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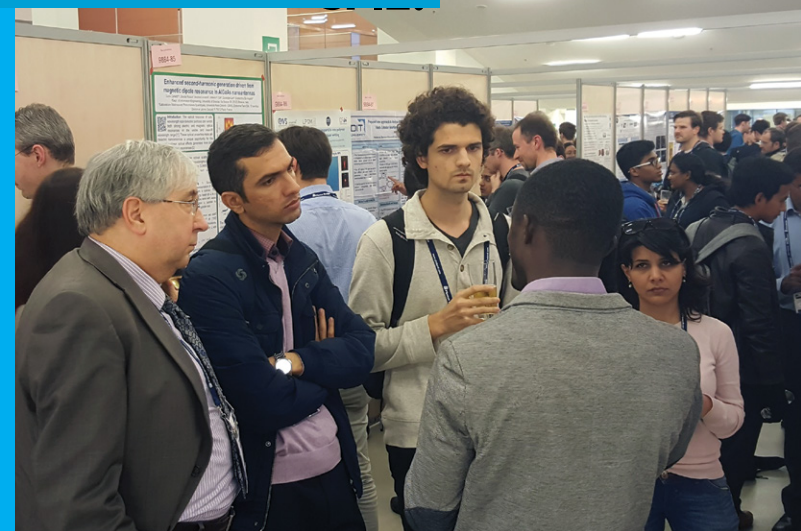
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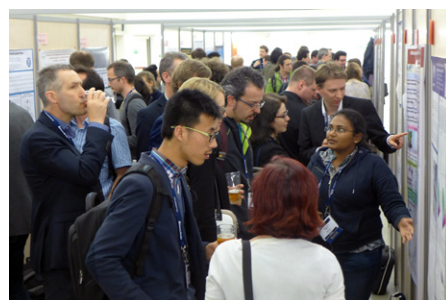
Don't miss your chance to speak face-to-face with top suppliers. Walk the floor and see the latest technology innovations and future applications in detection, imaging, sensing, lasers, and their supporting components and devices.

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- Photonics Europe is conferences, workshops, seminars, and an exhibition that will combine into a dynamic learning environment.
- Photonics Europe has programmes and experts on new business development and bridges the gap between academia and industry.
- Photonics Europe serves as the platform for information updates on the European Union's new Framework Programme for Research and Innovation Horizon 2020.
- Photonics Europe features a daily comprehensive Hot Topics session, and will include a unique welcome reception, daily coffee breaks, plus other technical and social events.
- Photonics Europe presents the Innovation Village: a window on creative products developed by universities and research centres.
- Photonics Europe hosts the European Village: a display on European Research and Innovation Actions, Coordinate and Support Actions, and other EC-funded initiatives that showcase their consortium as well as their newest breakthroughs.

The casual atmosphere of historical Strasbourg set in the beautiful region of Alsace provides a backdrop of good food, comfortable facilities, and easy transportation. The leadership of Photonics Europe 2018 has selected many of the toughest issues facing optical and photonics technologies today as the basis for their programmes. These current research issues will drive the development of new products for years to come.

Attend Photonics Europe 2018 and be among the leaders!

Plenary Events



Hear from leading experts

Don't miss these world-class speakers discussing game-changing technology and valuable insights.

Hot Topics I

Monday 23 April 2018 • 8:45 to 11:00

9:00 to 9:15

OPENING REMARKS AND AWARDS PRESENTATION

9:15 to 9:25

WELCOME

Paul Montgomery

Univ. of Strasbourg, France

9:25 TO 9:30

INTRODUCTION TO HOT TOPICS

Thierry Georges

Oxxius, France

9:30 to 10:15

FROM EINSTEIN DOUBTS TO QUANTUM BITS: A SECOND QUANTUM REVOLUTION



Alain Aspect

Lab. Charles Fabry, Institut d'Optique, France

Abstract not available at the time of publishing.

Biography: **Alain Aspect** is an alumnus of the École Normale Supérieure (ENS) in Cachan and the Université d'Orsay. He has held positions at the Institut d'Optique, the ENS in Yaoundé (Cameroon), ENS in Cachan, ENS/Collège de France, and CNRS. He is currently a professor both at the Institut d'Optique Graduate School, where he holds the Augustin Fresnel chair, and at École Polytechnique, in Palaiseau. He is a member of science academies in France, the USA, Austria, Belgium, and the UK. He is the recipient of the CNRS Gold medal, the Wolf Prize in Physics, the Balzan prize on quantum information, the Niels Bohr Gold medal, the Albert Einstein medal, the Ives medal of the OSA and other awards. His research has focused on tests of Bell's inequalities with entangled photons, wave-particle duality for single photons, laser cooling of atoms with lasers below the one-photon recoil, quantum simulation, and quantum atom optics with ultracold atoms (More details on: <http://www.lcf.institutoptique.fr/Alain-Aspect-homepage>).

10:15 to 11:00

PICO-PHOTONICS: WATCHING AND SENSING SINGLE MOLECULES BY CONFINING LIGHT TO THE ATOM SCALE



Jeremy J. Baumberg

NanoPhotonics Ctr., Univ. of Cambridge, United Kingdom

Coupling between plasmonic metal nano-components generates strongly red-shifted resonances combined with intense local field amplification on the nanoscale. This allows us to watch in real time individual molecules and atoms or excitons in semiconductors. We have recently explored plasmonic coupling which can be tuned dynamically, through reliable bottom-up self-assembly using a nanoparticle-on-mirror geometry (NPoM). Now we show that it is possible to confine light to below 1nm³, allowing us to see single atoms move dynamically, and examine single bonds within a molecule. We show how molecular optomechanics works, and how it provides the ability to track and watch molecules interact and react. This opens up the ability to study chemistry molecule-by-molecule and potentially to control single reaction pathways.

- [1] Nature 491, 574 (2012); Revealing the quantum regime in tunnelling plasmonics,
- [2] Nature Comm. 5, 4568 (2014); Threading plasmonic nanoparticle strings with light
- [3] Nature Comm. 5, 3448 (2014); DNA origami based assembly of gold nanoparticle dimers for SERS detection
- [4] Nature 535, 127 (2016); Single-molecule strong coupling at room temperature in plasmonic nanocavities
- [5] Science 354, 726 (2016); Single-molecule optomechanics in picocavities

Biography: **Prof. Jeremy J. Baumberg FRS**, directs a UK Nano-Photonics Centre at the University of Cambridge and has extensive experience in developing optical materials structured on the nano-scale that can be assembled in large volume. He is also Director of the Cambridge Nano Doctoral Training Centre, a key UK site for training PhD students in interdisciplinary Nano research. Strong experience with Hitachi, IBM, and his own spin-offs help him combine academic insight with industry application. With over 20000 citations, he is a leading innovator in Nano. This has led to awards of the IoP Faraday gold Medal (2017), Royal Society Rumford Medal (2014), IoP Young Medal (2013), Royal Society Mullard Prize (2005), the IoP Charles Vernon Boys Medal (2000) and the IoP Mott Lectureship (2005). He is a Fellow of the Royal Society, the Optical Society of America, the Institute of Physics, and the Institute of NanoTechnology. [see np.phy.cam.ac.uk]

11:00 to 11:30 • **COFFEE BREAK**

Hot Topics II

Tuesday 24 April 2018 • 16:30 to 18:00

16.30 to 16.35

INTRODUCTION

Francis Berghmans

Vrije Univ. Brussel, Belgium

16:35 to 17:20

COHERENT COMBINATION OF FIBER AMPLIFIED ULTRAFAST LASER PULSES

**Jens Limpert**Institute of Applied Physics, Friedrich Schiller Univ.
Jena, Germany

In recent years intense laser pulses have found applications in various industrial and scientific areas. Significant progress has been made in scaling the energy of the pulses as well as the average power. However, different amplification schemes have been pushed to their specific limits, caused by detrimental nonlinear effects, by damage or by the occurrence of thermo-optical effects. New concepts have to be considered to address these issues and to enable new application fields. In that context, I will review the basics, achievements and newest developments of coherent combination of amplified femtosecond pulses, a concept which has already outperformed single aperture femtosecond laser systems and which allows for a scaling to unprecedented performance levels, i.e. the combination of highest peak power (Petawatt) and highest average power (Megawatt).

Biography: **Jens Limpert** received his M.S in 1999 and Ph.D. in Physics from the Friedrich Schiller University of Jena in 2003. His research interests include high power fiber lasers in the pulsed and continuous-wave regime, in the near-infrared and visible spectral range. After an one-year postdoc position at the University of Bordeaux, France, where he extended his research interests to high intensity lasers and nonlinear optics, he returned to Jena and is currently leading the Laser Development Group (including fiber- and waveguide lasers) at the Institute of Applied Physics. He is author or co-author of more than 280 peer-reviewed journal papers in the field of laser physics. His research activities have been awarded with the WLT-Award in 2006, an ERC starting grant in 2009 and an ERC consolidator grant in 2013. Jens Limpert is founder of the Active Fiber Systems GmbH a spin-off from the University Jena and the Fraunhofer-IOF Jena.

17.20 to 18.05

2D MATERIALS AND THEIR HETEROSTRUCTURES: FUNDAMENTALS, APPLICATIONS AND PROTOTYPES

**Frank Koppens**

ICFO-The Institute of Photonic Sciences, Spain

Heterostructures of graphene and related two-dimensional materials are a promising new material system with virtually unlimited possibilities. Van der Waals heterostructures are constructed by vertically stacking atomically thin materials, selected from a rich palette of thousands of materials that can be semi-conducting, insulating, superconducting, metallic or magnetic. These are key enablers for tailoring new and unique electronic, optical and opto-electronic properties. Moreover, the ability to manipulate several flavors of polaritons within the vast library of 2D materials, in addition to nano- and heterostructuring, promises the on-demand design of new optical properties that are not possible with traditional materials. In this talk, both fundamental properties and applications of this exciting material platform will be presented. Moreover, we show progress on the integration of 2D materials with CMOS-electronics, including the first prototype broadband image sensor and integrated photonics network.

Biography: **Prof. Frank Koppens** obtained his PhD in experimental physics at Delft University, at the Kavli Institute of Nanoscience, The Netherlands. After a postdoctoral fellowship at Harvard University, since August 2010, Koppens is a group leader at the Institute of Photonic Sciences (ICFO). The quantum nano-optoelectronics group of Prof. Koppens focuses on both science and technology of novel two-dimensional materials and quantum materials. Koppens has received the ERC starting grant, the ERC consolidator grant, two ERC proof-of-concept grants, the Christiaan Huygensprijs 2012, the national award for research in Spain, and the IUPAP young scientist prize in optics. Prof. Koppens is leader of the optoelectronics workpackage of the graphene flagship (1B€ project for 10 years), as well as a member of the executive board. In total, Koppens has published more than 70 refereed papers (H-index 40), with more than 35 in Science and Nature family journals. Total citations <12.000.

Plenary Events

Hot Topics III

Thursday 26 April 2018 • 8:45 to 10:30

9.00 to 9.05

INTRODUCTION

Harald Giese

Univ. of Stuttgart, Germany

9.05 to 9.50

FROM EXTREME NONLINEAR OPTICS TO ULTRAFAST ATOMIC PHYSICS



Anne L'Huillier

Lund Univ., Sweden

High-order harmonic generation (HHG) in gases and its applications is today an active field of research worldwide. High-order harmonics are created when intense laser radiation interacts with a gas of atoms or molecules. In the time domain, the emission is a train of pulses in the extreme ultraviolet range, separated by half a laser cycle and with attosecond duration. The interference between attosecond pulses results in a frequency comb of high-order (odd) harmonics. This presentation will introduce the physics of high-order harmonic generation and attosecond pulses.

There is today an increased diversity of HHG sources driven by a variety of lasers ranging from high energy lasers at low repetition rate to high average power lasers, based upon optical parametric amplification or simply high-power oscillators. HHG sources can be vastly different, with parameters such as peak power or repetition rate varying by several orders of magnitude. There is also a growing diversity of HHG applications spanning many areas from atomic and molecular physics to condensed matter. We will focus on the use of attosecond pulses to probe photoionization dynamics in atoms.

Biography: **Anne L'Huillier**, defended her PhD at the Commissariat à l'Energie Atomique, Saclay, France in 1986. She was postdoctoral fellow at Chalmers Institute of Technology, Gothenburg (1986), University of Southern California (1988), and visiting scientist at Lawrence Livermore National Laboratory (1993). She was employed as researcher in Saclay, France until she moved to Lund University, Sweden in 1995 and became full professor in 1997.

Her research is centered round the generation of high-order harmonics of the laser light and its applications, especially in attosecond science. Her research group at the Lund Laser Center is one of the few groups in the world producing routinely short attosecond pulses via harmonic generation and exploring applications of this source of radiation.

Anne L'Huillier is on the Nobel Committee for Physics (2010), and has been a member of the Swedish Academy of Sciences since 2004. In 2003, she received the Julius Springer Prize. In 2011 she received a UNESCO L'Oréal award for "Women in Science". In 2013, she was awarded the Carl-Zeiss Research Award and the Blaise Pascal Medal.[8] and an Honorary Degree, Université Pierre et Marie Curie (UPMC), Paris.

9:50 to 10:35

QUANTUM COMPUTATIONS AND QUANTUM SIMULATIONS WITH TRAPPED IONS



Rainer Blatt

Institute for Experimental Physics, Univ. of Innsbruck, Austria

In this talk, the basic toolbox of the Innsbruck quantum information processor based on a string of trapped Ca^+ ions will be reviewed. For quantum information processing, the toolbox operations are employed for quantum computations [1], for quantum simulations [2], and with optical cavities and photons they are used for the implementation of quantum interfaces [3] for the realization of quantum networks.

For quantum computation, a scalable Shor algorithm was realized [1] with a string of trapped Ca^+ ions. Towards scaling the trapped ion quantum computer, we encode one logical qubit in entangled states distributed over seven trapped-ion qubits. We demonstrate the capability of the code to detect one bit flip, phase flip or a combined error of both, regardless on which of the qubits they occur. Furthermore, we apply combinations of the entire set of logical single-qubit Clifford gates on the encoded qubit to explore its computational capabilities [4]. The quantum toolbox is further applied to carry out both analog and digital quantum simulations. The basic simulation procedure and its application will be discussed for a variety of spin Hamiltonians. Moreover, a spectroscopic technique is presented to study artificial quantum matter and use it for characterizing quasiparticles in a many-body system of trapped atomic ions [5]. Finally, we report the experimental demonstration of a digital quantum simulation of a lattice gauge theory, by realizing $(1+1)$ -dimensional quantum electrodynamics (the Schwinger model) on a few-qubit trapped-ion quantum computer [6].

[1] T. Monz et al., Science 351, 1068 (2016).

[2] P. Jurcevic et al., Nature 511, 202 (2014).

[3] T. Northup and R. Blatt, Nature Photonics 8, 356 (2014).

[4] D. Nigg et al., Science 345, 302 (2014).

[5] P. Jurcevic et al., Phys. Rev. Lett. 115, 100501 (2015).

[6] E. A. Martinez et al., Nature 534, 516 (2016).

Biography: **Rainer Blatt** is Professor of experimental physics at the University of Innsbruck, Austria, and Scientific Director at the Institute for Quantum Optics and Quantum Information (IQOQI) of the Austrian Academy of Sciences (ÖAW). He has carried out trail-blazing experiments in the fields of precision spectroscopy, quantum metrology and quantum information processing. Blatt works with atoms caught in ion traps which he manipulates using laser beams. This work is based on suggestions made in the mid-1990s by theorists Ignacio Cirac and Peter Zoller. In 2004 Blatt's research group succeeded for the first time in transferring the quantum information of one atom in a totally controlled manner onto another atom (teleportation). Two years later, his group already managed to entangle up to eight atoms in a controlled manner. Creating such a first "quantum byte" was a further step on the way towards a quantum computer. 2011 the team managed to push this record to 14 entangled atoms. Furthermore Rainer Blatt took important steps towards successful quantum error correction and the building of quantum simulators. He has received numerous awards for his achievements in the fields of quantum optics and meteorology. In 2012 the German Physical Society awarded him the Stern-Gerlach-Medaille. Together with Ignacio Cirac he won the 2009 Carl Zeiss Research Award. He also received a Humboldt Research Award (2013) and an ERC Advanced Grant by the European Research Council (2008).

In 2013 the Australian Academy of Science announced Rainer Blatt as the 2013 Frew Fellow. In 2014 he was awarded the "Tiroler Landespreis für Wissenschaft 2014" (science award of the state of Tyrol) and in 2015 the Stewart Bell Prize for Research on Fundamental Issues in Quantum Mechanics and Their Applications. Rainer Blatt is full member of the Austrian Academy of Sciences.

10:35 to 11:00 • **COFFEE BREAK**

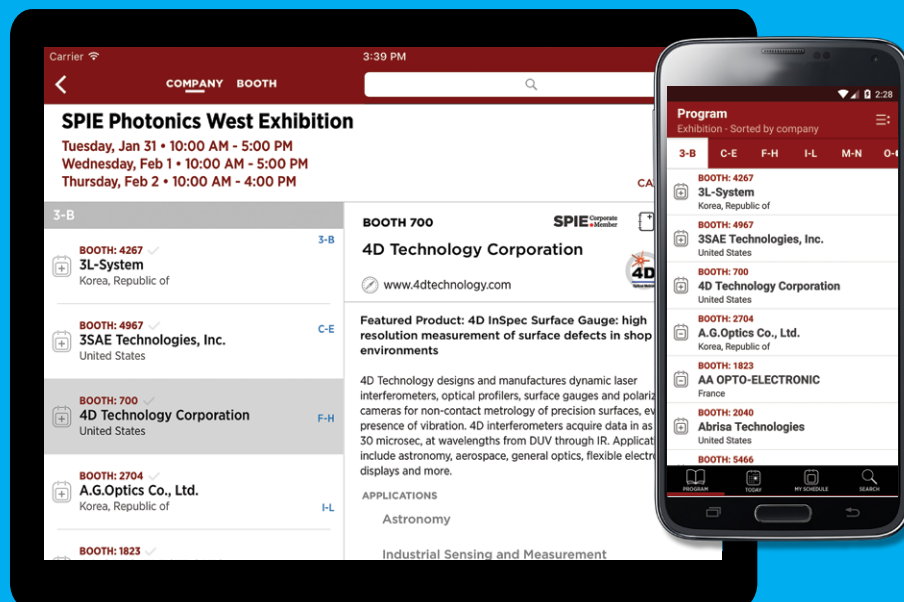
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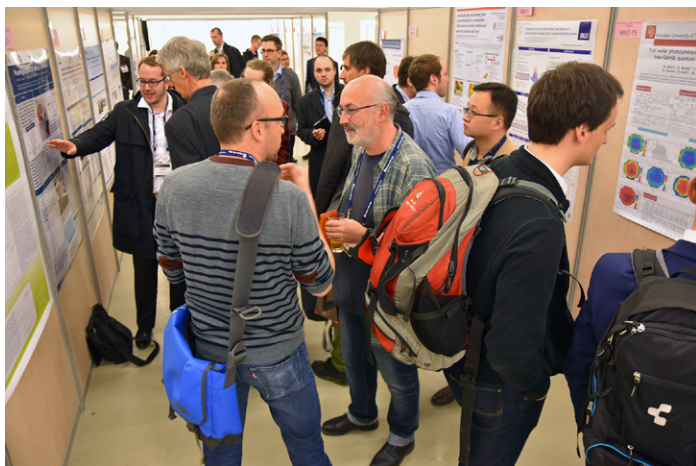
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Special Events



Interactive Poster Sessions

Monday 23 April 2018 17:30 to 19:00

Tuesday 24 April 2018 18:00 to 19:30

Wednesday 25 April 2018 17:45 to 19:30

Conference attendees are invited to attend the Photonics Europe poster sessions on Monday, Tuesday and Wednesday. Each day will feature posters from selected conferences. Posters will be on display after 10.00 on the morning of the respective Poster Session Day in the Conference Centre. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. For individual conference poster session, please refer to the conference program. Attendees are required to wear their conference registration badges to the poster sessions. Poster authors, view poster presentation guidelines and set-up instructions at <http://spie.org/x34963.xml> and on page 96.

Light Shaping Technical Group

Monday 23 April 2018 11:00 to 18:00

This Workshop will provide an overview of various methods of spatial light shaping, covering refractive freeform surfaces, diffractive beam splitters, diffusers, and multichannel array-type components including lens arrays. Light shaping techniques are classified and the strengths and weaknesses of the different methods are discussed with respect to different applications and light sources. The usage and limitations of ray and physical optics for the modeling and design of light shaping systems is considered. Fabrication techniques for light shaping components will be addressed.



Assemblée Générale de l'AFOP // AFOP General Assembly

Tuesday 24 April 2018 16:30 to 19:00
General Assembly of AFOP Members

"Light Culture" Hologram Exhibition

Tuesday - Thursday 24 - 26 April 2018. . . 10:00 to 12:00

In 1977 in Strasbourg, the holographic exhibition "Sculptures de Lumière" introduced holograms to the public in France after "Light Fantastic" in London in the same year. Forty years later, "Light Culture" takes a look back at the history of this remarkable 3D imaging technology and examples of other 3D imaging techniques right up to the full immersion augmented reality workbench. The exhibition will show a selection of holograms and curiosities showing the history of 3D imaging, including stereoscopic photos, the first holograms of the 1970's, commercial holograms from the 1990's, lenticular photos from the last ten years, modern full colour holograms, VR and AR goggles and the full immersion workbench. "Light Culture" will be on show between the Strasbourg Convention + Exhibition, Salle Etoile, First floor of the convention centre.

Women in Optics Panel and Reception

Wednesday 25 April 2018 17:00 to 18:30

Join us for an early evening of networking and inspiration. The "Nurturing Success" panel will explore the importance of fostering the right environment for women to flourish in the field of optics. Topics may include the importance of educational outreach during childhood, mentorship for students, family-oriented policies in the workplace, and recognition practices that inspire long-term career growth.

MODERATOR:



Agnes Huebscher,
SPIE European Advisory Committee Chair and European Marketing Director of Edmund Optics

PANELISTS:

Dr. Anna Grazia Mignani, Senior Scientist at CNR Institute for Applied Physics "Nello Carrara" and Scientific Officer at the European Research Council Executive Agency

Prof. Roberta Ramponi, Director of IFN-CNR and Professor in the Department of Physics at Politecnico di Milano

Dr. Michalina Gora, Tenured Researcher at the French National Center for Scientific Research CNRS, ICube Laboratory, Strasbourg

The panel will be followed by a reception, offering the opportunity to meet the speakers and connect with your peers. Light refreshments will be served.

Innovation Village Awards Ceremony

Wednesday 25 April 2018 15:00 to 15:30

The Innovation Village competition aims to find the best innovation by an individual researcher and the best innovation by a multilateral project, organization, or company. Join us to celebrate the 2018 winners!

Professional Development

Making the Most of Your Presentation

Sunday 22 April 2018 13:30 to 17:30

WS897 • Course Level: Introductory

Course Length: Half-day (3.5 hours)

Continuing Education Units (CEU): 0.35 Only available upon request.

Note: This course is free to technical attendees. No advance registration required.

Oral presentation skills are a key to success for researchers and professionals alike. This course offers a no-nonsense approach to preparing and giving presentations, with a particular focus on structure, slides, and delivery. It also offers tips on how to manage the nervousness associated with speaking in public.

LEARNING OUTCOMES

This course will enable you to:

- organize your material into an effective structure
- create slides that get the message across
- deliver your presentation effectively, both verbally and nonverbally

INTENDED AUDIENCE

This course is intended for anyone who must prepare and give oral presentations about his or her research work. Both novice and experienced speakers can expect to gain a lot from it.

INSTRUCTOR

Jean-luc Doumont runs lectures and workshops in scientific communication, pedagogy, critical thinking, and more for engineers, scientists, and other rational minds. He is an engineer from the University of Louvain and a doctor in applied physics from Stanford University. Articulate, entertaining, and thought-provoking, he is a popular invited speaker at top-notch universities and research centers worldwide.

Structuring Your Research Paper

Monday 23 April 2018. 8:30 to 12:30

WS908 • Course Level: Introductory

Course Length: Half-day (3.5 hours)

Continuing Education Units (CEU): 0.35 Only available upon request.

Note: This course is free to technical attendees. No advance registration required.

Strong writing skills are a key to success for researchers and professionals alike. This course discusses how to structure research papers, dissertations, and other reports effectively at all levels to get the readers' attention, facilitate navigation, and thus get the message across optimally to their audiences.

LEARNING OUTCOMES

This course will enable you to:

- create an effective abstract, introduction, and conclusion
- organize your material into an accessible structure
- construct paragraphs that get the message across

INTENDED AUDIENCE

This course is intended for anyone who must write or edit technical documents in general and research papers in particular. Both novice and experienced authors can expect to gain a lot from it.

INSTRUCTOR

Jean-luc Doumont runs lectures and workshops in scientific communication, pedagogy, critical thinking, and more for engineers, scientists, and other rational minds. He is an engineer from the University of Louvain and a doctor in applied physics from Stanford University. Articulate, entertaining, and thought-provoking, he is a popular invited speaker at top-notch universities and research centers worldwide.

Conveying Messages with Graphs

Monday 23 April 2018. 13:30 to 17:30

WS1202 • Course Level: Introductory

Course Length: Half-day (3.5 hours)

Continuing Education Units (CEU): 0.35 Only available upon request.

Note: This course is free to technical attendees. No advance registration required.

Widely used in research and development to analyze and communicate data, graphical displays are still poorly mastered by researchers (and popular software does not help). This course discusses how to create more effective graphs—graphs that are truly visual, are truthful to the data, and get the message across.

LEARNING OUTCOMES

This course will enable you to:

- select the right graph for a given data set and a given research question
- optimize this graph to make it intuitive and to reveal the data
- phrase a caption that gets the message across

INTENDED AUDIENCE

This course is intended for anyone who must create graphs for written documents or oral presentations. Both novice and experienced authors/speakers can expect to gain a lot from it.

INSTRUCTOR

Jean-luc Doumont runs lectures and workshops in scientific communication, pedagogy, critical thinking, and more for engineers, scientists, and other rational minds. He is an engineer from the University of Louvain and a doctor in applied physics from Stanford University. Articulate, entertaining, and thought-provoking, he is a popular invited speaker at top-notch universities and research centers worldwide.

Career Choices Speaker and Panel Discussion

Tuesday 24 April 2018 14:00 to 16:00

Open to Students, Early Career Professionals, and all Attendees

This event will start off with a talk from Rachel Won, Nature Photonics and conclude with a panel discussion that will help you explore potential career pathways in the world of photonics. Get solid advice on how you can translate your knowledge, abilities, and interests into meaningful work. Whether you end up in academia, industry, or start your own company, getting a clear picture of the options from experienced leaders will help you better manage your career trajectory.

14:00



Rachel Won

Nature Photonics

My Journey in Optics

Having been exposed to the environment of journalism where she worked as a student reporter during school days, Rachel had always been excited about news communications. However, she faced a dilemma - science or journalism - when it came to the time to choose a major in furthering her study. With a stronger interest in physics and mathematics, science was, naturally, her choice. Fortunately, after completing her PhD study in the world of science, she had the opportunity to combine her background in photonics and her enthusiasm in news communications working as an editor for Nature Photonics.

15:00

Career Choices Panel Discussion

PANELISTS: TBA

Social, Networking, and Student Events

Student Chapter Leadership Workshop

Saturday 21 April 2018 9:00 to 17:00

Open to SPIE Student Chapter members

Participate in the SPIE Student Chapter Leadership Workshop with student chapter leaders from around the world. During this highly interactive, all-day event facilitated by Dr. Jean-luc Doumont, you will discuss what being a leader is all about (and what it is not about), how to communicate across cultures, and how to go from ideas to achievements for your chapter. Expect to gain new insights, make new friends, and overall spend a rich and enjoyable first day at the conference.



Jean-luc Doumont
Principae

An engineer (Louvain) and PhD in applied physics (Stanford), Jean-luc is acclaimed worldwide for his no-nonsense approach, his highly applicable, often life-changing recommendations on a wide range of topics, and Trees, maps, and theorems, his book about “effective communication for rational minds.” He is a visiting lecturer for SPIE. For more information about Jean-luc, please visit www.principiae.be.

Lunch with the Experts - A Student Networking Event

Monday 23 April 2018 12:30 to 13:30

Open to Student Attendees

Enjoy a casual meal with colleagues at this engaging networking opportunity, hosted by SPIE Student Services. This event features experts willing to share their experience and wisdom on career paths in optics and photonics and an award presentation for SPIE scholarships. Seating is limited and will be granted on a first-come, first-served basis.

Welcome Reception

Monday 23 April 2018 19:00 to 21:00

All attendees are invited to the Welcome Reception. Relax, socialize, and enjoy the refreshments. Please remember to wear your registration badge. Dress is casual.

SPIE Fellows Luncheon

Tuesday 24 April 2018 13:00 to 14:30

All Fellows of SPIE are invited to join your colleagues for the sixth SPIE-hosted fellows luncheon in Europe. The new Fellows attending Photonics Europe will be introduced and recognised. Please plan to attend this informal lunch gathering and a special opportunity to meet with the international community of SPIE Fellows. Fellows planning to attend are asked to RSVP to brentj@spie.org.

FELLOWS LUNCHEON PRESENTATION:

Optical Challenges to Enable the Ultimate Mixed Reality Experience

The fast evolving fields of VR, AR and eventually MR aim at providing the ultimate user experience in digital immersion and visual comfort, in order to build up a solid acceptance base from both enterprise and consumer. Today's state of the art Head Mounted Display hardware offerings are still far away from this goal. Optics play a key role in enabling such stringent hardware requirements. We will review the most challenging aspects and discuss which emerging optical architectures and technologies might help to solve them.



Dr. Bernard Kress
Principal Optical Architect
Microsoft Corp.

Student Chapter Poster Session

Tuesday 24 April 2018 16:30 to 18:00

Open to all Attendees

Join us for refreshments and a late-afternoon mixer in the Student Chapter section of the Exhibition Hall. Meet our amazing students and learn about the innovative activities of some of the best and brightest Student Chapters across the globe!

AR/VR Design Challenge Awards and Networking Lunch

Wednesday 25 April 2018 12:00 to 13:00

Presenters, sponsors, and professionals associated with the AR/VR Design Challenge are invited to an awards ceremony and lunch reception. Awards for the best presentations during the design pitch competition will be presented here.

SPIE Members Reception

Wednesday 25 April 2018 19:30 to 20:30

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

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

Courses

Design, Modeling and Fabrication Techniques for Micro-optics: Applications to Display, Imaging, Sensing and Metrology

SC1217 • Sunday 8:30 am to 12:30 pm

Course Level: Intermediate

CEU: 0.4 \$315 Members • \$178 Student Members

\$370 Non-Members USD

This course provides an overview of the various design and fabrication techniques available to the optical engineer for micro / nano optics, diffractive optics and holographic optics. Emphasis is put on DFM (Design For Manufacturing) for wafer scale fabrication, Diamond Turning Machining (DTM) and holographic exposure. The course shows how design techniques can be tailored to address specific fabrication techniques' requirements and production equipment constraints. The course will also address various current application fields such as display, imaging, sensing and metrology.

The course is built around 4 points: (1) design, (2) modeling, (3) fabrication/mass production and (4) application fields.

1) The course will review various design techniques used in standard optical CAD tools such as Zemax and CodeV to design Diffractive Optical Elements (DOEs), Micro-Lens Arrays (MLAs), hybrid optics and refractive micro-optics, Holographic Optical Element (HOE), as well as the various numerical design techniques for Computer Generated Holograms (CGHs).

2) Modeling single micro optics or complex micro-optical systems including MLAs, DOEs, HOEs, CGHs, and other hybrid elements can be a difficult or nearly impossible task when using classical ray tracing algorithms. We will review techniques using physical optics propagation to model not only multiple diffraction effects and their interferences, but also systematic and random fabrication errors, multi-order propagation and other effects which cannot be modeled accurately through ray tracing.

3) Following the design (1) and modeling tasks (2), the optical engineer usually needs to perform a DFM process so that his/her design can be fabricated by the target manufacturing partner/vendor on specific equipment. We will review such DFM for wafer fab via optical lithography (tape-out process), single point diamond turning (SPDT), or holographic optics recording specification. The course also reviews fracturing techniques to produce GDSII layout files for specific lithographic fabrication techniques and manufacturing equipment.

4) In order to point out the potential of such micro-optics for consumer products, this section reviews current application fields for which such elements are providing an especially good match, impossible to implement with traditional optics, such as depth mapping sensing (structured illumination based sensor) and augmented reality display (waveguide grating combiner optics). We will also review applications in high resolution incremental/absolute optical encoders. Design and modeling techniques will be described for such applications fields, and optical hardware sub-system implementations and micro-optics elements will be shown and detailed.

LEARNING OUTCOMES

- review the various micro-optics / diffractive optics design techniques used today in popular optical design software such as Zemax and CodeV
- decide which design software would be best suited for a particular micro-optics design task
- evaluate the various constraints linked to either ray tracing or physical optics propagation techniques, and develop custom numerical propagation algorithms
- model systematic and random fabrication errors, especially for lithographic fabrication
- compare the various constraints linked to mask layout generation for lithographic fabrication (GDSII)
- review the different GDSII fabrication layout file architectures, and how to adapt them to various lithographic fabrication techniques such as the ones described in SC454
- discuss current application fields and products using such optics, as in Augmented and Mixed Reality headsets, and high resolution hybrid incremental/absolute diffractive optical encoders.

INTENDED AUDIENCE

Scientists, engineers, technicians, or managers who wish to learn more about how to design, model, fabricate and test micro-optics, diffractive optics and hybrid micro-optics, and how such optics can be integrated effectively in consumer products. Basic knowledge in optics is assumed.

INSTRUCTOR

Bernard Kress Over the past two decades, Bernard Kress has made significant scientific contributions as an engineer, researcher, associate professor, consultant, instructor, and author. He has been instrumental in developing numerous optical sub-systems for consumer and industrial products, generating IP, teaching and transferring technological solutions to industry. Application sectors include laser materials processing, optical anti-counterfeiting, biotech sensors, optical telecom devices, optical data storage, optical computing, optical motion sensors, digital displays systems, and eventually HUD and HMD displays (smart glasses, AR/MR/VR). Bernard has been specifically involved in the field of micro-optics, wafer scale optics, holography and nano-photonics. He has published half a dozen books and has more than 35 patents granted. He is a short course instructor for the SPIE and has been chair of various SPIE conferences. He is an SPIE fellow since 2013 and has been elected to the board of Directors of SPIE (2017-19). Bernard has joined Google [X] Labs. in 2011 as the Principal Optical Architect on the Google Glass project, and is since 2015 the Partner Optical Architect at Microsoft Corp. on the HoloLens project.

Optical Technologies and Architectures for Virtual Reality (VR), Augmented Reality (AR) and Mixed Reality (MR) Head-Mounted Displays (HMDs)

SC1218 • Sunday 1:30 pm to 5:30 pm

Course Level: Intermediate

CEU: 0.4 \$315 Members • \$178 Student Members

\$370 Non-Members USD

The course starts by providing an extensive overview of the numerous optical technologies and architectures implemented in today's wearable display consumer products such as in: Smart glasses and digital eyewear, Augmented Reality (AR) and Mixed Reality (MR) headsets, Virtual Reality (VR) and Merged Reality headsets.

The course describes the optical backbone of such head worn systems, and the various optical sub-systems building blocks are listed and analyzed. They include: Depth mapping sensors (either through structured illumination or time of flight), Head tracking sensors (either IMU or camera based), Gaze tracking sensors, Display engines including microdisplay panels, scanner based light engines and diffractive phase panels, Optical combiners integrated either in free space or waveguide platforms.

Emphasis is put on the design and fabrication techniques to provide the best immersion and comfort to the end user, along the following guidelines: Wearable comfort (size/ weight, center of gravity), Visual comfort (eye box size and IPD coverage, resolution, field of view, distortion, dynamic range, stereo overlay amount), Vergence / accommodation disparity (varifocal, multifocal, light fields and holographic displays), Foveated rendering and peripheral displays, Pupil swim and active distortion compensation.

The advantages and limitations of the various optical technologies addressing such specifications are reviewed and analyzed.

More specifically, emphasis will be put on eyepiece definition as an experienced spec, subsequent eyepiece replication and eyepiece enlargement techniques as well as alternative eyepiece generation techniques.

In order to design next generation head worn systems, one needs to fully understand the specifics and limitations of the human visual system, and design the optics and the optical architecture around such.

The course also lists the main challenges still lying ahead for next generation headworn systems, where immersion and comfort need to be addressed in concert. The course reviews how such drastic optomechanical specs may be addressed without compromising the features required to provide the user with the ultimate AR/VR experience.

Finally, the course reviews the major market analysts expectations for VR and AR, projected over the next 5 to 10 years, and lists the main actors (major consumer companies as well as start-ups and current investment rounds in such). Demonstration of some of the state of the art AR, MR and VR headsets will be offered to attendees at the end of the course.

LEARNING OUTCOMES

This course will enable you to:

- identify the various consumer and enterprise head worn systems available in industry today, defined as smart glasses, digital eyewear, AR, MR and VR HMDs, and understand their fundamental differences and specifics.
- explain the current optical technologies and sub-systems used in VR, AR and MR head worn systems, their advantages and limitations (such as depth mapping sensors, head tracking sensors, display engines, combiner optics, gaze trackers, etc...).
- explain the relations and implications between FOV, resolution, MTF, eyebox size, effective IPD coverage, screen door effects, pupil swim, vergence/accommodation disparity, foveated rendering, peripheral displays, etc.
- explain the limitations of current optical architectures and how such can be overcome by designing the optics around the human visual system. Gain a good understanding of the human visual system, its specifics and limitations.
- explain the requirement for next generation head worn AR and VR systems, and review the critical enabling technologies.
- the current AR/VR market status as well as the upcoming market expectations for each field (smart glasses, AR and VR).

INTENDED AUDIENCE

Optical, mechanical and electrical engineers involved in the design and development of Enterprise and Consumer HMDs in all their declinations. Product and project managers involved in defining current and next generation HMD products, technology product roadmaps and next generation optical sub-systems.

INSTRUCTOR

Bernard Kress Over the past two decades, Bernard Kress has made significant scientific contributions as an engineer, researcher, associate professor, consultant, instructor, and author. He has been instrumental in developing numerous optical sub-systems for consumer and industrial products, generating IP, teaching and transferring technological solutions to industry. Application sectors include laser materials processing, optical anti-counterfeiting, biotech sensors, optical telecom devices, optical data storage, optical computing, optical motion sensors, digital displays systems, and eventually HUD and HMD displays (smart glasses, AR/MR/VR). Bernard has been specifically involved in the field of micro-optics, wafer scale optics, holography and nano-photonics. He has published half a dozen books and has more than 35 patents granted. He is a short course instructor for the SPIE and has been chair of various SPIE conferences. He is an SPIE fellow since 2013 and has been elected to the board of Directors of SPIE (2017-19). Bernard has joined Google [X] Labs. in 2011 as the Principal Optical Architect on the Google Glass project, and is since 2015 the Partner Optical Architect at Microsoft Corp. on the HoloLens project.

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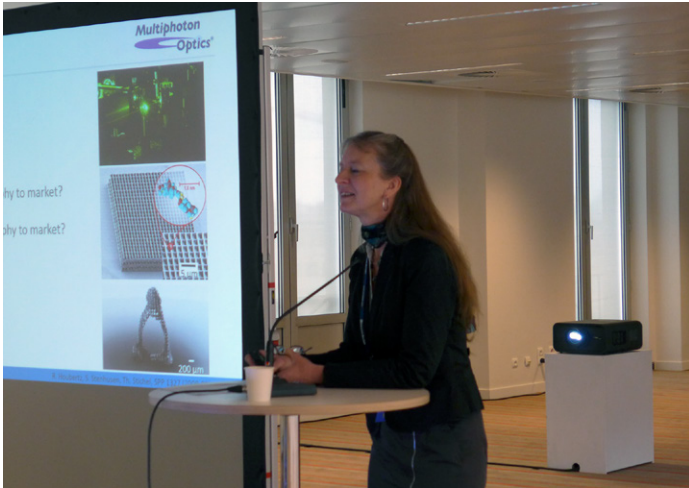
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Industry Programme



Photonics Europe Industry Programme

Strasbourg Convention Center • Leicester Room

Join your peers at these free sessions in which you will hear industry leaders speak to the markets and opportunities for photonics in Europe.

High-speed laser microprocessing

Monday, April 23, 2018. Afternoon



CHAIR: **Eric Mottay**,
President and CEO, Amplitude

Recent advances in high average power industrial ultra-fast lasers have opened the way for new laser processing applications that combine high throughput with superior precision and quality. This industry session will explore some of the new processing strategies and beam engineering technologies that are required in order to take full advantage of these novel laser sources.

- **High-speed polygon scanning**
Ronny De Loo, CTO, Next Scan Technology bvba, Belgium
- **Scaling Strategies for Surface Structuring using High Power USP Lasers**
Johannes-Thomas Finger, Team Manager 3D-Structuring, Fraunhofer ILT, Aachen, Germany
- **Beam shaping systems for Ultrafast Laser processing**
Jens Holtkamp, Co-Founder and managing partner, Pulsar Photonics GmbH, Germany
- **3D glass processing**
Jens Gottmann, Lightfab.
- **Smart machining**
Pending
- **Glass processing**
Pending

Global Industry Update

Tuesday, April 24, 2018 • 8:30 to 09:00



Stephen G Anderson, SPIE

A new report from the SPIE Industry Team presents the third biennial assessment of the world's core photonics components marketplace. Based on a detailed review of supplier revenues and technology trends, this presentation delivers a unique global perspective of the photonics business, its key players, and its markets.

Navigating the funding landscape in Europe

Tuesday, April 24, 2018 • 9:00 to 12:35



CHAIR: **Dr. Thomas Rettich**,
Head of Research Coordination, Trumpf
Member of Photonics21 Executive Board

Introduction to Funding Session:
Thomas Rettich

The funding landscape in Europe is complex and potentially overwhelming with a multitude of pan-European and national funding mechanisms available. This session explores some of the options available to those seeking funds and suggests strategies for navigating them.

- **H2020 – Current Funding Opportunities**
Jean-Jacques Bernardini, Alsace Innovation
- **ERC funding opportunities for creative minds of Europe and of anywhere in the world**
Anna Mignani, Consiglio Nazionale delle Ricerche (CNR-Italy) and European Research Council Executive Agency
- **COST: Networking for Success**
Sinead O’Keeffe, University of Limerick, Ireland
- **Coffee Break**
- **ITN Network “FINESSE”**
Kenny Hey Tow, FINESSE
- **Overview: Photonics Funding activity in Germany**
Peter Soldan, VDI-TZ
- **Overview: Photonics Funding activity in the United Kingdom**
John Lincoln, Harlin Ltd.,
- **Overview: Photonics Funding activity in France**
Sébastien Montusclat, BPIFrance

Biophotonics

Wednesday, April 25, 2018. Morning



CHAIR: **Eric Mottay**
President and CEO, Amplitude

Photonics has been recognized by the European Union as one of (six) Key Enabling Technologies and is a source of numerous new applications in the life sciences. This industry session will provide an overview of recent innovative industrial developments in biophotonics that promise significant health benefits and market potential.

- **Adaptive optics for microscopy**
Samuel Bucourt
- **Near infrared fluorescence imaging in surgery, a short overview**
Philippe Rizo, cofounder Fluoptics, Grenoble, France
- **XPulse Project, Laser-driven plasma X-ray source for breast cancer imaging**
Aboubakr Bakkali, Project Manager, ALPhANOV, Talence, France
- **Cataract surgery: past and future**
Aurélien Bernard, Scientific Director, Keranova, Saint-Etienne, France
- **3D Bioprinting**
Pending
- **STED microscopy**
Pending

Schott Workshop on the Properties of Optical Glass and Special Optical Materials

Thursday, April 26, 2018



Peter Hartmann
SCHOTT AG



Ralf Biertümpfe
SCHOTT AG

Optical glass is a key material for general technology. It is the material providing the essential function of imaging in precision optics, a ubiquitous discipline in scientific research, development, diagnosis and metrology in production processes.

SCHOTT offers an introduction to optical materials such as optical glass, special optical glass, filters from colored glasses or made by coating and the zero-expansion glass ceramic Zerodur.

ALSO INCLUDED WITH YOUR BADGE:

- Optical Design Challenge. A chance for students at Photonics Europe to pitch their optical design to industry. Over \$50,000 in prizes.
- Photonics Europe Exhibition (Tuesday and Wednesday)
- Photonics Innovation Village
- European Village
- Networking Opportunities

Exhibition



See top companies at the free Exhibition

100 COMPANIES • CONNECTING RESEARCH AND INDUSTRY

The SPIE Photonics Europe Exhibition is a prime opportunity for researchers and engineers to connect with leading companies throughout Europe.

FIND ADVANCED TECHNOLOGIES

- Chemical and biological sensing
- Ion-beam, x-ray, EUV, electron-beam
- Clinical, chemical, and biological instrumentation
- Lasers and other light sources, laser systems and accessories
- Cameras and CCD components
- Metrology, inspection, process control
- Infrared sources, detectors, and systems
- Optical components, detectors, fibres, materials, substrates
- Displays
- Communications

Tuesday 24 April..... 10.00 to 17.00

Wednesday 25 April..... 10.00 to 16.00

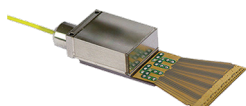
- Optical test and measurement equipment
- Electronic imaging components, equipment, and systems
- Finished optics, filters and coatings, optical fabrication equipment
- Signal analysis equipment
- Optics manufacturing
- Software for simulation and design
- Photonics equipment manufacturing

A prime opportunity for researchers and engineers to connect with leading companies throughout Europe.

3D Light Field LED Wall

AdIOptica Optical Systems GmbH

AEMtec GmbH



Multi-Channel Optical Transceiver

Agilent

AIP Publishing

Applied Surface Technologies

ASLD GmbH

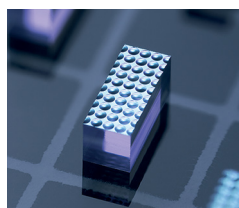
ASML

ATLA Lasers

Aurea Technology

Avantes B.V.

Axetris AG



Refractive and diffractive microoptical components, Infrared sources, Laser-based Gas Detection

BKTEL

Bridge Grant (BG) 297/2016

Chroma Technology GmbH

Cristal Laser S.A.

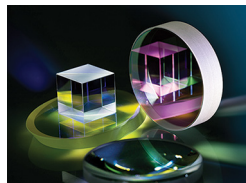
DIAFIR

Edmund Optics



Divergence Adjustable Fixed YAG Beam Expanders with $\lambda/10$ Transmitted Wavefront Error

EKSMA OPTICS



IBMS-coated optics for high power ultrafast lasers

EKSPLA uab

Electro Optics Magazine

Elsevier

EV Group (EVG)

EVOSENS

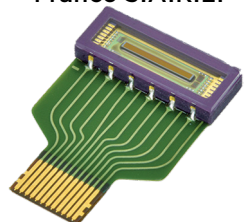
FIST SA

Flexible Optical B.V.

Fraunhofer

Fujifilm Visualsonics Inc

Hamamatsu Photonics France S.A.R.L.



G13913-256FG is a compact, low-cost InGaAs linear image sensor for portable instruments

HOLOEYE Photonics AG



GAEA-2 10 Megapixel Phase Only Spatial Light Modulator

HUBNER Photonics

IDIL Fibres Optiques



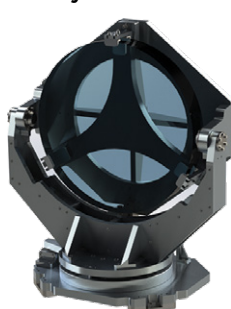
Laser seeder with arbitrary waveform generator and phase modulation

Imagine Optic

Innoptics

International OptoIndex

ISP System



Advanced electro-mechanical deformable mirror. Large aperture optics motorized mounts.

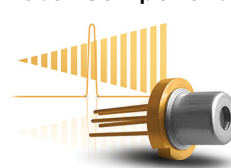
IX Blue

JD Photo Data

KERDRY

Laser & Electro-Optic Solutions

Laser Components GmbH



QuickSwitch Pulsed Laser Diode with world's shortest pulse duration

Le Verre Fluoré

LEUKOS

LightTrans International UG

MIRO Analytical Technologies

MPS Micro Precision Systems AG

NanoMagnetics Ins. Ltd

Nanoscribe GmbH

neaspes GmbH

NIREOS

NU-RISE

Ocean Optics BV

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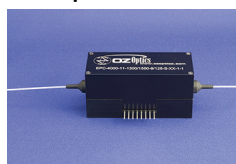
Optronix



Streak camera SC-10 covering synchroscan frequencies within 25-250 MHz

Oxxius SA

OZ Optics Ltd.



PHASICS

Photon Design Ltd

PHOTON LINES

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Photonics Media/Laurin Publishing

Photonics21

PhotonicSys Ltd.

PI France SAS

PolarNon

Polytec France S.A.S.



Reflectometers & Emissometers: characterization of surface and coating + thermal analysis

PYLA

Rollanddetect

Saint Petersburg Electrotechnical University

Santec Europe Ltd.

SEDI-ATI Fibres Optiques



SEDI-ATI - Multi fiber FC/APC Hermetic Feedthrough

SELENOPTICS

Sentec E&E

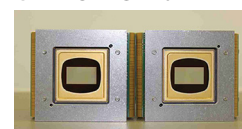
SPIE

SPRINGER NATURE

tectra GmbH

Toptica Photonics AG

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Additional companies are being added daily, see web site for updates and additional information:
www.spie.org/pe-exhibit

Exhibition

Photonics Innovation Village

This special section of the exhibition showcases the finest developments from universities, nonprofits, and research centres. The innovative researchers taking part in the programme participate in a competition for prizes by sharing their latest findings to industry innovators and other photonics visionaries.

Dublin City University

APT (Advanced Processing Technology Research Centre)
Laser-textured Interference-fit Fasteners with Highly Controlled Bond Strength

Holografika Ltd.

(a private company, SME Hungary)
Glasses-free 3D LED wall demonstrator

University of Arad, Romania

Eclipse choppers and choppers with rotational shaft

University of Bern and FBK

Private, non-profit research institute, Trentino, Italy
Time-resolved single-photon imaging system for quantum optics applications

Empa, ETH Zurich and FHNW Swiss Labs

Multi-component gas sensor based on dual-wavelength quantum cascade lasers

Irish Photonic Integration Centre,

Tyndall National Institute, Univ. Cork
Software package, which can design the complex structure of the photonics components and PICs

NU-RISE spin-off from the University of Aveiro (Portugal)

Software and dosimeter to help doctors to deliver better and safer radiation therapy by ensuring the proper radiation dose at the right place

CESNET

Association of Univ. of the Czech Republic and the Czech Academy of Sciences
Modular effective distributed fiber optic sensing system for acoustic/mechanical vibrations sensing

TU Delft, The Netherlands

Optical detection of small defects, particles and contamination on surfaces

ETH Zurich

PolarNon
High resolution nonscanning multiphoton polarimetric microscope

Physics Department of Politecnico di Milano, Italia

VIS/NIR spectrometer and more

ETH Zurich

High resolution nonscanning multiphoton polarimetric microscope

King's College London

Ultrasensitive metamaterial sensor for the optical detection of gases

Saint Petersburg Electrotechnical University "LETI"

Design and research of bidirectional surface acoustic wave delay line fabricated using laser ablation method

ICube laboratory

Strasbourg, France
Real time spectro-polarimetric optical biopsy tool: application to dermatology

Start-up from NTNU

Norwegian University of Science and Technology
Three prototypes of ultrashort-pulse mode-locked fiber-based lasers emitting in the mid-infrared spectral region between 2 and 3 microns

DAMAE and Charles Fabry Lab.

Paris, France
New approach to dermatological diagnostic through a novel hand-held diagnostic imaging device

Université de Bordeaux

(IMS, CELIA, INRIA), France
Hybrid optical bench for innovative teaching

Warsaw University of Technology

Poland
Optoelectronic system for monitoring physiological parameters of patients under MRI diagnosis

European Projects/Networks

See projects and related prototypes in a special section of the exhibition. Meet network representatives and discover more about links between groups across Europe in the field of optics and photonics.

PICS4All

Berenschö

E-PRISE PROJECT

Centre for Process Innovation Limited (CPI)

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A European partnership program dedicated to training in optics, photonics and lasers based on 3D virtual and augmented reality

Photonicsys Ltd

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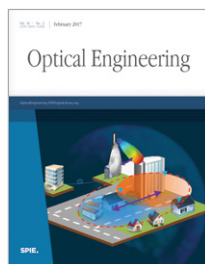
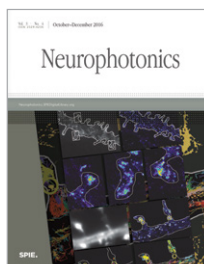
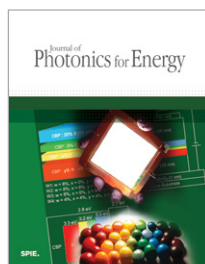
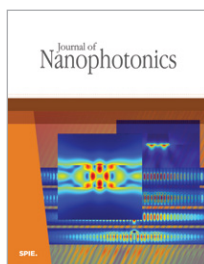
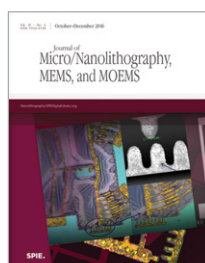
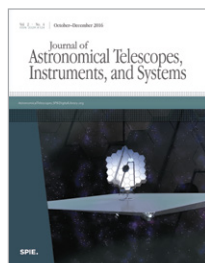
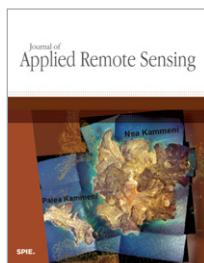
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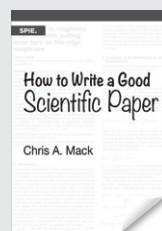
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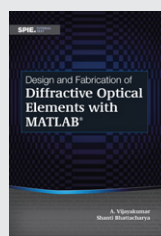
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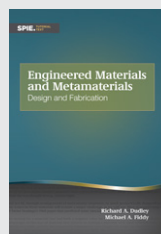
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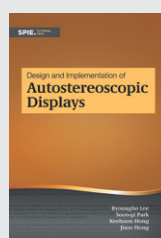
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CONFERENCE 10671

Monday–Thursday 23–26 April 2018 • Proceedings of SPIE Vol. 10671

Metamaterials

Conference Chairs: **Allan D. Boardman**, Univ. of Salford (United Kingdom); **Anatoly V. Zayats**, King's College London (United Kingdom); **Kevin F. MacDonald**, Univ. of Southampton (United Kingdom)

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MONDAY 23 APRIL

HOT TOPICS SESSION I 9:00 TO 11:00

From Einstein doubts to quantum bits: a second quantum revolution

Alain Aspect, Lab. Charles Fabry, Institut d'Optique, France

Pico-Photonics: watching and sensing single molecules by confining light to the atom scale

Jeremy J. Baumberg, NanoPhotonics Ctr., Univ. of Cambridge, United Kingdom

For additional details see page 6.

SESSION 1 MON 11:25 TO 12:30

2D Materials

Potential and limitations of graphene photonics (*Invited Paper*), **Philippe Tassin**, Chalmers Univ. of Technology (Sweden). [10671-1]

Radiation-reaction electric fields in 2D crystals and metasurfaces, **Michele Merano**, Univ. degli Studi di Padova (Italy). [10671-2]

Current-driven “one-way” surface plasmons in graphene (*Invited Paper*), **Tiago Morgado**, Instituto de Telecomunicações (Portugal) and Univ. de Coimbra (Portugal); **Mário Silveirinha**, Instituto de Telecomunicações (Portugal) and Univ. de Lisboa (Portugal) and Instituto Superior Técnico (Portugal). [10671-3]

Lunch Break Mon 12:30 to 13:30

SESSION 2 MON 13:30 TO 15:30

Nonlinear Metamaterials

Highly nonlinear all-dielectric metasurfaces (*Invited Paper*), **Igal Brener**, Sandia National Labs. (United States). [10671-4]

Generation and control of light by nonlinear metasurfaces (*Invited Paper*), **Tal Ellenbogen**, Tel Aviv Univ. (Israel). [10671-5]

Nanocross metasurface for controlling four-wave mixing processes, **Giovanni Sartorello**, King's College London (United Kingdom); **Guixin Li**, Southern Univ. of Science and Technology of China (China); **Shumei Chen**, The Univ. of Birmingham (United Kingdom); **Luke H. Nicholls**, King's College London (United Kingdom); **King Fai Li**, Southern Univ. of Science and Technology of China (China); **Thomas Zentgraf**, Univ. Paderborn (Germany); **Shuang Zhang**, The Univ. of Birmingham (United Kingdom); **Anatoly V. Zayats**, King's College London (United Kingdom). [10671-6]

Local field coupling effects in silicon oligomers revealed by third-harmonic generation microscopy, **Maria Kroychuk**, **Damir Yagudin**, **Alexander S. Shorokhov**, **Maxim R. Shcherbakov**, **M.V. Lomonosov Moscow State Univ.** (Russian Federation); **Dragomir N. Neshev**, **Yuri S. Kivshar**, **The Australian National Univ.** (Australia); **Andrey A. Fedyanin**, **M.V. Lomonosov Moscow State Univ.** (Russian Federation). [10671-7]

Third-order nonlinear processes at anapole modes in all-dielectric germanium nanoantennas, **Yi Li**, **Gustavo Grinblat**, **Michael P. Nielsson**, **Rupert F. Oulton**, Imperial College London (United Kingdom); **Stefan A. Maier**, Imperial College London (United Kingdom) and **Ludwig-Maximilians-Univ. München** (Germany). [10671-8]

Ultrafast pulse design in anisotropic metamaterials through nonlinear optical control (*Invited Paper*), **Luke H. Nicholls**, **Francisco J. Rodríguez-Fortuño**, **Mazhar E. Nasir**, **R. Margothe Córdova-Castro**, King's College London (United Kingdom); **Tomasz Stefaniuk**, Univ. of Warsaw (Poland); **Nicolas Olivier**, Ecole Polytechnique (France); **Gregory A. Wurtz**, Univ. of North Florida (United States); **Anatoly V. Zayats**, King's College London (United Kingdom). [10671-9]

SESSION 3 MON 15:55 TO 17:50

Metamaterials Applications

Active, nonlinear, and tunable Mie-resonant semiconductor metasurfaces (*Keynote Presentation*), **Isabelle Staude**, **Friedrich-Schiller-Univ. Jena** (Germany). [10671-10]

Wavefront control for flat optics using subwavelength dielectric metasurfaces, **Chan-Wook Baik**, Samsung Advanced Institute of Technology (Korea, Republic of); **Heejeong Jeong**, Hong Kong Univ. of Science and Technology (Hong Kong, China); **Chang-Won Lee**, Hanbat National Univ. (Korea, Republic of); **Jeong Yub Lee**, **Jae Kwan Kim**, **Byonggwon Song**, **Jang Hwan Tae**, **Kyung-Sang Cho**, **Hong-Seok Lee**, Samsung Advanced Institute of Technology (Korea, Republic of). [10671-11]

Transparency effect in all-dielectric metamaterials due to the nullifying of multipoles, **Anar K. Ospanova**, National Univ. of Science and Technology “MISIS” (Russian Federation) and **Ben-Gurion Univ. of the Negev** (Israel); **Alexey A. Basharin**, National Univ. of Science and Technology “MISIS” (Russian Federation) and **Politecnico di Torino** (Italy); **Alina Karabchevsky**, **Ben-Gurion Univ. of the Negev** (Israel). [10671-12]

Dielectric-rod gradient metasurfaces based on matched toroidal and magnetic dipole resonances, **Odysseas Tsilipakos**, **Anna C. Tasolamprou**, Foundation for Research and Technology-Hellas (Greece); **Thomas Koschny**, **Ames Lab.**, Iowa State Univ. of Science and Technology (United States); **Maria Kafesaki**, Foundation for Research and Technology-Hellas (Greece) and Univ. of Crete (Greece); **Eleftherios N. Economou**, Foundation for Research and Technology-Hellas (Greece); **Costas M. Soukoulis**, **Ames Lab.**, Iowa State Univ. of Science and Technology (United States). [10671-13]

Resonant effects in dielectric nanoantennas and metasurfaces (*Invited Paper*), **Arseniy I. Kuznetsov**, A*STAR – Data Storage Institute (Singapore). [10671-14]

MONDAY POSTER SESSION MON 17:30 TO 19:00

Posters-Monday

Conference attendees are invited to attend the Photonics Europe poster session on Monday 17.30 to 19.00. Posters will be on display after 10.00 Monday morning in the Hall Rhin. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster authors, view poster presentation guidelines and set-up instructions at <http://spie.org/x34963.xml> and on page 96.

Nonlocal computing metasurfaces performing mathematical operations, **Andrea Cordaro**, Univ. of Amsterdam (Netherlands) and FOM Institute for Atomic and Molecular Physics (Netherlands); **Hoyeong Kwon**, **Dimitrios Sounas**, The Univ. of Texas at Austin (United States); **Albert Polman**, FOM Institute for Atomic and Molecular Physics (Netherlands); **Andrea Alù**, The Univ. of Texas at Austin (United States). [10671-72]

Nonlocal and quantum resonance behavior in plasmonics nanostructures: analysis and simulations, **Milan Burda**, **Pavel Kwiecien**, **Ivan Richter**, Czech Technical Univ. in Prague (Czech Republic). [10671-73]

Far-infrared plasmon-phonon coupling enhances modal characteristics of graphene-LiF waveguides, **Hodjat Hajian**, **Bilkent Univ.** (Turkey); **Andriy E. Serebryannikov**, Technische Univ. Hamburg-Harburg (Germany); **Amir Ghebadi**, **Yiğit Demirağ**, **Bayram Butun**, **Bilkent Univ.** (Turkey); **Guy A. E. Vandenbosch**, KU Leuven (Belgium); **Ekmel Özbay**, **Bilkent Univ.** (Turkey). [10671-74]

Transformation Optics

Novel perspectives on transformation optics (Keynote Presentation), Martin W. McCall, Imperial College London (United Kingdom) . . [10671-15]

Utilizing dielectric annulus-based metamaterial to achieve Harry Potter's invisible cloak, Tung Lee, Tsung-Yu Huang, Ta-Jen Yen, National Tsing Hua Univ. (Taiwan) [10671-16]

Metamaterials for cloaking: physical limitations, Giovanni Franco Crosta, Univ. degli Studi di Milano-Bicocca (Italy) [10671-17]

PT-vector fields, Waqas Waseem Ahmed, Ramon Herrero, Muriel Botey, Univ. Politècnica de Catalunya (Spain); Zeki Hayran, Hamza Kurt, TOBB ETÜ (Turkey); Kestutis Staliunas, Univ. Politècnica de Catalunya (Spain) and Institutió Catalana de Recerca i Estudis Avançats (Spain) [10671-18]

Homogenization of metamaterials with strong spatial dispersion (Invited Paper), Carsten Rockstuhl, Karim Mnasri, Joshua Feis, Andrii Khrabustovskyi, Michael Plum, Christian Stohrer, Karlsruhe Institut für Technologie (Germany) [10671-19]

Hyperbolic Metamaterials

Nonlinear waves in hyperbolic metamaterials with a focus on solitons and rogues (Invited Paper), Allan D. Boardman, Univ. of Salford (United Kingdom); Bertrand Kibler, Univ. de Bourgogne (France); James McNiff, Univ. of Salford (United Kingdom); Igor Nefedov, Aalto Univ. (Finland); Yuriy G. Rapoport, Taras Shevchenko National Univ. of Kyiv (Ukraine); Costas Valagiannopoulos, Nazarbayev Univ. (Kazakhstan); Christos Argyropoulos, Univ. of Nebraska-Lincoln (United States) [10671-20]

Transparent conducting and phase-change oxides: new classes of plasmonic and hyperbolic metamaterials, Arrigo Calzolari, Alessandra Catellani, Istituto Nanoscienze (Italy) [10671-21]

Into the deep UV: self-assembled hyperbolic metamaterials for the ultraviolet range, William P. Wardley, Francisco J. Rodríguez-Fortuño, Luke H. Nicholls, Serena S. Campbell, Mazhar E. Nasir, Anatoly V. Zayats, Wayne Dickson, King's College London (United Kingdom) [10671-22]

Structured hyperbolic metamaterials for control of spontaneous emission, Diane Roth, Mazhar E. Nasir, Alexey V. Krasavin, King's College London (United Kingdom); Pavel Ginzburg, Tel Aviv Univ. (Israel); Wayne Dickson, David Richards, King's College London (United Kingdom); Viktor A. Podolskiy, Univ. of Massachusetts Lowell (United States); Anatoly V. Zayats, King's College London (United Kingdom) [10671-23]

Dispersion management in nanorod metamaterials, Tomasz Stefaniuk, King's College London (United Kingdom) and Univ. of Warsaw (Poland); R. Margoth Córdova-Castro, Mazhar E. Nasir, Anatoly V. Zayats, King's College London (United Kingdom) [10671-24]

Strongly nonlinear surface plasmons and active hyperbolic metamaterials and hot spot formation (Invited Paper), Yuriy G. Rapoport, Taras Shevchenko National Univ. of Kyiv (Ukraine); Allan D. Boardman, Univ. of Salford (United Kingdom); Vladimir V. Grimalsky, Univ. Autónoma del Estado de Morelos (Mexico) [10671-25]

Lunch/Exhibition Break Tue 12:45 to 13:50

Analytical and Numerical Modelling of Metamaterials

Extreme properties meta-atoms with compensated loss (Invited Paper), Sergei A. Tretyakov, Aalto Univ. (Finland); M. Albooyeh, Univ. of California (United States); M. Safari, Iran Univ. of Science and Technology (Iran, Islamic Republic of); Constantin R. Simovski, Aalto Univ. School of Electrical Engineering (Finland) [10671-26]

Breaking time-reversal symmetry with nonlinear nanophotonics (Invited Paper), Andrea Alù, Dimitrios Sounas, The Univ. of Texas at Austin (United States) [10671-27]

Dynamics of slowly varying fields in bianisotropic media, Stanislav I. Maslovski, Instituto de Telecomunicações (Portugal) [10671-28]

On the Aharonov-Bohm effect and generation of electromagnetic potentials in the context of dynamic anapoles, Nikita Nemkov, Alexey A. Basharin, National Univ. of Science and Technology "MISIS" (Russian Federation); Vasily Fedotov, Optoelectronics Research Ctr., Univ. of Southampton (United Kingdom) [10671-29]

Anomalous localization behaviors in pseudospin systems (Invited Paper), Che Ting Chan, Anan Fang, Zhao-Qing Zhang, Hong Kong Univ. of Science and Technology (Hong Kong, China); Steven G. Louie, Hong Kong Univ. of Science and Technology (Hong Kong, China) and Univ. of California, Berkeley (United States) [10671-30]

Micron-scale light structuring via flat nanodevices, Nasir Mahmood, Information Technology Univ. of the Punjab (Pakistan) and National Univ. of Sciences and Technology (Pakistan); Muhammad Qasim Mehmood, Information Technology Univ. of the Punjab (Pakistan); Inki Kim, Heongyeong Jeong, Pohang Univ. of Science and Technology (Korea, Republic of); Farooq Ahmad Tahir, National Univ. of Sciences and Technology (Pakistan); Junsuk Rho, Pohang Univ. of Science and Technology (Korea, Republic of) [10671-75]

UV near-infrared broadband pyramidal absorbers via a genetic algorithm optimization approach, Alexandre Mayer, Univ. of Namur (Belgium); Michaël Lobet, Harvard Univ. (United States) [10671-76]

Polarization tomography of the spin-orbital angular momentum coupling of light with a chiral plasmonic lens, Aorong Zhao, Nessim Jebali, Kim Anh Alin Pham, Aurelien Drezet, Institut NÉEL (France) [10671-77]

Near-field phase characterization of gradient gap plasmon-based metasurfaces, Rucha A. Deshpande, Vladimir A. Zenin, Sergey I. Bozhevolnyi, Univ. of Southern Denmark (Denmark) [10671-78]

The photo-sensitization of zinc oxide by the localized-surface-plasmon-generated hot electron tunneling from the nanostructured titanium nitride nanodisk array, Yue Bian, Zhonghua Xu, Jiandong Ye, Shunming Zhu, Shulin Gu, Kun Tang, Nanjing Univ. (China) [10671-79]

Efficient vortex generation in subwavelength epsilon-near-zero slabs, Alessandro Ciattoni, CNR-SPIN (Italy); Andrea Marini, Istituto dei Sistemi Complessi (Italy); Carlo Rizza, CNR-SPIN (Italy) and Univ. degli Studi dell'Aquila (Italy) [10671-80]

Multifunctional meta-mirror: polarization splitting and focusing, Sergejs Boroviks, Rucha A. Deshpande, N. Asger Mortensen, Sergey I. Bozhevolnyi, Univ. of Southern Denmark (Denmark) [10671-81]

Optical filters through plasmonic metamaterials, Francesco Lotti, Anatoly V. Zayats, King's College London (United Kingdom) [10671-82]

Optical planar filter for visible RGB resonance, Igor Leonardo Gomes de Souza, Univ. Federal da Bahia (Brazil); Davi Franco Rego, Univ. Federal da Bahia (Brazil) and Instituto Federal da Bahia (Brazil); Vitaly F. Rodriguez-Esquerre, Univ. Federal da Bahia (Brazil) [10671-83]

Ultra-broadband plasmonic groove absorbers for visible light optimized by genetic algorithms, Davi Franco Rego, Univ. Federal da Bahia (Brazil) and Instituto Federal da Bahia (Brazil); Igor Leonardo Gomes de Souza, Vitaly F. Rodriguez-Esquerre, Univ. Federal da Bahia (Brazil) [10671-84]

Metasurface-based total internal reflection bioimaging, Antu Gortari, Alejandro Yacomotti, Sophie Bouchoule, Edmond Cambil, Ctr. de Nanosciences et de Nanotechnologies (France) [10671-85]

Elasto-optic metamaterials for macroscale optical components using silica aerogels, Kyoungsik Kim, Dongheok Shin, Changuk Kim, Yonsei Univ. (Korea, Republic of) [10671-86]

Exceptional points in the strong-coupling regime with active hyperbolic metamaterials, Fabio Vaianella, Univ. de Mons (Belgium); Joachim Hamm, Ortwin Hess, Imperial College London (United Kingdom); Bjorn Maes, Univ. de Mons (Belgium) [10671-87]

Large radiative emission rate of deep ultraviolet emitter with hyperbolic metamaterial structure, Kun-Ching Shen, Yuh-Jen Cheng, Din Ping Tsai, Research Ctr. for Applied Sciences - Academia Sinica (Taiwan) [10671-88]

Enhancing light absorption inside CZTS solar cells using plasmonic and dielectric wire grating metasurface, Omar A. M. Abdelraouf, The American Univ. in Cairo (Egypt) and Ain Shams Univ. (Egypt); Ahmed Shaker, Ain Shams Univ. (Egypt); Nageh K. Allam, The American Univ. in Cairo (Egypt) [10671-89]

Sensitivity enhancement via Fano-resonance by the coupling between metamaterial-based perfect absorber and chemical molecule, Chieh-Ting Lin, Ta-Jen Yen, Tsung-Yu Huang, National Tsing Hua Univ. (Taiwan) [10671-90]

Active THz asymmetric split-loop resonator type metamaterials based on vanadium dioxide thin film, Han-Cheol Ryu, Dae-Jun Park, Sahmyook Univ. (Korea, Republic of); Min Yong Jeon, Chungnam National Univ. (Korea, Republic of) [10671-91]

Tunable metasurfaces with nematic liquid crystals, Nazmi Yilmaz, Ibrahim Halil Giden, Fehim Taha Bagci, TOBB ETÜ (Turkey); Aytekin Ozdemir, College of Optical Sciences, The Univ. of Arizona (United States) and American College of the Middle East (Kuwait) and TOBB ETÜ (Turkey); Ahmet Ozer, Hamza Kurt, TOBB ETÜ (Turkey) [10671-92]

Metamaterial transparency effects: broken symmetry, multipolar decomposition, Kerker conditions, Anar K. Ospanova, National Univ. of Science and Technology "MISIS" (Russian Federation) and Ben-Gurion Univ. of the Negev (Israel); Alexey A. Basharin, National Univ. of Science and Technology "MISIS" (Russian Federation) and Politecnico di Torino (Italy); Alina Karabchevsky, Ben-Gurion Univ. of the Negev (Israel) [10671-93]

Tuning the metal filling fraction in metal-insulator-metal ultra-broadband perfect absorbers to maximize the absorption bandwidth, Amir Ghobadi, Hodjat Hajian, Bayram Butun., Ekmel Özbay, Bilkent Univ. (Turkey) . . [10671-94]

Nanofabrication and synthesis of metamaterials based on binary semiconductor compounds, Ion M. Tiginyanu, Academy of Sciences of Moldova (Moldova) [10671-95]

CONFERENCE 10671

Analogues of spoof plasmons in elastodynamics and design of seismic metamaterials (*Invited Paper*), Sébastien Guenneau, Ctr. National de la Recherche Scientifique (United States). [10671-31]

HOT TOPICS SESSION II. 16:30 TO 18:05

Coherent combination of fiber amplified ultrafast laser pulses
Jens Limpert, Institute of Applied Physics, Friedrich Schiller Univ. Jena, Germany

2D materials and their heterostructures: fundamentals, applications and prototypes
Frank Koppens, ICFO-The Institute of Photonic Sciences, Spain

For additional details, please see page 7

WEDNESDAY 25 APRIL

SESSION 7. WED 8:30 TO 10:35

New Materials and Fabrication Methods for Metamaterials

It is possible to produce volumetric metamaterials and plasmonic materials (*Keynote Presentation*), Dorota A. Pawlak, Katarzyna Sadecka, Paweł Osewski, Marta Kurowska, Aneta Antolik, Institute of Electronic Materials Technology (Poland); Piotr Paszke, Rafał Nowaczynski, Ctr. of New Technologies, Univ. of Warsaw (Poland); Andrzej Kłos, Hańcza B. Surma, Institute of Electronic Materials Technology (Poland) . . . [10671-32]

New and industrially relevant fabrication process for GaN metalenses (*Invited Paper*), Patrice Genevet, Harvard John A. Paulson School of Engineering and Applied Sciences (United States). [10671-33]

Dynamic plasmonic metasurface holograms, Laura N. Liu, Ruprecht-Karls-Universität Heidelberg (Germany). [10671-34]

High-quality ultrathin gold layers for use in plasmonic and metamaterials applications, Johneph Sukham, Osamu Takayama, Andrei V. Lavrinenko, DTU Fotonik (Denmark) and Technical Univ. of Denmark (Denmark); Radu Malureanu, DTU Fotonik (Denmark) and DTU Danchip (Denmark) and Technical Univ. of Denmark (Denmark). [10671-35]

Floating metamaterials based on vaterite platform (*Invited Paper*), Pavel Ginzburg, Ivan I. Shishkin, Hani Barhom, Roman E. Noskov, Tel Aviv Univ. (Israel). [10671-36]

SESSION 8. WED 11:00 TO 12:30

Material Platforms for Metamaterials: Theory and Modelling

Tailoring the optical response of metasurfaces by deterministic structural disorder, Isabelle Staude, Stefan Fasold, Dennis Arslan, Friedrich-Schiller-Universität Jena (Germany); Aso Rahimzadegan, Karlsruher Institut für Technologie (Germany); Trideep Kawde, Sebastian Linss, Najmeh Abbasirad, Matthias Falkner, Friedrich-Schiller-Universität Jena (Germany); Manuel Decker, Friedrich-Schiller-Universität Jena (Germany) and The Australian National Univ. (Australia); Carsten Rockstuhl, Karlsruher Institut für Technologie (Germany); Thomas Pertsch, Friedrich-Schiller-Universität Jena (Germany). [10671-37]

Dynamic modeling of heat transfer in metamaterials, Hodjat Marjji, Stanislav I. Maslovski, Instituto de Telecomunicações (Portugal). [10671-38]

