanoparticles, Viktor Myroshnychenko, Consejo Superior de Investigaciones Científicas (Spain); Jessica Rodríguez-Fernandez, Enrique Carbó-Argibay, Isabel Pastoriza-Santos, Jorge Pérez-Juste, Luis M. Liz-Marzán, Univ. de Vigo (Spain); F. Javier García de Abajo, Consejo Superior de Investigaciones Científicas (Spain). . . . . .[7353-25]

Observation of enhanced transmission through a deep subwavelength aperture, Atilla O. Cakmak, Kamil B. Alici, Bilkent Univ. (Turkey); Filiberto Bilotti, Lucio Vegni, Univ. degli Studi di Roma Tre (Italy); Ekmel Özbay, Bilkent Univ. (Turkey) . . . . . .[7353-26]

Transmission enhancement of light through a metallic nanoslit with periodic metallic nanostrips, Yanxia Cui, Yi Jin, Zhejiang Univ. (China); Yoichi Okuno, Kumamoto Univ. (Japan); Sailing He, Royal Institute of Technology (KTH) (Sweden) . . . . . .[7353-27]

Plasmon-induced wavelength-dependent polarization switching in optical metamaterials, Maxim R. Shcherbakov, Polina P. Vabishchevich, Andrey A. Fedyanin, Lomonosov Moscow State Univ. (Russian Federation); Alexander S. Sigov, Alexander A. Zaitsev, Moscow Institute for Radioengineering, Electronics and Automation (Russian Federation) . . . . . .[7353-28]

Posters—Tuesday . . . . . .Tues. 17.45 to 19.15

All symposium attendees are invited to attend Tuesday 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.

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Superlensing for the generation of strongly enhanced localised field, Eugene G. Bortchagovsky, Institute of Semiconductor Physics (Ukraine) . . . . . .[7353-42]

Influence of ionized radiation of optical characteristics of Ge coordinate compounds, Yaroslav I. Lepikh, Odessa National I.I. Mechnikov Univ. (Ukraine) . . . . . .[7353-43]

Imaging in the visible wavelength range through anisotropic layered flat lens operating in the canalization regime, Anna Pastuszczak, Rafal Kotynski, Univ. Warszawski (Poland) . . . . . .[7353-44]

Zero-average index band-gap edges in m-bonacci metamaterial multilayers, Juan A. Monsoriu, Univ. Politécnica de Valencia (Spain); Ricardo A. Depine, Maria L. Martinez-Ricci, Univ. de Buenos Aires (Argentina); Enrique Silvestre-Mora, Pedro Andrés Bou, Univ. de València (Spain) . . . . . .[7353-45]

Surface defect layer for beaming with photonic crystals, Evrim I. Colak, Humeyra Caglayan, Ozgur A. Cakmak, Ekmel Özbay, Bilkent Univ. (Turkey); Alessandro D. Villa, Filippo Capolino, Univ. degli Studi di Siena (Italy).[7353-46]

Complex Fourier factorization method applied in modeling optical metamaterials based on 2D periodic nanostructures, Roman Antos, Martin Veis, Stefan Visnovsky, Charles Univ. (Czech Republic) . . . . . .[7354-47]

Wednesday 22 April

SESSION 6 . . . . . .Wed. 08.30 to 10.20

Subwavelength Imaging

Session Chair: **Vladimir Kuzmiak,** Institute of Photonics and Electronics (Czech Republic)

Novel approaches to subwavelength imaging based on metasurfaces *(Invited Paper)*, Constantin R. Simovski, Univ. ITMO (Russian Federation) . . . . . .[7353-29]

Super resolution and spectral properties of coupled guided wave system, Antonio Mandatori, Alessio Benedetti, Mario Bertolotti, Concita Sibilia, Univ. degli Studi di Roma, La Sapienza (Italy); Michael Scalora, Charles M. Bowden Research Facility (United States) . . . . . .[7353-30]

Metal-dielectric superlens with ultra-flat phase of the modulation transfer function, Tomasz Stefaniuk, Rafal Kotynski, Tomasz Szoplik, Univ. of Warsaw (Poland) . . . . . .[7353-31]

Focusing of radially polarized light with corrugated silver nanolayer, Piotr Wróbel, Jacek Pniewski, Tomasz J. Antosiewicz, Tomasz Szoplik, Univ. of Warsaw (Poland) . . . . . .[7353-32]

Subwavelength focus using radiationless inteference at optical wavelengths, Reuven Gordon, Univ. of Victoria (Canada). . . . . .[7353-33]

SESSION 7 . . . . . .Wed. 10.50 to 12.20

Metamaterials Fabrication Technologies

Session Chair: **Constantin R. Simovski,** Univ. ITMO (Russian Federation)

Tunability of metamaterial via a ferroelectric and liquid crystal technologies *(Invited Paper)*, Didier Lippens, Institut d'Electronique de Microélectronique et de Nanotechnologie (France) . . . . . .[7353-34]

Proximity-effect induced limitations on the density of electron-beam patterned planar photonic nanostructures, Robert Wueest, ETH Zürich (Switzerland) and ABB Switzerland (Switzerland); Heinz Jaeckel, ETH Zürich (Switzerland) . . . . . .[7353-35]

Optical spectroscopy of terbium-scandium-aluminium garnet and terbium-scandium perovskite, Kamil Postava, Lukas Halagacka, Ondrej Zivotsky, David Hrabovsky, Jaromir Pistora, Technical Univ. of Ostrava (Czech Republic); Dorota A. Pawlak, Sebastian Turczynski, Katarzyna Kolodziejak, Institute of Electronic Materials Technology (Poland) . . . . . .[7353-36]

Design of miniaturized printed monopole antennas through phase-compensation, Luca Scorrano, Filiberto Bilotti, Lucio Vegni, Univ. degli Studi di Roma Tre (Italy) . . . . . .[7353-37]

Lunch/Exhibition Break. . . . . .12.20 to 13.40

SESSION 8 . . . . . .Wed. 13.40 to 15.00

Device Application of Metamaterials

Session Chair: **Stavroula Foteinopoulou,** Foundation for Research and Technology-Hellas (Greece)

Optical antennas composed on multiple plasmonic nanoparticles, Ludmila N. Raguin, Matthew D. Mishrikey, Takumi Sannomiya, Christian Hafner, Rüdiger Vahldieck, ETH Zürich (Switzerland) . . . . . .[7353-38]

Asymmetric split ring resonators for optical sensing, Basudev Lahiri, Univ. of Glasgow (United Kingdom); Scott G. McMeekin, Glasgow Caledonian Univ. (United Kingdom); Ali Z. Khokhar, Richard M. De La Rue, Nigel P. Johnson, Univ. of Glasgow (United Kingdom) . . . . . .[7353-39]

A quantitative demonstration of multi-mode refractive index sensors based on standing-wave plasmonic resonances in split ring resonators, Yun-Tzu Chang, Chia-Yun Chen, Ta-Jen Yen, National Tsing Hua Univ. (Taiwan)[7353-40]

Tunable terahertz metamaterials with negative permeability, Petr Kuzel, Hynek Nemec, Filip Kadlec, Institute of Physics (Czech Republic); Patrick Mounaix, Univ. Bordeaux I (France) . . . . . .[7353-41]

Conference 7354

Monday-Wednesday 20-22 April 2009 • Proceedings of SPIE Vol. 7354

Nonlinear Optics and its Applications

Conference Chair: **Mario Bertolotti,** Univ. degli Studi di Roma, La Sapienza (Italy)

Conference Co-Chairs: **Joseph W. Haus,** Univ. of Dayton (USA); **Alexei M. Zheltikov,** Lomonosov Moscow State Univ. (Russian Federation)

Programme Committee: **Robert W. Boyd,** Univ. of Rochester (USA); **Bruno Crosignani,** Univ. dell'Aquila (Italy); **Claude Fabre,** Univ. Pierre et Marie Curie (France); **Hiromasa Ito,** The Institute of Physical and Chemical Research (RIKEN) (Japan); **Yuri S. Kivshar,** The Australian National Univ. (Australia); **Jan Perina, Sr.,** Univ. Palackeho (Czech Republic); **Derryck T. Reid,** Heriot-Watt Univ. (United Kingdom); **Mark I. Stockman,** Georgia State Univ. (USA); **Ching-Yue Wang,** Tianjin Univ. (China)

Monday 20 April

Opening Remarks . . . . . Mon. 13.25 to 13.30

Mario Bertolotti, Univ. degli Studi di Roma, La Sapienza (Italy)

SESSION 1 . . . . . Mon. 13.30 to 15.10

Solitons

Nonlinear photonics in multi-dimensional and complex photonic lattices *(Invited Paper),* Cornelia Denz, B.Terhalle, P.Rose, J.Xavier, J.Imbrock, Westfaelische Wilhelms-Univ. Muenster (Germany) . . . . . .[7354-01]

Instabilities and solitons in semiconductor media with spatiotemporal dispersion, Fabio Biancalana, Max Planck Institute for the Science of Light (Germany) . . . . . .[7354-02]

Optical spatial solitons in glassy potassium-lithium-tantalate-niobate, Eugenio Del Re, Univ. degli Studi dell'Aquila (Italy); Alessandro Ciattoni, Univ. degli Studi dell'Aguila (Italy); Claudio Conti, Univ. degli Studi di Roma, La Sapienza (Italy); Aharon J. Agranat, The Hebrew Univ. of Jerusalem (Israel) . . . . . .[7354-03]

Linear and nonlinear localization of light in one-dimensional bulk and planar photorefractive photonic superlattices in lithium niobate, Ksenia V. Shandarova, Technische Univ. Clausthal (Germany); Vladimir M. Shandarov, State Univ. of Control Systems and Radioelectronics (Russian Federation); Yang Tan, Feng Chen, Shandong Univ. (China); Detlef Kip, Christian Rüter, Technische Univ. Clausthal (Germany) . . . . . .[7354-04]

SESSION 2 . . . . . Mon. 15.40 to 17.40

Multiphoton Process

Simultaneous multiple species imaging by femtosecond multiphoton laser-induced fluorescence *(Invited Paper)*, Richard B. Miles, Arthur Dogariu, Herschel A. Rabitz, Jonathan D. Roslund, Princeton Univ. (United States) . . . . . .[7354-05]

Optical biopsy of early cancer development in nude mice by quantitative intravital multiphoton microscopy in vivo, Chun-Chin Wang, Ruei-Jr Wu, Ping-Jung Su, National Taiwan Univ. (Taiwan); Wei-Chou Lin, National Taiwan Univ. Hospital (Taiwan); Feng-Chieh Li, National Taiwan Univ. (Taiwan); Sung-Jan Lin, National Taiwan Univ. Hospital (Taiwan); Chen-Yuan Dong, National Taiwan Univ. (Taiwan) . . . . . .[7354-06]

Investigating myosin-based second-harmonic generation in the Drosophila muscle degeneration induced by proteasome inhibition, Chiao-Ying Lin, National Taiwan Univ. (Taiwan); June-Tai Wu M.D., Sung-Jan Lin M.D., National Taiwan Univ. Hospital (Taiwan); Chen-Yuan Dong, National Taiwan Univ. (Taiwan) . . . . . .[7354-07]

Photoluminescence and optical studies of photodegradation in nonlinear optical organic chromophores, Sebastiampillai G. Raymond, Grant V. M. Williams, Andrew J. Kay, Benjamin Lochocki, Delower Bhuiyan, Industrial Research Ltd. (New Zealand) . . . . . .[7354-08]

Size-dependent and dopant-enhanced three-photon absorption in semiconductor quantum dots, Wei Ji, National Univ. of Singapore (Singapore) . . . . . .[7354-09]

Tuesday 21 April

SESSION 3 . . . . . Tues. 08.30 to 10.30

Devices and Applications

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

Nonlinear effects in plasmonic nanostructures *(Invited Paper)*, Anatoly V. Zayats, Queen's Univ. Belfast (United Kingdom) . . . . . .[7354-10]

Plasmon-assisted effects in nonlinear-optical response of magnetic nanodisks, Tatyana V. Murzina, Irina A. Kolmychek, Oleg A. Aktsipetrov, Lomonosov Moscow State Univ. (Russian Federation); Alfonso Cebollada, Gaspar Armelles, Ctr. Nacional de Microelectrónica (Spain) . . . . . .[7354-11]

Properties of quadratic nonlinear interaction of GaN based structures, Fabio Antonio Bovino, Elsag Datamat S.p.A. (Italy); Maria Cristina Larciprete, Marco Centini, Alessandro Belardini, Mario Bertolotti, Concita Sibilia, Univ. degli Studi di Roma, La Sapienza (Italy); Adriana Passaseo, Vittorianna Tasco, National Nanotechnology Lab. (Italy). . . . . .[7354-12]

Novel ultra-high-speed deeply etched polymer electro-optic modulator, Shyqyri Haxha, Univ. of Kent (United Kingdom) . . . . . .[7354-13]

Second harmonic generation from metallic, Marco Centini, Alessio Benedetti, Concita Sibilia, Mario Bertolotti, Univ. degli Studi di Roma, La Sapienza (Italy); Michael Scalora, U.S. Army Aviation and Missile Command (United States) . . . . . .[7354-14]

SESSION 4 . . . . . Tues. 10.50 to 12.50

Applications and Photonic Crystals

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

Highly nonlinear GaSb-based saturable absorber mirrors, Riku A. Koskinen, Soile Suomalainen, Jonna Paajaste, Samuli Kivistö, Mircea D. Guina, Oleg G. Okhotnikov, Markus Pessa, Tampere Univ. of Technology (Finland) . .[7354-15]

Photo-physical properties and triplet-triplet absorption of platinum(II) acetylides in solid PMMA matrices, Eirik Glimsdal, Norwegian Univ. of Science and Technology (Norway); Robert M. Westlund, Royal Institute of Technology (KTH) (Sweden); Bertil Eliasson, Umeå Univ. (Sweden); Mikael Lindgren, Norwegian Univ. of Science and Technology (Norway) . . . . . .[7354-16]

Optical limiting in hydrogenated amorphous silicon selenium thin films, Hacene Manaa, Abdullah Al-Mulla, Noor Al-Jamal, Kuwait Univ. (Kuwait); Shawqi Al-Dallal, Saleh M. Al-Alawi, Univ. of Bahrain (Bahrain) . . . . . .[7354-17]

Design and modeling of chi (2) second harmonic amplification in Circular Photonic Crystal, Alessandro Massaro, Vittorianna Tasco, Maria T. Todaro, Tiziana Stomeo, Roberto Cingolani, Massimo De Vittorio, Adriana Passaseo, National Nanotechnology Lab. (Italy) . . . . . .[7354-18]

Dynamics of band-edge 2D-photonic crystal lasers, Rama Raj, Fabrice Raineri, Alejandro M. Yacomotti, Lab. de Photonique et de Nanostructures (France) . . . . . .[7354-19]

All-optical signal processing based on trapped modes of a photonic crystal resonator, Eugene Y. Glushko, Institute of Semiconductor Physics (Ukraine); Vladimir N. Evteev, Alexander N. Stepanyuk, Krivoy Rog Pedagogical Institute (Ukraine); Alexander E. Glushko, Univ. of Leoben (Austria) . . . . . .[7354-20]

Lunch/Exhibition Break. . . . . .12.50 to 13.50

SESSION 5 . . . . . Tues. 13.50 to 15.30

Non-classical Optics

Experimental test on dynamical vacuum fluctuations *(Invited Paper)*, Fabio A. Bovino, Elsag Datamat S.p.A. (Italy) . . . . . .[7354-21]

Generation of entangled photon pairs in periodically poled nonlinear crystals, Jiri Svozilík, Jan Perina, Jr., Palacky Univ. (Czech Republic) [7354-22]

Photon logic gates using ultraslow light, Byoung S. Ham, Joonsung Hahn, Inha Univ. (Korea, Republic of) . . . . . .[7354-23]

Advanced application of a planar wave guide from a bismuth as an active element of optical devices, Oleg V. Kondakov, Sylvestre Karambizi, National Univ. of Rwanda (South Africa) . . . . . .[7354-24]

SESSION 6 . . . . . Tues. 15.50 to 17.30

Nonlinear Generation

Application of waveguide arrays and spectral filtering for a multi-frequency picosecond: Mode-locked Pulse Source, Brandon G. Bale, J. Nathan Kutz, Univ. of Washington (United States); Edward D. Farnum, Kean Univ. (United States) . . . . . .[7354-25]

Pulse shortening by passive negative feedback in mode-locked train from highly-doped Nd:YAG in a bounce geometry, Václav Kubecek, Miroslav Cech M.D., Petr Hirsl , Czech Technical Univ. in Prague (Czech Republic); Andreas Stintz, Jean-Claude M. Diels, The Univ. of New Mexico (United States)[7354-26]

Efficient generation of 488 nm radiation by using a diode laser and a PPLN crystal in a monolithic ring resonator, Andreas Jechow, Danilo Skoczowsky, Ralf Menzel, Univ. Potsdam (Germany); Torsten Poßner, Herbert Stürmer, Grintech GmbH (Germany); Joachim R. Sacher, Sacher Lasertechnik GmbH (Germany) . . . . . .[7354-27]

Optical pulse frequency shift at mismatched parametric interaction, Valery E. Lobanov, Anatoly P. Sukhorukov, Lomonosov Moscow State Univ. (Russian Federation) . . . . . .[7354-28]

The unified theory of chirped-pulse oscillators, Vladimir L. Kalashnikov, Technische Univ. Wien (Austria) . . . . . .[7354-29]

Posters—Tuesday . . . . . Tues. 17.45 to 19.15

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Cd1−xHgxTe system for optoelectronic application: photo-electrical properties and composition dependent deep level energies, Volodymyr Babentsov, Institute of Semiconductor Physics (Ukraine); Jan Franc, Charles Univ. in Prague (Czech Republic); Fiodor F. Sizov, Institute of Semiconductor Physics (Ukraine) . . . . . .[7354-38]

Pr:YAP generation in blue spectral region, Martin Fibrich, Helena Jelínková, Miroslav Cech, Czech Technical Univ. in Prague (Czech Republic); Karel Nejezchleb, Václav Skoda, Crytur Ltd. (Czech Republic) . . . . . .[7354-42]

Parabolic pulse propagation in mean-zero, dispersion-managed transmission systems and mode-locked laser cavities, Brandon G. Bale, J. Nathan Kutz, Univ. of Washington (United States) . . . . . .[7354-43]

Solvents effects on NLO properties of ethyl eosin dye, Ahmad Y. Nooraldeen, Anna Univ. (India) . . . . . .[7354-44]

Photophysics of organic and inorganic media treated with nanoobjects, Natalie V. Kamanina, Petr Y. Vasilyev, Vladislav Studenov, S.I. Vavilov State Optical Institute (Russian Federation) . . . . . .[7354-45]

Optical switching mechanism in GaP double injection devices, Tina Laperashvili, Orest Kvitsiani, Institute of Cybernetics (Georgia) . . . . . .[7354-46]

Characterization of super optical power limiting in a triphenylamine derivative solution, Wei Huang, Ying Qian, Changgui Lu, Yiping Cui, Southeast Univ. (China) . . . . . .[7354-47]

The modeling and characterization of simple semiconductor wafers, Junewen Chen, Chung-Hua Univ. (Taiwan) . . . . . .[7354-48]