Plasmonics with refractory TiN, Alessandra Catellani, Istituto Nanoscienze (Italy). [10671-39]

Spatial and spectral control of infrared thermal emission in VO₂-based composite nanoantennas, Marco Centini, Gianmario Cesarini, Maria Cristina Larciprete, Alessandro Belardini, Roberto Li Voti, Concita Sibilia, Sapienza Univ. di Roma (Italy). [10671-40]

Tuning thermal emission in metamaterials composed by oriented polar inclusions, Maria Cristina Larciprete, Marco Centini, Roberto Li Voti, Concita Sibilia, Sapienza Univ. di Roma (Italy). [10671-41]

Plasmonic anisotropic metasurfaces: from far-field measurements to near-field properties, Oleh Y. Yermakov, Andrey A. Bogdanov, Dmitry V. Permyakov, Anton K. Samusev, ITMO Univ. (Russian Federation); Filipp V. Porubaev, St. Petersburg Theological Academy (Russian Federation); Pavel A. Dmitriev, Ivan V. Iorsh, ITMO Univ. (Russian Federation); Radu Malureanu, Andrei V. Lavrinenko, DTU Fotonik (Denmark) and Technical Univ. of Denmark (Denmark). [10671-42]

Lunch/Exhibition Break Wed 12:30 to 13:35

SESSION 9. WED 13:35 TO 15:30

Metasurface Functionalities

Multifunctional gap plasmon-based metasurfaces (*Invited Paper*), Sergey I. Bozhevolnyi, Univ. of Southern Denmark (Denmark). [10671-43]

Broadband Laguerre-Gaussian metasurfaces and direct phase mapping, Alexander Faßbender, Rheinische Friedrich-Wilhelms-Universität Bonn (Germany). [10671-44]

Nonlinear dynamics limiting the reconfiguration time of optomechanical metasurfaces, Sophie Viaene, Vrije Univ. Brussel (Belgium) and Chalmers Univ. of Technology (Sweden); Vincent Ginis, Jan Danckaert, Vrije Univ. Brussel (Belgium); Philippe Tassin, Chalmers Univ. of Technology (Sweden). [10671-45]

The physics of resonant waveguide-gratings and the development of meta-resonant waveguide gratings, Guillaume Basset, Ctr. Suisse d'Electronique et de Microtechnique SA (Switzerland). [10671-46]

Hot electrons in electrically driven plasmonic nanorod metamaterials, Pan Wang, Alexey V. Krasavin, Mazhar E. Nasir, Wayne Dickson, Anatoly V. Zayats, King's College London (United Kingdom). [10671-47]

Dielectric resonator surfaces for infrared filters and pleochroisms, Fabrizio Silvestri, TNO (Netherlands); Zuzanna K. Deutschman, Wrocław Univ. of Science and Technology (Poland) and TNO (Netherlands); Jonas Berzins, TNO (Netherlands) and Friedrich-Schiller-Universität Jena (Germany); Giampiero Gerini, TNO (Netherlands) and Technische Univ. Eindhoven (Netherlands); Stefan M. B. Bäumer, TNO (Netherlands). [10671-48]

Color filter arrays based on dielectric metasurface elements, Jonas Berzins, Friedrich-Schiller-Universität Jena (Germany) and TNO (Netherlands); Fabrizio Silvestri, TNO (Netherlands); Giampiero Gerini, TNO (Netherlands) and Technische Univ. Eindhoven (Netherlands); Frank Setzpfandt, Thomas Pertsch, Friedrich-Schiller-Universität Jena (Germany); Stefan M. B. Bäumer, TNO (Netherlands). [10671-49]

SESSION 10. WED 16:00 TO 17:45

New Materials for Metamaterials

Control of perovskite luminescence with metamaterials (*Invited Paper*), Giorgio Adamo, Harish N. S. Krishnamoorthy, Nanyang Technological Univ. (Singapore); Behrad Gholipour, Univ. of Southampton (United Kingdom); Daniele Cortecchia, Jin-Kyu So, Muhammad D. Birowosuto, Nanyang Technological Univ. (Singapore); Nikolay I. Zheludev, Univ. of Southampton (United Kingdom) and Nanyang Technological Univ. (Singapore); Cesare Soci, Nanyang Technological Univ. (Singapore). [10671-50]

Characterization of the phase transition of a vanadium dioxide film on a silicon substrate through radiative emission in the mid-infrared, Gianmario Cesarini, Grigore Leahu, Roberto Li Voti, Concita Sibilia, Mario Bertolotti, Sapienza Univ. di Roma (Italy). [10671-51]

Exploiting hot electron dynamics for nanoscale molecular self-assembly control on plasmonic nanoantennas (*Invited Paper*), Stefan A. Maier, Imperial College London (United Kingdom). [10671-52]

Digitally tunable metasurfaces based on phase-change material, Qian Wang, Institute of Materials Research and Engineering (IMRE) (Singapore); Shengtao Mei, National Univ. of Singapore (Singapore); Guanghui Yuan, Nanyang Technological Univ. (Singapore); Kian Shen Kiang, Univ. of Southampton (United Kingdom); Nikolay I. Zheludev, Nanyang Technological Univ. (Singapore) and Univ. of Southampton (United Kingdom); Jinghua Teng, Institute of Materials Research and Engineering (IMRE) (Singapore). [10671-53]

New materials for metamaterials: plasmonic and ENZ chalcogenides, (*Invited Paper*), Kevin F. MacDonald, Davide Piccinotti, Behrad Gholipour, Jin Yao, Brian E. Hayden, Univ. of Southampton (United Kingdom); Nikolay I. Zheludev, Univ. of Southampton (United Kingdom) and Nanyang Technological Univ. (Singapore). [10671-54]

THURSDAY 26 APRIL

HOT TOPICS SESSION III 9:00 TO 10:35

From extreme nonlinear optics to ultrafast atomic physics
Anne L'Huillier, Lund Univ., Sweden

Quantum computations and quantum simulations with trapped ions

Rainer Blatt, Institute for Experimental Physics, Univ. of Innsbruck, Austria

For additional details, please see page 8

SESSION 11 THU 10:55 TO 12:50

Metamaterials for Sensors

Photonic metasurfaces for next-generation biosensors
(Keynote Presentation), Hatice Altug, Ecole Polytechnique Fédérale de Lausanne (Switzerland) [10671-55]

Following molecular photo switching with optical nanoantennas in the strong coupling regime, Esteban Pedrueza Villalmanzo, Göteborgs Univ. (Sweden); Valeria Saavedra, Chalmers Univ. of Technology (Sweden); Mehdi Keshavarz Hedayati, Technical Univ. of Denmark (Denmark); Moheb Abdelaziz Mahoumd Abdelaziz, Christian-Albrechts-Univ. zu Kiel (Germany) and Aalto Univ. (Finland); Joakim Andreasson, Chalmers Univ. of Technology (Sweden); Mady Elbahri, Christian-Albrechts-Univ. zu Kiel (Germany) and Aalto Univ. (Finland); Alexander Dmitriev, Göteborgs Univ. (Sweden) [10671-56]

3D confocal Raman mapping of field enhancement inside supercluster metamaterials, Alberto Lauri, Leonora Velleman, Xiaofei Xiao, Emiliano Cortés, Joshua B. Edel, Vincenzo Giannini, Aliaksandra Rakovich, Imperial College London (United Kingdom) [10671-57]

Asymmetric split H resonators for estrogenic hormone detection, Ili Farhana Mohamad Ali Nasri, Richard M. De La Rue, Nigel P. Johnson, Graham P. Sharp, Marc Sorel, Caroline Gauchotte-Lindsay, Univ. of Glasgow (United Kingdom) [10671-58]

Metamaterial-based nanobiosensors, nanophotodetectors and perfect absorbers (Invited Paper), Ekmel Özbay, Bilkent Univ. (Turkey) . . . [10671-59]

Lunch Break Thu 12:50 to 13:50

SESSION 12 THU 13:50 TO 15:20

Chiral, Toroidal and Magneto-optic Metamaterials

All-dielectric toroidal metamaterials based on cylindrical particles, Ivan Stenishchev, Alexey A. Basharin, National Univ. of Science and Technology "MISIS" (Russian Federation) [10671-60]

Magnetic type of planar toroidal metamaterial, Maria V. Cojocari, Alexey A. Basharin, Nikita A. Volsky, National Univ. of Science and Technology "MISIS" (Russian Federation) [10671-61]

Magnetic control of the chiroptical plasmonic surfaces, Irina Zubritskaya, Chalmers Univ. of Technology (Sweden) [10671-62]

Manifestation of planar and bulk chirality mixture in plasmonic Λ -shaped nanostructures caused by symmetry breaking defects, Kim Anh Alin Pham, Quanbo Jiang, Airon Zhao, Institut NÉEL (France); Joël Bellessa, Institut Lumière Matière (France); Cyriaque Genet, Institut de Science et d'Ingénierie Supramoléculaires (France) [10671-63]

Experimental demonstration of 10dB isolation from a nonreciprocal magnetoplasmonic InSb mirror at 2.5 THz frequency, Oleksandr Stepanenko, Tomáš Horák, Institut d'Electronique de Microélectronique et de Nanotechnologie (France); Jan Chochol, Kamil Postava, VŠB-Technical Univ. of Ostrava (Czech Republic); Jean-François Lampin, Mathias Vanwolleghem, Institut d'Electronique de Microélectronique et de Nanotechnologie (France) [10671-64]

Enhanced magneto-optical effects in dielectric Mie-resonant metasurfaces, Maria Barsukova, Alexander S. Shorokhov, Alexander I. Musorin, M.V. Lomonosov Moscow State Univ. (Russian Federation); Maxim R. Shcherbakov, M.V. Lomonosov Moscow State Univ. (Russian Federation) and Cornell Univ. (United States); Dragomir N. Neshev, The Australian National Univ. (Australia); Boris S. Luk'yanchuk, M.V. Lomonosov Moscow State Univ. (Russian Federation) and A*STAR - Data Storage Institute (Singapore); Yuri S. Kivshar, The Australian National Univ. (Australia); Andrey A. Fedyanin, M.V. Lomonosov Moscow State Univ. (Russian Federation) [10671-65]

SESSION 13 THU 15:40 TO 17:30

All-dielectric Metamaterials

Application of metamaterial concepts to chipless RFID (Invited Paper), Ferran Martín, Cristian Herrojo, Javier Mata-Contreras, Univ. Autònoma de Barcelona (Spain); Alba Núñez, Instituto de Microelectrónica de Barcelona (Spain); Ferran Paredes, Univ. Autònoma de Barcelona (Spain); Eloi Ramon, Instituto de Microelectrónica de Barcelona (Spain) [10671-66]

Integration of subwavelength nanostructures in silicon waveguides: new phenomena and applications (Invited Paper), Alejandro Martínez, Univ. Politècnica de València (Spain) [10671-71]

High rejection ratio silicon membrane Bragg filters, Carlos A. Alonso-Ramos, Xavier Le Roux, Daniel Benedikovic, Vladyslav Vakarin, Elena Durán-Valdeiglesias, Dorian Oser, Ctr. de Nanosciences et de Nanotechnologies (France); Diego Pérez-Galacho, Ctr. de Nanosciences et de Nanotechnologies (France) and Univ. Politècnica de Valencia (Spain); Florent Mazeas, Sébastien Tanzilli, Laurent Labonté, Lab. de Physique de la Matière Condensée (France); Eric Cassan, Delphine Marris-Morini, Ctr. de Nanosciences et de Nanotechnologies (France); Pavel Cheben, National Research Council Canada (Canada); Laurent Vivien, Ctr. de Nanosciences et de Nanotechnologies (France) [10671-67]

All dielectric and plasmonic cross-grating metasurface for efficient perovskite solar cells, Omar A. M. Abdelraouf, The American Univ. in Cairo (Egypt) and Ain Shams Univ. (Egypt); Ahmed Shaker, Ain Shams Univ. (Egypt); Nageh K. Allam, The American Univ. in Cairo (Egypt) [10671-68]

Fibre-optic metadvice for signal processing with 1 THz bandwidth, Angelos Xomalis, Optoelectronics Research Ctr., Univ. of Southampton (United Kingdom) and Ctr. for Photonic Metamaterials, Univ. of Southampton (United Kingdom); Iosif Demirtzioglou, Optoelectronics Research Ctr., Univ. of Southampton (United Kingdom); Eric Plum, Optoelectronics Research Ctr., Univ. of Southampton (United Kingdom) and Ctr. for Photonic Metamaterials, Univ. of Southampton (United Kingdom); Yongmin Yung, Cosimo Lacava, Optoelectronics Research Ctr., Univ. of Southampton (United Kingdom); Kevin F. MacDonald, Optoelectronics Research Ctr., Univ. of Southampton (United Kingdom) and Ctr. for Photonic Metamaterials, Univ. of Southampton (United Kingdom); Periklis Petropoulos, David J. Richardson, Optoelectronics Research Ctr., Univ. of Southampton (United Kingdom); Nikolay I. Zheludev, Optoelectronics Research Ctr., Univ. of Southampton (United Kingdom) and Ctr. for Photonic Metamaterials, Univ. of Southampton (United Kingdom) and Ctr. for Disruptive Photonic Technologies, Nanyang Technological Univ. (Singapore) [10671-69]

Metasurface-enhanced AFM cantilevers, Fabrizio Silvestri, Bart G. Speet, TNO (Netherlands); Giampiero Gerini, TNO (Netherlands) and Technische Univ. Eindhoven (Netherlands); Samaneh Mashaghi Tabari, Hamed Sadeghian Marnani, TNO (Netherlands) [10671-70]

CONFERENCE 10672

Sunday–Thursday 22–26 April 2018 • Proceedings of SPIE Vol. 10672

Nanophotonics

Conference Chairs: **David L. Andrews**, Univ. of East Anglia (United Kingdom); **Angus J. Bain**, Univ. College London (United Kingdom); **Jean-Michel Nunzi**, Queen's Univ. (Canada); **Andreas Ostendorf**, Ruhr-Univ. Bochum (Germany)

Programme Committee: **Mario Berberan-Santos**, Univ. de Lisboa (Portugal); **Renato Bozio**, Univ. degli Studi di Padova (Italy); **Mark L. Brongersma**, Geballe Lab. for Advanced Materials (GLAM) (United States); **Céline Fiorini-Debuisschert**, Commissariat à l'Énergie Atomique (France); **Vincent Ginis**, Vrije Univ. Brussel (Belgium); **Theodore Goodson III**, Univ. of Michigan (United States); **Rachel Grange**, ETH Zurich (Switzerland); **Yasushi Inouye**, Osaka Univ. (Japan); **Martti Kauranen**, Tampere Univ. of Technology (Finland); **Arseniy I. Kuznetsov**, A*STAR - Data Storage Institute (Singapore); **Francois Lagugné-Labarthe**, The Univ. of Western Ontario (Canada); **Christoph Lienau**, Carl von Ossietzky Univ. Oldenburg (Germany); **Robert Lipson**, Univ. of Victoria (Canada); **Wolfgang Löffler**, Leiden Univ. (Netherlands); **Raúl J. Martín-Palma**, Univ. Autónoma de Madrid (Spain); **Jesper Mørk**, Technical Univ. of Denmark (Denmark); **Manijeh Razeghi**, Northwestern Univ. (United States); **Anatoly V. Zayats**, King's College London (United Kingdom)

SUNDAY 22 APRIL

OPENING REMARKS 13:05 TO 13:10

SESSION 1 SUN 13:10 TO 15:00

Surface Waves

Session Chair: **Vincent Ginis**, Vrije Univ. Brussel (Belgium)

Ultralow waves on the nanoscale (*Invited Paper*), Ortwin Hess, Imperial College London (United Kingdom) [10672-1]

Hyperbolic and dirac plasmons in topological insulators, Nahid Talebi, Max-Planck-Institut für Festkörperforschung (Germany); Mario Hentschel, Harald Giessen, Univ. Stuttgart (Germany); Robin Lingstaedt, Max-Planck-Institut für Festkörperforschung (Germany) [10672-2]

Boosting nonlinearity of metasurfaces through decrease in number of particles, Robert Czaplicki, Antti Kiviniemi, Mikko J. Huttunen, Xiaorun Zang, Timo Stolt, Tampere Univ. of Technology (Finland); Ismo Vartiainen, Janne Laukkanen, Markku Kuittinen, Univ. of Eastern Finland (Finland); Martti Kauranen, Tampere Univ. of Technology (Finland) [10672-3]

Quantum spill out in few-nanometer metal gaps: effect on gap plasmons and reflectance from groove arrays in noble metals, Enok Johannes Haahr Skjølstrup, Thomas M. Sondergaard, Thomas G. Pedersen, Aalborg Univ. (Denmark) [10672-4]

Nonlinear dynamics of counter-propagating beams in epsilon-near-zero films, Maria A. Vincenti, Univ. degli Studi di Brescia (Italy); Domenico de Ceglia, The AEGIS Technologies Group, Inc. (United States); Michael Scalora, U.S. Army Research, Development and Engineering Command (United States); Costantino De Angelis, Univ. degli Studi di Brescia (Italy) [10672-5]

SESSION 2 SUN 15:30 TO 17:50

Sensing

Session Chair: **Jean-Luc Pelouard**, Paris-Sud Univ. (France)

Bottom-up approaches to ultrabright, photostable and nontoxic luminescent nanoparticles for bioimaging (*Invited Paper*), Mireille Blanchard-Desce, Jonathan Daniel, Paolo Pagano, Guillaume Clermont, Michel Vaultier, Jean-Baptiste Verlhac, Cristiano Mastrodonato, Univ. Bordeaux 1 (France) [10672-6]

Membrane-encapsulated single nanoparticles, plasmon-based determination of macromolecular interactions and structural changes (*Invited Paper*), Paul Oshea, The Univ. of British Columbia (Canada); Joanna Richens, The Univ. of Nottingham (United Kingdom); Jonathan Bramble, The Univ. of British Columbia (Canada) [10672-7]

Octupolar nanostructures for LSPR detection of dsDNA, Massimo Rippa, Istituto di Scienze applicata e Sistemi Intelligenti (Italy); Remigiusz Kacper Trojanowicz, Advanced Materials Engineering and Modelling Group, Wrocław Univ. of Science and Technology (Poland); Riccardo Castagna, Istituto di Scienze applicata e Sistemi Intelligenti (Italy); Joseph Zyss, Lab. de Photonique Quantique et Moléculaire, Ecole Normale Supérieure de Cachan (France); Katarzyna Matczyszyn, Advanced Materials Engineering and Modelling Group, Wrocław Univ. of Science and Technology (Poland); Lucia Petti, Istituto di Scienze applicata e Sistemi Intelligenti (Italy) [10672-8]

Sensing properties of grating-assisted novel surface plasmon resonance sensor, Manish Kumar, Sanjeev Kumar Raghuwanshi, Indian Institute of Technology (Indian School of Mines), Dhanbad (India) [10672-9]

Photocurrent generated in graphene/LGO heterojunctions under cw- and pulsed laser irradiation, Ivan I. Bobrinetskiy, Aleksei Emelianov, National Research Univ. of Electronic Technology (Russian Federation) [10672-10]

Ultrathin-film sensing with phonon polaritons resonators, Rodrigo Berte, Imperial College London (United Kingdom); Christopher R. Gubbin, Univ. of Southampton (United Kingdom); Virginia D. Wheeler, Alexander J. Giles, U.S. Naval Research Lab. (United States); Vincenzo Giannini, Imperial College London (United Kingdom) and Instituto de Estructura de la Materia, Consejo Superior de Investigaciones Científicas (Spain); Stefan A. Maier, Imperial College London (United Kingdom) and Ludwig-Maximilians-Univ. München (Germany); Simone De Liberato, School of Physics and Astronomy (United Kingdom); Joshua D. Caldwell, U.S. Naval Research Lab. (United States) and Vanderbilt Univ. (United States) [10672-11]

MONDAY 23 APRIL

HOT TOPICS SESSION I 9:00 TO 11:00

From Einstein doubts to quantum bits: a second quantum revolution

Alain Aspect, Lab. Charles Fabry, Institut d'Optique, France

Pico-Photonics: watching and sensing single molecules by confining light to the atom scale

Jeremy J. Baumberg, NanoPhotonics Ctr., Univ. of Cambridge, United Kingdom

For additional details see page 6.

SESSION 3 MON 11:30 TO 12:40

Structured Light

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

Spin to orbital angular momentum conversion in visible light with dielectric metasurfaces (*Invited Paper*), Antonio Ambrosio, Harvard Univ. (United States); Noah Rubin, Harvard Univ. (United States); Robert C. Devlin, Balthassar Muller, Harvard Univ. (United States) [10672-12]

Vector beams for third-harmonic generation in subwavelength silicon resonators, Elizaveta V. Melik-Gaykazyan, M.V. Lomonosov Moscow State Univ. (Russian Federation); Sergey S. Kruk, Maria del Rocio Camacho-Morales, Lei Xu, Mohsen Rahmani, Khosro Zangeneh Kamali, Aristeidis Lamprianidis, Andrey E. Miroshnichenko, The Australian National Univ. (Australia); Andrey A. Fedyanin, M.V. Lomonosov Moscow State Univ. (Russian Federation); Dragomir N. Neshev, Yuri S. Kivshar, The Australian National Univ. (Australia) [10672-13]

Strong light confinement of tunable resonances in low symmetric quasicrystal through orientational variations, Döne Yilmaz, Mediha Tutgun, Hamza Kurt, TOBB ETÜ (Turkey) [10672-14]

Lunch Break Mon 12:40 to 13:50

SESSION 4 MON 13:50 TO 15:30

Plasmonics and Surface Nanostructures

Session Chair: **Wolfgang Loeffler**, Leiden Univ. (Netherlands)

High-Q plasmonics in hybrid resonators (*Invited Paper*), Femius Koenderink, FOM Institute for Atomic and Molecular Physics (Netherlands) [10672-15]

Advanced hybrid nanoplasmonics based on local photopolymerization (*Invited Paper*), Renaud J. Bachelot, Univ. de Technologie Troyes (France) [10672-16]

Nanoscale thermometry and optically pumped phonons in plasmonic nanocavities, Christophe Galland, Aqeel Ahmed, Philippe Roelli, Tianqi Zhu, Santiago Tarrago, Ecole Polytechnique Fédérale de Lausanne (Switzerland) [10672-17]

Rigorous and efficient 2D vector nonlinear solver for highly nonlinear waveguides: correct assessment of nonlinear parameter gamma and figure of merit, Gilles Renversez, Mahmoud M. R. Elsayy, Institut Fresnel (France) [10672-18]

SESSION 5. MON 16:00 TO 17:50

Microscopy and Imaging

Session Chair: **Andreas Ostendorf**, Ruhr-Univ. Bochum (Germany)

A dynamic plasmonic microscope (*Invited Paper*), Xiao-Cong Yuan, Shenzhen Univ. (China) [10672-19]

Optofluidic near-field optical microscopy: probing the evanescent field of photonic nanocavities using trapped microbeads, Christophe Pin, Claude Renaut, Univ. de Bourgogne Franche-Comté (France); Emmanuel Picard, CEA Grenoble (France); David Peyrade, Ctr. National de la Recherche Scientifique (France); Emmanuel Hadji, CEA Grenoble (France); Frédérique de Fornel, Benoît Cluzel, Lab. Interdisciplinaire Carnot de Bourgogne (France) [10672-20]

Near-field imaging of octave-spanning supercontinua generation in silicon nitride waveguides, Aurélien Coillet, Lab. Interdisciplinaire Carnot de Bourgogne (France); Maiwen Meisterhans, Lab. Interdisciplinaire Carnot de Bourgogne (France); Jean-Baptiste Jager, CEA-LETI (France); Marlène Petit, Lab. Interdisciplinaire Carnot de Bourgogne (France); Jean-Baptiste Dory, Pierre Noé, CEA-LETI (France) and Univ. Grenoble Alpes (France); Philippe Grelu, Benoît Cluzel, Lab. Interdisciplinaire Carnot de Bourgogne (France) [10672-21]

Probing the crystallographic orientation of AlGaAs nanodisks using second-harmonic generation microscopy with cylindrical vector beams, Maria del Rocio Camacho Morales, Nonlinear Physics Ctr., The Australian National Univ. (Australia); Godofredo Bautista Jr., Xiaorun Zang, Tampere Univ. of Technology (Finland); Lei Xu, Nonlinear Physics Ctr., The Australian National Univ. (Australia); Léo Turquet, Tampere Univ. of Technology (Finland); Mohsen Rahmani, Dragomir N. Neshev, Nonlinear Physics Ctr., The Australian National Univ. (Australia); Martti Kauranen, Tampere Univ. of Technology (Finland) [10672-22]

Real-time imaging of polaritonic transport in organic microcavities, Tal Schwartz, Tel Aviv Univ. (Israel) [10672-23]

TUESDAY 24 APRIL

SESSION 6. TUE 8:50 TO 10:30

Subwavelength Optics and Manipulation

Session Chair: **Anatoly Zayats**, King's College London (United Kingdom)

Transformation optics at the subwavelength scale (*Invited Paper*), Yu Luo, Nanyang Technological Univ. (Singapore) [10672-24]

Determination of rotation in the pitch degree of freedom for a spherical birefringent particle, Basudev Roy, Avin Ramaiya, Erik Schäffer, Eberhard Karls Univ. Tübingen (Germany) [10672-26]

Particle trapping and conveying using an optical Archimedes' screw, Barak Hadad, Sahar Froim, Harel Nagar, Tamir Admon, Yaniv Eliezer, Yael Roichman, Alon Bahabad, Tel Aviv Univ. (Israel) [10672-27]

Multidirectional optical sorting of Mie resonant dielectric nanoparticles, Evgeny V. Lyubin, M.V. Lomonosov Moscow State Univ. (Russian Federation); Daniil A. Shilkin, M.V. Lomonosov Moscow State Univ. (Russian Federation) and Immanuel Kant Baltic Federal Univ. (Russian Federation); Maxim R Shcherbakov, M.V. Lomonosov Moscow State Univ. (Russian Federation) and Cornell Univ. (United States); Mikhail Lapine, Univ. of Technology, Sydney (Australia); Andrey A. Fedyanin, M.V. Lomonosov Moscow State Univ. (Russian Federation) [10672-28]

SESSION 7. TUE 10:50 TO 12:50

Frequency Combs and Localised Interactions

Session Chair: **Jean-Michel Nunzi**, Queen's Univ. (Canada)

Integrated frequency combs for on-chip generation of high-dimensional entangled photon states and their coherent control (*Invited Paper*), Michael Kues, Christian Reimer, Institut National de la Recherche Scientifique (Canada); Stefania Sciarra, Institut National de la Recherche Scientifique (Canada) and Univ. degli Studi di Palermo (Italy); Piotr Roztock, Luis Romero Cortés, Institut National de la Recherche Scientifique (Canada); Benjamin Wetzel, Institut National de la Recherche Scientifique (Canada) and Univ. of Sussex (United Kingdom); YanBing Zhang, Institut National de la Recherche Scientifique (Canada); Alfonso Carmelo Cino, Univ. degli Studi di Palermo (Italy); Sai T. Chu, City Univ. of Hong Kong (China); Brent E. Little, Xi'an Institute of Optics and Precision Mechanics, CAS (China); David J. Moss, Swinburne Univ. of Technology (Australia); Lucia Caspani, Univ. of Strathclyde (United Kingdom); José Azaña, Roberto Morandotti, Institut National de la Recherche Scientifique (Canada) [10672-29]

Comb of high-Q resonances in a compact photonic cavity (*Invited Paper*), Alfredo De Rossi, Sylvain Combrié, Gaëlle Lehoucq, Grégory Moille, Thales Research & Technology (France) [10672-30]

Towards an efficient spin-photon interface with nitrogen vacancy centres in diamond, Laiyi Weng, Sam Johnson, Univ. of Oxford (United Kingdom); Hangyu Liu, Ross Leyman, Univ. of Strathclyde (United Kingdom); Yu-Chen Chen, Shazeaa Ishmael, Univ. of Oxford (United Kingdom); Paul Hill, Univ. of Strathclyde (United Kingdom); Ben Green, Gavin Morley, The Univ. of Warwick (United Kingdom); Aurelien A. P. Trichet, Univ. of Oxford (United Kingdom); Erdan Gu, Univ. of Strathclyde (United Kingdom); Mark E. Newton, The Univ. of Warwick (United Kingdom); Jason M. Smith, Univ. of Oxford (United Kingdom) [10672-31]

Single-photon and polarization-entangled photon emission from InAs quantum dots in the telecom C-Band, Fabian Olbrich, Jonatan Höschle, Matthias Paul, Jan Kettler, Simone L. Portalupi, Michael Jetter, Peter Michler, Univ. Stuttgart (Germany) [10672-32]

Near-field mapping of optical modes in all-dielectric nanostructures, Aleksandr Y. Frolov, M.V. Lomonosov Moscow State Univ. (Russian Federation); Niels Verellen, IMEC (Belgium); Jiaqi Li, IMEC (Belgium) and Institute for Nanoscale Physics and Chemistry, KU Leuven (Belgium); Xuezhong Zheng, KU Leuven (Belgium); Hanna Paddubrouskaya, Institute for Nanoscale Physics and Chemistry, KU Leuven (Belgium); Denitza Denkova, Ctr. for Nanoscale BioPhotonics, Macquarie Univ. (Australia); Maxim R. Shcherbakov, M.V. Lomonosov Moscow State Univ. (Russian Federation); Guy A. E. Vandenbosch, KU Leuven (Belgium); Vladimir I. Panov, M.V. Lomonosov Moscow State Univ. (Russian Federation); Pol Van Dorpe, IMEC (Belgium) and Institute for Nanoscale Physics and Chemistry, KU Leuven (Belgium); Andrey A. Fedyanin, M.V. Lomonosov Moscow State Univ. (Russian Federation); Victor V. Moshchalkov, Institute for Nanoscale Physics and Chemistry, KU Leuven (Belgium) [10672-33]

Lunch/Exhibition Break Tue 13:00 to 14:10

SESSION 8. TUE 14:00 TO 16:10

Molecular Photonics

Session Chair: **Jean-Michel Nunzi**, Queen's Univ. (Canada)

Control of photophysical properties of organics by metamaterials (*Invited Paper*), Jeong Weon Wu, Ewha Womans Univ. (Korea, Republic of) [10672-34]

Quadrupole and hexadecapole transition dipole moment alignment in fluorescent protein FRET, Angus J. Bain, Nicholas Robinson, Thomas Masters, Thomas Blacker, Richard J. Marsh, Daven A. Armoogum, Univ. College London (United Kingdom); Banafshe Larijani, Unidad de Biofísica (Spain) [10672-35]

Light-mediated tuning of resonance energy transfer in quantum dot-bacteriorhodopsin nano-bio hybrid material, Victor Krivenkov, Pavel S. Samokhvalov, Alexander A. Chistyakov, National Research Nuclear Univ. MEPhI (Russian Federation); Igor Nabiev, National Research Nuclear Univ. MEPhI (Russian Federation) and Univ. de Reims Champagne-Ardenne (France) [10672-36]

Chiroptical interactions between twisted light and chiral media, Kayn A. Forbes, David L. Andrews, Univ. of East Anglia (United Kingdom) [10672-37]

Mode-mismatched thermal lens experiment for fluorescence quantum yield measurement in silver nanoparticles-rhodamine b systems, Marco A. Ferreira, Univ. Central de Venezuela (Venezuela) [10672-38]

Optical properties of pseudoisocyanine molecular clusters embedded in a nanoporous alumina, Anton A. Starovoytov, Olga I. Lepeshova, ITMO Univ. (Russian Federation) [10672-39]

HOT TOPICS SESSION II. 16:30 TO 18:05

Coherent combination of fiber amplified ultrafast laser pulses, Jens Limpert, Institute of Applied Physics, Friedrich Schiller Univ. Jena, Germany

2D materials and their heterostructures: fundamentals, applications and prototypes, Frank Koppens, ICFO-The Institute of Photonic Sciences, Spain

For additional details, please see page 7

CONFERENCE 10672

TUESDAY POSTER SESSION TUE 18:00 TO 19:30

Posters-Tuesday

Conference attendees are invited to attend the Photonics Europe poster session on Tuesday 18.00 to 19.30. Posters will be on display after 10.00 Tuesday morning in the Hall Rhin. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster authors, view poster presentation guidelines and set-up instructions at <http://spie.org/x34963.xml> and on page 96.

Quantum dots extrinsic semiconductor nanoparticle, transparent thin film epitaxial growth induced by using laser beam holographic patterning and surface characterizing monitoring using rheed, Mohammad M. Anwar, Forever Living Products (Bangladesh). [10672-73]

Nanophosphors with persistent luminescence: design and uses for bioimaging, Cyrille Richard, Univ. Paris Descartes (France). [10672-74]

Theoretical investigation of electro-absorption in strain compensated Tin doped Group IV alloy-based quantum well, Prakash Pareek, K L Univ. (India); Lokendra Singh, DIT Univ. (India). [10672-75]

Spasers monolayer based on silver nanoparticles, Aisylu N. Kamaliev, Nikita A. Toropov, Tigran A. Vartanyan, ITMO Univ. (Russian Federation). [10672-76]

An experimental near-field study of subwavelength nanoaperture arrays in freestanding gold films, Mike Prämassing, Rheinische Friedrich-Wilhelms-Univ. Bonn (Germany); Stephan Irsen, Ctr. of Advanced European Studies and Research (Germany); Stefan Linden, Rheinische Friedrich-Wilhelms-Univ. Bonn (Germany) [10672-77]

Stochastic testing for dynamical hysteresis in nanoscale devices, Gian Piero Puccioni, Istituto dei Sistemi Complessi, Consiglio Nazionale delle Ricerche (Italy); Gian Luca Lippi, Univ. Côte d'Azur (France) [10672-78]

On-chip coherent control of the absorption and scattering of an isolated plasmonic nanoantenna, Alba Espinosa-Soria, Univ. Politècnica de Valencia (Spain); Amadeu Griol, Alejandro Martínez, Univ. Politècnica de Valencia (Spain) [10672-79]

Efficiency improvement of upconversion process of plasmonic-enhanced ceria nanoparticles doped with erbium, Ali Hajjiah, Kuwait Univ. (Kuwait); Nader Shehata, Ishac Kandas, Sara Elrefai, Alexandria Univ. (Egypt) [10672-80]

Triply resonant coupled nanobeam cavities for the enhancement of third-order nonlinear effect in silicon photonics, Xin Cui, Zhejiang Univ. (China) and Ctr. de Nanosciences et de Nanotechnologies, Ctr. National de la Recherche Scientifique (France) and Univ. Paris-Sud (France); Weiwei Zhang, Samuel Serna, Carlos Alonso-Ramos, Delphine Marris-Morini, Laurent Vivien, Ctr. de Nanosciences et de Nanotechnologies, Ctr. National de la Recherche Scientifique (France) and Univ. Paris-Sud (France) and Univ. Paris-Saclay (France); Jian-Jun He, Zhejiang Univ. (China); Eric Cassan, Ctr. de Nanosciences et de Nanotechnologies, Ctr. National de la Recherche Scientifique (France) and Univ. Paris-Sud (France) and Univ. Paris-Saclay (France) [10672-81]

Simulation of light scattering in clusters of nonspherical nanoparticles: the T-matrix approach, Dominik Theobald, Amos Egel, Guillaume Gomard, Uli Lemmer, Karlsruher Institut für Technologie (Germany) [10672-82]

Plasmonic heating-assisted pyroelectric harvesting of light fluctuations, Mina Shiran Chaharsoughi, Daniel Tordera, Andrea Grimaldi, Isak Engquist Engquist, Magnus Berggren, Simone Fabiano, Magnus Jonsson, Linköping Univ. (Sweden) [10672-83]

Limits of validity of rate equations predictions for nanolasers, Gian Luca Lippi, Univ. Côte d'Azur (France); Jesper Mørk, Technical Univ. of Denmark (Denmark); Gian Piero Puccioni, Istituto dei Sistemi Complessi, Consiglio Nazionale delle Ricerche (Italy) [10672-84]

Effect of guided and photonic crystal modes in nanowire arrays, Vilgaile Dagyte, Xulu Zeng, Gaute Otnes, Magnus T. Borgström, Nicklas Anttu, Lund Univ. (Sweden). [10672-85]

Probing stability of the topologically protected edge mode in a plasmonic waveguide array, Zlata Cherpakova, Physikalisches Institut (Germany); Felix Bleckmann, Stefan Linden, Andrea Alberti, Rheinische Friedrich-Wilhelms-Univ. Bonn (Germany) [10672-86]

Graphene/hBN-based ultracompact plasmonic nanomodulator on silicon photonics, Binbin Wang, Sylvain Blaize, Univ. de Technologie Troyes (France); Jinbong Seok, Sera Kim, Heejun Yang, Sungkyunkwan Univ. (Korea, Republic of); Rafael Salas-Montiel, Univ. de Technologie Troyes (France) [10672-87]

Experimental investigation of the losses in silicon slot photonic crystal waveguides, Eric Cassan, Samuel Serna, Xavier Le Roux, Laurent Vivien, Ctr. de Nanosciences et de Nanotechnologies (France) [10672-88]

Optimal design of Yagi-Uda nanoantennas based on elliptical shaped elements, Salah S.A. Obayya, Zewail City of Science and Technology (Egypt); Fatma Helmy, Helwan Univ. (Egypt); Mohamed Hussein, Mohamed O. Hameed, Zewail City of Science and Technology (Egypt); Ahmed Shaker, M. El-Adawy, Electronics (Egypt) [10672-89]

Detection of DNA hybridization by hybrid alternative plasmonic biosensor, Salah S.A. Obayya, Mohamed Farhat O. Hameed, Zewail City of Science and Technology (Egypt); A. Samy Saadeldin, Cairo Univ. (Egypt) and Akhbar El Yom Academy (Egypt); Essam M. A. Elkaramany, Cairo Univ. (Egypt) [10672-90]

Highly efficient multiplexer demultiplexer based on liquid crystal channels, Salah S.A. Obayya, Zewail City of Science and Technology (Egypt); B.M. Younis, Mohamed Farhat O. Hameed, Zewail City of Science and Technology (Egypt) and Mansoura Univ. (Egypt); A. M. Heikal, Ctr. for Photonics and Smart Materials (Egypt) and Mansoura Univ. (Egypt) [10672-91]

Formation of NbN ultrathin film for superconducting nanowire single-photon detectors (SNSPD) using Nd:YAG laser irradiation, Sang Min Jung, Jin Hwan Kim, Chul Jin Park, Moo Whan Shin, Yonsei Univ. (Korea, Republic of) [10672-92]

The influence of carrier mobility and electrical conductivity of thermoelectric device for organic/PbTe matrix, Chunyu Chen, Feng Chai Univ. (Taiwan); Shih Shou Lo, Feng Chia Univ. (Taiwan) [10672-93]

Emission outcoupling from microdisk laser with Si spherical nanoantenna, Natalia V. Kryzhanovskaya, Yuliya Polubavkina, Eduard Moiseev, St. Petersburg Academic Univ. (Russian Federation); Valentina Zhurikhina, Sergey Scherbak, Andrey Lipovskii, Saint-Petersburg State Polytechnical Univ. (Russian Federation); Marina Kulagina, Ioffe Institute (Russian Federation); Ivan Mukhin, Filipp Komissarenko, Andrey Bogdanov, ITMO Univ. (Russian Federation); Yuri Zadiranov, Ioffe Institute (Russian Federation); Mikhail Maximov, St. Petersburg Academic Univ. (Russian Federation); Alexander Krasnov, The Univ. of Texas at Austin (United States); Alexey Zhukov, St. Petersburg Academic Univ. (Russian Federation). [10672-94]

Directional emission from dielectric antennas: a parameter study, Till Leuteritz, Stefan Linden, Rheinische Friedrich-Wilhelms-Univ. Bonn (Germany) [10672-95]

Heterogeneous BaTiO₃-Au nanodimers for increased second-harmonic signals, Claude Renaut, Nicholas Hendricks, Flavia Timpu, ETH Zurich (Switzerland); Mihail Petrov, ITMO Univ. (Russian Federation); Songbo Ni, ETH Zurich (Switzerland); Heiko Wolf, IBM Research - Zürich (Switzerland); Lucio Isa, ETH Zurich (Switzerland); Yuri S. Kivshar, The Australian National Univ. (Australia); Rachel Grange, ETH Zurich (Switzerland). [10672-96]

Demonstration of high speed optical transmission at 2 µm in various material based waveguides, Manon Lamy, Christophe Finot, Julien Fatome, Juan Arocas, Jean-Claude Weeber, Lab. Interdisciplinaire Carnot de Bourgogne (France); Bart Kuyken, Günther Roelkens, Univ. Gent (Belgium); Mickael Brun, Pierre Labeye, CEA-LETI (France); Sergio Nicoletti, CEA-LETI (France) and MINATEC (France); Adonis Bogris, Dimitris Syvridis, National and Kapodistrian Univ. of Athens (Greece); Mohamed A. Ettabib, David J. Richardson, Periklis Petropoulos, Optoelectronics Research Ctr., Univ. of Southampton (United Kingdom); Kamal Hammani, Lab. Interdisciplinaire Carnot de Bourgogne, Univ. de Bourgogne Franche-Comté (France) [10672-97]

Quantitative polarimetric studies of plasmonic quasicrystals, Shubham Chandel, Ankit Kumar Singh, Aneeth K. Arun, Indian Institute of Science Education and Research Kolkata (India); Ajith P. Ravishanker, Achanta Venu Gopal, Tata Institute of Fundamental Research (India); Nirmalya Ghosh, Indian Institute of Science Education and Research Kolkata (India). [10672-98]

Silicon nanowires with an alternative plasmonic material for highly efficient light trapping, Salah S.A. Obayya, Mostafa AbdAllah Hassan, Zewail City of Science and Technology (Egypt); Mohamed Farhat O. O. Hameed, Zewail City of Science and Technology (Egypt) and Mansoura Univ. (Egypt); Mohamed Hussein, Zewail City of Science and Technology (Egypt) [10672-99]

Delocalized hot carrier generation by propagating surface plasmon polaritons, Romain Hernandez, Olivier Demichel, Jean-Claude Weeber, Alexandre Bouhelier, Benoit Cluzel, Lab. Interdisciplinaire Carnot de Bourgogne (France) [10672-100]

Raman spectroscopy study of the optical properties of albumin with dye aqueous solution droplet in present silver and gold nanoparticles, Elizaveta I. Konstantinova, Andrey Zyubin, Vasilii A. Slezhkin, Ilya I. G. Samusev, Valery V. Bryukhanov, Immanuel Kant Baltic Federal Univ. (Russian Federation). [10672-101]

Optimization of multicore photonic crystal fiber biosensor by particle swarm algorithm, Salah S.A. Obayya, Zewail City of Science and Technology (Egypt); A. M. Heikal, Mohamed Farhat O. Hameed, Zewail City of Science and Technology (Egypt) and Mansoura Univ. (Egypt); Doaa Mohamed, Eman Mohamed, Mansoura Univ. (Egypt) [10672-102]

Monolithically integrated InGaAs microdisk lasers on silicon using template-assisted selective epitaxy, Svenja Mauthe, Benedikt Mayer, Marilyne Sousa, Gustavo Villares, Philipp Staudinger, Heinz Schmid, Kirsten Moselund, IBM Research - Zürich (Switzerland). [10672-103]

Transition dynamics of single- and double Josephson junctions formed by spatially coupled soliton and surface plasmons, Güneş Aydınoğlu, Vestel Elektronik Sanayi Ve Ticaret A.Ş. (Turkey); Kaan Guven, Koç Univ. (Turkey) [10672-104]

Broad-band light emission in monolithic InGaN tunnel-junction light-emitting diodes, Yen-Kuang Kuo, Jih-Yuan Chang, National Changhua Univ. of Education (Taiwan); Ya-Hsuan Shih, National Cheng Kung Univ. (Taiwan). [10672-105]

Integrated optical vortex generator with improved emission efficiency, Sangin Kim, Thang Q. Tran, Ajou Univ. (Korea, Republic of) [10672-106]

Enhancing transverse spin and transverse spin momentum in micro- and nano-optical systems, Sudipta Saha, Ankit Kumar Singh, Indian Institute of Science Education and Research Kolkata (India); Subhasish Dutta Gupta, Univ. of Hyderabad (India); Nirmalya Ghosh, Indian Institute of Science Education and Research Kolkata (India) [10672-107]

Rapid realization of desired gold nanostructures by direct laser writing method at 532 nm: application to data storage and color nanoprinting, Fei Mao, Ecole Normale Supérieure de Cachan (France); Andrew Davis, Ecole Normale Supérieure Paris-Saclay (France); Cong Tong Quang, Vietnam Academy of Science and Technology (Viet Nam); Mai Hoang Luong, Univ. of Georgia (United States); Chi-Thanh Nguyen, Isabelle Ledoux-Rak, Ngoc Diep Lai, Ecole Normale Supérieure de Cachan (France) [10672-108]

Effect of plasmonic interaction between rhodamine 6G in polyvinyl alcohol film and rough silver surface: estimation of absorption energy to plasmon excitation transformation efficiency for fluorescence enhancement, Ilya I. G. Samusev, Anna V. Tcibulnikova, Andrey Zyubin, Elizaveta I. Konstantinova, Immanuel Kant Baltic Federal Univ. (Russian Federation); Vasily A. Slezhkin, Kaliningrad State Technical Univ. (Russian Federation); Valery V. Bryukhanov, Immanuel Kant Baltic Federal Univ. (Russian Federation). [10672-109]

Plasmon enhancement of porphyrin molecules fluorescence in the presence of ytterbium nanoparticles, Anna V. Tcibulnikova, Valery V. Bryukhanov, Rodion R. Y. Borkunov, Vasily A. Slezhkin, Ilya I. G. Samusev, Immanuel Kant Baltic Federal Univ. (Russian Federation) [10672-110]

Nanogap optical antennas: Impact of the tunnel effect on the effective index, Ludivine Emeric, Fayçal Bai, ONERA (France) and Ctr. de Nanosciences et de Nanotechnologies (France) and Univ. Paris-Saclay (France); Alan Durnez, Nathalie Bardou, Christophe Dupuis, Ctr. de Nanosciences et de Nanotechnologies (France) and Univ. Paris-Saclay (France); Fabrice Pardo, Ctr. de Nanosciences et de Nanotechnologies, Ctr. National de la Recherche Scientifique (France) and Univ. Paris-Saclay (France); Riad Haïdar, ONERA (France); Claire Deeb, C2N, CNRS, Univ. Paris-Saclay (France); Jean-Luc Pelouard, Ctr. de Nanosciences et de Nanotechnologies (France) and Univ. Paris-Saclay (France) [10672-111]

Voltage-controlled anisotropy of chemically synthesized silver nanorods ensembles intended for near IR applications, Yuliya Razumova, Nikita A. Toropov, Tigran A. Vartanyan, ITMO Univ. (Russian Federation). [10672-112]

Backward propagation of surface slow light in photonic crystals through morphological diversity, Aydan Yeltik, Döne Yilmaz, Döne Yilmaz, Hamza Kurt, TOBB ETÜ (Turkey) [10672-113]

Coupling of a single quantum dot to a polymer-based photonic structure, Thi Huong Au, Lab. de Photonique Quantique et Moléculaire, Ecole normale supérieure Paris-Saclay (France); Stéphanie Buil, Groupe d'Etude de la Matière Condensée, Univ. de Versailles Saint-Quentin en Yvelines (France); Xavier Quélin, Groupe d'Etude de la Matière Condensée, Univ. de Versailles Saint-Quentin-en Yvelines (France); Jean-Pierre Hermier, Groupe d'étude de la matière condensée, Univ. de Versailles Saint-Quentin-en Yvelines (France); Ngoc Diep Lai, Lab. de Photonique Quantique et Moléculaire, Ecole Normale Supérieure de Cachan (France) [10672-114]

Effect of the surface ligand length on the optical and electrical properties of PbS QD solids, Mariya Zvaigzne, National Research Nuclear Univ. MEPhI (Russian Federation); Alexey Alexandrov, A.N. Frumkin Institute of Physical Chemistry and Electrochemistry of the Russian Academy of Sciences (Russian Federation); Pavel S. Samokhvalov, National Research Nuclear Univ. MEPhI (Russian Federation); Alexey Tameev, A.N. Frumkin Institute of Physical Chemistry and Electrochemistry of the Russian Academy of Sciences (Russian Federation); Alexander A. Chistyakov, National Research Nuclear Univ. MEPhI (Russian Federation). [10672-115]

Ultrafast surface plasmon-driven beaming of secondary electrons from metallic films, Shawn R. Greig, Abdulhakem Y. Elezzabi, Univ. of Alberta (Canada) [10672-116]

Nanoscale AlGaAs disks for nonlinear frequency upconversion and heralded photon emission, Giuseppe Marino, Lab Matériaux et Phénomènes Quantiques, Univ. Paris Diderot - Paris 7 (France) and Nonlinear Physics Ctr., The Australian National Univ. (Australia) and King's College London (United Kingdom); Alexander S. Solntsev, Nonlinear Physics Ctr., The Australian National Univ. (Australia) and Univ. of Technology, Sydney (Australia); Lei Xu, Nonlinear Physics Ctr., The Australian National Univ. (Australia); Valerio F. Gili, Lab. Matériaux et Phénomènes Quantiques, Univ. Paris Diderot - Paris 7 (France); Luca Carletti, Univ. degli Studi di Brescia (Italy); Alexander N. Poddubny, Nonlinear Physics Ctr., The Australian National Univ. (Australia) and ITMO Univ. (Russian Federation) and Ioffe Physical-Technical Institute (Russian Federation); Mohsen Rahmani, Daria Smirnova, Haitao Chen, Nonlinear Physics Ctr., The Australian National Univ. (Australia); Guoquan Zhang, MOE Key Lab. of Weak Light Nonlinear Photonics, Nankai Univ. (China); Anatoly V. Zayats, King's College London (United Kingdom); Costantino De Angelis, Univ. degli Studi di Brescia (Italy); Giuseppe Leo, Lab Matériaux et Phénomènes Quantiques, Univ. Paris Diderot - Paris 7 (France); Yuri S. Kivshar, Andrey A. Sukhorukov, Dragomir N. Neshev, Nonlinear Physics Ctr., The Australian National Univ. (Australia) [10672-117]

Engineering electron emission order for surface plasmon-based electron sources, Shawn R. Greig, Univ. of Alberta (Canada); Amin Morteza-Najarian, Richard L. McCreery, Univ. of Alberta (Canada) and National Institute for Nanotechnology (Canada); Abdulhakem Y. Elezzabi, Univ. of Alberta (Canada) [10672-118]

Exotic ultrafast optical nonlinearity in reduced graphene oxide via comprehensive dual beam approach, Sayantan Bhattacharya, Shivam Raval, Arup Gorai, Manobina Karmakar, Arinjoy De, Anupam Midya, Samit K. Ray, Prasanta K. Datta, Indian Institute of Technology Kharagpur (India). [10672-119]

A simple three-layer dielectric structure for spatiotemporal differentiation of optical signals, Nikita V. Golovastikov, Samara Univ. (Russian Federation) and Image Processing Systems Institute, Russian Academy of Sciences (Russian Federation); Dmitry A. Bykov, Evgeni A. Bezus, Leonid L. Doskolovich, Image Processing Systems Institute, Russian Academy of Sciences (Russian Federation) and Samara Univ. (Russian Federation). [10672-120]

Polarization studies of fano-interference in waveguided plasmonic crystals, Ankit Kumar Singh, Shubham Chandel, Subir K. Ray, Abhishek Kumar, Angad Gupta, Arpita Mandal, Partha Mitra, Nirmalya Ghosh, Indian Institute of Science Education and Research Kolkata (India) [10672-121]

Exceptional points due to cross-polarization modes coupling in photonic crystal slabs, Dmitry A. Bykov, Leonid L. Doskolovich, Image Processing Systems Institute, Russian Academy of Sciences (Russian Federation) and Samara Univ. (Russian Federation) [10672-122]

Inducing asymmetrical THz absorption properties in RGO using aligned Fe₃O₄ nanoparticles, Nikita Porwal, Shivam Raval, Tridib Sinha, Indian Institute of Technology Kharagpur (India); Samit K. Ray, Indian Institute of Technology Kharagpur (India) and S.N. Bose National Ctr. for Basic Sciences (India); Prasanta Kumar Datta, Indian Institute of Technology Kharagpur (India). [10672-123]

Studies on coupling between guided modes and tamm states in one-dimensional photonic crystals, Sudha Maria Lis S., Shivakiran N. B. Bhaktha, Pratyusha Das, Sakshi Sharma, Indian Institute of Technology Kharagpur (India) [10672-124]

Enhanced graphene nonlinear response through geometrical plasmon focusing, José Ramón Martínez Saavedra, ICFO - Institut de Ciències Fotòniques (Spain); F. Javier García de Abajo, ICFO - Institut de Ciències Fotòniques (Spain) and Institució Catalana de Recerca i Estudis Avançats (Spain) [10672-125]

Waveguide-integrated narrowband transmission filter consisting of two grooves and a ridge cavity, Evgeni A. Bezus, Leonid L. Doskolovich, Dmitry A. Bykov, Image Processing Systems Institute, Russian Academy of Sciences (Russian Federation). [10672-126]

Efficient synthesis and optical properties of highly luminescent copper nanoclusters, Maria Jessabel Talite, National Chiao Tung Univ. (Taiwan); Chi-Tsu Yuan, Chung Yuan Christian Univ. (Taiwan); Wu-Ching Chou, National Chiao Tung Univ. (Taiwan) [10672-127]

Numerically optimized design for enhanced coupling efficiency of single-photon sources integrated into single-mode waveguides, Theresa Hoehne, Zuse Institute Berlin (Germany); Peter Schnauber, Sven Rodt, Stephan Reitzenstein, Institut für Festkörperphysik, Technische Univ. Berlin (Germany); Sven Burger, Zuse Institute Berlin (Germany) and JCMwave GmbH (Germany) [10672-128]

Dielectro-plasmonic tweezers for scalable trapping and hot electrons applications, Alberto Lauri, Emiliano Cortés, Evangelina Pensa, Imperial College London (United Kingdom); Avijit Barik, Univ. of Minnesota (United States); Aliaksandra Rakovich, Imperial College London (United Kingdom); Sang-Hyun Oh, Univ. of Minnesota (United States); Stefan A. Maier, Imperial College London (United Kingdom). [10672-129]

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Surface wave detection of hypersound in single plasmonic nanoantennas, Rodrigo Berte, Imperial College London (United Kingdom); Fabricio Della Picca, Lab. de Electronica Cuantica, Univ. de Buenos Aires (Argentina) and El Instituto de Fisica de Buenos Aires (Argentina) and Consejo Nacional de Investigaciones Cientificas y Técnicas (Argentina); Yi Li, Emiliano Cortés, Imperial College London (United Kingdom); Stefan A. Maier, Imperial College London (United Kingdom) and Ludwig-Maximilians-Universität München (Germany); Andrea Bragas, Lab. de Electronica Cuantica, Univ. de Buenos Aires (Argentina) [10672-130]

Anderson localization of visible light for high-quality on-chip optical cavities, Oliver Trojak, Tom Crane, Luca Sapienza, Univ. of Southampton (United Kingdom) [10672-131]

Polarization conversion within ultracompact on-chip all-plasmonic nanocircuits, Martin Thomaschewski, Yuanqing Yang, Sergey I. Bozhevolnyi, Univ. of Southern Denmark (Denmark) [10672-132]

Optical sensing with Anderson localized light, Oliver Trojak, Tom Crane, Luca Sapienza, Univ. of Southampton (United Kingdom) [10672-133]

Plasmon-exciton interaction in the thin film of inhomogeneous ensemble of silver nanoparticles and cyanine J-aggregates, Anton A. Starovoytov, Rezida D. Nabiullina, Igor A. Gladskikh, ITMO Univ. (Russian Federation) [10672-134]

Planar waveguide coupler based on tilted Bragg gratings and a discrete cladding mode, Mathias Weisen, Matthew T. Posner, Optoelectronics Research Ctr. (United Kingdom); James C. Gates, Optoelectronics Research Ctr., Univ. of Southampton (United Kingdom); Corin Gawith, Peter G. R. Smith, Peter Horak, Optoelectronics Research Ctr. (United Kingdom) [10672-135]

Investigation of bimetallic hollow nanoparticles for colorimetric detection of mercury, Sangeeta Yadav, VIT Univ. (India); Saumey Jain, KTH Royal Institute of Technology (Sweden); Jitendra Satija, Ctr. for Nanobiotechnology, VIT Univ. (India) [10672-136]

Using all dielectric and plasmonic cross grating metasurface for enhancing efficiency of CZTS solar cells, Omar A. M. Abdelraouf, The American Univ. in Cairo (Egypt) and Ain Shams Univ. (Egypt); Ahmed Shaker, Ain Shams Univ. (Egypt); Nageh K. Allam, The American Univ. in Cairo (Egypt) [10672-137]

Study of thermo-optical properties of nanofluids of gold and silver nanoparticles functionalized with polyethylene glycol and sodium dodecyl sulfate in water using thermal lens spectroscopy, Orlando Villegas, Jimmy Castillo, Alberto Fernández, Hector Gutierrez, Univ. Central de Venezuela (Venezuela) [10672-138]

One-pot synthesis red emission of photoluminescent silane capped gold nanoclusters, Hsiu-Ying Huang, Chi-Tsu Yuan, Chung Yuan Christian Univ. (Taiwan) [10672-139]

Nanofabrication on unconventional platforms: implications for novel opto-electronic functionalities, design, and enhanced performance, Jagdish Anakkavoor Krishnaswamy, Kavita Garg, Sandeep B.S., Kumar M.P., Praveen C. Ramamurthy, Debiprosad Roy Mahapatra, Indian Institute of Science (India) [10672-140]

The glutathione-capped gold nanoclusters based on doping zinc ion with aggregation-induced emission enhancement, Kun-Blin Cai, Li-Yun Chang, Chi-Tsu Yuan, Hsiu-Ying Huang, Chung Yuan Christian Univ. (Taiwan) [10672-141]

Near-field localization of Au nano-objects: PEEM and group theory description, Sarra Mitiche, Sylvie Marguet, Fabrice Charra, Ludovic Douillard, CEA-Ctr. de SACLAY (France) [10672-142]

Nanostructured layer of InP on GaP surface, Tinatin Laperashvili, Orest Kvitsiani, Institute of Cybernetics (Georgia); Davit Laperashvili, Georgian Technical Univ. (Georgia) [10672-143]

Integration of carbon nanotubes in slot photonic crystal cavities, Elena Durán-Valdeiglesias, Ctr. de Nanosciences et de Nanotechnologies (France); Thi Hong Cam Hoang, Ctr. de Nanosciences et de Nanotechnologies (France) and Institute of Materials Science (Viet Nam); Carlos Alonso-Ramos, Samuel Serna, Ctr. de Nanosciences et de Nanotechnologies (France); Weiwei Zhang, Ctr. de Nanosciences et de Nanotechnologies (France) and Univ. of Southampton (United Kingdom); Xavier Le Roux, Ctr. de Nanosciences et de Nanotechnologies (France); Matteo Balestrieri, CEA-Ctr. de SACLAY (France) and Commissariat à l'Énergie Atomique (France) and Nanosciences et Innovation pour les Matériaux, la Biomédecine et l'Énergie (France); Francesco Biccari, Anna Vinattieri, Lab. Europeo di Spettroscopia Non-Lineari, Univ. degli Studi di Firenze (Italy); Delphine Marris-Morini, Ctr. de Nanosciences et de Nanotechnologies (France); Arianna Filoramo, CEA-Ctr. de SACLAY (France) and Commissariat à l'Énergie Atomique (France) and Nanosciences et Innovation pour les Matériaux, la Biomédecine et l'Énergie (France); Massimo Grioli, Lab. Europeo di Spettroscopia Non-Lineari, Univ. degli Studi di Firenze (Italy); Eric Cassan, Ctr. de Nanosciences et de Nanotechnologies (France) [10672-144]

Optical coupling of a Mie-resonant silicon nanoparticle to a waveguide revealed by third harmonic generation spectroscopy, Kirill I. Okhlopov, Alexander A. Ezhov, Pavel A. Shafirin, M.V. Lomonosov Moscow State Univ. (Russian Federation); Nikolay A. Orlikovskiy, Bauman Moscow State Technical Univ. (Russian Federation); Maxim R. Shcherbakov, M.V. Lomonosov Moscow State Univ. (Russian Federation) and Cornell Univ. (United States); Andrey A. Fedyanin, M.V. Lomonosov Moscow State Univ. (Russian Federation) [10672-145]

Distance dependence of carrier transfer via tunneling processes from graphene quantum dots to InGaN quantum well, Tzu-Neng Lin, Svetlana Reina Merden S. Santiago, Ji-Lin Shen, Chung Yuan Christian Univ. (Taiwan) [10672-146]

Propagation of surface helicons in a semiconductor, Valentin A. Tolkachev, Chelyabinsk State Univ. (Russian Federation); Igor V. Bychkov, Dmitry A. Kuzmin, Chelyabinsk State Univ. (Russian Federation) and South Ural State Univ. (Russian Federation); Vladimir G. Shavrov, Kotel'nikov Institute of Radio Engineering and Electronics of Russian Academy of Sciences (Russian Federation); Olga Kharitotnova, Chelyabinsk State Univ. (Russian Federation) [10672-147]

Chirality and discrete diffraction in nonlinear Mathieu lattices, Marius Rimmner, Alessandro Zannotti, Westfälische Wilhelms-Universität Münster (Germany); Jadranka Vasiljevic, Dejan V. Timotijevic, Dragana M. Jović Savić, Univ. of Belgrade (Serbia); Cornelia Denz, Westfälische Wilhelms-Universität Münster (Germany) [10672-148]

Helium ion beam fabrication of nanofiber Bragg cavities, Andreas W. Schell, ICFO - Institut de Ciències Fotòniques (Spain); Hideaki Takashima, Hirogona Maruya, Atsushi Fukuda, Kyoto Univ. (Japan) [10672-149]

Tailored orbital and spin energy flow structures for advanced optical trapping, Eileen Otte, Eric Asché, Ramon Runde, Cornelia Denz V, Westfälische Wilhelms-Universität Münster (Germany) [10672-150]

Compact Bloch surface waves devices based on multimode interference effect, Kirill Safronov, Ksenia A. Abrashitova, Dmitry N. Gulkina, Natalia Kokareva, Ilya Antropov, Vladimir O. Bessonov, Andrey A. Fedyanin, M.V. Lomonosov Moscow State Univ. (Russian Federation) [10672-151]

Temperature-dependent photoluminescence in nitrogen-doped graphene quantum dots, Svetlana Reina Merden S. Santiago, Tzu-Neng Lin, Ji-Lin Shen, Chung Yuan Christian Univ. (Taiwan) [10672-152]

A software for the simulation of light scattering by many particles in planarily layered media, Amos Egel, Dominik Theobald, Guillaume Gomard, Uli Lemmer, Karlsruher Institut für Technologie (Germany) [10672-153]

GaP-on-insulator as a platform for nonlinear photonics, Simon Hönl, Katharina Schneider, IBM Research - Zürich (Switzerland); Pol Welter, IBM Research - Zürich (Switzerland) and ETH Zürich (Switzerland); Yannick Baumgartner, Herwig Hahn, Lukas Czornomaz, IBM Research - Zürich (Switzerland); Dalziel J. Wilson, IBM Research - Zürich (Switzerland) and École Polytechnique Fédérale de Lausanne (Switzerland) [10672-154]

Microwave surface plasmon-polariton resonances in VO2 during metal-insulator phase transition, Dmitry A. Kuzmin, Igor V. Bychkov, Chelyabinsk State Univ. (Russian Federation) and South Ural State Univ. (Russian Federation); Alexander P. Kamantsev, Victor V. Koledov, Dmitry S. Kuchin, Alexey V. Mashirov, Vladimir G. Shavrov, Kotel'nikov Institute of Radio Engineering and Electronics of Russian Academy of Sciences (Russian Federation) [10672-155]

Inverse Faraday effect mediated by surface plasmon-polaritons in graphene-dielectric-metal structure, Igor V. Bychkov, Chelyabinsk State Univ. (Russian Federation) and South Ural State Univ. (Russian Federation); Valentin A. Tolkachev, Chelyabinsk State Univ. (Russian Federation); Dmitry A. Kuzmin, Chelyabinsk State Univ. (Russian Federation) and South Ural State Univ. (Russian Federation); Pavel S. Plaksin, Chelyabinsk State Univ. (Russian Federation); Vladimir G. Shavrov, Kotel'nikov Institute of Radio Engineering and Electronics of Russian Academy of Sciences (Russian Federation) [10672-156]

Designing surface lattice resonances to enhance the luminescence from silicon nanocrystals, Frédéric Laux, Davy Gérard, Univ. de Technologie Troyes (France); Nicolas Bonod, Institut Fresnel (France) [10672-157]

Mie resonances and Purcell effect in nanodiamonds, Daniil A. Shilkin, M.V. Lomonosov Moscow State Univ. (Russian Federation) and Immanuel Kant Baltic Federal Univ. (Russian Federation); Dmitry V. Obaydenov, M.V. Lomonosov Moscow State Univ. (Russian Federation); Maxim R. Shcherbakov, M. V. Lomonosov Moscow State Univ. (Russian Federation) and Cornell Univ. (United States); Evgeny V. Lyubin, M.V. Lomonosov Moscow State Univ. (Russian Federation); Konstantin G. Katamadze, M.V. Lomonosov Moscow State Univ. (Russian Federation) and National Research Nuclear Univ. MEPhI (Russian Federation) and Institute of Physics and Technology, Russian Academy of Sciences (Russian Federation); Oleg S. Kudryavtsev, Vadim S. Sedov, A. M. Prokhorov General Physics Institute of the Russian Academy of Sciences (Russian Federation); Igor I. Vlasov, A. M. Prokhorov General Physics Institute of the Russian Academy of Sciences (Russian Federation) and National Research Nuclear Univ. MEPhI (Russian Federation); Andrey A. Fedyanin, M.V. Lomonosov Moscow State Univ. (Russian Federation) [10672-158]

Highly directional plasmonic nanolaser based on high-performance noble metal film photonic crystal on transparent substrate, Alexander S. Baburin, Anton Ivanov, Igor Trofimov, Alina Dobronosova, Bauman Moscow State Technical Univ. (Russian Federation); Pavel Melentiev, Victor Balykin, Institute of Spectroscopy (Russian Federation); Dmitriy Moskalev, Bauman Moscow State Technical Univ. (Russian Federation); Anastasiya Pishchimiya, Bauman Moscow State Technical Univ. (Russian Federation); Liutsiia Ganieva, Bauman Moscow State Technical Univ. (Russian Federation); Ilya Ryzhikov, Institute for Theoretical and Applied Electrodynamics (Russian Federation); Ilya Rodionov, Bauman Moscow State Technical Univ. (Russian Federation) [10672-159]

Enhanced SHG and DFG of GaAs inclusions in plasmonic resonators. Léna Soun, ONERA (France) [10672-160]

Indium phosphide nanostructures for solar cell application. Orest Kvitsiani, Tinatin Laperashvili, Institute of Cybernetics (Georgia); Davit Laperashvili, Georgian Technical Univ. (Georgia) [10672-161]

Diffusion by disordered assemblies of nanoantennas. Eslam El Shamy, Riad Haïdar, Patrick Bouchon, Julien Jaeck, ONERA (France) [10672-162]

Photonic graphene with broken symmetry: complete photonic bandgap and defect modes. Michiel J. A. de Dood, Leiden Univ. (Netherlands) [10672-163]

Photoluminescence enhancement in nanoimprinted halide perovskite film at low temperatures. Zarina Sadrieva, Ekaterina I. Tiguntseva, ITMO Univ. (Russian Federation); Yuriy Kapitonov, Saint Petersburg State Univ. (Russian Federation); Qing Gu, Walter Hu, The Univ. of Texas at Dallas (United States); Sergey Makarov, ITMO Univ. (Russian Federation); Anvar Zakhidov, The Univ. of Texas at Dallas (United States) [10672-164]

Ellipsometry of graphene-protected structures based on copper. Andrii Shcherbakov, Leonid V. Popov, Iryna V. Yurjevych, Taras Shevchenko National Univ. of Kyiv (Ukraine) [10672-165]

Automation of spectroellipsometric measurements within range of 1-4.9 eV by Beattie-Conn method. Ruslan Ryskulov, Peter Kovanzhi, Artem Sribniy, Yevhen Kovalevsky, Vadym Prokopets, Leonid V. Popov, Taras Shevchenko National Univ. of Kyiv (Ukraine) [10672-166]

Design of an efficient energy-harvesting metamaterial for WiFi signals. Gabin T. Oumbe Tekam, Vincent Ginis, Jan Danckaert, Vrije Univ. Brussel (Belgium); Philippe Tassin, Chalmers Univ. of Technology (Sweden) [10672-167]

Surface plasmon polariton generation in a single-walled carbon nanotube. Andrei Fotiadis, Sergey Moiseev, Igor Zolotovskii, Yuliya Dadoenkova, Alexey Kadochkin, Ulyanovsk State Univ. (Russian Federation) [10672-168]

Spectral analysis of volume holograms in materials with diffusion-based formation mechanisms by means of coupled wave theory and Kramers-Kronig relations. Vladimir N. Borisov, Aleksandr E. Angervaks, Alexander I. Ryskin, Andrey V. Veniaminov, ITMO Univ. (Russian Federation) [10672-169]

Analysis of localized resonances in nanodolmen plasmonic structures. Jiří Pirunčík, Pavel Kwiecien, Ivan Richter, Czech Technical Univ. in Prague (Czech Republic) [10672-170]

Plasmonic trapping using special structure. Wooreim Choi, Gwangju Institute of Science and Technology (Korea, Republic of) [10672-171]

WEDNESDAY 25 APRIL

SESSION 9. WED 8:30 TO 10:20

Nonlinear Optics

Session Chair: **Jean-Michel Nunzi**, Queen's Univ. (Canada)

Nonlinear optical effects in layered transition metal dichalcogenides (*Invited Paper*), Jun Wang, Shanghai Institute of Optics and Fine Mechanics (China) [10672-40]

Tunable nonlinearities at the single photon level with subradiant modes. Ilan Shlesinger, Institut d'Optique Graduate School (France); Loïc Lanco, Ctr. de Nanosciences et de Nanotechnologies (France); Jean-Jacques Greffet, Institut d'Optique Graduate School (France) [10672-41]

Plasmon-assisted high-harmonic generation in graphene. Joel D. Cox, ICFO - Institut de Ciències Fotòniques (Spain); Andrea Marini, Istituto dei Sistemi Complessi (Italy); F. Javier Garcia de Abajo, ICFO - Institut de Ciències Fotòniques (Spain) [10672-42]

Nonlinear 3D chiral plasmonics. Lili Gui, Mario Hentschel, Harald Giessen, Univ. Stuttgart (Germany) [10672-43]

Theoretical modelling of the saturable absorption of graphene. Andrea Marini, Istituto dei Sistemi Complessi, Consiglio Nazionale delle Ricerche (Italy); Joel D. Cox, ICFO - Institut de Ciències Fotòniques (Spain); F. Javier Garcia de Abajo, ICFO - Institut de Ciències Fotòniques (Spain) and Institució Catalana de Recerca i Estudis Avançats (Spain) [10672-44]

SESSION 10. WED 10:50 TO 12:30

Nanolasers

Session Chair: **Rachel Grange**, ETH Zurich (Switzerland)

Progress on bound states in continuum emitters (*Invited Paper*), Boubacar Kanté, Univ. of California, San Diego (United States) [10672-45]

Universal route to photon superbunching in bimodal nanolasers (*Invited Paper*), Alejandro M. Yacomotti, Ctr. de Nanosciences et de Nanotechnologies (France) [10672-46]

Photon-statistical repercussions of nanolasers' spontaneous spiking dynamics. Tao Wang, Univ. Côte d'Azur (France) and Hunan Univ. of Science and Technology (China); Djeylan Aktas, Olivier Alibert, Eric Picholle, Univ. Côte d'Azur (France); Gian Piero Puccioni, Istituto dei Sistemi Complessi (Italy); Sébastien Tanzilli, Gian Luca Lippi, Univ. Côte d'Azur (France) [10672-47]

Random lasers based on nanodiamonds. Judith M. Dawes, Macquarie Univ. (Australia); Corentin Huard, Macquarie Univ. (Australia) and Ecole Centrale de Lyon (France); Wan Zakiah Wan Ismail, Macquarie Univ. (Australia) and Univ. Sains Islam Malaysia (Malaysia) [10672-48]

Lunch/Exhibition Break Wed 12:30 to 13:40

SESSION 11. WED 13:40 TO 15:30

Photonic Crystals

Session Chair: **Jesper Mork**, Technical University of Denmark (Denmark)

Benchmarking state-of-the-art numerical simulation techniques for analyzing large photonic crystal membrane line defect cavities (*Invited Paper*), Niels Gregersen, Jakob Rosenkrantz de Lasson, Lars Hagedorn Frandsen, Technical Univ. of Denmark (Denmark); Philipp Gutsche, Sven Burger, Zuse Institute Berlin (Germany); Oleksiy S. Kim, Olav Breinbjerg, Technical Univ. of Denmark (Denmark); Aliaksandra Ivinskaya, ITMO Univ. (Russian Federation); Fengwen Wang, Ole Sigmund, Teppo Häyrynen, Andrei V. Lavrinenko, Technical Univ. of Denmark (Denmark) [10672-49]

Highly sensitive photonic crystal fiber biosensor based on alternative plasmonic material. Salah S.A. Obayya, Zewail City of Science and Technology (Egypt); Ahmed E. Khalil, Ahmed H. El-Saeed, Mohamed A. Farag, Mansoura Univ. (Egypt); Mohamed Farhat O. Hameed, Zewail City of Science and Technology (Egypt) and Mansoura Univ. (Egypt); Mohammad Y. Azab, Mansoura Univ. (Egypt) [10672-50]

Optical trapping in 1D mesoscopic photonic crystal microcavities. Benedetta Ferrara, Politecnico di Bari (Italy); Aurore Ecarnot, Ctr. de Nanosciences et de Nanotechnologies (France); Antoine Monmayrant, Lab. d'Analyse et d'Architecture des Systèmes (France); Marco Grande, Giovanna Calò, Vincenzo Petruzzelli, Politecnico di Bari (Italy); Olivier Gauthier-Lafaye, Lab. d'Analyse et d'Architecture des Systèmes (France); Vy Yam, Ctr. de Nanosciences et de Nanotechnologies (France); Antonella D'Orazio, Politecnico di Bari (Italy); Béatrice Dagens, Giovanni Magno, Ctr. de Nanosciences et de Nanotechnologies (France) [10672-51]

Tunable band gap biperiodic plasmonic crystals fabricated by laser interference lithography. Igor S. Balashov, Alexander A. Chezhnev, Andrey A. Grunin, Artem V. Chetvertukhin, Andrey A. Fedyanin, M.V. Lomonosov Moscow State Univ. (Russian Federation) [10672-52]

Investigation of the optical properties of single emitters in hBN. Andreas W. Schell, Mikael Svendahl, ICFO - Institut de Ciències Fotòniques (Spain); Toan Trong Tran, Igor Aharonovich, Univ. of Technology, Sydney (Australia); Hideaki Takashima, Shigeki Takeuchi, Kyoto Univ. (Japan); Romain Quidant, ICFO - Institut de Ciències Fotòniques (Spain) [10672-53]

SESSION 12. WED 16:00 TO 18:10

Novel Plasmonics and Surface Nanophotonics

Session Chair: **Anatoly Zayats**, King's College London (United Kingdom)

Magnetoplasmonics: magnetic control of light in nanoscale landscapes (*Invited Paper*), Alexandre Dmitriev, Göteborgs Univ. (Sweden) [10672-25]

Near-field plasmonic beam engineering by complex amplitude modulation based on metasurface. Lingling Huang, Xu Song, Beijing Institute of Technology (China); Lin Sun, Xiaomeng Zhang, Tsinghua Univ. (China); Ruizhe Zhao, Xiaowei Li, Beijing Institute of Technology (China); Jia Wang, Benfeng Bai, Tsinghua Univ. (China); Yongtian Wang, Beijing Institute of Technology (China); Thomas Zentgraf, Univ. Paderborn (Germany) [10672-54]

Modified conical silicon nanowires for highly efficient light trapping. Salah S.A. Obayya, Fatma Korany, Zewail City of Science and Technology (Egypt); Mohamed Farahat, Zewail City of Science and Technology (Egypt) and Mansoura Univ. (Egypt); Mohamed Hussein, Zewail City of Science and Technology (Egypt); Ahmed Shaker, Helwan Univ. (Egypt); M. El-Adawy, Helwan Univ. (Egypt) [10672-55]

What can we learn from the waves scattered off Mie particles trapped in an evanescent field? Vincent Ginis, Harvard Univ. (United States) [10672-56]

Faraday rotation induced by Bloch surface waves in magnetophotonic crystals. Maria N. Romodina, Irina V. Soboleva, Alexander I. Musorin, Ksenia A. Korzun, Andrey A. Fedyanin, M.V. Lomonosov Moscow State Univ. (Russian Federation) [10672-57]

Applications of bioreplication in optics and photonics. Raúl J. Martín-Palma, Univ. Autónoma de Madrid (Spain) [10672-58]

CONFERENCE 10672

THURSDAY 26 APRIL

HOT TOPICS SESSION III 9:00 TO 10:35

From extreme nonlinear optics to ultrafast atomic physics

Anne L'Huillier, Lund Univ., Sweden

Quantum computations and quantum simulations with trapped ions

Rainer Blatt, Institute for Experimental Physics, Univ. of Innsbruck, Austria

For additional details, please see page 8

SESSION 13 THU 11:00 TO 12:40

Quantum Systems

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

Manipulating heat in optomechanical systems (*Invited Paper*), Shabir Barzanjeh, Institute of Science and Technology Austria (Malta); Matteo Aquilina, National Aerospace Ctr. (Malta); André Xuereb, Univ. of Malta (Malta) [10672-59]

Temporal dynamics of strongly coupled exciton-localized surface plasmons beyond Rabi oscillations (*Invited Paper*), Elad Eizner, Katherine Akulov, Tal Schwartz, Tal Ellenbogen, Tel Aviv Univ. (Israel) [10672-60]

Weak value amplification of geometric spin Hall shift of light beam, Mandira Pal, Antariksha Das, Sumit Goswami, Nirmalya Ghosh, Indian Institute of Science Education and Research Kolkata (India) [10672-61]

Plasmon generation through electron tunneling in graphene, Sandra de Vega, F. Javier García de Abajo, ICFO - Institut de Ciències Fotòniques (Spain) [10672-62]

Lunch Break Thu 12:40 to 13:50

SESSION 14 THU 13:50 TO 15:40

Waveguides and Nanoantennas

Session Chair: **Jesper Mork**, Technical Univ. of Denmark (Denmark)

Nano-engineered high-confinement AlGaAs waveguide devices for nonlinear photonics (*Invited Paper*), Minhao Pu, Yi Zheng, Erik Stassen, Ayman N. Kamel, Pierre-Yves Bony, Luisa Ottaviano, Elizaveta Semenova, Kresten Yvind, Technical Univ. of Denmark (Denmark) [10672-63]

Full-vector finite element model for waveguide-based 3D plasmonic sensors, Gilles Renversez, Institut Fresnel (France) [10672-64]

Resonant integrated nanophotonic structures for analog differentiation of optical signals, Leonid L. Doskolovich, Evgeni A. Bezu, Dmitry A. Bykov, Nikita V. Golovastikov, Image Processing Systems Institute, Russian Academy of Sciences (Russian Federation) [10672-65]

III-V nanoantennas fabricated from nanowires for enhanced nonlinear optical signal at the Mie resonances, Maria Timofeeva, ETH Zurich (Switzerland) and ITMO Univ. (Russian Federation); Lukas Lang, Claude Renaut, Flavia Timpu, ETH Zurich (Switzerland); Igor Shtrom, Alexey Bouravleuv, George Cirlin, Saint Petersburg National Research Academic Univ. of the Russian Academy of Sciences (Russian Federation); Rachel Grange, ETH Zurich (Switzerland) [10672-66]

All-optical modulation of single nanoantenna on vanadium dioxide, Bigeng Chen, Otto L. Muskens, Daniel Traviss, Univ. of Southampton (United Kingdom); Yudong Wang, Seagate Technology LLC (United Kingdom); C. H. de Groot, Univ. of Southampton (United Kingdom); David W. Sheel, Univ. of Salford (United Kingdom); Luca Bergamini, Univ. del País Vasco (Spain); Javier Aizpurua, Ctr. de Física de Materiales, Consejo Superior de Investigaciones Científicas (Spain) and Univ. del País Vasco (Spain) and Donostia International Physics Ctr. (Spain); Nerea Zabala, Univ. del País Vasco (Spain); Jeffrey M. Gaskell, Univ. of Salford (United Kingdom) [10672-67]

SESSION 15 THU 16:00 TO 17:50

Quantum Dots

Session Chair: **Céline Fioroni-Debuischert**, CEA (France)

Colloidal quantum dot spasers and plasmonic amplifiers (*Invited Paper*), David J. Norris, ETH Zurich (Switzerland) [10672-68]

Nanophotonic enhanced two-photon excited fluorescence of perovskite quantum dots, Christiane Becker, David Eisenhauer, Grit Köppel, Helmholtz-Zentrum Berlin für Materialien und Energie GmbH (Germany); Pavel Chabera, Kaibo Zheng, Junsheng Chen, Tõnu Pullerits, Lund Univ. (Sweden) [10672-69]

The impact of nonbonding electrons on the spectroscopic properties of AgInS₂ quantum dots, Adam Olejniczak, Institute of Low Temperature and Structure Research (Poland); Bartłomiej Cichy, Institute of Low Temperature and Structure Research (Poland); Wiesław Stręk, Institute of Low Temperature and Structure Research (Poland) [10672-70]

Picosecond optical switching of the near-infrared localized surface plasmon resonances in colloidal doped metal oxide nanocrystals, Ilka Kriegel, Istituto Italiano di Tecnologia (Italy); Francesco Scotognella, Politecnico di Milano (Italy); Liberato Manna, Luca De Trizio, Istituto Italiano di Tecnologia (Italy); Daniele Viola, Politecnico di Milano (Italy); Carmine Urso, Istituto Italiano di Tecnologia (Italy); Giulio N. Cerullo, Politecnico di Milano (Italy) [10672-71]

Self-organized aggregation of a triple of resonant nanoparticles into stable structures with various shapes controlled by a laser field, Viktoria Kornienko, Institute of Computational Modeling (Russian Federation); Aleksey Tsipotan, Viktor Tkachenko, Vitaliy Slabko, Aleksandr Aleksandrovsky, Kirensky Institute of Physics (Russian Federation); Vladimir Shaidurov, Institute of Computational Modeling (Russian Federation) [10672-72]

CONFERENCE 10673

Monday–Tuesday 23–24 April 2018 • Proceedings of SPIE Vol. 10673

Advances in Ultrafast Condensed Phase Physics

Conference Chairs: **Martin Schultze**, Max-Planck-Institut für Quantenoptik (Germany); **Eleftherios Goulielmakis**, Max-Planck-Institut für Quantenoptik (Germany); **Thomas Brabec**, Univ. of Ottawa (Canada)

Programme Committee: **Dimitrios Charalambidis**, Foundation for Research and Technology-Hellas (Greece); **Peter Hommelhoff**, Max-Planck-Institut für Quantenoptik (Germany); **Gerhard G. Paulus**, Helmholtz Institute Jena (Germany); **Klaus Reimann**, Max-Born-Institut für Nichtlineare Optik und Kurzzeitspektroskopie (Germany); **Olga Smirnova**, Max-Born-Institut für Nichtlineare Optik und Kurzzeitspektroskopie (Germany); **Vladislav Yakovlev**, Max-Planck-Institut für Quantenoptik (Germany)

MONDAY 23 APRIL

HOT TOPICS SESSION I 9:00 TO 11:00

From Einstein doubts to quantum bits: a second quantum revolution

Alain Aspect, Lab. Charles Fabry, Institut d'Optique, France

Pico-Photonics: watching and sensing single molecules by confining light to the atom scale

Jeremy J. Baumberg, NanoPhotonics Ctr., Univ. of Cambridge, United Kingdom

For additional details see page 6.