Cascade parametric oscillator system at 5.75 m for cholesterol elimination, Tomokazu Shido, Chitose Institute of Science and Technology (Japan); Takuya Mikami, Chitose Institute of Science and Technology (Japan) and Okamoto Optics Work, Inc. (Japan); Kiyoshi Kato, Chitose Institute of Science and Technology (Japan) . . . . . .[7354-49]

Observation of laser induced Optogalvanic-like effect in liquid: a case of optical nutation of the dipole vectors, Rajib Bordoloi, Tinsukia College (India); Ranjana Bora, Namrup College (India); Gauranga D. Baruah, Dibrugarh Univ. (India) . . . . . .[7354-50]

Growth, FT-IR studies and in-situ growth rate measurements on [100] and [101] faces of K1-x(NH4)xH2PO4 mixed crystals from aqueous solutions, Zahra Zargar, Hamid Rezagholipour Dizaji, Univ. of Semnan (Iran, Islamic Republic of) . . . . . .[7354-51]

Optical studies of high-field carrier transport of AlGaInP and GaInP for optoelectronics device optimizations, Mohammad Reza Khalvati, Shahrood Univ. of Technology (Iran, Islamic Republic of) . . . . . .[7354-52]

Theoretical and experimental analysis of beam propagation in a nonlinear optical media using Gaussian decomposition method, Ehsan Koshki, Sabzevar Univ. of Tarbiat Moallem (Iran, Islamic Republic of); Sayed Hadi Mousavi, Shahrood Univ. of Technology (Iran, Islamic Republic of). . .[7354-53]

Partition function and order parameter measurements for nematic liquid crystals, Sayed Hadi Mousavi, Hamid Haratizadeh, Shahrood Univ. of Technology (Iran, Islamic Republic of); Ehsan koushki, Sabzevar Univ. of Tarbiat Moallem (Iran, Islamic Republic of) . . . . . .[7354-54]

The role of exciton-exciton interaction on nonlinearity in GaN microdisks, Saeid Shojaei, Univ. of Tabriz (Iran, Islamic Republic of) and Univ, degli Studi di Modena (Italy); Filippo Troiani, Guido Goldoni, Univ. degli Studi di Modena (Italy); Manouchehr Kalafi, Asghar Asgari, Univ. of Tabriz (Iran, Islamic Republic of) . . . . . .[7354-55]

Wednesday 22 April

SESSION 7 . . . . . .Wed. 08.20 to 10.00

Applications

Mapping of attosecond ionization dynamics by recollision-free higher-order harmonic generation *(Invited Paper),* A.J. Verhoef, A.V. Mitrofanov, D. Kartashov, Andrius Baltuska, Technische Univ. Wien (Austria); E.E. Serebryannikov, A.M. Zheltikov, M.V. Lomonosov Moscow State Univ. (Russia) . . . . . .[7354-30]

Double grating design of 3D phase matched waveguide for second harmonic chi(2) process., Alessandro Massaro, Roberto Cingolani, Massimo De Vittorio, Adriana Passaseo, National Nanotechnology Lab. (Italy). .[7354-31]

Blue laser light generation by frequency doubling of a cesium vapor laser, Boris V. Zhdanov, Yalin Lu, Michael Shaffer, Wooddy Miller, Dallas Wright, Randall J. Knize, U.S. Air Force Academy (United States) . . . . . .[7354-32]

Ultrafast depolarization based on four-wave mixing in highly nonlinear optical fiber, Changxi Yang, Yu Tian, Peng Dong, Tsinghua Univ. (China) . . . . . .[7354-33]

SESSION 8 . . . . . .Wed. 10.20 to 12.40

Generation and Terahertz

Numerical study and optimization of third harmonics generation in two-sectioned periodically poled $LiTaO_3$., Oleg A. Louchev, Megaopto Co., Ltd. (Japan); Satoshi Wada, The Institute of Physical and Chemical Research (RIKEN) (Japan) . . . . . .[7354-34]

Accurate design and modeling of chi(2) nonlinear processes in periodic waveguide of by Hertzian Potential Method, Alessandro Massaro, Vittorianna Tasco, Maria T. Todaro, Roberto Cingolani, Massimo De Vittorio, Adriana Passaseo, National Nanotechnology Lab. (Italy). . . . . .[7354-35]

Mid-infrared laser radiation generation by Fe:ZnSe laser, Helena Jelinkova, Petr Koranda, Czech Technical Univ. in Prague (Czech Republic); Maxim E. Doroshenko, Tasoltan T. Basiev, General Physics Institute (Russian Federation); Jan Sulc, Michal Nemec, Czech Technical Univ. in Prague (Czech Republic) . . . . . .[7354-36]

Femtosecond pump-probe optical spectroscopy studies of Ga1-xMnxAs thin films, G. Pepe, C. de Lisio, L. Parlato, V. Pagliarulo, N. Marrocco, Univ. degli Studi di Napoli Federico II (Italy); C. Zhao, Dong Pan, Hanan Dery, Roman Sobolewski, Univ. of Rochester (United States); V. Novak, K. Olejnik, M. Cukr, Fyzikální Ústav (Czech Republic) . . . . . .[7354-37]

Terahertz pulse generation by the method of optical rectification of few-cycle laser pulses propagating in GaAs crystal, Artsrun S. Martirosyan, Institute for Physical Research (Armenia); Davit L. Hovhannisyan, Yerevan State Univ. (Armenia); Vigen H. Chaltikyan, Institute for Physical Research (Armenia); Komitas G. Stepanyan, Yerevan State Univ. (Armenia). . . . . .[7354-39]

On the self-modulation mechanism of the emission of THz radiation from 2D lattice of nonlinear metallic nanoparticles illuminated by light, Roman Noskov, Alexander A. Zharov, Institute for Physics of Microstructures (Russian Federation); Maxim Tsarev, Nizhny Novgorod State Univ. (Russian Federation) . . . . . .[7354-40]

Laser-driven proton acceleration and plasma diagnostics with J-KAREN laser, Alexander S. Pirozhkov, Japan Atomic Energy Agency (Japan).[7354-41]

Conference 7355A

Monday 20 April 2009 • Proceedings of SPIE Vol. 7355

Quantum Optics and Quantum Information Transfer and Processing

Conference Chair: **Miloslav Dusek,** Univ. Palackeho (Czech Republic)

Programme Committee: **Ulrik Andersen,** Danmarks Tekniske Univ. (Denmark); **Markus Arndt,** Univ. of Vienna (Austria); **Jens Eisert,** Imperial College London (United Kingdom); **Jaromír Fiurásek,** Univ. Palackeho (Czech Republic); **Daniel F.V. James,** Univ. of Toronto (Canada); **Christian Kurtsiefer,** National Univ. of Singapore (Singapore); **Andreas Poppe,** Univ. Wien (Austria); **Fabio Sciarrino,** Univ. degli Studi di Roma, La Sapienza (Italy); **Andrew J. Shields,** Toshiba Research Europe Ltd. (United Kingdom)

Monday 20 April

Opening Remarks . . . . . Mon. 13.30 to 13.40

Miloslav Dusek, Univ. Palackeho (Czech Republic)

SESSION 1 . . . . . Mon. 13.40 to 15.30

Quantum Cryptography and Quantum Information Processing

Gigahertz decoy quantum key distribution with megabit/s secure key rate *(Invited Paper)*, Zhiliang Yuan, Toshiba Research Europe Ltd. (United Kingdom); Alex R. Dixon, Toshiba Research Europe Ltd. (United Kingdom) and Univ. of Cambridge (United Kingdom); James F. Dynes, Andrew W. Sharpe, Andrew J. Shields, Toshiba Research Europe Ltd. (United Kingdom) . . . . . [7355A-01]

Three-qubit quantum gates and filters for linear optical quantum information processing, Jaromír Fiurásek, Univ. Palackého V Olomouci (Czech Republic) . . . . . [7355A-02]

Principles of quantum computing on the base of physical properties of photon echo effect, Elena V. Melnichenko, Moscow Engineering Physics Institute (Russian Federation) . . . . . [7355A-03]

Perfect state transfer for quantum systems with multiple excitations, Thomas Brougham, Igor Jex, Vojtech Kostak, Czech Technical Univ. in Prague (Czech Republic); Georgios Nikolopoulos, Foundation for Research and Technology-Hellas (Greece) . . . . . [7355A-04]

Quantum interference by coherence transfer from spin to orbital angular momentum of photons, Eleonora Nagali, Istituto Nazionale di Fisica Nucleare (Italy) and Univ. degli Studi di Napoli Federico II (Italy); Fabio Sciarrino, Istituto Nazionale di Fisica Nucleare (Italy); Francesco De Martini, Univ. degli Studi di Roma, La Sapienza (Italy); Lorenzo Marrucci, Bruno Piccirillo, Ebrahim Karimi, Enrico Santamato, Univ. degli Studi di Napoli Federico II (Italy) . . . . [7355A-05]

SESSION 2 . . . . . Mon. 16.00 to 17.40

Quantum Entanglement and Quantum Optics

Micro-Macro entangled photon systems: reults and perrspectives, Chiara Vitelli, Fabio Sciarrino, Francesco De Martini, Univ. degli Studi di Roma, La Sapienza (Italy) . . . . . [7355A-06]

X-Entanglement of PDC photon pairs, Lucia Caspani, Enrico Brambilla, Ottavia Jedrkiewicz, Luigi Lugiato, Alessandra Gatti, Univ. degli Studi dell'Insubria (Italy) . . . . . [7355A-07]

Photon-number statistics of twin beams and their non-classical properties, Jan Perina, Jr., Jan Perina, Sr., Ondrej Haderka, Jaromir Krepelka, Martin Hamar, Vaclav Michalek, Univ. Palackého V Olomouci (Czech Republic); Maria Bondani, Alessia Allevi, Alessandra Andreoni, Univ. degli Studi dell'Insubria (Italy) . . . . . [7355A-08]

Complete bi-partite CV entanglement characterization via Coveriance Matrix measurement., Alberto Porzio, Istituto Nazionale di Fisica Nucleare (Italy); Stefano Fornaro, Salvatore Solimeno, Univ. degli Studi di Napoli Federico II (Italy); Virginia D'Auria, Ecole Normale Supérieure (France) . . . . . [7355A-09]

Wafer fused InP-GaAs optically-pumped semiconductor disk laser operating at 1.58-µm, Jari Lyytikäinen, Jussi Rautiainen, Tampere Univ. of Technology (Finland); Alexei Sirbu, Alexandru Mereuta, Andrei Caliman, Eli Kapon, Ecole Polytechnique Fédérale de Lausanne (Switzerland); Oleg G. Okhotnikov, Tampere Univ. of Technology (Finland) . . . . . [7355A-10]

Tuesday 21 April

Posters—Tuesday . . . . . Tues. 17.45 to 19.15

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Quantum random walk with jumps, Hynek Lavicka, Martin Stefanak, Igor Jex, Czech Technical Univ. in Prague (Czech Republic) . . . . . [7355A-11]

Recurrences in quantum walks, Martin Stefanak, Igor Jex, Czech Technical Univ. in Prague (Czech Republic); Tamas Kiss, Research Institute for Solid State Physics and Optics (Hungary) . . . . . [7355A-12]

Optimizing the quantum random-walk search on the hypercube, Václav Potocek, Czech Technical Univ. in Prague (Czech Republic); Aurél Gábris, Czech Technical Univ. in Prague (Czech Republic) and Research Institute for Solid State Physics and Optics (Hungary); Tamás Kiss, Research Institute for Solid State Physics and Optics (Hungary); Igor Jex, Czech Technical Univ. in Prague (Czech Republic) . . . . . [7355A-13]

Photon Counting Applications

Conference Chairs: **Ivan Prochazka,** Czech Technical Univ. in Prague (Czech Republic); **Roman Sobolewski,** Univ. of Rochester (USA)

Programme Committee: **Alan L. Migdall,** National Institute of Standards and Technology (USA); **Ulrich Schreiber,** Technische Univ. München (Germany); **Wojciech Slysz,** Instytut Technologii Elektronowej (Poland); **Michael Wahl,** PicoQuant GmbH (Germany); **Josef Blazej,** Czech Technical University in Prague (Czech Republic)

Tuesday 21 April

Opening Remarks . . . . . .Tues. 08.15 to 08.20

Ivan Prochazka, Czech Technical Univ. in Prague (Czech Republic); **Roman Sobolewski**, Univ. of Rochester (USA)

SESSION 3 . . . . . Tues. 08.20 to 10.20

Superconducting Photon Counters

Session Chair: **Roman Sobolewski,** Univ. of Rochester (USA)

Ultrafast infrared superconducting single-photon detectors *(Invited Paper)*, Robert H. Hadfield, Heriot-Watt Univ. (United Kingdom) . . . . . [7355B-15]

Superconducting nanowire detectors for quantum optics *(Invited Paper)*, Val Zwiller, Sander N. Dorenbos, R. Heeres, Tony Zijlstra, Teun M. Klapwijk, Technische Univ. Delft (Netherlands); G. Steudle, I. Muller, Oliver Benson, Humboldt Univ. zu Berlin (Germany); Roman Sobolewski, Univ. of Rochester (United States). . . . . [7355B-16]

Avoiding and exploiting the polarization dependence of superconducting single photon detectors, Sander N. Dorenbos, Nikolay Akopian, Umberto Perinetti, Valéry Zwiller, Tony Zijlstra, Teun M. Klapwijk, Delft Univ. of Technology (Netherlands) . . . . . [7355B-17]

Superconductor/ferromagnet bilayer nanostructures for optical photon counters, G. Pepe, C. de Lisio, L. Parlato, V. Pagliarulo, N. Marrocco, Univ. degli Studi di Napoli Federico II (Italy); Dong Pan, Roman Sobolewski, Univ. of Rochester (United States) . . . . . [7355B-18]

Superconducting single-photon detectors as optical-photon energy-resolving devices, Roman Sobolewski, Jennifer Kitaygorsky, Univ. of Rochester (United States); Sander N. Dorenbos, Elisabeth Reiger, R. Schouten, Val Zwiller, Technische Univ. Delft (Netherlands); Wojciech Slysz, Institute of Electron Technology (Poland); Arturas Jukna, Vilnius Gediminas Technical Univ. (Lithuania) . . . . . [7355B-19]

SESSION 4 . . . . . Tues. 10.50 to 12.20

Semiconducting Photon Counters

Session Chair: **Ivan Prochazka,** Czech Technical Univ. in Prague (Czech Republic)

Avalanche photodiode output pulse rise-time study *(Invited Paper)*, Ivan Prochazka, Josef Blazej, Czech Technical Univ. in Prague (Czech Republic) . . . . . [7355B-20]

High gain and low excess noise near infrared single photon avalanche detector, Krishna R. Linga, Amplification Technologies, Inc. (United States) . . . . . [7355B-21]

Simulation modelling for the analysis and the optimal design of SPAD detectors for time-resolved fluorescence measurements, Marina Repich, Univ. degli Studi di Trento (Italy) and Fondazione Bruno Kessler (Italy); David Stoppa, Lucio Pancheri, Fondazione Bruno Kessler (Italy); Gian-Franco Dalla Betta, Univ. degli Studi di Trento (Italy). . . . . [7355B-22]

Dynamic range of submicron/nanoparticle sizing with photon correlation LDA, Lénárd Vámos, Péter Jani, Research Institute for Solid State Physics and Optics (Hungary) . . . . . [7355B-23]

Lunch/Exhibition Break. . . . . .12.20 to 13.20

SESSION 5 . . . . . Tues. 13.20 to 15.30

Photon Counting Applications

Session Chair: **Cesare Barbieri,** Univ. degli Studi di Padova (Italy)

Photon counting for a space LIDAR: Phoenix Mars Lander *(Invited Paper)*, Alexander E. Dudelzak, Canadian Space Agency (Canada); Peter Dietrich, MDA Corp. (Canada); Grant Cunningham, Jeffrey W. Tripp, Optech, Inc. (Canada) . . . . . [7355B-24]

Very fast photon counting photometers for astronomical applications: IquEYE for the ESO 3.5m New Technology Telescope, Cesare Barbieri, Giampiero Naletto, Tommaso Occhipinti, Ivan Capraro, Enrico Verroi, Paolo Zoccarato, Claudia Facchinetti, Claudio Germanà, Univ. degli Studi di Padova (Italy); Sergio Billotta, Giovanni Bonanno, Osservatorio Astrofisico di Catania (Italy); Enrico Giro, Osservatorio Astronomico di Padova (Italy) . . . . [7355B-25]

Multilayers clouds monitoring by micro-Joule lidar based on photon counting receiver and diode laser, Sergei M. Pershin, A. N. Lyash, Vladislav S. Makarov, A. M. Prokhorov General Physics Institute (Russian Federation); Ivan Prochazka, Josef Blazej, Bruno Sopko, Czech Technical Univ. in Prague (Czech Republic) . . . . . [7355B-26]

Observing variable stars and transiting Exo-Planets with single photon counting, Georg Kirchner, Franz Koidl, Space Research Institute (Austria); Anton Dusleag, Farhat Iqbal, Technische Univ. Graz (Austria) . . . . . [7355B-27]

Graz kHz SLR LIDAR: first results, Georg Kirchner, Franz Koidl, Daniel Kucharski, Space Research Institute (Austria); Gerd Huebscher, Technische Univ. Graz (Austria) . . . . . [7355B-28]

Fully integrated time-to-amplitude converter for photon timing applications, Daniele Resnati, Ivan Rech, Massimo Ghioni, Sergio D. Cova, Politecnico di Milano (Italy) . . . . . [7355B-29]

SESSION 6 . . . . . Tues. 16.00 to 18.00

Semiconductor Photon Detectors

Session Chair: **Ivan Prochazka,** Czech Technical Univ. in Prague (Czech Republic)

SPAD active quenching circuit optimized for satellite laser ranging applications, Jan Kodet, Ivan Prochazka, Czech Technical Univ. in Prague (Czech Republic); Franz Koidl, Georg Kirchner, Space Research Institute (Austria) . . . . . [7355B-30]

Modeling photon detection efficiency and temporal response of single photon avalanche diodes, Angelo Gulinatti, Ivan Rech, Silvia Fumagalli, Mattia Assanelli, Massimo Ghioni, Politecnico di Milano (Italy); Sergio D. Cova, Politecnico di Milano (Italy) and Micro-Photon-Devices (Italy) . . . . . [7355B-31]

Optimizing the gated avalanche photodiode detector for quantum key distribution, Pradeep Kumar, Thiruthakka S. Thevan, Lakshmi V. Narayanan, Anil Prabhakar, Indian Institute of Technology Madras (India) . . . . . [7355B-32]

The development of extremely low noise InAs electron APDs for photon counting applications in SWIR/MWIR wavelengths, Chee Hing Tan, The Univ. of Sheffield (United Kingdom) . . . . . [7355B-33]

Single photon counting linear mode NIR APD, George M. Williams, Jr., Voxtel, Inc. (United States) . . . . . [7355B-34]

Sensitivity of a receiver using GaInAsSb/AlGaAsSb SAM avalanche photodiode for longwavelength optical communication systems in the mid-infrared spectral range, Maya P. Mikhailova, Igor A. Andreev, Ekaterina V. Kunitsyna, Yury P. Yakovlev, Ioffe Physico-Technical Institute (Russian Federation) . . . . . [7355B-35]