SESSION 1 MON 11:20 TO 12:30

Novel Tools for Ultrafast Spectroscopy

Ultrafast magnetism and THz spintronics (*Invited Paper*), Markus Münzenberg, Georg-August-Univ. Göttingen (Germany) . . . [10673-1]

Ultrafast dynamics of phase change material probed by frequency domain interferometry, Jérôme Gaudin, Irene Papagiannouli, Valérie Blanchet, Dominique Descamps, Claude Fourment, Stéphane Petit, Univ. de Bordeaux (France); Jea-Yves Raty, Univ. de Liège (Belgium); Nicolas Bernier, Pierre Noé, Jean-Baptiste Dory, CEA-LETI (France) . [10673-2]

Electron thermalization dynamics in metals excited by ultrashort laser pulse, Elena Silaeva, Univ. Jean Monnet Saint-Etienne (France) and Univ. de Lyon (France) and Institut d'Optique Graduate School (France); Razvan Stoian, Univ. Jean Monnet Saint-Etienne (France) and Univ. de Lyon (France) and Institut d'Optique Graduate School (France); Jean-Philippe Colombier, Univ. Jean Monnet Saint-Etienne (France) and Univ. de Lyon (France) and Institut d'Optique Graduate School (France) . . . [10673-3]

Lunch Break Mon 12:30 to 13:30

SESSION 2 MON 13:30 TO 15:30

Ultrafast Excitation Dynamics I

Optically excited structural transition in atomic wires on surfaces at the quantum limit: a femtosecond ultrafast surface electron diffraction study (*Invited Paper*), Michael Horn von Hoegen, Univ. Duisburg-Essen (Germany) . . . [10673-4]

Ultrafast near-field dynamics of polariton-exciton in WSe₂ slab waveguides at room temperature, Michael Mrejen, Lena Yadgarov, Assaf Levanon III, Hadar Greener, Haim Suchowski, Tel Aviv Univ. (Israel) . . [10673-5]

Ultrafast charge cooling and carrier multiplication in semiconductor nanocrystals and superlattices, Laurens D. Siebbeles, Technische Univ. Delft (Netherlands) . . . [10673-6]

Effect of size confinement in C exciton dynamics of few-layered MoS₂ nanosheets, Manobina Karmakar, Sayantan Bhattacharya, Subhrajit Mukherjee, Rup Kumar Chowdhury, Indian Institute of Technology Kharagpur (India); Samit K. Ray, Indian Institute of Technology Kharagpur (India) and S.N. Bose National Ctr. for Basic Sciences (India); Prasanta Kumar Datta, Indian Institute of Technology Kharagpur (India) . . . [10673-7]

Plasmonics at the space-time limit (*Invited Paper*), Martin Aeschlimann, Technische Univ. Kaiserslautern (Germany) . . . [10673-8]

SESSION 3 MON 15:50 TO 18:00

Ultrafast Excitation Dynamics II

Theoretical aspects of light-driven electronic dynamics in solids (*Invited Paper*), Joachim Burgdörfer, Technische Univ. Wien (Austria) . . . [10673-9]

Attosecond metrology of phase-coherent multi-PHz currents in bulk solids, Manish Garg, Minjie Zhan, Hee-Yong Kim, Harshit Lakhota, Eleftherios Goulielmakis, Max-Planck-Institut für Quantenoptik (Germany) . . . [10673-10]

Relaxation dynamics of nonequilibrium electrons in noble metals, dielectrics and itinerant ferromagnets, Baerbel Rethfeld, Sebastian T. Weber, Nils Brouwer, Technische Univ. Kaiserslautern (Germany) . . [10673-11]

Contrasted dynamics in the carrier relaxation in wide band gap oxides, Stéphane Guizard, Commissariat à l'Énergie Atomique (France) . . . [10673-12]

The optical conductivity of dielectrics after ultrafast multiphoton excitation, Vladislav S. Yakovlev, Michael S. Wismer, Max-Planck-Institut für Quantenoptik (Germany) . . . [10673-13]

Attosecond energy transfer dynamics in transparent solids, Florian Siegrist, Max-Planck-Institut für Quantenoptik (Germany) and Ludwig-Maximilians-Univ. München (Germany); Annkatrin Sommer, Max-Planck-Institut für Quantenoptik (Germany); Malte Schröder, Tobias Boolakee, Max-Planck-Institut für Quantenoptik (Germany) and Ludwig-Maximilians-Univ. München (Germany); Keyhan Golyari, Max-Planck-Institut für Quantenoptik (Germany); Ferenc Krausz, Martin Schultze, Max-Planck-Institut für Quantenoptik (Germany) and Ludwig-Maximilians-Univ. München (Germany) . . . [10673-14]

TUESDAY 24 APRIL

SESSION 4 TUE 8:30 TO 10:30

Electron Dynamics in Nanosystems

Interaction of electron beams with nanostructures and light beyond adiabatic approximations, Nahid Talebi, Max-Planck-Institut für Festkörperforschung (Germany); Jan Vogelsang, Christoph Lienau, Carl von Ossietzky Univ. Oldenburg (Germany) . . . [10673-15]

High harmonic generation in graphene, Shatha Kaassamani, Rana Nicolas, David Gauthier, Dominik Franz, Willem Boutu, Hamed Merdji, CEA-Ctr. de SACLAY (France) . . . [10673-16]

Ultrafast phase transitions and excited state dynamics at surfaces (*Invited Paper*), Martin Wolf, Fritz-Haber-Institut der Max-Planck-Gesellschaft (Germany) . . . [10673-17]

Ultrafast carrier dynamics in AlGaIn/GaN superlattices by time-dependent reflectivity measurements, Felix Mahler, Klaus Reimann, Jens W. Tomm, Michael Woerner, Thomas Elsässer, Max-Born-Institut für Nichtlineare Optik und Kurzzeitspektroskopie (Germany); Veit Hoffmann, Markus Weyers, Ferdinand-Braun-Institut, Leibniz-Institut für Höchstfrequenztechnik (Germany) . . . [10673-18]

Ultrafast electron diffraction and microscopy using coherent electron sources (*Invited Paper*), Claus Ropers, Georg-August-Univ. Göttingen (Germany) . . . [10673-20]

CONFERENCE 10673

SESSION 8. TUE 10:55 TO 12:55

High Harmonic Generation, Attosecond Physics in Solids

Microscopic modeling of ultrafast pulse generation in semiconductor microlasers (*Invited Paper*), Stephan W. Koch, Philipps-Univ. Marburg (Germany) [10673-21]

Amplification of high harmonics in semiconductor waveguides, Dominik Franz, Rana Nicolas, Willem Boutu, CEA-Ctr. de SACLAY (France); Liping Shi, Leibniz Univ. Hannover, Institut für Quantenoptik (Germany); Quentin Ripault, Maria Kholodtsova, Bianca Iwan, CEA-Ctr. de SACLAY (France); Ugaitz Elu Etxano, ICFO - Institut de Ciències Fotòniques (Spain); Milutin Kovacev, Leibniz Univ. Hannover (Germany); Jens Biegert, ICFO - Institut de Ciències Fotòniques (Spain); Hamed Merdji, CEA-Ctr. de SACLAY (France) . . [10673-22]

Real space approach to high harmonic generation in solids in strong field regime, Harshit Lakhotia, Minjie Zhan, Hee-Yong Kim, Eleftherios Goulielmakis, Max-Planck-Institut für Quantenoptik (Germany) . . . [10673-23]

Extreme ultraviolet high harmonic generation and spectroscopy in condensed matters, Tran Trung Luu, Zhong Yin, Arohi Jain, Thomas Gaumnitz, Hans Jakob Woerner, ETH Zurich (Switzerland) [10673-24]

Attosecond soft-X-ray spectroscopy of semimetal charge dynamics (*Invited Paper*), Jens Biegert, ICFO - Institut de Ciències Fotòniques (Spain) [10673-25]

Lunch/Exhibition Break Tue 12:55 to 13:50

SESSION 6. TUE 13:50 TO 16:10

Ultrafast Excitation Dynamics III

Attosecond electron pulse trains and applications to time-resolved diffraction and microscopy (*Invited Paper*), Yuya Morimoto, Peter Baum, Ludwig-Maximilians-Univ. München (Germany) and Max-Planck-Institut für Quantenoptik (Germany) [10673-26]

Band structure modification of wide-band-gap crystals by nonmonochromatic electron oscillations driven by high-intensity ultrashort pulses: multi-band and nonparabolic effects, Vitaly E. Gruzdev, Olga Sergaeva, Univ. of Missouri (United States) [10673-27]

Ultrafast excited state dynamics of NHC-Fe(II) complexes designed for light harvesting, Stefan Haacke, Li Liu, Univ. de Strasbourg (France) and CNRS (France); Edoardo Domenichini, Univ. de Strasbourg (France); Philippe Gros, Xavier Assfeld, Antonio Monari, Antonio Frances Monerris, Marc Beley, Cristina Cebrian Avila, Kevin Magra, Mariachiara Pastore, Univ. de Lorraine (France) and CNRS (France) [10673-28]

Ab-initio simulation for propagation of ultrashort laser pulse in solids, Mitsuhiro Uemoto, Kazuhiro Yabana, Univ. of Tsukuba (Japan) . . . [10673-29]

Optoelectronic measurements of light fields by subcycle carrier injection in dielectrics, Dmitry Zimin, Max-Planck-Institut für Quantenoptik (Germany) [10673-30]

ELI-ALPS status report and research opportunities (*Invited Paper*), Dimitris Charalambidis, ELI-HU Nonprofit Kft. (Hungary) [10673-31]

HOT TOPICS SESSION II. 16:30 TO 18:05

Coherent combination of fiber amplified ultrafast laser pulses
Jens Limpert, Institute of Applied Physics, Friedrich Schiller Univ. Jena, Germany

2D materials and their heterostructures: fundamentals, applications and prototypes
Frank Koppens, ICFO-The Institute of Photonic Sciences, Spain

For additional details, please see page 7

TUESDAY POSTER SESSION. TUE 18:00 TO 19:30

Posters-Tuesday

Conference attendees are invited to attend the Photonics Europe poster session on Monday 17.30 to 19.00. Posters will be on display after 10.00 Monday morning in the Hall Rhin. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster authors, view poster presentation guidelines and set-up instructions at <http://spie.org/x34963.xml> and on page 96.

Ultrafast dynamics of Bloch surface waves in one-dimensional photonic crystal, Anna A. Popkova, Vladimir O. Bessonov, Irina V. Soboleva, Andrey A. Fedyanin, M.V. Lomonosov Moscow State Univ. (Russian Federation) [10673-32]

Ultrafast structural dynamics of metallic materials studied by photoelectron spectroscopy, Manuel de Anda Villa, Anna Levy, Institut des NanoSciences de Paris (France); Jérôme Gaudin, Ctr. Lasers Intenses et Applications (France) and Ctr. National de la Recherche Scientifique (France); Sophie Cervera, Institut des NanoSciences de Paris (France); Benoit Chimier, Univ. Bordeaux 1 (France); P. Combis, Commissariat à l'Énergie Atomique (France); D. Descamps, Univ. de Bordeaux (France); N. Fedorov, Univ. Bordeaux 1 (France); R. Grisenti, Goethe-Univ. Frankfurt am Main (Germany); E. Lamour, S. Macé, Institut des NanoSciences de Paris (France); P. Martin, S. Petit, Univ. Bordeaux 1 (France); C. Prigent, Institut des NanoSciences de Paris (France); V. Recoules, Commissariat à l'Énergie Atomique (France); J. P. Rozet, Institut des NanoSciences de Paris (France); L. Souldard, Commissariat à l'Énergie Atomique (France); S. Steydli, Martino Trassinelli, Institut des NanoSciences de Paris (France); K. Ueda, Tohoku Univ. (Japan); L. Videau, Commissariat à l'Énergie Atomique (France); Dominique Vernhet, Institut des NanoSciences de Paris (France); Y. Ito, Tohoku Univ. (Japan) [10673-33]

Quantum entanglement, Kondo effect, and electronic transport in quantum dots system, Sahib Babae Tooski, Iran Elite Young Researcher Club, Islamic Azad Univ. (Iran, Islamic Republic of) [10673-34]

CONFERENCE 10674

Monday–Wednesday 23–25 April 2018 • Proceedings of SPIE Vol. 10674

Quantum Technologies

Conference Chairs: Jürgen Stuhler, TOPTICA Photonics AG (Germany); Andrew J. Shields, Toshiba Research Europe Ltd. (United Kingdom); Miles J. Padgett, Univ. of Glasgow (United Kingdom)

Programme Committee: Christoph Becher, Univ. des Saarlandes (Germany); Oliver Benson, Humboldt-Univ. zu Berlin (Germany); Rainer Blatt, Leopold-Franzens-Univ. Innsbruck (Austria); Kai Bongs, The Univ. of Birmingham (United Kingdom); Philippe Bouyer, Institut d'Optique Graduate School LP2N (France), Muquans Bordeaux (France); Eleni Diamanti, Télécom ParisTech (France); Sara Ducci, Univ. Paris 7-Diderot (France); Thomas Gerrits, National Institute of Standards and Technology (United States); Michael Jetter, Univ. Stuttgart (Germany); Christian Kurtsiefer, National Univ. of Singapore (Singapore); Eugene S. Polzik, Niels Bohr Institute (Denmark); Valerio Pruneri, ICFO - Institut de Ciències Fotòniques (Spain); Bruno Sanguinetti, id Quantique SA (Switzerland); Thomas Strohm, Max-Planck-Institut für Intelligente Systeme (Germany)

MONDAY 23 APRIL

HOT TOPICS SESSION I 9:00 TO 11:00

From Einstein doubts to quantum bits: a second quantum revolution

Alain Aspect, Lab. Charles Fabry, Institut d'Optique, France

Pico-Photonics: watching and sensing single molecules by confining light to the atom scale

Jeremy J. Baumberg, NanoPhotonics Ctr., Univ. of Cambridge, United Kingdom

For additional details see page 6.

OPENING REMARKS 11:25 TO 11:30

SESSION 1 MON 11:30 TO 12:40

Atomic Spectroscopy and Clocks

Session Chair: Jürgen Stuhler, TOPTICA Photonics AG (Germany)

Quantum-enhanced spectroscopy of trapped ions (*Invited Paper*), Piet O. Schmidt, Physikalisch-Technische Bundesanstalt (Germany) [10674-1]

A dual-frequency two-photon molecular clock with cold trapped HD⁺ ions, Florin L. Constantin, Lab. de Physique des Lasers, Atomes et Molécules (France) [10674-2]

Opticlock: towards an optical single-ion clock for applications beyond basic research

Nils Huntemann, Physikalisch-Technische Bundesanstalt (Germany); Stefan Brakhane, Dieter Meschede, Rheinische Friedrich-Wilhelms-Univ. Bonn (Germany); Michael Johanning, Christof Wunderlich, Univ. Siegen (Germany); Bassem Arar, Andreas Wicht, Ferdinand-Braun-Institut (Germany); Robert Jördens, QUARTIQ GmbH (Germany); Maximilian Biethahn, Michael Flämmich, VACOM Vakuum Komponenten & Messtechnik GmbH (Germany); Florian Karlewski, József Fortágh, HighFinesse GmbH (Germany); Enrico Vogt, Qubiq GmbH (Germany); Maurice Lessing, Ronald Holzwarth, Menlo Systems GmbH (Germany); Christian Tamm, Ekkehard Peik, Alexandre Didier, Tanja E. Mehlstäubler, Piet O. Schmidt, Physikalisch-Technische Bundesanstalt (Germany); Florian Kienle, Wilhelm Kaenders, TOPTICA Photonics AG (Germany) [10674-3]

Lunch Break Mon 12:40 to 13:50

SESSION 2 MON 13:50 TO 15:20

Keynote Session

Session Chair: Andrew J. Shields, Toshiba Research Europe Ltd. (United Kingdom)

Global quantum communication network and future prospect (*Keynote Presentation*), Jianwei Pan, Univ. of Science and Technology of China (China) [10674-4]

TBA1 (*Keynote Presentation*), Ian A. Walmsley, Univ. of Oxford (United Kingdom) [10674-5]

EU flagship programme in quantum technologies (*Keynote Presentation*), Tommaso Calarco, Univ. Ulm (Germany) [10674-6]

SESSION 3 MON 15:50 TO 17:40

Quantum Sensing

Testing gravity with atomic quantum sensors on ground and in space

(*Invited Paper*), Guglielmo M. Tino, Univ. degli Studi di Firenze (Italy) [10674-7]

Achievement of autonomous quantum sensing of gravity at the 10-10

level of stability over months, Jean Lautier-Gaud, Vincent Ménoret, Pierre Vermeulen, Fabiola Guillou-Camargo, Fabrice Tardif, Mathieu Corradini, Cédric Majek, Guillaume Stern, Mathieu Guéridon, Muquans (France) [10674-8]

Interference-based multimode opto-electro-mechanical transducers,

David Vitali, Giovanni Di Giuseppe, Nicola Malossi, Iman Moaddel Haghighi, Riccardo Natali, Univ. degli Studi di Camerino (Italy) [10674-9]

Quantum enhancements to microwave electric field sensing with

Rydberg atoms, James P. Shaffer, Quantum Valley Ideas Labs. (Canada); Harald Kübler, Univ. Stuttgart (Germany); Santosh Kumar, Haoquan Fan, The Univ. of Oklahoma (United States) [10674-10]

A transimpedance amplifier based on an LTPS process operated in alkali

vapor for the measurement of an ionization current, Johannes Schmidt, Patrick Schalberger, Holger Baur, Robert Löw, Tilman Pfau, Harald Kübler, Norbert Fruehauf, Univ. Stuttgart (Germany) [10674-11]

TUESDAY 24 APRIL

SESSION 4 TUE 8:30 TO 10:10

Quantum Imaging

Quantum temporal imaging with squeezed light, Giuseppe Patera, Lab.

de Physique des Lasers, Atomes et Molécules (France); Dmitri B. Horoshko, Lab. de Physique des Lasers, Atomes et Molécules (France) and B.I. Stepanov, Institute of Physics (Belarus); Junheng Shi, Lab. de Physique des Lasers, Atomes et Molécules (France) and Univ. of Chinese Academy of Sciences (China) [10674-12]

Super-resolution quantum imaging at the Heisenberg limit,

Bänz Bessire, Manuel Unterröhrer, Univ. Bern (Switzerland); Leonardo Gasparini, Majid Zarghami, Matteo Perenzoni, Fondazione Bruno Kessler (Italy); André Stefanov, Univ. Bern (Switzerland) [10674-13]

Progress in quantum optical lithography, Eugen Pavel, Storex Technologies Inc. (Romania) [10674-14]

Correlation plenoptic imaging with entangled photons, Francesco Maria

Di Lena, Univ. degli Studi di Bari Aldo Moro (Italy); Alessio Avella, Istituto Nazionale di Ricerca Metrologica (Italy); Milena D'Angelo, Augusto Garuccio, Univ. degli Studi di Bari Aldo Moro (Italy) and Istituto Nazionale di Fisica Nucleare (Italy) and Istituto Nazionale di Ottica (Italy); Francesco Pepe, Univ. degli Studi di Bari Aldo Moro (Italy); Ivano Ruo Berchera, Istituto Nazionale di Ricerca Metrologica (Italy); Giuliano Scarcelli, Univ. of Maryland, College Park (United States) [10674-15]

The orbital angular momentum of light for quantum applications,

Laurence Pruvost, Aurélien Chopinaud, Bruno Viarais de Leseqno, Ctr. National de la Recherche Scientifique (France); Marion Jacquay, Univ. Paris-Sud 11 (France) and Ctr. National de la Recherche Scientifique (France) ... [10674-16]

CONFERENCE 10674

SESSION 5. TUE 10:40 TO 12:30

Quantum Components I

High-performance semiconductor single photon sources

(Invited Paper), Pascale Senellart, Lab. de Photonique et de Nanostructures (France) [10674-17]

Single photon extraction from defects in hBN using a tapered fiber,

Andreas W. Schell, ICFO - Institut de Ciències Fotòniques (Spain); Toan Trong Tran, Univ. of Technology, Sydney (Australia); Hideaki Takashima, Kyoto Univ. (Japan); Igor Aharonovich, Univ. of Technology, Sydney (Australia); Shigeki Takeuchi, Kyoto Univ. (Japan) [10674-18]

Metallic nanorings for enhanced extraction of light from single InAs/GaAs quantum dots,

Oliver Trojak, Univ. of Southampton (United Kingdom); Jin D. Song, Korea Institute of Science and Technology (Korea, Republic of); Luca Sapienza, Univ. of Southampton (United Kingdom) [10674-19]

Hybrid plasmonic waveguide coupled to a single organic dye molecule,

Samuele Grandi, Michael Nielsen, Javier Cambiasso, Sebastian Boissier, Kyle D. Major, Imperial College London (United Kingdom); Christopher Reardon, Thomas F. Krauss, Univ. of York (United Kingdom); Rupert F. Oulton, E. A. Hinds, Alex Clark, Imperial College London (United Kingdom) . [10674-20]

On-demand single-photon source based on thermal rubidium,

Fabian Ripka, Harald Kübler, Robert Löw, Univ. Stuttgart (Germany) [10674-21]

Lunch/Exhibition Break Tue 12:30 to 13:50

SESSION 6. TUE 13:50 TO 16:00

Quantum Technology

TBA3 (Invited Paper), Christophe Salomon, Lab. Kastler Brossel

(France) [10674-22]

Alignment requirements of Fabry-Perot microresonators for ion

trap quantum information processing, Dean Clarke, Peter Horak, Optoelectronics Research Ctr. (United Kingdom) [10674-23]

Genetic quantum measurements, Ivo Pietro Degiovanni, Istituto Nazionale

di Ricerca Metrologica (Italy); Salvatore Virzi, Istituto Nazionale di Ricerca Metrologica (Italy) and Univ. degli Studi di Torino (Italy); Enrico Rebuffello, Istituto Nazionale di Ricerca Metrologica (Italy) and Politecnico di Torino (Italy); Alessio Avella, Fabrizio Piacentini, Giorgio Brida, Marco Gramegna, Marco Genovese, Istituto Nazionale di Ricerca Metrologica (Italy) [10674-24]

LIY1-xHoxF4: a candidate material for the implementation of solid state

qubits, Adrian Beckert, Paul Scherrer Institut (Switzerland); Joe Bailey, Paul Scherrer Institut (Switzerland) and Ecole Polytechnique Fédérale de Lausanne (Switzerland); Guy Matmon, London Ctr. for Nanotechnology (United Kingdom); Simon Gerber, Hans Sigg, Paul Scherrer Institut (Switzerland); Gabriel Aepli, Paul Scherrer Institut (Switzerland) and Ecole Polytechnique Fédérale de Lausanne (Switzerland) [10674-25]

Bridging integrated waveguides with single photon emitters,

Christophe Couteau, Stefano Pierini, Xiaolun Xu, Josslyn Beltram-Madrigal, Renaud Bachelot, Sylvain Blaize, Univ. de Technologie Troyes (France) [10674-26]

On-chip excitation of diamond colour centers using low-loss dielectric-

loaded surface plasmon polariton waveguides, Hamidreza Siampour, Shailesh Kumar, Sergey I. Bozhevolnyi, Univ. of Southern Denmark (Denmark) [10674-27]

HOT TOPICS SESSION II. 16:30 TO 18:05

Coherent combination of fiber amplified ultrafast laser pulses

Jens Limpert, Institute of Applied Physics, Friedrich Schiller Univ. Jena, Germany

2D materials and their heterostructures: fundamentals,

applications and prototypes
Frank Koppens, ICFO-The Institute of Photonic Sciences, Spain

For additional details, please see page 7

TUESDAY POSTER SESSION. TUE 18:00 TO 19:30

Posters-Tuesday

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Poster authors, view poster presentation guidelines and set-up instructions at <http://spie.org/x34963.xml> and on page 96.

Complete security model for authentication of QKD protocols, Aleksandar D. Stojanovic, Instituto de Telecomunicações (Portugal) [10674-48]

Quantum state comparison amplifier with feedforward state correction,

Luca Mazzarella, Univ. of Strathclyde (United Kingdom); Ross Donaldson, Robert Collins, Ugo Zanforlin, Heriot-Watt Univ. (United Kingdom); Gioan Tatti, Univ. of Strathclyde (United Kingdom); Gerald Buller, John Jeffers, Heriot-Watt Univ. (United Kingdom) [10674-49]

Zerodur-based optical benches for quantum sensor technology,

Patrick Windpassinger, André Wenzlawski, Moritz Mihm, Pierre Marburger, Johannes Gutenberg Univ. Mainz (Germany) [10674-50]

Enhanced time-bin quantum channels by use of migrated spatial or

polarization quantum states, Salem F. Hegazy, Cairo Univ. (Egypt); Salah S. A. Obayya, Zewail City of Science and Technology (Egypt); Bahaa E. A. Saleh, Univ. of Central Florida (United States) [10674-51]

Measuring orbital angular momentum of light by using a trapped atom,

Naeimeh Mohseni, Institute for Advanced Studies in Basic Sciences (Iran, Islamic Republic of) [10674-52]

Single-pulse and dual-pulse time resolved VUV LIBS: a comparative

study, Syedah Sadaf Zehra, Dublin City Univ. (Ireland); Peirgiorgio Nicolosi, Univ. degli Studi di Padova (Italy); John Costello, Paddy Hayden, Dublin City Univ. (Ireland) [10674-53]

In THz band Josephson junction can work as the superwide receiver, the

frequency meter and the tuner of generators, Alexander G. Denisov, Qiu Jinghui, Harbin Institute of Technology (China) [10674-54]

Single- and multidimensional integrated optic photon sources for

quantum communication, Rohit K. Ramakrishnan, Varun Raghunathan, Srinivas Talabattula, Indian Institute of Science (India) [10674-55]

Quantum correlations: or how to turn a quantum simulator into a

quantum sensor, Tommaso Roscilde, Irénée Frérot, Ecole Normale Supérieure de Lyon (France) [10674-56]

European coordinated metrological effort for quantum cryptography,

Marco Gramegna, Istituto Nazionale di Ricerca Metrologica (Italy) . [10674-57]

Entanglement of two-mode Schrödinger cats, Dmitri B. Horoshko,

B.I. Stepanov Institute of Physics (Belarus) and Lab. de Physique des Lasers, Atomes et Molécules (France); Stephan De Bievre, Univ. des Sciences et Technologies de Lille (France); Giuseppe Patera, Mikhail I. Kolobov, Lab. de Physique des Lasers, Atomes et Molécules (France) [10674-58]

Carbon quantum dots: synthesis and application in QLEDs, Sofia Paulo

Mirasol, ICIQ - Institut Català d'Investigació Química (Spain) [10674-59]

A systematic study of resonator quantum well infrared photodetector

(QWIP), Jason N. Sun, U.S. Army Research Lab. (United States) . . [10674-60]

High-dimensional quantum key distribution using differential-phase-

shifted twisted light, Ayman S. Morsy, Zewail City of Science and Technology (Egypt); Salem F. Hegazy, Cairo Univ. (Egypt); Salah S. A. Obayya, Zewail City of Science and Technology (Egypt) [10674-61]

High-dimensional quantum key distribution by coherence modulation

and orbital angular momentum at the photon-counting level, Yezid Torres Moreno, Paula A. López Higuera, Univ. Industrial de Santander (Colombia); William T. Rhodes, Florida Atlantic Univ. (United States) [10674-62]

Photoluminescence spectra of biexciton in GaAs strongly oblate

ellipsoidal quantum dot, Yura Bleyan, Russian-Armenian Univ. (Armenia); David Boris Hayrapetyan, Davit A. Baghdasaryan, H. A. Sarkisyan, Eduard M. Kazaryan, Russian-Armenian (Slavonic) Univ. (Armenia) . [10674-63]

Semiconductor quantum dot to fiber coupling system for 1.3μm range,

Kinga Żolnacz, Wacław Urbańczyk, Wrocław Univ. of Science and Technology (Poland); Nicole Srocka, Tobias Heuser, David Quandt, André Strittmatter, Sven Rodt, Stephan Reitzenstein, Institut für Festkörperphysik, Technische Univ. Berlin (Germany); Anna Musiał, Paweł Mrowiński, Grzegorz Sęk, Wrocław Univ. of Science and Technology (Poland); Krzysztof Poturaj, Univ. of Maria Curie-Skłodowska (Poland); Grzegorz Wójcik, Maria Curie-Skłodowska Univ. (Poland); Paweł Mergo, Univ. of Maria Curie-Skłodowska (Poland); Kamil Dybka, Mariusz Dyrkacz, Michał Dłubek, FIBRAIN Sp. z o.o. (Poland) [10674-64]

Measurement-immune quantum secured communications,

Byoung S. Ham, Gwangju Institute of Science and Technology (Korea, Republic of); Jungho Bang, Korea Institute for Advanced Study (Korea, Republic of) [10674-65]

WEDNESDAY 25 APRIL

SESSION 7.....WED 8:30 TO 10:20

Quantum Components II

Semiconductor quantum dots as photon sources in quantum networks (*Invited Paper*), Tim Kroh, Andreas Ahlrichs, Chris Müller, Humboldt-Univ. zu Berlin (Germany); Andreas W. Schell, ICFO - Institut de Ciències Fotòniques (Spain); Benjamin Sprenger, Menlo Systems GmbH (Germany); Janik Wolters, Univ. Basel (Switzerland); Johannes Wildmann, Rinaldo Trotta, Armando Rastelli, Johannes Kepler Univ. Linz (Austria); Oliver G. Schmidt, IFW Dresden (Germany); Oliver Benson, Humboldt-Univ. zu Berlin (Germany) [10674-28]

Nonlinear photon-atom coupling in free space, Matthias Steiner, National Univ. of Singapore (Singapore); Yue-Sum Chin, Christian Kurtsiefer, Ctr. for Quantum Technologies, National Univ. of Singapore (Singapore) ... [10674-29]

Ultrafast photonic quantum correlations mediated by individual phonons, Christophe Galland, Santiago Tarrago, Mitchell D. Anderson, Ecole Polytechnique Fédérale de Lausanne (Switzerland) [10674-30]

Generating entangled photons: a parallel crystal entanglement source (PACES), Aitor Villar, Alexander Lohrmann, Alexander Ling, Ctr. for Quantum Technologies, National Univ. of Singapore (Singapore) [10674-31]

Pure photon sources for many-photon cluster states generation, Dmytro Kundys, Francesco Graffitti, Massimiliano Proietti, Peter Barrow, Alex Pickston, Martin Ringbauer, Alessandro Fedrizzi, Heriot-Watt Univ. (United Kingdom) [10674-32]

SESSION 8.....WED 10:50 TO 12:40

Quantum Communications I

Quantum communication across deployed fibre (*Invited Paper*), Wolfgang Tittel, Univ. of Calgary (Canada) [10674-33]

Quantum interference with frequency-locked dissimilar light sources, Chris Müller, Tim Kroh, Humboldt-Univ. zu Berlin (Germany); Yanting Teng, Univ. of Illinois (United States); Andreas Ahlrichs, Oliver Benson, Humboldt-Univ. zu Berlin (Germany) [10674-34]

Optical injection locking applied to quantum key distribution protocols, George L. Roberts, James F. Dynes, Toshiba Research Europe Ltd. (United Kingdom); Seb J. Savory, Univ. of Cambridge (United Kingdom); Zhiliang L. Yuan, Andrew J. Shields, Marco Lucamarini, Toshiba Research Europe Ltd. (United Kingdom) [10674-35]

All-optical synchronization for quantum communication networks, Bruno Fedrici, Sébastien Tanzilli, Virginia D'Auria, Laurent Labonté, Olivier Alibert, Lab. de Physique de la Matière Condensée (France) . [10674-36]

Quantum optical state comparison amplification of coherent states, Ross Donaldson, Heriot-Watt Univ. (United Kingdom); Luca Mazzarella, Univ. of Strathclyde (United Kingdom); Robert Collins, Ugo Zanforlin, Heriot-Watt Univ. (United Kingdom); John Jeffers, Univ. of Strathclyde (United Kingdom); Gerald Buller, Heriot-Watt Univ. (United Kingdom) [10674-37]

SESSION 9.....WED 13:50 TO 15:40

Quantum Communications II

TBA2 (*Invited Paper*), Dirk R. Englund, Massachusetts Institute of Technology (United States) [10674-38]

High speed quantum key distribution in a metropolitan network, James F. Dynes, Winci W. S. Tam, Andrew W. Sharpe, Marco Lucamarini, Alan Plews, Zhiliang L. Yuan, Toshiba Research Europe Ltd. (United Kingdom); Ririka Takahashi, Toshiba Corp. (Japan); Joo Y. Cho, ADVA AG Optical Networking (Germany); Alexander R. Dixon, Yoshimichi Tanizawa, Toshiba Corp. (Japan); Adrian Wonfor, Richard V. Pentty, Univ. of Cambridge (United Kingdom); Andrew J. Shields, Toshiba Research Europe Ltd. (United Kingdom) [10674-39]

Design of an evaluation breadboard with SNSPD for testing various deep space optical communication applications, Hristo Ivanov, Erich Leitgeb, Technische Univ. Graz (Austria) [10674-40]

InP photonic integrated quantum random number generator based on measuring laser phase fluctuations, Francisco J. Diaz-Otero, Laura Pedrosa-Rodriguez, Omar Guillan-Lorenzo, Univ. de Vigo (Spain) [10674-41]

Modeling high quantum bit rate QKD systems over optical fiber, Michal Mlejnek, Corning Incorporated (United States); Nikolay A. Kaliteevskiy, Corning Scientific Ctr. (Russian Federation); Dan A. Nolan, Corning Incorporated (United States) [10674-42]

SESSION 10.....WED 16:10 TO 17:50

Metrology for Quantum Communications

High count rate InGaAs/InP SPAD system with balanced SPAD-dummy approach running up to 1.4 GHz, Mirko Sanzaro, Alessandro Ruggeri, Adriano Peruch, Alberto Tosi, Politecnico di Milano (Italy) [10674-43]

Quantum key distribution security threat: the backflash light case, Alice Meda, Ivo Pietro Degiovanni, Istituto Nazionale di Ricerca Metrologica (Italy); Alberto Tosi, Politecnico di Milano (Italy); Zhiliang L. Yuan, Toshiba Research Europe Ltd. (United Kingdom); Giorgio Brida, Marco Genovese, Istituto Nazionale di Ricerca Metrologica (Italy) [10674-44]

Looking-forward criteria for the certification of quantum key distribution, Marco Lucamarini, James F. Dynes, Zhiliang L. Yuan, Martin B. Ward, Andrew J. Shields, Toshiba Research Europe Ltd. (United Kingdom) [10674-45]

Measurements towards providing security assurance for a chip-scale QKD transmitter, Christopher J. Chunnillall, National Physical Lab. (United Kingdom); Andy Hart, Quantum Engineering Technology Labs., Univ. of Bristol (United Kingdom); Robert Kirkwood, National Physical Lab. (United Kingdom); Henry Semenenko, Quantum Engineering Ctr. for Doctoral Training, Univ. of Bristol (United Kingdom); Philip Sibson, Quantum Engineering Technology Labs., Univ. of Bristol (United Kingdom) [10674-46]

Pilot comparison on the measurement of detection efficiency of InGaAs/InP single-photon detectors, Marco Lopez, PTB (Germany) [10674-47]

CONFERENCE 10675

Monday–Tuesday 23–24 April 2018 • Proceedings of SPIE Vol. 10675

3D Printed Optics and Additive Photonic Manufacturing

Conference Chairs: **Alois M. Herkommer**, Univ. Stuttgart (Germany); **Georg von Freymann**, Technische Univ. Kaiserslautern (Germany); **Manuel Flury**, Institut National des Sciences Appliquées de Strasbourg (France)

Programme Committee: **Klaus Bade**, Karlsruher Institut für Technologie (Germany); **Alain Bosseboeuf**, Univ. Paris-Sud 11 (France); **Thierry Engel**, IREPA LASER (France); **François Geiskopf**, Institut National des Sciences Appliquées de Strasbourg (France); **Harald Giessen**, Univ. Stuttgart (Germany); **Kevin J. Heggarty**, Télécom Bretagne (France); **Hans Peter Herzig**, Ecole Polytechnique Fédérale de Lausanne (Switzerland); **Christian Koos**, Karlsruher Institut für Technologie (Germany); **Pierre Renaud**, Institut National des Sciences Appliquées de Strasbourg (France); **Michael Thiel**, Nanoscribe GmbH (Germany); **Michael Totzeck**, Carl Zeiss SMT GmbH (Germany); **Reinhard Voelkel**, SUSS MicroOptics SA (Switzerland); **Ricky D. Wildman**, The Univ. of Nottingham (United Kingdom)

MONDAY 23 APRIL

HOT TOPICS SESSION I 9:00 TO 11:00

From Einstein doubts to quantum bits: a second quantum revolution

Alain Aspect, Lab. Charles Fabry, Institut d'Optique, France

Pico-Photonics: watching and sensing single molecules by confining light to the atom scale

Jeremy J. Baumberg, NanoPhotonics Ctr., Univ. of Cambridge, United Kingdom

For additional details see page 6.

OPENING REMARKS 11:25 TO 11:30

SESSION 1 MON 11:30 TO 12:40

Hype Technology in 3D Printing

Session Chair: **Georg von Freymann**,
Technische Univ. Kaiserslautern (Germany)

3D printing for versatile optics (*Invited Paper*), Jyrki Saarinen, Bisrat G. Assefa, Markku Pekkarinen, Univ. of Eastern Finland (Finland); Joris Biskop, Luxexcel Group B.V. (Belgium) [10675-1]

Optimized ceramic mirror made by 3D printing, Nicolas Rousselet, 3DCeram (France) [10675-2]

3D printing for astronomical mirrors, Carolyn Atkins, UK Astronomy Technology Ctr. (United Kingdom); Sabri Lemared, Ctr. National de la Recherche Scientifique (France) and Lab. d'Astrophysique de Marseille (France) [10675-3]

Lunch Break Mon 12:40 to 13:50

SESSION 2 MON 13:50 TO 15:20

Integrated Optics and 3D Printing

Session Chair: **Alois M. Herkommer**, Univ. Stuttgart (Germany)

3D printing of material measures for areal surface texture (*Invited Paper*), Matthias Eifler, Julian Hering, Georg von Freymann, Jörg Seewig, Technische Univ. Kaiserslautern (Germany) [10675-4]

Inkjet printing from waveguiding to plasmonics, Fabian Lütolf, Ctr. Suisse d'Electronique et de Microtechnique SA (Switzerland); Pius Theiler, ETH Zurich (Switzerland); Luc Dümpelmann, Ctr. Suisse d'Electronique et de Microtechnique SA (Switzerland); Judith Müller, Univ. Basel (Switzerland); Saleh Aghajani, Politecnico di Milano (Italy); Benjamin Gallinet, Rolando Ferrini, Ctr. Suisse d'Electronique et de Microtechnique SA (Switzerland) ... [10675-5]

Out of plane couplers for direct laser-written polymer waveguides on optical chips, Alexander Landowski, State Research Ctr. for Optics and Material Sciences, Technische Univ. Kaiserslautern (Germany) and Graduate School Materials Science in Mainz (Germany); Stefan Guckenbiehl, Marius Schönborg, Jonas Gutsche, State Research Ctr. for Optics and Material Sciences, Technische Univ. Kaiserslautern (Germany); Georg von Freymann, State Research Ctr. for Optics and Material Sciences, Technische Univ. Kaiserslautern (Germany) and Fraunhofer Institute for Industrial Mathematics ITWM (Germany); Artur Widera, State Research Ctr. for Optics and Material Sciences, Technische Univ. Kaiserslautern (Germany) and Graduate School Materials Science in Mainz (Germany) [10675-6]

Structuring light using integrated miniature 3D printed phase elements, Shlomi Lightman, Gilad Hurvitz, Raz Gvishi, Soreq Nuclear Research Ctr. (Israel); Ady Arie, Tel Aviv Univ. (Israel) [10675-7]

SESSION 3 MON 15:50 TO 17:40

Two Photon Lithography

Session Chair: **Matthias Eifler**,
Technische Univ. Kaiserslautern (Germany)

Complex 3D printed microoptics: towards first applications (*Invited Paper*), Harald Giessen, Univ. Stuttgart (Germany) [10675-8]

Zero overlap stitching of microlens arrays with two-photon polymerisation, Sam Dehaeck, Benoit Scheid, Pierre Lambert, Univ. Libre de Bruxelles (Belgium) [10675-9]

Hybrid additive and subtractive laser 3D microprocessing in glass/polymer microsystems for chemical sensing applications, Titas Tičkūnas, Vilnius Univ. (Lithuania), Femtika Ltd. (Lithuania); Mangirdas Malinauskas, Domas Paipulas, Roaldas Gadonas, Vilnius Univ. (Lithuania); Yves Bellouard, Ecole Polytechnique Fédérale de Lausanne (Switzerland) [10675-10]

Rapid 3D printing in mesoscale, Mangirdas Malinauskas, Darius Gailevicius, Sima Rekstyte, Vilnius Univ. (Lithuania); Saulius Juodkazis, Swinburne Univ. of Technology (Australia) [10675-11]

Fabrication of 3D X-ray compound refractive lenses by two-photon polymerization lithography, Natalia Kokareva, M.V. Lomonosov Moscow State Univ. (Russian Federation); Alexander Petrov, Ctr. for Functionalized Magnetic Materials, Immanuel Kant Baltic Federal Univ. (Russian Federation) and M.V. Lomonosov Moscow State Univ. (Russian Federation); Vladimir Bessonov, M.V. Lomonosov Moscow State Univ. (Russian Federation); Ksenia Abrashitova, Immanuel Kant Baltic Federal Univ. (Russian Federation) and M.V. Lomonosov Moscow State Univ. (Russian Federation); Kirill Safronov, M.V. Lomonosov Moscow State Univ. (Russian Federation); Aleksandr Barannikov, Petr Ershov, Nataliya Klimova, Immanuel Kant Baltic Federal Univ. (Russian Federation); Ivan Lyatun, Ctr. for Functionalized Magnetic Materials, Immanuel Kant Baltic Federal Univ. (Russian Federation); Vyacheslav Yunkin, Institute of Microelectronics Technology and High Purity Materials RAS (Russian Federation); Maxim Polikarpov, European Molecular Biology Lab. (Germany); Irina Snigireva, ESRF - The European Synchrotron (France); Andrey Fedyanin, M.V. Lomonosov Moscow State Univ. (Russian Federation); Anatoly Snigirev, Immanuel Kant Baltic Federal Univ. (Russian Federation) [10675-12]

MONDAY POSTER SESSION MON 17:30 TO 19:00

Posters-Monday

Conference attendees are invited to attend the Photonics Europe poster session on Monday 17.30 to 19.00. Posters will be on display after 10.00 Monday morning in the Hall Rhin. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster authors, view poster presentation guidelines and set-up instructions at <http://spie.org/x34963.xml> and on page 96.

Polishing polycrystalline diamond composite wafers by selective ablation with high power femtosecond laser, William Scalbert, Element Six Ltd. (Ireland) [10675-23]

Effectiveness of fine-pitch lenticular lens arrays fabricated using projection lithography for improving resolution and clearness in switching of two pictures, Toshiyuki Horiuchi, Maiko Kurata, Sataoshi Miyazawa, Yuta Morizane, Tokyo Denki Univ. (Japan) [10675-24]

Fabrication test of reflective complex optical structure by 3D printing, Lihong Liu, ICube, Univ. de Strasbourg (France); Thierry Engel, Institut National des Sciences Appliquées de Strasbourg (France); Pierre Pfeiffer, Stephane Roques, ICube, Univ. de Strasbourg (France); Amadou Coulibaly, Denis Cavallucci, Manuel Flury, Institut National des Sciences Appliquées de Strasbourg (France) [10675-25]

SESSION 4..... TUE 8:30 TO 10:20

Additive Manufacturing

Session Chair: **Thierry ENGEL**, Univ. de Strasbourg (France)

3D printing of optics (*Invited Paper*), Andreas Heinrich, Manuel Rank, Andre Sigel, Sangeetha Suresh Nair, Yannick Bauckhage, Hochschule Aalen (Germany) [10675-13]

Optical line generation using a 3D-printed component: application for the development of a force sensor, Lucas Viot, ICube, Univ. de Strasbourg (France) and Ctr. National de la Recherche Scientifique (France) and Institut National des Sciences Appliquées de Strasbourg (France); Sylvain Lecler, ICube, Univ. de Strasbourg (France); Pierre Pfeiffer, ICube, Univ. de Strasbourg (France) and Ctr. National de la Recherche Scientifique (France); Jérémy Begey, ICube, Univ. de Strasbourg (France) and Ctr. National de la Recherche Scientifique (France) and Institut National des Sciences Appliquées de Strasbourg (France); François Geiskopf, ICube, Univ. de Strasbourg (France) and Institut National des Sciences Appliquées de Strasbourg (France) and Ctr. National de la Recherche Scientifique (France); Mathieu Nierenberger, ICube, Univ. de Strasbourg (France) and Institut National des Sciences Appliquées de Strasbourg (France) and Ctr. National de la Recherche Scientifique (France); Pierre Renaud, ICube, Univ. de Strasbourg (France) and Institut National des Sciences Appliquées de Strasbourg (France) and Ctr. National de la Recherche Scientifique (France) [10675-14]

Application of 3D printed models to visual measurement in the new innovative depth from defocus method, Wojciech Sulej, Krzysztof Murawski, Wojskowa Akademia Techniczna im. Jarosława Dąbrowskiego (Poland) [10675-15]

Applying fused layer modeling technologies to print embedded 3D optical waveguide structures for communication and sensor applications, Oliver Stübbe, Ostwestfalen-Lippe Univ. of Applied Sciences (Germany) [10675-16]

3D printing of coherent fiber optics image guides, Tomasz S. Tkaczyk, Ye Wang, John Gawedzinski, Michał Pawłowski, Rice Univ. (United States) [10675-17]

SESSION 5..... TUE 10:50 TO 12:00

Direct Laser Writing

Session Chair: **Manuel Flury**, Institut National des Sciences Appliquées de Strasbourg (France)

Direct laser writing of 2D and 3D submicrostructures via optically induced local thermal effect (*Invited Paper*), Ngoc Diep Lai, Ecole Normale Supérieure de Cachan (France) [10675-18]

Direct laser-written metal and metal-composite microstructures, Erik H. Waller, Technische Univ. Kaiserslautern (Germany); Georg von Freymann, Technische Univ. Kaiserslautern (Germany) and Fraunhofer Institute for Industrial Mathematics (Germany) [10675-19]

3D-printed dielectric devices for the THz range, Felipe Beltran-Mejia, Instituto Nacional de Telecomunicações – Inatel (Brazil); David Jahn, Marcel Weidenbach, Arno Rehn, Jannik Lehr, Stefan F. Busch, Philipps-Universität Marburg (Germany); Jan C. Balzer, Univ. Duisburg-Essen (Germany); Martin Koch, Philipps-Universität Marburg (Germany) [10675-20]

SESSION 6..... TUE 12:00 TO 12:50

Additive Manufacturing-Additive Layer-Powder

Session Chair: **Manuel Flury**, Institut National des Sciences Appliquées de Strasbourg (France)

LMD-CLAD® additive manufacturing: achieving trends of distortion and locating residual stresses in scale parts through time-efficient simulation (*Invited Paper*), Ludovic Kounde, IREPA LASER (France); Thierry Engel, Institut National des Sciences Appliquées de Strasbourg (France) and IREPA LASER (France); Didier Boisselier, IREPA LASER (France) [10675-21]

Production of glass filters by selective laser sintering, Anne-Marie Schwager, Jens Bliedtner, Kerstin Götzke, Armin Bruder, Ernst-Abbe-Hochschule Jena (Germany) [10675-22]

HOT TOPICS SESSION II..... 16:30 TO 18:05

Coherent combination of fiber amplified ultrafast laser pulses, Jens Limpert, Institute of Applied Physics, Friedrich Schiller Univ. Jena, Germany

2D materials and their heterostructures: fundamentals, applications and prototypes, Frank Koppens, ICFO-The Institute of Photonic Sciences, Spain

For additional details, please see page 7

Selective bio-functionalization of subdiffractive polymer structures, Eljasa Murtezi, Richard Wollhofen, Institute of Applied Physics, Johannes Kepler Univ. Linz (Austria); Jaroslav Jacak, Institute of Applied Physics, Johannes Kepler Univ. Linz (Austria) and Upper Austria Univ. of Applied Sciences (Austria); Thomas A. Klar, Institute of Applied Physics, Johannes Kepler Univ. Linz (Austria) [10675-26]

Wrinkled axicons and 3D metasurfaces, Mangirdas Malinauskas, Albertas Žukauskas, Vilnius Univ. (Lithuania); Armandas Balciytis, Swinburne Univ. of Technology (Australia); Benjamin Sanchez-Padilla, Davit Hakobyan, Etienne Brasselet, Univ. Bordeaux 1 (France); Saulius Juodkazis, Swinburne Univ. of Technology (Australia) [10675-27]

3D opto-structuring of ceramics at nanoscale, Mangirdas Malinauskas, Simas Sakirzanovas, Viktorija Padolskyte, Darius Gailevicius, Vilnius Univ. (Lithuania); Vygantas Mizeikis, Shizuoka Univ. (Japan); Kestutis Staliunas, Univ. Politècnica de Catalunya (Spain); Saulius Juodkazis, Swinburne Univ. of Technology (Australia) [10675-28]

Polarization influence in 3D femtosecond direct laser writing nanolithography, Mangirdas Malinauskas, Simonas Varapnickas, Sima Rekštyte, Darius Gailevicius, Vilnius Univ. (Lithuania); Saulius Juodkazis, Swinburne Univ. of Technology (Australia) [10675-29]

Real-time stop-flow two-photon lithography for microparticle array and particle cluster array, Bing Xu, Dong Wu, Yanlei Hu, Univ. of Science and Technology of China (China) [10675-30]

Helical microstructures fabricated by femtosecond structured optical vortices, Jincheng Ni, Yanlei Hu, Jiawen Li, Dong Wu, Univ. of Science and Technology of China (China) [10675-31]

Characterization and applications of 3D printed SWCNT-COOH/acrylate composites fabricated via multiphoton absorption polymerization, Adriano J. G. Otuka, Instituto de Física de São Carlos, Univ. de São Paulo (Brazil); Vinicius Tribuzi, Univ. Federal de São Carlos (Brazil); Josiani C. Stefanelo, Marcos R. Cardoso, Instituto de Física de São Carlos, Univ. de São Paulo (Brazil); Daniel S. Correa, Lab. Nacional de Nanotecnologia para o Agronegócio, Embrapa Instrumentação Agropecuária (Brazil); Antonio R. Zanatta, Cleber R. Mendonça, Instituto de Física de São Carlos, Univ. de São Paulo (Brazil) [10675-32]

Fabrication of 3D photonic crystal with band gap in the telecommunication region, Vinicius Tribuzi, Univ. Federal de São Carlos (Brazil); Adriano J. G. Galvani Otuka, Cleber R. Mendonça, Univ. de São Paulo (Brazil) [10675-33]

A coupled temperature-displacement-diffusion phase field model for grain growth during laser-aided metal deposition, Fikret Kh. Mirzade, Institute on Laser and Information Part Technologies of the Russian Academy of Sciences (Russian Federation) and ILIT RAS - Branch of the FSRC "Crystallography and Photonics" RAS (Russian Federation) [10675-34]

Fabrication of high-performance lithium niobate photonic integrated circuits using laser microtrimming, Aleksandr Tronev, ITMO Univ. (Russian Federation) and Ioffe Institute (Russian Federation); Mikhail Parfenov, Saint-Petersburg State Polytechnical Univ. (Russian Federation) and Ioffe Institute (Russian Federation); Peter Agruzov, Igor Ilichev, Aleksandr V. Shamrai, Ioffe Institute (Russian Federation) [10675-35]

The technology of laser fabrication of cell 3D scaffolds based on proteins and carbon nanoparticles, Alexander Yurevich Gerasimenko, Natalia Zhurbina, Ulyana Kurilova, Aleksandr Polokhin, Dmitry Ryabkin, Mikhail Savelyev, Levan Ichkitidze, Vitaliy Podgaetsky, Sergey V. Selishchev, National Research Univ. of Electronic Technology (Russian Federation) [10675-36]

Temperature distribution of gas powder jet formed by coaxial nozzle in laser metal deposition, Yuri N. Zavalov, Alexander V. Dubrov, Fikret Kh. Mirzade, Research Ctr. Crystallography and Photonics of the Russian Academy of Sciences (Russian Federation); Elena S. Makarova, Research Ctr. Crystallography and Photonics of the Russian Academy of Sciences (Russian Federation); Nikolay G. Dubrovin, Vladimir D. Dubrov, Research Ctr. Crystallography and Photonics of the Russian Academy of Sciences (Russian Federation) [10675-37]

On numerical modeling of heat transfer and fluid flow in selective laser melting of metal powder bed, Fikret Kh. Mirzade, ILIT RAS - Branch of the FSRC "Crystallography and Photonics" RAS (Russian Federation); Alexander V. Dubrov, Vladimir D. Dubrov, Institute on Laser and Information Part Technologies of the Russian Academy of Sciences (Russian Federation) [10675-38]

Optimization of process parameters at laser powder deposition using numerical simulation of thermal behavior, Alexander V. Dubrov, Fikret Kh. Mirzade, Vladimir D. Dubrov, Pavel S. Rodin, ILIT RAS - Branch of the FSRC "Crystallography and Photonics" RAS (Russian Federation) [10675-39]

On multiscale modelling of microstructure evolution in laser metal deposition process, Alexander V. Dubrov, Fikret Kh. Mirzade, Vladimir D. Dubrov, ILIT RAS - Branch of the FSRC "Crystallography and Photonics" RAS (Russian Federation) [10675-40]

Fabrication of 3D microstructure with direct selective laser baking of PDMS, Mohammadreza Riahi, Atefeh Ghaffari, Fatemeh Karimi, K.N. Toosi Univ. of Technology (Iran, Islamic Republic of) [10675-41]

CONFERENCE 10676

Tuesday–Wednesday 24–25 April 2018 • Proceedings of SPIE Vol. 10676

Digital Optics for Immersive Displays (DOID18)

Conference Chairs: **Bernard C. Kress**, Microsoft Corp. (United States); **Wolfgang Osten**, Institut für Technische Optik (Germany); **Hagen Stolle**, SeeReal Technologies GmbH (Germany)

Programme Committee: **Tibor Balogh**, Holografika Kft. (Hungary); **Christian Bosshard**, Ctr. Suisse d'Electronique et de Microtechnique SA (Switzerland); **Federico Capasso**, Harvard School of Engineering and Applied Sciences (United States); **Jerome Carollo**, Google (United States); **Arie den Boef**, ASML Netherlands B.V. (Netherlands); **Andreas Hermerschmidt**, HOLOEYE Photonics AG (Germany); **Hans Peter Herzig**, Ecole Polytechnique Fédérale de Lausanne (Switzerland); **Tobias Haist**, Institut für Technische Optik (Germany); **Marc D. Himel**, JENOPTIK Optical Systems, LLC (United States); **Hong Hua**, College of Optical Sciences, The Univ. of Arizona (United States); **Fu-Chung Huang**, NVIDIA Corp. (United States); **Norbert Kerwien**, Carl Zeiss AG (Germany); **Lutz Körner**, INTERGLASS Technology AG (Switzerland); **Byoung-Ho Lee**, Seoul National Univ. (Korea, Republic of); **Cindy Lee**, KHD Ltd. (China); **Scott McEldowney**, Oculus VR, LLC (United States); **Juan C. Miñano**, Limbak 4PI S.L. (Spain); **Ilmars Osmanis**, Lightspace Technologies, SIA (Latvia); **Silvania F. Pereira**, Technische Univ. Delft (Netherlands); **Christophe Peroz**, Magic Leap, Inc. (United States); **Pascal Picart**, Le Mans Univ. (France); **Demetri Psaltis**, Ecole Polytechnique Fédérale de Lausanne (Switzerland); **Monika Ritsch-Marte**, Medizinische Univ. Innsbruck (Austria); **Khaled Sarayedine**, Robert Stevens, Adlens Ltd (United Kingdom); **Hagen Stolle**, SeeReal Technologies GmbH (Germany); **Adrian Travis**, Microsoft Corp. (United States); **Reinhard Voelkel**, SUSS MicroOptics SA (Switzerland); **Angus Wu**, Huawei Technologies Co., Ltd. (United States); **Frank Wyrowski**, Friedrich-Schiller-Univ. Jena (Germany)

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TUESDAY 24 APRIL

OPENING REMARKS 8:25 TO 8:30

SESSION 1 TUE 8:30 TO 10:30

Optical Challenges for Next-generation AR/VR headsets

Session Chair: **Bernard C. Kress**, Microsoft Corp. (United States)

AR technologies enabling next generation surgical procedures (Keynote Presentation), Luc Soler, Univ. Louis Pasteur (France) [10676-1]

Optical challenges for next-generation AR headsets (Invited Paper), Hong Hua, College of Optical Sciences, The Univ. of Arizona (United States) [10676-2]

Field of view: not just a number, Brian M. Wheelwright, Yusufu Sulai, Melissa Geng, Selso Luanava, Weichuan Gao, Jacques Gollier, Oculus VR, LLC (United States) [10676-3]

Optical design challenges from satellite imaging to augmented reality displays, Louahab Noui, DAQRI (United Kingdom) [10676-4]

Stray light evaluation and mitigation in immersive near-eye displays, Melissa Geng, Brian M. Wheelwright, Fenglin Peng, Wai Sze T. Lam, Yijing Fu, Alex Sohn, Yusufu Sulai, Jacques Gollier, Oculus VR, LLC (United States) [10676-5]

SESSION 2 TUE 10:50 TO 13:00

Design, Fabrication and Testing of Novel Optics for AR/VR systems

Session Chair: **Lutz Körner**, INTERGLASS Technology AG (Switzerland)

Ultra-compact multichannel freeform optics for 4xWUXGA OLED microdisplays (Invited Paper), Marina Buljan, Limbak 4PI S.L. (Spain); Bharathwaj Narasimhan, Pablo Benítez, Juan Carlos Miñano, Limbak 4PI S.L. (Spain), Univ. Politécnica de Madrid (Spain); Jesús López, Dejan Grabovičkić, Limbak 4PI S.L. (Spain); Milena Nikolić, Univ. Politécnica de Madrid (Spain); Eduardo Pérez, Jorge Gorospe, Limbak 4PI S.L. (Spain); Eduardo Sanchez, Juan Carlos González, Univ. Politécnica de Madrid (Spain); Pablo Zamora, Rubén Mohedano, Limbak 4PI S.L. (Spain) [10676-6]

Additive manufacturing of freeform micro-optics: design, fabrication and optical performance, Simon Thiele, Alois Herkommer, Harald Giessen, Univ. Stuttgart (Germany) [10676-7]

Casting technology for embedding optical elements into prescription spectacle lenses, Lutz Körner, Daniel Muff, INTERGLASS Technology AG (Switzerland) [10676-8]

Monolithic mold light guide for near to eye optical system, Khaled Sarayedine, OPTINVENT S.A. (France) [10676-9]

Optical metrology for the test and fabrication of immersive display components and subsystems, Peter J. de Groot, Leslie L. Deck, Zygo Corporation (United States) [10676-10]

HMD quality evaluation of projected image: hardware assessment and software evaluation for distortions correction, Thomas Miletto, Entela Gurabardhi, Enzo Francesca, Francesco Giartosio, Marco Francardi, GlassUp S.r.l. (Italy) [10676-11]

Lunch/Exhibition Break Tue 13:00 to 14:00

SESSION 3. TUE 14:00 TO 16:10

Holographic Optics for AR/VR Systems

Session Chair: **Thomas P. Fäcke**, Covestro AG (Germany)

Curved wedges and shearing gratings for augmented reality (Invited Paper), Adrian Travis, Microsoft Corp. (United States); Jiaqi Chu, Univ. of Cambridge (United Kingdom); Andreas Georgiou, Microsoft Research Cambridge (United Kingdom) [10676-12]

Characterisation and optimisation of Volume Holographic Optical Elements (VHOEs) in AR combiners for ghost reduction, Marco Francardi, Nicola Truant, Enzo Francesca, Francesco Giartosio, Thomas Miletto, GlassUp S.r.l. (Italy) [10676-13]

Bragg polarization gratings used as switchable elements in AR/VR holographic displays, Hagen Sahm, SeeReal Technologies GmbH (Germany); Oksana Sakhno, Fraunhofer-Institut für Angewandte Polymerforschung (Germany); Yuri Gritsal, SeeReal Technologies GmbH (Germany); Joachim Stumpe, Institut für Dünnschichttechnologie und Mikrosensorik e.V. (Germany) [10676-14]

DigiLens switchable Bragg grating waveguide optics for augmented reality applications, Milan Popovich, DigiLens Inc. (United Kingdom); Jonathan D. Waldern, Alastair J. Grant, DigiLens Inc. (United States) [10676-15]

Wavelength multiplexing recording of vHOEs in Bayfol® HX photopolymer film, Friedrich-Karl Bruder, Sven Hansen, Christel Manecke, Christian Rewitz, Enrico Orselli, Thomas Rölle, Brita Wewer, Covestro AG (Germany) [10676-16]

Meta-resonant waveguide gratings for augmented and mixed reality, Guillaume Basset, Ctr. Suisse d'Electronique et de Microtechnique SA (Switzerland) [10676-17]

HOT TOPICS SESSION II. 16:30 TO 18:05

Coherent combination of fiber amplified ultrafast laser pulses Jens Limpert, Institute of Applied Physics, Friedrich Schiller Univ. Jena, Germany

2D materials and their heterostructures: fundamentals, applications and prototypes Frank Koppens, ICFO-The Institute of Photonic Sciences, Spain

For additional details, please see page 7

TUESDAY POSTER SESSION. TUE 18:00 TO 19:30

DOID STUDENT OPTICAL DESIGN CHALLENGE FOR VR/AR AND MR: POSTER PRESENTATIONS

SPIE is joining with the world leading companies in VR, AR and MR HMD hardware development to organize the first Student Optical Design Challenge at the Digital Optics for Immersive Displays (DOID) Conference during SPIE Photonics Europe in Strasbourg.

The awards are designed to encourage and acknowledge excellence in oral and poster student paper presentations, and bridge the gap between traditional academic optics teaching and tangible industry expectations for today's immersive display products.

Conference attendees are invited to attend the Photonics Europe poster session on Tuesday 18.00 to 19.30. Posters will be on display after 10.00 Tuesday morning in the Hall Rhin. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions. Poster authors, view poster presentation guidelines and set-up instructions at <http://spie.org/x34963.xml> and on page 96.

Design of a full color large field-of-view see-through near to eye display, Yang Jianming, Univ. de Strasbourg (France) [10676-100]

Design of a freeform gradient-index prism for mixed reality head mounted display, Anthony J. Yee, Wanyue Song, Nicholas Takaki, Tianyi Yang, Yang Zhao, Yun Hui Ni, S. Yvonne Bodell, Julie L. Bentley, Duncan T. Moore, Univ. of Rochester (United States) [10676-101]

Holographic glasses with dynamic eyepiece, Changwon Jang, Kiseung Bang, Byoungcho Lee, Seoul National Univ. (Korea, Republic of) [10676-102]

Optical design, assembly and characterization of a holographic head mounted display, Anne Gärtner, Ernst-Abbe-Hochschule Jena (Germany); Ralf Häussler, SeeReal Technologies GmbH (Germany); Burkhard Fleck, Ernst-Abbe-Hochschule Jena (Germany); Hagen Stolle, SeeReal Technologies GmbH (Germany) [10676-103]

Mitigating vergence-accommodation conflict for near-eye displays via deformable beamsplitters, David Dunn, Qian Dong, Henry Fuchs, The Univ. of North Carolina at Chapel Hill (United States) [10676-104]

Designing of a monocular see-through smart glass imaging system, Tatiana A. Koneva, Galina E. Romanova, ITMO Univ. (Russian Federation) [10676-105]

Multiple reflection bug-eye design, Alexis Benamira, Institut d'Optique Graduate School (France) [10676-106]

Adaptative focus for AR glasses based on eye-tracking and/or eye's lens analysis, and real-time image processing, Alexandre Bouchez, Jules Guillion, Matthieu Chourrout, Institut d'Optique Graduate School (France) [10676-107]

Design and optimization of a large FOV and low-distortion head mounted display, John He, China Jiliang Univ. (China); Young Liu, Yi Zhuang, Haiyan Qi, China Jiliang Univ. (China); Changlun Hou, Hangzhou Dianzi Univ. (China) [10676-108]

A reflective prism for augmented reality with large field of view, Bo Chen, Univ. Stuttgart (Germany) [10676-109]

Design of a spatially multiplexed light field display on curved surfaces for VR HMD applications, Tianyi Yang, Nicholas Kochan, Samuel J. Steven, Greg Schmidt, Julie L. Bentley, Duncan T. Moore, Univ. of Rochester (United States) [10676-110]

See-through smart glass with adjustable focus, Hossein Shahinian, Todd Noste, Nicholas Sizemore, Clark Hovis, Prithiviraj Shanmugam, Nicholas Horvath, The Univ. of North Carolina at Charlotte (United States) [10676-111]

Design of augmented reality system based on DMD, Gong Shaobin, Zhejiang Univ. (China) [10676-112]

Compact see-through near-eye display with depth adaption, Yun-Han Lee, Guanjun Tan, Kun Yin, Shin-Tson Wu, Univ. of Central Florida (United States) [10676-113]

Design of a gradient index waveguide for improved augmented reality systems, Eryn A. Fennig, Yang Zhao, Samuel J. Steven, Tianyi Yang, Greg Schmidt, Julie L. Bentley, Duncan T. Moore, Univ. of Rochester (United States) [10676-114]

Design of a head mounted display based on freeform surfaces prism and dual display sources, Siyue Feng, Yunbing Ji, Xiaoheng Wang, Hongliang Wang, Changchun Institute of Optics, Fine Mechanics and Physics (China) [10676-115]

Design of a compact near-eye display system with wide field and high resolution, Tao Xiao, Zhejiang Univ. (China) [10676-116]

Ultrathin full color visor with large field of view based on multilayered metasurface design, Ori Avayu, Ran Dircovski, Tal Ellenbogen, Tel Aviv Univ. (Israel) [10676-117]

Meta-resonance waveguide gratings as highly wavelength-selective optical combiners for augmented reality, Giorgio Quaranta, Guillaume Basset, Ctr. Suisse d'Electronique et de Microtechnique SA (Switzerland) [10676-118]

A vergence accommodation conflict-free virtual reality wearable headset, Simon Charrière, Louis Duveau, Nour Skaf, Institut d'Optique Graduate School (France) [10676-119]

Ultrathin optical combiner with microstructure mirrors in augmented reality, Miaomiao Xu, Hong Hua, The Univ. of Arizona (United States) [10676-120]

Wide field-of-view waveguide displays enabled by polarization-dependent metagratings, Zhujun Shi, Wei Ting Chen, Federico Capasso, Harvard Univ. (United States) [10676-121]

Overdesigned and underperforming: design, analysis, and tolerancing of a freeform prism via careful use of orthogonal surface descriptions, Nicholas Takaki, Wanyue Song, Anthony J. Yee, Jannick Rolland, Duncan T. Moore, Julie L. Bentley, Romita Chaudhuri, Univ. of Rochester (United States) [10676-122]

Improving immersion of head mounted displays through optical design optimizations, Badrinath Vadakkapattu C., Gabriela Molinar, Simon C. Stock, Karlsruher Institut für Technologie (Germany) [10676-123]

Tomographic near-eye displays, Seungjae Lee, Youngjin Jo, Dongheon Yoo, Jaebum Cho, Dukho Lee, Byoungcho Lee, Seoul National Univ. (Korea, Republic of) [10676-124]

Polarization-dependent metasurfaces for 2D/3D switchable displays, Zhujun Shi, Harvard Univ. (United States) [10676-125]

High-performance integral-imaging based light field augmented reality display, Hekun Huang, Hong Hua, The Univ. of Arizona (United States) [10676-126]

Design and stray light analysis of a microlens-array-based see-through light-field near-eye display, Cheng Yao, Dewen Cheng, Yongtian Wang, Beijing Institute of Technology (China) [10676-127]

High-resolution head mounted display using stacked LCDs and birefringent lens, Shuaishuai Zhu, Harbin Institute of Technology (China) and Univ. of Illinois (United States); Peng Jin, Harbin Institute of Technology (China); Liang Gao, Univ. of Illinois (United States) [10676-128]

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A retinal-projection based near-eye display for virtual reality, Lantian Mi, Wenbo Zhang, Chao Ping Chen, Lei Zhou, Yishi Wu, Yang Li, Bing Yu, Nizamuddin Maitlo, Shanghai Jiao Tong Univ. (China) [10676-129]

Freeform optics design for augmented reality displays with OpticsStudio API tools, Qiang Song Sr., Shanghai Institute of Optics and Fine Mechanics (China); Hao Huang, Univ. of Shanghai for Science and Technology (China); Yin Guo, Tsinghua Univ. (China) [10676-130]

Understanding waveguide-based architecture and ways to robust monolithic optical combiner for smart glasses, Vincent Brac de la Perriere, Ctr. de Nanosciences et de Nanotechnologies (France) [10676-131]

Compact see-through AR system using buried imaging fiber bundles, Simon Thiele, Univ. Stuttgart (Germany) [10676-132]

Design of an immersive head mounted display with coaxial catadioptric optics, Luo Gu, Dewen Cheng, Yongtian Wang, Beijing Institute of Technology (China) [10676-133]

Ultra-compact pancake optics based on ThinEyes® super-resolution technology for virtual reality headsets, Bharathwaj Appan Narasimhan, Limbak 4PI S.L. (Spain) and Univ. Politécnica de Madrid (Spain). . . [10676-134]

Solving the vergence-accommodation conflict in head mounted displays with a magnifier system, Francisco Javier Gantes, Daniel Malacara-Hernández, Zacarías Malacara-Hernández, Centro de Investigaciones en Óptica, A.C. (Mexico) [10676-135]

A compact varifocal see-through head mounted display based on a novel hybrid tunable lens, Tingting Zhai, Univ. of Freiburg (Germany) . . [10676-136]

The optimization and autodesign of the augmented reality waveguide based on API in ZEMAX, Yin Guo, Tsinghua Univ. (China); Hao Huang, Univ. of Shanghai for Science and Technology (China); Qiang Song, Shenzhen Lochn Optics Technology Co., Ltd. (China) [10676-137]

Use of eye tracking solution and liquid crystal lenses in HMDs to reduce VAC, Valentin Abdelouahab, Institut d'Optique (France) [10676-138]

Augmented reality display system for smart glasses with streamlined form factor, Yang Zhao, Samuel J. Steven, Greg Schmidt, Julie L. Bentley, Duncan T. Moore, Univ. of Rochester (United States) [10676-139]

High-resolution optical see-through vari-focal-plane head mounted display using freeform Alvarez lenses, Austin T. Wilson, Hong Hua, The Univ. of Arizona (United States) [10676-140]

Design of spatially multiplexed light field displays using GRIN waveguides for mixed reality systems, Samuel J. Steven, Eryn A. Fennig, Yang Zhao, Tianyi Yang, Greg Schmidt, Julie Bentley, Duncan T. Moore, Univ. of Rochester (United States) [10676-141]

Super multiview augmented reality glasses, Anastasiya Bolotova, Moscow Technological University (MIREA) (Russian Federation); Andrey Putilin, P.N. Lebedev Physical Institute (Russian Federation); Vladislav Druzhin, Bauman Moscow State Technical Univ. (Russian Federation) [10676-142]

PARA: experimental device for augmented/virtual reality, Stan Larroque, SL Process and HETIC (France); Julien Casarin, Gfi informatique/Strasbourg Univ. (France) [10676-143]

WEDNESDAY 25 APRIL

DOID STUDENT OPTICAL DESIGN CHALLENGE ORAL PRESENTATIONS AND AWARDS WED 8:30 TO 15:00

DOID Student Optical Design Challenge for VR/AR and MR: Oral Presentations and Awards

SPIE is joining with the world leading companies in VR, AR and MR HMD hardware development to organize the first Student Optical Design Challenge at the Digital Optics for Immersive Displays (DOID) Conference during SPIE Photonics Europe in Strasbourg.

The awards are designed to encourage and acknowledge excellence in oral and poster student paper presentations, and bridge the gap between traditional academic optics teaching and tangible industry expectations for today's immersive display products.

The DOID Student Optical Design Challenge Oral Presentations and Awards Session consists of short oral overviews of the posters presented during the DOID Student Optical Design Challenge Poster Session on Tuesday 24 April. The Jury will grade the optical design and the resulting optical specs (including tolerancing), as well as the actual work presentation in both poster and oral format.

Full schedule details will be listed at: <http://spie.org/conferences-and-exhibitions/photonics-europe/special-events>

SESSION 4 WED 15:30 TO 18:00

Improving visual comfort in AR/VR systems

Session Chair: **Hong Hua**,
College of Optical Sciences, The Univ. of Arizona (United States)

Tunable lens technologies for VAC mitigation in see-through AR headsets (*Invited Paper*), Robert E. Stevens, Adlens Ltd (United Kingdom) [10676-18]

Computationally efficient and antialiased dual-layer light-field displays, Konstantin Kolchin, Ilya Kurilin, Gleb Milyukov, Mikhail Popov, Mikhail Rychagov, Jaeyeol Ryu, Stanislav Shtykov, Sergey Turko, SAMSUNG Electronics Co., Ltd. (Russian Federation) [10676-19]

Improving image quality of 360 degree viewable holographic display system by applying a speckle reduction technique and a spatial filtering, Yongjun Lim, Keehoon Hong, Hanyang Kim, Minsik Park, Jin-Woong Kim, Electronics and Telecommunications Research Institute (Korea, Republic of) [10676-20]

Image sharpness of 3D images generated by viewing-zone scanning holographic display using MEMS SLM, Yasuhiro Takaki, Tokyo Univ. of Agriculture and Technology (Japan) [10676-21]

Experimental evaluation of self-focusing image formation in nonconventional near-eye display, Vladimir Krotov, Christophe Martinez, Commissariat à l'Énergie Atomique (France); Olivier Haeberlé, Univ. de Haute Alsace (France) [10676-22]

Alvarez lens for fast actuation of optical power, Martin Bawart, Alexander Jesacher, Philipp Zelger, Stefan Bernet, Monika Ritsch-Marte, Medizinische Univ. Innsbruck (Austria) [10676-23]

Visual and wearable comfort are key to the adoption of next-generation AR/VR headsets by enterprise and consumer, Bernard C. Kress, Microsoft Corp. (United States) [10676-24]

CONFERENCE 10677

Sunday–Thursday 22–26 April 2018 • Proceedings of SPIE Vol. 10677

Unconventional Optical Imaging

Conference Chairs: **Corinne Fournier**, Univ. Jean Monnet Saint-Etienne (France); **Marc P. Georges**, Liège Univ. (Belgium); **Gabriel Popescu**, Univ. of Illinois at Urbana-Champaign (United States)

Programme Committee: **Arun Anand**, The Maharaja Sayajirao Univ. of Baroda (India); **Matthieu Boffety**, Institut d'Optique Graduate School (France); **Pierre H. Chavel**, Institut d'Optique Graduate School (France); **Nicholas Devaney**, National Univ. of Ireland, Galway (Ireland); **Julien Fade**, Univ. de Rennes 1 (France); **Mathias Fink**, Institut Langevin, ESPCI Paris (France); **Sylvain Gioux**, Univ. de Strasbourg (France); **François Goudail**, Institut d'Optique Graduate School (France); **Olivier Haeblerl**, Univ. de Haute Alsace (France); **Giancarlo Pedrini**, Institut für Technische Optik (Germany); **François Ramaz**, Institut Langevin (France); **Neus Sabater**, Technicolor (France); **Frans Snik**, Leiden Observatory (Netherlands); **Enrique Tajahuerce**, Univ. Jaume I (Spain); **Pauline Trouvé**, ONERA (France)

SUNDAY 22 APRIL

OPENING REMARKS 13:05 TO 13:10

SESSION 1 SUN 13:10 TO 15:05

Modelling, Computation and Design I: Co-design for Unconventional Imaging

Computational Imaging: Going beyond the limits of conventional lenses using computation (*Invited Paper*), Ashok Veeraraghavan, Rice Univ. (United States) [10677-1]

Increasing image resolution in near-infrared to visible upconversion detection for long-range active imaging, Romain Demur, Eric Lallier, Loïc Morvan, Luc Leviandier, Thales Research & Technology (France); Nicolas Treps, Claude Fabre, Lab. Kastler Brossel, Univ. Pierre et Marie Curie (France) [10677-2]

Color correction matrix evaluation for sparse RGB-W image sensor without IR cutoff filter, Jérôme M. Vaillant, CEA-LETI (France); Axel Clouet, Commissariat à l'Énergie Atomique (France) [10677-3]

Embedded video rate super-resolution in the infrared with a low-cost multi-aperture camera, Roi Mendez-Rial, Antón García-Díaz, Alvaro Souto-López, AIMEN Ctr. Tecnológico (Spain) [10677-4]

Simple and cheap hyperspectral imaging for astronomy (and more), Marco Pisani, Massimo Zucco, Istituto Nazionale di Ricerca Metrologica (Italy) [10677-5]

Experimental demonstration of diffraction-limited plenoptic imaging, Francesco Vincenzo Pepe, Istituto Nazionale di Fisica Nucleare (Italy); Francesco Di Lena, Aldo Mazzilli, Univ. degli Studi di Bari Aldo Moro (Italy); Eitan Edrei, Univ. of Maryland, College Park (United States); Augusto Garuccio, Univ. degli Studi di Bari Aldo Moro (Italy); Giuliano Scarcelli, Univ. of Maryland, College Park (United States); Milena D'Angelo, Univ. degli Studi di Bari Aldo Moro (Italy) [10677-6]

Multispectral endoscopic measurement of amplitude and phase distribution based on acousto-optic image filtration in interferometer with artificial reference source, Ludmila Burmak, Alexander S. Machikhin, Vitold Pozhar, Scientific and Technological Ctr. for Unique Instrumentation (Russian Federation) [10677-7]

SESSION 2 SUN 15:30 TO 17:15

Modelling, Computation and Design II: Co-design for Unconventional Imaging

Chromatic add-on to improve depth from defocus with a conventional camera, Pauline Trouvé, Frédéric Champagnat, Anthelme Bernard-Brunel, ONERA (France); Jacques Sabater, Thierry Avignon, Institut d'Optique Graduate School (France); Guy Le Besnerais, ONERA (France) [10677-8]

SNR-optimized image fusion for transparent object inspection, Johannes Meyer, Karlsruher Institut für Technologie (Germany); Wolfgang Melchert, Matthias Hartumpf, Thomas Längle, Jürgen Beyerer, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung (Germany) [10677-9]

Pansharpening of images acquired with color filter arrays, Daniele Picone, Mauro Dalla Mura, Laurent Condat, GIPSA-lab (France) [10677-10]

Ultrafast single-pixel optical imaging based on multimode interference and compressed sensing, Chaitanya Kumar Mididoddi, Guoqing Wang, Chao Wang, Univ. of Kent (United Kingdom) [10677-12]

Time-resolved diffuse optical tomography system based on adaptive structured light illumination and compressive sensing detection

Andrea Farina, CNR-Istituto di Fotonica e Nanotecnologie (Italy); Marta M. Betcke, Ctr. for Medical Image Computing, Univ. College London (United Kingdom); Andrea Bassi, Politecnico di Milano (Italy) and CNR-Istituto di Fotonica e Nanotecnologie (Italy); Gianluca Valentini, Politecnico di Milano (Italy); Simon Arridge, Ctr. for Medical Image Computing, Univ. College London (United Kingdom); Cosimo D'Andrea, Politecnico di Milano (Italy) and Ctr. for Nano Science and Technology, Istituto Italiano di Tecnologia (Italy) . [10677-13]

Imaging VLS grating spectrographs, Eugene A. Vishnyakov, P.N. Lebedev Physical Institute (Russian Federation); Alexei O. Kolesnikov, Alexey N. Shatokhin, P.N. Lebedev Physical Institute (Russian Federation) and Moscow Institute of Physics and Technology (Russian Federation); Evgeny N. Ragozin, P.N. Lebedev Physical Institute (Russian Federation) and Moscow Institute of Physics and Technology (Russian Federation) [10677-14]

Calibration of a stereoscopic video endoscope for precise three-dimensional geometrical measurements in arbitrary spectral bands, Alexander S. Machikhin, Alexey Gorevoy, Demid Khokhlov, Alexander Naumov, Scientific and Technological Ctr. for Unique Instrumentation (Russian Federation) and National Research Univ. "MPEI" (Russian Federation) [10677-15]

MONDAY 23 APRIL

HOT TOPICS SESSION I 9:00 TO 11:00

From Einstein doubts to quantum bits: a second quantum revolution

Alain Aspect, Lab. Charles Fabry, Institut d'Optique, France

Pico-Photonics: watching and sensing single molecules by confining light to the atom scale

Jeremy J. Baumberg, NanoPhotonics Ctr., Univ. of Cambridge, United Kingdom

For additional details see page 6.

SESSION 3 MON 11:30 TO 12:40

Applications I: Bioimaging

Assessment of normal and pathological platelets aggregates by quantitative analysis with digital holographic microscopy (*Keynote Presentation*), Frank Dubois, Daniel Ribeiro de Sousa, Alexandre Rousseau, Catherine Yourassowsky, Univ. Libre de Bruxelles (Belgium); Alain Van Meerhaeghe, Univ. de Charleroi (Belgium); Bastien Chopard, Univ. de Genève (Switzerland); Karim Zouaoui Boudejlita, Univ. Libre de Bruxelles (Belgium) [10677-16]

Quantitative phase microscopy of dynamic cells using off-axis holographic compression by spatial multiplexing, Natan T. Shaked, Tel Aviv Univ. (Israel) [10677-17]

Color holographic microscope for monitoring lipids in microalgae, Pascal Picart, Le Mans Univ. (France); Michael Lebrun, Univ. du Maine (France); Gérald Thouand, Univ. de Nantes (France) [10677-18]

Lunch Break Mon 12:40 to 13:50

CONFERENCE 10677

SESSION 4.....MON 13:50 TO 15:30

Applications II: Bioimaging

Line-field confocal optical coherence tomography: technology and application in dermatology (*Invited Paper*), Olivier Levecq, DAMAE Medical (France); Arthur J. Davis, DAMAE Medical (United States); Hicham Azimani, David Siret, DAMAE Medical (France); Jean Luc Perrot, Ctr. Hospitalier Univ. de Saint-Étienne (France); Arnaud Dubois, Lab. Charles Fabry (France) and DAMAE Medical (France) [10677-19]

Label-free imaging of cellular optical and electrical properties using quantitative phase imaging and AC field modulation assays, Cristina Polonschii, Mihaela Gheorghiu, The International Ctr. of Biodynamics (Romania); Mikhail E. Kandel, Univ. of Illinois (United States); Sorin M. David, Dumitru Bratu, The International Ctr. of Biodynamics (Romania); Gabriel Popescu, Univ. of Illinois (United States); Eugen Gheorghiu, The International Ctr. of Biodynamics (Romania) [10677-20]

Quantitative phase retrieval reconstruction from in-line hologram using a new proximal operator: application to microscopy of bacteria and tracking of droplets, Fabien Momey, Univ. Jean Monnet Saint-Etienne (France); Frédéric Jolivet, Univ. Jean Monnet Saint-Etienne (France); Loïc Denis, Lab. Hubert Curien (France); Corinne Fournier, Univ. Jean Monnet Saint-Etienne (France); Loïc Mées, École Centrale de Lyon (France); Nicolas Faure, Frédéric Pinston, bioMérieux SA (France) [10677-21]

2D spectrometer for spectral and time domain optical coherence spectroscopy, Szymon Tamborski, Nicolaus Copernicus Univ. (Poland); Maciej M. Bartuzel, Nicolaus Copernicus Univ. (Poland) and Wrocław Univ. of Science and Technology (Poland); Krystian Wrobel, Maciej Szkulmowski, Nicolaus Copernicus Univ. (Poland) [10677-22]

Bioimaging with controlled depth using upconversion nanoparticles, Daria V. Pominova, Anastasia V. Ryabova, Igor D. Romanishkin, Vladimir I. Makarov, Pavel V. Grachev, A. M. Prokhorov General Physics Institute of the Russian Academy of Sciences (Russian Federation) [10677-23]

Label-free imaging and analysis of small lipid droplets in adipocyte cells by stimulated Raman microscopy, Rajeev Ranjan, Annalisa D'Arco, Maria Antonietta Ferrara, Istituto per la Microelettronica e Microsistemi (Italy); Maurizio Indolfi, Michele Larobina, Consiglio Nazionale delle Ricerche (Italy); Luigi Sirleto, Istituto per la Microelettronica e Microsistemi (Italy) ... [10677-24]

SESSION 5.....MON 16:00 TO 17:50

Applications III: Micro- Nanoscopic Imaging

Molecular imaging (*Invited Paper*), Philipp Kukura, Univ. of Oxford (United Kingdom) [10677-25]

Through-focus scanning optical microscopy applications (*Invited Paper*), Ravikiran Attota, National Institute of Standards and Technology (United States) [10677-26]

Ultrafast two-photon microscopy for high-speed brain imaging in awake mice, Radoslaw Chrapkiewicz, Tong Zhang, Oscar Hernandez, Adam S. Shai, Mark J. Wagner, Yanping Zhang, Cheng-Hsun Wu, Jin Zhong Li, Stanford Univ. (United States); Yiyang Gong, Duke Univ. (United States); Masatoshi Inoue, Haruhiko Bito, The Univ. of Tokyo (Japan); Mark J. Schnitzer, Stanford Univ. (United States) [10677-27]

Optofluidic time-stretch microscopy with an extreme throughput of 1 million cells/s, Cheng Lei, Hirofumi Kobayashi, Yasuyuki Ozeki, Keisuke Goda, The Univ. of Tokyo (Japan) [10677-28]

Probing the viscoelastic properties of ultrathin polymer films by combining coherent scanning interferometry and nanobubble inflation, Pierre Chapuis, ICube (France); Christian Gauthier, Damien Favier, Anne Rubin, Institut Charles Sadron (France); Freddy Anstötz, Paul C. Montgomery, ICube (France) [10677-29]

Laser sources in multiphoton microscopy: overview and optimization, Claire Lefort, XLIM Institut de Recherche (France) [10677-30]

TUESDAY 24 APRIL

SESSION 6.....TUE 8:40 TO 10:20

Modelling, Computation and Design III

Partially coherent imaging in phase space (*Invited Paper*), Colin J. R. Sheppard, Univ. of Wollongong (Australia) and Istituto Italiano di Tecnologia (Italy); Shalin B. Mehta, Chan Zuckerberg Biohub (United States) ... [10677-31]

Development of a realistic wave propagation-based chromatic confocal microscopy model for optical design and for solving the inverse problem, Daniel Claus, Institut für Lasertechnologien in der Medizin und Messtechnik (Germany); Giancarlo Pedrini, Wolfgang Osten, Univ. Stuttgart (Germany); Raimund Hibst, Institute für Lasertechnologien in der Medizin und Messtechnik (Germany) [10677-32]

Dimension reduction method for fast diffuse optical tomography, Mingyu Choi, Jaemyoung Kim, Minsu Ji, Haeil Lee, Seongkwon Yu, Hyeon-Min Bae, KAIST (Korea, Republic of) [10677-33]

Super defocusing of light by optical suboscillations, Yaniv Eliezer, Tel Aviv Univ. (Israel) [10677-34]

Super-resolution for noisy images via deep convolutional neural network, Xinyan Zhang, Peng Gao, Guitao Li, Tsinghua Univ. (China) [10677-35]

Deep Learning-based object recognition through multimode fiber via a CNN-architecture SpeckleNet, Ping Wang, Northwestern Polytechnical Univ. (China) and Chang'an Univ. (China); Jianglei Di, Northwestern Polytechnical Univ. (China) [10677-36]

SESSION 7.....TUE 10:50 TO 13:00

Advanced Methods I: Light Scattering

Unconventional ways of using a scattering media for optical imaging (*Keynote Presentation*), Wolfgang Osten, Giancarlo Pedrini, Alok Kumar Singh, Institut für Technische Optik (Germany); Mitsuo Takeda, Utsunomiya Univ. Ctr. for Optical Research & Education (Japan) [10677-37]

Single-shot fluorescence imaging through scattering media in epi wide-field microscopy, Matthias Hofer, Institut Fresnel (France); Christian Soeller, Univ. of Exeter (United Kingdom); Sophie Brasselet, Institut Fresnel (France); Jacopo Bertolotti, Univ. of Exeter (United Kingdom) [10677-38]

Correlations between reflected and transmitted intensity patterns during coherent multiple scattering, Illia Starshynov, Alba M. Paniagua-Diaz, Univ. of Exeter (United Kingdom); Nikos Fayard, Institut Langevin, ESPCI ParisTech (France) and Ctr. National de la Recherche Scientifique (France) and PSL Research Univ. Paris (France); Arthur Goetschy, Institut Langevin, ESPCI ParisTech (France) and Ctr. National de la Recherche Scientifique (France) and PSL Research Univ. (France); Romain Pierrat, Institut Langevin, ESPCI ParisTech (France) and Ctr. National de la Recherche Scientifique (France) and PSL Research Univ. (France); Rémi Carminati, Institut Langevin, ESPCI ParisTech (France) and Ctr. National de la Recherche Scientifique (France) and PSL Research Univ. (France); Jacopo Bertolotti, Univ. of Exeter (United Kingdom) [10677-39]

Vision through turbid media by Fourier filtering and single-pixel detection, Yessenia Jauregui-Sánchez, Pere Clemente, Enrique Tajahuerce, Jesús Lancis, Univ. Jaume I (Spain) [10677-40]

Light statistics in disordered media predicted with a unique correlation parameter, Myriam Zerrad, Gabriel Soriano, Ayman Ghabbach, Claude Amra, Institut Fresnel (France) [10677-41]

Improved image acquisition with a scattering plate microscope, Stephan Ludwig, Alok K. Singh, Giancarlo Pedrini, Institut für Technische Optik, Univ. Stuttgart (Germany) [10677-42]

Mueller microscopy of anisotropic scattering media: theory and experiments, Tatiana Novikova, Ecole Polytechnique (France); Hee Ryung Lee, Thomas Sang Hyuk Yoo, Lab. de Physique des Interfaces et des Couches Minces, CNRS-Ecole Polytechnique (France) and Univ. Paris-Saclay (France); Pengcheng Li, Tsinghua Univ. (China) and Lab. de Physique des Interfaces et des Couches Minces, CNRS-Ecole Polytechnique (France) and Univ. Paris-Saclay (France); Enric Garcia-Caurel, Razvigor Ossikovski, Lab. de Physique des Interfaces et des Couches Minces, CNRS-Ecole Polytechnique (France) and Univ. Paris-Saclay (France); Christian Lotz, Universitätsklinikum Würzburg (Germany); Florian Kai Groeber-Becker, Sofia Dembski, Universitätsklinikum Würzburg (Germany) and Fraunhofer-Institut für Silicatforschung ISC (Germany) [10677-43]

Lunch/Exhibition BreakTue 13:00 to 14:10

SESSION 8 TUE 14:10 TO 16:05

Advanced Methods II: Quantitative Phase Imaging

Off-axis digital holography for flow analysis (*Invited Paper*), Pascal Picart, Le Mans Univ. (France) [10677-44]

Improving color lensless microscopy reconstructions by self-calibration, Olivier Flasseur, Frédéric Jolivet, Fabien Momey, Univ. Jean Monnet Saint-Etienne (France); Loïc Denis, Lab. Hubert Curien (France); Corinne Fournier, Univ. Jean Monnet Saint-Etienne (France) [10677-45]

Hyperspectral profile measurement from phase-coded diffraction patterns: computational sparse phase retrieval technique, Vladimir Y. Katkovnik, Igor Shevkunov, Karen Eguiazarian, Tampere Univ. of Technology (Finland) [10677-46]

Quantitative phase imaging in turbid media by coherence controlled holographic microscopy, Radim Chmelík, CEITEC Brno Univ. of Technology (Czech Republic); Jana Čolláková, CEITEC - Central European Institute of Technology (Czech Republic); Miroslav Duris, Brno Univ. of Technology (Czech Republic) [10677-47]

Simplified approach for tomographic diffractive microscopy of axisymmetric samples, Ludovic Foucault, Olivier Haeberlé, Nicolas Verrier, Lab. Modélisation Intelligence Processus Systèmes (MIPS) (France); Matthieu Debailleul, Univ. de Haute Alsace (France) [10677-48]

Gradient light interference microscopy for imaging thick specimens in transmission and reflection, Mikhail E. Kandel, Catherine Best-Popescu, Gabriel Popescu, Univ. of Illinois (United States) [10677-49]

Ptychography: quantitative phase imaging with incoherent imaging properties, Daniel Claus, Univ. Stuttgart (Germany) [10677-50]

HOT TOPICS SESSION II 16:30 TO 18:05

Coherent combination of fiber amplified ultrafast laser pulses
Jens Limpert, Institute of Applied Physics, Friedrich Schiller Univ. Jena, Germany

2D materials and their heterostructures: fundamentals, applications and prototypes
Frank Koppens, ICFO-The Institute of Photonic Sciences, Spain

For additional details, please see page 7

WEDNESDAY 25 APRIL

JOINT SESSION 1 WED 8:30 TO 10:40

Optics in Surgery I

Joint Session between Conferences 10677 and 10685

Session Chair: **Sylvain Gioux**, ICube (France)

Looking and listening to tissues: advances in fluorescence and optoacoustic bio-imaging (*Invited Paper*), Vasilis Ntziachristos, Technische Univ. München (Germany) and Helmholtz Zentrum München GmbH (Germany) [10677-51]

Real-time oxygenation imaging using spatio-temporal modulation of light, Manon Schmidt, Amir Nahas, Swapnesh Panigrahi, Murielle Torregrossa, Sylvain Gioux, ICube (France) [10685-57]

Quantitative subsurface fluorescence imaging enabled by spatial frequency domain imaging for enhanced fluorescence-guided surgery, Mira Sibai, Univ. of Toronto (Canada) and Princess Margaret Cancer Ctr., Univ. Health Network (Canada); Dennis J. Wirth, Thayer School of Engineering at Dartmouth (United States); Frédéric Leblond, Ecole Polytechnique de Montréal (Canada); David W. Roberts M.D., Dartmouth Hitchcock Medical Ctr. (United States); Brian C. Wilson, Princess Margaret Cancer Ctr., Univ. Health Network (Canada) and Univ. of Toronto (Canada) [10685-58]

Phantom and methodology for fluorescence molecular imaging systems benchmarking, Dimitris Gorpas, Helmholtz Zentrum München GmbH (Germany); Maximilian Koch, Maria Anastasopoulou, Helmholtz Zentrum München GmbH (Germany) and Technische Univ. München (Germany); Uwe Klemm, Helmholtz Zentrum München GmbH (Germany); Vasilis Ntziachristos, Helmholtz Zentrum München GmbH (Germany) and Technische Univ. München (Germany) [10677-52]

Real-time differentiation of healthy tissue using an OCT device steered by a robotized flexible endoscope, Oscar Caravaca Mora, Lucile Zorn, Philippe Zanne, Florent Nageotte, Paul C. Montgomery, Michel De Mathelin, ICube (France); Michalina Gora, ICube, Univ. of Strasbourg (France) and Ctr. National de la Recherche Scientifique (France) [10677-53]

CMOS-based contact imaging system for skin condition diagnosis by spatially resolved diffuse reflectance spectroscopy, Nils Petitdidier, Anne Koenig, Rémi Gerbelot, Henri Grateau, CEA-LETI (France); Sylvain Gioux, Univ. de Strasbourg (France); Sophie Morales, CEA-LETI (France) [10685-59]

Differentiation of femur bone from surrounding soft tissue using laser-induced breakdown spectroscopy as a feedback system for smart laserosteotomy, Hamed Abbasi, Georg Rauter, Raphael Guzman, Philippe C. Cattin, Azhar Zam, Univ. Basel (Switzerland) [10685-60]

JOINT SESSION 2 WED 11:00 TO 12:55

Optics in Surgery II

Joint Session between Conferences 10677 and 10685

Session Chair: **Sylvain Gioux**, ICube (France)

Optics in surgery: the surgeon perspective (*Invited Paper*), Alexander L. Vahrmeijer, Leiden Univ. Medical Ctr. (Netherlands) .. [10677-54]

Standardization of quantitative NIR fluorescent imaging in patient: a preliminary attempt on flap reconstructive surgery, Muriel Abbaci, Wahib Ghanem M.D., Ingrid Breuskin M.D., Haïtham Mirghani M.D., Philippe Gorphe M.D., Antoine Moya-Plana M.D., Heba Alkhashnam M.D., Kim De Fremicourt M.D., Jean-François Honart M.D., Anne AUPERIN, François Janot M.D., Frédéric Kolb M.D., Stéphane Temam M.D., Quentin Qassemyar M.D., Corinne Laplace-Builhé, Dana Hartl M.D., Gustave Roussy (France) [10685-61]

NIR fluorescence imaging methods to evaluate blood flow state in the skin lesions, Pavel V. Grachev, A. M. Prokhorov General Physics Institute of the Russian Academy of Sciences (Russian Federation); Zera Abdulvapova, Gagik Galstyan, Endocrinology Research Ctr. (Russian Federation); Victor Loschenov, A. M. Prokhorov General Physics Institute of the Russian Academy of Sciences (Russian Federation) [10677-55]

Interventional fluorescence spectroscopy to detect tumor margins during glioma resection with two fluorescence spectra of PpIX, Laure Alston, CREATIS (France); Jacques Guyotat, Ctr. Hospitalier Univ. de Lyon (France); Laurent Mahieu-William, CREATIS (France); Mathieu Hebert, Lab. Hubert Curien (France); Pascal Kantapareddy, David Meyronet, Ctr. Hospitalier Univ. de Lyon (France); David Rousseau, Bruno Montcel, CREATIS (France) [10677-56]

Femtosecond laser nanosurgery to study cellular regeneration: keeping the whole cell in mind, Stefan Michael Klaus Kalies, Laser Zentrum Hannover e.V. (Germany); Dorian Hagenah, Dominik Müller, Daphne DeTemple, Alexander Heisterkamp, Leibniz Univ. Hannover (Germany) [10685-62]

Spatially-resolved spectroscopy for guiding margin delineation during human skin carcinomas resection: first clinical results on diffuse reflectance and autofluorescence spectra and in vivo skin optical properties, Grégoire Khairallah M.D., Univ. de Lorraine (France) and Ctr. National de la Recherche Scientifique (France) and Metz-Thionville Regional Hospital Ctr. (France); Marine Amouroux, Univ. de Lorraine (France) and Ctr. National de la Recherche Scientifique (France); Prisca Rakotomanga, Charles Soussen, Ctr. de Recherche en Automatique de Nancy (France) and Ctr. National de la Recherche Scientifique (France); Frédéric Marchal M.D., Ctr. de Recherche en Automatique de Nancy (France) and Ctr. National de la Recherche Scientifique (France) and Institut de Cancérologie de Lorraine (France); Alain Delconte, Ctr. National de la Recherche Scientifique (France); Hang Chen, Univ. de Lorraine (France) and Ctr. National de la Recherche Scientifique (France); Walter C. P. M. Blondel, Univ. de Lorraine (France) and Ctr. National de la Recherche Scientifique (France) [10685-63]

Single- and multispectral fiber probes as a solution for guided diagnostics and therapy, Olga Bibikova, art photonics GmbH (Germany) and Saratov State Univ. (Russian Federation); Urszula J. Zabarylo, Charité Universitätsmedizin Berlin (Germany); Valeria Belikova, Anastasiya Melenteva, Samara State Technical Univ. (Russian Federation); Iskander Usenov, art photonics GmbH (Germany) and Technical Univ. Berlin (Germany); Tatiana Sakharova, Alexey Bocharnikov, Georgy Danielyan, art photonics GmbH (Germany); Olaf Minet, Charité Universitätsmedizin Berlin (Germany); Hans J. Eichler, Technische Univ. Berlin (Germany); Viacheslav Artyushenko, art photonics GmbH (Germany) [10685-64]

Lunch/Exhibition Break Wed 12:55 to 14:05

SESSION 9 WED 14:05 TO 15:15

Applications IV: Bioimaging

Extreme imaging for large-scale single-cell analysis (*Invited Paper*), Keisuke Goda, The Univ. of Tokyo (Japan) [10677-57]

Ultrathin narrow spectral filter for acousto-optic imaging for medical applications, Caroline Venet, Maïmouna Bocoum, Institut Langevin (France); Thierry Chancelière, Lab. Aimé Cotton (France); François Ramaz, Institut Langevin (France); Anne Louchet-Chauvet, Lab. Aimé Cotton (France) [10677-58]

Characterization of ocular tissues applying multifractal analysis to multispectral imaging, Ouafa Sijilmassi, José Manuel López-Alonso, María del Carmen Barrio Asensio, Aurora Del Río Sevilla, Univ. Complutense de Madrid (Spain) [10677-59]

Electro-optical polarization modulation in coherent Raman scattering for the observation of molecular dynamics in real-time, Matthias Hofer, Naveen K. Balla, Sophie Brasselet, Institut Fresnel (France) [10677-60]

CONFERENCE 10677

SESSION 10. WED 15:35 TO 16:05

Advanced Methods III: Quantitative Phase Imaging

Quantitative phase imaging by using a position sensitive detector, Fernando Soldevila, Vicente Durán, Pere Clemente, Jesús Lancis, Enrique Tajahuerce, Univ. Jaume I (Spain) [10677-61]

In-line and off-axis hybrid digital holography, Fengpeng Wang, Beijing Univ. of Technology (China) and Gannan Normal Univ. (China); Dayong Wang, Lu Rong, Yunxin Wang, Jie Zhao, Beijing Univ. of Technology (China) [10677-62]

SESSION 11. WED 16:05 TO 17:45

Applications V: Wavefront Shaping and Restoration

Phase diversity: math, methods and prospects, including sequential diversity imaging (Invited Paper), Robert A. Gonsalves, Tufts Univ. (United States) [10677-63]

Enhanced deep detection of light for Raman spectroscopy by wavefront shaping, Alba M. Paniagua-Díaz, William L. Barnes, Jacopo Bertolotti, Univ. of Exeter (United Kingdom) [10677-64]

Methods of image correction formed on horizontal long paths, Vladimir P. Lukin, V.E. Zuev Institute of Atmospheric Optics (Russian Federation) [10677-65]

First light of CIAO at Pic du Midi, Guillaume Dovillaire, Imagine Optic SA (France); François Colas, Observatoire de Paris (France); Jean-Luc Dauvergne, T1M Association - S2P (France); Antoine Moutenet, Imagine Optic SA (France) [10677-66]

Closed- and open-loop approaches for focus recovering through scattering media by wavefront shaping based on digital-micromirror devices, Alejandro Turpin, Ivan Vishniakou, Johannes D. Seelig, Ctr. of Advanced European Studies and Research (Germany) [10677-67]

Interest of polarimetric refocused images calibrated in depth for control by vision, Luc Gendre, Stéphane Bazeille, Christophe Cudel, Laurent Bigué, Univ. de Haute Alsace (France) [10677-68]

WEDNESDAY POSTER SESSION WED 17:45 TO 19:30

Posters-Wednesday

Conference attendees are invited to attend the Photonics Europe poster session on Wednesday 17.45 to 19.30. Posters will be on display after 10.00 Wednesday morning in the Hall Rhin. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster authors, view poster presentation guidelines and set-up instructions at <http://spie.org/x34963.xml> and on page 96.

Prototyping a compressive line sensing hyperspectral imaging sensor, Bing Ouyang, Michael Twardowski, Yanjun Li, Fraser R. Dalgleish, Harbor Branch Oceanographic Institute (United States) [10677-11]

Multimodal fluorescence imaging navigation for surgical guidance of malignant tumors in photosensitized tissues of neural system and other organs, Maxim Loshchenov, A. M. Prokhorov General Physics Institute of the Russian Academy of Sciences (Russian Federation); Walter Blondel, Univ. de Lorraine (France) and Ctr. National de la Recherche Scientifique (France); Aleksandr A. Potapov M.D., N.N. Burdenko Neurosurgical Institute (Russian Federation); Rudolf Steiner, Institute für Lasertechnologien in der Medizin und Messtechnik (Germany); Marine Amouroux, Univ. de Lorraine (France) and Ctr. National de la Recherche Scientifique (France); Victor Loschenov, A. M. Prokhorov General Physics Institute of the Russian Academy of Sciences (Russian Federation) [10677-86]

Recognition of blastic cells in human peripheral blood by diffraction phase microscopy, Freddy A. Monroy Ramírez, Caori A. Organista, Marcela Camacho, Univ. Nacional de Colombia (Colombia) [10677-87]

Fluorescence holographic microscope, Pavel Kolman, Zbyněk Dostál, Radim Chmelík, Brno Univ. of Technology (Czech Republic) [10677-88]

Multichannel pyrometer of the spectral ratio for on-line monitoring in the additive technologies of metal deposition, Yuri N. Zavalov, Alexander V. Dubrov, Fikret K. Mirzade, Vladislav N. Glebov, Andrey M. Malutin, Vladimir D. Dubrov, FECC "Crystallography and Photonics" of the Russian Academy of Sciences (Russian Federation) [10677-89]

Multiscale photoacoustic microscopy imaging with image improvement and quantification technique, Seungwan Jeon, Jin Young Kim, Chulhong Kim, Pohang Univ. of Science and Technology (Korea, Republic of) [10677-90]

LED misalignment determination in LED illumination optics using linear and nonlinear methods, Pau Castilla, Noemí Domínguez, SnellOptics (Spain); Cristina Garcia, Univ. Politècnica de Catalunya (Spain); Carles Pizarro, SnellOptics (Spain); Patricia Blanco, Manuel Espinola, Josep Arasa, Univ. Politècnica de Catalunya (Spain) [10677-91]

Optimizing phase object reconstruction using an in-line digital holographic microscope and a reconstruction based on a Lorenz Mie model, Thomas Olivier, Lab. Hubert Curien (France); Olivier Flasseur, Univ. Jean Monnet Saint-Etienne (France); Loïc Méès, Ecole Centrale de Lyon (France); Corinne Fournier, Univ. Jean Monnet Saint-Etienne (France) [10677-92]

Multiscale integrated free-form microoptics out of photoinitiator-free hybrid organic-inorganic photopolymer via femtosecond 3D laser lithography, Linas Jonušauskas, Titas Tičkūnas, Darius Gailevičius, Gedivas Nemickas, Vilnius Univ. (Lithuania), Femtika Ltd. (Lithuania); Andrius Narmontas, Femtika (Lithuania); Vytautas Purlys, Giedrė Grigalevičiūtė, Raldas Gadonas, Vilnius Univ. (Lithuania), Femtika Ltd. (Lithuania) [10677-93]

Broadband Sb/B4C multilayer mirrors for XUV spectroscopy applications, Eugene A. Vishnyakov, P.N. Lebedev Physical Institute (Russian Federation); Igor A. Kopylets, Valeriy V. Kondratenko, Kharkiv Polytechnical Institute (Ukraine); Aleksei O. Kolesnikov, P.N. Lebedev Physical Institute (Russian Federation) and Moscow Institute of Physics and Technology (Russian Federation); Alexey N. Shatokhin, P.N. Lebedev Physical Institute (Russian Federation) and Moscow Institute of Physics and Technology (Russian Federation); Evgeny N. Ragozin, P.N. Lebedev Physical Institute (Russian Federation) and Moscow Institute of Physics and Technology (Russian Federation) [10677-94]

Redistribution of an index of refraction of a media causing required transformation of a light beam, Petr Pokorný, Filip Šmejkal, Pavel Novák, Jiří Novák, Antonín Mikš, Czech Technical Univ. in Prague (Czech Republic) [10677-95]

Design and calibration for a Full-Stokes imaging polarimeter, Ivan Montes, Univ. Nacional Autónoma de México (Mexico); Neil C. Bruce, Univ. Nacional Autónoma de México (Mexico) [10677-96]

Unconventional imaging with radial Walsh filters, Walter D. Furlan, Univ. de València (Spain); Federico Machado, Vicente Ferrando, Juan A. Monsoriu, Univ. Politècnica de València (Spain) [10677-97]

Digital holographic lens configurations for LCoS displays autocalibration, Haolin Zhang, Angel Lizana, Univ. Autònoma de Barcelona (Spain); Claudio Lemmi, Univ. de Buenos Aires (Argentina); Freddy A. Monroy Ramírez, Univ. Nacional de Colombia (Colombia); Andrés Márquez, Univ. de Alicante (Spain); Ignacio Moreno, Univ. Miguel Hernández de Elche (Spain); Juan Campos, Univ. Autònoma de Barcelona (Spain) [10677-98]

Image quality enhancement based on real-time deconvolution and super resolution, Yoan Marin, Abdelali Douiyek, Johel Miteran, Julien Dubois, Barthélémy Heyrman, Dominique Ginjac, Le2I - Lab d'Electronique, Informatique et Image (France) [10677-99]

A method for counterfeits detection using a smartphone camera and spectral line imaging, Ilze Ošiņa, Peteris Potapovs, Janis Spigulis, Univ. of Latvia (Latvia) [10677-100]

MWIR infrared gating imaging with uncooled PbSe FPAs for surveillance application, Roi Méndez-Rial, Álvaro Souto-López, Antón García-Díaz, AIMEN Ctr. Tecnológico (Spain) [10677-101]

Semidiffraction model of a plenoptic camera for in-situ space exploration, Ulrike Krutz, Martin Lingenauber, Anko Börner, Klaus Strobl, Florian Fröhlich, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany) [10677-102]

Aberrations analysis and image simulation of a focused plenoptic camera, Alessandro Grosso, Datalogic IP Tech S.r.l. (Italy); Toralf Scharf, Ecole Polytechnique Fédérale de Lausanne (Switzerland); Kurt Vonmetz, Datalogic IP Tech S.r.l. (Italy) [10677-103]

Optimization of a plenoptic imaging system for 3D reconstruction, Charlotte Herzog, Imagine Optic SA (France) and Lab. Photonique, Numérique et Nanosciences (France) and INRIA Bordeaux (France); Guillaume Dovillaire, Imagine Optic SA (France); Xavier Granier, Lab. Photonique, Numérique et Nanosciences (France) and INRIA Bordeaux (France) and Lab. Bordelais de Recherche en Informatique (France); Fabrice Harms, Xavier Levecq, Imagine Optic SA (France); Elena Longo, Lab. d'Optique Appliquée (France); Loïs Mignard-Debise, Lab. Photonique, Numérique et Nanosciences (France) and INRIA Bordeaux (France); Philippe Zeitoun, Lab. d'Optique Appliquée (France); Ombeline de La Rochefoucauld, Imagine Optic SA (France) [10677-104]

On the use of image quality measures of multiviews in light sheet fluorescence 3D microscopy, Rosa Huaman, Univ. d'Angers (France); Charlotte Riviere, Univ. Claude Bernard Lyon 1 (France); Carole Frindel, Institut National des Sciences Appliquées de Lyon (France); David Rousseau, Univ. d'Angers (France) [10677-105]

Image reconstruction in multiphoton imaging through multivar-iate Gaussian fitting, Claire Lefort, XLIM Institut de Recherche (France); Emilie Chouzenoux, Ctr. de Vision Numerique, Univ. Paris-Saclay (France) and Lab. d'Informatique Gaspard Monge, Univ. Paris-Est Marne-la-Vallée (France); Jean-Christophe Pesquet, Univ. Paris Saclay (France) [10677-106]

Application of stacked auto encoders in automated detection of glaucoma in fundus images, Sawon Pratiher, Indian Institute of Technology Kanpur (India); Subhankar Chattoraj, Karan Vishwakarma, Techno India Univ. (India) [10677-107]

Automated identification of glaucoma in fundus images using variational mode decomposition and 2D spectral biomarkers, Karan Vishwakarma, Techno India Univ. (India); Sawon Pratiher, Indian Institute of Technology Kanpur (India); Subhankar Chatteraj, Techno India Univ. (India) . . . [10677-108]

New method for evaluating the surface energy value of rough surfaces with a confocal microscope, Noemí Domínguez, Pau Castella, SnellOptics (Spain); Cristina Garcia, Univ. Politècnica de Catalunya (Spain); Carles Pizarro, SnellOptics (Spain); Patricia Blanco, Manuel Espinola, Josep Arasa, Univ. Politècnica de Catalunya (Spain) . . . [10677-109]

Comparison of iterative phase retrieval for Fourier ptychographic microscopy, Min Wan, Inbarasan Muniraj, Changliang Guo, Ra'ed Malallah, Derek Cassidy, John T. Sheridan, John J. Healy, Univ. College Dublin (Ireland) . . . [10677-110]

A simple and automatic method to obtain the particle size and flame area in strong light, Jianhua Shi, Hairong Zhong, Sihua Fu, Bing Lei, Wei Liu, Wei Wang, National Univ. of Defense Technology (China) . . . [10677-111]

Imaging of supersonically expanded and pulsed molecular beams by nonlinear photoionization processes, Watheq Al-Basheer, King Fahd Univ. of Petroleum & Minerals (Saudi Arabia) . . . [10677-112]

Study of some aberrations in microsphere-based microscopy, Stéphane Perrin, Audrey Leong-Hoi, Sylvain Lecler, Paul C. Montgomery, ICube (France) . . . [10677-113]

Innovative morphological and metabolic microtomography to improve surgical resection in breast cancer, Emilie Benoit a la Guillaume, LLTech SAS (France); Clément Apellan, Institut Langevin, ESPCI ParisTech (France); Eugénie Dalimier, LLTech SAS (France); Claude Boccara, Institut Langevin, ESPCI ParisTech (France) and LLTech SAS (France); Aïcha Ben Lakhdar M.D., Marie-Christine Mathieu M.D., Odile Casiraghi M.D., Muriel Abbaci, Corinne Laplace-Builhé, Gustave Roussy (France) . . . [10677-114]

Scanning fiber-based microcantilever for forward viewing, bronchoscope-like imaging of peripheral airways, Geoffrey Hohert, BC Cancer Research Ctr. (Canada); Yasong Li, Aydin Ahrabi, Carlo Menon, Simon Fraser Univ. (Canada); Pierre Lane, BC Cancer Research Ctr. (Canada) . . . [10677-115]

Multispectral imaging technique for skin grafts' functional state assessment, Vladimir I. Makarov, Daria V. Pominova, Anastasia V. Ryabova, Tatiana A. Savelieva, A. M. Prokhorov General Physics Institute of the Russian Academy of Sciences (Russian Federation); Irina V. Ignateva, Igor V. Reshetov, I.M. Sechenov Moscow Medical Univ. (Russian Federation) . . . [10677-116]

Simultaneous phase and intensity biopsy imaging using color SLIM (cSLIM) for quantitative histopathology, Hassaan Majeed, Univ. of Illinois (United States); Tan Nguyen, Massachusetts Institute of Technology (United States); Mikhail E. Kandel, Andre Kajdacsy-Balla, Univ. of Illinois (United States); Gabriel Popescu, Univ. of Illinois (United States) . . . [10677-117]

Low-cost polarimetric imaging for surveillance, Philip M. Birch, Rupert Young, Chris Chatwin, Univ. of Sussex (United Kingdom) . . [10677-118]

Applications of polarimetric imaging in the oil film detection, Juan Zhao, Shenzhen Institutes of Advanced Technology (China); Zhan Song, Shenzhen Institutes of Advanced Technology (China) and The Chinese Univ. of Hong Kong (China); Feifei Gu, Jing Liu, Shenzhen Institutes of Advanced Technology (China) . . . [10677-119]

Database of polarimetric and multispectral images in the visible and NIR regions, Pierre-Jean Lapray, Luc Gendre, Alban Foulonneau, Laurent Bigué, Univ. de Haute Alsace (France) . . . [10677-120]

Description of near-field digital in-line holograms using vectorial Rayleigh-Sommerfeld integral, Teddy Tawk, Sebastien Coëtmelec, Denis Lebrun, CORIA (France) . . . [10677-121]

Combined digital-DOE holographic interferometer for force identification in vibroacoustics, Pascal Picart, Le Mans Univ. (France); Julien Poittevin, Charly Faure, Charles Pezerat, Univ. du Maine (France); Kevin Heggarty, IMT Atlantique Bretagne-Pays de la Loire (France) [10677-122]

Data acquisition from digital holograms of particles, Victor Dyomin, Alexey S. Olshukov, Alexandra Davydova, Tomsk State Univ. (Russian Federation) . . . [10677-123]

Quantitative phase imaging of low-cost digital in-line holography in comparison with off-axis digital holographic microscopy, Hanu Phani Ram Gurram, Renu John, Indian Institute of Technology Hyderabad (India) . . . [10677-124]

Details retrieval of crystal particle from interferometric out-of-focus image, Huanhuan Shen, Lingyuan Wu, Yanglong Li, Weiping Wang, China Academy of Engineering Physics (China) . . . [10677-125]

Investigation of the effect of the spectral and angular selectivities of three-dimensional color security holographic stereograms on the process of the reconstruction of 3D images, Dmitrii S. Lushnikov, Sergey Odinkov, Alexander Zherdev, Vladimir Markin, Bauman Moscow State Technical Univ. (Russian Federation); Andrey Smirnov, Krypten (Russian Federation) . . . [10677-126]

Position measurement of in-line microbid holograms using an autoregressive method, Nadia Saidani, Ali Boukellal, Univ. Mouloud Mammeri de Tizi-Ouzou (Algeria); Pierre Pfeiffer, Télécom Physique Strasbourg, Univ. de Strasbourg (France); Rabah Mokdad, Univ. Mouloud Mammeri de Tizi-Ouzou (Algeria) . . . [10677-127]

Photon-counted integral holography using orthographic projection images, Min Wan, Inbarasan Muniraj, Changliang Guo, James P. Ryle, John J. Healy, John T. Sheridan, Univ. College Dublin (Ireland) . . . [10677-128]

Optimization of the complex coherence function for diffraction based wave front transformations, Gerald Fütterer, Hochschule Deggendorf Technologiecampus Teisnach (Germany) . . . [10677-129]

Terahertz hyperspectral imaging of lab-prepared versus commercial paracetamol tablets and potential applications, Dinh Nguyen, Yves Hernandez, Fabian Dortu, Multitel A.S.B.L. (Belgium); Amandine Dispa, Philippe Hubert, Eric Ziemons, Univ. de Liège (Belgium) . . . [10677-130]

The modeling peculiarities of recording of pulsed broadband THz holograms for nonscattering objects, Nikolay S. Balbekin, Maksim S. Kulya, ITMO Univ. (Russian Federation); Andrei A. Gorodetsky, Imperial college London (United Kingdom); Nikolay V. Petrov, ITMO Univ. (Russian Federation) . . . [10677-131]

Multispectral PSF engineering through a complex medium with a transmission matrix approach, Antoine Boniface, UPMC Sorbonne Univ. (France) . . . [10677-132]

Partial compensation of the cataract effects using wavefront shaping, Augusto Arias Gallego, Enrique Josua Fernández, Pablo Artal, Lab. de Óptica Univ. de Murcia (Spain) . . . [10677-133]

Applications of fractional wavelet-based denoising method in biomedical hyperspectral imaging, Dragos Manea, Mihaela Antonina Calin, National Institute of Research and Development for Optoelectronics (Romania); Radu Mutihac, Univ. of Bucharest (Romania) . . . [10677-134]

Comparison of spectral angle mapper and support vector machine classification methods for mapping skin burn using hyperspectral imaging, Mihaela Antonina Calin, National Institute of Research and Development for Optoelectronics (Romania); Sorin Viorel Parasca, "Carol Davila" Univ. of Medicine and Pharmacy (Romania); Dragos Manea, National Institute of Research and Development for Optoelectronics (Romania) . . . [10677-135]

THURSDAY 26 APRIL

HOT TOPICS SESSION III 9:00 TO 10:35

From extreme nonlinear optics to ultrafast atomic physics

Anne L'Huillier, Lund Univ., Sweden

Quantum computations and quantum simulations with trapped ions

Rainer Blatt, Institute for Experimental Physics, Univ. of Innsbruck, Austria

For additional details, please see page 8

SESSION 12. THU 11:00 TO 12:25

Advanced Methods IV: Terahertz Imaging

Continuous-wave terahertz phase-contrast imaging (Invited Paper), Dayong Wang, Lu Rong, Yunxin Wang, Jie Zhao, Jinxin Guo, Beijing Univ. of Technology (China) . . . [10677-69]

High spatial resolution for terahertz imaging and spectroscopy of biological tissues, Nikita V. Chernomyrdin, Alexander Schadko, Bauman Moscow State Technical Univ. (Russian Federation); Gennady Komandin, A. M. Prokhorov General Physics Institute of the Russian Academy of Sciences (Russian Federation); Anna Kucheryavenko, Arseniy Gavdush, Bauman Moscow State Technical Univ. (Russian Federation); Kirill Zaytsev, A. M. Prokhorov General Physics Institute of the Russian Academy of Sciences (Russian Federation) . . . [10677-70]

Terahertz pulsed imaging reveals the stratigraphy of a seventeenth-century oil painting, Alexandre Locquet, Junliang Dong, Georgia Tech-Lorraine (France); Marcello Melis, Profilocolore Srl (Italy); David S. Citrin, Georgia Institute of Technology (United States) . . . [10677-71]

Resolution limits of terahertz ptychography, Lorenzo Valzania, Erwin Hack, Peter Zolliker, EMPA (Switzerland) . . . [10677-72]

Increasing field of view and enhancement of resolution of reconstructed images in digital THz holography, Nikolay V. Petrov, Nikolay S. Balbekin, Maksim S. Kulya, ITMO Univ. (Russian Federation); Andrei A. Gorodetsky, Aston Univ. (United States) . . . [10677-73]

Lunch Break Thu 12:25 to 13:35

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SESSION 13..... THU 13:35 TO 15:15

Advanced Methods V: Harsh Environments

Digital holography for erosion monitoring inside the ITER Tokamak (*Invited Paper*), Giancarlo Pedrini, Igor Alekseenko, Institut für Technische Optik (Germany); Govind Jagannathan, George Vayakis, ITER Organization (France)..... [10677-74]

Interferometric measurements in hostile environments, Peter Bryanston-Cross, Warwick Univ. (United Kingdom) and Optical Diagnostics Ltd. (United Kingdom)..... [10677-75]

Digital holographic microscopy for remote life detection, Eugene Serabyn, Kent Wallace, Kurt M. Liewer, Chris Lindensmith, Jet Propulsion Lab. (United States)..... [10677-76]

Marine particles investigation by underwater digital holography, Victor Dyomin, Igor Polovtsev, Tomsk State Univ. (Russian Federation); Anton Olenin, P.P. Shirshov Institute of Oceanology of the Russian Academy of Sciences (Russian Federation)..... [10677-77]

MEMS-based serial LiDAR detection and imaging architecture for automated surveillance of undersea marine life, Fraser R. Dalgleish, Bing Ouyang, Anni K. Vuorenkoski, Brian Ramos, Yanjun Li, Harbor Branch Oceanographic Institute (United States); Frank M. Caimi, Harbor Branch Oceanographic Institute (United States); Jose Principe, Univ. of Florida (United States); Zheng Cao, Univ. of Florida (United States)..... [10677-78]

Simultaneous measurements of velocity and density of transient flows using high-speed camera technique, Johannes Gürtler, TU Dresden (Germany); Felix Greiffenhagen, Technische Univ. Graz (Austria); Andrés E. Ramos Ruiz, Robert Kuschmierz, TU Dresden (Germany); Jakob Woisetschläger, Technische Univ. Graz (Austria); Jürgen W. Czarske, TU Dresden (Germany)..... [10677-79]

SESSION 14..... THU 15:45 TO 17:15

Modelling, Computation and Design IV

Supervised machine learning for 3D light sheet fluorescence microscopy without manual annotation: application to spheroids, Rosa Huaman, Pejman Rasti, Univ. d'Angers (France); Charlotte Riviere, Univ. Claude Bernard Lyon 1 (France); David Rousseau, Univ. d'Angers (France)..... [10677-80]

Analysis of probe position correction method in ptychography, Priya Dwivedi, Silvania F. Pereira, H. Paul Urbach, Technische Univ. Delft (Netherlands)..... [10677-81]

Single-frame fringe pattern analysis using modified variational image decomposition aided by the Hilbert transform for fast full-field quantitative phase imaging, Maria Cywińska, Maciej Trusiak, Warsaw Univ. of Technology (Poland); Vicente Micó, Univ. de València (Spain); Krzysztof Patroski, Warsaw Univ. of Technology (Poland)..... [10677-82]

A computationally efficient method of object reconstruction in synthetic aperture, Nikolay Nikolaev, Loughborough Univ. (United Kingdom)..... [10677-83]

Shape measurement by inverse raytracing, Carsten Glasenapp, Carl Zeiss AG (Germany)..... [10677-84]

L₁-norm minimization-based accurate diffraction field calculation method emitted by three-dimensional objects, Gokhan Bora Esmer, Marmara Univ. (Turkey)..... [10677-85]

CONFERENCE 10678

Wednesday–Thursday 25–26 April 2018 • Proceedings of SPIE Vol. 10678

Optical Micro- and Nanometrology

Conference Chairs: **Christophe Gorecki**, FEMTO-ST (France); **Anand Krishna Asundi**, Nanyang Technological Univ. (Singapore); **Wolfgang Osten**, Institut für Technische Optik (Germany)

Programme Committee: **Jürgen W. Czarke**, Technische Univ. Dresden (Germany); **Peter J. de Groot**, Zygo Corporation (United States); **Pietro Ferraro**, Istituto Nazionale di Ottica (Italy); **Cosme Furlong**, Worcester Polytechnic Institute (United States); **Yoshio Hayasaki**, Utsunomiya Univ. (Japan); **Michał Józwick**, Warsaw Univ. of Technology (Poland); **Peter H. Lehmann**, Univ. Kassel (Germany); **Paul C. Montgomery**, Univ. de Strasbourg (France); **Andreas Ostendorf**, Ruhr-Univ. Bochum (Germany); **Yukitoshi Otani**, Utsunomiya Univ. (Japan); **Heidi Ottevaere**, Vrije Univ. Brussel (Belgium); **Nicolas Passilly**, FEMTO-ST (France); **Christof Pruss**, Univ. Stuttgart (Germany); **Xiaocong Yuan**, Nankai Univ. (China)

WEDNESDAY 25 APRIL

OPENING REMARKS 8:25 TO 8:30

SESSION 1 WED 8:30 TO 10:20

Interferometry I

Session Chair: **Wolfgang Osten**,
Institut für Technische Optik (Germany)

Speckle Interferometry in harsh environments: considerations and successful examples (*Invited Paper*), Armando Albertazzi Gonçalves Jr., Matias R. Viotti, Fabio Silva, Celso L. N. Veiga, E. S. Barrera, M. Benedete, Analucia V. Fantin, Daniel P. Willemann, Univ. Federal de Santa Catarina (Brazil) [10678-1]

Impulsive Brillouin micro-elastography for noncontact, fast mechanical mapping, Benedikt Krug, Nektarios Koukourakis, Jürgen Czarke, TU Dresden (Germany) [10678-2]

Focusing type grating interferometer, Jia-Xian Liao, Bo-Yen Sun, Hung-Lin Hsieh, National Taiwan Univ. of Science and Technology (Taiwan) ... [10678-3]

Perturbation-resistant RGB interferometry with pulsed LED illumination, Markus Schake, Peter Lehmann, Univ. Kassel (Germany) [10678-4]

Laser heterodyne interferometer for simultaneous measurement of displacement, and roll-angle based on the acousto-optic modulators, Jingya Qi, Zhao Wang, Junhui Huang, Jianmin Gao, Xi'an Jiaotong Univ. (China) [10678-5]

SESSION 2 WED 10:40 TO 12:10

Optical Tomography

Session Chair: **Christophe Gorecki**, FEMTO-ST (France)

The SS-OCT endomicroscopy probe based on MOEMS Mirau micro-interferometer for early stomach cancer detection (*Invited Paper*), Przemyslaw Struk, FEMTO-ST (France) and Silesian Univ. of Technology (Poland) and Univ. de Bourgogne Franche-Comté (France); Sylwester Bargiel, Quentin Tanguy, Christophe Gorecki, Ravinder Chutani, Nicolas Passilly, Luc Froehly, Alain Billard, FEMTO-ST (France) and Univ. de Bourgogne Franche-Comté (France) [10678-6]

Stability characterization of a fixed sample, areal approach to wafer-scale profilometry using a modified low-coherence interferometer, Christopher Taudt, Tobias Baselt, Bryan L. Nelsen, Westsächsische Hochschule Zwickau (Germany); Edmund Koch, TU Dresden (Germany); Peter Hartmann, Westsächsische Hochschule Zwickau (Germany) .. [10678-7]

Measurement of 3D refractive index distribution of multicore photonic crystal fibers by using self-interference digital holographic tomography, Jianglei Di, Kun Wei, Jinzhan Zhong, Jianlin Zhao, Northwestern Polytechnical Univ. (China) [10678-8]

The original application of hybrid lens in micromasurements for optical coherence tomography, Dmitrii Igorevich Egorov, ITMO University (Russian Federation) [10678-9]

Lunch/Exhibition Break Wed 12:10 to 13:30

SESSION 3 WED 13:30 TO 15:10

Metrology of Microoptics/MEMS

Session Chair: **Przemyslaw Struk**, FEMTO-ST (France)

Assessing microlens quality based on 3D irradiance measurement at the focal spot area, Jeremy Béguelin, SUSS MicroOptics SA (Switzerland); Michail Symeonidis, Ecole Polytechnique Fédérale de Lausanne (Switzerland); Wilfried Noell, Reinhard Voelkel, SUSS MicroOptics SA (Switzerland); Toralf Scharf, Ecole Polytechnique Fédérale de Lausanne (Switzerland) .. [10678-10]

Detecting steam condensation by means of polymer racetrack microresonators: highlighting the dynamics of such a soft-matter process, Lucas Garnier, Véronique Vié, Institut de Physique de Rennes (France); Hervé Lhermite, Institut d'Electronique et de Télécommunications de Rennes (France); Qingyue Li, Institut de Physique de Rennes (France); Mathieu Berges, Vincent Cazin, Hervé Cormerais, Jacques Weiss, CentraleSupélec (France); Etienne Gaviot, Univ. du Maine (France); Bruno Bêche, Institut de Physique de Rennes (France) [10678-11]

d'Nanoimager and d'Holoscope: a comparative study for MEMS metrology, Rosmin E. Mohan, Anand K. Asundi, Nanyang Technological Univ. (Singapore); Rachel Wang, d'Optron Pte Ltd. (Singapore) [10678-12]

Wave optical approach to deriving forces in optical tweezers, Qin Yu, Bryan Hennelly, National Univ. of Ireland, Maynooth (Ireland); John Healy, Univ. College Dublin (Ireland) [10678-13]

Lithographic diffraction grating with a period failure, Maria Shishova, Sergey ... B. Odinov, Dmitriy S. Lushnikov, Alexander Y. Zherdev, Bauman Moscow State Technical Univ. (Russian Federation) [10678-14]

SESSION 4 WED 15:40 TO 16:40

Holography

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

Holographic characterization and laser structuring of a microphone membrane, Bryan L. Nelsen, Westsächsische Hochschule Zwickau (Germany); Christopher Taudt, Westsächsische Hochschule Zwickau (Germany) and Fraunhofer-Institut für Werkstoff- und Strahltechnik (Germany) and Technische Univ. Dresden (Germany); Florian Rudek, Peter Hartmann, Westsächsische Hochschule Zwickau (Germany) and Fraunhofer-Institut für Werkstoff- und Strahltechnik (Germany) [10678-16]

Optical profilometry using synthetic aperture interferometry, Ian S. Park, Robert J. C. Middleton, Charles R. Coggrave, Nikolay Nikolaev, Pablo D. Ruiz, Jeremy M. Coupland, Loughborough Univ. (United Kingdom) [10678-17]

Size measurements of an optical fiber by diffraction pattern analysis in Fraunhofer approximation, Karima Boumrar, Ali Boukellal, Univ. Mouloud Mammeri de Tizi-Ouzou (Algeria); Pierre Pfeiffer, Univ. de Strasbourg (France); Rabah Mokdad, Univ. Mouloud Mammeri de Tizi-Ouzou (Algeria) [10678-18]

CONFERENCE 10678

SESSION 5. WED 16:40 TO 17:40

Optical Scatterometry

Session Chair: **Tino Hausotte**,
Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany)

New challenges in light scattering analysis of complex optical components, Myriam Zerrad, Michel Lequime, Simona Liukaityte, Claude Amra, Institut Fresnel (France) [10678-19]

Mueller matrix imaging polarimetric scatterometry to study polarimetric properties of diffraction gratings, Thomas Sang Hyuk Yoo, Ecole Polytechnique (France) and Ctr. National de la Recherche Scientifique (France); Jean-Pierre Perin, Kurt Hingerl, Johannes Kepler Univ. Linz (Austria); Razvigor Ossikovski, Enric Garcia-Caurel, Ecole Polytechnique (France) and Ctr. National de la Recherche Scientifique (France) [10678-20]

Multiple scattering of a focused laser beam by a cluster consisting of nonconcentric layered particles, Hany Ibrahim, Telecom Egypt (Egypt); Elsayed Esam M. Khaled, Assiut Univ. (Egypt) [10678-21]

WEDNESDAY POSTER SESSION WED 17:45 TO 19:30

Posters-Wednesday

Conference attendees are invited to attend the Photonics Europe poster session on Wednesday 17.45 to 19.30. Posters will be on display after 10.00 Wednesday morning in the Hall Rhin. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster authors, view poster presentation guidelines and set-up instructions at <http://spie.org/x34963.xml> and on page 96.

Strain soliton detection and velocity measurements in opaque materials: holographic approach, Andrey V. Belashov, Ioffe Institute (Russian Federation) and ITMO Univ. (Russian Federation); Yaroslav Beltukov, Irina Semenova, Ioffe Institute (Russian Federation) [10678-37]

Investigation of alumina nanometer pore sizes on the broadening of molecular oxygen absorption line, Ahmed Al-Saudi, Abdulaziz Aljalal, Watheq Al-Basheer, Khaled Gasmi, King Fahd Univ. of Petroleum & Minerals (Saudi Arabia) [10678-38]

Optical challenging feature inline measurement system based on photometric stereo and HON feature extractor, Huiyu Liu, Northeastern Univ. (China) [10678-39]

Precision inspection of microcomponents flatness by Moiré interferometry, Saïd Meguellati, Univ. Ferhat Abbas de Sétif (Algeria) [10678-40]

High-accuracy autofocusing for microshapes measurement based on multi-incidence digital holography, Marta Mikula, Tomasz Kozacki, Michal Jozwik, Julianna Kostencka, Warsaw Univ. of Technology (Poland) [10678-41]

Glass blowing platform for microfabrication of microoptical components, Christophe Gorecki, José Vincente Carrion, Nicolas Passilly, Sylvester Bargiel, FEMTO-ST (France) [10678-42]

Step-index optical fiber sizing with low-coherence rainbow technique, Grzegorz Świrniak, Grzegorz Glomb, Wrocław Univ. of Science and Technology (Poland) [10678-43]

Immersion white light scanning interferometry using elastic polymer path length compensation, Husneni Mukhtar, ICube (France) [10678-44]

Determination of mechanical properties of borosilicate BK7 by multiscale and multicycle indentations, H. Benzaama, Ecole Nationale Polytechnique d'Oran (Algeria); M. Bentoumi, Univ. Ferhat Abbas Sétif 1 (Algeria); M. Benchrif, Ecole Nationale Polytechnique d'Oran (Algeria) [10678-45]

THURSDAY 26 APRIL

HOT TOPICS SESSION III 9:00 TO 10:35

From extreme nonlinear optics to ultrafast atomic physics
Anne L'Huillier, Lund Univ., Sweden

Quantum computations and quantum simulations with trapped ions

Rainer Blatt, Institute for Experimental Physics, Univ. of Innsbruck, Austria

For additional details, please see page 8

SESSION 6. THU 11:00 TO 12:40

Micro- and Nanotopography

Session Chair: **Armando Albertazzi Gonçalves Jr.**,
Univ. Federal de Santa Catarina (Brazil)

Application of coherence scanning interferometry for local spectral characterization of transparent layers, Rémy Claveau, Paul Montgomery, Manuel Flury, Univ. de Strasbourg (France) [10678-22]

Residual flatness error correction in three-dimensional imaging confocal microscopes, Carlos Bermudez, Sensofar-Tech, S.L. (Spain); André Felgner, Physikalisch-Technische Bundesanstalt (Germany); Pol Martinez, Aitor Matilla, Cristina Cadevall, Roger Artigas, Sensofar-Tech, S.L. (Spain) [10678-23]

GPU-accelerated simulation of the superresolution capabilities of dielectric microspheres using the differential method, Johannes Drozella, Karsten Frenner, Wolfgang Osten, Univ. Stuttgart (Germany) [10678-24]

Determination of structural deviations in wire grid polarizers for DUV application wavelengths by transmission spectroscopy in the visible spectral range, Thomas Siefke, Walter Dickmann, Johannes Dickmann, Carol Bibiana Rojas Hurtado, Bernd Bodermann, Stefanie Kroker, Physikalisch-Technische Bundesanstalt (Germany) [10678-25]

Parallel phase shift microscopy, vibrometry and focus tracking systems, Ibrahim Abdulhalim, Michael Ney, Amir Aizen, Andrey Nazarov, Avner Safrani, Ben-Gurion Univ. of the Negev (Israel) [10678-26]

Lunch Break Thu 12:40 to 13:50

SESSION 7. THU 13:50 TO 16:20

Interferometry II

Session Chair: **Wolfgang Osten**,
Institut für Technische Optik (Germany)

Interferometric measuring systems of nanopositioning and nanomeasuring machines (Invited Paper), Tino Hausotte, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany) [10678-27]

Dispersion-controlled low-coherent interferometry for thin-film characterization, Marco Preuss, Bryan L. Nelsen, Christopher Taudt, Peter Hartmann, Westsächsische Hochschule Zwickau (Germany) [10678-28]

Ultrastable metrology laser at 633 nm using an optical frequency comb, Paul Köchert, Ulrike Blumröder, Technische Univ. Ilmenau (Germany) [10678-29]

Symmetrical double diffraction laser encoder, An-Jie Liang, Hung-Lin Hsieh, Pei-Yun He, National Taiwan Univ. of Science and Technology (Taiwan) [10678-30]

Dual wavelength fiber laser and its application in displacement measurement with wavelength multiple self-mixing heterodyne interferometry, Hui Wang, Fang Xie, Lianlian Dong, Yunzhi Wang, Hengxiao Xu, Beijing Jiaotong Univ. (China) [10678-31]

Two-step phase shifting in fringe projection, Yongkai Yin, Jiaqi Mao, Xiangfeng Meng, Xiulun Yang, Shandong Univ. (China); Lei Lu, Henan Univ. of Technology (China); Dechun Li, Shandong Univ. (China); Eduard Reithmeier, Leibniz Univ. Hannover (Germany) [10678-32]

SESSION 8. THU 16:20 TO 17:40

Specialized Techniques

Session Chair: **Christophe Gorecki**, FEMTO-ST (France)

Mapping of the detecting units of the resonator-based multiplexed sensor, Anton V. Saetchnikov, Ruhr-Univ. Bochum (Germany) and Belarusian State Univ. (Belarus); Elina A. Tcherniavskaia, Vladimir A. Saetchnikov, Belarusian State Univ. (Belarus); Andreas Ostendorf, Ruhr-Univ. Bochum (Germany) [10678-33]

Numerical analysis of angle-selective one-dimensional periodic structure for building energy management, Kazutaka Isoda, Koki Nagata, Mizue Ebisawa, Tokyo Metropolitan Industrial Technology Research Institute (Japan); Yukitoshi Otani, Utsunomiya Univ. (Japan) [10678-34]

A model-based investigation on the effects of non-ideal display properties in phase measuring deflectometry, Jonas Bartsch, Bremer Institut für angewandte Strahltechnik GmbH (Germany); Johann Rasmus Nüss, Univ. Bremen (Germany); Martin Prinzier, Michael Kalms, Bremer Institut für angewandte Strahltechnik GmbH (Germany); Ralf B. Bergmann, Bremer Institut für angewandte Strahltechnik GmbH (Germany) and Univ. Bremen (Germany) [10678-35]

Ultrasmall mechanical deformation sensor using a hybrid fiber optic-based triangular photonic crystal structure, Roxana-Mariana Beiu, Valeriu Beiu, Virgil-Florin Duma, Aurel Vlaicu Univ. of Arad (Romania) [10678-36]

CONFERENCE 10679

Tuesday–Thursday 24–26 April 2018 • Proceedings of SPIE Vol. 10679

Optics, Photonics and Digital Technologies for Imaging Applications

Conference Chairs: **Peter Schelkens**, Vrije Univ. Brussel (Belgium); **Touradj Ebrahimi**, Ecole Polytechnique Fédérale de Lausanne (Switzerland); **Gabriel Cristóbal**, Consejo Superior de Investigaciones Científicas (Spain)

Programme Committee: **Olivier Aubreton**, Univ. de Bourgogne (France); **Jan T. Bosiers**, Teledyne DALSA (Netherlands); **Daping Chu**, Univ. of Cambridge (United Kingdom); **Jana Dittmann**, Otto-von-Guericke-Univ. Magdeburg (Germany); **Marek Domanski**, Univ. of Poznan (Poland); **Boris Escalante-Ramirez**, Univ. Nacional Autónoma de México (Mexico); **Pascuala García-Martínez**, Univ. de València (Spain); **Laurent Jacques**, Univ. Catholique de Louvain (Belgium); **Tom R. L. Kimpe**, Barco N.V. (Belgium); **Tomasz Kozacki**, Warsaw Univ. of Technology (Poland); **Dragan Kukolj**, RT-RK Institute for Computer Based Systems (Serbia); **Jukka-Tapani Mäkinen**, VTT Technical Research Ctr. of Finland (Finland); **Maria S. Millán García-Varela**, Univ. Politècnica de Catalunya (Spain); **Stuart W. Perry**, Canon Information Systems Research (Australia); **Pasi Saarikko**, Oculus VR, LLC (United States); **Martin Schrader**, Nokia Research Ctr. (Finland); **Lea Skorin-Kapov**, Univ. of Zagreb (Croatia); **Colin James Richard Sheppard**, National Univ. of Singapore (Singapore); **Athanassios N. Skodras**, Univ. of Patras (Greece); **Andrew G. Tescher**, AGT Associates (United States); **Frédéric Truchetet**, Univ. de Bourgogne (France); **Gerald Zauner**, FH OÖ Forschungs & Entwicklungs GmbH (Austria)

TUESDAY 24 APRIL

OPENING REMARKS 8:35 TO 8:40

SESSION 1 TUE 8:40 TO 10:20

Medical Imaging I

Quality enhancement of multispectral images for skin cancer optical diagnostics, Katrina Bolochko, Dmitrijs Bliznuks, Riga Technical Univ. (Latvia); Ilze Lihacova, Alexey Lihachov, Univ. of Latvia (Latvia) [10679-1]

Monitoring of the excretion of fluorescent nanocomposites out of the body using artificial neural networks, Olga Sarmanova, Sergey Burikov, M.V. Lomonosov Moscow State Univ. (Russian Federation); Sergey Dolenko, Igor Isaev, Skobeltsyn Institute of Nuclear Physics (Russian Federation); Kirill Laptinskiy, M.V. Lomonosov Moscow State Univ. (Russian Federation); Neeraj Prabhakar, Jessica Rosenholm, Åbo Akademi Univ. (Finland); Tatiana Dolenko, M.V. Lomonosov Moscow State Univ. (Russian Federation) [10679-2]

Cloud infrastructure for skin cancer scalable detection system, Dmitrijs Bliznuks, Pavels Osipovs, Riga Technical Univ. (Latvia); Alexey Lihachev, Institute of Atomic Physics and Spectroscopy, Univ. of Latvia (Latvia) [10679-3]

Deep features using convolutional neural networks for early stage cancer detection, Sawon Pratiher, Indian Institute of Technology Kanpur (India); Sabyasachi Mukhopadhyay, Nirmalya Ghosh, Indian Institute of Science Education and Research Kolkata (India); Asima Pradhan, Indian Institute of Technology Kanpur (India); Prasanta K. Panigrahi, Indian Institute of Science Education and Research Kolkata (India) [10679-4]

Multiclass classifications of diabetic retinopathy by support vector machine, Sabyasachi Mukhopadhyay, Indian Institute of Science Education and Research Kolkata (India); Sawon Pratiher, Indian Institute of Technology Kanpur (India); Jay Chhablani, Ashutosh Richhariya, LV Prasad Eye Institute (India); Nirmalya Ghosh, Prasanta K. Panigrahi, Indian Institute of Science Education and Research Kolkata (India) [10679-5]

SESSION 2 TUE 10:50 TO 12:30

Medical Imaging II

Classification of brain tissue with optical coherence tomography by employing texture analysis, Marcel Lenz, Ruhr-Univ. Bochum (Germany); Robin Krug, Univ. Knappschafts-Krankenhaus Bochum GmbH (Germany); Christopher Dillmann, Technische Fachhochschule Georg Agricola zu Bochum (Germany); Nils C. Gerhardt, Ruhr-Univ. Bochum (Germany); Hubert Welp, Technische Fachhochschule Georg Agricola zu Bochum (Germany); Kirsten Schmieder, Univ. Knappschafts-Krankenhaus Bochum GmbH (Germany); Martin R. Hofmann, Ruhr-Univ. Bochum (Germany) [10679-6]

Visual measurement of any shape of the flaccid membrane of the extracorporeal pneumatic heart assist pump, Wojciech Sulej, Krzysztof Murawski, Wojskowa Akademia Techniczna im. Jarosława Dąbrowskiego (Poland) [10679-7]

Dual-beam manually-actuated distortion-corrected imaging (DMDI) using galvanometer scanner, Madeline Harlow, Anthony Lee M.D., Geoffrey Hohert, Pierre Lane, Calum MacAulay, BC Cancer Research Ctr. (Canada) [10679-8]

Quantification of breast cancerous tissue using high-resolution full-field optical coherence tomography, Kavita Dubey, Neeru Singla, Vishal Srivastava, Thapar Institute of Engineering and Technology Univ. (India) [10679-9]

High sensitivity low-power CMOS transimpedance amplifier for near-infrared optical tomography, Ahmed Atef, Sohag Univ. (Egypt); Elsayed Esam M. Khaled, Assiut Univ. (Egypt) [10679-10]

Lunch/Exhibition Break Tue 12:30 to 14:00

SESSION 3 TUE 14:00 TO 16:00

Microscopic Imaging

Fluorescence whole slide imaging using LED-based color-sequential multiline scanning, Leon van der Graaff, Sjoerd Stallinga, Lucas van Vliet, Technische Univ. Delft (Netherlands) [10679-11]

Axial scanning and spherical aberration correction in confocal microscopy employing an adaptive lens, Katrin Philipp, TU Dresden (Germany); Florian Lemke, Matthias C. Wapler, Univ. of Freiburg (Germany); Nektarios Koukourakis, TU Dresden (Germany); Ulrike Wallrabe, Univ. of Freiburg (Germany); Jürgen W. Czarske, TU Dresden (Germany) [10679-12]

Digital Rheinberg illumination: optodigital staining of cells with digital holographic microscopy, Bryan M. Hennelly, National Univ. of Ireland, Maynooth (Ireland); John J. Healy, Univ. College Dublin (Ireland); Xin Fan, National Univ. of Ireland, Maynooth (Ireland) [10679-13]

Lights and pitfalls of convolutional neural networks for diatom identification, Anibal Pedraza, Gloria Bueno, Oscar Déniz, Jesus Ruiz-Santaquiteria, VISILAB, Univ. de Castilla-La Mancha (Spain); Carlos Sanchez, Instituto de Óptica “Daza de Valdés” (Spain) and Consejo Superior de Investigaciones Científicas (Spain); Saúl Blanco, María Borrego-Ramos, Adriana Olenici, Univ. de León (Spain); Gabriel Cristóbal, Instituto de Óptica “Daza de Valdés” (Spain) and Consejo Superior de Investigaciones Científicas (Spain) [10679-14]

Image scanning microscopy (ISM) with a single photon avalanche diode (SPAD) array detector, Colin J. R. Sheppard, Istituto Italiano di Tecnologia (Italy) and Univ. of Wollongong (Australia); Mauro Buttafava, Politecnico di Milano (Italy); Marco Castello, Alberto Diaspro, Giorgio Tortarolo, Istituto Italiano di Tecnologia (Italy); Alberto Tosi, Politecnico di Milano (Italy); Giuseppe Vicidomini, Istituto Italiano di Tecnologia (Italy); Federica Villa, Politecnico di Milano (Italy) [10679-15]

The generation of optical needle and magnetization needle with tunable longitudinal depth, Jian Fu, Peifeng Chen, Ying Wang, Huazhong Univ. of Science and Technology (China) [10679-16]

HOT TOPICS SESSION II 16:30 TO 18:05

Coherent combination of fiber amplified ultrafast laser pulses
Jens Limpert, Institute of Applied Physics, Friedrich Schiller Univ. Jena, Germany

2D materials and their heterostructures: fundamentals, applications and prototypes
Frank Koppens, ICFO-The Institute of Photonic Sciences, Spain

For additional details, please see page 7

CONFERENCE 10679

TUESDAY POSTER SESSION TUE 18:00 TO 19:30

Posters-Tuesday

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Poster authors, view poster presentation guidelines and set-up instructions at <http://spie.org/x34963.xml> and on page 96.