Posters—Tuesday . . . . . .Tues. 17.45 to 19.15

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Superconducting NbN nanostructures with a dielectric resonant microcavity and metallic mirror for single-photon optical detectors, Wojciech Slysz, Marek Guziewicz, Jan Bar, Maciej Wegrzecki, Piotr Grabiec, Iwona Wegrzecka, Remigiusz Grodecki, Institute of Electron Technology (Poland); Vallery Zwiller, Technische Univ. Delft (Netherlands); Sander N. Dorenbos, Technische Univ. Delft (Poland); Irina Milostnaya, Boris Voronov, Gregory N. Gol'tsman, Moscow State Pedagogical Univ. (Russian Federation); Jennifer Kitaygorsky, Roman Sobolewski, Univ. of Rochester (United States) . . . . . [7355B-36]

Conference 7356

Monday-Wednesday 20-22 April 2009 • Proceedings of SPIE Vol. 7356

Optical Sensors

Conference Chairs: **Francesco Baldini,** Istituto di Fisica Applicata Nello Carrara (Italy); **Jiri Homola,** Institute of Photonics and Electronics (Czech Republic); **Robert A. Lieberman,** Intelligent Optical Systems, Inc. (USA)

Programme Committee: **Vladimir Baumruk,** Charles Univ. in Prague (Czech Republic); **Artur Dybko,** Warsaw Univ. of Technology (Poland); **N. Jaffrezic,** Ctr. de Génie Electrique de Lyon (France); **Laura Maria Lechuga,** CIN2 Research Ctr. on Nanoscience and Nanotechnology (Spain); **Bo Liedberg,** Linköpings Univ. (Sweden); **Aleksandra Lobnik,** Univ. of Maribor (Slovenia); **Ramaier Narayanaswamy,** The Univ. of Manchester (United Kingdom); **Guillermo Orellana,** Univ. Complutense de Madrid (Spain); **Reinhardt Willsch,** IPHT Jena (Germany); **Otto S. Wolfbeis,** Univ. Regensburg (Germany)

Monday 20 April

Opening Remarks . . . . . Mon. 13.25 to 13.30

Jiri Homola, Institute of Photonics and Electronics (Czech Republic); **Francesco Baldini,** Istituto di Fisica Applicata Nello Carrara (Italy); **Robert A. Lieberman,** Intelligent Optical Systems, Inc. (USA)

SESSION 1 . . . . . Mon. 13.30 to 15.20

Advances in Transducers

Optical fingerprinting with computer screen photo-assisted techniques *(Invited Paper)*, Ingemar Lundstrom, Daniel Filippini, Linköpings Univ. (Sweden) . . . . . .[7356-01]

Label-free biosensing by means of an optical micro-ring resonator., Mario Iodice, Luca De Stefano III, Giuseppe Coppola, Vito Mocella, Ilaria Rea, Edoardo De Tommasi, Ivo Rendina, Istituto per la Microelettronica e Microsistemi (Italy) . . . . . .[7356-02]

Microchanneled chirped fibre Bragg grating, Pouneh Saffari, Aston Univ. (United Kingdom). . . . . .[7356-03]

Analysis and modeling of a silicon nitride slot-waveguide microring resonator biochemical sensor, Carlos A. Barrios, Univ. Politécnica de Madrid (Spain) . . . . . .[7356-04]

Spin coating and plasma process for 2.5D and hybrid 3D micro-resonators on multilayer polymers, Bruno Bêche, Univ. de Rennes 1 (France); Etienne Gaviot, Univ. du Maine (France); Christian Godet, Abdel Zebda, Arnaud Potel, Jérémy Barbe, Univ. de Rennes 1 (France); Lionel Camberlein, Univ. du Maine (France); Véronique Vié, Pascal Panizza, Goulc'hen Loas, Cyril Hamel, Univ. de Rennes 1 (France); Joseph Zyss, Ecole Normale Supérieure de Cachan (France); Nolwenn Huby, Univ. de Rennes 1 (France) . . . . . .[7356-05]

SESSION 2 . . . . . Mon. 15.50 to 17.10

Interferometric Sensors

Subwavelength phase sensing by RSOD based low coherence interferometer, Wen-Chuan Kuo, Chung-Yu Chuang, Ming-Yu Chou, Wen-Hung Huang, National Taiwan Normal Univ. (Taiwan) . . . . . .[7356-06]

Refractometric sensor based on all-fiber coaxial Michelson interferometers, Paola Barrios, Univ. Autónoma de San Luis Potosi (Mexico); David Sáez-Rodríguez, Univ. de València (Spain); Amparo Rodríguez, Univ. Autónoma de San Luis Potosi (Mexico); José L. Cruz Munoz, Antonio Díez, Miguel V. Andrés, Univ. de València (Spain). . . . . .[7356-07]

Tolerance analysis of interferometric sensors, Gerhard Kloos, Hella KGaA Hueck & Co. (Germany). . . . . .[7356-08]

Time-delayed quadrature signal processing for a fiber-optic interferometric CT, Hyoung Jun Park, Yo Han Cho, Minho Song, Chonbuk National Univ. (Korea, Republic of). . . . . .[7356-09]

Tuesday 21 April

SESSION 3 . . . . . Tues. 08.30 to 11.10

SPR Sensors

Design of plasmonic nanocavities for subradiant LSPR sensing with high sensitivities *(Invited Paper)*, Stefan A. Maier, Imperial College London (United Kingdom). . . . . .[7356-10]

Compact and low-cost biosensor based on novel approach to spectroscopy of surface plasmons, Jiri Homola, Marek Piliarik, Milan Vala, Ivo Tichy, Barbora Spackova, Karel Chadt, Jan Hepnar, Pavel Adam, Alexandra Friedl, Institute of Photonics and Electronics (Czech Republic) . . . . . .[7356-11]

Development of portable SPR sensor devices based on integrated periodic arrays of nanoholes, Fatemeh Eftekhari, Jacqueline Ferreira, Marcos L. J. Santos, Carlos Escobedo, Alexandre G. Brolo, David Sinton, Reuven Gordon, Univ. of Victoria (Canada) . . . . . .[7356-12]

Surface plasmon resonance imaging for parallelized detection of cancer biomarkers, Marek Piliarik, Lucie Parova, Hana Vaisocherova, Jiri Homola, Institute of Photonics and Electronics (Czech Republic) . . . . . .[7356-13]

Visualization of surface electromagnetic waves in one-dimensional photonic crystal by flourescence dye, Irina V. Soboleva, Andrey A. Fedyanin, Lomonosov Moscow State Univ. (Russian Federation); Francesco Michelotti, Univ. degli Studi di Roma, La Sapienza (Italy); Emiliano Descrovi, Fabrizio Giorgis, Politecnico di Torino (Italy). . . . . .[7356-14]

Interaction of blood plasma with SPR sensors, Eduard Brynda, Cesar Rodriguez Emmenegger, Tomas Riedel, Milan Houska, Institute of Macromolecular Chemistry (Czech Republic). . . . . .[7356-15]

SESSION 4 . . . . . Tues. 11.10 to 12.10

Physical Sensors I

Ambient humidity monitoring using a 1D photonic crystal sensor fabricated with glancing angle deposition, Matthew M. Hawkeye, Univ. of Alberta (Canada); Michael J. Brett, Univ. of Alberta (Canada) and National Institute for Nanotechnology (Canada). . . . . .[7356-16]

Active axial eye motion sensing and tracking by closed loop OPD-locked white light interferometry for combined confocal/ en face optical coherence tomography imaging of the human eye fundus in vivo, Radu G. Cucu, Univ. of Kent (United Kingdom); Mark W. Hathaway, OTI/Opko Health Inc. (United Kingdom); Adrian G. Podoleanu, Univ. of Kent (United Kingdom); Richard B. Rosen M.D., The New York Eye and Ear Infirmary (United States). . . .[7356-17]

Miniature laser doppler velocimetry systems, Christopher I. Moir, Exact Group LLP (United Kingdom) . . . . . .[7356-18]

Lunch/Exhibition Break. . . . . .12.10 to 13.30

SESSION 5 . . . . . Tues. 13.30 to 15.10

Physical Sensors II

A fibre optic sensor for high temperature measurements, Gaetano D'Altrui, Claudio Calisti Tassini, D'Appolonia S.p.A. (Italy); Harris Tsangaris, Univ. of Cyprus (Cyprus). . . . . .[7356-19]

Influence of residual fiber Birefringence and temperature on the high-current performance of an interferometric fiber-optic current sensor, Robert Wueest, Andreas Frank, Samuel Wiesendanger, Philippe Gabus, Urs E. Meier, Juergen Nehring, Klaus M. Bohnert, ABB Corporate Research (Switzerland) . . . . . .[7356-20]

Pump depletion reduction technique for extended-range distributed Brillouin fiber sensors, Romeo Bernini, Consiglio Nazionale delle Ricerche (Italy); Aldo Minardo, Luigi Zeni, Seconda Univ. degli Studi di Napoli (Italy) . . . . . .[7356-21]

A novel concept for high-speed, short- and long-distance precision laser ranging, Alexander E. Dudelzak, Canadian Space Agency (Canada); Guerman A. Pasmanik, Passat Ltd. (Canada) . . . . . .[7356-22]

On the minimization of timing walk in industrial pulsed time-of-flight laser radars, Juha Kostamovaara, Jan Nissinen, Sami Kurtti, Ilkka Nissinen, Jussi Jansson, Antti Mäntyniemi, Univ. of Oulu (Finland). . . . . .[7356-23]

SESSION 6 . . . . . Tues. 15.40 to 17.40

Physical Sensors III

All-silicon carbide hybrid wireless-wired optics temperature sensor: turbine tests and distributed fiber sensor network design, Nabeel A. Riza, Mumtaz A. Sheikh, CREOL,The College of Optics and Photonics (United States).[7356-24]

Laser light-section sensor automating the production of textile-reinforced composites, Robert Schmitt, Christian Niggemann, Christoph Mersmann, RWTH Aachen (Germany) . . . . . .[7356-25]

A self - mixing laser sensor for the real - time correction of straightness/ flatness deviations of a linear slide, Simona Ottonelli, Maurizio Dabbicco, Gaetano Scamarcio, Francesco De Lucia, Univ. degli Studi di Bari (Italy) . . . . . .[7356-26]

Optical sensing of magnetic field based on magnetorefractive effect in manganites, David Hrabovsky, Technical Univ. of Ostrava (Czech Republic); Gervasi Herranz, Institut de Ciència de Materials de Barcelona (Spain); Kamil Postava, Technical Univ. of Ostrava (Czech Republic); Ingrid C. Infante, Thales Research & Technology (France); Florencio Sánchez, Josep Fontcuberta, Institut de Ciència de Materials de Barcelona (Spain) . . . . . .[7356-27]

Optical system for the simultaneous measurement of two-dimensional straightness errors and the roll angle, Ilko Rahneberg, Hans J. Büchner, Gerd Jäger, Technische Univ. Ilmenau (Germany). . . . . .[7356-28]

Optical sensing in laser machining, Igor Smurov, Maria Doubenskaia, Ecole Nationale d'Ingénieurs de Saint-Etienne (France). . . . . .[7356-29]

Posters—Tuesday . . . . . .Tues. 17.45 to 19.15

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Toward extended range sub-micron conoscopic holography profilometers, using multiple wavelengths and phase measurement, Jose M. Enguita, Ignacio Alvarez, Univ. de Oviedo (Spain); Jorge Marina, DSI Plus (Spain); Guillermo Ojea, Jose A. Cancelas, Maria Frade, Univ. de Oviedo (Spain) . . . . . .[7356-44]

Measuring small thickness changes of a thin film by white-light spectral interferometry, Petr Hlubina, Jiri Lunacek, Dalibor Ciprian, Milena Lunackova, Technical Univ. of Ostrava (Czech Republic) . . . . . .[7356-45]

An optical biochip calibration method using a novel design of double integrating sphere system, Daniel Ramiz, Ronen Almog, Yelena Sverdlov, Tel Aviv Univ. (Israel); Sharon Yagur-Kroll, Shimshon Belkin, The Hebrew Univ. of Jerusalem (Israel); Yosi Shacham Diamand, Tel Aviv Univ. (Israel). . . .[7356-46]

Laser-self-mixing interferometric fiber strain sensor, Maurizio Dabbicco, Simona Ottonelli, Angela Intermite, Gaetano Scamarcio, Univ. degli Studi di Bari (Italy) . . . . . .[7356-47]

A signal-to-noise ratio comparison of high dynamic range CMOS image sensors, Leo H. C. Braga, Suzana Domingues, Jose G. Gomes, Antonio C. Mesquita, Univ. Federal do Rio de Janeiro (Brazil) . . . . . .[7356-48]

Ink-jet printed fluorescent ammonia sensor on the base of polymer micro- and nanoparticles, Artem A. Khlebunov, Dmitry V. Ionov, Vyacheslav A. Sazhnikov, Aleksander V. Koshkin, Vladimir M. Aristarhov, Andrej N. Petrov, Photochemistry Ctr. (Russian Federation); Natalia Shevchenko, Anastasiya Y. Menshikova, Aleksander V. Yakimanski, Institute of Macromolecular Compounds (Russian Federation); Michael V. Alfimov, Photochemistry Ctr. (Russian Federation) . . . . . .[7356-49]

A Hydrophone Unit based on DFB Fiber Laser, Bo Tan, Junbin Huang, Hongcan Gu, Rizhong Li, Naval Univ. of Engineering (China). . . . . .[7356-50]

Application of a silica-on-silicon planar optical waveguide Bragg grating sensor for organic liquid compound detection, Steffen Scheurich, Stefan Belle, Ralf Hellmann, Univ. of Applied Sciences Aschaffenburg (Germany); Gregory D. Emmerson, Ian J. Sparrow, Stratophase Ltd. (United Kingdom). . . . . .[7356-51]

Non-invasive sensor for Nukti Paameter diagnostics of blood biochemistry, Vladimir A. Saetchnikov, Elina A. Tcherniavskaia, Belarusian State Univ. (Belarus); Gustav Schweiger, Ruhr-Univ. Bochum (Germany) . . . . . .[7356-52]

Preparation of Ni/Zn and NiO/ZnO heterojunction nanowires and their optoelectrical characteristics, Wei-Chih Tsai, Shui-Jinn Wang, Chih-Ren Tseng, Rong-Ming Kuo, National Cheng Kung Univ. (Taiwan); Jia-Chuan Lin, St. John's Univ. (Taiwan) . . . . . .[7356-53]

Detection and identification of micro particles and biological agents by optical micro resonance methods, Vladimir A. Saetchnikov, Elina A. Tcherniavskaia, Belarusian State Univ. (Belarus); Gustav Schweiger, Ruhr-Univ. Bochum (Germany) . . . . . .[7356-54]

Preparation and optoelectronic properties of NiO/ZnO heterostructure nanowires, Wei-Chih Tsai, Shui-Jinn Wang, Chih-Ren Tseng, Rong-Ming Kuo, National Cheng Kung Univ. (Taiwan); Jia-Chuan Lin, St. John's Univ. (Taiwan) . . . . . .[7356-55]

Novel optical-fiber structure as a tension sensor, Jan Skapa, Petr Siska, Jan Vanda, Vladimir Vaöinek, Technical Univ. of Ostrava (Czech Republic)[7356-56]

Calculation of the band structure of HgCdTe-based variable composition heterostructures with taking into account the dependence of electron affinity on the composition of HgCdTe, Gorn Dmitry, Tomsk State Univ. (Russian Federation); Sergey N. Nesmelov, Siberian Physical-Technical Institute (Serbia); Andrey P. Kokhanenko, Alexander V. Voitsekhovskii, Tomsk State Univ. (Russian Federation) . . . . . .[7356-57]

Photo-erasure of Type-II femtosecond laser written Bragg gratings employed as high reflectors in moderate power Q-switch fibre laser, Mattias L. ≈slund, The Univ. of Sydney (Australia); Nemanja Jovanovic, Macquarie Univ. (Australia); Stuart D. Jackson, John Canning, Graham D. Marshall, The Univ. of Sydney (Australia); Alexander Fuerbach, Michael J. Withford, Macquarie Univ. (Australia); Kevin Cook, The Univ. of Sydney (Australia) . . . . . .[7356-58]

Compact all-fiber light source for Brillouin sensor applications, Christian A. Cuadrado-Laborde, Pere Perez-Millan, Miguel V. Andres, Antonio DÌez, Jose L. Cruz Munoz, Univ. de ValËncia (Spain); Yuri O. Barmenkov, Ctr. de Investigaciones en "ptica, A.C. (Mexico). . . . . .[7356-59]

Dew point measurement technique utilizing fiber cut reflection, Sergey M. Kostritskii, Alexey A. Dikevich, Yuri N. Korkishko, Vyacheslav A. Fedorov, Moscow Institute of Electronic Technology (Russian Federation) . . . .[7356-60]

Air-suspended solid-core fibers for sensing, Stefano Selleri, Annamaria Cucinotta, Federica Poli, Davide Passaro, Univ. degli Studi di Parma (Italy) . . . . . .[7356-61]

Usage of liquid crystals in optical sensors of mechanical forces and motion, Sergey Pasechnik, Moscow State Univ. of Instrument Engineering and Computer Science (Russian Federation) and Hong Kong Univ. of Science and Technology (Hong Kong, China); Dina Shmeliova, Valentin A. Tsvetkov, Aleksandra Torchinskaya, Moscow State Univ. of Instrument Engineering and Computer Science (Russian Federation); Vladimir G. Chigrinov, Hong Kong Univ. of Science and Technology (Hong Kong, China) . . . . . .[7356-62]

Ratiometric wavelength monitor based on X-type spectral response using two edge filters, Agus M. Hatta, Ginu Rajan, Gerald T. Farrell, Yuliya V. Semenova, Dublin Institute of Technology (Ireland) . . . . . .[7356-63]

Experimental demonstration of a Ferroelectric LC tunable filter for fast demodulation of FBG sensors, Sunish J. Mathews, Yuliya V. Semenova, Ginu Rajan, Gerald T. Farrell, Dublin Institute of Technology (Ireland) . . . . .[7356-64]

The detector of submillimetric radiation on the base of CdxHg1-xTe (~0.2), Vyacheslav V. Zabudsky, Fedir F. Sizov, Alexey B. Smirnov, Joanna V. Gumenjuk-Sichevska, Natalia I. Momot, V. Lashkariov Institute of Semiconductor Physics (Ukraine). . . . . .[7356-65]

Multi-domain LC cell by photoalignment method, Tao Du, Xiaojin Zhao, Vladimir G. Chigrinov, Hoi Sing Kwok, Hong Kong Univ. of Science and Technology (Hong Kong, China) . . . . . .[7356-66]

Numerical analysis of reflection characteristics of cascaded non-uniform fiber Bragg gratings, Erik Gemzick˝, Jarmila M¸llerov·, éilinsk· Univ. (Slovakia) [7356-67]

Multi-wavelength switchable fibre laser using polarisation selective tilted fibre grating capable for strain and temperature sensing, Pouneh Saffari, Aston Univ. (United Kingdom). . . . . .[7356-68]