Region of interest extraction based on common saliency analysis and superpixel clustering for remote sensing images, Xinran Lv, Libao Zhang, Shuang Wang, Beijing Normal Univ. (China) [10679-46]

Hough transform-based image processing algorithm in the optical-electronic angle measuring device, Anton A. Nogin, Timofey K. Korolev, Igor A. Konyakhin, ITMO Univ. (Russian Federation) [10679-47]

Influence of noise on the estimation method to reject damped sinusoidal vibrations in adaptive optics systems, Dariusz Kania, Wroclaw Univ. of Technology (Poland) [10679-48]

Augmented logarithmic Gaussian process regression methodology for chlorophyll prediction, Subhadip Dey, Indian Institute of Technology Kharagpur (India); Sawon Pratiher, Indian Institute of Technology Kanpur (India); Chanchal K. Mukherjee, Indian Institute of Technology Kharagpur (India) [10679-49]

Block reconstruction of object image based on compressed sensing and orthogonal modulation, Xin Zhou, Yuanyuan Zhou, Sichuan Univ. (China); Jianping Hu, Chengdu Fine Optical Engineering Research Ctr. (China); Sheng Yuan, North China Univ. of Water Resources and Electric Power (China); Luozhi Zhang, Dongming Huo, Jinxi Li, Sichuan Univ. (China) [10679-50]

Optical design and unification of objectives: CCF PlanApo for 28 mm observation in the microscope, Dmitry N. Frolov, Olga A. Vinogradova, Labor-Microscopes (Russian Federation); Vladimir N. Frolov, Pavel S. Vakulov, JSC NPP "AME" (Russian Federation) [10679-51]

A multiphase active contour model based on the Hermite transform for texture segmentation, Erik Carbajal-Degante, Jimena Olveres, Boris Escalante-Ramírez, Univ. Nacional Autónoma de México (Mexico) [10679-52]

Dynamic ultrasonic wavefield noncontact measurement based on digital holography, Xing Wang, Hongwei Ma, Guangming Zhang, Yishu Zhang, Haotian Wang, Yan Wang, Xi'an Univ. of Science and Technology (China) [10679-53]

Airport detection via superpixel segmentation and salient feature extraction for remote sensing images, Xinran Lv, Shiyi Wang, Libao Zhang, Beijing Normal Univ. (China) [10679-54]

Particle image models for optical flow-based velocity field estimation in image velocimetry, Grzegorz Glomb, Grzegorz Świrniak, Janusz Mroczka, Wroclaw Univ. of Science and Technology (Poland) [10679-55]

Fluid flow measurements using optical flow velocity field estimation and LED-based light sheet illumination, Grzegorz Glomb, Grzegorz Świrniak, Janusz Mroczka, Wroclaw Univ. of Science and Technology (Poland) [10679-56]

Freeform optics complexity estimation: comparison of methods, Eduard R. Muslimov, Lab. d'Astrophysique de Marseille, Aix-Marseille Univ. (France); Emmanuel Hugot, Simona Lombardo, Mélanie Roulet, Marc Ferrari, Lab. d'Astrophysique de Marseille, Aix-Marseille Univ. (France) [10679-57]

Endogenous two- and three-photon fluorescence of a biological substance with a picosecond ultrawide band laser source, Claire Lefort, XLIM Institut de Recherche (France); Laetitia Magnol, Univ. de Limoges (France); Véronique Blanquet, Unité de Génétique Moléculaire Animale (France); Philippe Lévêque, Vincent Couderc, XLIM Institut de Recherche (France) [10679-58]

Optical system design of the telescopic system with a variable magnification, Ivan Tarasov, Helen A. Tsyganok, ITMO Univ. (Russian Federation) [10679-59]

The optimal planning methods of remote sensing experiment in IR-range for the satellite meteorology problems, Nikolay Uvarov, EOS Data Analytics, Inc. (Ukraine) [10679-60]

Sparse matrix-based image enhancement for target detection using deep learning, Zhe-Yuan Kao, Shih-Yu Chen, Fu-Ming Yang, Yen-Chung Chen, National Yunlin Univ. of Science and Technology (Taiwan) [10679-61]

A method for automatic analysis of scanned 3D models of human hands and feet, Mihails Kovalovs, Riga Technical Univ. (Latvia) [10679-62]

Multisensor array for polarimetric light-field imaging, Yunsong Nie, Beijing Institute of Space Mechanics and Electricity (China); Chongde Zi, Tao Yue, Xun Cao, Yunqian Li, Nanjing Univ. (China) [10679-63]

Statistical image processing approach for characterization of morphological changes in ocular tissues related with folic acid deficiency pathologies, Ouafa Sijilmassi, José Manuel López Alonso, Aurora Del Río Sevilla, María del Carmen Barrio Asensio, Univ. Complutense de Madrid (Spain) [10679-64]

New structures of diffraction-resistant beams, Michel Zamboni-Rached, Univ. Estadual de Campinas (Brazil); Ahmed Dorrah, Mohammad Mojahedi, Univ. of Toronto (Canada) [10679-65]

Electrochromic tunable filters based on nanotubes with viologen incorporation, Alexander Hein, Technical Univ. Kaiserslautern (Germany); Carsten Kortz, Egbert Oesterschulze, Technische Univ. Kaiserslautern (Germany) [10679-66]

Opto-electronic scanner for operational control of security holograms authenticity on documents, Ivan Tsyganov, Vasily V. Kolyuchkin, Vladimir E. Talalaev, Nikolay V. Piryutin, Sergey B. Odinkov, Bauman Moscow State Technical Univ. (Russian Federation); Evgenii Y. Zlokazov, Vsevolod D. Cheburkanov, National Research Nuclear Univ. MEPhI (Russian Federation) [10679-67]

Analysis of lightguide parameters for multicolor augmented reality indicator based on DOEs, Yanina Grad, Sergey B. Odinkov, Vladimir Nikolaev, Artem B. Solomashenko, Bauman Moscow State Technical Univ. (Russian Federation) [10679-68]

Convolutional neural networks for skin cancer classification on OCT images, Dmitry S. Raupov, Oleg Myakinin, Ivan Bratchenko, Valery Zakharov, Samara Univ. (Russian Federation) [10679-69]

Asymmetric optical encryption technique implementing spatially incoherent illumination, Vitaly V. Krasnov, Pavel A. Cheremkhin, Nikolay N. Evtikhiev, Ekaterina D. Minaeva, Vladislav G. Rodin, National Research Nuclear Univ. MEPhI (Russian Federation) [10679-70]

Digital hologram quality improvement by elimination of imaging sensor noise, Pavel A. Cheremkhin, Nikolay N. Evtikhiev, Vitaly V. Krasnov, Vladislav G. Rodin, Rostislav S. Starikov, National Research Nuclear Univ. MEPhI (Russian Federation) [10679-71]

Deep learning object recognition in multispectral UAV imagery, Vladimir A. Knyaz, Sergey Zheltov, GosNIAS (Russian Federation) [10679-72]

Methods of entering of compensation distortions into images for projection on nonplanar surfaces by development of systems of augmented reality, Anton Chukhlamov, Ksenia Ezhova, ITMO Univ. (Russian Federation) [10679-73]

A square glass fiber measurement method for the collection of X-rays in outer space, YaFeng Qiu, Shilin Chen, Nanjing Univ. of Science and Technology (China) [10679-74]

Intelligent reconnaissance method and system of mountain geological disaster based on mobile machine vision and artificial neural network information fusion, Cheng Zhu, Shenzhen Univ. (China) [10679-75]

Pattern recognition based on analysis of the summary ellipse polarization state in the Fraunhofer diffraction area, Barbara N. Kilosanidze, George Kakauridze, Irina Kobulashvili, Institute of Cybernetics, Georgian Technical Univ. (Georgia) [10679-76]

Application of 2D laser displacement sensor for 3D strawberry shape information construction, Jongguk Lim, Changyeun Mo, Giyoung Kim, Rural Development Administration (Korea, Republic of) [10679-77]

Dense disparity estimation based on the bidimensional empirical mode decomposition and Riesz transformation, Feifei Gu, Shenzhen Institutes of Advanced Technology (China) [10679-78]

Overview of optical image authentication scheme: double random phase encoding and photon counting imaging, Samaneh Gholami, Keyvan Jaferzadeh, Inkyu Moon, Chosun Univ. (Korea, Republic of) [10679-79]

WEDNESDAY 25 APRIL

SESSION 4 WED 8:40 TO 10:20

Plenoptic Image Processing

Information processing challenges of full parallax light field displays, Zahir Y. Alpaslan, Hussein S. El-Ghoroury, Ostendo Technologies, Inc. (United States); Peter Schelkens, Vrije Univ. Brussel (Belgium) [10679-17]

Benchmarking coding standards for digital holography represented on the object plane, Marco Bernardo, Antonio M. G. Pinheiro, Manuela Pereira, Univ. da Beira Interior (Portugal) [10679-18]

Compression scheme for sparsely sampled light field data based on pseudo multiview sequences, Waqas Ahmad, Mårten Sjöström, Roger Olsson, Mid Sweden Univ. (Sweden) [10679-19]

View-dependent compression of computer-generated hologram based on matching pursuit, Anas El Rhammad, b<>com (France); Patrick Gioia, Orange SA (France); Antonin Gilles, b<>com (France); Marco Cagnazzo, Béatrice Pesquet, Télécom ParisTech (France) [10679-20]

Advanced mobile three-dimensional display based on computer-generated integral imaging, Munkh-Uchral Erdenebat, Byeong-Jun Kim, Yan-Ling Piao, Nyamsuren Darkhanbaatar, Ki-Chul Kwon, Nam Kim, Chungbuk National Univ. (Korea, Republic of) [10679-21]

SESSION 5 WED 10:50 TO 12:10

Display Systems

Laser speckle reduction based on partial spatial coherence and microlens-array screens, Jaël Pauwels, Guy Verschaffelt, Vrije Univ. Brussel (Belgium) [10679-22]

Camera-based color measurement of DLP projectors using a semisynchronized projector camera system, Marcel Heinz, Guido Brunnnett, Danny Koverko, Technische Univ. Chemnitz (Germany) [10679-23]

Optical flow-based filtering for effective presentation of the enhanced vision on a HUD, Vladimir V. Kniaz, GosNIIAS (Russian Federation) [10679-24]

Conception of a touchless human machine interaction system for operating rooms using deep learning, Florian Pereme, Jesus Zegarra, Mirko Scavazzin, Franck Valentini, Jean-Pierre Radoux, Altran Technologies (France) [10679-80]

Lunch/Exhibition Break Wed 12:10 to 13:30

SESSION 6 WED 13:30 TO 15:10

Holographic Imaging and Rendering

Image blur for incoherent light holographic display with DMD modulator, Maksymilian Chlipala, Warsaw Univ. of Technology (Poland); Hyon-Gon Choo, Electronics and Telecommunications Research Institute (Korea, Republic of); Tomasz Kozacki, Warsaw Univ. of Technology (Poland) [10679-25]

Image blur and visual perception for rainbow holographic display, Hyon-Gon Choo, Electronics and Telecommunications Research Institute (Korea, Republic of); Maksymilian Chlipala, Tomasz Kozacki, Warsaw Univ. of Technology (Poland) [10679-26]

Spatial frequency response of nanocomposite holographic gratings, Yasuo Tomita, Toshihiro Nakamura, Agyl F. Rizky, Ryota Fujii, The Univ. of Electro-Communications (Japan); Jinxin Guo, Beijing Univ. of Technology (China) [10679-27]

Holographic fringe printer for computer-generated holograms, Erkhembataar Dashdavaa, Anar Khuderchuluun, Chang-Won Shin, Young-Tae Lim, Nam Kim, Chungbuk National Univ. (Korea, Republic of) [10679-28]

Diffraction elements by nanoparticle composites for holographic display, Lin Cao, Jinxin Guo, Lu Rong, Xinping Zhang, Dayong Wang, Beijing Univ. of Technology (China) [10679-29]

SESSION 7 WED 15:40 TO 17:40

Image Acquisition

Curved detectors for wide-field imaging systems: impact on tolerance analysis, Eduard R. Muslimov, Lab. d'Astrophysique de Marseille, Aix-Marseille Univ. (France); Emmanuel Hugot, Lab. d'Astrophysique de Marseille, Aix Marseille Univ. (France); Simona Lombardo, Lab. d'Astrophysique de Marseille, Aix Marseille Univ. (France); Mélanie Roulet, Thibault Behaghel, Lab. d'Astrophysique de Marseille, Aix Marseille Univ. (France); Marc Ferrari, Wilfried Jahn, Lab. d'Astrophysique de Marseille, Aix Marseille Univ. (France); Christophe Gaschet, Bertrand Chambion, David Henry, Univ. Grenoble Alpes (France) and CEA-LETI (France) [10679-30]

Real-time spatially adaptive deconvolution for CFA images, Ljubomir Jovanov, Wilfried Philips, Univ. Gent (Belgium) [10679-31]

Polymer conjugations of graphene quantum dots-based materials for two-photon imaging, Wen-Shuo Kuo, National Cheng Kung Univ. (Taiwan) [10679-32]

Real-time high-speed motion blur compensation method using galvanometer mirror for shape sensing of microfabricated objects, Kenichi Murakami, Tomohiko Hayakawa, Masatoshi Ishikawa, The Univ. of Tokyo (Japan) [10679-33]

Curved CMOS sensor: characterization of the first fully functional prototype, Simona Lombardo, Wilfried Jahn, Thibault Behaghel, Emmanuel Hugot, Eduard R. Muslimov, Mélanie Roulet, Marc Ferrari, Lab. d'Astrophysique de Marseille, Ctr. National de la Recherche Scientifique (France); Christophe Gaschet, Bertrand Chambion, David Henry, CEA-LETI (France) [10679-34]

Visualization of an acoustic stationary wave by optical feedback interferometry, Fernando Urgiles, Julien Perchoux, Antonio Luna, Thierry Bosch, Francis Jayat, Lab. d'Analyse et d'Architecture des Systèmes (France) [10679-35]

THURSDAY 26 APRIL

HOT TOPICS SESSION III 9:00 TO 10:35

From extreme nonlinear optics to ultrafast atomic physics
Anne L'Huillier, Lund Univ., Sweden

Quantum computations and quantum simulations with trapped ions
Rainer Blatt, Institute for Experimental Physics, Univ. of Innsbruck, Austria

For additional details, please see page 8

SESSION 8 THU 11:00 TO 12:40

Quality Assessment

How to measure image quality of virtual reality cameras in practice, Veli-Tapani Peltoketo, Nokia Corp. (Finland) [10679-36]

Interplay between light pipe and controlled coherence laser source on the emergence of subjective speckle, Pierre Walczak, Stéphane Barland, Institut de Physique de Nice (France); Xavier Hachair, BBright (France) [10679-37]

Automating the surface inspection on small customer-specific optical elements, Alexander Schöch, Carlo Bach, Carsten Ziolek, NTB Interstaatliche Hochschule für Technik Buchs (Switzerland) [10679-38]

Multiperspective measurement of yarn hairiness using mirrored images, Bugao Xu, Univ. of North Texas (United States); Lei Wang, Weidong Gao, Jiangnan Univ. (China) [10679-39]

The device for automated quality inspection and authentication of security holograms, Vasily V. Kolyuchkin, Sergey B. Odinovok, Vladimir E. Talalaev, Ivan Tsyganov, Bauman Moscow State Technical Univ. (Russian Federation) [10679-40]

Lunch Break Thu 12:40 to 13:50

SESSION 9 THU 13:50 TO 15:30

Image Analysis

Face recognition method for cases of an insufficient training set, using 3D models of face that were created using two facial images, Olga Krutikova, Aleksandrs Sisojevs, Riga Technical Univ. (Latvia) [10679-41]

Research on method of vision navigation for mobile robot in unstructured environment, Liming Zhao, Chongqing Univ. of Posts and Telecommunications (China) [10679-42]

Development algorithms for object detection and tracking on video in automatic control solution context, Dmitriy Fedorenko, Kseniia Ezhova, ITMO Univ. (Russian Federation) [10679-43]

Fast object recognition method from random measurements of compressive sensing camera, Lingli Tang, Lingling Ma, Chuanrong Li, Yongsheng Zhou, Qi Wang, Chinese Academy of Sciences (China) [10679-44]

Detection of multiple moving objects from UAV videos, Bahareh Kalantar, Shattri Mansor, Univ. Putra Malaysia (Malaysia); Octavio Icasio-Hernández, Ctr. Nacional de Metrología (Mexico); Alfian Abdul Halin, Helmi Zulhaidi M. Shafri, Univ. Putra Malaysia (Malaysia); Mohsen Zand, Islamic Azad Univ. (Iran, Islamic Republic of) [10679-45]

CONFERENCE 10680

Monday–Thursday 23–26 April 2018 • Proceedings of SPIE Vol. 10680

Optical Sensing and Detection

Conference Chairs: **Francis Berghmans**, Vrije Univ. Brussel (Belgium); **Anna G. Mignani**, Istituto di Fisica Applicata Nello Carrara (Italy)

Programme Committee: **Francesco Baldini**, Istituto di Fisica Applicata Nello Carrara (Italy); **Hartmut Bartelt**, Institut für Photonische Technologien e.V. (Germany); **Brian Culshaw**, Univ. of Strathclyde (United Kingdom); **Thomas Geernaert**, Vrije Univ. Brussel (Belgium); **Roger M. Groves**, Technische Univ. Delft (Netherlands); **Jane Hodgkinson**, Cranfield Univ. (United Kingdom); **Jiri Homola**, Institute of Photonics and Electronics of the ASCR, v.v.i. (Czech Republic); **Leszek Roman Jaroszewicz**, Military Univ. of Technology (Poland); **Elfed Lewis**, Univ. of Limerick (Ireland); **Alexis Mendez**, MCH Engineering LLC (United States); **Luc Thevenaz**, Ecole Polytechnique Fédérale de Lausanne (Switzerland); **Alessandro Tredicucci**, NEST (Italy); **Moshe Tur**, Tel Aviv Univ. (Israel); **Waclaw Urbanczyk**, Wroclaw Univ. of Technology (Poland); **Jan Van Roosbroeck**, FBGS International (Belgium); **David J. Webb**, Aston Univ. (United Kingdom); **Libo Yuan**, Harbin Engineering Univ. (China)

MONDAY 23 APRIL

HOT TOPICS SESSION I 9:00 TO 11:00

From Einstein doubts to quantum bits: a second quantum revolution

Alain Aspect, Lab. Charles Fabry, Institut d'Optique, France

Pico-Photonics: watching and sensing single molecules by confining light to the atom scale

Jeremy J. Baumberg, NanoPhotonics Ctr., Univ. of Cambridge, United Kingdom

For additional details see page 6.

OPENING REMARKS 11:25 TO 11:30

SESSION 1 MON 11:30 TO 12:40

Detector and Imager Technology and Physics I

On-ground calibration of DESIS: DLR's Earth sensing imaging spectrometer for the international space station ISS (*Invited Paper*), Ilse Sebastian, David Krutz, Andreas Eckardt, Holger Venus, Ingo Walter, Burghardt Günther, Michael Neidhardt, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany); Ralf Reulke, Humboldt-Univ. zu Berlin (Germany); Rupert Müller, Mathias Uhlig, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany); Sandra Müller, Thomas Peschel, Fraunhofer-Institut für Angewandte Optik und Feinmechanik (Germany); Simone Arloth, Matthias Lieder, Friedrich Schrandt, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany) [10680-1]

Classification of cracks on concrete surface using false colour HSV images, including near-infrared information, Bruno Oliveira Santos, Jónatas Valença, Eduardo Júlio, Instituto Superior Técnico (Portugal) [10680-2]

Kernel-based crosstalk quantification and analysis of a CMOS image sensor, Swaraj Bandhu Mahato, Joris De Ridder, Hans Van Winckel, KU Leuven (Belgium) [10680-3]

Lunch Break Mon 12:40 to 13:50

SESSION 2 MON 13:50 TO 15:20

Detector and Imager Technology and Physics II

Temperature imaging in the MWIR range independent on emissivity (*Invited Paper*), Álvaro Souto-López, Antón García-Díaz, Roi Méndez-Rial, AIMEN Ctr. Tecnológico (Spain) [10680-4]

Room-temperature carbon nanotube bolometer with surface-plasmon enhanced and spectrally selective response, Boris I. Afonogov, Daria S. Kopylova, Skolkovo Institute of Science and Technology (Russian Federation); Ksenia A. Abrashitova, Vladimir O. Bessonov, M.V. Lomonosov Moscow State Univ. (Russian Federation); Anton S. Anisimov, Canatu Oy (Finland); Sergey A. Dyakov, Nikolay A. Gippius, Skolkovo Institute of Science and Technology (Russian Federation); Andrey A. Fedyanin, M.V. Lomonosov Moscow State Univ. (Russian Federation); Albert G. Nasibulin, Skolkovo Institute of Science and Technology (Russian Federation) and Aalto Univ. (Finland) [10680-5]

Graphene-based lateral Schottky diodes for detecting terahertz radiation, Georgy Fedorov, Moscow Institute of Physics and Technology (Russian Federation); Igor Gayduchenko, Nadezhda Titova, Moscow State Pedagogical Univ. (Russian Federation); Maksim Moskotin, National Research Univ. of Electronic Technology (Russian Federation); Elena Obratsova, Maxim Rybin, A. M. Prokhorov General Physics Institute of the Russian Academy of Sciences (Russian Federation); Gregory Goltsman, Moscow State Pedagogical Univ. (Russian Federation) [10680-6]

Localized surface plasmon resonance assisted UV photodetection through nanoholes, Abhishek Dubey, Chang Wei Cheng, Ragini Mishra, Tsung-Yu Huang, Ta-Jen Yen, Shangji Gwo, National Tsing Hua Univ. (Taiwan) [10680-7]

SESSION 3 MON 15:50 TO 17:30

Detector and Imager Technology and Physics III

Fast fluorescence lifetime determination with an ASIC detector unit, Christian Möller, CiS Forschungsinstitut für Mikrosensorik und Photovoltaik GmbH (Germany); Volkhard Körner, DMOS GmbH (Germany); Christoph Heinze, Hans-Georg Ortlepp, CiS Forschungsinstitut für Mikrosensorik und Photovoltaik GmbH (Germany); Wolfram Altermann, Tobias Schilbach, Markus Winkler, Dagmar Buchweitz, Marco Götz, DMOS GmbH (Germany); Thomas Ortlepp, CiS Forschungsinstitut für Mikrosensorik und Photovoltaik GmbH (Germany) [10680-8]

Study of CdTe/HgCdTe annealing on the effect of long-wavelength HgCdTe detector, Xi Wang, Chun Lin, Songmin Zhou, Hui Xia, Changhong Sun, Yanfeng Wei, Quanzhi Sun, Shanghai Institute of Technical Physics of the Chinese Academy of Sciences (China) [10680-9]

Silicon impurities in AlGaAs/GaAs heterointerface and registration efficiency of quantum well infrared photodetector, Yavor V. Lebiadok, Alena A. Shalayeva, B.I. Stepanov Institute of Physics (Belarus) ... [10680-10]

Influence of different light conditions on activation of GaAs photocathodes, Yijun Zhang, Jingzhi Zhang, Cheng Feng, Nanjing Univ. of Science and Technology (China); Xiaohui Wang, Univ. of Electronic Science and Technology of China (China); Chengwei Fang, Qingxin Dai, Yunsheng Qian, Nanjing Univ. of Science and Technology (China) [10680-11]

Design and development of portable fluorescence reader using silicon photo multiplier (SiPM) sensor, Roshan Lal Makkar, Indian Institute of Technology Bombay (India) and Society for Applied Microwave Electronics Engineering and Research (India); Sana Syeda Aliya, Vivek Borse, Rohit Srivastava, Indian Institute of Technology Bombay (India) [10680-12]

TUESDAY 24 APRIL

SESSION 4 TUE 8:30 TO 10:20

Optical Spectroscopy and Devices

Session Chair: **Anna Grazia Mignani**, Istituto di Fisica Applicata "Nello Carrara" (Italy)

In-situ ratiometric pathlength calibration of integrating spheres used in measurement of absorbance (*Invited Paper*), Sarah Bergin, Jane Hodgkinson, Daniel Francis, Ralph P. Tatam, Cranfield Univ. (United Kingdom) [10680-13]

Herriot FT-IR (Fourier Transform InfraRed): achieving compact high spectral resolution, Erga Lifshitz, Assaf Levanon, Michael Mrejen, Haim Suchowski, Tel Aviv Univ. (Israel) [10680-14]

RLS (Raman laser spectrometer) optical behavior after a qualification test campaign, Cecilia Gordillo, Ingeniería de Sistemas para la Defensa de España (Spain); Gonzalo Ramos, INTA Instituto Nacional de Técnica Aeroespacial (Spain); Juan Cabrero, José Antonio Rodríguez, Amaia Santiago, Ingeniería de Sistemas para la Defensa de España (Spain); Rosario Canchal, INTA Instituto Nacional de Técnica Aeroespacial (Spain); Laurent Bastide, Ingeniería de Sistemas para la Defensa de España (Spain); Andoni Moral, Tomás Belenguer, Miguel Sanz-Palomino, Carlos Pérez, Mariana Fernández, María Colombo, Paloma Gallego, INTA Instituto Nacional de Técnica Aeroespacial (Spain); Ian Hutchinson, Univ. of Leicester (United Kingdom); José Miguel Encinas, INTA Instituto Nacional de Técnica Aeroespacial (Spain); Richard Ingley, Univ. of Leicester (United Kingdom); David Escribano, INTA Instituto Nacional de Técnica Aeroespacial (Spain); Guillermo López-Reyes, Fernando Rull, Univ. de Valladolid (Spain) [10680-15]

Rephasing the rotational centrifugal effect by laser-induced alignment echoes, Dina Rosenberg, Ran Damari, Tel Aviv Univ. (Israel); Shimshon Kallush, ORT Braude College (Israel) and The Hebrew Univ. of Jerusalem (Israel); Sharly Fleischer, Tel Aviv Univ. (Israel) [10680-16]

Filter design in laser frequency calibration system using heterodyne with frequency comb, Wenhui Yu, ICube, Univ. de Strasbourg (France); Pierre Pfeiffer, Télécom Physique Strasbourg (France) [10680-17]

SESSION 5. TUE 10:50 TO 11:50

Detection for Visible Light Communications

Fine-grained indoor localization: optical sensing and detection, Manuela Vieira, Instituto Superior de Engenharia de Lisboa (Portugal); Manuel Augusto Vieira, Paula Louro, UNINOVA (Portugal); Pedro Vieira, Instituto de Telecomunicações (Portugal); Alessandro Fantoni, Instituto Superior de Engenharia de Lisboa (Portugal) [10680-18]

Design of a transmission system for indoors navigation based on VLC, Paula Louro, Manuela Vieira, Fábio Rodrigues, Manuel Augusto Vieira, Instituto Superior de Engenharia de Lisboa (Portugal); João Costa, Ctr. of Technology and Systems, UNINOVA (Portugal) [10680-19]

Vehicular visible light communication: road-to-vehicle, Manuel Augusto Vieira, UNINOVA (Portugal); Manuela Vieira, Instituto Superior de Engenharia de Lisboa (Portugal); Paula Louro, UNINOVA (Portugal); Pedro Vieira, Instituto de Telecomunicações (Portugal); Fábio Rodrigues, Instituto Superior de Engenharia de Lisboa (Portugal) [10680-20]

Lunch/Exhibition Break Tue 11:50 to 13:20

SESSION 6. TUE 13:20 TO 16:00

Grating-based Sensors

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

Coating influence on the refractometric sensitivity of plasmonic optical fiber grating spectral combs, Christophe Caucheteur, Méric Loyez, Andreas Ioannou, Álvaro González-Vila, Univ. de Mons (Belgium) . . [10680-21]

Microstructured fiber Bragg grating-based pressure sensors in a downhole-like hydrogen rich environment, Ji-Ying Huang, Univ. de Mons (Belgium); Jan Van Roosbroeck, Johan Vlekken, FBGS International NV (Belgium); Damien Kinet, Antonio Bueno Martinez, Univ. de Mons (Belgium); Thomas Geernaert, Francis Berghmans, Vrije Univ. Brussel (Belgium); Bram Van Hoe, Eric Lindner, FBGS International NV (Belgium); Christophe Caucheteur, Univ. de Mons (Belgium) [10680-22]

Integrated interrogator circuits for fiber optic sensor network in generic InP photonic integrated circuit technology, Andrzej Kaźmierczak, Anna Jusza, Mateusz Slowikowski, Stanisław Stopiński, Ryszard Piramidowicz, Warsaw Univ. of Technology (Poland) [10680-23]

Fibre Bragg gratings in the visible: towards low-cost detection, Greter Capote Mastrapa, Gabriel G. Guimarães, Univ. Federal Fluminense (Brazil); Patrícia L. Inácio, Valmir Oliveira, Univ. Tecnológica Federal do Paraná (Brazil); Hypolito J. Kalinowski, Univ. Federal Fluminense (Brazil) [10680-24]

A computationally efficient approximation of the transfer matrix model for analysis of FBG reflected spectra, Aydin Rajabzadeh, Richard C. Hendriks, Richard Heusdens, Roger M. Groves, Technische Univ. Delft (Netherlands) [10680-25]

Flexible thin film bending sensor based on Bragg gratings in hybrid polymers, Maiko Girschikofsky, Manuel Rosenberger, Hochschule Aschaffenburg (Germany); Michael Förthner, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); Mathias Rommel, Lothar Frey, Fraunhofer-Institut für Integrierte Systeme und Bauelemententechnologie IISB (Germany); Ralf Hellmann, Hochschule Aschaffenburg (Germany) [10680-26]

Temperature corrected lab-on-a-chip-platform with integrated epoxy polymer Bragg gratings, Steffen Hessler, Andreas Räder, Hochschule Aschaffenburg (Germany); Bernhard Schmauss, Institute of Microwaves and Photonics, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany) [10680-27]

Surface temperature measurement using surface plasmon resonance, Joyce Ibrahim, Lab. Hubert Curien (France); Mostafa El Masri, Frédéric Lefevre, Ctr. d'Énergie et de Thermique de Lyon, Univ. Claude Bernard Lyon 1 (France); Colette Veillas, Olivier Parriaux, Yves Jourlin, Isabelle Verrier, Lab. Hubert Curien (France) [10680-28]

HOT TOPICS SESSION II 16:30 TO 18:05

Coherent combination of fiber amplified ultrafast laser pulses Jens Limpert, Institute of Applied Physics, Friedrich Schiller Univ. Jena, Germany

2D materials and their heterostructures: fundamentals, applications and prototypes

Frank Koppens, ICFOT-The Institute of Photonic Sciences, Spain

For additional details, please see page 7

WEDNESDAY 25 APRIL

SESSION 7. WED 8:30 TO 10:20

Optical Sensors for Medical Applications I

Session Chair: **Anna Grazia Mignani**, Istituto di Fisica Applicata "Nello Carrara" (Italy)

Laser-based remote measurement of vital parameters of the heart (*Invited Paper*), Kristian Kroschel, Fraunhofer-Institut für Optoelektronik und Bildauswertung (Germany) [10680-29]

Noninvasive optoelectronic system for monitoring of the heart and respiratory rate of the patient exposed to MRI scanning, Stanisław Stopiński, Anna Jusza, Krzysztof Anders, Andrzej Kaźmierczak, Konrad Markowski, Tomasz Osuch, Warsaw Univ. of Technology (Poland); Mariusz Krej, Lukasz Dziuda, Military Institute of Aviation Medicine (Poland); Paweł Szczepański, Ryszard Piramidowicz, Warsaw Univ. of Technology (Poland) [10680-30]

Characterization of a TDLAS system for carbon dioxide isotopic ratio measurement in human breath, Anna Ghetti, Lorenzo Cocola, CNR-IFN UoS Padova (Italy); Giuseppe Tondello, CNR-IFN UoS Padova (Italy) and L pro srl (Italy); Gianluca Galzerano, Politecnico di Milano (Italy); Luca Poletto, CNR-IFN UoS Padova (Italy) [10680-31]

An optofluidic sensor for point-of-care whole blood hemolysis detection, Chen Zhou, Mehdi K. Hedayati, Xiaolong Zhu, DTU Nanotech (Denmark); Frank Nielsen, Radiometer Medical A/S (Denmark); Uriel Levy, The Hebrew Univ. of Jerusalem (Israel); Anders Kristensen, DTU Nanotech (Denmark) [10680-32]

Low-coherence fiber optic interferometric sensor for assessment of enamel microgeometry, Katarzyna Karpienko, Gdansk Univ. of Technology (Poland); Michał Wąsowicz, Warsaw Univ. of Life Sciences SGGW (Poland); Maciej S. Wróbel, Małgorzata Jędrzejewska-Szczerska, Gdansk Univ. of Technology (Poland) [10680-33]

SESSION 8. WED 10:50 TO 12:30

Optical Sensors for Medical Applications II

Session Chair: **Anna Grazia Mignani**, Istituto di Fisica Applicata "Nello Carrara" (Italy)

Expanding luminescence thermometry detection range to the SWIR for biomedical applications, Albenc Nexha, Maria Cinta Pujol, Magdalena Aguiló, Francesc Díaz, Joan J. Carvajal Martí, Olexandr Savchuk, Univ. Rovira i Virgili (Spain) [10680-34]

Optical fibre luminescence sensor for real-time LDR brachytherapy dosimetry, Peter Woulfe, Galway Clinic (Ireland); Sinead O'Keeffe, Univ. of Limerick (Ireland); Francis J. Sullivan, National Univ. of Ireland, Galway (Ireland) [10680-35]

Novel optical fiber sensors and their applications in radiotherapy, Majed Alharbi, Michael Martyn, National Univ. of Ireland, Galway (Ireland); Lingxia Chen, Univ. of Limerick (Ireland); Sean Gillespie, Peter Woulfe, Galway Clinic (Ireland); Sinead O'Keeffe, Univ. of Limerick (Ireland); Mark Foley, National Univ. of Ireland, Galway (Ireland) [10680-36]

Detection limits of diffraction-limited focal molography, Yves Blickenstorfer, Andreas Frutiger, Silvio Bischof, Volker Gatterdam, Janos Vörös, ETH Zurich (Switzerland); Christof Fattinger, F. Hoffmann-La Roche Ltd. (Switzerland) [10680-37]

Cost effective LED-based multi-spot projection system for stereo 3D reconstruction, Thomas Kämpfe, Univ. de Lyon (France) and Univ. Jean Monnet Saint-Etienne (France); Shamus Husheer, Heartfelt Technologies Ltd. (United Kingdom); Michael Vervaeke, Vrije Univ. Brussel (Belgium); Mathias Hecke, Karlsruher Institut für Technologie (Germany) . . . [10680-38]

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

SESSION 9. WED 13:30 TO 15:20

Optical Biosensors

Session Chair: **Anna Grazia Mignani**, Istituto di Fisica Applicata "Nello Carrara" (Italy)

Photonic biosensors for Fab'-AFM1 interaction study in real milk (*Invited Paper*), Tatevik Chalyan, Univ. degli Studi di Trento (Italy); Cristina Potrich, Fondazione Bruno Kessler (Italy); Erik Schreuder, Lionix International (Netherlands); Lorenzo Pavesi, Univ. degli Studi di Trento (Italy) [10680-39]

DNA analysis with UV-LEDs, Christian Möller, CIS Forschungsinstitut für Mikrosensorik und Photovoltaik GmbH (Germany); Martin Hentschel, Thomas Hensel, Andreas Müller, Analytik Jena AG (Germany); Christoph Heinze, Olaf Brodersen, Thomas Ortlepp, CIS Forschungsinstitut für Mikrosensorik und Photovoltaik GmbH (Germany) [10680-40]

An imprinted polymer-based guided mode resonance grating biosensor, Marie-Aline Mattelin, Jeroen Missinne, Geert Van Steenberge, Ctr. for Microsystems Technology (Belgium) [10680-41]

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SNORW biosensor for measuring glucose level in blood samples, Vishnu Priye, Ritu Raj Singh, Soumya Kumari, Indian Institute of Technology (Indian School of Mines), Dhanbad (India)[10680-42]

Analysis of phase error and cross talk for a multimode interference-based multichannel biosensor, Moisi Xhoxhi, Univ. Politeknik i Tiranes (Albania); Alma Dudia, Aurel Ymeti, Nanoalmyona B.V. (Netherlands)[10680-43]

SESSION 10. WED 15:50 TO 17:10

Optical Sensors for Environmental Applications

Session Chair: **Anna Grazia Mignani**,
Istituto di Fisica Applicata "Nello Carrara" (Italy)

Measurement of the main compounds present in the diesel particulate matter exhaust emissions generated from the real diesel combustion engine passenger vehicles (*Invited Paper*), Richard Viskup, Werner Baumgartner, Johannes Kepler Univ. Linz (Austria)[10680-44]

Cost-effective optical fiber gas leakage detector around buried pipelines, Damien Kinet, Marc Wuilpart, Univ. de Mons (Belgium); Michel Reginster, Air Liquide Benelux Industries (Belgium); Christophe Caucheteur, Univ. de Mons (Belgium); Frédéric Musin, Emphase Environnement (Belgium)[10680-45]

Fiber optic surface plasmon resonance-based arsenic sensor using $\text{Fe}_2\text{O}_3/\text{SnO}_2$ core-shell nanostructure, Banshi D. Gupta, Sonika Sharma, Indian Institute of Technology Delhi (India)[10680-46]

Conducting polymer-based optical sensor for heavy metal detection in drinking water, Sutapa Chandra, Soumyo Mukherji, Indian Institute of Technology Bombay (India)[10680-47]

WEDNESDAY POSTER SESSION WED 17:45 TO 19:30

Posters-Wednesday

Conference attendees are invited to attend the Photonics Europe poster session on Wednesday 17.45 to 19.30. Posters will be on display after 10.00 Wednesday morning in the Hall Rhin. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster authors, view poster presentation guidelines and set-up instructions at <http://spie.org/x34963.xml> and on page 96.

Accurate estimation of mercury level concentration in water using smartphone, Pabitra Nath, Trishna Das, Sibasish Dutta, Utpal Bora, Diganta Rabha, Tezpur Univ. (India)[10680-60]

Investigation of hydrogen sulphide gas sensor using Pd/Au material based plasmonic ring resonator, Amna Bedi, Santosh Kumar, DIT Univ. (India); Nan-Kuang Chen, National United Univ. (Taiwan)[10680-61]

Sensing of liquid analytes via the phase shift induced by surface plasmon resonance, Roman Kaňok, Dalibor Ciprian, Petr Hlubina, VŠB-Technical Univ. of Ostrava (Czech Republic)[10680-62]

Measurement of the dispersion of a liquid analyte using surface plasmon resonance: a theoretical approach, Jakub Chylek, Iva Bezděková, Dalibor Ciprian, Petr Hlubina, VŠB-Technical Univ. of Ostrava (Czech Republic)[10680-63]

Refractometric sensing capabilities of higher order cladding modes, Andreas Ioannou, Univ. de Mons (Belgium); Antreas Theodosiou, Kyriacos Kalli, Cyprus Univ. of Technology (Cyprus); Christophe Caucheteur, Univ. de Mons (Belgium)[10680-64]

An efficient and selective sensing of creatinine based on fiber optic SPR technique exploiting the advantages of molecular imprinting technique, Sonika Sharma, Banshi D. Gupta, Indian Institute of Technology Delhi (India)[10680-65]

GaInAsSb-based sensor for measurement of oil and oil products concentration in water, Yahor V. Lebiadok, Dzmitry M. Kabanau, Raman Y. Mikulich, B.I. Stepanov Institute of Physics (Belarus)[10680-66]

Mode-mode fiber interferometer with impact localization ability: investigation of various optical schemes, Ivan Chapalo, Saint-Petersburg State Polytechnical Univ. (Russian Federation)[10680-67]

Requirements for surface plasmon resonance excitation in air with slightly tilted fiber Bragg gratings, Álvaro González-Vila, Médéric Loyez, Andreas Ioannou, Christophe Caucheteur, Univ. de Mons (Belgium)[10680-68]

Polydimethylsiloxane Fabry-Perot interferometer and its sensing application, Daniel Káčik, Ivan Martinček, Univ. of Žilina (Slovakia) [10680-69]

Optomechanical frequency analyzer using polymeric optical resonators, Amir R. Ali, Southern Methodist Univ. (United States) and The German Univ. in Cairo (Egypt); Haidi H. Badawi, The German Univ. in Cairo (Egypt)[10680-70]

Fabrication techniques for micro-optical hollow resonator used in high-bandwidth sensing applications, Amir R. Ali, Southern Methodist Univ. (United States) and The German Univ. in Cairo (Egypt); Ahmad M. Monier, The German Univ. in Cairo (Egypt)[10680-71]

Surface roughness measurement using a single white light interferogram, Yunsheng Qian, Chunkan Tao, Yujing Wu, Weiyei Wang, Nanjing Univ. of Science and Technology (China)[10680-72]

Optical fiber tip with deep seated negative axicon as plasmonic sensor for monitoring protein binding, Rashmi Achla, Kaushal Vairagi, Aditi Chopra, Central Scientific Instruments Organisation (India); Priyanka Kumari, Postgraduate Institute of Medical Education & Research, Chandigarh (India); Sudipta Sarkar, Samir Mondal, Central Scientific Instruments Organisation (India)[10680-73]

Design of experiments for the magnetorheological dielectric bio-optical sensors, Amir R. Ali, Southern Methodist Univ. (United States) and The German Univ. in Cairo (Egypt); Karim M. Elewa, The German Univ. in Cairo (Egypt); Lamia A. Shihata, The German Univ. in Cairo (Egypt) and Ain Shams Univ. (Egypt)[10680-74]

Design of a portable spectrometer using optoelectronics and electronics devices, Carlos Esteban Cabrera Reyes, Roberto Carlos Barragán Campos, Guillermo García Torales, Univ. de Guadalajara (Mexico)[10680-75]

Transformation of a harmonized random process by spectral devices that perform instantaneous spectrum analysis, Vasily I. Kazakov, Oleg Moskaletz, Saint-Petersburg State Univ. of Aerospace Instrumentation (Russian Federation)[10680-76]

Instantaneous spectra in spectral and correlation processing of dynamic signal devices of radio and optical ranges and their linear and nonlinear transformations, Anastasiya Kuryleva, Oleg Moskaletz, Vasily I. Kazakov, Saint-Petersburg State Univ. of Aerospace Instrumentation (Russian Federation); Dmitry Moskaletz, Saint Petersburg Electrotechnical Univ. "LETI" (Russian Federation)[10680-77]

Time-dispersion analysis of the spectrum of optical pulse signals, Ilya Izholdin, Oleg Moskaletz, Saint-Petersburg State Univ. of Aerospace Instrumentation (Russian Federation)[10680-78]

Investigation of wavenumber calibration for Raman spectroscopy using a polymer standard, Dongyue Liu, Bryan Hennelly, Tomás Ward, National Univ. of Ireland, Maynooth (Ireland)[10680-79]

Doppler velocity measurement with self-mixing effect of direct modulated laser diode enabling velocity direction, Osamu Mikami, Amalina Ibrahim, Sumiaty Ambran, Fauzan Ahmad, Univ. Teknologi Malaysia (Malaysia); Chiemi Fujikawa, Tokai Univ. (Japan)[10680-80]

Design and development of a detection chain for an atmospheric lidar system, Khaled Gasmi, King Fahd Univ. of Petroleum & Minerals (Saudi Arabia)[10680-81]

Experimental testing of optical choppers using laser lines, Mihai Stefan Duma, Moise Nicora National College (Romania); Virgil-Florin Duma, Aurel Vlaicu Univ. of Arad (Romania)[10680-82]

Investigation of optical radiation losses and heating of passive copper-coated silica fibers, Ivan Khramov, Nikolay Ishmametiev, Moscow Institute of Physics and Technology (Russian Federation); Renat Shaidullin, Oleg Ryabushkin, Moscow Institute of Physics and Technology (Russian Federation) and Kotelnikov Institute of Radio-engineering and Electronics (Russian Federation)[10680-83]

Autocollimating system for precise measuring of three angular coordinates, Tatiana V. Turgalieva, Igor A. Konyakhin, ITMO Univ. (Russian Federation)[10680-84]

Dome diagnostics system of optical parameters and characteristics of LEDs, Vladimir S. Peretyagin, Nikita Pavlenko, ITMO Univ. (Russian Federation)[10680-85]

Analysis of the influence of the properties of a Gaussian beam in the problem of optical control of small amplitude mechanical oscillations, Helen Kravets, Vasily I. Kazakov, Saint-Petersburg State Univ. of Aerospace Instrumentation (Russian Federation)[10680-86]

Dynamic polarization direction monitoring in optical fibers based on vectorial polarization light, Bing Lei, Xin Cheng, Rujin Deng, Wei Peng, Jianhua Shi, Hairong Zhong, National Univ. of Defense Technology (China)[10680-87]

Sensitivity and noise reduction methods for the automatic particle counter based on image sensor, Dmitry V. Kornilin, Ilya A. Kudryavtsev, Samara Univ. (Russian Federation)[10680-88]

Double junction photodiodes for multiwavelength photoplethysmography, João Costa, Hugo Vieira, Paula Louro, Manuela Vieira, Instituto Superior de Engenharia de Lisboa (Portugal) and Instituto Politécnico de Lisboa (Portugal)[10680-89]

Plasmonic magneto-optical structure for visualization of magnetic information holders, Stepan Baryshev, Sergey B. Odnokov, Alexey S. Kuznetsov, Bauman Moscow State Technical Univ. (Russian Federation)[10680-90]

Angular orientation effects on electric field optical sensor, Amir R. Ali, Southern Methodist Univ. (United States) and The German Univ. in Cairo (Egypt); Mohamed A. Kamel, The German Univ. in Cairo (Egypt) . . . [10680-91]

Optical position encoder based on structured analyzing diffraction grating, Alexander Y. Zherdev, Sergey B. Odinov, Dmitrii S. Lushnikov, Vladimir V. Markin, Maria V. Shishova, Oleg A. Gurylev, Bauman Moscow State Technical Univ. (Russian Federation); Vladimir V. Popov, M.V. Lomonosov Moscow State Univ. (Russian Federation) . . . [10680-92]

Algorithm for monitoring the displacement of an optical sensor monitoring the surface of a millimeter-wave radio telescope, Timofei K. Korolev, Igor A. Konyakhin, Anton A. Nogin, ITMO Univ. (Russian Federation) . . . [10680-93]

Alternative methods of analysis and design for the two-mirror angular device, Maria-Alexandra Duma, Moise Nicoar National College (Romania); Virgil-Florin Duma, Aurel Vlaicu Univ. of Arad (Romania) . . . [10680-94]

The optical-electronic autoreflexion sensor for measurement an angle of rotation, Aiganyam M. Sakharivanova, Igor A. Konyakhin, ITMO Univ. (Russian Federation) . . . [10680-95]

Approaches to cross-talk noise reduction in modal holographic wavefront sensors, Vladimir Y. Venediktov, Saint Petersburg Electrotechnical Univ. "LETI" (Russian Federation) . . . [10680-96]

Development of robotic platform with optical sensor-based control system, Dmitriy Fedorenko, Kseniia Ezhova, ITMO Univ. (Russian Federation) . . . [10680-97]

Optical fuel pump pressure sensors, Alberto Sposito, Ralf Pechstedt, Oxsensis Ltd. (United Kingdom); Ethan E. Moss, Alessio Cipullo, Airbus Operations Ltd. (United Kingdom) . . . [10680-98]

Biaxial optical fiber sensor based in two multiplexed Bragg gratings for simultaneous shear stress and vertical pressure monitoring, Cátia Tavares, Instituto de Telecomunicações (Portugal); M. Fátima Domingues, Instituto de Telecomunicações (Portugal) and Univ. de Aveiro (Portugal) and Ctr. de Automática y Robótica, CSIC-UPM (Spain); Anselmo Anselmo Frizera-Neto, UFES (Brazil); Cátia Leitão, Univ. de Aveiro (Portugal) and Instituto de Telecomunicações (Portugal); Nélia Alberto, Carlos F. Marques, Instituto de Telecomunicações (Portugal) and Univ. de Aveiro (Portugal); Ayman Radwan, Instituto de Telecomunicações (Portugal); Eduardo Rocon, Ctr. de Automática y Robótica, CSIC-UPM (Spain); Paulo André, Instituto de Telecomunicações (Portugal) and Instituto Superior Técnico, Univ. Técnica de Lisboa (Portugal); Paulo Antunes, Instituto de Telecomunicações (Portugal) and i3N, Univ. of Aveiro (Portugal) . . [10680-99]

Cost-effective laser source for phase-OTDR vibration sensing, Cesar A. Lopez-Mercado, Johan Jason, Univ. de Mons (Belgium); Vasily V. Spirin, Ctr. de Investigación Científica y de Educación Superior de Ensenada B.C. (Mexico); J. L. Bueno-Escobedo, Ctr. de Investigación en Materiales Avanzados, S.C. (Mexico); Marc Wulpart, Patrice Mégret, Univ. de Mons (Belgium); Dmitry A. Korobko, Igor O. Zolotovskii, Ulyanovsk State Univ. (Russian Federation); Andrei A. Fotiadi, Univ. de Mons (Belgium) . . [10680-100]

Accurate phase unwrapping for high-noise phase fields in fringe projection profilometry, Meiqi Fang, Hong Zhao, Pingping Jia, Xi'an Jiaotong Univ. (China) . . . [10680-101]

Infrared (IR) photoresistors based on recrystallized amorphous germanium films on silicon using liquid phase epitaxy, Saloni Chaurasia, Indian Institute of Science (India); Avijit Chatterjee, Shankar Kumar Selvaraja, Indian Institute of Science (India); Sushobhan Avasthi, Indian Institute of Science (India) . . . [10680-102]

HOT TOPICS SESSION III 9:00 TO 10:35

From extreme nonlinear optics to ultrafast atomic physics

Anne L'Huillier, Lund Univ., Sweden

Quantum computations and quantum simulations with trapped ions

Rainer Blatt, Institute for Experimental Physics, Univ. of Innsbruck, Austria

For additional details, please see page 8

SESSION 11 THU 11:00 TO 12:20

Optical Fibre-based Sensors I

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

Sensitivity of high Rayleigh scattering fiber in acoustic/vibration sensing using phase-OTDR, Johan Jason, Univ. de Mons (Belgium); Sergei M. Popov, Oleg V. Butov, Yuri K. Chumakovskii, Konstantin M. Golant, Kotelnikov Institute of Radio Engineering and Electronics of Russian Academy of Sciences (Russian Federation); Andrei A. Fotiadi, Univ. de Mons (Belgium) and Ulyanovsk State Univ. (Russian Federation); Marc Wulpart, Univ. de Mons (Belgium) . . . [10680-48]

Fabry-Perot cavity based on air bubble in multimode fiber for sensing applications, Susana Novais, Marta S. Ferreira, João L. Pinto, Univ. de Aveiro (Portugal) . . . [10680-49]

In-situ fiber-based surface profile measurement system using low coherence interferometer, Ranveer S. Matharu, Jon Petzing, Shreedhar Rangappa, Peter Kinnell, Loughborough Univ. (United Kingdom) . . . [10680-50]

Fluorescent fiber implementation of a high-resolution distributed position sensor, Paul Farago, Ramona Galatus, Technical Univ. of Cluj Napoca (Romania); Sorin Hintea, Technical Univ. of Cluj-Napoca (Romania); Juan Carlos Martin, Juan Vallés, Univ. de Zaragoza (Spain) . . . [10680-51]

Lunch Break Thu 12:20 to 13:50

SESSION 12 THU 13:50 TO 14:50

Optical Fibre-based Sensors II

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

Functionalization of optical fibers with Bi:YIG microcrystals for magneto-optic sensing applications, Issatay Nadinov, Mircea Vomir, Jean-Luc Rehspringer, Jean-Yves Bigot, Loic Mager, Institut de Physique et Chimie des Matériaux de Strasbourg (France) . . . [10680-52]

Optimization of a temperature and pressure fibre optic sensor based on a deformable micromirror, Nacer-Eddine Demagh, Assia Guessoum, Univ. Ferhat Abbas Sétif 1 (Algeria); Abdelhak Guermat, Univ. Ferhat Abbas Sétif 1 (Algeria) and Ctr. de Développement des Technologies Avancées (Algeria); Amina Nezzar, Nadjiba Boulaiche, Zaied Bouhafs Bouhafs, Univ. Ferhat Abbas Sétif 1 (Algeria) . . . [10680-53]

All-fibre wave front sensor, Kerriane Harrington, Stephanos Yerolatsitis, Tim A. Birks, Univ. of Bath (United Kingdom) . . . [10680-54]

SESSION 13 THU 15:20 TO 17:00

Interferometric and Resonance-based Sensors

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

Refractive index and dispersion measurement using low-coherence interferometry with broadband confocal scanning, Daniel Francis, Helen D. Ford, Ralph P. Tatam, Cranfield Univ. (United Kingdom) . . [10680-55]

Study of bottle resonators of the whispering gallery modes cross-sensitivity to rotation, Yuri Filatov, Alexander Kukaev, Egor Shalymov, Vladimir Y. Venediktov, Saint Petersburg Electrotechnical Univ. "LETI" (Russian Federation) . . . [10680-56]

Increase of the free-spectral range by composing a structure from wavelength tunable wedged interferometers, Elena Stoykova, Institute of Optical Materials and Technologies (Bulgaria); Marin Nenchev, Technical Univ. of Sofia (Bulgaria) . . . [10680-57]

Azimuth rate sensing based on polymeric micro-optical cavity, Amir R. Ali, Southern Methodist Univ. (United States) and The German Univ. in Cairo (Egypt) . . . [10680-58]

Terahertz waveguides, based by sapphire shaped crystal for sensing applications, Gleb M. Katyba, Institute of Solid State Physics RAS (Russian Federation) . . . [10680-59]

CONFERENCE 10681

Wednesday–Thursday 25–26 April 2018 • Proceedings of SPIE Vol. 10681

Micro-Structured and Specialty Optical Fibres

Conference Chairs: **Kyriacos Kalli**, Cyprus Univ. of Technology (Cyprus); **Alexis Mendez**, MCH Engineering LLC (United States); **Christian-Alexander Bunge**, Hochschule für Telekommunikation Leipzig (Germany)

Programme Committee: **Jean-Luc Adam**, Univ. de Rennes 1 (France); **Jean-Louis Auguste**, XLIM Institut de Recherche (France); **Ole Bang**, Technical Univ. of Denmark (Denmark); **Neil G. R. Broderick**, The Univ. of Auckland (New Zealand); **Benoit Cadier**, ixFiber SAS (France); **Adrian L. Carter**, Nufern (United States); **Liang Dong**, Ctr. for Optical Materials Science + Engineering Technologies (United States); **Henry H. Du**, Stevens Institute of Technology (United States); **Sebastien Fevrier**, XLIM Institut de Recherche (France); **Jiri Kanka**, Institute of Photonics and Electronics of the ASCR, v.v.i. (Czech Republic); **Karl-Friedrich Klein**, Technische Hochschule Mittelhessen (Germany); **Jonathan C. Knight**, Univ. of Bath (United Kingdom); **Michael Komodromos**, Frederick Univ. (Cyprus); **Walter Margulis**, Acreo Swedish ICT AB (Sweden); **Chengbo Mou**, Shanghai Univ. (China); **Pavel Peterka**, Institute of Photonics and Electronics of the ASCR, v.v.i. (Czech Republic); **Saeed Rehman**, Fibercore Ltd. (United Kingdom); **Valerio Romano**, Bern Univ. of Applied Sciences (Switzerland); **Kunimasa Saitoh**, Hokkaido Univ. (Japan); **Kay Schuster**, Institut für Photonische Technologien e.V. (Germany); **Sergei V. Semyonov**, Fiber Optics Research Ctr. (Russian Federation); **Waclaw Urbanczyk**, Wroclaw Univ. of Technology (Poland); **David J. Webb**, Aston Univ. (United Kingdom); **Alexei M. Zheltikov**, Lomonosov Moscow State Univ. (Russian Federation); **Hwa-Yaw Tam**, The Hong Kong Polytechnic Univ. (Hong Kong, China)

WEDNESDAY 25 APRIL

OPENING REMARKS 8:25 TO 8:30

SESSION 1 WED 8:30 TO 10:20

Transmission and Modal Propagation Phenomena in Specialty Fibres

Laser beam shaping in a multicore optical fiber produced by the sol-gel based granulated silica method (*Invited Paper*), Ali F. El Sayed, Univ. Bern (Switzerland) and Berner Fachhochschule (Switzerland); Jonas Scheuner, Univ. Bern (Switzerland); Sönke Pilz, Valerio Romano, Berner Fachhochschule (Switzerland) [10681-1]

Transmission of few-mode fibers at 355 nm using pulsed Nd-YAG laser, Karl-Friedrich Klein, Technische Hochschule Mittelhessen (Germany); Philipp Raithel, TransMIT GmbH (Germany); Georg Hillrichs, Hochschule Merseburg (Germany) [10681-2]

Hollow-core antiresonant fibers optimized for operation in the spectral range 0.6–2.5 μm , Vladimir Demidov, Alexander Khokhlov, S.I. Vavilov State Optical Institute (Russian Federation); Stanislav Leonov, Vladislav Tigeav, Elizaveta Yelistratova, Bauman Moscow State Technical Univ. (Russian Federation); Peter Agruzov, Ioffe Institute (Russian Federation); Alexander Komarov, Vladislav Ananyev, Egishe Ter-Nersesyants, Peter Zlobin, S.I. Vavilov State Optical Institute (Russian Federation); Nikolay Nikonov, ITMO Univ. (Russian Federation) [10681-3]

All solid nitroaniline-silica photonic bandgap fiber, Georgios Violakis, Stavros Pissadakis, Foundation for Research and Technology-Hellas (Greece) [10681-4]

Frequency-interleaved SDM transmission over multicore fiber for next-generation short-reach optical interconnect systems, Jitendra Kumar Mishra, National Institute of Technology Raipur (India); Vishnu Priye, Indian Institute of Technology (Indian School of Mines), Dhanbad (India); B.M.A. Rahman, City, Univ. of London (United Kingdom) [10681-5]

SESSION 2 WED 10:50 TO 12:20

Physical and Bio Sensing I

Innovative 2D-nanomaterial integrated optical fibre sensors for biochemical applications (*Invited Paper*), Xianfeng Chen, Bangor Univ. (United Kingdom); Miguel V. Andrés, Univ. de València (Spain); Lin Zhang, Aston Univ. (United Kingdom) [10681-6]

LPG inscription in mPOF for optical sensing, Rui Min, Univ. Politècnica de València (Spain); Carlos Marques, Instituto de Telecomunicações (Portugal) and Univ. de Aveiro (Portugal); Beatriz Ortega, Univ. Politècnica de València (Spain); Ole Bang, DTU Fotonik (Denmark) [10681-7]

L-band CYTOP Bragg gratings for ultrasound sensing, Christian F. B. Broadway, Univ. de Mons (Belgium); Kyriacos Kalli, Antreas Theodosiou, Cyprus Univ. of Technology (Cyprus); Michal Zubel, Kate Sugden, Aston Institute of Photonic Technologies, Aston Univ. (United Kingdom); Patrice Mégret, Christophe Caucheteur, Univ. de Mons (Belgium) [10681-8]

Mode-selective excitation of multimode Fibre-Bragg gratings and their possibilities to multidimensional sensing, Robert Benitz, Christian-Alexander Bunge, Hochschule für Telekommunikation Leipzig (Germany) [10681-9]

Lunch/Exhibition Break Wed 12:20 to 13:30

SESSION 3 WED 13:30 TO 15:20

Processing and Modifying Fibres

Discovery of parabolic SNAP microresonators produced in fibre tapering (*Invited Paper*), Gabriella Gardosi, Sajid Zaki, Dashiell L. P. Vitullo, Kirill V. Tokmakov, Aston Institute of Photonic Technologies, Aston Univ. (United Kingdom); Michael Brodsky, U.S. Army Research Lab. (United States); Misha Sumetsky, Aston Institute of Photonic Technologies, Aston Univ. (United Kingdom) [10681-10]

Damage threshold studies on optical fibers and end-capped fibers with random antireflection (RAR) nanostructures, Devinder Saini, Ron C. Mehl, Fiberguide Industries, Inc. (United States) [10681-11]

Femtosecond 3D laser lithography of photoinitiator-free optically resilient microoptics on the tips of optical fibers, Linas Jonušauskas, Titas Tičkūnas, Darius Gailevičius, Gedvinas Nemickas, Vilnius Univ. (Lithuania), Femtika (Lithuania); Andrius Narmontas, Femtika (Lithuania); Vytautas Purlys, Giedrė Grigalevičiūtė, Roaldas Gadonas, Vilnius Univ. (Lithuania), Femtika (Lithuania) [10681-12]

Optical fibre end microforming by chemical etching for direct photonic nanoJet material laser processing, Grégoire Chabrol, ECAM Strasbourg-Europe (France) [10681-13]

Surface nanoscale axial photonic structures introduced by bending of optical fibers, Daria Boček, Ilya Vatrik, Novosibirsk State Univ. (Russian Federation); Misha Sumetsky, Aston Institute of Photonic Technologies, Aston Univ. (United Kingdom) [10681-14]

SESSION 4 WED 15:50 TO 17:50

Novel Optical Components and Devices

Tapered fibre liquid crystal optical device, Karol A. Stasiewicz, Joanna Korec, Olga Strzeżysz, Przemysław Kula, Leszek R. Jaroszewicz, Joanna E. Moś, Wojskowa Akademia Techniczna im. Jarosława Dąbrowskiego (Poland) [10681-15]

The effect of coupling between core and cladding modes in twisted microstructured optical fibers, Maciej Napiorkowski, Waclaw Urbańczyk, Wroclaw Univ. of Science and Technology (Poland) [10681-16]

Towards ultrafast subnanjoule solitonic nonlinear directional coupler based on soft glass dual-core photonic crystal fibers, Ignác Bugár, Institute of Electronic Materials Technology (Poland); Lubomír Čurilla, Comenius Univ. (Slovakia); Ignas Astrauskas, Audrius Pugzlys, Andrius Baltuška, Technische Univ. Wien (Austria); Dariusz Pysz, Institute of Electronic Materials Technology (Poland); František Uherek, International Laser Ctr. (Slovakia); Pavol Staján, Bundesanstalt für Materialforschung und -prüfung (Germany) [10681-17]

Structural evolution of fused optic-fiber components: numerical simulations and experimental study, Avihai Spizzichino, Nuclear Research Ctr. Negev-Soreq (Israel); Sharone Goldring, Soreq Nuclear Research Ctr. (Israel); Yuri Feldman, Ben-Gurion Univ. of the Negev (Israel) [10681-18]

Diameter and tensile strain measurements of optical nanofibers using Brillouin reflectometry, Adrien Godet, Ctr. National de la Recherche Scientifique (France) and FEMTO-ST (France); Abdoulaye Ndao, Vincent Pêcheur, Ctr. National de la Recherche Scientifique (France) and FEMTO-ST (France); Sylvie Lebrun, Lab. Charles Fabry, Institut d'Optique Graduate School (France) and Univ. Paris-Sud (France) and Ctr. National de la Recherche Scientifique (France); Gilles Pauliat, Lab. Charles Fabry (France); Jean-Charles Beugnot, Ctr. National de la Recherche Scientifique (France) and FEMTO-ST (France); Kien Phan Huy, Ctr. National de la Recherche Scientifique (France) and FEMTO-ST (France) and Univ. Bourgogne Franche-Comté (France); Thibaut Sylvestre, Ctr. National de la Recherche Scientifique (France) and FEMTO-ST (France) [10681-19]

PT-symmetric chirped Bragg structures, Pavel Shestakov, Vladimir F. Marchenko, Anatoliy V. Kozar, M.V. Lomonosov Moscow State Univ. (Russian Federation) [10681-20]

WEDNESDAY POSTER SESSION WED 17:45 TO 19:30

Posters-Wednesday

Conference attendees are invited to attend the Photonics Europe poster session on Wednesday 17.45 to 19.30. Posters will be on display after 10.00 Wednesday morning in the Hall Rhin. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster authors, view poster presentation guidelines and set-up instructions at <http://spie.org/x34963.xml> and on page 96.

Influence of drawing conditions on radiation-induced attenuation of pure-silica-core fibers in the near-IR range, Pavel F. Kashaykin, Alexander L. Tomashuk, Fiber Optics Research Ctr. of the Russian Academy of Sciences (Russian Federation); Mikhail Y. Salganskii, Alexey N. Guryanov, G. G. Devyatykh Institute of Chemistry of High-Purity Substances of the Russian Academy of Sciences (Russian Federation); Evgeny M. Dianov, Fiber Optics Research Ctr. of the Russian Academy of Sciences (Russian Federation) [10681-35]

Study on microstructured high-birefringence photonic crystal fiber, Yue-e Chen, Yanshan Univ. (China); Wang Yong, Qingdao Research Ctr. for Advanced Photonic Technologies, Shandong Academy of Sciences (China) [10681-36]

Femtosecond core-scanning inscription of tilted fiber Bragg gratings, Alexey Wolf, Novosibirsk State Univ. (Russian Federation) and Institute of Automation and Electrometry of the Siberian Branch of RAS (Russian Federation); Mikhail Kotyushev, Novosibirsk State Univ. (Russian Federation); Alexandr Dostovalov, Sergey Babin, Institute of Automation and Electrometry of the Siberian Branch of RAS (Russian Federation) and Novosibirsk State Univ. (Russian Federation) [10681-37]

Application of a novel drilling method for the creation of polymer preforms: standard and core-modified structures, Eneko Arrospe, Gaizka Durana, Mikel Azkune, Iñaki Bikandi, Gotzon Aldabaldetrekue, Joseba Zubia, Univ. del País Vasco (Spain) [10681-38]

Spectral measurements of thermo-optical properties of polymers used in fiber optics, Renata Ismagilova, Moscow Institute of Physics and Technology (Russian Federation); Renat Shaidullin, Oleg Ryabushkin, Moscow Institute of Physics and Technology (Russian Federation) and Kotelnikov Institute of Radio-engineering and Electronics (Russian Federation) [10681-39]

Synchronous interferometric broadband measurement of dispersion applied to manufacturing optimization of microstructured optical fibers, Héctor Muñoz-Marco, Javier Abreu-Afonso Sr., Viorel Otgon, FYLA Laser S.L. (Spain); Romain Dauliat, Raphael Jamier, Philippe Roy, XLIM Institut de Recherche (France); Pere Pérez-Millán, FYLA Laser S.L. (Spain) [10681-40]

Fiber grating assisted mode selective polished fiber couplers, Sebastian Schlangen, Kort Bremer, Yulong Zheng, Hannoversches Zentrum für Optische Technologien (Germany); Andreas Isaak, Marc Wurzel, Leibniz Univ. Hannover (Germany); Sebastian Böhm, Felix Wellmann, Michael Steinke, Gabriel Pelegrina Bonilla, Jörg Neumann, Dietmar Kracht, Laser Zentrum Hannover e.V. (Germany); Bernhard Roth, Ludger Overmeyer, Hannoversches Zentrum für Optische Technologien (Germany) [10681-41]

Ge-Sb-S-Se-Te amorphous chalcogenide thin films for nonlinear mid-infrared applications, Jean-Baptiste Dory, CEA-LETI (France); Jean-Baptiste Jager, CEA-INAC (France); Aurélien Coillet, Lab. Interdisciplinaire Carnot de Bourgogne (France); Jean-Yves Raty, Univ. de Liège (Belgium); Anthonin Verdy, Magali Tessaïre, Mathieu Bernard, Jean-Marc Fédéli, CEA-LETI (France); Benoît Cluzel, Lab. Interdisciplinaire Carnot de Bourgogne (France); Pierre Noé, CEA-LETI (France) [10681-42]

Optical coupling devices fabricated using UV-curable resin for board level optical interconnect, Chiemi Fujikawa, Tokai Univ. (Japan); Osamu Mikami, Sumiaty Ambran, Nurul Atiqah Baharudin, Yuzafirah Yuzafirah Yaacob, Amalina Athira Ibrahim, Univ. Teknologi Malaysia (Malaysia) [10681-43]

Femtosecond laser pulses self-trapping at THG, Vyacheslav A. Trofimov, Pavel Sidorov, M.V. Lomonosov Moscow State Univ. (Russian Federation) [10681-44]

Synthesis and nonlinear optics characterization of DAST submicron crystals in polymer thin films, Tamara Poghosyan, ITMO Univ. (Russian Federation) and Ecole Normale Supérieure Paris-Saclay (France); Ngoc Diep Lai, Ecole Normale Supérieure Paris-Saclay (France); Igor Denisov, ITMO Univ. (Russian Federation) [10681-45]

Optical properties of Al-doped ZnO nanorods and nanotubes arrays by nanoimprint lithography, Yang Yi-Ting, Feng Chia Univ. (Taiwan) [10681-46]

THURSDAY 26 APRIL

HOT TOPICS SESSION III 9:00 TO 10:35

From extreme nonlinear optics to ultrafast atomic physics
Anne L'Huillier, Lund Univ., Sweden

Quantum computations and quantum simulations with trapped ions

Rainer Blatt, Institute for Experimental Physics, Univ. of Innsbruck, Austria

For additional details, please see page 8

SESSION 5 THU 11:00 TO 12:30

Physical and Bio Sensing II

Fiber grating assisted surface plasmon resonance for biochemical and electrochemical sensing (*Invited Paper*), Tuan Guo, Jinan Univ. (China) [10681-21]

Chalcogenide sensing elements for the mid-IR analysis of liquids: design on the base of electromagnetic theory of optical fibers, Svetlana V. Korsakova, Elena A. Romanova, Andrei Rozhnev, Saratov State Univ. (Russian Federation); Aleksandr P. Velmuzhov, Tatyana Kotereva, Maksim Sukhanov, Vladimir Shiryayev, G. G. Devyatykh Institute of Chemistry of High-Purity Substances of the Russian Academy of Sciences (Russian Federation) [10681-22]

Solution doping of commercial plastic optical fibers, Pavol Stajanca, Samuel Pötschke, Katerina Krebber, Bundesanstalt für Materialforschung und -prüfung (Germany) [10681-23]

Weaved distributed fiber optic sensors for smart textile fabrics, ropes, and cables, Edgar Mendoza, John Prohaska, Yan Esterkin, Ted Andreas, Redondo Optics, Inc. (United States); Kyriacos Kalli, Antreas Theodosiou, Cyprus Univ. of Technology (Cyprus); John Bazin, Airborne Systems North America (United States) [10681-24]

Lunch Break Thu 12:30 to 13:40

SESSION 6 THU 13:40 TO 15:30

Novel Fibre Fabrication and Design

Resorbable phosphate glass optical and hollow fibers for biomedicine (*Invited Paper*), Daniel Milanese, Politecnico di Torino (Italy) and CNR-Istituto di Fotonica e Nanotecnologie (Italy); Edoardo Ceci-Ginistrelli, Diego Pugliese, Politecnico di Torino (Italy); Nadia G. Boetti, Istituto Superiore Mario Boella (Italy); Cecilia Bertiond, Univ. degli Studi di Torino (Italy); Mauro Tortello, Politecnico di Torino (Italy); Vincenzo M. Sglavo, Univ. degli Studi di Trento (Italy); Nadia Barbero, Sonja Visentin, Univ. degli Studi di Torino (Italy); Duccio Gallichi-Nottiani, Politecnico di Torino (Italy); Claudia Barolo, Univ. degli Studi di Torino (Italy); Davide Janner, Politecnico di Torino (Italy) [10681-25]

Intermediate-Tg glasses for multimaterial fibers, Sylvain Danto, Clemson Univ. (United States); Clément Strutyński, Ctr. National de la Recherche Scientifique (France); Frédéric Désédevy, Univ. de Bourgogne Franche-Comté (France); Yannick Petit, Alain Abou Khalil, Univ. de Bordeaux (France); Marc Dussauze, Ctr. National de la Recherche Scientifique (France); Jean-Charles Jules, Gregory Gadret, Frédéric Smektala, Univ. de Bourgogne Franche-Comté (France); Lionel Canioni, Univ. de Bordeaux (France); Thierry Cardinal, Ctr. National de la Recherche Scientifique (France) [10681-26]

Highly birefringent low-loss slotted core photonic crystal fiber in THz regime, KM Samaun Reza, Karlsruhe Institute of Technology (Germany) [10681-27]

Hexagonal based low-symmetry large-pitch fibers for Yb-doped lasers, Vladimir Demidov, Vladislav Ananyev, Alexandra Matrosova, Peter Zlobin, S.I. Vavilov State Optical Institute (Russian Federation); Stanislav Leonov, Bauman Moscow State Technical Univ. (Russian Federation) [10681-28]

Noncircular side-emitting fibres for directed lighting, Christian-Alexander Bunge, Hochschule für Telekommunikation Leipzig (Germany); Benjamin Mohr, Markus Beckers, Thomas Vad, Thomas Gries, RWTH Aachen Univ. (Germany) [10681-29]

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SESSION 7..... THU 16:00 TO 17:50

Fibre Lasers and Supercontinuum Sources

Supercontinuum generation in a suspended core heavy metal oxide glass photonic crystal fiber (*Invited Paper*), Thibaut Sylvestre, Ctr. National de la Recherche Scientifique (France), FEMTO-ST (France); Amar Nath Ghosh, Ctr. National de la Recherche Scientifique (France), FEMTO-ST (France); Mariusz Klimczak, Ryszard Buczyński, Institute of Electronic Materials Technology (Poland); John Dudley, Ctr. National de la Recherche Scientifique (France), FEMTO-ST (France) [10681-30]

Numerical investigation on W-type index chalcogenide fiber based MIR supercontinuum generation, Mustafa A. Khamis, Ruben Sevilla, Karin Ennser, Swansea Univ. (United Kingdom) [10681-31]

Nanostructured core single mode phosphate fiber laser with high slope efficiency, Marcin Franczyk, Ryszard Stepień, Adam Filipkowski, Dariusz Pysz, Institute of Electronic Materials Technology (Poland); Ryszard Buczyński, Institute of Electronic Materials Technology (Poland) and Univ. of Warsaw (Poland) [10681-32]

Multicore photonic crystal fibers for high-power laser application, Yue-e Chen, Yanshan Univ. (China); Wang Yong, Qingdao Research Ctr. for Advanced Photonic Technologies, Shandong Academy of Sciences (China) [10681-33]

Design of a highly nonlinear carbon disulfide liquid core photonic crystal with two zero-dispersion wavelengths, Mohamed Lamine Ferhat, Lynda Cherbi, Mohamed Touzene, Hichem Ziada, Farid Lecheheb, Univ. des Sciences et de la Technologie Houari Boumediene (Algeria) [10681-34]

CONFERENCE 10682

Monday–Thursday 23–26 April 2018 • Proceedings of SPIE Vol. 10682

Semiconductor Lasers and Laser Dynamics

Conference Chairs: **Krassimir Panajotov**, Vrije Univ. Brussel (Belgium); **Marc Sciamanna**, CentraleSupélec (France); **Rainer Michalzik**, Univ. Ulm (Germany)

Programme Committee: **Erwin A.J.M. Bente**, Technische Univ. Eindhoven (Netherlands); **Dieter Bimberg**, Technische Univ. Berlin (Germany); **Weng W. Chow**, Sandia National Labs. (United States); **Kent D. Choquette**, Univ. of Illinois at Urbana-Champaign (United States); **Wolfgang E. Elsässer**, Technische Univ. Darmstadt (Germany); **Hitoshi Kawaguchi**, Nara Institute of Science and Technology (Japan); **Fumio Koyama**, Tokyo Institute of Technology (Japan); **Michael Kneissl**, Technische Univ. Berlin (Germany); **Anders G. Larsson**, Chalmers Univ. of Technology (Sweden); **Fan-Yi Lin**, National Tsing Hua Univ. (Taiwan); **Cristina Masoller**, Univ. Politècnica de Catalunya (Spain); **Luke J. Mawst**, Univ. of Wisconsin-Madison (United States); **Jesper Mørk**, Technical Univ. of Denmark (Denmark); **Johann Peter Reithmaier**, Univ. Kassel (Germany); **Carlo Sirtori**, Univ. Paris 7-Denis Diderot (France); **Peter M. Smowton**, Cardiff Univ. (United Kingdom); **Anne C. Tropper**, Univ. of Southampton (United Kingdom)

MONDAY 23 APRIL

HOT TOPICS SESSION I 9:00 TO 11:00

From Einstein doubts to quantum bits: a second quantum revolution

Alain Aspect, Lab. Charles Fabry, Institut d'Optique, France

Pico-Photonics: watching and sensing single molecules by confining light to the atom scale

Jeremy J. Baumberg, NanoPhotonics Ctr., Univ. of Cambridge, United Kingdom

For additional details see page 6.

SESSION 1 MON 13:20 TO 15:30

VCSELS

Session Chair: **Rainer Michalzik**, Univ. Ulm (Germany)

High-bandwidth simplicity VCSELS for optical communication (*Invited Paper*), James A. Lott, Nasibeh Haghighi, Technische Univ. Berlin (Germany); Martin Zorn, JENOPTIK Diode Lab GmbH (Germany); Gunter Larisch, Ricardo Rosales, Technische Univ. Berlin (Germany) [10682-1]

GaN VCSELS with semiconductor-based DBRs (*Invited Paper*), Tetsuya Takeuchi, Satoshi Kamiyama, Motoaki Iwaya, Meijo Univ. (Japan); Isamu Akasaki, Meijo Univ. (Japan) and Nagoya Univ. (Japan) [10682-2]

Optical wireless power transmission using VCSELS (*Invited Paper*), Tomoyuki Miyamoto, Tokyo Institute of Technology (Japan) [10682-3]

Spin lasers for optical data communication, Markus Lindemann, Ruhr-Univ. Bochum (Germany); Rainer Michalzik, Univ. Ulm (Germany); Tobias Pusch, Univ. Ulm (Germany); Nils C. Gerhardt, Ruhr-Univ. Bochum (Germany); Martin R. Hofmann, Ruhr-Univ. Bochum (Germany) [10682-4]

Design of an electro-absorption modulator for integration onto a VCSEL, Ludovic Marigo-Lombart, Lab. d'Analyse et d'Architecture des Systèmes (France) and Vrije Univ. Brussel (Belgium) and Ctr. National de la Recherche Scientifique (France); Stéphane Calvez, Alexandre Arnoult, Lab. d'Analyse et d'Architecture des Systèmes (France); Hugo Thienpont, Vrije Univ. Brussel (Belgium); Guilhem Almuneau, Lab. d'Analyse et d'Architecture des Systèmes (France); Krassimir Panajotov, Vrije Univ. Brussel (Belgium) [10682-5]

SESSION 2 MON 16:00 TO 17:20

Novel Concepts I

Transient behaviors in parity-time-symmetric lasers (*Invited Paper*), Mercedeh Khajavikhan, Milad Gholipour Vazimali, William Hayenga, Enrique Sanchez Cristobal, Jinhan Ren, Midya Parto, Mohammad Hokmabadi, Demetrios Christodoulides, CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States) [10682-6]

1.3- μ m transistor lasers with AlGaInAs buried hetero-regrowth structure (*Invited Paper*), Nobuhiko Nishiyama, Tokyo Institute of Technology (Japan) [10682-7]

Toward single frequency semiconductor laser exploiting the concept of parity-time symmetry, Vincent Brac de la Perrière, Ctr. de Nanosciences et de Nanotechnologies (France); Quentin Gaimard, Ctr. de Nanoscience et de Nanotechnologies (France); Henri Benisty, Institut d'Optique Graduate School (France); Abderrahim Ramdane, Ctr. de Nanosciences et de Nanotechnologies (France); Anatole Lupu, Centre de Nanoscience et de Nanotechnologies (France) [10682-8]

MONDAY POSTER SESSION MON 17:30 TO 19:00

Posters-Monday

Conference attendees are invited to attend the Photonics Europe poster session on Monday 17.30 to 19.00. Posters will be on display after 10.00 Monday morning in the Hall Rhin. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster authors, view poster presentation guidelines and set-up instructions at <http://spie.org/x34963.xml> and on page 96.

Advanced research optics in LAMSEBP, Raoul Thepi Siewe, Alain F. Talla, Paul Wofo, Univ. de Yaoundé 1 (Cameroon) [10682-54]

Study of a single emitter laser diode: PSpice model and characterization system, Ramon Borrás, MONOCROM S.L. (Spain); Joaquin del Río, Univ. Politècnica de Catalunya (Spain) [10682-55]

Transient polarisation statistics at the turn-on of a microscale VCSEL, Hadrien Vergnet, Univ. Côte d'Azur (France) and École Normale Supérieure (France); Tao Wang, Univ. Côte d'Azur (France) and Hunan University of Science and Technology (China); Gian Piero Puccioni, Istituto dei Sistemi Complessi (Italy); Gian Luca Lippi, Univ. Côte d'Azur (France) [10682-56]

X-band optical injection-locked VCSEL-based optoelectronic oscillators, Juan F. Coronel, Institut Supérieur de l'Aéronautique et de l'Espace (France); Angélique Rissons, Institut Supérieur de l'Aéronautique et de l'Espace (France); Margarita Varon, Univ. Nacional de Colombia (Colombia) [10682-57]

Numerical study of the time-delay signature in chaos optical injection system with phase-conjugate feedback, Penghua Mu, Wei Pan, Lianshan Yan, Bin Luo, Southwest Jiaotong Univ. (China) [10682-58]

Temperature dependence of external differential quantum efficiency of GaN-based blue laser diode, Watheq Al-Basheer, Abdulaziz Aljalal, Khaled Gasmi, Taofeek O. Adigun, King Fahd Univ. of Petroleum & Minerals (Saudi Arabia) [10682-59]

Design and characterization of a laser integrated with long on-chip optical feedback usable as compact random number generator, Guy Verschaffelt, Mulham Khoder, Guy Van der Sande, Vrije Univ. Brussel (Belgium) [10682-60]

Suppressed time delay signature in chaotic nanolasers with hybrid feedback, Amr Elsonbaty, Masmoura Univ. (Egypt); Salem F. Hegazy, Cairo Univ. (Egypt); Salah S. A. Obayya, Zewail City of Science and Technology (Egypt) [10682-61]

Equivalent circuit modeling of the dynamic operation of ultrahigh speed multimode VCSELS, Wissam Hamad, Technische Univ. Berlin (Germany); Elio Nakhle, Oliver Daou, Marwan Bou Sanayeh, Mustapha Hamad, Notre Dame Univ., Louaize (Lebanon); Werner Hofmann, Technische Univ. Berlin (Germany) [10682-62]

IFVD-based large intermixing selectivity window process for high power laser diodes, Seval Arslan, Bilkent Univ. (Turkey); Seval Sahin, Anadolu Univ. (Turkey); Abdullah Demir, Bilkent Univ. (Turkey); Atilla Aydinli, Uludag Univ. (Turkey) [10682-63]

De-embedding device parasitics of ultrahigh speed VCSELS, Wissam Hamad, Technische Univ. Berlin (Germany); Nataly Dalal, Serena Bou Nassar, Marwan Bou Sanayeh, Mustapha Hamad, Notre Dame Univ., Louaize (Lebanon); Werner Hofmann, Technische Univ. Berlin (Germany) [10682-64]

Numerical computation of resonance modes and of constant-flux modes in VCSELS, Theresa Hoehne, Zuse Institute Berlin (Germany); Lin Zschiedrich, JCMwave GmbH (Germany); Nasibeh Haghighi, James A. Lott, Technische Univ. Berlin (Germany); Sven Burger, JCMwave GmbH (Germany) [10682-65]

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Modeling of a semiconductor laser coupled to an external fiberoptic ring resonator, Dmitry A. Korobko, Igor Zolotovskii, Ulyanovsk State Univ. (Russian Federation); Krassimir Panajotov, Vrije Univ. Brussel (Belgium); Vasily Spirin, Ctr. de Investigación Científica y de Educación Superior de Ensenada B.C. (Mexico); Andrei A. Fotiadis, Univ. de Mons (Belgium) [10682-66]

Canard explosion in the optically injected semiconductor laser, Michael Dillane, Univ. College Cork (Ireland) and Tyndall National Institute (Ireland); David Goulding, Cork Institute of Technology (Ireland) and Tyndall National Institute (Ireland); Bryan Kelleher, Univ. College Cork (Ireland) and Tyndall National Institute (Ireland) [10682-67]

InP-based high speed electro-absorption modulator, Hua Yang, Tyndall National Institute (Ireland) [10682-68]

Numerical modeling of mode-locking stability and repetition rate transitions in monolithic multisection semiconductor lasers, Martin Birkholz, Technische Univ. Darmstadt (Germany); Julien Jalavoyes, Univ. de les Illes Balears (Spain); Oleg Nikiforov, Christoph Weber, Technische Univ. Darmstadt (Germany); Luke F. Lester, Virginia Polytechnic Institute and State Univ. (United States); Stefan Breuer, Technische Univ. Darmstadt (Germany) [10682-69]

Timing stability and repetition rate frequency tuning analysis of a passively mode-locked multimode well semiconductor laser subject to dual cavity optical self-feedback, Dominik Auth, Christoph Weber, Technische Univ. Darmstadt (Germany); Andreas Klehr, Andrea Knigge, Ferdinand-Braun-Institut (Germany); Stefan Breuer, Technische Univ. Darmstadt (Germany) [10682-70]

Lasing and carrier confinement in high Sn content GeSn-based heterostructures, Mathieu Bertrand, CEA-LETI (France) and Univ. Grenoble Alpes (France); Quang Minh Thai, Nicolas Pauc, CEA-INAC (France) and Univ. Grenoble Alpes (France); Joris Aubin, Jérémie Chrétien, CEA-LETI (France) and Univ. Grenoble Alpes (France); Francesco Armand Pilon, Hans Sigg, Paul Scherrer Institut (Switzerland); Alexei Chelnokov, Jean-Michel Hartmann, CEA-LETI (France) and Univ. Grenoble Alpes (France); Vincent Calvo, CEA-INAC (France) and Univ. Grenoble Alpes (France); Vincent Reboud, CEA-LETI (France) and Univ. Grenoble Alpes (France) [10682-71]

Refractory time, multipulse excitability and resonant feature for a semiconductor laser with retroaction, Axel Dolcemascio, Univ. de Nice Sophia Antipolis (France) and Ctr. National de la Recherche Scientifique (France); Romain Veltz, INRIA Sophia Antipolis - Méditerranée (France); Stéphane Barland, Institut de Physique de Nice, Univ. de Nice Sophia Antipolis (France) and Ctr. National de la Recherche Scientifique (France) . . . [10682-72]

Optical feedback stabilization of a frequency comb generated by a self-mode-locked quantum dot laser emitting at 1255 nm, Sebastian Stutz, Dominik Auth, Christoph Weber, Oleg Nikiforov, Technische Univ. Darmstadt (Germany); Luke F. Lester, Virginia Polytechnic Institute and State Univ. (United States); Thomas Walther, Stefan Breuer, Technische Univ. Darmstadt (Germany) [10682-73]

RF line width and integrated RIN study of a single-section quantum dot comb laser, Paolo Bardella, Politecnico di Torino (Italy); Christoph Weber, Technische Univ. Darmstadt (Germany); Lorenzo Columbo, Politecnico di Torino (Italy); Luke F. Lester, Virginia Polytechnic Institute and State Univ. (United States); Mariangela Gioannini, Politecnico di Torino (Italy); Stefan Breuer, Technische Univ. Darmstadt (Germany) [10682-74]

Nonlinear characteristics of semiconductor laser subject to optical incoherent feedback, Ming-Ju Wu, Yu-Shan Juan, Shin-Chuan Chen, You-Peng Hong, Yuan Ze Univ. (Taiwan) [10682-75]

Dynamical characteristics of semiconductor laser under both optical and optoelectronic feedback, Yu-Shan Juan, Ting-De Liao, Shao-Wei Lu, Yuan Ze Univ. (Taiwan) [10682-76]

Theoretical study of mode-locked lasers with nonlinear loop mirrors, Anton V. Kovalev, Evgeny A. Viktorov, ITMO Univ. (Russian Federation); Andrei Vladimirov, Weierstrass-Institut für Angewandte Analysis und Stochastik (Germany); Natalia Rebrova, Cork Institute of Technology (Ireland); Guillaume Huyet, Ctr. National de la Recherche Scientifique, Institut de Physique de Nice (France) and ITMO Univ. (Russian Federation) [10682-77]

Shilnikov-like chaos in two nonlinear coupled photonic nanocavities, Andrus Giraldo, Bernd Krauskopf, Neil G. R. Broderick, The Univ. of Auckland (New Zealand); Maia Brunstein, Ctr. de Nanosciences et de Nanotechnologies (France); Alejandro M. Yacomotti, Ctr. de Nanosciences et de Nanotechnologies (France) and Univ. Paris-Sud, Univ. Paris-Saclay (France) and Ctr. National de la Recherche Scientifique (France); Juan A. Levenson, Ctr. de Nanosciences et de Nanotechnologies (France) [10682-78]

Development of InP-based multichannel transmitters for application in WDM access systems, Aleksandra Pańnikowska, Stanisław Stopiński, Krzysztof Anders, Andrzej Kaźmierczak, Ryszard Piramidowicz, Warsaw Univ. of Technology (Poland); Marcin Tomkiewicz, FCA Sp. z o.o. (Poland) [10682-79]

Experimental investigation of degradation mechanisms of GaN-based diode lasers, Dorota Pierścińska, Kamil Pierściński, Mariusz Pluska, Institute of Electron Technology (Poland); Łucja Marona, Przemysław Wiśniewski, Piotr Perlin, Institute of High Pressure Physics, Polish Academy of Sciences (Poland); TopGaN Ltd. (Poland); Maciej Bugajski, Institute of Electron Technology (Poland) [10682-80]

Analysis of waveguide asymmetry, waveguide thickness, and doping for improving efficiency of high power laser diodes at the 1.5 micrometer spectral range, Eugene A. Avrutin, Univ. of York (United Kingdom); Boris Ryvkin, Univ. of Oulu (Finland) and Ioffe Institute (Russian Federation); Juha Kostamovaara, Univ. of Oulu (Finland) [10682-81]

Facet temperature reduction by separate pumped window in high power laser diodes, Seval Arslan, Sinan Gündoğdu, Abdullah Demir, Bilkent Univ. (Turkey); Atilla Aydınli, Uludağ Univ. (Turkey) [10682-82]

300mm focal length optical system design for direct high power laser diodes stack, Qinggai Mi, Xubao Wang, Rongshi Xiao, Beijing Univ. of Technology (China) [10682-83]

Frequency modulated external cavity laser with photonic crystal resonator and microheater, Sharon M. Butler, Cork Institute of Technology (Ireland); Andrei P. Bakoz, Tyndall National Institute (Ireland); Alexandros A. Liles, Univ. of St. Andrews (United Kingdom); Ben O'Shaughnessy, Tyndall National Institute (Ireland); Guillaume Huyet, Institut de Physique de Nice (France); Liam O'Faolain, Stephen P. Hegarty, Tyndall National Institute (Ireland) [10682-84]

TUESDAY 24 APRIL

SESSION 3 TUE 8:30 TO 10:30

Quantum Dot Lasers and Amplifiers

Quantum dot micropillar lasers: a model system to approach the quantum regime of nonlinear dynamics (*Invited Paper*), Sören Kreinberg, Elisabeth Schlottmann, Steffen Holzinger, Arseniy Kaganskiy, Christoph Redlich, Benjamin Lingnau, Xavier Parera, Kathy Lüdge, Technische Univ. Berlin (Germany); Christian Schneider, Sven Höfling, Julius-Maximilians-Univ. Würzburg (Germany); Stephan Reitzenstein, Technische Univ. Berlin (Germany) [10682-9]

How short time scales substitute for cryogenic cooling: quantum coherent effect in room temperature QD amplifiers (*Invited Paper*), Gadi Eisenstein, Technion-Israel Institute of Technology (Israel) . . . [10682-10]

Non-Adler excitable interplay between lasing quantum dot states, Bryan Kelleher, Univ. College Cork (Ireland) and Tyndall National Institute (Ireland); Nikita Fedorov, Ilya Dubinkin, ITMO Univ. (Russian Federation); Michael Dillane, Univ. College Cork (Ireland) and Tyndall National Institute (Ireland); David Goulding, Cork Institute of Technology (Ireland) and Tyndall National Institute (Ireland); Thomas Erneux, Univ. Libre de Bruxelles (Belgium); Evgeny A. Viktorov, ITMO Univ. (Russian Federation) and Univ. Libre de Bruxelles - Optique Nonlinéaire Théorique (Belgium) [10682-11]

Performance and dynamics of mode-locked lasers with complex geometry, Stefan Meinecke, Technische Univ. Berlin (Germany); Lukas Drzewietzki, Christoph Weber, Technische Univ. Darmstadt (Germany); Benjamin Lingnau, Technische Univ. Berlin (Germany); Stefan Breuer, Technische Univ. Darmstadt (Germany); Kathy Lüdge, Technische Univ. Berlin (Germany) [10682-12]

Effect of modulation p-doping level on multistate lasing in InAs/InGaAs quantum dot lasers having different external loss, Vladimir V. Korenev, Artem Savelyev, St. Petersburg Academic Univ. (Russian Federation); Mikhail Maximov, St. Petersburg Academic Univ. (Russian Federation) and Ioffe Institute (Russian Federation) and Saint-Petersburg State Polytechnical Univ. (Russian Federation); Fedor Zubov, St. Petersburg Academic Univ. (Russian Federation); Yuri Shernyakov, Ioffe Institute (Russian Federation) and St. Petersburg Academic Univ. (Russian Federation); Marina Kulagina, Ioffe Institute (Russian Federation); Alexey Zhukov, St. Petersburg Academic Univ. (Russian Federation) and Saint-Petersburg State Polytechnical Univ. (Russian Federation) [10682-13]

SESSION 4 TUE 11:00 TO 13:00

Laser Nonlinear Dynamics I

Session Chair: **Marc Sciamanna**, CentraleSupélec (France)

Diode laser efficiency revisited: the case of quantum dots (*Invited Paper*), Peter Blood, Cardiff Univ. (United Kingdom) [10682-14]

Self-generation of optical frequency combs in single section quantum dot lasers: theory and numerical modelling (*Invited Paper*), Paolo Bardella, Lorenzo Columbo, Javad Rahimi, Mariangela Gioannini, Politecnico di Torino (Italy) [10682-15]

Theory of delay-coupled nonidentical quantum cascade lasers, Daan Lenstra, Technische Univ. Eindhoven (Netherlands); Andreas Herdt, Markus Weidmann, Till Mohr, Wolfgang E. Elsaesser, Technische Univ. Darmstadt (Germany) [10682-16]

Experimental investigation of thermal designs of InP-based quantum cascade lasers, Kamil Pierscinski, Dorota Pierścińska, Piotr Gutowski, Grzegorz Sobczak, Kamil Janus, Maciej Bugajski, Institute of Electron Technology (Poland) [10682-17]

Thermal characterisation of quantum cascade lasers with Fabry Perot modes, Sinan Gundogdu, Hadi Sedaghat Pisheh, Abdullah Demir, Bilkent Univ. (Turkey); Mete Günöven, Middle East Technical Univ. (Turkey); Atilla Aydınli, Uludağ Univ. (Turkey); Carlo Sirtori, Univ. Paris Diderot - Paris 7 (France) [10682-18]

Lunch/Exhibition Break Tue 13:00 to 14:20

SESSION 5..... TUE 14:20 TO 16:00

Mode-locked Lasers and Frequency Combs

Optical dual-comb generation and molecular spectroscopy using only one unstabilized semiconductor laser (*Invited Paper*), Ursula Keller, ETH Zurich (Switzerland) [10682-19]

Modelling dynamics of high bit rate mode-locked VECSELs with different cavity geometries (*Invited Paper*), Eugene A. Avrutin, Univ. of York (United Kingdom); Krassimir Panajotov, Vrije Univ. Brussel (Belgium) [10682-20]

Monolithic reflective loop mirror mode-locked laser, Mu-Chieh Lo, Robinson C. Guzmán, Guillermo Carpintero, Univ. Carlos III de Madrid (Spain) [10682-21]

Mode-locked diode laser with resonant ring amplifier, Mohammad Ali Alloush, Rouven H. Pilny, Carsten Brenner, Ruhr-Univ. Bochum (Germany); Andreas Klehr, Andrea Knigge, Günther Tränkle, Ferdinand-Braun-Institut (Germany); Martin R. Hofmann, Ruhr-Univ. Bochum (Germany) [10682-22]

HOT TOPICS SESSION II..... 16:30 TO 18:05

Coherent combination of fiber amplified ultrafast laser pulses
Jens Limpert, Institute of Applied Physics, Friedrich Schiller Univ. Jena, Germany

2D materials and their heterostructures: fundamentals, applications and prototypes
Frank Koppens, ICFO-The Institute of Photonic Sciences, Spain

For additional details, please see page 7

WEDNESDAY 25 APRIL

SESSION 6..... WED 8:30 TO 10:30

Nanolasers

Bifurcations in coupled nanolasers (*Invited Paper*), Alejandro M. Yacomotti, Ctr. de Nanosciences et de Nanotechnologies, Ctr. National de la Recherche Scientifique (France) [10682-28]

Threshold dynamics in meso- and nanoscale lasers (*Invited Paper*), Tao Wang, Univ. Côte d'Azur (France) and Hunan Univ. of Science and Technology (China); Gian Piero Puccioni, Istituto dei Sistemi Complessi (Italy); Gian Luca Lippi, Univ. Côte d'Azur (France) [10682-29]

An analytical approach to collective effects in nanolasers, Emil André, DTU Fotonik (Denmark); Igor E. Protsenko, P.N. Lebedev Physical Institute (Russian Federation); Alexander V. Uskov, P.N. Lebedev Physical Institute (Russian Federation) and ITMO Univ. (Russian Federation); Jesper Mørk, Martijn Wubs, Technical Univ. of Denmark (Denmark) [10682-30]

Stability and long-term behaviour of pulse trains in an excitable microlaser with delayed optical feedback, Soizic Terrien, Bernd Krauskopf, Neil G. R. Broderick, The Univ. of Auckland (New Zealand); Sylvain Barbay, Lab. de Photonique et de Nanostructures (France) [10682-31]

Lasing from ZnO nanorods prepared on ITO coated substrate, Wan Maryam Wan Ahmad Kamil, Muhammad Nuri Nordin, Univ. Sains Malaysia (Malaysia); Davide Priante, Mohammad Khaled Shakfa, King Abdullah Univ. of Science and Technology (Saudi Arabia) [10682-27]

SESSION 7..... WED 11:00 TO 12:40

On-Si Integration

III-V-on-silicon heterogeneously integrated lasers (*Invited Paper*), Gunther Roelkens, Univ. Gent IMEC (Belgium) [10682-23]

Hybrid integration of GaInAsP LD on silicon platform by epitaxial growth using directly bonded InP/Si substrate (*Invited Paper*), Kazuhiko Shimomura, Sophia Univ. (Japan) [10682-24]

Continuous wavelength operation of injection III-V microdisk lasers directly grown on Si substrate with emission wavelength beyond 1.2 μm , Natalia V. Kryzhanovskaya, Eduard Moiseev, Yuliya Polubavkina, Mikhail Maximov, St. Petersburg Academic Univ. (Russian Federation); Andrey Lipovskii, Saint-Petersburg State Polytechnical Univ. (Russian Federation); Mingchu Tang, Mengya Liao, Jiang Wu, Siming Chen, Univ. College London (United Kingdom); Alexandr Dubinov, Nikolay Baidus, Dmitriy Yurasov, Institute for Physics of Microstructures Russian Academy of Sciences (Russian Federation); Yulia Guseva, Ioffe Institute (Russian Federation); Zakhary Krasilnik, Institute for Physics of Microstructures Russian Academy of Sciences (Russian Federation); Huiyun Liu, Univ. College London (United Kingdom); Alexey Zhukov, St. Petersburg Academic Univ. (Russian Federation) [10682-25]

Lasing in Ge_{1-x}Sn_x-based photonic crystals, Quang Minh Thai, CEA-INAC (France); Mathieu Bertrand, CEA-LETI (France); Nicolas Pauc, CEA-INAC (France); Joris Aubin, Alexei Tchelnokov, Jean-Michel Hartmann, Vincent Reboud, CEA-LETI (France); Vincent Calvo, CEA-INAC-PHELIQS (France); Jérémie Chrétien, CEA-LETI (France) [10682-26]

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

SESSION 8..... WED 13:40 TO 15:40

Laser Nonlinear Dynamics II

Active-MMI laser diode toward high-speed direct modulation based on multiple photon-photon resonance (*Invited Paper*), Kiichi Hamamoto, Kyushu Univ. (Japan) [10682-32]

Multimode optical feedback dynamics in InAs/GaAs quantum dot lasers operating with short optical feedback (*Invited Paper*), Frédéric Grillot, Heming Huang, Télécom ParisTech (France); Lyu-Chih Lin, Chih-Ying Chen, National Tsing Hua Univ. (Taiwan); Dejan Arsenijevic, Dieter Bimberg, Technische Univ. Berlin (Germany); Fan-Yi Lin, National Tsing Hua Univ. (Taiwan) [10682-33]

Injection locking of two laterally- coupled semiconductor laser arrays, Nianqiang Li, Hadi Susanto, Benjamin Cemlyn, Ian Henning, Michael Adams, Univ. of Essex (United Kingdom) [10682-34]

Beyond the relaxation frequency limit in square wave dynamics, Chi-Hak Uy, Lionel Weicker, Damien Rontani, Marc Sciamanna, Lab. Matériaux Optiques, Photonique et Systèmes (LMOPS) (France) and Chaire Photonique (France) [10682-35]

External cavity laser optoelectronic oscillator stabilization, Michael Joe Wishon, Nathan Webster, Tobias Niebur, Chien-Yuan Chang, Daeyoung Choi, Georgia Tech-Lorraine (France); Evgeny A. Viktorov, ITMO Univ. (Russian Federation); David Citrin, Alexandre Locquet, Georgia Tech-Lorraine (France) [10682-36]

SESSION 9..... WED 16:10 TO 17:50

Novel Concepts II

Integrated metasurfaces for multifunctional semiconductor lasers (*Invited Paper*), Qi Jie Wang, Nanyang Technological Univ. (Singapore); Guozhen Liang, Columbia Univ. (United States); Yongquan Zeng, Nanyang Technological Univ. (Singapore) [10682-37]

MECSEL: new concept for optically pumped semiconductor disk lasers with versatile wavelength (*Invited Paper*), Michael Jetter, Roman Bek, Univ. Stuttgart (Germany); Hermann Kahle, Tampere Univ. of Technology (Finland); Peter Michler, Univ. Stuttgart (Germany) [10682-38]

Optically in-well-pumped semiconductor disk lasers capable of single- and dual-wavelength emission, Markus Polanik, Philipp Ackermann, Peter Unger, Univ. Ulm (Germany) [10682-39]

High power GaSb superluminescent diodes with broadband emission around 2.55 μm , Nouman Zia, Jukka Viheriälä, Eero Koivusalo, Antti Aho, Soile Suomalainen, Mircea Guina, Tampere Univ. of Technology (Finland) [10682-40]

CONFERENCE 10682

THURSDAY 26 APRIL

HOT TOPICS SESSION III 9:00 TO 10:35

From extreme nonlinear optics to ultrafast atomic physics

Anne L'Huillier, Lund Univ., Sweden

Quantum computations and quantum simulations with trapped ions

Rainer Blatt, Institute for Experimental Physics, Univ. of Innsbruck, Austria

For additional details, please see page 8

SESSION 10 THU 11:00 TO 12:40

Photonic Crystal Lasers/VCSELs

Photonic crystal fanolaser (*Invited Paper*), Kresten Yvind, DTU Fotonik (Denmark); Yi Yu, Technical Univ. of Denmark (Denmark); Elizaveta Semenova, Luisa Ottaviano, DTU Fotonik (Denmark); Dagmawi Bekele, Aurimas Sakanas, Thorsten S. Rasmussen, Technical Univ. of Denmark (Denmark); Kristoffer S. Mathiesen, DTU Fotonik (Denmark); Jesper Mørk, Technical Univ. of Denmark (Denmark) [10682-41]

Membrane DFB and DR lasers for low-power consumption and high-speed operation (*Invited Paper*), Shigehisa Arai, Tokyo Institute of Technology (Japan) [10682-42]

Optical manipulation of current confinement in VCSELs with an external laser beam, Sven Bader, Mohamed Elattar, Univ. Ulm (Germany); Philipp Gerlach, Philips GmbH U-L-M Photonics (Germany); Rainer Michalzick, Univ. Ulm (Germany) [10682-43]

Thermally-induced birefringence in VCSELs: approaching the limits, Tobias Pusch, Univ. Ulm (Germany); Markus Lindemann, Nils C. Gerhardt, Martin R. Hofmann, Ruhr-Univ. Bochum (Germany); Rainer Michalzick, Univ. Ulm (Germany) [10682-44]

SESSION 11 THU 13:40 TO 15:40

Novel Concepts III

Hybrid silicon-on-chip lasers based on quasi-bound states in the continuum (*Invited Paper*), Il-Sug Chung, Technical Univ. of Denmark (Denmark); Alireza Taghizadeh, Aalborg Univ. (Denmark) [10682-45]

Near-infrared GaAsBi quantum well laser diodes (*Invited Paper*), Shumin Wang, Chalmers Univ. of Technology (Sweden) and Shanghai Institute of Microsystem and Information Technology, Chinese Academy of Sciences (China); Xiaoyan Wu, Juanjuan Liu, Wenwu Pan, Chunfang Cao, Yaoyao Li, Lijuan Wang, Shanghai Institute of Microsystem and Information Technology (China) [10682-46]

Combining nanoscale light emitters with hyperbolic metamaterials as an efficient platform for the enhancement of random laser action, Hung-I Lin, Yu-Ming Liao, National Taiwan Univ. (Taiwan); Kun-Ching Shen, Research Ctr. for Applied Sciences - Academia Sinica (Taiwan); Yang-Fang Chen, National Taiwan Univ. (Taiwan) [10682-47]

Theoretical study of polarization dynamics in VCSEL-based optical frequency combs, Ana Quirce, Vrije Univ. Brussel (Belgium); Cristina de Dios Fernandez, Univ. Carlos III de Madrid (Spain); Ángel Valle, Luis Pesquera, Univ. de Cantabria (Spain); Pablo Acedo, Univ. Carlos III de Madrid (Spain) [10682-48]

Towards the realization of compact and integrated mode-locked lasers, Malik Kemiche, Jérémy Lhuillier, Thomas Wood, Aziz Benamrouche, Philippe Regreny, Radoslaw Mazurczyk, Pedro Rojo Romeo, Xavier Letartre, Ségolène Callard, Christelle Monat, Ecole Centrale de Lyon (France) [10682-49]

SESSION 12 THU 16:00 TO 17:40

Spatiotemporal and Feedback-induced Dynamics

Session Chair: Krassimir Panajotov, Vrije Univ. Brussel (Belgium)

Spatiotemporal extreme events in spatially extended lasers (*Invited Paper*), Cristina Rimoldi, Stephane Barland, Institut de Physique de Nice, Univ. Côte d'Azur (France); Franco Prati, Univ. degli Studi dell'Insubria (Italy); Giovanna Tissoni, Institut de Physique de Nice, Univ. Côte d'Azur (France) [10682-50]

Pinning and delay-induced depinning of cavity solitons in spatially inhomogeneous optical systems (*Invited Paper*), Svetlana V. Gurevich, Felix Tabbert, Westfälische Wilhelms-Univ. Münster (Germany); Krassimir Panajotov, Vrije Univ. Brussel (Belgium); Mustapha Tlidi, Univ. Libre de Bruxelles (Belgium) [10682-51]

Extreme events induced by collisions in a forced semiconductor laser, Pierre Walczak, Cristina Rimoldi, Institut de Physique de Nice (France); François Gustave, Univ. des Sciences et Technologies de Lille (France); Lorenzo Columbo, Politecnico di Torino (Italy) and CNR-Istituto di Fotonica e Nanotecnologie (Italy); Massimo Brambilla, CNR-Istituto di Fotonica e Nanotecnologie (Italy) and Politecnico di Bari (Italy); Franco Prati, Univ. degli Studi dell'Insubria (Italy); Giovanna Tissoni, Stéphane Barland, Institut de Physique de Nice (France) [10682-52]

Feedback-induced discretization of the relaxation oscillation frequency in a semiconductor laser, Anton V. Kovalev, Evgeny A. Viktorov, ITMO Univ. (Russian Federation); Boguslaw Tykalewicz, David Goulding, Cork Institute of Technology (Ireland) and Tyndall National Institute, Univ. College Cork (Ireland); Bryan Kelleher, Univ. College Cork (Ireland) and Tyndall National Institute (Ireland) [10682-53]

Fiber Lasers and Glass Photonics: Materials through Applications

Conference Chairs: **Stefano Taccheo**, Swansea Univ. (United Kingdom); **Jacob I. Mackenzie**, Univ. of Southampton (United Kingdom); **Maurizio Ferrari**, CNR-Istituto di Fotonica e Nanotecnologie (Italy)

Programme Committee: **Rolindes Balda**, Univ. del País Vasco (Spain); **Patrice Camy**, Ctr. de Recherche sur les Ions, les Matériaux et la Photonique (France); **Yanne K. K. Chembo**, FEMTO-ST (France); **Amol Choudhary**, The Univ. of Sydney (Australia); **Cosimo D'Andrea**, Politecnico di Milano (Italy); **Miroslav Dramicanin**, Univ. of Belgrade (Serbia); **Ulrich Hefter**, ROFIN-SINAR Laser GmbH (Germany); **Shibin Jiang**, AdValue Photonics, Inc. (United States); **Udo Klotzbach**, Fraunhofer IWS Dresden (Germany); **Antti Lassila**, MIKES Mittatekniikan keskus (Finland); **Antonio Lucianetti**, HiLASE Ctr. (Czech Republic); **Anna Luiza Lukowiak**, Institute of Low Temperature and Structure Research (Poland); **Virginie Nazabal**, Univ. de Rennes 1 (France); **Nasser N. Peyghambarian**, College of Optical Sciences, The Univ. of Arizona (United States); **Francesco Prudenzano**, Politecnico di Bari (Italy); **Alexander Quandt**, Univ. of the Witwatersrand (South Africa); **Gediminas Račiukaitis**, Ctr. for Physical Sciences and Technology (Lithuania); **Angela B. Seddon**, The Univ. of Nottingham (United Kingdom); **Akira Shirakawa**, The Univ. of Electro-Communications (Japan); **Irina T. Sorokina**, Norwegian Univ. of Science and Technology (Norway)

SUNDAY 22 APRIL

OPENING REMARKS 13:10 TO 13:25

SESSION 1 **SUN 13:25 TO 15:10**

From Glass to Applications I

Session Chair: **Stefano Taccheo**, Swansea Univ. (United Kingdom)

A unified materials approach to mitigating optical nonlinearities in fiber laser (Keynote Presentation), John M. Ballato, Clemson Univ. (United States); Peter Dragic, Univ. of Illinois (United States); Maxime Cavillon, Courtney Kucera, Clemson Univ. (United States) [10683-1]

Monitoring and controlling fiber laser-based machining processes, Roberto Ocaña Pérez, IK4 Tekniker (Spain) [10683-2]

Monolithic Er/Yb double-clad fiber laser with FBG inscribed using the plane-by-plane inscription method, Jan Aubrecht, Institute of Photonics and Electronics of the ASCR, v.v.i. (Czech Republic); Andreas Theodosiou, Cyprus Univ. of Technology (Cyprus); Pavel Peterka, Ivan Kašik, Filip Todorov, Ondřej Moravec, Pavel Honzátko, Institute of Photonics and Electronics of the ASCR, v.v.i. (Czech Republic) [10683-3]

Improvement of noise reduction in fiber Brillouin lasers due to multi-Stokes operation, Ananthu Sebastian, Schadrac Fresnel, Stéphane Trebaol, Frédéric Ginovart, Pascal Besnard, CNRS-Fonctions Optiques pour les Techniciens de l'information (France) [10683-4]

Optimum parameters for high-repetition rate femtosecond laser glass welding using an optical head with long focal length, Marion Gstalter, ICube (France); Grégoire Chabrol, ICube (France) and ECAM Strasbourg-Europe (France); Armel Bahouka, IREPA LASER (France); Kokou-Dodzi Dorkenoo, Jean-Luc Rehspringer, Institut de Physique et Chimie des Matériaux de Strasbourg (France); Sylvain Lecler, ICube (France) ... [10683-5]

SESSION 2 **SUN 15:40 TO 17:35**

From Glass to Applications II

Session Chair: **Jacob I. Mackenzie**, Univ. of Southampton (United Kingdom)

The bright white emission of μ -diamonds (Invited Paper), Wiesław Strek, Robert Tomala, Adam Olejniczak, Anna Lukowiak, O. Ignatenko, Institute of Low Temperature and Structure Research (Poland) [10683-6]

Narrowband gain in chalcogenide waveguides for low-power RF delay lines, Amol Choudhary, Yang Liu, The Univ. of Sydney (Australia); Khu Vu, Stephen Madden, The Australian National Univ. (Australia); David A. I. Marpaung, Benjamin J. Eggleton, The Univ. of Sydney (Australia) [10683-7]

Silica glass-based fiberoptic distributed meandering waveguides for integrated photonics, Muhammad Zakwan, Koç Univ. (Turkey) and Air Univ. (Pakistan); Ceren B. Dag, Univ. of Michigan (United States); Ali Serpengüzel, Koç Univ. (Turkey) [10683-8]

Large (GeTe)(Sb₂Te₃) ratio phase change memory thin films, Marek Bouska, Univ. Pardubice (Czech Republic); Stanislav Pechev, Quentin Simon, Institut de Chimie de la Matière Condensée de Bordeaux (France); Virginie Nazabal, Univ. de Rennes 1 (France); Jan Gutwirth, Petr Nemec, Univ. Pardubice (Czech Republic) [10683-9]

Temperature dependence of spectral characteristics of distributed feedback resonators, Cristine C. Kores, Nur Ismail, Dimitri Geskus, KTH Royal Institute of Technology (Sweden); Meindert Dijkstra, Univ. Twente (Netherlands); Edward H. Bernhardt, KTH Royal Institute of Technology (Sweden); Markus Pollnau, Univ. of Surrey (United Kingdom) [10683-10]

Vacuum-assisted precision molding of 3D thin microstructure glass optics, Anh Tuan Vu, Paul-Alexander Vogel, Olaf Dambon, Fritz Klocke, Fraunhofer-Institut für Produktionstechnologie IPT (Germany) [10683-11]

Impact on pumping efficiency of the reverse cross-relaxation process in Tm-doped glasses based lasers and amplifiers, Ali Albalawi, Swansea Univ. (United Kingdom); Hrvoje Gebavi, Institut Ruder Boškovic (Croatia); Alessandro Chiasera, CNR-Istituto di Fotonica e Nanotecnologie (Italy); Rolindes Balda, Univ. del País Vasco (Spain); Anna Lukowiak, Institute of Low Temperature and Structure Research (Poland); Wilfried Blanc, Univ. de Nice Sophia Antipolis (France); Maurizio Ferrari, CNR-Istituto di Fotonica e Nanotecnologie (Italy); Stefano Taccheo, Swansea Univ. (United Kingdom) [10683-88]

MONDAY 23 APRIL

HOT TOPICS SESSION I **9:00 TO 11:00**

From Einstein doubts to quantum bits: a second quantum revolution

Alain Aspect, Lab. Charles Fabry, Institut d'Optique, France

Pico-Photonics: watching and sensing single molecules by confining light to the atom scale

Jeremy J. Baumberg, NanoPhotonics Ctr., Univ. of Cambridge, United Kingdom

For additional details see page 6.

SESSION 3 **MON 11:30 TO 12:40**

Materials and Components I

Session Chair: **Francesco Scotognella**, Politecnico di Milano (Italy)

Glass-based microresonators (Invited Paper), Simone Berneschi, Daniele Farnesi, Gabriele Frigenti, Istituto di Fisica Applicata "Nello Carrara" (Italy); Giancarlo C. Righini, Museo Storico della Fisica e Ctr. Studi e Ricerche "Enrico Fermi" (Italy); Stefano Pelli, Istituto di Fisica Applicata "Nello Carrara" (Italy) and Museo Storico della Fisica e Ctr. Studi e Ricerche "Enrico Fermi" (Italy); Silvia Soria, Francesco Baldini, Istituto di Fisica Applicata "Nello Carrara" (Italy); Francesco Prudenzano, Politecnico di Bari (Italy); Romeo Bernini, Istituto per il Rilevamento Elettromagnetico dell'Ambiente (Italy); Yannick Dumeige, Patrice Féron, Ecole Nationale Supérieure des Sciences Appliquées et de Technologie (France); Davor Ristić, Mile Ivanda, Institut Ruder Boškovic (Croatia); Gualtiero Nunzi Conti, Istituto di Fisica Applicata "Nello Carrara" (Italy) and Museo Storico della Fisica e Ctr. Studi e Ricerche "Enrico Fermi" (Italy) [10683-12]

Lasing properties of Er³⁺ activated SiO₂-HfO₂ coated microspheres, Davor Ristić, Institut Ruder Boškovic (Croatia); Andrea Chiappini, Maurizio Mazzola, CNR-Istituto di Fotonica e Nanotecnologie (Italy); Patrice Féron, Ecole Nationale Supérieure des Sciences Appliquées et de Technologie (France); Hrvoje Gebavi, Daniil Zhivotkov, Mile Ivanda, Maurizio Ferrari, Institut Ruder Boškovic (Croatia) [10683-13]

Relative intensity noise in Er:ZBLALiP whispering gallery mode laser: theory and experiments, Patrice Féron, Jean-Baptiste Ceppe, Ecole Nationale Supérieure des Sciences Appliquées et de Technologie (France); Michel Mortier, Ctr. National de la Recherche Scientifique (France); Yannick Dumeige, Ecole Nationale Supérieure des Sciences Appliquées et de Technologie (France) [10683-14]

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LiNbO₃ integrated microdisk resonator fabricated by optical grade dicing and dynamic robotic positioning, Alexis Caspar, Florent Behague, Venancio Calero, FEMTO-ST (France); Bruno Robert, SATT GRAND EST (France); Miguel Suárez, Jean-Yves Rauch, Olivier Lehman, Roland Salut, Maria-Pilar Bernal, Cédric Clévy, Philippe Lutz, Nadège Courjal, FEMTO-ST (France) [10683-15]
Lunch Break Mon 12:40 to 13:50

SESSION 4. MON 13:50 TO 15:15

Fibers and Waveguide Sources

Session Chair: **Angela B. Seddon**,
The Univ. of Nottingham (United Kingdom)

Functionalised optical fibres: exploring embedded semiconductors, metals and electrodes (*Invited Paper*), Pier J. Sazio, Francesco De Lucia, Univ. of Southampton (United Kingdom); Costantino Corbari, Renishaw plc (United Kingdom); John Badding, The Pennsylvania State Univ. (United States) [10683-16]

Pr³⁺Yb:ZBLAN glasses for applications in fiber lasers operating in VIS, Urszula Zdulska, Anna Jusza, Krzysztof Anders, Ryszard Piramidowicz, Warsaw Univ. of Technology (Poland) [10683-17]

Global optimization via evolutionary approach of a Dy³⁺:ZBLAN fiber amplifier for MID-IR applications, Mario Falconi, Dario Laneve, Caterina Clemente, Politecnico di Bari (Italy); Toney Teddy Fernandez, Gianluca Galzerano, Politecnico di Milano (Italy); Francesco Prudenzano, Politecnico di Bari (Italy) [10683-18]

Luminescent sol-gel-derived silica-based glass nanoparticles, Anna Lukowiak, Yuriy Gerasymchuk, Wieslaw Strek, Institute of Low Temperature and Structure Research (Poland); Beata Borak, Wroclaw Univ. of Science and Technology (Poland); Andrea Chiappini, Fondazione Bruno Kessler (Italy) and CNR-Istituto di Fotonica e Nanotecnologie (Italy); Alessandro Chiasera, CNR-Istituto di Fotonica e Nanotecnologie (Italy) and Fondazione Bruno Kessler (Italy); Maurizio Ferrari, CNR-Istituto di Fotonica e Nanotecnologie (Italy) and Fondazione Bruno Kessler (Italy) and Museo Storico della Fisica e Ctr. Studi e Ricerche "Enrico Fermi" (Italy); Stefano Taccheo, Swansea Univ. (United Kingdom) [10683-19]

Study of spectral variations in generation of random fiber laser based on set of fiber Bragg gratings, Elena Chaikina, Ctr. de Investigación Científica y de Educación Superior de Ensenada B.C. (Mexico); Ilya D. Vatik, Institute of Automation and Electrometry of the Siberian Branch of RAS (Russian Federation) and Novosibirsk State Univ. (Russian Federation); Dmitry V. Churkin, Novosibirsk State Univ. (Russian Federation) [10683-20]

SESSION 5. MON 15:45 TO 17:35

Materials and Components II

Session Chair: **Akira Shirakawa**,
The Univ. of Electro-Communications (Japan)

Structural color tuning in 1D photonic crystals with electric field and magnetic field (*Invited Paper*), Francesco Scotognella, Politecnico di Milano (Italy); Eduardo Aluicio-Sarduy, Istituto Italiano di Tecnologia (Italy); Simone Callegari, Politecnico di Milano (Italy); Diana Gisell Figueroa del Valle, Andrea Desii, Ilka Kriegel, Istituto Italiano di Tecnologia (Italy) [10683-21]

Supersensitive luminescence thermometric binary films and coatings based on the emissions of rare earth and transition metal ions (*Invited Paper*), Milica Sekulic, Sanja Kuzman, Vesna Djordjevic, Mina Medic, Miroslav Dramićanin, Univ. of Belgrade (Serbia) [10683-22]

Fabrication by rf-sputtering and assessment of dielectric Er³⁺ doped monolithic 1-D microcavity for coherent emission at 1.5 μ m, Alessandro Chiasera, CNR-Istituto di Fotonica e Nanotecnologie (Italy), Fondazione Bruno Kessler (Italy); Francesco Scotognella, Politecnico di Milano (Italy), Istituto Italiano di Tecnologia (Italy); Yann G. Boucher, Ecole Nationale Supérieure des Sciences Appliquées et de Technologie (France); Anna Lukowiak, Institute of Low Temperature and Structure Research (Poland); Davor Ristić, Institut Ruder Bošković (Croatia); Giorgio Speranza, Fondazione Bruno Kessler (Italy); Cesare Meroni, Univ. degli Studi di Trento (Italy); Stefano Varas, CNR-Istituto di Fotonica e Nanotecnologie (Italy); Lidia Zur, Museo Storico della Fisica e Ctr. Studi e Ricerche "Enrico Fermi" (Italy), Fondazione Bruno Kessler (Italy); Mile Ivanda, Institut Ruder Bošković (Croatia); Stefano Taccheo, Swansea Univ. (United Kingdom); Roberta Ramponi, CNR-Istituto di Fotonica e Nanotecnologie (Italy), Politecnico di Milano (Italy); Giancarlo C. Righini, Museo Storico della Fisica e Ctr. Studi e Ricerche "Enrico Fermi" (Italy); Maurizio Ferrari, CNR-Istituto di Fotonica e Nanotecnologie (Italy), Museo Storico della Fisica e Ctr. Studi e Ricerche "Enrico Fermi" (Italy) [10683-23]

Fabrication of ring-core waveguide structure inside silicate glass by using CW laser metal microsphere manipulation, Tetsuo Kishi, Yukihiro Yoshida, Tokyo Institute of Technology (Japan); Hirofumi Hidai, Chiba Univ. (Japan); Fumiya Noritake, Univ. of Yamanashi (Japan); Nobuhiro Matsushita, Tetsuji Yano, Tokyo Institute of Technology (Japan) [10683-24]

Bifunctional Bi₂ZnOB₂O₆ single crystals doped with Nd³⁺ or Pr³⁺: luminescence and μ -Raman investigations, Dobrosława Kasprzowicz, Poznan Univ. of Technology (Poland) [10683-25]

Investigation of the role of Ag multimers as broadband sensitizers in Tb³⁺/Yb³⁺ doped glasses and glass ceramics, Francesco Enrichi, Luleå Univ. of Technology (Sweden) and Museo Storico della Fisica e Ctr. Studi e Ricerche "Enrico Fermi" (Italy) [10683-26]

MONDAY POSTER SESSION MON 17:30 TO 19:00

Posters-Monday

Conference attendees are invited to attend the Photonics Europe poster session on Monday 17.30 to 19.00. Posters will be on display after 10.00 Monday morning in the Hall Rhin. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster authors, view poster presentation guidelines and set-up instructions at <http://spie.org/x34963.xml> and on page 96.

Characteristics of oxide multilayers (IGZO/Al/IGZO) with different zinc ratio for low emissive glass coating, Chang Liu, Yi Zhao, Hongbo Wang, Houyun Qin, Ying Sun, Jilin Univ. (China) [10683-87]

Influence of Kerr nonlinearity on PT-transition in coupled fibre lasers, Sergey V. Smirnov, Maxim O. Makarenko, Novosibirsk State Univ. (Russian Federation); Andrey A. Sukhorukov, Novosibirsk State Univ. (Russian Federation) and The Australian National Univ. (Australia); Dmitry V. Churkin, Novosibirsk State Univ. (Russian Federation) [10683-89]

Optical characterization of photopolymer material using $\lambda=532$ nm and investigation into future use at $\lambda=850$ nm and $\lambda=1300$ nm, Derek Cassidy, Ra'ed Malallah, Inbarasan Muniraj, John Healy, John T. Sheridan, Univ. College Dublin (Ireland) [10683-90]

Influence of interionic energy transfer mechanisms in Tm,Ho:YAG on the maximum extractable energy in regenerative amplifiers, Ramon Springer, Christoph Pflaum, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany) [10683-91]

Silica- and germanate-based rare earth doped glasses for fiber lasers, Michal Kamrádek, Ivan Kašík, Pavel Peterka, Jan Aubrecht, Pavel Honzátko, Ondřej Podrážský, Jan Mrázek, Institute of Photonics and Electronics of the ASCR, v.v.i. (Czech Republic); Václav Kubeček, Czech Technical Univ. in Prague (Czech Republic) [10683-92]

One-dimensional disordered photonic structures with two or more materials, Alessandro Chiasera, CNR-Istituto di Fotonica e Nanotecnologie (Italy); Luigino Criante, Istituto Italiano di Tecnologia (Italy); Stefano Varas, CNR-Istituto di Fotonica e Nanotecnologie (Italy); Giuseppe Della Valle, Politecnico di Milano (Italy); Roberta Ramponi, Maurizio Ferrari, Lidia Zur, CNR-Istituto di Fotonica e Nanotecnologie (Italy); Anna Lukowiak, Institute of Low Temperature and Structure Research (Poland); Ilka Kriegel, Istituto Italiano di Tecnologia (Italy); Michele Bellingeri, Univ. degli Studi di Parma (Italy); Francesco Scotognella, Politecnico di Milano (Italy) [10683-93]

Near-infrared emission in barium gallo-germanate glasses co-doped with Ce³⁺ and Pr³⁺ for broadband optical amplifiers, Marta Soltys, Agata Górny, Univ. of Silesia (Poland); Lidia Zur, Museo Storico della Fisica e Ctr. Studi e Ricerche "Enrico Fermi" (Italy) and Fondazione Bruno Kessler (Italy); Maurizio Ferrari, Fondazione Bruno Kessler (Italy) and Museo Storico della Fisica e Ctr. Studi e Ricerche "Enrico Fermi" (Italy); Giancarlo C. Righini, Museo Storico della Fisica e Ctr. Studi e Ricerche "Enrico Fermi" (Italy) and Istituto di Fisica Applicata "Nello Carrara" (Italy); Dominik Dorosz, AGH Univ. of Science and Technology (Poland); Wojciech A. Pisarski, Joanna Pisarska, Univ. of Silesia (Poland) [10683-94]

Dynamic mode analysis with arbitrary rate equations, Christoph Pflaum, Erlangen Graduate School in Advanced Optical Technologies (Germany); Ramon Springer, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany) [10683-95]

Glass photonic structures fabricated by sol-gel route, Robert Tomala, Anna Lukowiak, Institute of Low Temperature and Structure Research (Poland); Beata Borak, Wroclaw Univ. of Science and Technology (Poland); Andrea Chiappini, CNR-Istituto di Fotonica e Nanotecnologie (Italy), Fondazione Bruno Kessler (Italy); Wilfried Blanc, Univ. Côte d'Azur (France); Maurizio Ferrari, CNR-Istituto di Fotonica e Nanotecnologie (Italy), Museo Storico della Fisica e Ctr. Studi e Ricerche "Enrico Fermi" (Italy), Fondazione Bruno Kessler (Italy); Adel Bouajaj, Univ. Abdelmalek Essaadi (Morocco); Davor Ristić, Institut Ruder Bošković (Croatia); Stefano Taccheo, Swansea Univ. (United Kingdom); Wieslaw Strek, Polish Academy of Sciences (Poland) [10683-96]

Development of thulium-doped fibre amplifiers for the 2 μ m waveband, Eoin Russell, Tyndall National Institute (Ireland) [10683-97]

Dynamics and trajectories of multiwavelength solitons in a Tm-doped fiber laser, Saïd Hamdi, Aurélien Collet, Philippe Grelu, Lab. Interdisciplinaire Carnot de Bourgogne (France) [10683-98]

Modeling with the progressive wave model passively Q-switched and gain-switched dual-cavity fiber laser doped Yb:Yb, Djillali Djellout, Hocine Djellout, Zaina Sidi Ahmed, Ouiza Arar, Univ. Mouloud Mammeri de Tizi-Ouzou (Algeria); Pierre Pfeiffer, Télécom Physique Strasbourg, Univ. de Strasbourg (France) and ICube, Univ. de Strasbourg (France); Rabah Mokdad, Univ. Mouloud Mammeri de Tizi-Ouzou (Algeria) [10683-99]

Exploiting silicon oxycarbides for integrated photonic applications, Faisal Ahmed Memon, Politecnico di Milano (Italy) and Mehran Univ. of Engineering & Technology (Pakistan); Francesco Morichetti, Andrea Melloni, Politecnico di Milano (Italy) [10683-100]

Fabrication of microstructures by rear-side picosecond laser irradiation of two-layer PMMA, Jiang Li, Xi'an Jiaotong Univ. (China) [10683-101]

Pump wavelength dependence of ASE and SBS in Er:Yb co-doped fiber amplifiers, Phillip Booker, Fabian Kranert, Michael Steinke, Jörg Neumann, Dietmar Kracht, Laser Zentrum Hannover e.V. (Germany) [10683-102]

Molecular dynamics study of rare earth-doped Mg-silicate nanoparticles in vitreous silica: from the preform to the fiber, Jérémy Turlier, Stéphane Chaussedent, Univ. d'Angers (France); Wilfried Blanc, Univ. de Nice Sophia Antipolis (France); Natalie Gaumer, Dominique Guichaoua, Patrice Raso, Xavier Bidault, Univ. d'Angers (France) [10683-103]

Energy transfer and multicolor emission in germanate glasses containing Ce³⁺ and Pr³⁺ for white light-emitting diodes, Agata Górny, Marta Sołtys, Univ. of Silesia (Poland); Lidia Zur, Museo Storico della Fisica e Ctr. Studi e Ricerche "Enrico Fermi" (Italy), Fondazione Bruno Kessler (Italy), CNR-Istituto di Fotonica e Nanotecnologie (Italy); Maurizio Ferrari, CNR-Istituto di Fotonica e Nanotecnologie (Italy), Museo Storico della Fisica e Ctr. Studi e Ricerche "Enrico Fermi" (Italy), Fondazione Bruno Kessler (Italy); Giancarlo C. Righini, Museo Storico della Fisica e Ctr. Studi e Ricerche "Enrico Fermi" (Italy), Istituto di Fisica Applicata "Nello Carrara" (Italy); Wojciech A. Pisarski, Joanna Pisarska, Univ. of Silesia (Poland) .. [10683-104]

Producing high quality chalcogenide spherical microresonators and investigating their nonlinear properties, Daniil Zhivotkov, Davor Ristić, Mile Ivanda, Institut Ruder Bošković (Croatia); Elena Romanova, Saratov State Univ. (Russian Federation); Vladimir Shiryayev, G. G. Devyatkykh Institute of Chemistry of High-Purity Substances of the Russian Academy of Sciences (Russian Federation); Silvia Soria, Gualtiero Nunzi Conti, Istituto di Fisica Applicata "Nello Carrara" (Italy) [10683-105]

Calibration of optical power meters for plastic optical fibers in the NIR-VIS range, Pedro Corredera, Aitor Villafranca Velasco, Juan Galindo-Santos, Concepción Pulido de Torre, José Luis de Miguel, Consejo Superior de Investigaciones Científicas (Spain) [10683-106]

Photonic jet submicron laser ablation: from fiber core diameter to working distance and required energies, Sylvain Leclerc, Robin Pierron, Julien Zelgowski, Pierre Pfeiffer, ICube (France) [10683-107]

Effect of gamma irradiation over erbium-doped fibers into a fiber ring laser configuration, Andrei Stancalie, Dan Sporea, National Institute for Laser, Plasma and Radiation Physics (Romania); Rosa Ana Pérez Herrera, Manuel Lopez-Amo, David Erro, Univ. Pública de Navarra (Spain); Daniel Daniel Neguț, Horia Hulubei National Institute of Physics and Nuclear Engineering (Romania) [10683-108]

Span optimization for transmission based on ultralong Raman fiber laser amplifier, Giuseppe Rizzelli Martella, Consejo Superior de Investigaciones Científicas (Spain); Paweł Rosa, National Institute of Telecommunications (Poland); Pedro Corredera, Juan Diego Ania-Castañón, Consejo Superior de Investigaciones Científicas (Spain) [10683-109]

Functional oxide waveguides for linear and nonlinear optics, Guillaume Marcaud, Institut d'Electronique du Sud (France); Samuel Serna, Sylvia Matzen, Carlos Alonso-Ramos, Xavier Le Roux, Mathias Berciano, Valérie Pillard, Pedro Damas, Thomas Maroutian, Guillaume Agnus, Ludovic Largeau, Eric Cassan, Delphine Marris-Morini, Philippe Lecoer, Ctr. de Nanosciences et de Nanotechnologies (France) [10683-110]

Transverse mode selection in diode-pumped multimode fiber Raman lasers, Sergey A. Babin, Ekaterina A. Zlobina, Sergey I. Kablukov, Alexey A. Wolf, Alexandr V. Dostovalov, Ilya N. Nemov, Institute of Automation and Electrometry of the Siberian Branch of RAS (Russian Federation) [10683-111]

Revealing spectral cross-correlations in radiation of multiwavelength fiber laser with randomly distributed feedback, Oleg Gorbunov, Ilya D. Vatik, Institute of Automation and Electrometry of the Siberian Branch of RAS (Russian Federation); Srikanth Sugavanam, Aston Univ. (United Kingdom); Dmitry V. Churkin, Novosibirsk State Univ. (Russian Federation) [10683-112]

Modelling of standard and specialty fibre-based systems using finite element methods, Natascia Castagna, Jacques Morel, Federal Office of Metrology METAS (Switzerland); Luc Testa, Ecole Polytechnique Fédérale de Lausanne (Switzerland); Sven Burger, JCMwave GmbH (Germany) [10683-113]

Development of a comprehensive 3D model for transversal mode instability investigations, Sergii O. Iakushev, Michael Steinke, Dietmar Kracht, Jörg Neumann, Peter Wessels, Laser Zentrum Hannover e.V. (Germany) [10683-114]

High-power picosecond fiber-based laser operating at 515 nm, Jean-Bernard Lecourt, Sébastien Guillemet, Julien Dupuy, Alexandre Gognau, Yves Hernandez, Multitel A.S.B.L. (Belgium) [10683-115]

Suppression of self-pulsing in fibre amplifier using pump modulation, Ikram Khan, Anil Prabhakar, Indian Institute of Technology Madras (India) [10683-116]

Benefits of visible light communication in car-to-car communication, Pasha Bekhrad, Erich Leitgeb, Technische Univ. Graz (Austria) ... [10683-117]

Femtosecond laser-induced CNT heterojunction as visible light photodetector, Aleksei Emelianov, Ivan Bobrinetskiy, National Research Univ. of Electronic Technology (Russian Federation) [10683-118]

Optimization of upconversion excitation conditions in Er³⁺/Yb³⁺ doped ZBLAN glasses for application in fiber lasers and amplifiers, Krzysztof Anders, Paweł Komorowski, Urszula Zdulska, Anna Jusza, Ryszard Piramidowicz, Warsaw Univ. of Technology (Poland) [10683-119]

Alpha particle irradiation on various properties of Er³⁺, Yb³⁺ doped phosphate glasses, Rajannya Sen, Tampere Univ. of Technology (Finland); Ofelia Mureşan, National Institute of Physics and Nuclear Engineering (Romania); Nadia G. Boetti, Istituto Superiore Mario Boella (Italy); Laura Mihai, Dan Sporea, National Institute for Laser, Plasma and Radiation Physics (Romania); Ion Rusen, National Institute of Physics and Nuclear Engineering (Romania); Laetitia Petit, Tampere Univ. of Technology (Finland) .. [10683-120]

Upconversion in low rare earth concentrated phosphate glasses prepared using direct doping method, Nirajan Ojha, Tampere Univ. of Technology (Finland); Minnea Tuomisto, Univ. of Turku (Finland); Turkka Salminen, Tampere Univ. of Technology (Finland); Mika Lastusaari, Univ. of Turku (Finland); Laetitia Petit, Tampere Univ. of Technology (Finland) [10683-121]

Raman-based CW supercontinuum generation in a fiber ring laser with low-output coupling, Muhammad Assad Arshad, Leibniz-Institut für Photonische Technologien e.V. (Germany), Friedrich-Schiller-Univ. Jena (Germany); Alexander Hartung, Leibniz-Institut für Photonische Technologien e.V. (Germany); Mikael Leduc, Nicolas Godbout, Ecole Polytechnique de Montréal (Canada); Hartmut Bartelt, Matthias Jäger, Leibniz-Institut für Photonische Technologien e.V. (Germany) [10683-122]

Multicolor emission in silica sol-gel materials co-doped with Tb³⁺ and Eu³⁺ for near-UV photonic devices, Natalia Pawlik, Barbara Szpikowska-Sroka, Maria Bańczyk, Wojciech A. Pisarski, Univ. of Silesia (Poland) [10683-123]

Energy conversion from 3.3 µm to 660 nm in rare earth-doped materials for all optical gas sensing, Imen Hafienne, Alain Braud, Ctr. de Recherche sur les Ions, les Matériaux et la Photonique (France) [10683-124]

Integrated photonic devices with silicon oxycarbide, Faisal Ahmed Memon, Francesco Morichetti, Andrea Melloni, Politecnico di Milano (Italy) [10683-125]

Broadband frequency conversion inside periodically poled lithium niobate pumped by a near-infrared supercontinuum source (Invited Paper), Jinmei Yao, Bin Zhang, Shengping Chen, Jing Hou, National Univ. of Defense Technology (China) [10683-126]

Structure and optical properties of PECVD-prepared As-Se-Te chalcogenide films designed for the IR optical applications, Aleksey Nezhdanov, Leonid Mochalov, Dmitry Usanov, Mikhail Kudryashov, Alexandr Logunov, N.I. Lobachevsky State Univ. of Nizhni Novgorod (Russian Federation); Andrey Stepanov, Aleksey Murzanev, Alexander Romashkin, Institute of Applied Physics of the Russian Academy of Sciences (Russian Federation); Dominik Dorosz, AGH Univ. of Science and Technology (Poland); Aleksandr Mashin, N.I. Lobachevsky State Univ. of Nizhni Novgorod (Russian Federation); Alexey Korytin, Institute of Applied Physics of the Russian Academy of Sciences (Russian Federation) [10683-127]

Nondestructive characterisation technology for dispersion measurements in optical fibres, Aigars Vaigu, VTT Technical Research Ctr. of Finland Ltd. (Finland) [10683-128]

Mode analysis in phase-locked multicore fiber laser by interference method, Akira Shirakawa, Yuta Kurosu, Henrik Tünnermann, The Univ. of Electro-Communications (Japan) [10683-129]

Effect of ZnO-HfO₂ hybrid nanocrystals on amplified spontaneous emission in Eu-doped ternary glass-ceramic waveguides, Subhabrata Ghosh, Shivakiran N. B. Bhaktha, Indian Institute of Technology Kharagpur (India) [10683-130]

Design and research of bidirectional surface acoustic wave delay line fabricated using laser ablation method, Dmitry Lukyanov, Alexander Kukaev, Daniil Safronov, Saint Petersburg Electrotechnical Univ (Russian Federation); Galina Yakubovskaya, Saint Petersburg Electrotechnical Univ "LETI" (Russian Federation) [10683-131]

CONFERENCE 10683

Solid state laser medium temperature distribution control under lasing condition, Andrei Korolkov, Moscow Institute of Physics and Technology (Russian Federation) and Kotel'nikov Institute of Radio-engineering and Electronics (Russian Federation); Dmitrii Belogolovskii, Moscow Institute of Physics and Technology (Russian Federation); Alexei Konyashkin, Oleg Ryabushkin, Moscow Institute of Physics and Technology (Russian Federation) and Kotel'nikov Institute of Radio-engineering and Electronics (Russian Federation) [10683-132]

TUESDAY 24 APRIL

SESSION 6. TUE 8:30 TO 10:35

Applications and Metrology

Session Chair: **Amol Choudhary**, The Univ. of Sydney (Australia)

Fiber frequency combs for remote sensing (*Invited Paper*), Ian Coddington, National Institute of Standards and Technology (United States); Caroline Alden, Univ. of Colorado Boulder (United States); Esther Baumann, National Institute of Standards and Technology (United States); Sean Coburn, Univ. of Colorado Boulder (United States); Kevin Cossel, Fabrizio Giorgetta, Daniel Herman, Prasad Kuldeep, Nathan Newbury, National Institute of Standards and Technology (United States); Greg Rieker, Univ. of Colorado Boulder (United States); Eleanor Waxman, National Institute of Standards and Technology (United States); Robert Wright, Univ. of Colorado Boulder (United States); Gabe Ycas, National Institute of Standards and Technology (United States) [10683-27]

Nanocarbon integrated compact ultrafast solid state lasers (*Invited Paper*), Fabian Rotermund, KAIST (Korea, Republic of) [10683-28]

Towards high-power on-chip GHz frequency combs, Amol Choudhary, The Univ. of Sydney (Australia); Alexander A. Lagatsky, Fraunhofer Ctr. for Applied Photonics (United Kingdom); Pradeesh Kannan, Government Victoria College, Palakkad (India); Christian T. A. Brown, Univ. of St. Andrews (United Kingdom); David P. Shepherd, Optoelectronics Research Ctr., Univ. of Southampton (United Kingdom) [10683-29]

Characterisation metrology for THz communications devices, Mira Naftaly, National Physical Lab. (United Kingdom) [10683-30]

Subwavelength engineered ultrabroadband mode multiplexer, David González-Andrade, Instituto de Óptica "Daza de Valdés" (Spain); Juan Gonzalo Wangüemert-Pérez, Univ. de Málaga (Spain); Aitor Villafranca Velasco, Instituto de Óptica "Daza de Valdés" (Spain); Alejandro Ortega-Moñux, Univ. de Málaga (Spain); Alaine Herrero-Bermello, Instituto de Óptica "Daza de Valdés" (Spain); Robert Halir, Univ. de Málaga (Spain); Pavel Cheben, National Research Council Canada (Canada) [10683-31]

Carbon nanotube planar absorber cryogenic bolometer as a novel primary absolute standard detector for optical power measurements for fibre optics and photonics, Marek Šmíd, Geiland Porrovecchio, Czech Metrology Institute (Czech Republic); Malcolm G. White, Nathan A. Tomlin, Igor Vayshenker, Christopher S. Yung, John H. Lehman, National Institute of Standards and Technology (United States) [10683-32]

High efficiency polarization beam splitter based on anisotropy-engineered MMI, Alaine Herrero-Bermello, Consejo Superior de Investigaciones Científicas (Spain); José Manuel Luque-González, Univ. de Málaga (Spain); Aitor Villafranca Velasco, Consejo Superior de Investigaciones Científicas (Spain); Alejandro Ortega Moñux, Univ. de Málaga (Spain); Pavel Cheben, National Research Council Canada (Canada); Robert Halir, Univ. de Málaga (Spain) [10683-33]

SESSION 7. TUE 11:05 TO 12:40

Applications and Sources

Session Chair: **Cosimo D'Andrea**, Politecnico di Milano (Italy)

Multimodal imaging utilizing novel fiber laser concepts (*Invited Paper*), Thomas Gottschall, Friedrich-Schiller-Univ. Jena (Germany); Tobias Meyer, Leibniz-Institut für Photonische Technologien e.V. (Germany); Michael Schmitt, Jens Limpert, Friedrich-Schiller-Univ. Jena (Germany); Andreas Tünnermann, Fraunhofer-Institut für Angewandte Optik und Feinmechanik (Germany); Jürgen Popp, Leibniz-Institut für Photonische Technologien e.V. (Germany) [10683-34]

Fiber-based front ends for extreme light applications (*Invited Paper*), Jonathan Tyler Green, Jack Alexander Naylon, Lukaš Indra, František Batysta, Martin Horáček, Bogusław Tykalewicz, Roman Antipenkov, Jakub Novák, Zbyněk Hubka, Robert Boge, Pavel Bakule, Bedřich Rus, ELI Beamlines (Czech Republic) [10683-35]

FLIM of a novel intracellular magnesium probe with an excitation source-based supercontinuum laser, Alessia Candeo, Politecnico di Milano (Italy); Azzurra Sargenti, Emil Malucelli, Univ. degli Studi di Bologna (Italy); Cosimo D'Andrea, Politecnico di Milano (Italy); Stefano Iotti, Univ. degli Studi di Bologna (Italy); Paola Taroni, Gianluca Valentini, Politecnico di Milano (Italy) [10683-36]

High-power narrow-bandwidth fiber amplifier with a FBG-based seed, Jinping Hao, Nianjiang Chen, Hong Zhao, North China Research Institute of Electro-optics (China) [10683-37]

High-energy subpicosecond 2 μ m fiber laser, Jitka Černohorská, HiLASE Ctr. (Czech Republic); Michal Jelínek, Czech Technical Univ. in Prague (Czech Republic); Martin Smrž, HiLASE Ctr. (Czech Republic); Pavel Peterka, Institute of Photonics and Electronics of the ASCR, v.v.i. (Czech Republic); Michael Pisafik, Antonio Lucianetti, Akira Endo, Tomáš Mocek, HiLASE Ctr. (Czech Republic) [10683-38]