Performance analysis of diode optopair gas sensors, Galina Y. Sotnikova, Sergey E. Aleksandrov, Gennadiy A. Gavrilov, Ioffe Physico-Technical Institute (Russian Federation) . . . . . .[7356-69]

Local real-time detection of pH using fibre tapers, Ivan Kasik, Tomas Martan, Ondrej Podrazky, Jan Mrazek, Marie Pospisilova, Vlastimil Matejec, Institute of Photonics and Electronics (Czech Republic) . . . . . .[7356-70]

Optical measuring system used in magnetic field detectors, Jacek Golebiowski, Politechnika LÛdzka (Poland) . . . . . .[7356-71]

Light- and touch-point localization using flexible large area organic photodiodes and elastomer waveguides, Petr Bartu, Johannes Kepler Univ. Linz (Austria); Robert Koeppe, Johannes Kepler Univ. Linz (Austria) and isiQiri interface technologies GmbH i.G. (Austria); Lisa Fallon, The Dublin Institute for Advanced Studies (Ireland); Siegfried Bauer, Niyazi S. Sariciftci, Johannes Kepler Univ. Linz (Austria). . . . . .[7356-72]

Frequency fiber-optical sensor system with wavelength division multiplexing, Alexandre V. Poliakov, Belarusian State Univ. (Belarus) [7356-73]

Optical fiber sensor based on redistribution of power among several guided modes, Petr Siska, Technical Univ. of Ostrava (Czech Republic) . . . .[7356-74]

Design and evaluation of diffractive optical elements: optimization by using iterative angular spectrum approach and evaluation based on vector diffraction theory, Shuhei Yoshida, Manabu Yamamoto, Tokyo Univ. of Science (Japan). . . . . .[7356-75]

Review of new progress in optical point spread function, Zhiguang Xu, Kamal Youcef-Toumi, Massachusetts Institute of Technology (United States); Soon Fatt Yoon, Nanyang Technological Univ. (Singapore) . . . . . .[7356-76]

Observation of plasmon-induced optical field enhancement near a pair of partialy metal covered dielectric spheres manipulated by the terms of optical tweezers, Alexander G. Zhdanov, Lomonosov Moscow State Univ. (Russian Federation); Mark P. Kreuzer, Satish Rao, Petru V. Ghenuche, Romain Quidant, ICFO - Instituto de Ciencias Fotónicas (Spain); Andrey A. Fedyanin, Lomonosov Moscow State Univ. (Russian Federation); Dmitri Petrov, ICFO - Instituto de Ciencias Fotónicas (Spain). . . . . .[7356-77]

Micro force measurement by photoelastic effect in solid-state laser, Khelifa Naceur-Eddine, Conservatoire National des Arts et Métiers (France) .[7356-78]

Sensitivity enhancement in surface plasmon resonance sensors theoretical modeling, Jaroslav Vlcek, Jaromir Pistora, Michal Lesnak, Technical Univ. of Ostrava (Czech Republic) . . . . . .[7356-79]

Collection of photogenerated charge carriers in small-pitched PV arrays based on HgCdTe heterostructures, Mikhail S. Nikitin, Galina V. Chekanova, Alpha (Russian Federation); Albina A. Drugova, Viacheslav A. Kholodnov, Institute of Radio-engineering and Electronics (Russian Federation) . .[7356-80]

Characterization of sensing layer onto the tip taper fiber, Marie Pospisilova, Institute of Radio Engineering and Electronics (Czech Republic); Jan Petrasek, Institute of Experimental Botany (Czech Republic); Vlastimil Matejec, Ivan Kasik, Institute of Photonics and Electronics (Czech Republic) . . . . . .[7356-81]

Long range surface plasmons for fluorescence spectroscopy-based optical biosensors, Chun Jen Huang, Jakub Dostalek, Max-Planck-Institut für Polymerforschung (Germany) and Austrian Research Ctrs. GmbH (Austria); Wolfgang Knoll, Austrian Research Ctrs. GmbH (Austria) . . . . . .[7356-82]

Fiber optic detection of creatinine in a microsystem, Ilona Grabowska, Michal Chudy, Zbigniew Brzozka, Artur Dybko, Warsaw Univ. of Technology (Poland) . . . . . .[7356-83]

Experimental performances and Monte Carlo modelling of LWIR HgCdTe Avalanche Photodiodes, Sophie Derelle, Sylvie Bernhardt, Riad Haidar, Joel Deschamps, Jérôme Primot, ONERA (France); Johan Rothman, Commissariat à l'Energie Atomique (France) . . . . . .[7356-84]

Sensor of back-scattered light polarization in body cells, Jan Miklás, Pavel Tománek, Lubomir Grmela, Jitka Brüstlová, Pavel Dobis, Brno Univ. of Technology (Czech Republic) . . . . . .[7356-85]

Why is Rhodopsin a fastest biosensor for visible light?, Anatoly V. Stepanov, Belarusian State Univ. (Belarus) . . . . . .[7356-86]

Design of spectrophotometers and ended-ended systems, Armando G. Rojas, Instituto Nacional de Astrofísica, Óptica y Electrónica (Mexico)[7356-87]

A smart CMOS image sensor for a light-section based range finder with -56.5dB SBR and ±0.16 subpixel-resolution, Jimin Cheon, Dongsoo Kim, Youngcheol Chae, Seunghyun Lim, Inhee Lee, Yonsei Univ. (Korea, Republic of); Hyoung-Ki Lee, Dong Jo Kim, Samsung Advanced Institute of Technology (Korea, Republic of); Gunhee Han, Yonsei Univ. (Korea, Republic of) .[7356-88]

Further developments on a novel color sensitive CMOS detector, Giacomo Langfelder, Antonio Longoni, Federico Zaraga, Politecnico di Milano (Italy) . . . . . .[7356-89]

Optical interferometric vibration measurements of biological objects, Elena Seryozhkina, National Technical Univ. of Ukraine (Ukraine) . . . . . .[7356-90]

Broadband transmission spectroscopy in tissue, application to radiofrequency tissue fusion, Timmy Floume, Richard R. A. Syms, Ara W. Darzi, George B. Hanna, Imperial College London (United Kingdom) .[7356-91]

Development of a high-resolution pattern-projection system using linescan cameras, Berend Denkena, Univ. Hannover (Germany); Philipp Huke, Leibnitz Univ. Hannover (Germany) . . . . . .[7356-92]

Wednesday 22 April

SESSION 7 . . . . . .Wed. 08.40 to 10.00

Components for Sensors

A temperature insensitive silicon photodetector, James A. Harder, Michaelene W. Sprague, Elbit Systems of America (United States) . . .[7356-30]

Slab waveguide spatial heterodyne spectrometers for remote sensing from space, Miroslaw Florjanczyk, York Univ. (Canada) and National Research Council Canada (Canada); Pavel Cheben, Siegfried Janz, National Research Council Canada (Canada); Alan D. Scott, COM DEV Canada (Canada); Brian H. Solheim, York Univ. (Canada); Dan-Xia Xu, National Research Council Canada (Canada) . . . . . .[7356-31]

Organic photo sensors operating at high speed utilizing poly(9,9-dioctylfluorene) derivative and fullerene derivative fabricated by solution process, Yutaka Ohmori, Tatsunari Hamasaki, Osaka Univ. (Japan); Taichiro Morimune, Takuma National College of Technology (Japan); Hirotake Kajii, Osaka Univ. (Japan) . . . . . .[7356-32]

Sensitivity of fast-response nanographite photodetector at high temperature, Gennady M. Mikheev, Ruslan G. Zonov, Institute of Applied Mechanics (Russian Federation); Alexander N. Obraztsov, Lomonosov Moscow State Univ. (Russian Federation); Yuri P. Svirko, Univ. of Joensuu (Finland). . . . . .[7356-33]

SESSION 8 . . . . . .Wed. 10.30 to 12.10

Chemical Sensors

Remote Tuneable Diode Laser Absorption Spectroscopy (TDLAS) via a 1W raman source, David M. Mitchell, Kevin Duffin, Walter Johnstone, Univ. of Strathclyde (United Kingdom) . . . . . .[7356-34]

Chemical sensor applications of whispering-gallery modes resonances of thin capillaries with submicrometric wall, Vanessa Zamora, Antonio Díez, Benito Gimeno, Miguel V. Andrés, Univ. of Valencia (Spain) . . . . . .[7356-35]

Infrared optical sensor for CO2 detection, Frédéric Charpentier, Bruno Bureau, Virginie Nazabal, Johann Troles, Quentin Coulombier, Laurent Brilland, Univ. de Rennes 1 (France); Frédéric Smektala, Univ. de Bourgogne (France); Hervé Lhermite, Joël Charrier, Univ. de Rennes 1 (France); Petr Nemec, Miloslav Frumar, Univ. Pardubice (Czech Republic); Karine Le Pierres, BRGM (France); Nathalie Thybaud, ADEME (France) . . . . . .[7356-36]

The ZnO-based hybrid layer used for improving NO gas sensing, Chien-Sheng Liu, National Taiwan Univ. (Taiwan) . . . . . .[7356-37]

Liquid-crystal based optical gas sensors, Kun-Lin Yang, National Univ. of Singapore (Singapore). . . . . .[7356-38]

Lunch/Exhibition Break. . . . . .12.10 to 13.30

SESSION 9 . . . . . .Wed. 13.30 to 15.20

Biosensors

Principles and applications of fluorescence lifetime correlation *(Invited Paper)*, Martin Hof, J. Heyrovsky Institute of Physical Chemistry (Czech Republic) . . . . . .[7356-39]

A fluorescent immunoassay for the determination of procalcitonin and C-reactive protein, Francesco Baldini, Istituto di Fisica Applicata Nello Carrara (Italy); Luca Bolzoni, Datamed S.r.L. (Italy); Ambra Giannetti, Istituto di Fisica Applicata Nello Carrara (Italy); Giampiero Porro, Datamed S.r.L. (Italy); Folco Senesi, Cosimo Trono, Istituto di Fisica Applicata Nello Carrara (Italy) [7356-40]

Advanced biosensing based on surface plasmon-enhanced fluorescence spectroscopy, Jakub Dostalek, Max-Planck-Institut für Polymerforschung (Germany) and Austrian Research Ctrs. GmbH (Australia); Yi Wang, Chun Jen Huang, Max-Planck-Institut für Polymerforschung (Germany) and Austrian Research Centers - ARC (Austria); Raquel Chulia-Jordan, Max-Planck-Institut für Polymerforschung (Germany) and Austrian Research Ctrs. GmbH (Austria); Alena Aulasevich, Robert F. Roskamp, Annette Brunsen, Max-Planck-Institut für Polymerforschung (Germany); Wolfgang Knoll, Austrian Research Ctrs. GmbH (Austria) . . . . . .[7356-41]

Intrinsic photoluminescence of diatom shells in sensing applications., Edoardo De Tommasi, Ivo Rendina, Istituto per la Microelettronica e Microsistemi (Italy); Mario De Stefano, Annalisa Lamberti, Univ. degli Studi di Napoli Federico II (Italy); Luca De Stefano III, Istituto per la Microelettronica e Microsistemi (Italy). . . . . .[7356-42]

Perfluorinated polymer optical fiber tapers for fluorescence collection, Romeo Bernini, Consiglio Nazionale delle Ricerche (Italy) . . . . . .[7356-43]

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Photonic Crystal Fibres

Conference Chair: **Kyriacos Kalli,** Cyprus University of Technology (Cyprus)

Conference Co-Chairs: **Dmitry V. Skryabin,** Univ. of Bath (United Kingdom); **Francis Berghmans,** Vrije Univ. Brussel (Belgium)

Programme Committee: **Hartmut Bartelt,** IPHT Jena (Germany); **Benjamin J. Eggleton,** The Univ. of Sydney (Australia); **Sebastien Fevrier,** Univ. de Limoges (France); **Jiri Kanka,** Institute of Photonics and Electronics (Czech Republic); **Jonathan Knight,** Univ. of Bath (United Kingdom); **Hanne Ludvigsen,** Helsinki Univ. of Technology (Finland); **Azizur B. Rahman,** The City Univ. (United Kingdom); **Karsten Rottwitt,** Danmarks Tekniske Univ. (Denmark); **Kay Schuster,** IPHT Jena (Germany); **Waclaw Urbanczyk,** Wroclaw Univ. of Technology (Poland); **David J. Webb,** Aston Univ. (United Kingdom); **Alexei M. Zheltikov,** Lomonosov Moscow State Univ. (Russian Federation)

Wednesday 22 April

Opening Remarks . . . . . Wed. 13.25 to 13.30

Kyriacos Kalli, Cyprus University of Technology (Cyprus)

SESSION 1 . . . . . Wed. 13.30 to 15.20

Advances in PCF Fabrication: Doped and Nonlinear Fibers

Session Chair: **Kay Schuster,** IPHT Jena (Germany)

Microstructured fibers with high lanthanum oxide glass core for nonlinear applications *(Invited Paper)*, Jens Kobelke, Kay Schuster, Doris Litzkendorf, Anka Schwuchow, Johannes Kirchhof, Hartmut Bartelt, Vincent Tombelaine, IPHT Jena (Germany); Philippe Leproux, Vincent Couderc, Univ. de Limoges (France); Alexis Labruyere, XLIM Institut de Recherche (France) . . . . .[7357-01]

Highly nonlinear chalcogenide core nanofiber and photonic crystal fiber showing zero dispersion at 1.55 m, Chitrarekha B. Chaudhari, Takenobu Suzuki, Yasutake Ohishi, Toyota Technological Institute (Japan). . . . .[7357-02]

Chalcogenide photonic crystal fibers: elaboration and non linear optical characterizations, Frédéric Smektala, Mohammed ElAmraoui, Coraline Fortier, Univ. de Bourgogne (France); Gilles Renversez, Univ. Aix Marseille III (France); Julien Fatome, Jean Charles Jules, Gregory Gadret, Sophie Salaün, Univ. de Bourgogne (France); Johann Troles, Univ. de Rennes 1 (France); Laurent Brilland, PERFOS (France); Frederic Desevedavy, Univ. de Rennes 1 (France); Nick Traynor, PERFOS (France) . . . . . .[7357-03]

Dispersion-engineered and highly-nonlinear microstructured polymer optical fibres, Michael H. Frosz, Kristian Nielsen, Ole Bang, Technical Univ. of Denmark (Denmark). . . . . .[7357-04]

Y-shaped microstructured fibers with Ge-doped core, Salvador Torres-Peiró, Antonio Díez, José L. Cruz Munoz, Miguel V. Andrés, Univ. de València (Spain) . . . . . .[7357-05]

SESSION 2 . . . . . Wed. 15.50 to 16.50

Super Continuum Generation in PCF

Session Chair: **Sébastien Février,** Univ. de Limoges (France)

Relativistic particle white light super continuum generation, Kent E. Mattsson, Crystal Fibre A/S (Denmark). . . . . .[7357-06]

Ge-doped Y-shaped microstructured fiber for supercontinuum generation, Jaime Cascante-Vindas, Salvador Torres-Peiró, Antonio Díez, Miguel V. Andrés, Univ. de València (Spain). . . . . .[7357-07]

Ultraflat supercontinuum generation in soft-glass photonic crystal fibers, Juan J. Miret, Univ. de Alicante (Spain); Pedro Andrés Bou, Enrique Silvestre-Mora, Univ. de València (Spain) . . . . . .[7357-08]

SESSION 3 . . . . . Wed. 16.50 to 17.50

Measurement and Characterisation of PCF

Session Chair: **Waclaw Urbanczyk,** Politechnika Wroclawska (Poland)

Broadband measurement of dispersion in a two-mode birefringent holey fiber by spectral interferometric techniques, Petr Hlubina, Dalibor Ciprian, Miroslava Kadulova, Technical Univ. of Ostrava (Czech Republic); Gabriela Statkiewicz-Barabach, Waclaw Urbanczyk, Wroclaw Univ. of Technology (Poland) . . . . . .[7357-09]

Characterization of modes excited in a nonlinear photonic crystal fibre using low coherence interferometry, Purnananda Nandi, William J. Wadsworth, Timothy A. Birks, Jonathan C. Knight, Univ. of Bath (United Kingdom) . . . . . .[7357-10]

Birefringence dispersion in elliptical-core fibers measured over a broad wavelength range by interferometric techniques, Petr Hlubina, Dalibor Ciprian, Miroslava Kadulova, Technical Univ. of Ostrava (Czech Republic); Gabriela Statkiewicz-Barabach, Waclaw Urbanczyk, Wroclaw Univ. of Technology (Poland); Jan Wojcik, Maria Curie-Sklodowska Univ. (Poland) . . . . . .[7357-11]

Thursday 23 April

SESSION 4 . . . . . Thurs. 08.30 to 09.50

PCF-based Laser Mid-infrared Sources

Session Chair: **Dmitry V. Skryabin,** Univ. of Bath (United Kingdom)

Dynamic behaviour of an Ytterbium-doped rodlike PCF laser, Federica Poli, Davide Passaro, Annamaria Cucinotta, Stefano Selleri, Univ. of Parma (Italy) . . . . . .[7357-12]

Hollow-core photonic crystal fibers for integrated mid infrared sources, Benoit Beaudou, Univ. de Limoges (France) and CPPM, Univ. of Bath (United Kingdom) . . . . . .[7357-13]

Chalcogenide As2S3 suspended core fiber for mid-IR wavelength conversion based on degenerate four-wave mixing, Marcin Szpulak, Wroclaw Univ. of Technology (Poland); Sébastien Février, Univ. de Limoges (France). . . . . .[7357-14]

Singlemode leakage channel fiber for the middle infrared, Leonid N. Butvina, Olesya V. Sereda, Alexey L. Butvina, Eugeny M. Dianov, A. M. Prokhorov General Physics Institute (Russian Federation); Ninel V. Lichkova, Vladimir N. Zagorodnev, Institute of Microelectronics Technology and High Purity Materials (Russian Federation) . . . . . .[7357-15]

SESSION 5 . . . . . Thurs. 10.20 to 12.10

Grating Sensor Applications of PCF

Session Chair: **Francis Berghmans,** Vrije Univ. Brussel (Belgium)

otonBragg grating writing in phic crystal fibres *(Invited Paper)*, Kevin J. Cook, John Canning, The Univ. of Sydney (Australia); Alexandre A. P. Pohl, Federal Univ. of Technology Parana (Brazil); John L. Holdsworth, The Univ. of Newcastle (Australia); Nathaniel Groothoff, The Univ. of Sydney (Australia) . . . . .[7357-16]

Fiber bragg gratings in microstructured optical fibers for stress monitoring, Thomas Geernaert, Vrije Univ. Brussel (Belgium); Geert Luyckx, Eli Voet, Univ. Gent (Belgium); Tomasz A. Nasilowski, Karima Chah, Vrije Univ. Brussel (Belgium); Martin Becker, Hartmut Bartelt, IPHT Jena (Germany); Waclaw Urbanczyk, Wroclaw Univ. of Technology (Poland); Jan Wójcik, Maria Curie-Sklodowska Univ. (Poland); Wim De Waele, Joris Degrieck, Univ. Gent (Belgium); Francis Berghmans, Hugo Thienpont, Vrije Univ. Brussel (Belgium) . .[7357-17]