Lunch/Exhibition Break Tue 12:40 to 14:00

SESSION 8. TUE 14:00 TO 16:00

Special Session: PHOTIND EMPIR European Project

Session Chair: **Antti Lassila**, MIKES Mittatekniikan keskus (Finland)

Single-mode fiber dispersion characterization from ultrabroadband white light spatial-spectral interferogram, Sandhra-Mirella Valdma, Heli Valtua-Lukner, Univ. of Tartu (Estonia) [10683-39]

Online measurement of optical fibre geometry during manufacturing, Maksim Shpak, VTT Technical Research Ctr. of Finland Ltd. (Finland); Sven Burger, JCMwave GmbH (Germany); Ville Byman, VTT Technical Research Ctr. of Finland Ltd. (Finland); Kimmo Saastamoinen, Univ. of Eastern Finland (Finland); Mertsä Haapalainen, Oplatek Group Oy (Finland); Antti Lassila, VTT Technical Research Ctr. of Finland Ltd. (Finland) [10683-40]

Spectral retrieval techniques for high-resolution Fourier transform microspectrometers, Aitor Villafranca Velasco, Alaine Herrero-Bermello, Consejo Superior de Investigaciones Científicas (Spain); Hugh Podmore, York Univ. (Canada); Pavel Cheben, Jens H. Schmid, National Research Council Canada (Canada); María L. Calvo, Univ. Complutense de Madrid (Spain); Siegfried Janz, Dan-Xia Xu, National Research Council Canada (Canada); Alan Scott, Honeywell Aerospace (Canada); Regina Lee, York Univ. (Canada) [10683-41]

Characterization of fibers used in high-power amplifiers, Till Walbaum, Andreas Liem, Franz Beier, Thomas Schreiber, Ramona Eberhardt, Fraunhofer-Institut für Angewandte Optik und Feinmechanik (Germany) [10683-42]

Traceable instruments for encircled angular flux measurements, Natascia Castagna, Jacques Morel, Federal Office of Metrology METAS (Switzerland); Edward Robinson, Hui Yang, Arden Photonics Ltd. (United Kingdom) [10683-43]

Detecting single photon signals with mirror-enhanced grating couplers, Anna P. Ovvyan, Westfälische Wilhelms-Univ. Münster (Germany); Pietro E. Lombardi, Univ. degli Studi di Firenze (Italy); Sofia Pazzagli, Istituto Nazionale di Ottica (Italy); Giacomo Mazzamuto, LENS - Lab. Europeo di Spettroscopia Non-Lineari (Italy); Günter Kewes, Oliver Neitzke, Humboldt-Univ. zu Berlin (Germany); Nico Gruhler, Westfälische Wilhelms-Univ. Münster (Germany); Oliver Benson, Humboldt-Univ. zu Berlin (Germany); Wolfram H. P. Pernice, Westfälische Wilhelms-Univ. Münster (Germany); Francesco S. Cataliotti, Costanza Toninelli, LENS - Lab. Europeo di Spettroscopia Non-Lineari (Italy) [10683-44]

Characterization of fiber connections for high power operation, Till Walbaum, Johannes Nold, Marco Plöthner, Thomas Schreiber, Ramona Eberhardt, Andreas Tünnermann, Fraunhofer-Institut für Angewandte Optik und Feinmechanik (Germany) [10683-45]

Calibration schemes for Fiber Bragg gratings interrogators, Pedro Corredera, José Luis de Miguel, Juan Galindo-Santos, Concepción Pulido de Torres, Aitor V. Velasco, Consejo Superior de Investigaciones Científicas (Spain) [10683-46]

HOT TOPICS SESSION II. 16:30 TO 18:05

Coherent combination of fiber amplified ultrafast laser pulses, Jens Limpert, Institute of Applied Physics, Friedrich Schiller Univ. Jena, Germany

2D materials and their heterostructures: fundamentals, applications and prototypes, Frank Koppens, ICFO-The Institute of Photonic Sciences, Spain

For additional details, please see page 7

WEDNESDAY 25 APRIL

SESSION 9.....WED 8:30 TO 10:25

Materials and Components III

Session Chair: **Miroslav Dramićanin**,
Vinca Institute of Nuclear Sciences (Serbia)

Tm-doped nanoparticles in optical fibers (*Invited Paper*), Wilfried Blanc, Manuel Vermillac, Univ. Côte d'Azur (France); Hussein Fneich, Univ. Montpellier (France); Jérémy Turlier, Univ. d'Angers (France); Martiane Cabié, Aix-Marseille Univ. (France); Courtney Kucera, Clemson Univ. (United States); Daniel Borschneck, Aix-Marseille Univ. (France); François Peters, Philippe Vennéguès, Univ. Côte d'Azur (France); Thomas Neisius, Aix-Marseille Univ. (France); Stéphane Chaussedent, Univ. d'Angers (France); Daniel R. Neuville, Institut de Physique du Globe de Paris (France); Ahmad Mehdi, Univ. Montpellier (France); John M. Ballato, Clemson Univ. (United States)[10683-47]

Synthesis, multifunctional properties and applications of bivo4 nanoparticles, Slobodan Dolic, Dragana Jovanovic, Vinca Institute of Nuclear Sciences (Serbia); Lidia Zur, Museo Storico della Fisica e Ctr. Studi e Ricerche "Enrico Fermi" (Italy); Milena Cincović, Vinca Institute of Nuclear Sciences (Serbia); Maurizio Ferrari, CNR-Istituto di Fotonica e Nanotecnologie (Italy), Fondazione Bruno Kessler (Italy); Miroslav Dramićanin, Vinca Institute of Nuclear Sciences (Serbia)[10683-48]

Saturation of refractive index modulation in photosensitive materials, Sergiy Mokhov, CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States)[10683-49]

MWIR emissions from 3.1 to 8 µm of Tb³⁺ doped seleno-telluride fibers, Nora Abdellaoui, Univ. de Rennes 1 (France); Florent Starecki, Ctr. de Recherche sur les Ions, les Matériaux et la Photonique (France); Catherine Bousard-Plédel, Univ. de Rennes 1 (France); Jean-Louis Doualan, Alain Braud, Ctr. de Recherche sur les Ions, les Matériaux et la Photonique (France); Petr Nemec, Univ. Pardubice (Czech Republic); Bureau Bruno, Univ. de Rennes 1 (France); Patrice Camy, Ctr. de Recherche sur les Ions, les Matériaux et la Photonique (France); Virginie Nazabal, Univ. de Rennes 1 (France)[10683-50]

Femtosecond and dual-wavelength mode-locked operation in Nd:Lu:CaF₂, Rémi Souldard, Simone Normani, Jean-Louis Doualan, Alain Braud, ENSICAEN (France); Diane Stoffel, Sébastien Montant, Jean-Paul Goossens, Commissariat à l'Énergie Atomique (France); Patrice Camy, ENSICAEN (France)[10683-51]

UV-VIS upconversion emission properties of Tm³⁺Yb³⁺:ZBLAN glasses, Anna Jusza, Michał Poplawski, Krzysztof Anders, Ryszard Piramidowicz, Warsaw Univ. of Technology (Poland)[10683-52]

Development of a reliable fabrication process of evanescent field coupled fused fiber couplers, Sebastian Böhm, Katharina Hausmann, Mateusz Wyszomolek, Felix Wellmann, Gabriel Pelegrina Bonilla, Laser Zentrum Hannover e.V. (Germany); Sebastian Schlangen, Kort Bremer, Bernhard Roth, Ludger Overmeyer, Hannoversches Zentrum für Optische Technologien (Germany); Michael Steinke, Jörg Neumann, Dietmar Kracht, Laser Zentrum Hannover e.V. (Germany)[10683-53]

SESSION 10.....WED 10:55 TO 12:30

Industrial Session

Session Chair: **TBC**

Amplified spontaneous emission (ASE) and laser effect in -NaYF₄:Ce,Tb nanocrystals (*Invited Paper*), Eugen Pavel, Storex Technologies Inc. (Romania)[10683-54]

Compact fiber-based mid-IR ultrafast lasers and frequency combs (*Invited Paper*), Nikolai Tolstik, Atla Lasers AS (Norway) and Norwegian Univ. of Science and Technology (Norway); Evgeni Sorokin, Atla Lasers AS (Norway) and Technische Univ. Wien (Austria); Irina T. Sorokina, Atla Lasers AS (Norway) and Norwegian Univ. of Science and Technology (Norway)[10683-55]

High power picosecond MOPA with anisotropic ytterbium-doped tapered double clad fiber, Valery Filippov, Ampliconix Oy (Finland) and Saint-Petersburg State Polytechnical Univ. (Russian Federation) and ITMO Univ. (Russian Federation); Andrei Fedotov, Ampliconix Oy (Finland) and ITMO Univ. (Russian Federation); Teppo Noronen, Ampliconix Oy (Finland); Joona Rissanen, Tampere Univ. of Technology (Finland); Regina Gumenyuk, Tampere Univ. of Technology (Finland) and Ampliconix Oy (Finland); Andrey Petrov, ITMO Univ. (Russian Federation); Yuri Chamorovskii, Konstantin Golant, Kotelnikov Institute of Radio Engineering and Electronics of Russian Academy of Sciences (Russian Federation); Maxim Odnoblyudov, ITMO Univ. (Russian Federation) and Saint-Petersburg State Polytechnical Univ. (Russian Federation)[10683-56]

All-fiber pulse shaper for adaptive dispersion compensation in industrial lasers, Alexander Yusim, Dmitry Pestov, Anton Ryabtsev, Anton Drozhzhin, Armen Sevan, IPG Photonics Corp. (United States); Bruce Jenket, IPG Photonics Corp (United States); George Venus, Justin M. Barsalou, Joe Antas, Nikolai Platonov, Igor Samartsev, Valentin Gapontsev, IPG Photonics Corp. (United States)[10683-57]

Two photon microscopy with a 1064 nm femtosecond fiber laser, Jean-Bernard Lecourt, Alexandre Gognau, Yves Hernandez, Multitel A.S.B.L. (Belgium)[10683-58]

Lunch/Exhibition BreakWed 12:30 to 13:40

JOINT SESSION.....WED 13:40 TO 15:35

Mode-locked Fibre Lasers

Joint Session between Conferences 10682 and 10683

Propagation of infrared ultrashort pulses in the air (*Invited Paper*), Thomas J. Karr, Defense Advanced Research Projects Agency (United States)[10684-40]

High power ultrafast mode-locked ring fibre laser with InN SESAM, Francesca Gallazzi, Instituto de Óptica "Daza de Valdés" (Spain); Marco Jimenez-Rodriguez, Univ. de Alcalá (Spain); Eva Monroy, Univ. Grenoble Alpes (France) and CEA Grenoble (France); Pedro Corredra, Instituto de Óptica "Daza de Valdés" (Spain); Miguel González-Herráez, Fernando B. Naranjo, Univ. de Alcalá (Spain); Juan Diego Ania-Castañón, Instituto de Óptica "Daza de Valdés" (Spain)[10683-59]

Dissipative soliton resonance in the Er:Yb-doped double-clad fiber laser, François Sanchez, Georges Semaan, Fatma Ben Braham, Mohamed Salhi, Meriem Kemel, Alioune Niang, Univ. d'Angers (France); Yichang Meng, Hebei Univ. of Science and Technology (China)[10684-41]

Ytterbium-doped mode-locked fiber laser with three gain media for micromachining, Neil G. R. Broderick, Stanley Tang, Richard Provo, Miro Erkintalo, Claude Ageuray, The Univ. of Auckland (New Zealand)[10683-60]

Graphene-based saturable absorber for high average-power fiber lasers, Georges Semaan, Univ. d'Angers (France); Paul Mouchel, Univ. d'Angers (France) and Keopsys SA (France); Yichang Meng, Hebei Univ. of Science and Technology (China); Mohamed Salhi, Meriem Kemel, François Sanchez, Univ. d'Angers (France)[10684-42]

High energy, femtosecond fiber laser source at 1750 nm for 3-photon microscopy, Andreas Wienke, Dieter Wandt, Jörg Neumann, Dietmar Kracht, Laser Zentrum Hannover e.V. (Germany)[10683-61]

Intracavity pulse dynamics in all-normal dispersion all-fiber oscillator, Jan Szczepanek, Univ. of Warsaw (Poland); Tomasz M. Kardaś, Institute of Physical Chemistry of the Polish Academy of Sciences (Poland); Czesław Radzewicz, Univ. of Warsaw (Poland); Yuriy Stepanenko, Institute of Physical Chemistry of the Polish Academy of Sciences (Poland), Univ. of Warsaw (Poland)[10684-43]

SESSION 11.....WED 16:05 TO 18:00

Materials and Components

Session Chair: **Maurizio Ferrari**,
CNR-Istituto di Fotonica e Nanotecnologie (Italy)

UV written integrated waveguides for quantum photonics (*Invited Paper*), James C. Gates, Univ. of Southampton (United Kingdom)[10683-62]

Nd:Lu:CaF₂ fluoride crystals for inertial confinement fusion laser drivers, Jean-Paul Goossens, Commissariat à l'Énergie Atomique (France); Simone Normani, Patrice Camy, Alain Braud, Rémy Souldard, Jean-Louis Doualan, Ctr. de Recherche sur les Ions, les Matériaux et la Photonique (France); Sébastien Montant, Diane Stoffel, Commissariat à l'Énergie Atomique (France)[10683-63]

Laser material Nd:Lu:CaF₂ characterization for high-energy and high-repetition rate amplification at 1053 nm, Diane Stoffel, Sébastien Montant, Jean-Paul Goossens, Commissariat à l'Énergie Atomique (France); Simone Normani, Alain Braud, Patrice Camy, Ctr. de Recherche sur les Ions, les Matériaux et la Photonique (France)[10683-64]

Stochastic model of energy transfer processes among rare earth ions, Pavel Loiko, KTH Royal Institute of Technology (Sweden); Markus Pollnau, Univ. of Surrey (United Kingdom)[10683-65]

Synthesis, structure and spectroscopic assessment of luminescent GdVO₄:Dy³⁺ and DyVO₄ nanoparticles, Dragana Jovanovic, Vinca Institute of Nuclear Sciences (Serbia); Andrea Chiappini, Fondazione Bruno Kessler (Italy); Lidia Zur, Museo Storico della Fisica e Ctr. Studi e Ricerche "Enrico Fermi" (Italy), Fondazione Bruno Kessler (Italy); Tamara Gavrilovic, Vinca Institute of Nuclear Sciences (Serbia); Lam Thi Ngoc Tran, Univ. degli Studi di Trento (Italy), Fondazione Bruno Kessler (Italy), Ho Chi Minh City Univ. of Technology (Viet Nam); Alessandro Chiasera, Fondazione Bruno Kessler (Italy); Anna Lukowiak, Institute of Low Temperature and Structure Research (Poland); Miroslav Dramićanin, Vinca Institute of Nuclear Sciences (Serbia); Maurizio Ferrari, Fondazione Bruno Kessler (Italy), Museo Storico della Fisica e Ctr. Studi e Ricerche "Enrico Fermi" (Italy)[10683-66]

New infrared laser-operated chalcogenide materials: syntehsis and properties, Iwan Kityk, Katarzyna Ozga D.D.S., Czestochowa Univ. of Technology (Poland)[10683-67]

Future solar energy devices, Mihaela Girtan, Univ. d'Angers (France)[10683-68]

CONFERENCE 10683

THURSDAY 26 APRIL

HOT TOPICS SESSION III 9:00 TO 10:35

From extreme nonlinear optics to ultrafast atomic physics

Anne L'Huillier, Lund Univ., Sweden

Quantum computations and quantum simulations with trapped ions

Rainer Blatt, Institute for Experimental Physics, Univ. of Innsbruck, Austria

For additional details, please see page 8

SESSION 12 THU 11:00 TO 12:25

High-Power Fiber Lasers

Session Chair: **Patrice Camy**,

Ctr. de Recherche sur les Ions, les Matériaux et la Photonique (France)

Monolithic fiber amplifier for the next generation of gravitational wave detectors (Invited Paper), Sven Hochheim, Felix Wellmann, Michael Steinke, Jörg Neumann, Dietmar Kracht, Laser Zentrum Hannover e.V. (Germany) [10683-69]

Internal second harmonic generation at 450 nm of a CW Nd-doped fiber laser, Baptiste Leconte, Hervé Gilles, Ctr. de Recherche sur les Ions, les Matériaux et la Photonique (France); Benoit Cadier, Thierry Robin, iXBlue SAS (France); Mathieu Laroche, Ctr. de Recherche sur les Ions, les Matériaux et la Photonique (France) [10683-70]

110 W all-fiber picosecond MOPA laser at 1016 nm, Xue Qi, Shengping Chen, Zhihong Li, Jing Hou, National Univ. of Defense Technology (China) [10683-71]

KW-class clad-pumped Raman all-fiber laser with brightness enhancement, Yaakov Glick, Yariv Shamir, Matitya Aviel, Shaul Pearl, Soreq Nuclear Research Ctr. (Israel) [10683-72]

Linearly polarized all-fiber Raman laser operating near 1680 nm, Romain Thouroude, Hervé Gilles, ENSICAEN (France); Benoit Cadier, Thierry Robin, iXBlue SAS (France); Aleksey Tyazhev, Ammar Hideur, CORIA (France); Rémi Soulard, Patrice Camy, Jean-Louis Doualan, Mathieu Laroche, ENSICAEN (France) [10683-73]

Lunch Break Thu 12:25 to 13:35

SESSION 13 THU 13:35 TO 15:30

Special Session: Minerva Project and Mid-infrared Materials and Sources

Session Chair: **Bruce Napier**, Vivid Components Ltd. (Germany)

Breakthroughs in mid-infrared fibre technology (Invited Paper), Angela B. Seddon, Zhuoqi Tang, David Furniss, The Univ. of Nottingham (United Kingdom); Lukasz Sojka, Univ. of Wrocław (Poland); Hesham Sakr, Harriet Parnell, Dinuka Jayasuriya, Trevor Benson, Slawomir Sujecki, The Univ. of Nottingham (United Kingdom) [10683-74]

Supercontinuum for microscopy and sensing in the 2-4.5 µm region, Peter Morten Moselund, Patrick Bowen, NKT Photonics A/S (Denmark); Laurent Huot, NKT Photonics A/S (Denmark) and Technical Univ. of Denmark (Denmark); Joanna Carthy, Ross Powell, Lucy Hooper, NKT Photonics (United Kingdom) [10683-75]

Acousto-optic devices for operation in the Infrared, Jon D. Ward, Gooch & Housego (UK) Ltd. (United Kingdom); Stefano Valle, Optoelectronics Research Ctr., Univ. of Southampton (United Kingdom) [10683-76]

Mid-IR supercontinuum between 1 and 5 µm in step index tellurite fibres for greenhouse or pollutant gases detection, Arnaud Lemièrre, Paul Froidevaux, Bertrand Kibler, Frédéric Désévéday, Jean-Charles Jules, Grégory Gadret, Pierre Mathey, Frédéric Smehtala, Univ. de Bourgogne Franche-Comté (France) [10683-77]

Spectroscopic study of Dy doped CaF₂ crystals for the development of MIR lasers around 3 µm, Gurvan Brasse, Jean-Louis Doualan, Abdelmjid Benayad, Alain Braud, Patrice Camy, Ctr. de Recherche sur les Ions, les Matériaux et la Photonique (France) [10683-78]

Comparative study of infrared fiber laser models, Slawomir Sujecki, The Univ. of Nottingham (United Kingdom); Lukasz Sojka, Wrocław Univ. of Science and Technology (Poland); Angela B. Seddon, Trevor Benson, The Univ. of Nottingham (United Kingdom); Elzbieta Beres-Pawlik, Wrocław Univ. of Science and Technology (Poland); Francesco Prudeniano, Politecnico di Bari (Italy); Marian Marciniak, National Institute of Telecommunications (Poland); Hovik Baghdasary, National Polytechnic Univ. of Armenia (Armenia); Pavel Peterka, Institute of Photonics and Electronics of the ASCR, v.v.i. (Czech Republic); Stefano Taccheo, Swansea Univ. (United Kingdom) [10683-79]

2-6 µm mid-infrared supercontinuum generation in cascaded ZBLAN and As₂Se₃ step-index fiber, Jinmei Yao, Bin Zhang, Shengping Chen, Jing Hou, Ke Yin, National Univ. of Defense Technology (China) [10683-80]

SESSION 14 THU 16:00 TO 17:40

Special Session Dedicated to Early Stage Researchers and Woman Scientists

Session Chair: **Anna Luiza Lukowiak**,

Institute of Low Temperature and Structure Research (Poland)

SiO₂-SnO₂:Er³⁺ transparent glass-ceramics: fabrication and photonic assessment (Invited Paper), Lam Thi Ngoc Tran, Fondazione Bruno Kessler (Italy) and Univ. degli Studi di Trento (Italy) and Ho Chi Minh City Univ. of Technology (Viet Nam); Lidia Zur, Museo Storico della Fisica e Ctr. Studi e Ricerche "Enrico Fermi" (Italy) and Fondazione Bruno Kessler (Italy) and CNR-Istituto di Fotonica e Nanotecnologie (Italy); Damiano Massella, Univ. degli Studi di Trento (Italy) and CNR-Istituto di Fotonica e Nanotecnologie (Italy) and Fondazione Bruno Kessler (Italy); Beata Derkowska-Zielinska, Nicolaus Copernicus Univ. (Poland); Alessandro Chiasera, Stefano Varas, Cristina Armellini, CNR-Istituto di Fotonica e Nanotecnologie (Italy) and Fondazione Bruno Kessler (Italy); Daniele Zonta, Univ. degli Studi di Trento (Italy) and Univ. of Strathclyde (United Kingdom) and CNR-Istituto di Fotonica e Nanotecnologie (Italy); Thi Thanh Van Tran, Univ. of Science Ho Chi Minh City (Viet Nam); Anna Lukowiak, Institute of Low Temperature and Structure Research (Poland); Stefano Taccheo, Swansea Univ. (United Kingdom); Dominik Dorosz, AGH Univ. of Science and Technology (Poland); Giancarlo C. Righini, Museo Storico della Fisica e Ctr. Studi e Ricerche "Enrico Fermi" (Italy) and Istituto di Fisica Applicata "Nello Carrara" (Italy); Yann G. Boucher, Ecole Nationale Supérieure des Sciences Appliquées et de Technologie (France); Maurizio Ferrari, CNR-Istituto di Fotonica e Nanotecnologie (Italy) and Museo Storico della Fisica e Ctr. Studi e Ricerche "Enrico Fermi" (Italy) and Fondazione Bruno Kessler (Italy) [10683-81]

Studies on carbon dot embedded pillar microcavities, Pratyusha Das, Meher Wan, Subhrajit Mukherjee, Indian Institute of Technology Kharagpur (India); Samit K. Ray, S.N. Bose National Ctr. for Basic Sciences (India); Shivakiran N. B. Bhaktha, Indian Institute of Technology Kharagpur (India) [10683-82]

Optical data transmission with plastic scintillating fibers, Ramona M. Galatus, Paul Farago, Technical Univ. of Cluj Napoca (Romania); Juan Vallés, Univ. de Zaragoza (Spain) [10683-83]

Examination of dual ion beam sputtered HR mirrors by cavity ring-down spectroscopy and laser-induced damage threshold, Igor Stevanovic, Thomas Gischkat, Rhysearch (Switzerland); Valentin Wittwer, Univ. de Neuchâtel (Switzerland); Andreas Bächli, Rhysearch (Switzerland); Carsten Ziolek, NTB Interstaatliche Hochschule für Technik Buchs (Switzerland); Thomas Südmeyer, Univ. de Neuchâtel (Switzerland) [10683-84]

The role of gap states in chalcogenide glass response to photoexcitation by the high-intensity femtosecond laser pulses, Elena Romanova, Semyon Evseiko, Saratov State Univ. (Russian Federation); Vladimir Shiryayev, G. G. Devyatikh Institute of Chemistry of High-Purity Substances of the Russian Academy of Sciences (Russian Federation); Stéphane Guizard, Ecole Polytechnique (France) [10683-85]

Dual polarization DFB fiber lasers as optical phase-locked microwave sources in the 1-10 GHz range, Marie Guionie, Ludovic Frein, François Bondu, Anthony Carré, Goulc'hén Loas, Institut de Physique de Rennes (France); Emmanuel Pinsard, Benoit Cadier, iXBlue Photonics (France); Mehdi Alouini, Marco Romanelli, Marc Vallet, Marc Brunel, Institut de Physique de Rennes (France) [10683-86]

CONFERENCE 10684

Monday–Wednesday 23–25 April 2018 • Proceedings of SPIE Vol. 10684

Nonlinear Optics and its Applications

Conference Chairs: Benjamin J. Eggleton, The Univ. of Sydney (Australia); Neil G. R. Broderick, The Univ. of Auckland (New Zealand); Anna C. Peacock, Univ. of Southampton (United Kingdom)

Programme Committee: Fabio Biancalana, Heriot-Watt Univ. (United Kingdom); Camille Brès, Ecole Polytechnique Fédérale de Lausanne (Switzerland); Alex S. Clark, Imperial College London (United Kingdom); Christophe Dorrer, Univ. of Rochester (United States); Majid Ebrahim-Zadeh, ICFO - Institut de Ciències Fotòniques (Spain); Mark Foster, Johns Hopkins Univ. (United States); Goëry Genty, Tampere Univ. of Technology (Finland); Irina V. Kabakova, Imperial College London (United Kingdom); Mercedeh Khajavikhan, CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States); Christelle Monat, Ecole Centrale de Lyon (France); Dragomir N. Neshev, The Australian National Univ. (Australia); Francesca Parmigiani, Univ. of Southampton (United Kingdom); Michelle Y. Sander, Boston Univ. (United States); Dawn T. H. Tan, Singapore Univ. of Technology & Design (Singapore)

MONDAY 23 APRIL

HOT TOPICS SESSION I 9:00 TO 11:00

From Einstein doubts to quantum bits: a second quantum revolution

Alain Aspect, Lab. Charles Fabry, Institut d'Optique, France

Pico-Photonics: watching and sensing single molecules by confining light to the atom scale

Jeremy J. Baumberg, NanoPhotonics Ctr., Univ. of Cambridge, United Kingdom

For additional details see page 6.

OPENING REMARKS 11:25 TO 11:30

SESSION 1 MON 11:30 TO 12:40

2nd Order Nonlinear Effects

Session Chair: **Andrea Blanco Redondo**,
The Univ. of Sydney (Australia)

Engineering nano-oxides to enhance nonlinear optical signal for integrated devices (*Invited Paper*), Rachel Grange, ETH Zurich (Switzerland) [10684-1]

Nonlinear optical properties of germanium at mid-infrared wavelengths, Byoung-Uk Sohn, Singapore Univ. of Technology & Design (Singapore); Corentin Monmeyran, Lionel Kimerling, Anuradha Agarwal, Massachusetts Institute of Technology (United States); Dawn T.H. Tan, Singapore Univ. of Technology & Design (Singapore) [10684-2]

Asymmetrical second harmonic generation from metal-oxides and metal-metal boundaries, Michael Scalora, U.S. Army Aviation & Missile Research, Development & Engineering Ctr. (United States); Maria A. Vincenti, Univ. degli Studi di Brescia (Italy); Domenico de Ceglia, Neset Akozbek, The AEgis Technologies Group, Inc. (United States); Mark J. Bloemer, U.S. Army Aviation & Missile Research, Development, & Engineering Ctr. (United States); Jose Trull, Crina Cojocar, Univ. Politècnica de Catalunya (Spain) . . . [10684-3]

Lunch Break Mon 12:40 to 13:50

SESSION 2 MON 13:50 TO 15:20

Silicon Photonics

Session Chair: **Rachel Grange**, ETH Zurich (Switzerland)

Silicon photonics (*Invited Paper*), Nobuyuki Matsuda, Nippon Telegraph and Telephone Corp. (Japan) [10684-4]

High gain optical parametric amplification in ultra-silicon-rich nitride waveguides, Kelvin J. A. Ooi, Singapore Univ. of Technology & Design (Singapore); Doris K. T. Ng, A*STAR - Data Storage Institute (Singapore); Ezgi Sahin, Ting Wang, Singapore Univ. of Technology & Design (Singapore); Arthur Chee, Anuradha Agarwal, Lionel Kimerling, Massachusetts Institute of Technology (United States); Dawn T.H. Tan, Singapore Univ. of Technology & Design (Singapore) [10684-5]

Intermodal four wave mixing in silicon waveguides for on-chip wavelength conversion and generation, Stefano Signorini, Univ. degli Studi di Trento (Italy); Mattia Mancinelli, Univ. degli Studi di Trento (Italy) and SM Optics S.r.l. (Italy); Massimo Borghi, Univ. degli Studi di Trento (Italy); Martino Bernard, Fondazione Bruno Kessler (Italy) and Univ. degli Studi di Trento (Italy); Mher Ghulinyan, Georg Pucker, Fondazione Bruno Kessler (Italy); Lorenzo Pavesi, Univ. degli Studi di Trento (Italy) [10684-6]

Controlling stimulated and spontaneous four wave mixing in coupled microring resonators, Massimo Borghi, Alessandro Trenti, Univ. degli Studi di Trento (Italy); Jean Marc Fédéli, MINATEC (France); Lorenzo Pavesi, Univ. degli Studi di Trento (Italy) [10684-7]

SESSION 3 MON 15:50 TO 18:00

Photonic Circuits

Session Chair: **Nobuyuki Matsuda**,
Nippon Telegraph and Telephone Corp. (Japan)

Novel nanophotonic circuits (*Invited Paper*), Andrea Blanco Redondo, The Univ. of Sydney (Australia) [10684-8]

Octave-spanning supercontinuum generation in titanium dioxide waveguides, Kamal Hammani, Lab. Interdisciplinaire Carnot de Bourgogne (France) and Univ. de Bourgogne Franche-Comté (France); Laurent Markey, Bertrand Kibler, Lab. Interdisciplinaire Carnot de Bourgogne (France); Manon Lamy, Lab. Interdisciplinaire Carnot de Bourgogne (France) and Univ. de Bourgogne Franche-Comté (France); Juan Arocas, Jean-Claude Weeber, Christophe Finot, Lab. Interdisciplinaire Carnot de Bourgogne (France) [10684-9]

Gallium phosphide microresonator frequency combs, Simon Hönl, Katharina Schneider, IBM Research - Zürich (Switzerland); Miles Anderson, Ecole Polytechnique Fédérale de Lausanne (Switzerland); Dalziel Wilson, IBM Research - Zürich (Switzerland) and Ecole Polytechnique Fédérale de Lausanne (Switzerland); Paul Seidler, IBM Research - Zürich (Switzerland); Tobias J. Kippenberg, Ecole Polytechnique Fédérale de Lausanne (Switzerland) [10684-10]

Experimental demonstration of soliton-plasmon coupling in planar waveguides, Tintu Kuriakose, FEMTO-ST (France) and Ctr. National de la Recherche Scientifique (France); Tomas Halenkovic, Univ. Pardubice (Czech Republic); Mahmoud M. R. Elsaywy, Institut Fresnel (France) and Aix-Marseille Univ. (France) and Ecole Centrale Marseille (France); Petr Nemec, Univ. Pardubice (Czech Republic); Virginie Nazabal, Univ. de Rennes 1 (France); Gilles Renversez, Institut Fresnel (France) and Aix-Marseille Univ. (France) and Ecole Centrale Marseille (France); Mathieu Chauvet, FEMTO-ST (France) and Ctr. National de la Recherche Scientifique (France) [10684-11]

High-repetition-rate femtosecond-laser micromachining of low-loss photonic-lattice-like waveguides in lithium niobate, Teerawat Piromjitpong, Aston Univ. (United Kingdom); Mykhaylo Dubov, Optoscribe Ltd. (United Kingdom); Sonia Boscolo, Aston Univ. (United Kingdom) . . . [10684-12]

All-optical switches, unidirectional flow, and logic gates with discrete solitons in waveguide arrays, Usama Al Khawaja, United Arab Emirates Univ. (United Arab Emirates) [10684-13]

MONDAY POSTER SESSION MON 17:30 TO 19:00

Posters-Monday

Conference attendees are invited to attend the Photonics Europe poster session on Monday 17.30 to 19.00. Posters will be on display after 10.00 Monday morning in the Hall Rhin. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster authors, view poster presentation guidelines and set-up instructions at <http://spie.org/x34963.xml> and on page 96.

Morphology-directed plasmon-enhanced two-photon absorption in a strongly coupled nano-molecular hybrid, Kaweri Gambhir, Parag Sharma, Ranjana Mehrotra, CSIR-National Physical Lab. (India) [10684-44]

Femtosecond filament-array in fused silica, Zuoqiang Hao, Dongwei Li, Lanzhi Zhang, Changchun Univ. of Science and Technology (China); Tingting Xi, Univ. of Chinese Academy of Sciences (China) [10684-45]

Analysis of frequency modulation of femtosecond laser pulses with various incident pulse shape at SHG in medium with combined nonlinear response, Vyacheslav A. Trofimov, Dmitry Kharitonov, Mikhail Fedotov, M.V. Lomonosov Moscow State Univ. (Russian Federation) [10684-46]

Physical parameters of ultrawide band laser sources and its impacts on multiphoton imaging, Claire Lefort, XLIM Institut de Recherche (France) [10684-47]

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Influence of pulse edges on femtosecond filamentation and supercontinuum generation in air, Tingting Xi, Lindi Zhan, Mengning Xu, Univ. of Chinese Academy of Sciences (China); Zuoqiang Hao, Changchun Univ. of Science and Technology (China)[10684-48]

Supercontinuum generation and intermodal four-wave mixing in a step-index few-mode fibre, Solveig Perret, Gil Fanjoux, FEMTO-ST (France); Laurent Bigot, Lab. de Physique des Lasers, Atomes et Molécules (France); Julien Fatome, Lab. Interdisciplinaire Carnot de Bourgogne (France); John M. Dudley, FEMTO-ST (France); Guy Millot, Lab. Interdisciplinaire Carnot de Bourgogne (France); Thibaut Sylvestre, FEMTO-ST (France)[10684-49]

Nonlinear optical characterization of new ionic liquids by a noise reduced thermally managed EZ-Scan technique, Vinicius C. Ferreira, Ricardo R. B. Correia, Graciane Marin, Univ. Federal do Rio Grande do Sul (Brazil); Jesum A. Fernandes, The Univ. of Nottingham (United Kingdom); Jairton Dupont, Univ. Federal do Rio Grande do Sul (Brazil)[10684-50]

Effect of pump depletion on the evolution of cavity solitons in whispering gallery mode resonator structures, Maitrayee Saha, Samudra Roy, Shailendra K. Varshney, Indian Institute of Technology Kharagpur (India)[10684-51]

Analysis of supported by points mounting configuration for second harmonic generation of a KDP crystal, Guoqing Pei, Mengmeng Han, Xu Xu, China Academy of Engineering Physics (China)[10684-52]

795-nm polarization squeezing at audio frequency band based on OPO at rubidium D1 line, Xin Wen, Yashuai Han, Jinyu Liu, Lele Bai, Jun He, Junmin Wang, Shanxi Univ. (China)[10684-53]

Nonlinear refractive index measurement by SPM-induced phase reconstruction, Piotr Kabacinski, Warsaw Univ. of Technology (Poland) and Institute of Physical Chemistry of the Polish Academy of Sciences (Poland); Tomasz M. Kardas, Institute of Physical Chemistry of the Polish Academy of Sciences (Poland); Czesław Radzewicz, Institute of Experimental Physics SAS (Poland) and Univ. of Warsaw (Poland)[10684-54]

Spatial-temporal pulses in a waveguide under conditions of second harmonic generation, Sergey V. Sazonov, Alexey A. Kalinovich, Maria V. Komissarova, Irina G. Zakharova, M.V. Lomonosov Moscow State Univ. (Russian Federation)[10684-55]

Two-dimensional semiconductors: a novel platform for integrated parametric oscillators, Andrea Marini, Istituto dei Sistemi Complessi (Italy); Alessandro Ciattoni, CNR - SPIN (Italy); Carlo Rizza, CNR - SPIN (Italy) and Univ. degli Studi dell'Aquila (Italy); Claudio Conti, Istituto dei Sistemi Complessi (Italy)[10684-56]

Correlated photon pair generation based on spontaneous four-wave-mixing in ultra-silicon-rich nitride waveguides, Ju Won Choi, Byoung-Uk Sohn, George F. R. Chen, Singapore Univ. of Technology & Design (Singapore); Doris K. T. Ng, A*STAR - Data Storage Institute (Singapore); Dawn T.H. Tan, Singapore Univ. of Technology & Design (Singapore)[10684-57]

Fiber-based measurement of temporal intensity and phase profiles through self-phase modulation, Frédéric Audo, Kilian Baudin, Christophe Finot, Lab. Interdisciplinaire Carnot de Bourgogne (France)[10684-58]

Dissipative soliton dynamics in non-Kerr and Kerr type nonlinear media, Ambareesh Sahoo, Samudra Roy, Indian Institute of Technology Kharagpur (India)[10684-59]

Generation of terahertz pulses in a nonlinear dielectric waveguide, Alexander N. Bugay, Joint Institute for Nuclear Research (Russian Federation); Sergey V. Sazonov, Russian Research Ctr. Kurchatov Institute (Russian Federation); Pavel Yu. Shestakov, M.V. Lomonosov Moscow State Univ. (Russian Federation)[10684-60]

Absorbance testing of massive nonlinear optical crystal boules of polyhedron shape, Georgii Aloian, Nikita Kovalenko, Oleg Ryabushkin, Moscow Institute of Physics and Technology (Russian Federation)[10684-61]

Angular momentum power canalization technology for three-dimensional electromagnetic and/or optoelectronic and/or photonic laser wave communication in space time domains, Francesco Romano, HTEE (Italy)[10684-62]

Fabrication of microstructures on C/SiC surface by diffraction effect of femtosecond laser, Zhaoyang Zhai, Wenjun Wang, Xuesong Mei, Xi'an Jiaotong Univ. (China)[10684-63]

Compact diode-pumped Nd:YVO₄ slab ns-amplifier, Yefei Mao, Lei Wang, Qian Xuessen Lab. of Space Technology (China); Hengli Zhang, Beijing Institute of Technology (China)[10684-64]

Breakdown of optical lattice formation in dual-pumped supercavity soliton states, Arkadev Roy, Raktim Haldar, Shailendra K. Varshney, Indian Institute of Technology Kharagpur (India)[10684-65]

Piezoelectric resonance spectroscopy for measuring surface temperature distribution of optical materials interacting with laser radiation, Nikita Kovalenko, George Aloyan, Oleg Ryabushkin, Moscow Institute of Physics and Technology (Russian Federation)[10684-66]

First demonstration of surface-enhanced stimulated Raman spectroscopy using continuous wave sources, Kevin C. Hewitt, Dalhousie Univ. (Canada)[10684-67]

Design of binary comparator using reversible gate based on lithium niobate-based Mach-Zehnder interferometer, Chanderkanta Chauhan, DIT Univ. (India)[10684-68]

Competing of saturation effect and Tyndall scattering in colloidal solution of quantum dots under the action of a high-power laser radiation, Alexander M. Smirnov, Anastasiya Golinskaya, M.V. Lomonosov Moscow State Univ. (Russian Federation)[10684-69]

The saturate absorption spectroscopy effected by the temperature on the rubidium vapor cell D2 line, Nut Thanaboonrungrach, Wittoon Yindeesuk, King Mongkut's Institute of Technology Ladkrabang (Thailand); Pichet Limsuwan, King Mongkut's Univ. of Technology Thonburi (Thailand); Prathan Buranasiri, King Mongkut's Institute of Technology Ladkrabang (Thailand)[10684-70]

1-μm-pumped optical parametric generator and oscillator based on orientation-patterned gallium phosphide, Hanyu Ye, ICFO - Institut de Ciències Fotòniques (Spain); Suddapalli Chaitanya Kumar, Radiant Light SL (Spain); Junxiong Wei, ICFO - Institut de Ciències Fotòniques (Spain); Peter G. Schunemann, BAE Systems (United States); Majid Ebrahim-Zadeh, ICFO - Institut de Ciències Fotòniques (Spain) and Institució Catalana de Recerca i Estudis Avançats (Spain)[10684-71]

Threshold effect in optical limiters based on conjugates J-type phthalocyanine dimers Zn and Mg with single-walled carbon nanotubes, Mikhail S. Savelyev, Alexander Gerasimenko, Vitaly Podgaetsky, National Research Univ. of Electronic Technology (Russian Federation); Alexander Tolbin, Institute of Physiologically Active Compounds (Russian Federation); Pavel Vasilevsky, Sergey Tereschenko, National Research Univ. of Electronic Technology (Russian Federation)[10684-72]

Compact continuous wave THz source based on monolithic two-color laser diode, Jared Ombiro Gwaro, Carsten Brenner, Ruhr-Univ. Bochum (Germany); Bernd Sumpf, Ferdinand-Braun-Institut (Germany) and Leibniz-Institut für Höchstfrequenztechnik (Germany); Andreas Klehr, Jörg Fricke, Ferdinand-Braun-Institut (Germany); Martin R. Hofmann, Ruhr-Univ. Bochum (Germany)[10684-73]

Tunable spatial compensation for polarization entangled photons, Salem F. Hegazy, Salah Hassab Elnaby, Hussien Garalaby, Cairo Univ. (Egypt)[10684-74]

Nonlinear properties of CdSe/ZnS quantum dots colloidal solution under one- and two-photon excitation by means of high-power ultrashort laser pulses, Alexander M. Smirnov, Yana Valchuk, Maria Kozlova, Vladimir Mantsevich, Vladimir Dneprovskii, M.V. Lomonosov Moscow State Univ. (Russian Federation)[10684-75]

Nonlinear effects in colloidal nanoplatelets with two-dimensional electronic structure, Alexander M. Smirnov, Anastasiya Golinskaya, Dmitrii Przhivalyovskii, Maria Kozlova, Bedil Saidjonov, Roman Vasiliev, Vladimir Dneprovskii, M.V. Lomonosov Moscow State Univ. (Russian Federation)[10684-76]

Dynamics of an all-fibre laser with saturable absorber, Robert Otipiri, Bruno Garbin, Soizic Terrien, Neil Broderick, Bernd Krauskopf, The Dodd-Walls Ctr. for Photonic and Quantum Technologies (New Zealand) and The Univ. of Auckland (New Zealand)[10684-77]

Method of femtosecond LIBS for monitoring elemental composition of seawater and aerosol, Yuliya S. Tolstonogova, Sergey Golik, Alexey Ilyin, Michael Babyi, Far Eastern Federal Univ. (Russian Federation); Alexander Mayor, Institute for Automation and Control Processes (Russian Federation)[10684-78]

Peculiarities of spatial soliton formation in azobenzene liquid crystal, Rafael Drampany, Institute for Physical Research, NAS Armenia (Armenia); Varsenik Nersesyan, Institute for Physical Research, NAS Armenia (Armenia) and Univ. Gent (Belgium); Tigran Dadalyan, Anahit Gogyan, Yuri Malakyan, Institute for Physical Research, NAS Armenia (Armenia); Jeroen Beekman, Kristiaan Neyts, Univ. Gent (Belgium)[10684-79]

Graphene all-optical sensor based on nonlinear multimode interference coupler, Mohammad Adnin Abdul Hassim, Wan Maryam Wan Ahmad Kamil, Mohd Zubir Mat Jafri, Univ. Sains Malaysia (Malaysia)[10684-80]

Determination of Kerr and two-photon absorption coefficients of ABI thin films, Arturs Bundulis, Edgars Nitiss, Martins Rutkiss, Univ. of Latvia (Latvia)[10684-81]

Measurement of spectral amplitude and phase of 10 GHz single section quantum-dash mode-locked laser using a continuous tuning high-speed wavelength-swept light source, Mokhtar Korti, Télécom SudParis (France) and Univ. Abou Bekr Belkaid Tlemcen (Algeria) and Univ. Paris-Saclay (France); Svetlana Slepneva, Ctr. for Advanced Photonics & Process Analysis, Cork Institute of Technology (Ireland) and Tyndall National Institute (Ireland); Tatiana Gabruseva, Ctr. for Advanced Photonics and Process Analysis (Ireland) and Tyndall National Institute (Ireland); Kamel Merghem, Ctr. de Nanosciences et de Nanotechnologies (France); Guillaume Huyet, Ctr. for Advanced Photonics and Process Analysis (Ireland) and Tyndall National Institute (Ireland) and ITMO Univ. (Russian Federation); Yaneck Gottesman, Télécom SudParis (France) and Univ. Paris-Saclay (France) and Ctr. National de la Recherche Scientifique (France); Abderrahim Ramdane, Ctr. de Nanosciences et de Nanotechnologies (France) and Ctr. National de la Recherche Scientifique (France); Badr-Eddine Benkelfat, Télécom SudParis (France) and Univ. Paris-Saclay (France) and Ctr. National de la Recherche Scientifique (France); Omar Seddiki, Lab. de Télécommunications, Univ. Abou Bekr Belkaid Tlemcen (Algeria)[10684-82]

The impact of GDD and phase difference of ultrashort light pulses on the THz spectrum generated from two-color asymmetric air plasma. Roland Flender, Univ. of Szeged (Hungary); Krisztina Sárosi, ELI-HU Nonprofit Kft. (Hungary); Ervin Petrás, Univ. of Szeged (Hungary); Adam Borzsonyi, Univ. of Szeged (Hungary) and ELI-HU Nonprofit Kft. (Hungary); Viktor Chikán, ELI-HU Nonprofit Kft (Hungary) and Kansas State Univ. (United States)[10684-83]

Switching from sub- to superluminal light in a Y-type system using wavelength mismatching. Kavita Yadav, Ajay Wasan, Indian Institute of Technology Roorkee (India)[10684-84]

Two-axis acousto-optical deflector for high-power laser radiation. Dmitrii Velikovskii, Scientific and Technological Ctr. for Unique Instrumentation (Russian Federation); Michail Mazur, VNIIFTRI (Russian Federation)[10684-85]

Noise-like pulse generation in all-normal dispersion all-fiber passively mode-locked Yb-doped fiber laser. Min Yong Jeon, Eun Kwang Kang, Hyun Moon Yang, Chungnam National Univ. (Korea, Republic of); Han-Cheol Ryu, Sahmyook Univ. (Korea, Republic of)[10684-86]

Phase stochastic resonance in a forced nano-electromechanical oscillator. Avishkek Chowdhury, Sylvain Barbay, Ctr. National de la Recherche Scientifique (France) and Ctr. de Nanosciences et de Nanotechnologies (France); Marcel Clerc, Univ. de Chile (Chile); Isabelle Robert-Philip, Rémy Braive, Ctr. National de la Recherche Scientifique (France) and Ctr. de Nanosciences et de Nanotechnologies (France)[10684-87]

High efficient phonon mode excitation in submicron single crystal diamond films with built-in graphitized layer. Maria Tareeva, Valeri Dravin, P.N. Lebedev Physical Institute (Russian Federation); Roman Khmel'nitsky, P.N. Lebedev Physical Institute (Russian Federation) and Kotel'nikov Institute of Radio Engineering and Electronics of Russian Academy of Sciences (Russian Federation) and A. M. Prokhorov General Physics Institute of the Russian Academy of Sciences (Russian Federation); Anna Kudryavtseva, Maksim Stokrov, Mikhail Shevchenko, Nikolay Tcherniega, P.N. Lebedev Physical Institute (Russian Federation); Konstantin Tsarik, National Research Univ. of Electronic Technology (Russian Federation)[10684-88]

Application of a second order nonlinear optical technique to probe gold nanoparticle-protein interaction in solution. Kamini Mishra, Puspendu K. Das, Indian Institute of Science (India)[10684-89]

Improvement of IM/DD-OFDM performance using adaptive equalization. Besma Wchir, Sofien Mhatli, Ecole Polytechnique de Tunisie (Tunisia); Mutsam Jarajreh, Fahd Bin Sultan Univ. (Saudi Arabia); Rabah Attia, Ecole Polytechnique de Tunisie (Tunisia)[10684-90]

Performance analysis of fast-OFDM in SMF-based IM/DD link. Besma Wchir, Sofien Mhatli, Ecole Polytechnique de Tunisie (Tunisia); Mutsam Jarajreh, Fahd Bin Sultan Univ. (Saudi Arabia); Rabah Attia, Ecole Polytechnique de Tunisie (Tunisia)[10684-91]

Generation of dark soliton trains with high repetition rates through dissipative four wave mixing. Dmitry A. Korobko, Igor Zolotovskii, Ulyanovsk State Univ. (Russian Federation); Andrei Fotiadis, Ulyanovsk State Univ. (Russian Federation) and Univ. de Mons (Belgium)[10684-92]

Image fidelity improvement using self-pumped phase conjugation digital holographic microscopy. Yang Kun Chew, Optoelectronics Research Ctr. (United Kingdom) and MingDao Univ. (Taiwan); Huang Tian Chan, MingDao Univ. (Taiwan); Min Tzung Zhiu, National Defense Univ. (Taiwan); Chia Hao Wu, Chi-Ching Chang, MingDao Univ. (Taiwan)[10684-93]

Implementation of stimulated Raman losses and stimulated Raman gain microscopy using three femtosecond laser sources. Rajeev Ranjan, CNR Istituto per la Microelettronica e Microsistemi (Italy)[10684-94]

TUESDAY 24 APRIL

SESSION 4. TUE 8:30 TO 10:20

Developments in Nonlinear Fibre Optics

Session Chair: **Benjamin J. Eggleton**, The Univ. of Sydney (Australia)

Fibre nonlinear optics (*Invited Paper*), Francesca Parmigiani, Univ. of Southampton (United Kingdom)[10684-14]

Tunability improvement of a doubly resonant OPO for fast and high-resolution gas spectroscopy. Benjamin Szymanski, Johann Georges des Aulnois, Blue Industry and Science (France)[10684-15]

Experimental observation of dispersive photon focusing dam break flows. Frédéric Audo, Bertrand Kibler, Julien Fatome, Christophe Finot, Guy Millot, Lab. Interdisciplinaire Carnot de Bourgogne (France) ... [10684-16]

Compact fibre-integrated femtosecond optical parametric oscillator. Callum F. O'Donnell, Chaitanya Kumar Suddapalli, Radiant Light SL (Spain) and ICFO - Institut de Ciències Fotòniques (Spain); Therese Paoletta, ICFO - Institut de Ciències Fotòniques (Spain); Majid Ebrahim-Zadeh, Radiant Light SL (Spain) and ICFO - Institut de Ciències Fotòniques (Spain) and Institutió Catalana de Recerca i Estudis Avançats (Spain)[10684-17]

Ultraviolet-extended supercontinuum generation in seven-core photonic crystal fiber. Sheng-Ping Chen, Nan Wang, Xue Qi, National Univ. of Defense Technology (China)[10684-18]

SESSION 5. TUE 10:50 TO 12:40

High Harmonic Generation

Session Chair: **Natalia M. Litchinitser**, Univ. at Buffalo (United States)

Single molecule nonlinear optics (*Invited Paper*), Vahid Sandoghdar, Max-Planck-Institut für die Physik des Lichts (Germany)[10684-19]

Phase-matched optical wave mixing in the XUV region by two-colour high-order harmonic generation. Khoa A. Tran, Peter Hannaford, Lap V. Dao, Swinburne Univ. of Technology (Australia)[10684-20]

Generation of extreme ultraviolet vector beams driven by high harmonic generation. Slobodan Dolic, Dragana Jovanovic, Vinca Institute of Nuclear Sciences (Serbia); Lidia Zur, Museo Storico della Fisica e Ctr. Studi e Ricerche "Enrico Fermi" (Italy); Milena Cincović, Vinca Institute of Nuclear Sciences (Serbia); Maurizio Ferrari, CNR-Istituto di Fotonica e Nanotecnologie (Italy); Fondazione Bruno Kessler (Italy); Miroslav Dramićanin, Vinca Institute of Nuclear Sciences (Serbia)[10684-21]

Ultrashort optical pulses and single-cycle terahertz fields in the service of molecular rotations: a comparative study. Sharly Fleischer, Ran Damari, Tel Aviv Univ. (Israel); Shimshon Kallush, ORT Braude College (Israel) and The Hebrew Univ. of Jerusalem (Israel); Dina Rosenberg, Tel Aviv Univ. (Israel)[10684-22]

On the fly control of high harmonic generation using a structured pump beam. Liliya Lobachinsky, Liran Hareli, Georgiy Shoulga, Yaniv Eliezer, Linor Michaeli, Alon Bahabad, Tel Aviv Univ. (Israel)[10684-23]

Lunch/Exhibition BreakTue 12:40 to 13:50

SESSION 6. TUE 13:50 TO 16:00

New Materials and Processes

Session Chair: **Vahid Sandoghdar**, Max-Planck-Institut für die Physik des Lichts (Germany)

Structured light and nonlinear metamaterials (*Invited Paper*), Natalia M. Litchinitser, Univ. at Buffalo (United States)[10684-24]

Modeling and parameters retrieving in time domain spectroscopy of material and metamaterial. Romain Peretti, Institut d'Electronique de Microélectronique et de Nanotechnologie (France); Martin Micica, Institut d'Electronique de Microélectronique et de Nanotechnologie (France), VŠB-Technical Univ. of Ostrava (Czech Republic); Sophie Eliet, Mathias Vanwolleghem, Jean-François Lampin, Institut d'Electronique de Microélectronique et de Nanotechnologie (France)[10684-25]

Analysis of the characteristics of the airy beam off-shooting soliton. Thomas Bouchet, Delphine Wolfersberger, Marc Sciamanna, CentraleSupélec (France)[10684-26]

Analysis of the relationship between surface function and the harmonic generation efficiency of a KDP crystal. Guoqing Pei, Xu Xu, Mengmeng Han, China Academy of Engineering Physics (China)[10684-27]

Hot electron generation and dynamics within plasmonic nano-antenna. Olivier Demichel, Benoît Cluzel, Alexandre Bouhelier, Régis Mejdard, Lab. Interdisciplinaire Carnot de Bourgogne (France)[10684-28]

Realization of a watt-level narrow-linewidth 318-nm UV laser and single-photon Rydberg excitation of cesium atoms. Junmin Wang, Jieying Wang, Jiandong Bai, Jun He, Shanxi Univ. (China)[10684-29]

HOT TOPICS SESSION II. 16:30 TO 18:05

Coherent combination of fiber amplified ultrafast laser pulses Jens Limpert, Institute of Applied Physics, Friedrich Schiller Univ. Jena, Germany

2D materials and their heterostructures: fundamentals, applications and prototypes Frank Koppens, ICFO-The Institute of Photonic Sciences, Spain

For additional details, please see page 7

CONFERENCE 10684

WEDNESDAY 25 APRIL

SESSION 7.....WED 8:30 TO 10:20

Nonlinear effects in optical waveguides

Session Chair: **Anna C. Peacock**,
Univ. of Southampton (United Kingdom)

Fibre optical parametric amplifiers (*Invited Paper*), Kenneth K. Y. Wong, The Univ. of Hong Kong (Hong Kong, China)[10684-30]

Temporal optical super-resolution by super-oscillating beats, Alon Bahabad, Yaniv Eliezer, Liran Hareli, Lilya Lobachinsky, Sahar Froim, Tel Aviv Univ. (Israel)[10684-31]

Optimal input signal distribution and capacity for nondispersive nonlinear optical fiber channel at large signal to noise ratio, Ivan Terekhov, Alexey Reznichenko, Budker Institute of Nuclear Physics SB RAS (Russian Federation)[10684-32]

Broadband four-wave mixing and optical parametric gain of broadband incoherent light using ultra-silicon-rich nitride waveguides, Ju Won Choi, Byoung-Uk Sohn, George F. R. Chen, Singapore Univ. of Technology & Design (Singapore); Doris K. T. Ng, A*STAR - Data Storage Institute (Singapore); Dawn T.H. Tan, Singapore Univ. of Technology & Design (Singapore)[10684-33]

Mitigation of self-phase modulation by sinusoidally time varying phase, Frédéric Audo, Lab. Interdisciplinaire Carnot de Bourgogne (France); Sonia Boscolo, Aston Univ. (United Kingdom); Christophe Finot, Lab. Interdisciplinaire Carnot de Bourgogne (France)[10684-34]

SESSION 8.....WED 10:50 TO 12:40

Quantum and nonlinear optics

Session Chair: **Thomas H Kerr III III**, TeK Associates (United States)

Enhancing the performance of fibre-based nonlinear heralded single-photon sources through active switching (*Invited Paper*), Peter J. Mosley, Univ. of Bath (United Kingdom)[10684-35]

Continuous-wave, multi-milliwatt, tunable difference-frequency generation across 4608-4694 nm in orientation-patterned GaP, Kavita Devi, Anuja Padhye, ICFO - Institut de Ciències Fotòniques (Spain); Peter G. Schunemann, BAE Systems (United States); Majid Ebrahim-Zadeh, ICFO - Institut de Ciències Fotòniques (Spain) and Institució Catalana de Recerca i Estudis Avançats (Spain)[10684-36]

A new way of controlling NesCOPs (Nested Cavity doubly resonant OPO) for faster and more efficient high resolution spectrum measurement, Johann Georges des Aulnois, Benjamin Szymanski, Axel Grimieau, Léo Sillard, Blue Industry and Science (France) ...[10684-37]

Optical rectification for a new shot to shot feedback system for laser-driven plasma wakefield accelerators, Stefano Mattiello, Andreas Penirschke, Technische Hochschule Mittelhessen (Germany); Holger Schlarb, Deutsches Elektronen-Synchrotron (Germany) ...[10684-38]

Temperature dependent noise in quantum frequency conversion, Paulina S. Kuo, National Institute of Standards and Technology (United States); Carsten Langrock, Jason S. Pelc, Martin M. Fejer, Stanford Univ. (United States)[10684-39]

JOINT SESSION.....WED 13:40 TO 15:35

Mode-locked Fibre Lasers

Joint Session between Conferences 10682 and 10683

Session Chair: **Neil G. R. Broderick**,
The Univ. of Auckland (New Zealand)

Propagation of infrared ultrashort pulses in the air (*Invited Paper*), Thomas J. Karr, Defense Advanced Research Projects Agency (United States)[10684-40]

High power ultrafast mode-locked ring fibre laser with InN SESAM, Francesca Gallazzi, Instituto de Óptica "Daza de Valdés" (Spain); Marco Jimenez-Rodriguez, Univ. de Alcalá (Spain); Eva Monroy, Univ. Grenoble Alpes (France) and CEA Grenoble (France); Pedro Corredera, Instituto de Óptica "Daza de Valdés" (Spain); Miguel González-Herráez, Fernando B. Naranjo, Univ. de Alcalá (Spain); Juan Diego Ania-Castañón, Instituto de Óptica "Daza de Valdés" (Spain)[10683-59]

Dissipative soliton resonance in the Er:Yb:doped double-clad fiber laser, François Sanchez, Georges Semaan, Fatma Ben Braham, Mohamed Salhi, Meriem Kemel, Alioune Niang, Univ. d'Angers (France); Yichang Meng, Hebei Univ. of Science and Technology (China)[10684-41]

Ytterbium-doped mode-locked fibre laser with three gain media for micromachining, Neil G. R. Broderick, Stanley Tang, Richard Provo, Miro Erkintalo, Claude Aeguray, The Univ. of Auckland (New Zealand)[10683-60]

Graphene-based saturable absorber for high average-power fiber lasers, Georges Semaan, Univ. d'Angers (France); Paul Mouchel, Univ. d'Angers (France) and Keopsys SA (France); Yichang Meng, Hebei Univ. of Science and Technology (China); Mohamed Salhi, Meriem Kemel, François Sanchez, Univ. d'Angers (France)[10684-42]

High energy, femtosecond fiber laser source at 1750 nm for 3-photon microscopy, Andreas Wienke, Dieter Wandt, Jörg Neumann, Dietmar Kracht, Laser Zentrum Hannover e.V. (Germany)[10683-61]

Intracavity pulse dynamics in all-normal dispersion all-fiber oscillator, Jan Szczepanek, Univ. of Warsaw (Poland); Tomasz M. Kardaś, Institute of Physical Chemistry of the Polish Academy of Sciences (Poland); Czesław Radzewicz, Univ. of Warsaw (Poland); Yuriy Stepanenko, Institute of Physical Chemistry of the Polish Academy of Sciences (Poland), Univ. of Warsaw (Poland)[10684-43]

CONFERENCE 10685

Monday–Thursday 23–26 April 2018 • Proceedings of SPIE Vol. 10685

Biophotonics: Photonic Solutions for Better Health Care

Conference Chairs: **Jürgen Popp**, Leibniz-Institut für Photonische Technologien e.V. (Germany); **Valery V. Tuchin**, N.G. Chernyshevsky Saratov State Univ. (Russian Federation); **Francesco Saverio Pavone**, European Lab. for Non-linear Spectroscopy (Italy)

Programme Committee: **Peter E. Andersen**, Technical Univ. of Denmark (Denmark); **Arthur E. T. Chiou**, National Yang-Ming Univ. (Taiwan); **Johannes F. de Boer**, Vrije Univ. Amsterdam (Netherlands); **Kishan Dholakia**, Univ. of St. Andrews (United Kingdom); **Dror Fixler**, Bar-Ilan Univ. (Israel); **Paul Garside**, Univ. of Glasgow (United Kingdom); **Sylvain Gioux**, Univ. de Strasbourg (France); **Kirill V. Larin**, Univ. of Houston (United States); **Qingming Luo**, Britton Chance Ctr. for Biomedical Photonics (China); **Thomas G. Mayerhöfer**, Leibniz-Institut für Photonische Technologien e.V. (Germany); **Vasilis Ntziachristos**, Helmholtz Zentrum München GmbH (Germany); **David D. Sampson**, The Univ. of Western Australia (Australia); **Ernst H. K. Stelzer**, Johann Wolfgang Goethe-Univ. Frankfurt am Main (Germany); **Hugo Thienpont**, Vrije Univ. Brussel (Belgium); **Siva Umapathy**, Indian Institute of Science (India); **I. Alex Vitkin**, Ontario Cancer Institute (Canada); **Gert von Bally**, Ctr. for Biomedical Optics and Photonics (Germany); **Brian C. Wilson**, Princess Margaret Hospital (Canada)

MONDAY 23 APRIL

HOT TOPICS SESSION I 9:00 TO 11:00

From Einstein doubts to quantum bits: a second quantum revolution

Alain Aspect, Lab. Charles Fabry, Institut d'Optique, France

Pico-Photonics: watching and sensing single molecules by confining light to the atom scale

Jeremy J. Baumberg, NanoPhotonics Ctr., Univ. of Cambridge, United Kingdom

For additional details see page 6.

OPENING REMARKS 11:25 TO 11:30

SESSION 1 MON 11:30 TO 12:40

Therapy I

Session Chair: **Jürgen Popp**,

Leibniz-Institut für Photonische Technologien e.V. (Germany)

Investigations and developments for PDT in brain tumors (Invited Paper), Ronald Sroka, Adrian Rühm, Herbert Stepp, Niklas Markwardt, Laser-Forschungslabor (Germany) [10685-1]

Monte Carlo based light propagation models to improve efficacy of biophotonics based therapeutics of hollow organs and solid tumours including photodynamic therapy and photobiomodulation, Lothar D. Lilge, Univ. Health Network (Canada); Jeffrey Cassidy, Abdul-Amir Yassine, William Kingsford, Univ. of Toronto (Canada); Yiwen Xu, Brian C. Wilson, Univ. Health Network (Canada); Vaughn Betz, Univ. of Toronto (Canada) [10685-2]

Binding of cationic porphyrins and metalloporphyrins to the human transferrin for photodynamic therapy of tumors, Anna G. Gyulkhandanyan, Anna A. Zakoyana, Institute of Biochemistry, National Academy of Sciences of Armenia (Armenia); Aram G. Gyulkhandanyan, Molécules Thérapeutiques in silico (MTi) (France) and INSERM (France) and Univ. Paris Diderot (France); Marina V. Parkhats, Boris M. Dzharagov, B.I. Stepanov Institute of Physics, National Academy of Sciences of Belarus (Belarus); Marina A. Sheyryanyan, Yerevan State Univ. (Armenia); Guevork A. Kevorkian, Grigor V. Gyulkhandanyan, Institute of Biochemistry, National Academy of Sciences of Armenia (Armenia) [10685-3]

Holographic monitoring of living cells response to intracellular generation of singlet oxygen by means of digital holographic microscopy and holographic tomography, Andrey V. Belashov, ITMO Univ. (Russian Federation); Anna A. Zhikhoreva, Ioffe Institute (Russian Federation) and ITMO Univ. (Russian Federation); Tatiana Belyaeva, Elena Kornilova, Anna Salova, Institute of Cytology of the Russian Academy of Sciences (Russian Federation); Irina Semenova, Oleg Vasyutinskii, Ioffe Institute (Russian Federation) [10685-4]

Lunch Break Mon 12:40 to 13:50

SESSION 2 MON 13:50 TO 15:35

Imaging I

Session Chair: **Lothar D. Lilge**, Univ. Health Network (Canada)

Handheld laser speckle photometer for skin diagnostics, Rainer Riesenberger, Andreas Wuttig, Mario Kanka, Daniel Kraus, Sarmiza Stanca, Leibniz-Institut für Photonische Technologien e.V. (Germany); Michael Zieger, Martin Kaatz, SRH Wald-Klinikum Gera GmbH (Germany) [10685-5]

Monitoring fruits viscoelastic properties using time-resolved spatial speckle imaging, Christelle Abou Nader, Jean-Michel Tualle, Eric Tinet, Dominique Ettori, Lab. de Physique des Lasers, Univ. Paris 13 (France) and Institut Galilée (France) [10685-6]

Wide-field speckle imaging and two-photon microscopy close up for the investigation of cerebral blood flow in vivo in mice models of obesity, Frédéric Pain, Univ. Paris Sud 11 (France) and Ctr. National de la Recherche Scientifique (France); Hirc Gurden, Ctr. National de la Recherche Scientifique (France) and Univ. Paris Diderot - 7 (France); Haleh Soleimanzad, Univ. Paris-Sud 11 (France) and Univ. Paris - Diderot 7 (France) and Ctr. National de la Recherche Scientifique (France) [10685-7]

Investigation of speckle pattern dynamics by laser speckle contrast imaging, Anton Sdobnov, Alexander Bykov, Alexey Popov, Igor A. Meglinski, Univ. of Oulu (Finland) [10685-8]

Indices of polarimetric purity for biophotonics imaging, Albert Van Eenckhout, Angel Lizana, Univ. Autònoma de Barcelona (Spain); Enric Garcia-Caurel, Ecole Polytechnique (France); Jose J. Gil, Univ. de Zaragoza (Spain); Adrià Sansa, Carla Rodríguez, Irene Estévez, Univ. Autònoma de Barcelona (Spain); Emilio González, Hospital Univ. de Canarias (Spain) and Univ. Autònoma de Madrid (Spain); Juan Carlos Escalera, Univ. Autònoma de Barcelona (Spain); Ignacio Moreno, Univ. Miguel Hernández de Elche (Spain); Juan Campos, Univ. Autònoma de Barcelona (Spain) [10685-9]

Rotation-independent polarization parameters for distinguishing different anisotropic microstructures, Pengcheng Li, Tsinghua Univ. (China); Chuhui Wang, Tsinghua Univ. (China); Donghong Lv, Graduate School at Shenzhen, Tsinghua Univ. (China); Honghui He, Graduate School at Shenzhen, Tsinghua Univ. (China); Hui Ma, Tsinghua Univ. (China) [10685-10]

Collinear back scattering Muller microscopy for biomedical applications, Zhenhua Chen, Yuanhuan Zhu, Tsinghua-Berkeley Shenzhen Institute (China); Honghui He, Graduate School at Shenzhen, Tsinghua Univ. (China); Hui Ma, Tsinghua-Berkeley Shenzhen Institute (China) and Graduate School at Shenzhen, Tsinghua Univ. (China) [10685-11]

SESSION 3 MON 16:05 TO 17:45

Therapy II

Session Chair: **Ronald Sroka**, Laser-Forschungslabor (Germany)

Personalizing cytotoxic dose for Ru(II) coordination complex mediated photodynamic therapy in nonmuscle invasive bladder cancer (Invited Paper), Lothar D. Lilge, Univ. Health Network (Canada); Arkadii Mandel, Theralase, Inc. (Canada); Savo Lazic, Pavel Kaspeler, Theralase, Inc. (Canada); Girish Kulkarni, Michael Jewett, Univ. Health Network (Canada) [10685-12]

Optical cavitation around gold nanorods for photoacoustic microsurgery, Lucia Cavigli, Istituto di Fisica Applicata "Nello Carrara" (Italy); Paolo Tortoli, Univ. degli Studi di Firenze (Italy); Sonia Centi, Claudia Borri, Istituto di Fisica Applicata "Nello Carrara" (Italy); Ilaria Panettieri, Ingolf Streit, Asclepion Laser Technologies GmbH (Germany); Francesca Rossi, Fulvio Ratto, Roberto Pini, Istituto di Fisica Applicata "Nello Carrara" (Italy) [10685-13]

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Blue LED treatment of superficial abrasions: in vivo experimental evidence of wound healing improvement, Francesca Rossi, Istituto di Fisica Applicata "Nello Carrara" (Italy); Riccardo Cicchi, Istituto Nazionale di Ottica (Italy); Giada Magni, Francesca Tatini, Lucia Cavigli, Istituto di Fisica Applicata "Nello Carrara" (Italy); Stefano Bacci, Univ. degli Studi di Firenze (Italy); Domenico Alfieri, Cristina Tripodi, Lorenzo Targetti, EmoLED S.r.l. (Italy); Gaetano De Siena, Univ. degli Studi di Firenze (Italy); Francesco Saverio Pavone, Istituto Nazionale di Ottica (Italy) and LENS - Lab. Europeo di Spettroscopie Non-Lineari (Italy) and Univ. degli Studi di Firenze (Italy); Roberto Pini, Istituto di Fisica Applicata "Nello Carrara" (Italy) [10685-14]

Insight into viscosity of tumor on the microscopic level, Marina V. Shirmanova, Lubov Shimolina, Elena V. Zagaynova M.D., Nizhny Novgorod State Medical Academy (Russian Federation); Larisa Klapshina, G.A. Razuvaev Institute of Organometallic Chemistry, Russian Academy of Sciences (Russian Federation); Maria Lukina, Varvara Dudenkova, Nizhny Novgorod State Medical Academy (Russian Federation); Marina Kuimova, Imperial College London (United Kingdom) [10685-15]

Evaluation of short pulse laser damage to the retinal pigment epithelium layer: a key point for the assessment of devices using the nanosecond regime, Scarlett Ramos, Robert Bosch GmbH (Germany); Miriam Reh, Günther Zeck, Naturwissenschaftliches und Medizinisches Institut an der Univ. Tübingen (Germany); Nico Heussner, Robert Bosch GmbH (Germany) [10685-16]

Femtosecond laser pulses and gold nanorods towards treatment of Retinoblastoma, Nir Katchinskiy, Roseline Godbout, Abdulhakem Y. Elezabi, Univ. of Alberta (Canada) [10685-17]

TUESDAY 24 APRIL

SESSION 4. TUE 8:30 TO 10:40

Imaging II: Raman

Session Chair: **Jürgen Popp**,
Leibniz-Institut für Photonische Technologien e.V. (Germany)

Molecular profiling of sepsis in mice using vibrational microspectroscopy (*Invited Paper*), Taru Verma, Indian Institute of Science (India); Rekha Gautam, The Univ. of Alabama at Birmingham (United States); Dipankar Nandi, Siva Umapathy, Indian Institute of Science (India) [10685-18]

In-situ species authentication of frozen-thawed meat and meat juice using shifted excitation Raman difference spectroscopy, Kay Sowoldnich, STFC Rutherford Appleton Lab. (United Kingdom) [10685-19]

Investigations on multimodal image analysis routines for tissue diagnostics, Thomas Bocklitz, Friedrich-Schiller-Univ. Jena (Germany); Shuxia Guo, Northwestern Polytechnical Univ. (China) [10685-20]

Analysis of human skin Raman and autofluorescence as predictors of chronic diseases, Ivan A. Bratchenko, Lyudmila A. Shamina, Dmitry N. Artemyev, Oleg O. Myakinin, Yulia A. Khristoforova, Valery P. Zakharov, Dmitriy V. Kornilov, Vladimir N. Grishanov, Samara Univ. (Russian Federation); Peter A. Lebedev, Larissa A. Rogozina, Daria Y. Pimenova, Samara State Medical Univ. (Russian Federation) [10685-21]

Raman spectroscopic profiling of intracellular lipid compositions of macrophages induced in the vicinity of cancer cells, Christian Matthäus, Leibniz-Institut für Photonische Technologien e.V. (Germany); Simona Pace, Andreas Koeberle, Oliver Werz, Friedrich-Schiller-Univ. Jena (Germany); Jürgen Popp, Leibniz-Institut für Photonische Technologien e.V. (Germany) [10685-22]

Resonance Raman spectroscopy on whole blood in a microfluidic device with hydrodynamic cell-free layer creation, Moritz Matthäus, Technical Univ. of Denmark (Denmark); Xiaolong Zhu, Technical Univ. of Denmark (Denmark); Rodolphe Marie, Anders Kristensen, Technical Univ. of Denmark (Denmark) [10685-23]

Time-resolved single photon spectroscopy through a single optical fibre for miniaturised medical probe design, Katjana Ehrlich, Heriot-Watt Univ. (United Kingdom); Andras Kufcsák, Sarah McLaughtrie, Holly Fleming, Nikola Krstajić, Colin J. Campbell, Robert K. Henderson, Kevin Dhaliwal, The Univ. of Edinburgh (United Kingdom); Robert R. Thomson, Michael G. Tanner, Heriot-Watt Univ. (United Kingdom) [10685-24]

Investigation of brass as a real-time substrate for surface-enhanced Raman spectroscopy, Behzad Sardari, Sabanci Univ (Turkey); Meriç Özcan, Sabanci Univ. (Turkey) [10685-25]

SESSION 5 11:00 TO 12:55

Point of Care I

Session Chair: **Sergei G. Sokolovski**, Aston Univ. (United Kingdom)

Multiparametric analysis of tumor response to chemotherapy using fluorescence imaging (*Invited Paper*), Elena V. Zagaynova M.D., Marina V. Shirmanova, Tatiana Sergeeva, Maria Lukina, Alena Gavrina, Anastasia Shumilova, Nizhny Novgorod State Medical Academy (Russian Federation); Varvara Dudenkova, N.I. Lobachevsky State Univ. of Nizhny Novgorod (Russian Federation); Alexander Mishin, Shemyakin-Ovchinnikov Institute of Bioorganic Chemistry RAS (Russian Federation); Olga Furman, Nizhny Novgorod State Medical Academy (Russian Federation); Vladislav Shcheslavskiy, Becker & Hickl GmbH (Germany); Konstantin Lukyanov, Shemyakin-Ovchinnikov Institute of Bioorganic Chemistry RAS (Russian Federation) [10685-26]

Estimation of blood Raman spectrum from tissue measurements utilizing blood pulse, Maciej S. Wróbel, Janusz Smulko, Gdansk Univ. of Technology (Poland) [10685-27]

Engineering nanopattern geometry at molecular resolution to enhance sensitivity of nanoplasmonic biosensors, Rishabh Rastogi, Luxembourg Institute of Science and Technology (Luxembourg); Suresh Poovanthinal, Luxembourg Ctr. for Systems Biomedicine, Univ. of Luxembourg (Luxembourg); Pierre Michel Adam, Univ. de Technologie Troyes (France); Jewgeni Starikov, Karlsruhe Institute of Technology (Germany); Saulius Juodkakis, Swinburne Univ. of Technology (Australia); Sivashankar Krishnamoorthy, Luxembourg Institute of Science and Technology (Luxembourg) [10685-28]

Quantifying the glucose, urea, and lactic acid concentration in mixture by confocal Raman microscopy, Zhengyuan Tang, Sinead Baraton, Tomás Ward, Bryan Hennelly, National Univ. of Ireland, Maynooth (Ireland) [10685-29]

Chiral hybrid nanostructures for biomedical applications, Anastasia Visheratina, ITMO Univ. (Russian Federation); Vera Kuznetsova, Trinity College Dublin (Ireland) and ITMO Univ. (Russian Federation); Finn Purcell-Milton, Trinity College Dublin (Ireland); Anna Orlova, Anatoly Fedorov, Alexander Baranov, ITMO Univ. (Russian Federation); Yuri Gun'ko, Trinity College Dublin (Ireland) and ITMO Univ. (Russian Federation) [10685-30]