Comparison between femtosecond laser and fusion-arc inscribed long period gratings in photonic crystal fibre, Tom D. P. Allsop, Aston Univ. (United Kingdom); Kyriacos Kalli, Cyprus Institute of Technology (Cyprus); Kaiming Zhou, Graham N. Smith, Aston Univ. (United Kingdom); Michalis Z. Komodromos, Frederick Institute of Technology (Cyprus); Kate Sugden, Mykhaylo Dubov, David J. Webb, Ian Bennion, Aston Univ. (United Kingdom) . . . . . .[7357-18]

Inscription of type IIA bragg reflectors in a highly non-linear microstructured optical fiber using deep ultraviolet laser radiation, Stavros Pissadakis, Michalis Livitziis, Georgios Tsibidis, Foundation for Research and Technology-Hellas (Greece); Jens Kobelke, Kay Schuster, IPHT Jena (Germany) . . . . . .[7357-19]

Long period fibre gratings photoinscribed in a microstructured polymer optical fibre by UV radiation, David Sáez-Rodríguez, Jose L. Cruz Munoz, Univ. de València (Spain); I. Johnson, David J. Webb, Aston Univ. (United Kingdom); Maryanne C. J. Large, Alexander Argyros, Martijn A. van Eijkelenborg, The Univ. of Sydney (Australia) . . . . . .[7357-20]

Lunch Break . . . . . 12.10 to 13.30

SESSION 6 . . . . . Thurs. 13.30 to 16.30

Modelling and Numerical Analysis of PCF

Session Chair: **Jiri Kanka,** Institute of Photonics and Electronics (Czech Republic)

A mode-solver for photonic crystal fibers based on the source-model technique *(Invited Paper)*, Yehuda Leviatan, Amit Hochman, Technion-Israel Institute of Technology (Israel) . . . . . .[7357-21]

Understanding form Birefringence of microstructured fibres, Laurent Labonté, Lab. de Physique de la Matière Condensée (France) and Univ. de Nice Sophia Antipolis (France); Dominique Pagnoux, Univ. de Limoges (France); Elio Pone, Maksim Skorobogatiy, Suzanne Lacroix, Ecole Polytechnique de Montréal (Canada) . . . . . .[7357-22]

Guiding and amplification properties of rod-type photonic crystal fibers with sectioned core doping, Stefano Selleri, Federica Poli, Davide Passaro, Annamaria Cucinotta, Univ. of Parma (Italy); Jesper Lægsgaard, Danmarks Tekniske Univ. (Denmark); Jes Broeng, Crystal Fibre A/S (Denmark). .[7357-23]

Single-mode regime in large mode area moat fiber, Davide Passaro, Federica Poli, Annamaria Cucinotta, Stefano Selleri, Univ. of Parma (Italy); Emil Voiculescu, Univ. of Cluj-Napocã (Romania) . . . . . .[7357-24]

Unbounded modal analysis of MOF: robust modelling of leaky modes, Andrew Docherty, The Univ. of Sydney (Australia) . . . . . .[7357-25]

Dispersion optimization of nonlinear glass photonic crystal fibers and impact of fabrication tolerances on their telecom nonlinear applications performance, Jiri Kanka, Institute of Photonics and Electronics (Czech Republic) . . . . . .[7357-26]

Novel design of photonic crystal fibres with highly birefringence, low confinement losses and low chromatic dispersion, Shyqyri Haxha, Univ. of Kent (United Kingdom) . . . . . .[7357-27]

SESSION 7 . . . . . Thurs. 16.30 to 17.40

Guided Wave Sensing Applications of PCF

Session Chair: **David J. Webb,** Aston Univ. (United Kingdom)

Role of microstructure on guided acoustic wave Brillouin scattering in photonic crystal fibers *(Invited Paper)*, Jean-Charles Beugnot, Ecole Polytechnique Fédérale de Lausanne (Switzerland); Thibaut Sylvestre, Émile Carry, Hervé Maillotte, Univ. de Franche-Comté (France); Gilles Melin, Draka Comteq France (France); Vincent Laude, Institut Femto-ST (France). .[7357-28]

Highly birefringent microstructured fibers with zero sensitivity to temperature, Tadeusz Martynkien, Waclaw Urbanczyk, Politechnika Wroclawska (Poland). . . . . .[7357-29]

Suspended-core fibres as optical gas sensing cells: study and implementation, Isabelle Dicaire, Jean-Charles Beugnot, Luc Thévenaz, Ecole Polytechnique Fédérale de Lausanne (Switzerland) . . . . . .[7357-30]

Conference 7358

Wednesday-Thursday 22-23 April 2009 • Proceedings of SPIE Vol. 7358

Holography: Advances and Modern Trends

Conference Chairs: **Miroslav Miler,** Institute of Photonics and Electronics (Czech Republic); **Miroslav Hrabovsky,** Joint Lab. of Optics and Univ. Palackeho (Czech Republic)

Programme Committee: **Ivo Aubrecht,** Police presidium CR (Czech Republic); **Radim Chmelik,** Brno Univ. of Technology (Czech Republic); **Pavel Fiala,** Czech Technical Univ. in Prague (Czech Republic); **Romuland Jozwicki,** Warsaw Univ. of Technology (Poland); **Milos Kopecky,** Institute of Physics (Czech Republic); **Raymond K. Kostuk,** The Univ. of Arizona (USA); **Libor Kotacka,** Optaglio s.r.o. (Czech Republic); **Dagmar Senderakova,** Comenius Univ. in Bratislava (Slovakia); **G¸nther K. G. Wernicke,** Humboldt-Univ. zu Berlin (Germany)

Tuesday 21 April

Posters—Tuesday . . . . . Tues. 17.45 to 19.15

All symposium attendees are invited to attend Tuesday 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.

Poster presenters may post their poster papers starting at 10:00 hrs on Tuesday in the Conference Area Hallway. Any papers left on the boards following the end time of the poster session will be considered unwanted and will be discarded. SPIE Europe assumes no responsibility for posters left up after the end of the poster session. Poster authors should be at their papers from 17:45 to 19:15 hrs to answer questions from attendees. Attendees are requested to wear their conference registration badges to the poster sessions.

Fabrication of 2D photonic crystal with micron to sub-micron hexagonal lattices using single-exposure holographic technique, Xiangsu Zhang, Sensen Li, Shou Liu, Han Lin, Xuechang Ren, Xiamen Univ. (China) . .[7358-39]

Linear response deviations in photopolymers, Manuel Ortuño, Cristian Neipp, Elena Fernández Varo, Mariela L. Álvarez, Augusto Beléndez, Univ. de Alicante (Spain) . . . . . .[7358-40]

Research of a method and optical system for record multiplex holograms in system of holographic memory, Sergey B. Odinokov, Bauman Moscow State Technical Univ. (Russian Federation). . . . . .[7358-41]

Phase recording for formation of holographic optical elements on silver-halide photographic emulsions, Nina M. Ganzherli, Ioffe Physico-Technical Institute (Russian Federation); Sergei N. Gulyaev, St. Petersburg State Polytechnical Univ. (Russian Federation); Irina A. Maurer, Dmitri F. Chernykh, Ioffe Physico-Technical Institute (Russian Federation) . . . . . .[7358-42]

Short-wavelength ultraviolet radiation for formation of holographic optical elements on silver-halide photographic emulsions, Nina M. Ganzherli, Ioffe Physico-Technical Institute (Russian Federation) . . . . . .[7358-43]

Holographic fabrication of periodic structures on silicon as anti-reflective layers for high efficiency solar cells, Xiaoyun Chen, Xiamen Univ. (China) . . . . . .[7358-44]

An elementary research on wireless transmission of holographic 3D moving pictures, Kunihiko Takano, Tokyo Metropolitan College of Industrial Technology (Japan); Koki Sato, Shonan Institute of Technology (Japan). . . . . .[7358-45]

A color retrieval technique using hologram, Mitsuo Fukuda, Shota Yamamoto, Masaki Aono, Hideo Sekino, Mitsuteru Inoue, Toyohashi Univ. of Technology (Japan); Makoto Kato, Tadahiko Kawaguchi, Papa Lab. Co., Ltd. (Japan). . . . . .[7358-46]

Multiplexing holograms for data page storage using a LCD as hybrid ternary modulation, Elena Fernández Varo, Manuel Ortuño, Sergi Gallego, Andrés Ruiz Márquez, Augusto Beléndez, Inmaculada V. Pascual, Univ. de Alicante (Spain) . . . . . .[7358-47]

Reflection holograms in a PVA/AA photopolymer: several composition, Rosa Fuentes, Elena Fernández Varo, Celia Garcia Llopis, Inmaculada V. Pascual, Univ. de Alicante (Spain). . . . . .[7358-48]

Phase code multiplexed ROM type holographic memory using the computer generated hologram, Yasuhiro Ohuchi, Manabu Yamamoto, Tokyo Univ. of Science (Japan) . . . . . .[7358-49]

Azopolymeric films for tridimensional recording of submicron gratings, Ileana G. Apostol, National Institute for Lasers, Plasma and Radiation Physics (Romania) . . . . . .[7358-50]

Volume hologram multiplexing in dye-doped jelly-like gelatin, Vasili M. Katarkevich, Terlan S. Efendiev, Anatoli N. Rubinov, B.I. Stepanov Institute of Physics (Belarus) . . . . . .[7358-51]

Properties of PVA/AA photopolymers at very low spatial frequencies, Sergi Gallego, Andrés Ruiz Márquez, David I. Méndez, Stephan Marini, Elena Fernández Varo, Univ. de Alicante (Spain) . . . . . .[7358-52]

Microdisplays in holographic mastering applications, Sven Plöger, Stefan Osten, Sven Krüger, Günther K. G. Wernicke, HOLOEYE Photonics AG (Germany); Gerhard K. Ackermann, Jürgen P. Eichler, Technische Fachhochschule Berlin (Germany) . . . . . .[7358-53]

Wednesday 22 April

Opening Remarks . . . . . Wed. 08.25 to 08.30

Miroslav Miler, Institute of Photonics and Electronics (Czech Republic); **Miroslav Hrabovsky,** Joint Lab. of Optics and Univ. Palackeho (Czech Republic)

SESSION 1 . . . . . Wed. 08.30 to 10.00

Recording Materials I

Session Chairs: **Miroslav Miler,** Institute of Photonics and Electronics (Czech Republic); **Günther K. G. Wernicke,** Humboldt-Univ. zu Berlin (Germany)

A comparative review of silver halide, photopolymerizable system and sol-gel holographic materials *(Invited Paper)*, Antonio Fimia-Gil, Pablo Acebal, Salvador Blaya, Luis Carretero, Angel Murciano, Roque F. Madrigal, Univ. Miguel Hernández de Elche (Spain) . . . . . .[7358-01]

Optimization of the photochromic response of photoaddressable polymers with azobenzene-containing molecular glasses, Roland Walker, Hubert Audorff, Univ. Bayreuth (Germany) . . . . . .[7358-02]

Photo-kinetic study of Irgacure 784, Dusan Sabol, Michael R. Gleeson, Shui Liu, John T. Sheridan, National Univ. of Ireland, Dublin (Ireland) . . . . .[7358-03]

Dynamic behavior investigation of refractive index grating in a new nematic liquid crystal doped with azo dye., Habib Khoshsima, Rana Asgari Sabet, Univ. of Tabriz (Iran, Islamic Republic of) . . . . . .[7358-04]

SESSION 2 . . . . . Wed. 10.30 to 12.20

Advanced Holography

Session Chair: **Libor Kotacka,** Optaglio s.r.o. (Czech Republic)

Sub-50nm extreme ultraviolet holographic imaging *(Invited Paper)*, Przemyslaw W. Wachulak, Mario C. Marconi, Randy A. Bartels, Carmen S. Menoni, Jorge J. Rocca, Colorado State Univ. (United States) . . . . . .[7358-05]

Harrison's 'H4' holograms: stopping time, Martin J. Richardson, De Montfort Univ. (United Kingdom) . . . . . .[7358-06]

3-D coherence holography using a modified Sagnac radial shearing interferometer with geometric phase shift, Dinesh N. Naik, Takahiro Ezawa, Yoko Miyamoto, Mitsuo Takeda, The Univ. of Electro-Communications (Japan). . . . . .[7358-07]

Time-resolved two-wavelength contouring of adaptive fluidic PDMS-lenses, Uwe Griebner, Thomas Hansel, Ruediger Grunwald, Günter Steinmeyer, Max-Born-Institut für Nichtlineare Optik und Kurzzeitspektroskopie (Germany); Florian Schneider, Ulrike Wallrabe, Albert-Ludwigs-Univ. Freiburg (Germany) . . . . . .[7358-08]

Polarization-holographic element for complete analysis of light, Barbara N. Kilosanidze, George A. Kakauridze, Institute of Cybernetics (Georgia) [7358-09]

Lunch/Exhibition Break. . . . . .12.20 to 13.40

SESSION 3 . . . . . .Wed. 13.40 to 15.20

Holography for Security

Session Chair: **Przemyslaw W. Wachulak,** Colorado State Univ. (USA)

The role of holograms to detect counterfeits in a digital systems world *(Invited Paper)*, Ian M. Lancaster, Reconnaissance International Ltd. (United Kingdom) . . . . . .[7358-10]

Advanced synthetic holograms for security purposes *(Invited Paper)*, Libor Kotacka, Petr Vizdal, Tomaö Behounek, Optaglio s.r.o. (Czech Republic) . . . . . .[7358-11]

Polarization-sensitive multilayer diffractive structures for document security, Ivo Aubrecht, Police presidium CR (Czech Republic) . . . . . .[7358-12]

Self-organized holographic diffuser in an azo polymer film, Sohrab Ahmadi-Kandjani, Univ. of Tabriz (Iran, Islamic Republic of) . . . . . .[7358-13]

SESSION 4 . . . . . .Wed. 15.50 to 17.50

Holography for Photonic Crystals

Session Chair: **Ivo Aubrecht,** Police presidium CR (Czech Republic)

Holographic 3D microfabrication by femtosecond pulse laser, Masahiro Yamaji, Hayato Kawashima, Jun'ichi Suzuki, Shuhei Tanaka, New Glass Forum (Japan). . . . . .[7358-16]

Device for synthetising computer-generated holograms, Jakub Svoboda, Pavel Fiala, Czech Technical Univ. in Prague (Czech Republic) . . . . . .[7358-14]

Hybrid aplanatic diffractive optical systems, Jaroslav Hopp, Pavel Fiala, Czech Technical Univ. in Prague (Czech Republic) . . . . . .[7358-15]

The importance of holograms in dentistry, Cosmin G. H. Sinescu M.D., Univ. de Medicina si Farmacie Victor Babes, Timisoara (Romania); Meda-Lavinia V. Negrutiu, Univ. de Medicina si Farmacie Victor Babes,Timisoara (Romania); Dana Pop, Univ. de Medicina si Farmacie Victor Babes, Timisoara (Romania); Lavinia Cuc, Aurel Vlaicu Univ. of Arad (Romania); Aldo De Sabata, Radu Negru, Mihai Hluscu, Politehnica Univ. Timisoara (Romania); Mihai Rominu, Univ. de Medicina si Farmacie Victor Babes, Timisoara (Romania) . . . . . .[7358-17]

Optimization of lattice constants of 2D photonic crystals fabricated on ITO layers of LEDs using holographic method for efficient light extraction, Han Lin, Xiangsu Zhang, Shou Liu, Xiamen Univ. (China) . . . . . .[7358-18]

Photonic crystals and plasmonic structures recorded by multi-exposure of holographic patterns, Lucila H. D. Cescato, Jacson W. Menezes, Univ. Estadual de Campinas (Brazil). . . . . .[7358-19]

Thursday 23 April

SESSION 5 . . . . . Thurs. 08.30 to 10.00

Holographic Gratings

Session Chair: **Miroslav Hrabovsky,** Univ. Palackeho (Czech Republic)

1×2 demultiplexer for a light waveguide communications system based on a holographic grating *(Invited Paper)*, Xuechang Ren, Xiangsu Zhang, Canhui Wang, Shou Liu, Xiamen Univ. (China) . . . . . .[7358-20]

Detection of evanescent waves generated by high frequency holographic gratings, Canhui Wang, Shou Liu, Xiangsu Zhang, Xuechang Ren, Xiamen Univ. (China) . . . . . .[7358-21]

Holographic fabrication and characteristic analysis of anti-reflective subwavelength cross gratings, Fengmei Zhao, Xiamen Univ. (China)[7358-22]

Optical polyfunctional nanoglassceramics for photonic applications, Nikolay V. Nikonorov, Vladimir A. Aseev, Alexander Ignatev, Viktor A. Tsekhomsky, Ekaterina V. Tsygankova, Andrey Zlatov, St. Petersburg Institute of Fine Mechanics and Optics (Russian Federation). . . . . .[7358-23]

SESSION 6 . . . . . Thurs. 10.30 to 12.10

Recording Materials II

Session Chair: **Antonio Fimia-Gil,** Univ. Miguel Hernández de Elche (Spain)

Non-local photo-polymerization kinetics with multiple termination mechanisms and post-exposure effects *(Invited Paper)*, Michael R. Gleeson, John T. Sheridan, National Univ. of Ireland, Dublin (Ireland). . . . . .[7358-24]

Highly effective dynamical holographic grating in doped bithmus titanate crystals and applications to metrology, George E. Dovgalenko, ITT Technical Institute (United States); Ying Wu, Shanghai Jing Na Luo Decorative Design Engineering Co. (China). . . . . .[7358-25]

Improved model of the photo-initiation mechanisms in photopolymer materials, Shui Liu, John T. Sheridan, Michael R. Gleeson, National Univ. of Ireland, Dublin (Ireland) . . . . . .[7358-26]

Parameter extraction from gratings recorded in photopolymer, Dusan Sabol, John T. Sheridan, National Univ. of Ireland, Dublin (Ireland). . . . . .[7358-27]

Dynamic polarization holography: materials and applications, Barbara N. Kilosanidze, George A. Kakauridze, Irakli Chaganava, Institute of Cybernetics (Georgia) . . . . . .[7358-28]

Lunch Break. . . . . .12.20 to 13.30

SESSION 7 . . . . . Thurs. 13.30 to 15.20

Computer Assisted Holography

Session Chair: **John T. Sheridan,** National Univ. of Ireland, Dublin (Ireland)

'Blased' dynamic holography as a tool of adaptive optic *(Invited Paper)*, Vladimir Y. Venediktov, St. Petersburg State Polytechnical Univ. (Russian Federation) . . . . . .[7358-29]

Semi-Lens Lens Array and Fast Fourier Transform to Generate Hologram for Live Electronic Holography, Kenji Yamamoto, Tomoyuki Mishina, Makoto Okui, National Institute of Information and Communications Technology (Japan). . . . . .[7358-30]

Walk through type electro-holographic display using 3D screen, Koki Sato, Makoto Ohki, Shonan Institute of Technology (Japan); Kunihiko Takano, Tokyo Metropolitan College of Industrial Technology (Japan). . . . . .[7358-31]

Computer generated holographic invariant LPCC filters for 4-f correlator, Rostislav S. Starikov, Evgeny Y. Zlokazov, Moscow Engineering Physics Institute (Russian Federation) . . . . . .[7358-32]

Complex computer-synthesized holograms, forming uncaused fields, Eugene V. Braginets, National Taras Shevchenko Univ. of Kyiv (Ukraine); Volodymyr I. Girnyk, OPTRONICS PC (Ukraine); Sergey A. Kostyukevich, Institute of Semiconductor Physics (Ukraine); Vitaliy N. Kurashov, National Taras Shevchenko Univ. of Kyiv (Ukraine) . . . . . .[7358-33]

SESSION 8 . . . . . Thurs. 15.50 to 17.30

Digital Holography

Session Chair: **Vladimir Yu. Venediktov,** S.I. Vavilov State Optical Institute (Russian Federation)

Holographic data storage with a planar-integrated optical write-read head, Matthias Gruber, Matthias Soellner, Univ. of Hagen (Germany) . . . . . .[7358-34]

Rainbow digital holography: modeling and experiment, Malgorzata Kujawinska, Grzegorz F. Finke, Warsaw Univ. of Technology (Poland)[7358-35]

Digital holography with arbitrary phase-step reconstruction using multiple holograms, Chi-Ching Chang, Ming Dao Univ. (Taiwan); Wang Ta Hsieh, National Defense Univ. (Taiwan) . . . . . .[7358-36]

Deformation and shape measurement by compensation in digital holography, János Kornis, Richárd Séfel, Budapest Univ. of Technology and Economics (Hungary) . . . . . .[7358-37]

Compression of digital holographic sequences using MPEG-4/H.264, Emmanouil Darakis, National Univ. of Ireland, Maynooth (Ireland) and Nanyang Technological Univ. (Singapore); Thomas J. Naughton, National Univ. of Ireland, Maynooth (Ireland) and Univ. of Oulu (Finland). . . . . .[7358-38]

Conference 7359

Wednesday-Thursday 22-23 April 2009 • Proceedings of SPIE Vol. 7359

Harnessing Relativistic Plasma Waves as Novel Radiation Sources from Terahertz to X-rays and Beyond

Conference Chairs: **Dino A. Jaroszynski,** Univ. of Strathclyde (United Kingdom); **Antoine Rousse,** Ecole Nationale Supérieure de Techniques Avancées (France)

Programme Committee: **Robert Bingham,** Science and Technology Facilities Council (United Kingdom); **Chris E. Clayton,** Univ. of California/ Los Angeles (USA); **N. Piovella,** Univ. di Milano (Italy); **Alexander Pukhov,** Heinrich-Heine-Univ. Düsseldorf (Germany); **Luca Serafini,** Univ. degli Studi di Milano (Italy); **Gennady Shvets,** The Univ. of Texas at Austin (USA); **Luis Silva,** Instituto Superior Tecnico (Portugal); **Mark Wiggins,** Univ. of Strathclyde (United Kingdom); **Matt Zepf,** Queen's Univ. Belfast (United Kingdom)

Tuesday 21 April

Posters—Tuesday . . . . . Tues. 17.45 to 19.15

All symposium attendees are invited to attend Tuesday 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.

Poster presenters may post their poster papers starting at 10:00 hrs on Tuesday in the Conference Area Hallway. Any papers left on the boards following the end time of the poster session will be considered unwanted and will be discarded. SPIE Europe assumes no responsibility for posters left up after the end of the poster session. Poster authors should be at their papers from 17:45 to 19:15 hrs to answer questions from attendees. Attendees are requested to wear their conference registration badges to the poster sessions.

Plasma diagnostics of a capillary plasma using pulse power *(Invited Paper)*, Takeshi Higashiguchi, Utsunomiya Univ. (Japan) . . . . . .[7359-42]

Compression of an ultrashort laser pulse via self-modulation in argon gas *(Invited Paper)*, Takeshi Higashiguchi, Utsunomiya Univ. (Japan) . . . .[7359-43]

Visualization of the electron-acceleration process in a table-top laser-plasma accelerator (stand-by oral presentation) *(Invited Paper)*, Malte C. Kaluza, Hans-Peter Schlenvoigt, Friedrich-Schiller-Univ. Jena (Germany); Stuart P. D. Mangles, Imperial College London (United Kingdom); Alexander G. R. Thomas, Univ. of Michigan (United States); Aboobaker E. Dangor, Imperial College London (United Kingdom); Heinrich Schwoerer, Stellenbosch Univ. (South Africa); Warren B. Mori, Univ. of California, Los Angeles (United States); Zulfikar Najmudin, Imperial College London (United Kingdom); Karl M. Krushelnick, Univ. of Michigan (United States) . . . . . .[7359-44]

Wednesday 22 April

Opening Remarks . . . . . Wed. 08.25 to 08.30

Dino A. Jaroszynski, Univ. of Strathclyde (United Kingdom); *Antoine Rousse,* Ecole Nationale Supérieure de Techniques Avancées (France)

SESSION 1 . . . . . Wed. 08.30 to 10.00

Towards a Compact X-FEL I

Session Chair: **Luis O. Silva,** Instituto Superior Técnico (Portugal)

To be announced. . . . . . .[7359-01]

Towards table-top free-electron-lasers *(Invited Paper)*, Florian J. Gruener, Andreas R. Maier, Ludwig-Maximilians-Univ. München (Germany); Carl B. Schroeder, Wim P. Leemans, Lawrence Berkeley National Lab. (United States); Ferenc Krausz, Max-Planck-Institut für Quantenoptik (Germany) . . . .[7359-02]

An experimental proposal for attosecond slicing of an LWFA produced electron beam *(Invited Paper)*, Christopher M. S. Sears, Max-Planck-Institut für Quantenoptik (Germany) . . . . . .[7359-03]

Coherent Thomson scattering at laser compressed and accelerated electron bunches *(Invited Paper)*, Daniel R. an der Bruegge, Heinrich-Heine-Univ. Düsseldorf (Germany). . . . . .[7359-04]

SESSION 2 . . . . . Wed. 10.30 to 11.30

Towards a Compact X-FEL II

Session Chair: **Christopher E. Clayton,** Univ. of California, Los Angeles (USA)

Nonlinear dynamics of electrons in plasma cavitations *(Invited Paper)*, Sijia Chen, Univ. of Strathclyde (United Kingdom) . . . . . .[7359-05]

A compact synchrotron radiation source driven by a laser-plasma wakefield accelerator *(Invited Paper)*, Richard P. Shanks, Maria P. Anania, Enrico Brunetti, Silvia Cipiccia, Riju C. Issac, Univ. of Strathclyde (United Kingdom); Hans-Peter Schlenvoigt, Heinrich Schwoerer, Friedrich-Schiller-Univ. Jena (Germany); Gregory Vieux, Gregor H. Welsh, Mark S. Wiggins, Dino A. Jaroszynski, Univ. of Strathclyde (United Kingdom) . . . . . .[7359-06]

Prospects of laser driven radiation sources at the FZD *(Invited Paper)*, Ulrich Schramm, Thomas Cowan, Stephan Kraft, Michael Bussmann, Alexander Debus, Axel Jochmann, Roland A. Sauerbrey, Forschungszentrum Dresden-Rossendorf (Germany). . . . . .[7359-07]

SESSION 3 . . . . . Wed. 11.30 to 12.10

Frequency Shifting and Photon Acceleration I

Session Chair: **Christopher E. Clayton,** Univ. of California, Los Angeles (USA)

The flying mirror: future brightest X-ray source *(Invited Paper)*, Timur Z. Esirkepov, Sergei V. Bulanov, Masaki Kando, Alexander S. Pirozhkov, Japan Atomic Energy Agency (Japan) . . . . . .[7359-08]

Photon Landau damping of relativistic plasma waves *(Invited Paper)*, Tito Mendonca, Instituto Superior Técnico (Portugal) . . . . . .[7359-09]

Lunch/Exhibition Break. . . . . .12.10 to 13.30

SESSION 4 . . . . . Wed. 13.30 to 15.20

High-Harmonic Generation I

Session Chair: **Mark S. Wiggins,** Univ. of Strathclyde (United Kingdom)

New mechanism of harmonic generation in relativistic plasma *(Invited Paper)*, Alexander S. Pirozhkov, Masaki Kando, Timur Z. Esirkepov, Jinglong Ma, Yuji Fukuda, Liming Chen, Izuru Daito, Koichi Ogura, Takayuki Homma, Yukio Hayashi, Hideyuki Kotaki, Akito Sagisaka, Michiaki Mori, James Koga, Tetsuya Kawachi, Hiromitsu Kiriyama, Hajime Okada, Keigo Kawase, Takashi Kameshima, Noboyuki Nishimori, Japan Atomic Energy Agency (Japan); Eugene N. Ragozin, P.N. Lebedev Physical Institute (Russian Federation); Anatoly Y. Faenov, Tatiana A. Pikuz, Hiroyuki Daido, Sergei V. Bulanov, Toyoaki Kimura, Yoshiaki Kato, Toshiki Tajima, Japan Atomic Energy Agency (Japan). . . . . .[7359-10]

Coherent X-rays and energy transport into relativistic overdense laser-plasmas *(Invited Paper)*, Teodora Baeva, Heinrich-Heine-Univ. Düsseldorf (Germany) . . . . . .[7359-11]

Harmonic emission from high intensity laser-solid interactions as a coherent XUV source with attosecond resolution *(Invited Paper)*, Rainer Hoerlein, Yutaka Nomura, Max-Planck-Institut für Quantenoptik (Germany); Paraskevas Tzallas, Foundation for Research and Technology-Hellas (Greece); Brendan H. Dromey, Queen's Univ. Belfast (United Kingdom); Sergey G. Rykovanov, Zsuzsanna Major, Jens Osterhoff, Stefan Karsch, Laszlo Veisz, Max-Planck-Institut für Quantenoptik (Germany); Matthew Zepf, Queen's Univ. Belfast (United Kingdom); Dimitris Charalambidis, Foundation for Research and Technology-Hellas (Greece); Ferenc Krausz, George D. Tsakiris, Max-Planck-Institut für Quantenoptik (Germany) . . . . . .[7359-12]

High-order harmonic generation on plasma mirrors *(Invited Paper)*, Fabien Quere, Hervé George, Commissariat à l'Energie Atomique (France); Cédric Thaury, Jean-Paul Geindre, Ecole Polytechnique (France); Pascal Monot, Philippe Martin, Commissariat à l'Energie Atomique (France) . . . . . .[7359-13]

High harmonics and attosecond pulses in relativistic regime *(Invited Paper)*, Alexander Pukhov, Heinrich-Heine-Univ. Düsseldorf (Germany) . . . . .[7359-14]

SESSION 5 . . . . . Wed. 15.50 to 16.50

High-Harmonic Generation II

Session Chair: **Tito Mendonca,** Instituto Superior Técnico (Portugal)

Bright Attosecond pulses from relativistic plasma surfaces *(Invited Paper)*, Matthew Zepf, Queen's Univ. Belfast (United Kingdom). . . . . .[7359-15]

Electron acceleration, lateral transport and X-ray emission for large incidence angles of femtosecond laser pulses on a foil *(Invited Paper)*, Jan Psikal, Jiri Limpouch, Ondrej Klimo, Czech Technical Univ. in Prague (Czech Republic) . . . . . .[7359-16]

High harmonic generation from relativistic plasmas - diffraction limited performance and attosecond phaselocking *(Invited Paper)*, Brendan H. Dromey, Queen's Univ. Belfast (United Kingdom) . . . . . .[7359-17]

SESSION 6 . . . . . Wed. 16.50 to 17.50

Frequency Shifiting and Photon Acceleration II

Session Chair: **Tito Mendonca,** Instituto Superior Técnico (Portugal)

Short-wavelength plasma undulators for ultra-compact synchrotron radiation sources *(Invited Paper)*, Frederico Fiuza, Samuel Martins, Ricardo Fonseca, Luis O. Silva, Instituto Superior Técnico (Portugal) . . . . . .[7359-18]

XUV and IR electromagnetic radiation from nonlinear laser-plasma interaction *(Invited Paper)*, Masaki Kando, Japan Atomic Energy Agency (Japan). . . . . .[7359-19]

Photon acceleration by amplified wakefield generated by two copropagating laser pulses in plasma *(Invited Paper)*, Gaurav Raj, Dino A. Jaroszynski, Univ. of Strathclyde (United Kingdom) . . . . . .[7359-20]

Thursday 23 April

SESSION 7 . . . . . Thurs. 08.20 to 10.20

Raman and Brillouin Amplification

Session Chair: **Dino A. Jaroszynski,** Univ. of Strathclyde (United Kingdom)

A high intensity desktop laser source based on Raman amplification in plasma *(Invited Paper)*, John P. Farmer, Bernhard Ersfeld, Dino A. Jaroszynski, Univ. of Strathclyde (United Kingdom) . . . . . .[7359-21]

Experimental investigation of short pulse amplification using SBS *(Invited Paper)*, Livia Lancia, Jean-Raphael Marquès, Julien Fuchs, Motoaki Nakatsutsumi, Patrizio Antici, Caterina Riconda, Ecole Polytechnique (France) . . . . . .[7359-22]

Nonlinear temporal evolution of the backward stimulated Raman scattering instability in a density rippled plasma *(Invited Paper)*, G. Raj, Bernhard Ersfeld, John P. Farmer, M. R. Islam, Dino A. Jaroszynski, Univ. of Strathclyde (United Kingdom) . . . . . .[7359-23]

Effects of energy absorption on Raman amplification in plasma *(Invited Paper)*, Bernhard Ersfeld, John P. Farmer, Dino A. Jaroszynski, Univ. of Strathclyde (United Kingdom) . . . . . .[7359-24]

Chirped pulse amplification based on Raman backscattering in plasma *(Invited Paper)*, Xue Yang, Gregory Vieux, Enrico Brunetti, Bernhard Ersfeld, John P. Farmer, Riju C. Issac, Mark S. Wiggins, Dino A. Jaroszynski, Univ. of Strathclyde (United Kingdom) . . . . . .[7359-25]

Raman amplification in a plasma channel: high gain and thermal effects *(Invited Paper)*, Gregory Vieux, Xue Yang, Enrico Brunetti, Bernhard Ersfeld, John P. Farmer, Riju C. Issac, Mark S. Wiggins, Dino A. Jaroszynski, Univ. of Strathclyde (United Kingdom) . . . . . .[7359-26]

SESSION 8 . . . . . Thurs. 10.45 to 12.15

Betatron Radiation I

Session Chair: **Antoine Rousse,** Ecole Nationale Supérieure de Techniques Avancées (France)

Study of betatron radiation produced by laser plasma accelerator *(Invited Paper)*, Silvia Cipiccia, Riju C. Issac, Ranaul Islam, Gregory Vieux, Mark S. Wiggins, Richard P. Shanks, Albert A. J. W. Reitsma, Univ. of Strathclyde (United Kingdom); Dima Maneuski, Val O'Shea, Univ. of Glasgow (United Kingdom); Nuno Lemos, Rodolfo Bendoyro, Joana L. Martins, Frederico Fiuza, Michael Marti, Luis O. Silva, Instituto Superior Técnico (Portugal); Rajeev P. Pattathil, Peta Foster, Science and Technology Facilities Council (United Kingdom); Nicolas Bourgeois, Tom Ibbotson, Univ. of Oxford (United Kingdom); Dino A. Jaroszynski, Univ. of Strathclyde (United Kingdom); João Mendanha Dias, Instituto Superior Técnico (Portugal) . . . . . .[7359-27]

Betatron radiation from laser-wakefield accelerated bunches Of quasi-monoenergetic electrons *(Invited Paper)*, Stefan Kneip, Imperial College London (United Kingdom) . . . . . .[7359-28]

Hard x-ray and relativistic electron beams from laser wakefield experiments at the University of Michigan *(Invited Paper)*, Karl M. Krushelnick, Univ. of Michigan (United States) . . . . . .[7359-29]

Radiation post-processing in PIC codes *(Invited Paper)*, Joana L. Martins, Samuel F. Martins, Ricardo A. Fonseca, Luis O. Silva, Instituto Superior Técnico (Portugal) . . . . . .[7359-30]

Lunch Break. . . . . .12.15 to 13.30

SESSION 9 . . . . . Thurs. 13.30 to 15.00

Betatron Radiation II

Session Chair: **Alexander Pukhov,** Heinrich-Heine-Univ. Düsseldorf (Germany)

Towards a compact 0.1-10 MeV broadband betatron photon source *(Invited Paper)*, Christopher E. Clayton, Univ. of California, Los Angeles (United States) . . . . . .[7359-31]

Temporal characterization and flux improvement of the X-ray betatron source *(Invited Paper)*, Romuald Fitour, Kim Ta Phuoc, Sebastien Corde, Antoine Rousse, Ecole Nationale Supérieure de Techniques Avancées (France). . . . . .[7359-32]

Electron trapping, acceleration and betatron emission in a laser-plasma accelerator *(Invited Paper)*, Ranaul Islam, Silvia Cipiccia, Bernhard Ersfeld, Riju C. Issac, Univ. of Strathclyde (United Kingdom); Luis O. Silva, Instituto Superior Técnico (Portugal); Dino A. Jaroszynski, Univ. of Strathclyde (United Kingdom) . . . . . .[7359-33]

Radiation from self-injected beam in the blow-out regime with multi-PW lasers *(Invited Paper)*, Luis O. Silva, Instituto Superior Técnico (Portugal) . . . . . .[7359-34]

SESSION 10 . . . . . Thurs. 15.30 to 16.30

Terahertz Sources

Session Chair: **Matthew Zepf,** Queen's Univ. Belfast (United Kingdom)

Novel THz radiation sources from relativistic laser-plasmas *(Invited Paper)*, Zheng-Ming Sheng, Shanghai Jiao Tong Univ. (China) . . . . . .[7359-35]

Possibility of high power THz radiation via electromagnetically induced transparency at ion acoustic frequency region in laser-produced dense plasmas *(Invited Paper)*, Noboru Yugami, Takeshi Higashiguchi, Utsunomiya Univ. (Japan) . . . . . .[7359-36]

Strong Terahertz radiation from the interaction of laser air interaction *(Invited Paper)*, Min Chen, Alexander Pukhov, Heinrich-Heine-Univ. Düsseldorf (Germany) . . . . . .[7359-37]

SESSION 11 . . . . . Thurs. 16.30 to 17.30

Beams, Plasma Channels, and Diagnostics

Session Chair: **Matthew Zepf,** Queen's Univ. Belfast (United Kingdom)

Non-linear oscillations in relativistic thermal plasmas *(Invited Paper)*, David A. Burton, Lancaster Univ. (United Kingdom) and The Cockcroft Institute (United Kingdom). . . . . .[7359-38]

Narrow energy spread electron beams from the ALPHA-X laser wakefield accelerator *(Invited Paper)*, Mark S. Wiggins, Maria P. Anania, Enrico Brunetti, Silvia Cipiccia, Ranaul Islam, Riju C. Issac, Richard P. Shanks, Gregory Vieux, Gregor H. Welsh, Univ. of Strathclyde (United Kingdom); W. Allan Gillespie, Univ. of Dundee (United Kingdom); Allan MacLeod, Univ. of Abertay Dundee (United Kingdom); Dino A. Jaroszynski, Univ. of Strathclyde (United Kingdom) . . . . . .[7359-39]

Electron beam pointing on a laser wakefield accelerator *(Invited Paper)*, Riju C. Issac, Gregor H. Welsh, Richard P. Shanks, Gregory Vieux, Ranaul Islam, Mark S. Wiggins, Enrico Brunetti, Silvia Cipiccia, Maria P. Anania, Xue Yang, Bernhard Ersfeld, John P. Farmer, Sijia Chen, David Clark, Tom McCanny, Dino A. Jaroszynski, Univ. of Strathclyde (United Kingdom). . . . . .[7359-40]

SESSION 12 . . . . . Thurs. 17.30 to 17.50

Towards a Compact X-FEL III

Session Chair: **Matthew Zepf,** Queen's Univ. Belfast (United Kingdom)

Transport of ultra-short electron bunches in a free-electron laser driven by a laser-plasma wakefield accelerator *(Invited Paper)*, Maria P. Anania, Univ. of Strathclyde (United Kingdom); Bas S. B. van der Geer, Marieke M. J. de Loos, Technische Univ. Eindhoven (Netherlands); Albert A. J. W. Reitsma, Riju C. Issac, Mark S. Wiggins, Dino A. Jaroszynski, Univ. of Strathclyde (United Kingdom) . . . . . .[7359-41]

Conference 7360

Monday-Wednesday 20-22 April 2009 • Proceedings of SPIE Vol. 7360

EUV and X-ray Optics: Synergy between Laboratory and Space

Conference Chairs: **René Hudec,** Astronomical Institute of the Academy of Sciences of the Czech Republic (Czech Republic); **Ladislav Pina,** Czech Technical Univ. in Prague (Czech Republic)

Programme Committee: **Webster C. Cash, Jr.,** Univ. of Colorado at Boulder (USA); **George W. Fraser,** Univ. of Leicester (United Kingdom); **Ali M. Khounsary,** Argonne National Lab. (USA); **Milos Klima,** Czech Technical Univ. in Prague (Czech Republic); **Alan G. Michette,** King's College London (United Kingdom); **Giovanni Pareschi,** Osservatorio Astronomico di Brera (Italy); **Yuriy Ya Platonov,** Rigaku Innovative Technologies, Inc. (USA); **Paul B. Reid,** Harvard-Smithsonian Ctr. for Astrophysics (USA); **Bedrich Rus,** Institute of Physics (Czech Republic); **Peter Z. Takacs,** Brookhaven National Lab. (USA); **Melville P. Ulmer,** Northwestern Univ. (USA); **William W. Zhang,** NASA Goddard Space Flight Ctr. (USA); **Josef Zicha,** Czech Technical Univ. in Prague (Czech Republic)

Monday 20 April

Opening Remarks . . . . . .Mon. 13.25

René Hudec, Astronomical Institute of the Academy of Sciences of the Czech Republic (Czech Republic); **Ladislav Pina,** Czech Technical Univ. in Prague (Czech Republic)

SESSION 1 . . . . . Mon. 13.30 to 15.10

EUV and X-Ray Optics I

Session Chair: **René Hudec,** Astronomical Institute (Czech Republic)

Focusing EUV radiation from a laser plasma source using grazing incidence and multilayer optics, Henryk Fiedorowicz, Andrzej S. Bartnik, Roman Jarocki, Jerzy Kostecki, Rafal Rakowski, Magdalena Sawicka, Anna Szczurek, Miroslaw Szczurek, Wojskowa Akademia Techniczna (Poland); Ladislav Pina, Libor Sveda, Czech Technical Univ. in Prague (Czech Republic); Torsten Feigl, Fraunhofer-Institut für Angewandte Optik und Feinmechanik (Germany); Pawel Puchalski, Wojskowa Akademia Techniczna (Poland) . . . . . .[7360-01]

EUV off-axis focusing using a high harmonic source, Ben Mills, Edward Rogers, Sarah Stebbings, James Grant-Jacob, Richard Chapman, Tom Butcher, William Brocklesby, Jeremy Frey, Univ. of Southampton (United Kingdom) . . . . . .[7360-02]

Material analysis with EUV/XUV radiation using a broadband laser plasma source and optics system, Armin Bayer, Frank Barkusky, Stefan Döring, Bernhard Flöter, Christian Peth, Klaus Mann, Laser-Lab. Göttingen e.V. (Germany) . . . . . .[7360-03]

Two magnification steps EUV microscopy with a Schwarzschild-objective and an adapted zone plate lens, Larissa Juschkin, AIXUV GmbH (Germany); Ralf Freiberger, RWTH Aachen (Germany) . . . . . .[7360-04]

Imaging properties of a spherical compound refractive x-ray lens, Chengchao Huang, Baozhong Mu, Zhanshan Wang, Lingyan Chen, Tongji Univ. (China); Yury I. Dudchik, Belarusian State Univ. (Belarus) . . . . . .[7360-05]

SESSION 2 . . . . . Mon. 15.40 to 17.40

EUV and X-Ray Optics II

Session Chair: **Henryk Fiedorowicz,** Wojskowa Akademia Techniczna (Poland)

Active microstructured X-ray optical arrays, Alan G. Michette, Slawka J. Pfauntsch, Shahin Sahraei, Matthew Shand, Graeme R. Morrison, David Hart, King's College London (United Kingdom); Boris Vojnovic, Univ. of Oxford (United Kingdom) and King's College london (United Kingdom); Tom Stevenson, William Parkes, Camelia Dunare, The Univ. of Edinburgh (United Kingdom); Richard Willingale, Charlotte H. Feldman, Univ. of Leicester (United Kingdom); Tim W. Button, Dou Zhang, Daniel Rodriguez-Sanmartin, The Univ. of Birmingham (United Kingdom); Hongchang Wang, Univ. College London (United Kingdom); Andy D. Smith, Science and Technology Facilities Council (United Kingdom). . . . . .[7360-06]

Active X-ray optics for the next generation of X-ray telescopes, Hongchang Wang, Carolyn Atkins, Peter Deol, Samantha J. Thompson, David Brook, Univ. College London (United Kingdom); Charlotte H. Feldman, Richard Willingale, Univ. of Leicester (United Kingdom); Tim W. Button, Dou Zhang, Daniel Rodriguez-Sanmartin, The Univ. of Birmingham (United Kingdom); Ady James, Craig Theobald, Univ. College London (United Kingdom) . . . . . .[7360-07]

Active X-ray optics, René Hudec, Astronomical Institute (Czech Republic); Martin Hromcik, Czech Technical Univ. in Prague (Czech Republic) . .[7360-08]

Alignment system for full-shell replicated X-ray mirrors, Mikhail V. Gubarev, Brian D. Ramsey, NASA Marshall Space Flight Ctr. (United States). . .[7360-09]

Development of high-resolution and light-weight x-ray optics with deformed silicon wafers, Yuichiro Ezoe, Takayuki Shirata, Takaya Ohashi, Tokyo Metropolitan Univ. (Japan); Manabu Ishida, Kazuhisa Mitsuda, Japan Aerospace Exploration Agency (Japan); Kozo Fujiwara, Kohei Morishita, Kazuo Nakajima, Tohoku Univ. (Japan) . . . . . .[7360-39]

Novel ultra-lightweight and high-resolution MEMS X-ray optics, Ikuyuki Mitsuishi, Japan Aerospace Exploration Agency (Japan); Yuichiro Ezoe, Utako Takagi, Tokyo Metropolitan Univ. (Japan); Raul E. Riveros, Hitomi Yamaguchi, Univ. of Florida (United States); Fumiki Kato, Susumu Sugiyama, Ritsumeikan Univ. (Japan); Kouzou Fujiwara, Kohei Morishita, Kazuo Nakajima, Shinya Fujihira, Yoshiaki Kanamori, Tohoku Univ. (Japan); Noriko Y. Yamasaki, Kazuhisa Mitsuda, Japan Aerospace Exploration Agency (Japan); Ryutaro Maeda, National Institute of Advanced Industrial Science and Technology (Japan). . . . . .[7360-40]

Tuesday 21 April

SESSION 3 . . . . . Tues. 08.30 to 10.00

X-ray Optics I

Session Chair: **Alan G. Michette,** King's College London (United Kingdom)

Development of grazing incidence X-ray optics in the Czech Republic: past, present, future *(Invited Paper)*, René Hudec, Astronomical Institute (Czech Republic) . . . . . .[7360-10]

Requirements on grazing incidence optics for hard X-ray European XFEL beamlines: analysis and simulation of wavefront transformation, Liubov Samoylova, Harald Sinn, European XFEL (Germany) . . . . . .[7360-11]

Lobster eye: technology and imaging properties, Libor Sveda, Czech Technical Univ. in Prague (Czech Republic); René Hudec, Astronomical Institute (Czech Republic); Ladislav Pina, Czech Technical Univ. in Prague (Czech Republic); Veronika Semencova, Adolf J. Inneman, Rigaku Innovative Technologies Europe s.r.o. (Czech Republic) . . . . . .[7360-12]

Replicated grazing incidence microscopic mirrors and micromirrors, René Hudec, Astronomical Institute (Czech Republic); Ladislav Pina, Czech Technical Univ. in Prague (Czech Republic); Adolf J. Inneman, Veronika Semencova, Rigaku Innovative Technologies Europe s.r.o. (Czech Republic) . . . . .[7360-13]

SESSION 4 . . . . . Tues. 10.30 to 12.10

IXO

Session Chair: **William W. Zhang,** NASA Goddard Space Flight Ctr. (USA)

To be announced. . . . . .[7360-14]

Glass foils thermal forming for X-ray space telescopes, Martin Mika, Martina Landova, Institute of Chemical Technology (Czech Republic); Veronika Semencova, Rigaku Innovative Technologies Europe s.r.o. (Czech Republic); René Hudec, Astronomical Institute (Czech Republic); Adolf J. Inneman, Rigaku Innovative Technologies Europe s.r.o. (Czech Republic); Libor Sveda, Ladislav Pina, Czech Technical Univ. in Prague (Czech Republic); Michaela Skulinova, Astronomical Institute (Czech Republic); Vlastimil Brozek, Institute of Plasma Physics (Czech Republic); Jan Sik, ON Semiconductor Czech Republic (Czech Republic) . . . . . .[7360-15]

Large area X-ray telescope design for IXO - a Si pore optics approach, Marcos Bavdaz, David Lumb, Kotska Wallace, Philippe Gondoin, European Space Agency (Netherlands). . . . . .[7360-16]

Development of silicon pore optics for IXO, Max Collon, Ramses Gunther, Rakesh Partapsing, Marcelo Ackermann, Marco W. Beijersbergen, cosine Science & Computing B.V. (Netherlands); Marcos Bavdaz, Kotska Wallace, European Space Agency (Netherlands); Marko Blom, Mark Olde Riekerink, Micronit Microfluidics BV (Netherlands); Coen van Baren, SRON Nationaal Instituut voor Ruimteonderzoek (Netherlands); Carsten P. Jensen, Danish National Space Ctr. (Denmark); Markus Erhard, Kayser-Threde GmbH (Germany); Michael Freyberg, Max-Planck-Institut für Extraterrestrische Physik (Germany); Michael K. Krumrey, Physikalisch-Technische Bundesanstalt (Germany) . . . . . .[7360-17]

Back-up technologies for IXO, René Hudec, Astronomical Institute (Czech Republic); Ladislav Pina, Czech Technical Univ. in Prague (Czech Republic); Adolf J. Inneman, Veronika Semencova, Rigaku Innovative Technologies Europe s.r.o. (Czech Republic); Libor Sveda, Czech Technical Univ. in Prague (Czech Republic); Michaela Skulinova, Rigaku Innovative Technologies Europe s.r.o. (Czech Republic) . . . . . .[7360-18]

Lunch/Exhibition Break. . . . . .12.10 to 13.30

SESSION 5 . . . . . Tues. 13.30 to 15.30

Multilayers

Session Chair: **Ladislav Pina,** Czech Technical Univ. in Prague (Czech Republic)

Angle alignment method for soft X-ray using double-periodic multilayer, Baozhong Mu, Jingtao Zhu, Jiang Li, Shengzhen Yi, Jing Xu, Wang Xin, Moyan Tan, Qiushi Huang, Liang Bai, Shengling Huang, Xiaoqiang Wang, Zhanshan Wang, Lingyan Chen, Tongji Univ. (China) . . . . . .[7360-19]

Spectroscopic characterization of novel multilayer mirrors intended for astronomical and laboratory applications, Eugene N. Ragozin, Konstantin N. Mednikov, Andrei A. Pertsov, P.N. Lebedev Physical Institute (Russian Federation); Alexander S. Pirozhkov, Japan Atomic Energy Agency (Japan) and P.N.Lebedev Physical Institute (Russian Federation); Anton A. Reva, Sergei V. Shestov, Artem S. Ul'yanov, Evgenii A. Vishnyakov, P.N. Lebedev Physical Institute (Russian Federation) . . . . . .[7360-20]

Optical and chemical characterization of Al/SiC periodic multilayers, Philippe Jonnard, Karine Le Guen, Minhui Hu, Jean-Michel André, Univ. Pierre et Marie Curie (France); Evgueni Meltchakov, Christophe Hecquet, Franck Delmotte, Institut d'Optique (France) . . . . . .[7360-21]

Formation of silicides in annealed periodic multilayers, Hélène Maury, Univ. Pierre et Marie Curie (France) and CEA (France); Philippe Jonnard, Karine Le Guen, Jean-Michel André, Univ. Pierre et Marie Curie (France) . . . . . .[7360-22]

Innovative methods for optimization and characterization of multilayer coatings, Maria G. Pelizzo, Michele Suman, Univ. degli Studi di Padova (Italy) and CNR-INFM Lab. for Ultraviolet and X-Ray Optical Research (Italy); David L. Windt, Reflective X-Ray Optics LLC (United States); Gianni G. Monaco, Sara Zuccon, Piergiorgio Nicolosi, Univ. degli Studi di Padova (Italy) and CNR-INFM Lab. for Ultraviolet and X-Ray Optical Research (Italy) . . . . . .[7360-23]

Metrology of advanced ML mirrors, Ladislav Pina, Libor Sveda, Czech Technical Univ. in Prague (Czech Republic); Adolf J. Inneman, Rigaku Innovative Technologies Europe s.r.o. (Czech Republic); René Hudec, Astronomical Institute (Czech Republic); Veronika Semencova, Michaela Skulinova, Rigaku Innovative Technologies Europe s.r.o. (Czech Republic) . . . . . .[7360-24]

SESSION 6 . . . . . Tues. 16.00 to 17.40

Depositions and Coatings

Session Chair: **Marcos Bavdaz,** European Space Agency (Netherlands)

Magnetron sputtering deposition of multi-layered reflective coatings, with atomic scale smoothness, on electro-formed metallic substrates, Guido Salmaso, Valentina Mattarello, Robert Banham, Jacques Kools, Media Lario Technologies (Italy) . . . . . .[7360-25]

Design of innovative multilayer coatings for solar imaging and spectroscopy, Michele Suman, Maria G. Pelizzo, Univ. degli Studi di Padova (Italy); David L. Windt, Reflective X-Ray Optics LLC (United States); Gianni G. Monaco, Sara Zuccon, Piergiorgio Nicolosi, Univ. degli Studi di Padova (Italy) . . . . . .[7360-26]

Deposition of hard X-ray reflective coatings as an industrial manufacturing process, Enrico Boscolo Marchi, Denis Garoli, Valentina Mattarello, Juri Bertoli, Jacques Kools, Media Lario Technologies (Italy); Daniele Spiga, Giampiero Tagliaferri, Giovanni Pareschi, Osservatorio Astronomico di Brera (Italy)[7360-27]

Characteristics of X-ray Kirkpatrick-Baez imaging with different coatings, Baozhong Mu, Shengzhen Yi, Jingtao Zhu, Jing Xu, Wang Xin, Shengling Huang, Jiang Li, Qiushi Huang, Liang Bai, Xiaoqiang Wang, Zhanshan Wang, Lingyan Chen, Tongji Univ. (China) . . . . . .[7360-28]

Optical constants of silicon carbide thin films deposited with emerging PVD techniques, Gianni G. Monaco, Piergiorgio Nicolosi, Michele Suman, Maria G. Pelizzo, Monica Gastaldi, Univ. degli Studi di Padova (Italy) and CNR-INFM Laboratory for Ultraviolet and X-Ray Optical Research (Italy). . . . . .[7360-29]

Posters—Tuesday . . . . . .Tues. 17.45 to 19.15

All symposium attendees are invited to attend Tuesday 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.

Poster presenters may post their poster papers starting at 10:00 hrs on Tuesday in the Conference Area Hallway. Any papers left on the boards following the end time of the poster session will be considered unwanted and will be discarded. SPIE Europe assumes no responsibility for posters left up after the end of the poster session. Poster authors should be at their papers from 17:45 to 19:15 hrs to answer questions from attendees. Attendees are requested to wear their conference registration badges to the poster sessions.

Microstructured optical arrays for smart X-ray optics, Camelia Dunare, The Univ. of Edinburgh (United Kingdom) . . . . . .[7360-36]

New lightweight X-ray optics: alternative materials, Michaela Skulinova, René Hudec, Astronomical Institute (Czech Republic); Ladislav Pina, Czech Technical Univ. in Prague (Czech Republic); Jan Sik, Michal Lorenc, ON Semiconductor Czech Republic (Czech Republic); Veronika Semencova, Rigaku Innovative Technologies Europe s.r.o. (Czech Republic) . . . . . .[7360-37]

Development and spectrometric performance study of semi-insulating GaAs detectors for application in soft X-ray region, Frantiöek Dubeck˝, Bohumìr Zatko, Institute of Electrical Engineering (Slovakia); Leszek Ryc, Institute of Plasma Physics and Laser Microfusion (Poland); Pavol Boh·cek, Jozef Huran, Institute of Electrical Engineering (Slovakia); Vladimìr Necas, Slovenska Technicka Univ. (Slovakia) . . . . . .[7360-38]

New developments in the on-axis and off-axis HEW simulation for the optical module of the SIMBOL-X hard X-ray telescope, Daniele Spiga, Marta Civitani, Vincenzo Cotroneo, Osservatorio Astronomico di Brera (Italy)[7360-41]

Wednesday 22 April

SESSION 7 . . . . . .Wed. 08.30 to 11.20

X-ray Optics II

Session Chair: **Webster C. Cash, Jr.,** Univ. of Colorado at Boulder (USA)

Invited Presentation--TBA *(Invited Paper)*, , ...[7360-30]

Fourier transform imaging spectrometer in soft X-ray region, Jaroslava Z. Wilcox, Victor White, Kirill Shcheglov, Yekta Gursel, Jet Propulsion Lab. (United States) . . . . . .[7360-31]

A generic X-ray tracing toolbox in Geant4, Giuseppe Vacanti, Ernst-Jan Buis, Max Collon, cosine Science & Computing B.V. (Netherlands) . . . . . .[7360-32]

Wavefront sensing of XUV beams, Bedrich Rus, Pavel Homer, Institute of Physics (Czech Republic) . . . . . .[7360-33]

Small X-ray telescope based on Lobster Eye X-Ray optics and pixel detector, Vladimir Tichy, Martin Hromcik, Czech Technical Univ. in Prague (Czech Republic); René Hudec, Astronomical Institute (Czech Republic); Libor Sveda, Ladislav Pina, Jan Jakubek, Czech Technical Univ. in Prague (Czech Republic); Veronika Semencova, Rigaku Innovative Technologies Europe s.r.o. (Czech Republic); Jiri Marsik, REFLEX s.r.o. (Czech Republic); Adolf J. Inneman, Rigaku Innovative Technologies Europe s.r.o. (Czech Republic) . . . . .[7360-34]

Transition radiation in VUV and soft X-ray range from moderately relativistic particles (electrons), Alexander P. Potylitsyn, Dan A. Verigin, Tomsk Polytechnic Univ. (Russian Federation). . . . . .[7360-35]

Magnetic field assisted finishing of ultra-lightweight and high-resolution MEMS X-ray micro-pore optics, Raul E. Riveros, Hitomi Yamaguchi, Univ. of Florida (United States); Ikuyuki Mitsuishi, Japan Aerospace Exploration Agency (Japan); Utako Takagi, Yuichiro Ezoe, Tokyo Metropolitan Univ. (Japan); Fumiki Kato, Susumu Sugiyama, Ritsumeikan Univ. (Japan); Noriko Y. Yamasaki, Kazuhisa Mitsuda, Japan Aerospace Exploration Agency (Japan). . . .[7360-42]

SESSION 8 . . . . . .Wed. 11:20 to 12.20

Late Breaking News

Damage to VUV, EUV, and X-ray Optics II (XDam2)

Tuesday 21 April

Posters—Tuesday . . . . . Tues. 17.45 to 19.15

All symposium attendees are invited to attend Tuesday 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.

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Degradation of thin-film filters irradiated by debris emission of a laser induced plasma, David Schäfer, RheinAhrCampus Remagen (Germany); Urs Wiesemann, ACCEL Instruments GmbH (Germany); Thomas Nisius, Thomas Wilhein, RheinAhrCampus Remagen (Germany). . . . . .[7361-31]

Risk analysis of laser elements for complex characterization of damages by space radiation, Anatoliy M. Negriyko, Mykhailo S. Brodyn, Institute of Physics (Ukraine); Vitaliy A. Yatsenko III, Institute of Space Research (Ukraine)[7361-32]

Characterization of tin vapor from CO_2 laser produced EUV light source, Yoshifumi Ueno, Tatsuya Yanagida, Takashi Suganuma, Hiroshi Komori, Akira Endo, Akira Sumitani, EUVA (Japan). . . . . .[7361-33]

Applicability of transmissive diffractive optics to high flux FEL radiation, Thomas Nisius, David Schäfer, RheinAhrCampus Remagen (Germany); Marek Wieland, Univ. Hamburg (Germany); Thomas Wilhein, RheinAhrCampus Remagen (Germany) . . . . . .[7361-34]

Liquid metal collector optics for EUV lithography, Kenneth M. Fahy, Paul Sheridan, Padraig A. Dunne, Patrick B. Hayden, Gerard D. O'Sullivan, Fergal O'Reilly, Dublin City Univ. (Ireland) . . . . . .[7361-35]

Towards a best understanding of multi-wavelength effects on KDP crystals, Stéphane Reyné, Commissariat a'l'Energie Atomique (France) and Institut Fresnel (France); Marc Loiseau, Guillaume Duchateau, Commissariat a'l'Energie Atomique (France); Jean-Yves Natoli, Institut Fresnel (France); Laurent LamaignËre, Commissariat a'l'Energie Atomique (France). . . . . .[7361-36]

Damage thresholds of various materials irradiated by 100-ps pulses of 21.2-nm laser radiation, Vera Hajkova, Jaromir Chalupsky, Institute of Physics (Czech Republic); Hubertus Wabnitz, Josef Feldhaus, Deutsches Elektronen-Synchrotron (Germany); Tomas Mocek, Michaela Kozlova, Jiri Polan, Pavel Homer, Bedrich Rus, Libor Juha, Institute of Physics (Czech Republic)[7361-37]

Response of carbonaceous materials to intense XUV/x-ray radiation, Martina Toufarova, Vera Hajkova, Jaromir Chalupsky, Tomas Burian, Ludek Vysin, Institute of Physics (Czech Republic); Jacek Krzywinski, Ryszard Sobierajski, Dorota Klinger, Jerzy B. Pelka, Institute of Physics (Poland); Frank Barkusky, Klaus Mann, Laser-Lab Göttingen e.V. (Germany); Hamed Merdji, Marco V. De Grazia, Stéphane Guizard, Commissariat a'l'Energie Atomique (France); Constance Valentin, Julien Gautier, Ecole Nationale Supérieure de Techniques Avancées (France); Janos Hajdu, Uppsala Univ. (Sweden); Hubertus Wabnitz, Kai I. Tiedtke, Jerome Gaudin, Sven Toleikis, Thomas Tschentscher, Deutsches Elektronen-Synchrotron (Germany); Michael Störmer, GKSS-Forschungszentrum Geeshacht, GmbH (Germany); Libor Juha, Institute of Physics (Czech Republic) . . . . . .[7361-38]

Wednesday 22 April

Opening Remarks . . . . . Wed. 13.00 to 13.05

Libor Juha, Institute of Physics (Czech Republic); **Sasa Bajt,** Deutsches Elektronen-Synchrotron (Germany); **Ryszard Sobierajski,** Institute of Physics (Poland)

SESSION 1 . . . . . Wed. 13.05 to 15.10

Facilities and their Optics

Session Chair: **Libor Juha,** Institute of Physics (Czech Republic)

LCLS facilities, beamlines, optics, and detectors *(Invited Paper)*, Stefan P. Hau-Riege, Lawrence Livermore National Lab. (United States) . . . . . .[7361-01]

The FLASH Facility *(Invited Paper)*, Kai I. Tiedtke, Elke Ploenjes, Deutsches Elektronen-Synchrotron (Germany). . . . . .[7361-02]

Current status of Japanese XFEL project and beamlines *(Invited Paper)*, Makina Yabashi, Atsushi Higashiya, Tadashi Togashi, Mitsuru Nagasono, Takaki Hatsui, Kenji Tamasaku, Yoshihito Tanaka, The Institute of Physical and Chemical Research (RIKEN) (Japan); Hiroaki Kimura, Togo Kudo, Hiromitsu Tomizawa, Sunao Takahashi, Kunikazu Takeshita, Haruhiko Ohashi, Shunji Goto, Japan Synchrotron Radiation Research Institute (Japan); Tetsuya Ishikawa, The Institute of Physical and Chemical Research (RIKEN) (Japan) . . . . . .[7361-03]

Damage studies for the design of the European XFEL beamline optics. *(Invited Paper)*, Jérôme Gaudin, European XFEL (Germany) and Service des Accélérateurs, de Cryogénie et de Magnétisme (France); Antje Trapp, Fan Yang, Harald Sinn, Thomas Tschentscher, European XFEL (Germany) . . . . .[7361-04]

The FERMI@Elettra FEL photon transport system *(Invited Paper)*, Daniele Cocco, Marco Zangrando, Alessandro Abrami, Anna Bianco, Ivan Cudin, Claudio Fava, Dario Giuressi, Roberto Godnig, Fulvio Parmigiani, Barbara Ressel, Luca Rumiz, Rudi Sergo, Alberto Simoncig, Cristian Svetina, Goran Zgrablic, Sincrotrone Trieste S.C.p.A. (Italy) . . . . . .[7361-05]

SESSION 2 . . . . . Wed. 15.35 to 16.55

Damage by Ultra-short XUV/X-ray Pulses

Session Chair: **Eric Louis,** FOM-Instituut voor Plasmafysica Rijnhuizen (Netherlands)

Interaction of intense ultrashort XUV pulses with silicon, Ryszard Sobierajski, Institute of Physics (Poland) and FOM-Instituut voor Plasmafysica Rijnhuizen (Netherlands); Marek Jurek, Dorota Klinger, Jerzy B. Pelka, Institute of Physics (Poland); Libor Juha, Jaromir Chalupsky, Vera Hajkova, Institute of Physics (Czech Republic); Ulf Jastrow, Kai I. Tiedtke, Hubertus Wabnitz, Sven Toleikis, European XFEL (Germany); Ali R. Khorsand, FOM-Instituut voor Plasmafysica Rijnhuizen (Netherlands); Jacek Krzywinski, Stanford Linear Accelerator Ctr. (United States); Stefan P. Hau-Reige, Lawrence Livermore National Lab. (United States); Jérôme Gaudin, European XFEL (Germany) . . . . . .[7361-06]

Response of molecular solids to ultra-intense femtosecond soft x-ray pulses, Jaromir Chalupsky, Institute of Physics (Czech Republic) and Czech Technical Univ. (Czech Republic); Libor Juha, Vera Hajkova, Jaroslav Cihelka, Ludek Vysin, Institute of Physics (Czech Republic); Julien Gautier, Ecole Nationale Supérieure de Techniques Avancées (France); Janos Hajdu, Uppsala Univ. (Sweden); Stefan P. Hau-Riege, Lawrence Livermore National Lab. (United States); Marek Jurek, Jacek Krzywinski, Institute of Physics (Poland); Richard A. London, Lawrence Livermore National Lab. (United States); Evangelos Papalazarou, Ecole Nationale Supérieure de Techniques Avancées (France); Jerzy B. Pelka, Institute of Physics (Poland); Gilles Rey, Stephane Sebban, Ecole Nationale Supérieure de Techniques Avancées (France); Ryszard Sobierajski, Institute of Physics (Poland); Nikola Stojanovic, Kai I. Tiedtke, Sven Toleikis, Thomas Tschentscher, Deutsches Elektronen-Synchrotron (Germany); Constance Valentin, Ecole Nationale Supérieure de Techniques Avancées (France); Hubertus Wabnitz, Deutsches Elektronen-Synchrotron (Germany); Philippe Zeitoun, Ecole Nationale Supérieure de Techniques Avancées (France) . . . . . .[7361-07]

Laser-induced periodic surface structures (LIPSS) on surfaces irradiated by XUV/x-ray lasers, Libor Juha, Institute of Physics (Czech Republic) .[7361-08]

Efficient materials processing by dual action of XUV/Vis-NIR ultrashort laser pulses, Krzysztof Jakubczak, Tomas Mocek, Jiri Polan, Pavel Homer, Bedrich Rus, Institute of Physics (Czech Republic); I Jong Kim, Chul Min Kim, Seung Beom Park, Tae Keun Kim, Gye Hwang Lee, Chang Hee Nam, Korea Advanced Institute of Science and Technology (Korea, Republic of); Jaromir Chalupsky, Vera Hajkova, Libor Juha, Institute of Physics (Czech Republic) . . . . . .[7361-09]

SESSION 3 . . . . . .Wed. 16.55 to 18.10

Damage by Short XUV/X-ray Pulses

Session Chair: **Jérôme Gaudin,** Deutsches Elektronen-Synchrotron (Germany)

Silica nano-ablation using laser plasma soft X-rays *(Invited Paper)*, Tetsuya Makimura, Shuichi Torii, Univ. of Tsukuba (Japan); Hiroyuki Niino, National Institute of Advanced Industrial Science and Technology (Japan); Kouichi Murakami, Univ. of Tsukuba (Japan). . . . . .[7361-10]

Surface changes of solids under intense EUV irradiation using a laser-plasma source *(Invited Paper)*, Andrzej S. Bartnik, Henryk Fiedorowicz, Roman Jarocki, Jerzy Kostecki, Rafal Rakowski, Miroslaw Szczurek, Wojskowa Akademia Techniczna (Poland) . . . . . .[7361-11]

Photo-etching of solids by EUV radiation from table-top laser-produced plasma sources *(Invited Paper)*, Frank Barkusky, Armin Bayer, Christian Peth, Klaus Mann, Laser-Lab. Göttingen e.V. (Germany). . . . . .[7361-12]

Thursday 23 April

SESSION 4 . . . . . Thurs. 08.30 to 09.50

Theory and Computer Simulation

Session Chair: **Sasa Bajt,** Deutsches Elektronen-Synchrotron (Germany)

Dynamic of electronic subsystem of semiconductors with an ultrashort VUV laser pulse irradiation, Nikita A. Medvedev, Baerbel Rethfeld, Technische Univ. Kaiserslautern (Germany) . . . . . .[7361-13]

Radiation damage within atomic clusters irradiated with intense VUV and soft X-ray radiation, Beata Ziaja-Motyka, Deutsches Elektronen-Synchrotron (Germany) . . . . . .[7361-14]

Modelling of Damage Processes of the Optical-Cryogenic Sensor at Microscopic and Macroscopic Levels, Vitaliy A. Yatsenko III, Institute of Space Research (Ukraine); Leonid Yatsenko, Anatoliy Negriyko, Janna Potemkina, Elena Udovitskaya, Institute of Physics (Ukraine) . . . . . .[7361-15]

Finite element simulations for the European XFEL beamline optics design, Fan Yang, European XFEL (Germany); Jérôme Gaudin, European XFEL (Germany) and Commissariat a'l'Energie Atomique (France); Liuba Samoylova, Antie Trapp, Harald Sinn, Thomas Tschentscher, European XFEL (Germany) . . . . . .[7361-16]

SESSION 5 . . . . . Thurs. 10.20 to 11.50

Damage to Multilayers

Session Chair: **Ryszard Sobierajski,** Institute of Physics (Poland)

Damage studies of multilayer optics for XUV FELs *(Invited Paper)*, Eric Louis, Ali R. Khorsand, FOM-Instituut voor Plasmafysica Rijnhuizen (Netherlands); Ryszard Sobierajski, FOM-Instituut voor Plasmafysica Rijnhuizen (Netherlands) and Institute of Physics (Poland); Eddie D. van Hattum, Tim Tsarfati, FOM-Instituut voor Plasmafysica Rijnhuizen (Netherlands); Marek Jurek, Dorota Klinger, Jerzy B. Pelka, Institute of Physics (Poland); Libor Juha, Jaromir Chalupsky, J. Cihelka, Vera Hajkova, Institute of Physics (Czech Republic); Ulf Jastrow, Sven Toleikis, Hubertus Wabnitz, Kai I. Tiedtke, Deutsches Elektronen-Synchrotron (Germany); Jérôme Gaudin, European XFEL (Germany); Fred Bijkerk, FOM-Instituut voor Plasmafysica Rijnhuizen (Netherlands) . . .[7361-17]

Sub-micron focusing of soft X-ray free electron laser beam, Sasa Bajt, Deutsches Elektronen-Synchrotron (Germany); Henry N. Chapman, Univ. Hamburg (Germany); Art J. Nelson, Richard W. Lee, Paul B. Mirkarimi, Jennifer B. Alameda, Sherry L. Baker, Hubert J. Vollmer, Eric M. Gullikson, Andrew L. Aquila, Julia Meyer-Ilse, Lawrence Berkeley National Lab. (United States); Eberhard A. Spiller, Spiller X-ray Optics (United States); Jacek Krzywinski, Stanford Linear Accelerator Ctr. (United States); Libor Juha, Institute of Physics (Czech Republic); Sven Toleikis, Deutsches Elektronen-Synchrotron (Germany); Janos Hajdu, Uppsala Univ. (Sweden); Thomas Tschentscher, Deutsches Elektronen-Synchrotron (Germany). . . . . .[7361-18]

Design considerations for high damage threshold VUV mirrors, Volodymyr Pervak, Ludwig-Maximilians-Univ. M¸nchen (Germany); Eleftherios Goulielmakis, Max-Planck-Institut für Quantenoptik (Germany) . . . . . .[7361-19]

Competitive reactions of carbon deposition and oxidation on the surface of Mo/Si multilayer mirrors by EUV irradiation *(Invited Paper)*, Masahito Niibe, Univ. of Hyogo (Japan) . . . . . .[7361-20]

Lunch Break. . . . . .11.50 to 13.10

SESSION 6 . . . . . Thurs. 13.10 to 14.10

Laser-induced Damage

Session Chair: **Jaromir Chalupsky,** Institute of Physics (Czech Republic)

Laser damage densities measurements on fused silica optics: round-robin test at 351-355 nm., Laurent Lamaignère, Marc Loiseau, Thierry Donval, Roger Courchinoux, Stéphane Bouillet, Jean-Christophe Poncetta, Bertrand Bertussi, HervÈ Bercegol, Commissariat a'l'Energie Atomique (France). . . . . .[7361-21]

Laser-induced damage studies in optical elements using X-ray laser interferometric microscopy, Michaela Kozlova, Institute of Physics (Czech Republic) . . . . . .[7361-22]

Characterization of focused beam of desktop 10-Hz capillary-discharge 46.9-nm laser, Ludek Vysin, Tomas Burian, Institute of Physics (Czech Republic) and Czech Technical Univ. in Prague (Czech Republic); Jaromir Chalupsky, Institute of Physics (Czech Republic); Michael Grisham, Colorado State Univ. (United States); Vera Hajkova, Institute of Physics (Czech Republic); Scott C. Heinbuch, Colorado State Univ. (United States); Krzysztof Jakubczak, Libor Juha, Tomas Mocek, Institute of Physics (Czech Republic); Peter Pira, Charles Univ. in Prague (Czech Republic); Jiri Polan, Institute of Physics (Czech Republic); Jorge J. Rocca, Colorado State Univ. (United States); Bedrich Rus, Institute of Physics (Czech Republic); Jaroslav Sobota, Institute of Scientific Instruments (Czech Republic) . . . . . .[7361-23]

SESSION 7 . . . . . Thurs. 14.10 to 15.10

Laser Plasmas

Session Chair: **Beata Ziaja-Motyka,** Deutsches Elektronen-Synchrotron (Germany)

SESSION 8 . . . . . Thurs. 15.40 to 17.00

Damage to Phosphors, Filters, Detectors and Coatings

Session Chairs: **Kai I. Tiedtke,** Deutsches Elektronen-Synchrotron (Germany); **Elke Ploenjes,** Deutsches Elektronen-Synchrotron (Germany)

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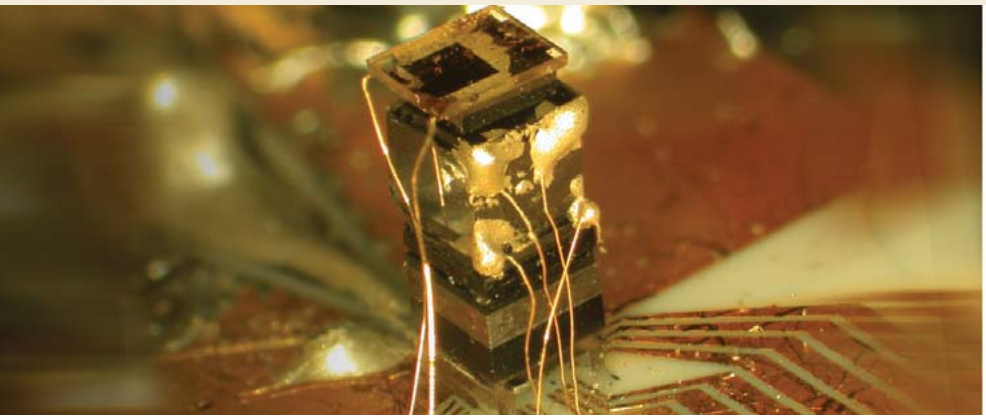

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