Arterial pulses assessed with FBG based films: a smart skin approach, Cátia J. Leitão, Univ. de Aveiro (Portugal); M. Fátima Domingues, Univ. de Aveiro (Portugal) and Instituto de Telecomunicações (Portugal); Cátia Tavares, Instituto de Telecomunicações (Portugal); João Lemos Pinto, Univ. de Aveiro (Portugal); Paulo André, Instituto de Telecomunicações (Portugal) and Univ. de Lisboa (Portugal); Carlos Marques, Paulo Antunes, Univ. de Aveiro (Portugal) and Instituto de Telecomunicações (Portugal) [10685-31]

Combined label-free/fluorescence platform based on Bloch surface waves biochips for early cancer biomarker detection, Norbert Danz, Fraunhofer-Institut für Angewandte Optik und Feinmechanik (Germany); Alberto Sinibaldi, Sapienza Univ. di Roma (Italy); Matteo Allegretti, Istituto Nazionale Tumori Regina Elena (Italy); Peter Munzert, Fraunhofer-Institut für Angewandte Optik und Feinmechanik (Germany); Elisabetta Sepe, Sapienza Univ. di Roma (Italy); Patrizio Giacomini, Istituto Nazionale Tumori Regina Elena (Italy); Francesco Michelotti, Sapienza Univ. di Roma (Italy) [10685-32]

Lunch/Exhibition Break Tue 12:55 to 13:55

SESSION 6. TUE 13:55 TO 16:20

Point of Care II

Session Chair: **Elena V. Zagaynova M.D.**,
Nizhny Novgorod State Medical Academy (Russian Federation)

Laser-induced singlet oxygen generation in biotic systems and its emerging applications (*Invited Paper*), Sergei G. Sokolovski, Aston Univ. (United Kingdom); Oxana V. Semyachkina-Glushkovskaya, Saratov State Univ. (Russian Federation); Edik U. Rafailov, Aston Univ. (United Kingdom) [10685-33]

Optical flocculation technique based on optogenetic and whispering gallery modes for drinking water purification, Amir R. Ali, Southern Methodist Univ. (United States) and the German Univ. in Cairo (Egypt); Amal S. Tourky, Al-Azhar Univ. (Egypt); Roushdy A. Ali, Al Azhar Univ. (Egypt) [10685-34]

An injection-locking OF-CEAS for trace gas detection, Zhongqi Tan, Zanran Xu, Zhifu Luo, Xingwu Long, National Univ. of Defense Technology (China) [10685-35]

Analysis of exhaled air of patients with myocardial infarction by laser spectroscopy and data mining, Kavita Devi, Anuja Padhye, ICFO - Institut de Ciències Fotòniques (Spain); Peter G. Schunemann, BAE Systems (United States); Majid Ebrahim-Zadeh, ICFO - Institut de Ciències Fotòniques (Spain), Institutió Catalana de Recerca i Estudis Avançats (Spain) [10685-36]

Application of optical feedback cavity enhanced absorption spectroscopy to the trace gas detection in human breath, Zhifu Luo, Liu Siqi, Zhongqi Tan, Xingwu Long, National Univ. of Defense Technology (China)[10685-37]

Highly sensitive SPR-based PCF for biological substance sensing: design and analysis, Sayed Asaduzzaman, Bikash Kumar Paul, Kawsar Ahmed, Mawlana Bhashani Science and Technology Univ. (Bangladesh); Touhid Bhuiyan, S.A.M. Matior Rahman, Daffodil International Univ. (Bangladesh)[10685-38]

Multidistance time-domain diffuse optical spectroscopy in the assessment of abdominal fat heterogeneity, Pranav Lanka, Politecnico di Milano (Italy); Andrea Farina, CNR-Istituto di Fotonica e Nanotecnologie (Italy); Sanathana Konugolu Venkata Sekar, Claudia Guadagno, Politecnico di Milano (Italy); Lorenzo Spinelli, CNR-Istituto di Fotonica e Nanotecnologie (Italy); Enzo Nisoli, Univ. degli Studi di Milano (Italy); Paola Taroni, Rinaldo Cubeddu, Antonio Pifferi, Politecnico di Milano (Italy)[10685-39]

Study of optimal measurement conditions for time-domain diffuse optics systems, Anurag Behera, Laura Di Sieno, Antonio Pifferi, Politecnico di Milano (Italy); Fabrizio Martelli, Univ. degli Studi di Firenze (Italy); Alberto Dalla Mora, Politecnico di Milano (Italy)[10685-40]

Pulse excitation fluorescence meter for diagnostic purposes, Dmitriy V. Kornilin, Vladimir N. Grishanov, Dmitriy S. Burkov, Konstantin V. Cherepanov, Victor S. Kulikov, Samara Univ. (Russian Federation) . . [10685-41]

HOT TOPICS SESSION II. 16:30 TO 18:05

Coherent combination of fiber amplified ultrafast laser pulses
Jens Limpert, Institute of Applied Physics, Friedrich Schiller Univ. Jena, Germany

2D materials and their heterostructures: fundamentals, applications and prototypes
Frank Koppens, ICFO-The Institute of Photonic Sciences, Spain

For additional details, please see page 7

WEDNESDAY 25 APRIL

Join Session 1 runs concurrently with Session 7

JOINT SESSION 1 8:30 TO 10:40

Optics in Surgery I

Joint Session between Conferences 10677 and 10685

Session Chair: **Sylvain Gioux**, ICube (France)

Looking and listening to tissues: advances in fluorescence and optoacoustic bio-imaging (*Invited Paper*), Vasilis Ntziachristos, Technische Univ. München (Germany) and Helmholtz Zentrum München GmbH (Germany)[10677-51]

Real-time oxygenation imaging using spatio-temporal modulation of light, Manon Schmidt, Amir Nahas, Swapnesh Panigrahi, Murielle Torregrossa, Sylvain Gioux, ICube (France)[10685-57]

Quantitative subsurface fluorescence imaging enabled by spatial frequency domain imaging for enhanced fluorescence-guided surgery, Mira Sibai, Univ. of Toronto (Canada) and Princess Margaret Cancer Ctr., Univ. Health Network (Canada); Dennis J. Wirth, Thayer School of Engineering at Dartmouth (United States); Frédéric Leblond, Ecole Polytechnique de Montréal (Canada); David W. Roberts M.D., Dartmouth Hitchcock Medical Ctr. (United States); Brian C. Wilson, Princess Margaret Cancer Ctr., Univ. Health Network (Canada) and Univ of Toronto (Canada)[10685-58]

Phantom and methodology for fluorescence molecular imaging systems benchmarking, Dimitris Gorpas, Helmholtz Zentrum München GmbH (Germany); Maximilian Koch, Maria Anastasopoulou, Helmholtz Zentrum München GmbH (Germany) and Technische Univ. München (Germany); Uwe Klemm, Helmholtz Zentrum München GmbH (Germany); Vasilis Ntziachristos, Helmholtz Zentrum München GmbH (Germany) and Technische Univ. München (Germany)[10677-52]

Real-time differentiation of healthy tissue using an OCT device steered by a robotized flexible endoscope, Oscar Caravaca Mora, Lucile Zorn, Philippe Zanne, Florent Nageotte, Paul C. Montgomery, Michel De Mathelin, ICube (France); Michalina Gora, ICube, Univ. of Strasbourg (France) and Ctr. National de la Recherche Scientifique (France)[10677-53]

CMOS-based contact imaging system for skin condition diagnosis by spatially resolved diffuse reflectance spectroscopy, Nils Petitdidier, Anne Koenig, Rémi Gerbelot, Henri Grateau, CEA-LETI (France); Sylvain Gioux, Univ. de Strasbourg (France); Sophie Morales, CEA-LETI (France)[10685-59]

Differentiation of femur bone from surrounding soft tissue using laser-induced breakdown spectroscopy as a feedback system for smart laserosteotomy, Hamed Abbasi, Georg Rauter, Raphael Guzman, Philippe C. Cattin, Azhar Zam, Univ. Basel (Switzerland)[10685-60]

SESSION 7 WED 8:30 TO 10:30

Imaging III

Session Chair: **Francesco Saverio Pavone**,
LENS - Lab. Europeo di Spettroscopia Non-Lineari (Italy)

Hyperspectral evaluation of skin blood oxygen saturation at baseline and during arterial occlusion, Zbignevs Marcinkevics, Uldis Rubins, Andris Grabovskis, Janis Cimurs, Anastasija Caica, Univ. of Latvia (Latvia)[10685-42]

In vivo fast automatic skin cancer recognition using a multispectral dermatoscopy imaging tool, Oleg O. Myakinin, Oleg A. Melsitov, Semyon G. Kononov, Ivan A. Bratchenko, Samara National Research Univ. (Russian Federation); Alexander A. Moryatov, Sergey V. Kozlov, Samara State Medical Univ. (Russian Federation); Valery P. Zakharov, Samara National Research Univ. (Russian Federation)[10685-43]

Hydrogel-based light guides for the design of optogenetic implants, Sonja Johannsmeier, Laser Zentrum Hannover e.V. (Germany); Maria Leilani Torres, Leibniz Univ. Hannover (Germany); Tammo Ripken, Dag Heinemann, Laser Zentrum Hannover e.V. (Germany); Alexander Heisterkamp, Leibniz Univ. Hannover (Germany)[10685-44]

Analysis of the connectivity of in vitro human iPSC-derived neuronal networks using holographic illumination, Felix Schmieder, TU Dresden (Germany); Simon Klapper, DFG-Ctr. for Regenerative Therapies Dresden (Germany); Lars Büttner, TU Dresden (Germany); Volker Busskamp, DFG-Ctr. for Regenerative Therapies Dresden (Germany); Jürgen Czarske, TU Dresden (Germany)[10685-45]

Deep tissue optogenetics: targeted stimulation of light-sensitive cardiac tissues using near-infrared lasers, Maria Leilani Torres-Mapa, Institut für Quantenoptik, Leibniz Univ. Hannover (Germany); Monica Jara-Avaca, Mine Bakar, Ina Gruh, Medizinische Hochschule Hannover (Germany); Rajesh Komban, Christoph Gimmmler, CAN GmbH (Germany); Sonja Johannsmeier, Tammo Ripken, Dag Heinemann, Laser Zentrum Hannover e.V. (Germany); Alexander Heisterkamp, Leibniz Univ. Hannover (Germany)[10685-46]

High-resolution magnetic field biosensor based on optical resonators, Amir R. Ali, Southern Methodist Univ. (United States) and The German Univ. in Cairo (Egypt); Abdelkarim H. Saleh, The German Univ. in Cairo (Egypt)[10685-47]

3D digital histopathology of the human brain cortex, Irene Costantini, Giacomo Mazzamuto, Ludovico Silvestri, LENS - Lab. Europeo di Spettroscopia Non-Lineari (Italy); M. Neri, M. Roffilli, Bioretics Srl (Italy); Valerio Conti, Renzo Guerrini, Azienda Ospedaliera Univ. Anna Meyer (Italy); Leonardo Sacconi, Francesco Saverio Pavone, LENS - Lab. Europeo di Spettroscopia Non-Lineari (Italy)[10685-48]

Terahertz dielectric spectroscopy of malignancies, Arseniy A. Gavdush, Nikita V. Chernomyrdin, Bauman Moscow State Technical Univ. (Russian Federation); Sheyh-Islyam Beshplav, N.N. Burdenko Neurosurgery Institute (Russian Federation); Kirill M. Malakhov, Anna S. Kucheryavenko, Irina N. Dolganova, Stanislav O. Yurchenko, Bauman Moscow State Technical Univ. (Russian Federation); Sergey A. Goryainov, N.N. Burdenko Neurosurgical Institute (Russian Federation); Vladimir N. Kurlov, Institute of Solid State Physics RAS (Russian Federation); Igor V. Reshetov, I.M. Sechenov Moscow Medical Univ. (Russian Federation); Kirill I. Zaytsev, Bauman Moscow State Technical Univ. (Russian Federation) and A.M. Prokhorov General Physics Institute of the Russian Academy of Sciences (Russian Federation)[10685-49]

CONFERENCE 10685

Join Session 2 runs concurrently with Session 8

JOINT SESSION 2 WED 11:00 TO 12:55

Optics in Surgery II

Joint Session between Conferences 10677 and 10685

Session Chair: **Sylvain Gioux**, ICube (France)

Optics in surgery: the surgeon perspective (*Invited Paper*),
[Alexander L. Vahrmeijer, Leiden Univ. Medical Ctr. (Netherlands) . . . [10677-54]

Standardization of quantitative NIR fluorescent imaging in patient: a preliminary attempt on flap reconstructive surgery, Muriel Abbaci, Wahib Ghanem M.D., Ingrid Breuskin M.D., Haïtham Mirghani M.D., Philippe Gorphe M.D., Antoine Moya-Plana M.D., Heba Alkhashnam M.D., Kim De Fremicourt M.D., Jean-François Honart M.D., Anne AUPERIN, François Janot M.D., Frédéric Kolb M.D., Stéphane Temam M.D., Quentin Qassemyar M.D., Corinne Laplace-Builhé, Dana Hartl M.D., Gustave Roussy (France) [10685-61]

NIR fluorescence imaging methods to evaluate blood flow state in the skin lesions, Pavel V. Grachev, A. M. Prokhorov General Physics Institute of the Russian Academy of Sciences (Russian Federation); Zera Abdulvapova, Gagik Galstyan, Endocrinology Research Ctr. (Russian Federation); Victor Loschenov, A. M. Prokhorov General Physics Institute of the Russian Academy of Sciences (Russian Federation) [10677-55]

Interventional fluorescence spectroscopy to detect tumor margins during glioma resection with two fluorescence spectra of PpIX, Laure Alston, CREATIS (France); Jacques Guyotat, Ctr. Hospitalier Univ. de Lyon (France); Laurent Mahieu-Williams, CREATIS (France); Mathieu Hebert, Lab. Hubert Curien (France); Pascal Kantapareddy, David Meyronet, Ctr. Hospitalier Univ. de Lyon (France); David Rousseau, Bruno Montcel, CREATIS (France) [10677-56]

Femtosecond laser nanosurgery to study cellular regeneration: keeping the whole cell in mind, Stefan Michael Klaus Kalies, Laser Zentrum Hannover e.V. (Germany); Dorian Hagenah, Dominik Müller, Daphne DeTemple, Alexander Heisterkamp, Leibniz Univ. Hannover (Germany) [10685-62]

Spatially-resolved spectroscopy for guiding margin delineation during human skin carcinomas resection: first clinical results on diffuse reflectance and autofluorescence spectra and in vivo skin optical properties, Grégoire Khairallah M.D., Univ. de Lorraine (France) and Ctr. National de la Recherche Scientifique (France) and Metz-Thionville Regional Hospital Ctr. (France); Marine Amouroux, Univ. de Lorraine (France) and Ctr. National de la Recherche Scientifique (France); Prisca Rakotomanga, Charles Soussen, Ctr. de Recherche en Automatique de Nancy (France) and Ctr. National de la Recherche Scientifique (France); Frédéric Marchal M.D., Ctr. de Recherche en Automatique de Nancy (France) and Ctr. National de la Recherche Scientifique (France) and Institut de Cancérologie de Lorraine (France); Alain Delconte, Ctr. National de la Recherche Scientifique (France); Hang Chen, Univ. de Lorraine (France) and Ctr. National de la Recherche Scientifique (France); Walter C. P. M. Blondel, Univ. de Lorraine (France) and Ctr. National de la Recherche Scientifique (France) [10685-63]

Single- and multispectral fiber probes as a solution for guided diagnostics and therapy, Olga Bibikova, art photonics GmbH (Germany) and Saratov State Univ. (Russian Federation); Urszula J. Zabarylo, Charité Universitätsmedizin Berlin (Germany); Valeria Belikova, Anastasija Melenteva, Samara State Technical Univ. (Russian Federation); Iskander Usenov, art photonics GmbH (Germany) and Technical Univ. Berlin (Germany); Tatiana Sakharova, Alexey Bocharnikov, Georgy Danielyan, art photonics GmbH (Germany); Olaf Minet, Charité Universitätsmedizin Berlin (Germany); Hans J. Eichler, Technische Univ. Berlin (Germany); Viacheslav Artyushenko, art photonics GmbH (Germany) [10685-64]

SESSION 8 WED 10:50 TO 12:45

Imaging IV: OCT

Session Chair: **Kirill V. Larin**,
Univ. of Houston (United States)

Multimodal approaches for skin cancer diagnosis (*Invited Paper*), Valery P. Zakharov, Samara National Research Univ. (Russian Federation); Sergey V. Kozlov, Samara State Medical Univ. (Russian Federation); Ivan A. Bratchenko, Oleg O. Myakinin, Samara National Research Univ. (Russian Federation); Alexander A. Moryatov, Samara State Medical Univ. (Russian Federation); Andrey E. Orlov, Samara Regional Oncology Clinical Ctr. (Russian Federation) [10685-50]

Bladder cancer biomarkers in co-localised two-photon excited fluorescence and optical coherence microscopy images from fresh biopsies, Björn-Ole Meyer, Dominik Marti, Peter E. Andersen, DTU Fotonik (Denmark); Karin Mogensen, Herlev Hospital (Denmark) and Gentofte Hospital (Denmark); Gregers G. Hermann, Frederiksberg Hospital (Denmark) [10685-51]

Micromotor catheters for dual-beam manually-actuated distortion-corrected imaging, Anthony Lee M.D., Madeline Harlow, Geoffrey Hohert, Calum MacAulay, Pierre Lane, BC Cancer Research Ctr. (Canada) [10685-52]

Innovative morphological and metabolic microtomography to improve surgical resection in breast cancer, Emilie Benoit a la Guillaume, LLTech SAS (France); Clément Apelian, Institut Langevin, Ecole Supérieure de Physique et de Chimie Industrielles de la Ville de Paris (France) and PSL Research Univ. (France) and Ctr. National de la Recherche Scientifique (France); Muriel Abbaci, Gustave Roussy (France) and Univ. Paris-Saclay (France); Eugénie Dalimier, LLTech SAS (France); Claude Boccara, Institut Langevin (France) and LLTech SAS (France); Aïcha Ben Lakhdar M.D., Gustave Roussy (France) and Univ. Paris-Saclay (France); Marie-Christine Mathieu M.D., Odile Casiraghi M.D., Gustave Roussy (France); Corinne Laplace-Builhé, Gustave Roussy (France) and Ctr. National de la Recherche Scientifique (France) [10685-53]

Optical coherence tomography for noninvasive evaluation of the middle ear effusion, Pavel A. Shilyagin, Dmitry Terpelov, Institute of Applied Physics of the Russian Academy of Sciences (Russian Federation); Valery Gelikonova, N.I. Lobachevsky State Univ. of Nizhni Novgorod (Russian Federation); Alexey Novozhilov, Timur Abubakirov, The Volga District Medical Ctr. (VDMC) (Russian Federation) and Institute of Applied Physics of the Russian Academy of Sciences (Russian Federation); Grigory V. Gelikonov, Institute of Applied Physics of the Russian Academy of Sciences (Russian Federation); Andrey Shakhov, The Volga District Medical Ctr. (VDMC) (Russian Federation) and Institute of Applied Physics of the Russian Academy of Sciences (Russian Federation); Valentin M. Gelikonov, Institute of Applied Physics of the Russian Academy of Sciences (Russian Federation) [10685-54]

Depth of focus extension in OCT by numerical emulation of diffractionless beam illumination, Alexander A. Moiseev, Grigory V. Gelikonov, Pavel A. Shilyagin, Sergey U. Ksenofontov, Valentine M. Gelikonov, Institute of Applied Physics of the Russian Academy of Sciences (Russian Federation) [10685-55]

Development of OCT-based strain- and stiffness-mapping techniques for applications in thermomechanical reshaping of collagenous tissues, Vladimir Y. Zaitsev, Alexandr Matveyev, Lev A. Matveev, Dmitry Shabanov, Grigory V. Gelikonov, Institute of Applied Physics of the Russian Academy of Sciences (Russian Federation); Aleksandr Omelchenko, Alexey Yuzhakov, Emil Sobol, Institute of Photonic Technologies (Russian Federation) [10685-56]

Lunch/Exhibition Break Wed 12:45 to 13:45

SESSION 9. WED 13:45 TO 15:25

Imaging V: OCT

Session Chair: **Valery P. Zakharov**,
Samara Univ. (Russian Federation)

All-optical dynamic coherence elastography using laser excited dye-loaded perfluorocarbon nanoparticles (*Invited Paper*), Kirill V. Larin, Chih-Hao Liu, Alexander Schill, Susobhan Das, Univ. of Houston (United States); Dmitry Nevozhay, The Univ. of Texas M.D. Anderson Cancer Ctr. (United States); Manmohan Singh, Univ. of Houston (United States); Konstantin Sokolov, The Univ. of Texas M.D. Anderson Cancer Ctr. (United States) [10685-65]

Thermomechanical mechanism of laser-induced pore-formation in sclera for glaucoma treatment: AFM and OCT investigations, Olga I. Baum, Alexander Omelchenko, Aleksey Yuzhakov, Institute on Laser and Information Part Technologies of the Russian Academy of Sciences (Russian Federation); Vladimir Y. Zaitsev, Lev A. Matveev, Institute of Applied Physics of the Russian Academy of Sciences (Russian Federation); Emil Sobol, FECC "Crystallography and Photonics" of the Russian Academy of Sciences (Russian Federation) [10685-66]

Pre-clinical parametric imaging for tumor delineation with optical coherence tomography, Valentin Demidov, Univ. of Toronto (Canada); Dina Guryanova, Saratov State Univ. (Russian Federation); Costel Fluoraru, National Research Council Canada (Canada); I. Alex Vitkin, Univ. of Toronto (Canada) and Princess Margaret Cancer Ctr. (Canada) [10685-67]

Multiphoton tomography and multimodal OCT for in vivo visualization of oral malignancy in the hamster cheek pouch, Vadim Elagin, Maria Karabut, Elena B. Kiseleva, Marina A. Sirotkina, Nizhny Novgorod State Medical Academy (Russian Federation); Varvara Dudenkova, N.I. Lobachevsky State Univ. of Nizhny Novgorod (Russian Federation); Nadezhda Pavlova, Sergey S. Kuznetsov, Nizhny Novgorod State Medical Academy (Russian Federation); Lev A. Matveev, Alexander A. Moiseev, Nizhny Novgorod State Medical Academy (Russian Federation) and Institute of Applied Physics of the Russian Academy of Sciences (Russian Federation); Anastasia Shumilova, Nizhny Novgorod State Medical Academy (Russian Federation) and N.I. Lobachevsky State Univ. of Nizhny Novgorod (Russian Federation); Felix Feldchtein, Elena V. Zagaynova M.D., Nizhny Novgorod State Medical Academy (Russian Federation); I. Alex Vitkin, Nizhny Novgorod State Medical Academy (Russian Federation) and Univ. of Toronto (Canada); Natalia D. Gladkova, Nizhny Novgorod State Medical Academy (Russian Federation) [10685-68]

Estimating the shape of the human eye using widefield optical coherence tomography (OCT), Manuel Steidle, Jochen Straub, Carl Zeiss Meditec, Inc. (United States) [10685-69]

Towards swept-source mid-infrared OCT, Suzanna Freer, Dmitry Revin, Kristian Groom, Stephen J. Matcher, The Univ. of Sheffield (United Kingdom) [10685-70]

SESSION 10. WED 15:50 TO 18:05

Imaging VI

Session Chair: **Valery V. Tuchin**,
Saratov State Univ. (Russian Federation)

Tumour detection and staging through multimodal fibre-probe spectroscopy, Enrico Baria, Suresh Anand, LENS - Lab. Europeo di Spettroscopie Non-Lineari (Italy); Riccardo Fantechi, Simone Morselli, Mauro Gacci, Univ. degli Studi di Firenze (Italy); Riccardo Cicchi, Istituto Nazionale di Ottica (Italy); Francesco Saverio Pavone, LENS - Lab. Europeo di Spettroscopie Non-Lineari (Italy) [10685-71]

The temporal correlation transfer simulation in a tissue model with anisotropic scattering patterns for the blood flow analyses, Vladimir L. Kuzmin, Alexey Valkov, Saint-Petersburg State Polytechnical Univ. (Russian Federation); Leonid Zubkov, Drexel Univ. (United States) [10685-72]

Depth profiling of stratum corneum hydration and lipids in vivo: comparison between short-wave infrared spectroscopic and biophysical measurements, Anna Ezerskaya, Philips Research (Netherlands) and Technische Univ. Delft (Netherlands); Silvana Pereira, Paul Urbach, Technische Univ. Delft (Netherlands); Babu Varghese, Philips Research (Netherlands) [10685-73]

The portable 'hand held' digital ophthalmoscope: a new type of high-resolution hand held retinal imaging instrument, Peter Bryanston-Cross, The Univ. of Warwick (United Kingdom) and Optical Diagnostics Ltd. (United Kingdom) [10685-74]

Novel nanomaterials for applications in lung cancer imaging, Michal M. Godlewski, Paula Kielbik, Jaroslaw Kaszewski, Emanuel Borgstrom, Warsaw Univ. of Life Sciences SGGW (Poland); Bartłomiej S. Witkowski, Institute of Physics, Polish Academy of Sciences (Poland); Zdzislaw Gajewski, Warsaw Univ. of Life Sciences SGGW (Poland); Marek Godlewski, Institute of Physics, Polish Academy of Sciences (Poland) [10685-75]

Brillouin micro-elastography for three-dimensional, noninvasive studies of zebrafish spinal cord, Jürgen W. Czarske, Jochen Guck, Raimund Schölzler, Stephanie Möllmert, TU Dresden (Germany) [10685-76]

Classification of cancerous tissue spectra using variational mode decomposition and artificial neural network, Sawon Pratiher, Indian Institute of Technology Kanpur (India); Sabyasachi Mukhopadhyay, Indian Institute of Science Education and Research Kolkata (India); Asima Pradhan, Indian Institute of Technology Kanpur (India); Nirmalya Ghosh, Prasanta K. Panigrahi, Indian Institute of Science Education and Research Kolkata (India) [10685-77]

The use of microbubbles as the diffuse optical imaging contrast agents, Homa Assadi, Ryerson Univ. (Canada) [10685-78]

Spatially resolved diffuse optical correlation spectroscopy (SR-DOCS) for quantitative assessment of tissue perfusion matrix, Sujatha Narayanan Unni, Vysakh Vasudevan, Kavyakantha R.S., Indian Institute of Technology Madras (India) [10685-79]

WEDNESDAY POSTER SESSION. WED 17:45 TO 19:30

Posters-Wednesday

Conference attendees are invited to attend the Photonics Europe poster session on Wednesday 17.45 to 19.30. Posters will be on display after 10.00 Wednesday morning in the Hall Rhin. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster authors, view poster presentation guidelines and set-up instructions at <http://spie.org/x34963.xml> and on page 96.

Bedsore revitalization by laser therapy (LLLT), Mohammad Nazrul Islam, Shaheed Suhrawardy Medical College and Hospital (Bangladesh) [10685-101]

Eating habits characterization with NIR spectroscopy and bioimpedance wearable sensor, Vladislav Lychagov, Samsung Russia Research Institute (Russian Federation) [10685-102]

Polymeric optical fiber tweezers trapping performance of single biological versus synthetic structures: a theoretical and experimental approach, Joana I. Paiva, INESC TEC (Portugal) and Univ. do Porto (Portugal); Rita S. R. Ribeiro, 4Dcell (France) and Elvysys (France); Pedro A. S. Jorge, Carla C. Rosa, INESC TEC (Portugal) and Univ. do Porto (Portugal); Maria M. Azevedo, Paula Sampaio, i3S - Instituto de Investigação e Inovação em Saúde (Portugal); Joao P. S. Cunha, INESC TEC (Portugal) and Univ. do Porto (Portugal) [10685-103]

Interaction of upconversion luminescent nanoparticles with tissues and organs, Irina Yu Yanina, Elena K. Volkova, Saratov State Univ. (Russian Federation) and Tomsk State Univ. (Russian Federation); Elena A. Sagaidachnaya, Saratov State Univ. (Russian Federation); Nikita A. Navolokin, Saratov State Medical Univ. (Russian Federation); Mohammed Ammar Hussein, Andrei M. Zakharevich, Saratov State Univ. (Russian Federation); Vyacheslav I. Kochubey, Saratov State Univ. (Russian Federation) and Tomsk State Univ. (Russian Federation); Valery V. Tuchin, Saratov State Univ. (Russian Federation) and Tomsk State Univ. (Russian Federation) and Institute of Precision Mechanics and Control RAS (Russian Federation) [10685-104]

2D MFDA analysis to diagnose solar retinopathy, Sabyasachi Mukhopadhyay, Nandan Das, Sawon Pratiher, Indian Institute of Science Education and Research Kolkata (India); Jay Chhablani, Ashutosh Richhariya, LV Prasad Eye Institute (India); Nirmalya Ghosh, Prasanta K. Panigrahi, Indian Institute of Science Education and Research Kolkata (India) [10685-105]

Photonic immobilization techniques used for the detection of cardiovascular disease biomarkers, Odete Sofia Gonçalves, Aalborg Univ. (Denmark); María-José Bañuls, Rafael Alonso, Pilar Jiménez-Meneses, Ángel Maquieira, Instituto Interuniversitario de Reconocimiento Molecular y Desarrollo Tecnológico (IDM) (Spain); Henrik Vorum M.D., Steffen B. Petersen, Maria Teresa Neves-Petersen, Aalborg Univ. (Denmark) [10685-106]

Ex-vivo characterization of cancerous and noncancerous tissues by multispectral Mueller polarimetric imaging, Azael Mora-Núñez, Univ. de Guadalajara (Mexico); Geminiano Martínez-Ponce, Centro de Investigaciones en Óptica, A.C. (Mexico); Guillermo García Torales, Beethoven Bravo-Medina, Anuar Beltrán-González, Univ. de Guadalajara (Mexico) [10685-107]

Nanoparticle-induced aggregation of red blood cells probed with optical tweezers, Tatiana I. Avsievich, Alexey Popov, Alexander Bykov, Igor A. Meglinski, Univ. of Oulu (Finland) [10685-108]

Multimodal optical diagnostic approach in psoriasis diagnosis, Viktor V. Dremine, Mariya A. Filina, Elena V. Zharkikh, Igor O. Kozlov, Orel State Univ. named after I.S. Turgenev (Russian Federation); Evgeny A. Zherebtsov, Aston Univ. (United Kingdom); Elena V. Potapova, Orel State Univ. named after I.S. Turgenev (Russian Federation); Nadezda S. Malaya, Orel Dermatovenerologic Dispensary (Russian Federation); Irina A. Snimshchikova, Andrey V. Dunaev, Orel State Univ. named after I.S. Turgenev (Russian Federation) [10685-109]

Monitoring of fibrinogen in blood using double slot hybrid plasmonic waveguide, Lokendra Singh, Santosh Kumar, DIT Univ. (India); Nan-Kuang Chen, National United Univ. (Taiwan) [10685-111]

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Optical breast spectroscopy enabled prescreening of women for breast cancer with a focus on low resource setting, Lothar D. Lilge, Jane Walter, Univ. Health Network (Canada); Julia Knight, Samuel Lunenburg Research Institute, Mount Sinai Hospital (Canada); Michelle Nielsen, Brian C. Wilson, Univ. Health Network (Canada) [10685-112]

A method for skin malformation classification by combining multispectral and skin autofluorescence imaging, Ilze Lihacova, Univ. of Latvia (Latvia); Katrina Bolochko, Riga Technical Univ. (Latvia); Emilija V. Plorina, Marta Lange, Ilze Ošiņa, Alexey Lihachev, Univ. of Latvia (Latvia) [10685-113]

OCT-based characterization of the nonlinear properties of biological tissues in various states, Alexandr A. Sovetsky, Institute of Applied Physics of the Russian Academy of Sciences (Russian Federation); Ekaterina V. Gubarkova, Nizhny Novgorod State Medical Academy (Russian Federation); Lev A. Matveev, Alexander L. Matveyev, Institute of Applied Physics of the Russian Academy of Sciences (Russian Federation); Marina A. Sirotkina, Natalia D. Gladkova, Nizhny Novgorod State Medical Academy (Russian Federation); Vladimir Y. Zaitsev, Institute of Applied Physics of the Russian Academy of Sciences (Russian Federation) [10685-114]

Label-free gram classification of bacterial colonies using hyperspectral imaging, Manuel Petit, Rony Midahuen, Pierre Mahé, Philippine Barlas, Eric Laloum, Corine Fulchiron, Denis F. Leroux, bioMérieux SA (France) [10685-115]

An automated preprocessing method based on multiple wavelength measurements for image reconstruction of ultrasound-guided DOT, Murad Althobaiti, Imam Abdulrahman Bin Faisal Univ. (Saudi Arabia); Quing Zhu, Univ. of Connecticut (United States) [10685-116]

Optical fibre ultrasound transmitters using polydimethylsiloxane (PDMS) composites with wavelength-selective inks, Richard J. Colchester, Sacha Noimark, Erwin J. Alles, Sunish J. Mathews, Univ. College London (United Kingdom); Malcolm C. Finlay, Queen Mary Univ. of London (United Kingdom) and Barts Health NHS Trust (United Kingdom); Edward Z. Zhang, Paul C. Beard, Ivan P. Parkin, Sébastien Ourselin, Ioannis Papakonstantinou, Adrien E. Desjardins, Univ. College London (United Kingdom) [10685-117]

Pork spoilage examination by visible and near-infrared spectroscopy, Motahareh Peyvaste, Alexey Popov, Aleksander Bykov, Igor A. Meglinski, Optoelectronics and Measurement Techniques Lab. (Finland) [10685-118]

Multimodal OCT characterization of human breast cancer morphological types: preliminary study, Ekaterina V. Gubarkova, Nizhny Novgorod State Medical Academy (Russian Federation); Alexandr A. Sovetsky, Institute of Applied Physics of the Russian Academy of Sciences (Russian Federation); Lev A. Matveev, Nizhny Novgorod State Medical Academy (Russian Federation) and Institute of Applied Physics of the Russian Academy of Sciences (Russian Federation); Vladimir Y. Zaitsev, Nizhny Novgorod State Medical Academy (Russian Federation) and Institute of Applied Physics of the Russian Academy of Sciences (Russian Federation); Alexander A. Moiseev, Nizhny Novgorod State Medical Academy (Russian Federation) and Institute of Applied Physics of the Russian Academy of Sciences (Russian Federation); Dmitry A. Vorontsov, Alexey Y. Vorontsov, Nizhny Novgorod Regional Oncology Hospital (Russian Federation); Sergey S. Kuznetsov, Natalia D. Gladkova, Marina A. Sirotkina, Nizhny Novgorod State Medical Academy (Russian Federation) [10685-119]

High-speed functional optical-resolution photoacoustic microscopy using stimulated Raman scattering source and contrast agent, Sang-Won Lee, Korea Research Institute of Standards and Science (Korea, Republic of) and Korea Univ. of Science and Technology (Korea, Republic of); Soon-Woo Cho, Pusan National Univ. (Korea, Republic of); Heesung Kang, Korea Research Institute of Standards and Science (Korea, Republic of); Sang Min Park, Pusan National Univ. (Korea, Republic of); Tae Geol Lee, Korea Research Institute of Standards and Science (Korea, Republic of); Chang-Seok Kim, Pusan National Univ. (Korea, Republic of) [10685-120]

Interaction of some styryl dyes with DNA and its spectroscopic manifestation, Eldar N. Kurtaliev, Negmat Nizomov, Samarkand State Univ. (Uzbekistan); Shawkat Nizamov, Almazov National Medical Research Ctr. (Germany); Dilorom Khakimova, "Sihat-Shifo-Bakhsh" Medical Ctr. (Uzbekistan); Akmal Yarmukhamedov, Samarkand State Univ. (Uzbekistan) [10685-121]

Optical properties of colorectal muscle in visible/NIR range, Isa Carneiro, Sónia Carvalho, Rui Henrique, Luis Oliveira, IPO-PORTO (Portugal); Valery V. Tuchin, Saratov State Univ. (Russian Federation) [10685-122]

Fluorescent properties of nanodiamonds in result of interactions of nanodiamonds with biomacromolecules in water, Ekaterina Vervald, Alexey Vervald, Kirill A. Laptinskiy, Tatiana Dolenko, M.V. Lomonosov Moscow State Univ. (Russian Federation) [10685-123]

Visual assessment criteria of microstructural ex vivo co- and cross-polarized optical coherence tomography images in gliomas, Konstantin Yashin, Privolzhsky Federal Research Ctr. (Russian Federation); Elena B. Kiseleva, Ekaterina V. Gubarkova, Nizhny Novgorod State Medical Academy (Russian Federation); Alexander A. Moiseev, Institute of Applied Physics of the Russian Academy of Sciences (Russian Federation); Sergey S. Kuznetsov, Nizhny Novgorod State Medical Academy (Russian Federation); Igor A. Medyanik, Privolzhsky Federal Research Ctr. (Russian Federation); Elena V. Zagaynova M.D., Nizhny Novgorod State Medical Academy (Russian Federation); Leonid Y. Kravets, Privolzhsky Federal Research Ctr. (Russian Federation); Natalia D. Gladkova, Nizhny Novgorod State Medical Academy (Russian Federation) [10685-124]

Determination of optical properties of mice internal organs in the range of 380 nm to 1900 nm, Marcelo Saito Nogueira, Tyndall National Institute (Ireland) and Univ. College Cork (Ireland); Michael Raju, Jacqueline Gunther, Katarzyna Komolibus, Konstantin Grygoryev, Huihui Lu, Eduardo Moriyama, Stefan Andersson-Engels, Tyndall National Institute (Ireland) [10685-125]

Vibrational spectroscopy of tissue-engineered structures based on proteins, chitosan and carbon nanotube conjugates, Yuliya Fedorova, Aleksandr Alexandrovich Polokhin, Alexander Gerasimenko, National Research Univ. of Electronic Technology (Russian Federation) [10685-126]

Development of the experimental setup for multispectral nanoparticle tracking analysis, Pavel V. Shalaev, Bogdan Kvasnov, Sergey Dolgushin, Sergey Tereshchenko, National Research Univ. of Electronic Technology (Russian Federation) [10685-127]

Design of the stand for in vivo skin surface study by scattered ellipsometry method, Anastasiia B. Bul'ykina, Victoria Ryzhova, Valery Korotaev, Nikita Samokhin, ITMO Univ. (Russian Federation) [10685-128]

Analysis of the microtubule electrical transmission from the mathematical crystal theory approach: is it feasible using transport electrical properties to detect diseases?, Noemí Sánchez Castro, Benemérita Univ. Autónoma de Puebla (Mexico) and École d'optométrie, Univ. of Montreal (Canada); Martha A. Palomino Ovando, Benemérita Univ. Autónoma de Puebla (Mexico); Kanad Ray, Amity Institute of Applied Sciences, Amity Univ. (India); Anirban Bandyopadhyay, National Institute for Materials Science (Japan); Jocelyn Faubert, J. Eduardo Lugo Arce, École de Optométrie, Univ. of Montreal (Canada) [10685-129]

Study of photodynamic diagnosis for peritoneal metastasis using talaporfin sodium, Kensho Suzuki, Liming Li, Chitose Institute of Science and Technology (Japan) [10685-130]

Component analysis of gallstones using FE-SEM and EDS, Hajime Mizumoto, Chitose Institute of Science and Technology (Japan) . . . [10685-131]

Photoacoustic microscopy with transmissive adaptive optics using liquid crystal, Yusuke Notsuka, Saga Univ. (Japan); Makoto Kurihara, Nobuyuki Hashimoto, Citizen Watch Co., Ltd. (Japan); Yoshinori Harada M.D., Kyoto Prefectural Univ. of Medicine (Japan); Eiji Takahashi, Yoshihisa Yamaoka, Saga Univ. (Japan) [10685-132]

Development and validation of a heuristic algorithm for the calculation of the optical properties of turbid media, Marius Hinsberger, Univ. des Saarlandes (Germany); Stefan Naumann, Klaus-Uwe Gollmer, Hochschule Trier (Germany); Achim Langenbucher, Bernhard Schick, Univ. des Saarlandes (Germany) [10685-133]

In vivo study of skin cancers with dermatoscopy, hyperspectral imaging and Raman spectroscopy, Ivan A. Bratchenko, Samara Univ. (Russian Federation); Alexander A. Moryatov, Samara State Medical Univ. (Russian Federation); Yulia A. Khristoforova, Dmitry N. Artemyev, Oleg O. Myakinin, Samara Univ. (Russian Federation); Sergey V. Kozlov, Oleg I. Kaganov, Samara State Medical Univ. (Russian Federation); Valery P. Zakharov, Samara Univ. (Russian Federation) [10685-134]

Stimulation of the specific conductivity of the biocompatible nanomaterial layers by laser irradiation, Levon Ichkitidze, National Research Univ. of Electronic Technology (Russian Federation); Olga Glukhova, Georgy Savostyanov, Saratov State Univ. (Russian Federation); Alexander Gerasimenko, Vitaly Podgaetsky, Sergey Selishchev, National Research Univ. of Electronic Technology (Russian Federation) [10685-135]

Relationship between NIR laser power and the human forehead tissue backscattering image features, Jirapong Manit, Achim Schweikard, Floris Ernst, Univ. zu Lübeck (Germany) [10685-136]

Feasibility study of polarization imaging and confocal fluorescence microscopy for histology analysis of soft tissue neoplasia, Tsanislava I. Genova-Hristova, Institute of Electronics (Bulgaria); Thomas Sang Hyuk Yoo, Hee Ryung Lee, Ecole Polytechnique (France) and Univ. Paris-Saclay (France) and Ctr. National de la Recherche Scientifique (France); Ekaterina G. Borisova, Institute of Electronics (Bulgaria); Enric Garcia-Caurel, Ecole Polytechnique (France) and Univ. Paris-Saclay (France) and Ctr. National de la Recherche Scientifique (France); Razvigor Ossikovski, Tatiana Novikova, Ecole Polytechnique (France) and Univ. Paris-Saclay (France) and Ctr. National de la Recherche Scientifique (France); Oxana Semyachkina-Glushkovskaya, Daniil Bratashov, Dmitry Gorin, Saratov State Univ. (Russian Federation); Ivan Terziev M.D., Univ. Hospital "Tsaritsa Yoanna-ISUL" (Bulgaria) [10685-137]

Optical UV-VIS-NIR spectroscopy of benign, dysplastic and malignant cutaneous lesions ex vivo, Ekaterina G. Borisova, Tsanislava I. Genova-Hristova, Institute of Electronics (Bulgaria); Petranka Troyanova M.D., Ivan Terziev M.D., Univ. Hospital "Tsaritsa Yoanna-ISUL" (Bulgaria); Elina Genieva, Alexey Bashkatov, Valery V. Tuchin, Saratov State Univ. (Russian Federation) [10685-138]

The laser welding of the nanocomposites with biotissues of the cardiovascular system, Dmitry I. Ryabkin, Alexander Gerasimenko, Vitaly Podgaetsky, National Research Univ. of Electronic Technology (Russian Federation) [10685-139]

Multispectral analysis and characterization of biological tissues for the evaluation of ocular changes derived from folic acid deficiency, Ouafa Sijlmasi, José Manuel López-Alonso, Pablo Guillén Montesdeoca, María del Carmen Barrio Asensio, Aurora Del Río Sevilla, Univ. Complutense de Madrid (Spain) [10685-140]

Double-snapshot mapping of up to five skin chromophores, Ilze Ošiņa, Raimonds Ciems, Kalvis Lauberts, Edgars Kviesis-Kipge, Janis Spigulis, Univ. of Latvia [10685-141]

Optical monitoring of cell migration processes in a 3D scaffold, Ines Delfino, Univ. degli Studi della Tuscia (Italy); Marianna Portaccio, Antonella D'Agostino, Univ. degli Studi della Campania Luigi Vanvitelli (Italy); Maria Lepore, Seconda Univ. degli Studi di Napoli (Italy); Felice Campitello, Chiara Schiraldi, Univ. degli Studi della Campania Luigi Vanvitelli (Italy) [10685-142]

Snapshot hyperspectral system for noninvasive skin blood oxygen saturation monitoring, Uldis Rubins, Zbigniew Marcinkevics, Janis Cimurs, Andris Grabovskis, Edgars Kviesis-Kipge, Univ. of Latvia (Latvia) [10685-143]

Assessment of oxidative stress in liver grafts using time-resolved fluorescence spectroscopy, Marcelo Saito Nogueira, Alessandro Cosci, Instituto de Física de São Carlos, Univ. of São Paulo (Brazil); Cristina Kurachi D.D.S., Instituto de Física de São Carlos (Brazil) [10685-144]

Studies of normal and glycated hemoglobin refraction, fluorescence and Raman scattering, Ekaterina N. Lazareva, Saratov State Univ. (Russian Federation) and Immanuel Kant Baltic Federal Univ. (Russian Federation) and National Research Tomsk State Univ. (Russian Federation); Andrey Y. Zyubin, Ilya G. Samusev, Immanuel Kant Baltic Federal Univ. (Russian Federation); Vyacheslav I. Kochubev, Saratov State Univ. (Russian Federation) and National Research Tomsk State Univ. (Russian Federation); Valery V. Tuchin, Saratov State Univ. (Russian Federation) and National Research Tomsk State Univ. (Russian Federation) and Institute of Precision Mechanics and Control, Russian Academy of Sciences (Russian Federation) [10685-145]

Application of portable fluorescence reader for evaluation of skin autofluorescence in patients with age-related macular degeneration and cataract, Ivan A. Bratchenko, Vladimir N. Grishanov, Dmitry V. Kornilov, Valery P. Zakharov, Samara Univ. (Russian Federation); Peter A. Lebedev, Igor V. Malov, Elena S. Pshenitsina, Elena V. Baykina, Samara State Medical Univ. (Russian Federation) [10685-146]

Optical design improvement for noncontact skin cancer diagnostic device, Emilija V. Plorina, Institute of Atomic Physics and Spectroscopy, Univ. of Latvia (Latvia); Dmitrijs Bliznuks, Riga Technical Univ. (Latvia); Alexey Lihachev, Aleksandrs Derjabo, Ilze Ošiņa, Ilze Lihacova, Marta Lange, Institute of Atomic Physics and Spectroscopy, Univ. of Latvia (Latvia) [10685-147]

Convolutional neural networks for diagnostics skin cancer on images of optical coherence tomography, Dmitry S. Raupov, Ivan A. Bratchenko, Valery P. Zakharov, Samara Univ. (Russian Federation) [10685-148]

Raman spectral features of human body fluids from the patients with malignant tumors and correlation with biochemical analysis results, Lyudmila A. Shamina, Ivan A. Bratchenko, Dmitry N. Artemyev, Oleg O. Myakinin, Samara Univ. (Russian Federation); Alexander A. Moryatov, Samara State Medical Univ. (Russian Federation); Andrey E. Orlov, Samara Regional Clinical Oncology Dispensary (Russian Federation); Sergey V. Kozlov, Valery P. Zakharov, Samara State Medical Univ. (Russian Federation) [10685-149]

Effect of excitation wavelength and light exposure time on quantum dots luminescent properties, Julie Hottechamps, Univ. de Liège (Belgium); Thomas Noblet, Christophe Humbert, Univ. Paris-Sud 11 (France); Laurent Dreesen, Univ. de Liège (Belgium) [10685-150]

On-the-fly respiratory cycle estimation method based on photoplethysmography waveform morphology analysis, Sylwester Nowocień, Wrocław Univ. of Science and Technology (Poland) [10685-151]

Raman spectra comparative analysis of human tissues excited at 785 nm using PLS method, Dmitry N. Artemyev, Ivan A. Bratchenko, Anastasia Lykina, Samara Univ. (Russian Federation); Vladimir Kukushkin, Institute of Applied Physics of the Russian Academy of Sciences (Russian Federation); Sofya Avraamova, Nikolay Aleksandrov, Uryi Kirillov, Sechenov Univ. (Russian Federation); Valery P. Zakharov, Samara Univ. (Russian Federation) [10685-152]

Study of the effectiveness of sunscreen lotion under long-term exposure to ultraviolet, Chun Ho Tan, Wan Maryam Wan Ahmad Kamal, Mohd Zubir Mat Jafri, Ahmad Fairuz Omar, Univ. Sains Malaysia (Malaysia) [10685-153]

Visible light communication-based safe and accurate healthcare system for EEG using color constellation scheme, Dil Nashin Anwar, Anand Srivastava, Indian Institute of Technology Delhi (India) [10685-154]

Cardiovascular effects of mannitol infusion: a comparison study performed on mouse and human, Teemu S. Myllylä, Mika Kaakinen, Aleksandra Zienkiewicz, Erkki Vihriälä, Vesa Korhonen, Matti Huotari, Univ. of Oulu (Finland); Outi Kuittinen M.D., Oulu Univ. Hospital (Finland); Lauri Eklund, Univ. of Oulu (Finland); Vesa Kiviniemi M.D., Oulu Univ. Hospital (Finland) [10685-155]

Strategic combination of antimicrobial photodynamic therapy with mathematical tools to eradicate *Enterococcus faecalis*, Janice R. Perussi, Eduardo B. Azevedo, Larissa S. Amaral, Univ. de São Paulo (Brazil) [10685-156]

Blood flow oscillations as a characteristic of microvascular abnormalities, Elena V. Zharkikh, Orel State Univ. named after I.S. Turgenev (Russian Federation); Irina Mizeva, Institute of Continuous Media Mechanics (Russian Federation); Irina Makovik, Viktor V. Dremine, Orel State Univ. named after I.S. Turgenev (Russian Federation); Evgeny Zharebtsov, Aston Univ. (United Kingdom); Elena V. Potapova, Andrey V. Dunaev, Orel State Univ. named after I.S. Turgenev (Russian Federation) [10685-157]

Detection of structural changes based on Mie scattering analyses of mouse fibroblast L929 cells before and after apoptosis, Tobias Baselt, Westsächsische Hochschule Zwickau (Germany); Florian Rudek, Clemens Richter, Bryan Nelsen, Westsächsische Hochschule Zwickau (Germany) and Fraunhofer IWS Dresden (Germany); Andrés Fabián Lasagni, Fraunhofer IWS Dresden (Germany); Peter Hartmann, Fraunhofer IWS Dresden (Germany) and Westsächsische Hochschule Zwickau (Germany) [10685-158]

Verification of NADH content measurements by portable optical diagnostic system in living brain tissue, Evgeny Zharebtsov, Aston Univ. (United Kingdom); Plamena Angelova, Univ. College London (United Kingdom); Sergei G. Sokolovski, Aston Univ. (United Kingdom); Andrey Abramov, Univ. College London (United Kingdom); Edik U. Rafailov, Aston Univ. (United Kingdom) [10685-159]

Enhanced Savitzky-Golay smoothing for optimal denoising of Raman spectra, Sinead Barton, Tomás Ward, Bryan Hennelly, National Univ. of Ireland, Maynooth (Ireland) [10685-160]

Precision farming solutions powered by laser applications, Christian Marx, Laser Zentrum Hannover e.V. (Germany) [10685-161]

2D photonic crystal membranes for biosensing applications, Mayur K. Chhipa, K. Srimannarayana, K L Univ. (India) [10685-162]

Nonlinear microscopy differentiates normal from pathological breast tissue, Evangelia Gavgiotaki, Foundation for Research and Technology-Hellas (Greece) [10685-163]

Diatomite nanovectors uptake in cancer cells: a Raman imaging study, Stefano Managò, Consiglio Nazionale delle Ricerche (Italy); Nunzia Migliaccio, Univ. degli Studi di Napoli Federico II (Italy); Monica Terracciano, Michela Napolitano, Istituto per la Microelettronica e Microsistemi (Italy); Nicola Martucci, Univ. degli Studi di Napoli Federico II (Italy); Luca De Stefano, Ivo Rendina, Istituto per la Microelettronica e Microsistemi (Italy); Anna Chiara De Luca, Consiglio Nazionale delle Ricerche (Italy); Annalisa Lamberti, Univ. degli Studi di Napoli Federico II (Italy); Ilaria Rea, Istituto per la Microelettronica e Microsistemi (Italy) [10685-164]

Investigating the progression of oral cancer using Raman spectroscopy, Nikki Kuhar, Indian Institute of Science (India); Shaiju S. Nazeer, Sree Chitra Tirunal Institute for Medical Sciences & Technology (India); Rekha V. Kumar, Siva Umamathy, Indian Institute of Science (India) [10685-165]

Insights into phenotypic antibiotic resistance in *E. coli*: a Raman spectroscopic approach, Taru Verma, Dipankar Nandi, Siva Umamathy, Indian Institute of Science (India) [10685-166]

Investigating the effect of singlet oxygen of polymerase activity during modulated irradiation at photodynamic treatment, Nikita Kaydanov, A. K. Emelyanov, Stanislav V. Shmakov, Nikolay A. Knyazev, Vladimir Vitalievich Klimentko, St. Petersburg Academic Univ. (Russian Federation) [10685-167]

Selective detection of MT1-MMP using peptide fluorescent gold nanocluster for metastatic cancer imaging, Minhee Ku, Jaemoon Yang, Yonsei Univ. College of Medicine (Korea, Republic of) [10685-168]

Dynamical and structural properties of flavin adenine dinucleotide in aqueous solutions, Ines Delfino, Univ. degli Studi della Tuscia (Italy); Rosario Esposito, Univ. degli Studi di Napoli Federico II (Italy); Marianna Portaccio, Maria Lepore, Univ. degli Studi della Campania Luigi Vanvitelli (Italy) [10685-169]

Laser Doppler spectrum decomposition applied in diagnostics of microcirculatory disturbances, Igor O. Kozlov, Orel State Univ. named after I.S. Turgenev (Russian Federation); Evgeny A. Zharebtsov, Aston Univ. (United Kingdom); Victor V. Dremine, Elena V. Zharkikh, Andrey V. Dunaev, Orel State Univ. named after I.S. Turgenev (Russian Federation); Edik U. Rafailov, Aston Univ. (United Kingdom) [10685-170]

Application of the fluorescence spectroscopy for the analysis of the state of abdominal cavity organs tissues in mini-invasive surgery, Ksenia Kandurova, Victor V. Dremine, Orel State Univ. named after I.S. Turgenev (Russian Federation); Evgeny A. Zharebtsov, Aston Univ. (United Kingdom); Andrey V. Dunaev, Orel State Univ. named after I.S. Turgenev (Russian Federation); Andrian V. Mamoshin, Alexandr L. Alyanov, Orel State Univ. named after I.S. Turgenev (Russian Federation) and Orel Regional Clinical Hospital (Russian Federation); Vadim F. Muradyan, Orel Regional Clinical Hospital (Russian Federation) [10685-171]

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Optimisation of multimodal optical measurements for assessment of the dynamics in cutaneous blood flow and fluorescence in patients with diabetes, Elena V. Zharkikh, Viktor V. Dremine, Orel State Univ. named after I.S. Turgenyev (Russian Federation); Evgeny A. Zherebtsov, Aston Univ. (United Kingdom); Elena V. Potapova, Andrey V. Dunaev, Orel State Univ. named after I.S. Turgenyev (Russian Federation); Viktor V. Sidorov, SPE LAZMA Ltd. (Russian Federation); Alexander I. Krupatkin, Central Scientific-Research Institute of Traumatology and Orthopedics, n.n. Priorova (Russian Federation); Edik U. Rafailov, Aston Univ. (United Kingdom) [10685-172]

Use of fluorescent optical fibre probe for recording parameters of brain metabolism in rat model, Olga Stelmashchuk, Evgeniya Seryogina, Gennadii Pivachenko, Alexander Alekseyev, Orel State Univ. named after I.S. Turgenyev (Russian Federation); Evgeny A. Zherebtsov, Ilya Rafailov, Aston Univ. (United Kingdom); Evgeny Vorobyev, Alyona Kuznetsova, Elena Kuznetsova, Orel State Univ. named after I.S. Turgenyev (Russian Federation); Edik U. Rafailov, Aston Univ. (United Kingdom) [10685-173]

Evaluation of microvascular disturbances in rheumatic diseases by analysis of skin blood flow oscillations, Irina N. Makovik, Orel State Univ. named after I.S. Turgenyev (Russian Federation); Irina A. Mizeva, Institute of Continuous Media Mechanics (Russian Federation); Alexander I. Krupatkin, Central Scientific-Research Institute of Traumatology and Orthopedics, n.n. Priorova (Russian Federation); Igor V. Meglinski, Univ. of Oulu (Finland); Andrey V. Dunaev, Orel State Univ. named after I.S. Turgenyev (Russian Federation) [10685-174]

Investigating the effect of singlet oxygen on polymerase activity during modulated irradiation at photodynamic treatment, Nikita Kaydanov, Vladimir Vitalievich Klimenko, Stanislav V. Shmakov, Anton K. Emelyanov, Nickolay A. Knyazev, St Petersburg Academic Univ (Russian Federation) [10685-175]

Evaluation of ring PMUT arrays for photoacoustic imaging, Ajay Dangi, Pennsylvania State Univ (United States); Rudra Pratap, Indian Institute of Science (India); Sri-Rajasekhar Kothapalli, Pennsylvania State Univ (United States) [10685-176]

THURSDAY 26 APRIL

HOT TOPICS SESSION III 9:00 TO 10:35

From extreme nonlinear optics to ultrafast atomic physics
Anne L'Huillier, Lund Univ., Sweden

Quantum computations and quantum simulations with trapped ions

Rainer Blatt, Institute for Experimental Physics, Univ. of Innsbruck, Austria

For additional details, please see page 8

SESSION 11 THU 11:00 TO 12:15

Therapy III

Session Chair: **Sylvain Gioux**, ICube (France)

Histological study of the oral mucosa regeneration after fractional diode laser treatment with a wavelength of 980 nm, Elena S. Sergeeva, Saint Petersburg State Univ. (Russian Federation); Andrey V. Belikov, ITMO Univ. (Russian Federation); Luidmila A. Ermolaeva, Dmitriy E. Korzhevsky, Saint Petersburg State Univ. (Russian Federation); Yulia V. Semyashkina, Maria M. Antropova, ITMO Univ. (Russian Federation); Denis Y. Fedotov, Saint Petersburg State Univ. (Russian Federation) [10685-80]

Analysis of cardiomyocyte regeneration and mechanics via femtosecond nanosurgery and multiphoton microscopy, Dominik Müller, Patrick Heeger, Alexander Heisterkamp, Stefan Michael Klaus Kalies, Leibniz Univ. Hannover (Germany) [10685-81]

Development of an optogenetic triggered biohybrid cochlea implant, Patrick Heeger, Stefan Michael Klaus Kalies, Leibniz Univ. Hannover (Germany); Dag Heinemann, Laser Zentrum Hannover e.V. (Germany); Maria Leilani Torres, Alexander Heisterkamp, Leibniz Univ. Hannover (Germany) [10685-82]

Sapphire cryoprobe combining laser-assisted destruction and optical diagnostics of biotissue, Evgeniya Dubyanskaya, Institute of Solid State Physics RAS (Russian Federation) [10685-83]

Review article : PET and the optimized time to take ¹¹C-PiB PET for Alzheimer patient, Pachara Thonglim, Prathan Buranasiri, Ratchanok Somphonsane King Mongkut's Institute of Technology Ladkrabang (Thailand) [10685-84]

Lunch BreakThu 12:15 to 13:15

SESSION 12 THU 13:15 TO 15:15

Imaging and Spectroscopy

Session Chair: **Francesco Saverio Pavone**,
LENS - Lab. Europeo di Spettroscopia Non-Lineari (Italy)

In vivo detection of reactive oxygen species using Eu-based luminescent nanoparticles, Nicolas Pétri, Mouna Abdesslem, Ecole Polytechnique (France); Valérie Rouffiac, Gustave Roussy (France); Rivo O. Ramodiharilafy, Thierry Gacoin, Ecole Polytechnique (France); Corinne Laplace-Builhé, Gustave Roussy (France); Cédric I. Bouzigues, Antigoni Alexandrou, Ecole Polytechnique (France) [10685-85]

White-light from soot: closing the gap in the diagnostic market, Hannelore Bové, Univ. Hasselt (Belgium) and KU Leuven (Belgium); Christian Steuwe, KU Leuven (Belgium); Nelly Saenen, Univ. Hasselt (Belgium); Tim Nawrot, Univ. Hasselt (Belgium) and KU Leuven (Belgium); Maarten Roeffaers, KU Leuven (Belgium); Marcel Ameloot, Univ. Hasselt (Belgium) [10685-86]

Remote monitoring vital signs using active 3D imaging, Piotr Garbat, Agata Olszewska, Karolina Waledzik, Ryszard Piramidowicz, Warsaw Univ. of Technology (Poland) [10685-87]

Early arriving photon imaging for locating optical endomicroscopy fibres and medical devices, Michael G. Tanner, Tushar R. Choudhary, Heriot-Watt Univ. (United Kingdom); Tom H. Craven, Bethany Mills, Mark Bradley, Robert K. Henderson, Kevin Dhaliwal, The Univ. of Edinburgh (United Kingdom); Robert R. Thomson, Heriot-Watt Univ. (United Kingdom) [10685-88]

Laser correlation spectroscopy as a powerful tool to study immune responses, Elina K. Nepomnyashchaya, Elena N. Velichko, Evgenij Aksenov, Saint-Petersburg State Polytechnical Univ. (Russian Federation); Tatyana Bogomaz, Saint Petersburg State Polytechnic Univ. (Russian Federation) [10685-89]

Single-shot microsecond-resolved spectroscopy of the bacteriorhodopsin photocycle with quantum cascade laser frequency combs, Markus Geiser, IRSweep GmbH (Switzerland); Jessica L. Klocke, Univ. Bielefeld (Germany); Markus Mangold, Pitt Allmendinger, Andreas Hugi, Pierre Jouy, Balint Horvath, IRSweep GmbH (Switzerland); Jérôme Faist, ETH Zurich (Switzerland); Tilman Kottke, Univ. Bielefeld (Germany) [10685-90]

Salient features of strain incorporation in individual and multicomponent amino acids using confocal Raman spectroscopy, Abigail Casey, Gregory E. Triplett, Virginia Commonwealth Univ. (United States) .. [10685-91]

Modular spectroscopy system for medical diagnosis, Iskander Usenov, Christian Nitschke, Technische Univ. Berlin (Germany); Urszula J. Zabarylo, Thaddäus Hocotz, Charité Universitätsmedizin Berlin (Germany); Viacheslav Artyushenko, art photonics GmbH (Germany) [10685-92]

SESSION 13 THU 15:45 TO 17:55

Imaging VII: Fluorescence

Session Chair: **Valery V. Tuchin**,
Saratov State Univ. (Russian Federation)

Structured illumination for live cell microscopy (Invited Paper), Herbert Schneckenburger, Verena Richter, Michael Wagner, Mathis Piper, Hochschule Aalen (Germany) [10685-93]

Novel fluorescent oxides provide insight into the dynamics of nanoparticle-mediated drug uptake from the gastro-intestinal tract, Waldemar Lipinski, Jaroslaw Kaszewski, Zdzislaw Gajewski, Michal M. Godlewski, Warsaw Univ. of Life Sciences SGGW (Poland); Marek Godlewski, Institute of Physics, Polish Academy of Sciences (Poland) [10685-94]

Synchronous fluorescence spectroscopy with and without polarization sensitivity for colorectal cancer differentiation, Tzanislava I. Genova-Hristova, Ekaterina G. Borisova, Institute of Electronics (Bulgaria); Nikolay Penkov M.D., Univ. Hospital "Tsaritsa Yoanna-ISUL" (Bulgaria); Borislav Vladimirov M.D., Univ. Hospital "Tsaritsa Yoanna-ISUL" (Bulgaria); Latchezar Avramov, Institute of Electronics (Bulgaria) [10685-95]

Multimodal non-gadolinium oxide nanoparticles for MRI and fluorescence labelling, Jaroslaw Olszewski, Michal M. Godlewski, Paula Kielbik, Jaroslaw Kaszewski, Warsaw Univ. of Life Sciences SGGW (Poland); Bartłomiej S. Witkowski, Institute of Physics, Polish Academy of Sciences (Poland); Zdzislaw Gajewski, Warsaw Univ. of Life Sciences SGGW (Poland); Marek Godlewski, Institute of Physics, Polish Academy of Sciences (Poland) [10685-96]

Measurement of skin autofluorescence by fluorescent spectrometry for diabetes diagnostics and control, Yulia Kononova, Saint Petersburg National Research Univ. of Information Technologies, Mechanics and Optics (Russian Federation) and Almazov National Medical Research Ctr. (Russian Federation); Anastasiya Arkhipova, Almazov National Medical Research Ctr. (Russian Federation); Garry Papayan, Saint Petersburg National Research Univ. of Information Technologies, Mechanics and Optics (Russian Federation) and Almazov National Medical Research Ctr. (Russian Federation) and Pavlov First Saint Petersburg State Medical Univ. (Russian Federation); Mikhail Khodzitsky, Saint Petersburg National Research Univ. of Information Technologies, Mechanics and Optics (Russian Federation); Alina Babenko, Elena Grineva, Saint Petersburg National Research Univ. of Information Technologies, Mechanics and Optics (Russian Federation) and Almazov National Medical Research Ctr. (Russian Federation)[10685-97]

Biodegradable, fluorescent oxide nanocrystals for application in biology and medicine, Paula Kielbik, Warsaw Univ. of Life Sciences SGGW (Poland); Jarosław Kaszewski, Institute of Physics, Polish Academy of Sciences (Poland); Jarosław Kaszewski, Warsaw Univ. of Life Sciences SGGW (Poland); Ewelina Wolska-Kornio, Bartłomiej S. S. Witkowski, Institute of Physics, Polish Academy of Sciences (Poland); Mikołaj A. Gralak, Zdzisław Gajewski, Warsaw Univ. of Life Sciences SGGW (Poland); Marek Godlewski, Institute of Physics, Polish Academy of Sciences (Poland); Michał M. Godlewski, Warsaw Univ. of Life Sciences SGGW (Poland)[10685-98]

Simple fibre-based dispersion management for two-photon excited fluorescence imaging through an endoscope, Dominik Marti, Konstantinos Dimopoulos, DTU Risø Campus (Denmark); Björn-Ole Meyer, Peter E. Andersen, DTU Fotonik (Denmark)[10685-99]

Multispectral fibre endoscope imaging system for enhanced visualisation of smartprobes, Helen Parker, The Univ. of Edinburgh (United Kingdom); James M. Stone, Univ. of Bath (United Kingdom); Tom Speight, The Univ. of Edinburgh (United Kingdom); Robert R. Thomson, Heriot-Watt Univ. (United Kingdom); Kevin Dhaliwal, Nikola Krstajić, Michael G. Tanner, The Univ. of Edinburgh (United Kingdom)[10685-100]

CONFERENCE 10686

Monday–Thursday 23–26 April 2018 • Proceedings of SPIE Vol. 10686

Silicon Photonics: from Fundamental Research to Manufacturing

Conference Chairs: **Roel G. Baets D.D.S.**, Univ. Gent (Belgium); **Peter O'Brien**, Tyndall National Institute (Ireland); **Laurent Vivien**, Ctr. de Nanosciences et de Nanotechnologies (France)

Programme Committee: **Frédéric Boeuf**, STMicroelectronics (France); **Jean-Marc Fédéli**, CEA-LETI (France); **José Capmany Franco**, Univ. Politècnica de Valencia (Spain); **Frederic Y. Gardes**, Univ. of Southampton (United Kingdom); **Martijn J. R. Heck**, Aarhus Univ. (Denmark); **Lorenzo Pavesi**, Univ. degli Studi di Trento (Italy); **Stefano Pelli**, Istituto di Fisica Applicata “Nello Carrara” (Italy); **Andrew W. Poon**, Hong Kong Univ. of Science and Technology (Hong Kong, China); **Joyce K. Poon**, Univ. of Toronto (Canada); **Miloš A. Popović**, Boston Univ. (United States); **Stefan F. Preble**, Rochester Institute of Technology (United States); **Jeremy Witzens**, RWTH Aachen Univ. (Germany); **Dan-Xia Xu**, National Research Council Canada (Canada); **Koji Yamada**, National Institute of Advanced Industrial Science and Technology (Japan); **Zhiping Zhou**, Peking Univ. (China)

MONDAY 23 APRIL

HOT TOPICS SESSION I 9:00 TO 11:00

From Einstein doubts to quantum bits: a second quantum revolution

Alain Aspect, Lab. Charles Fabry, Institut d'Optique, France

Pico-Photonics: watching and sensing single molecules by confining light to the atom scale

Jeremy J. Baumberg, NanoPhotonics Ctr., Univ. of Cambridge, United Kingdom

For additional details see page 6

OPENING REMARKS 11:25 TO 11:30

SESSION 1 MON 11:30 TO 13:00

Optical Transceivers and Manufacturing

Session Chair: **Roel G. Baets D.D.S.**,
Photonics Research Group (Belgium)

Advanced optical transceivers based on III-V-on-silicon photonic integrated circuits (*Invited Paper*), Günther Roelkens, Univ. Gent (Belgium) [10686-1]

Path for the silicon photonic transceiver to sit on the host-ASIC-substrate: III-V and 3D integration (*Invited Paper*), Sylvie Menezes, CEA-LETI (France) [10686-2]

Silicon photonics in 300mm: recent results and new applications (*Invited Paper*), Antonio Fincato, Marco Piazza, P. Orlandi, STMicroelectronics (Italy); Angelica Simbula, Univ. degli Studi di Pavia (Italy); Enrico Temporiti, STMicroelectronics SRL (Italy); Frédéric Boeuf, Charles Baudot, Sébastien Crémer, STMicroelectronics S.A. (France) [10686-3]

Lunch Break Mon 13:00 to 14:10

SESSION 2 MON 14:10 TO 15:30

Emerging Concepts and Technologies I

Session Chair: **Peter O'Brien**, Tyndall National Institute (Ireland)

Single atom electronics and photonics (*Invited Paper*), Juerg Leuthold, Alexandros Emboras, Bojun Cheng, Mathieu Luisier, Samuel Andermatt, Fabian Ducry, ETH Zurich (Switzerland); Thomas Schimmel, Karlsruher Institut für Technologie (Germany) [10686-4]

Reconfigurable photonics enabled by optical phase change materials (*Invited Paper*), Yifei Zhang, Massachusetts Institute of Technology (United States); Jeffrey B. Chou, MIT Lincoln Lab. (United States); Qihang Zhang, Junying Li, Massachusetts Institute of Technology (United States); Huashan Li, Sun Yat-Sen Univ. (China); Qingyang Du, Massachusetts Institute of Technology (United States); Anupama Yadav, Myungkoo Kang, Cesar Blanco, Univ. of Central Florida (United States); Huikai Zhong, Mikhail Y. Shalaginov, Jeffrey C. Grossman, Massachusetts Institute of Technology (United States); Richard Soref, Univ. of Massachusetts Boston (United States); Vladimir Liberman, MIT Lincoln Lab. (United States); Kathleen Richardson, Univ. of Central Florida (United States); Juejun Hu, Tian Gu, Massachusetts Institute of Technology (United States) [10686-5]

High-speed characteristics of strain-induced pockels effect in silicon, Mathias Berciano, Guillaume Marcaud, Xavier Le Roux, Paul Crozat, Carlos Alonso-Ramos, Daniel Benedikovic, Delphine Marris-Morini, Eric Cassan, Ctr. de Nanosciences et de Nanotechnologies (France); Pedro Damas, Ctr. de Nanosciences et de Nanotechnologies (France) and Calopa (Belgium); Laurent Vivien, Ctr. de Nanosciences et de Nanotechnologies (France) [10686-6]

SESSION 3 MON 16:00 TO 17:10

Emerging Concepts and Technologies II

Session Chair: **Peter O'Brien**, Tyndall National Institute (Ireland)

Photonic wirebonding and 3D nanoprinting in optical packaging: from research to manufacturing (*Invited Paper*), Christian Koos, Karlsruher Institut für Technologie (Germany) [10686-7]

Coherent absorption with plasmonics nanoantennas on SOI racetrack resonator, Bigeng Chen, Roman Bruck, Univ. of Southampton (United Kingdom); Nicholas J. Dinsdale, Optoelectronics Research Ctr., Univ. of Southampton (United Kingdom); David J. Thomson, Goran Z. Mashanovich, Graham T. Reed, Otto L. Muskens, Univ. of Southampton (United Kingdom) [10686-8]

Demonstration of photonic digital-to-analog conversion utilizing a single silicon Mach-Zehnder modulator, Guangwei Cong, National Institute of Advanced Industrial Science and Technology (Japan); Shota Kita, Kengo Nozaki, NTT Nanophotonics Ctr. (Japan) and NTT Basic Research Labs. (Japan); Takashi Inoue, National Institute of Advanced Industrial Science and Technology (Japan); Akihiko Shinya, NTT Nanophotonics Ctr. (Japan) and NTT Basic Research Labs. (Japan); Makoto Okano, Yuriko Maegami, Noritsugu Yamamoto, Morifumi Ohno, National Institute of Advanced Industrial Science and Technology (Japan); Masaya Notomi, NTT Nanophotonics Ctr. (Japan) and NTT Basic Research Labs. (Japan); Koji Yamada, National Institute of Advanced Industrial Science and Technology (Japan) [10686-9]

MONDAY POSTER SESSION MON 17:30 TO 19:00

Posters-Monday

Conference attendees are invited to attend the Photonics Europe poster session on Monday 17:30 to 19:00. Posters will be on display after 10.00 Monday morning in the Hall Rhin. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster authors, view poster presentation guidelines and set-up instructions at <http://spie.org/x34963.xml> and on page 96.

Novel ultralow power optical memory using liquid crystal, Salah S. A. Obayya, Zewail City of Science and Technology (Egypt); Mahmoud A. Elrabiaey, Zewail City of Science and Technology (Egypt) and Alexandria Univ. (Egypt); Hossam M. H. Shalaby, El-Sayed A. Youssef, Alexandria Univ. (Egypt) [10686-43]

Plasmonic dipole nanoantennas on a SiO₂/Si substrate and their characterization, Toni Haugwitz, TU Dresden (Germany); Jens-Wolfram Erben, Fraunhofer-Institut für Elektronische Nanosysteme (Germany); Niels Neumann, TU Dresden (Germany); Danny Reuter, Fraunhofer-Institut für Elektronische Nanosysteme (Germany); Dirk Plettemeier, TU Dresden (Germany) [10686-44]

Silicon-on-insulator-based slab to slot waveguide mode coupler, Bhaswati Singha Deo, Nishit Malviya, Vishnu Priye, Indian Institute of Technology (Indian School of Mines), Dhanbad (India) [10686-45]

Optimizing band-edge slow light in silicon-on-insulator grating waveguides, Marco Passoni, Dario Gerace, Lucio Claudio Andreani, University of Pavia (Italy); Liam O'Faolain, Center for Advanced Photonics and Process Analysis (Ireland) [10686-46]

Polymeric quantum dots and ZnS for light emitting structures for silicon photonics, Iago Rodriguez Diez, Isaac J. Luxmoore, Geoffrey Nash, Anna Baldycheva, Univ. of Exeter (United Kingdom) [10686-47]

TUESDAY 24 APRIL

SESSION 4. TUE 13:30 TO 16:00

Lasers and Amplifiers

Session Chair: **Roel G. Baets D.D.S.**,
Photonics Research Group (Belgium)

Advances on GeSn alloys lasers on Si (*Invited Paper*), Vincent Reboud, Mathieu Bertrand, CEA-LETI (France); Quang Minh Thai, CEA-INAC (France); Jérémie Chrétien, CEA-LETI (France); Nicolas Pauc, CEA-INAC (France); Rami Khazaka, Andrea Quintero, Philippe Rodriguez, CEA-LETI (France); Francesco Taro Armard, Hans Sigg, Paul Scherrer Institut (Switzerland); Alexei Chelnokov, Jean-Michel Hartmann, CEA-LETI (France); Vincent Calvo, CEA-INAC (France). [10686-10]

SiGeSn material for integrated optical devices (*Invited Paper*), Michael Oehme, Univ. Stuttgart (Germany). [10686-11]

Excitation wavelength dependency of photoluminescence spectra of highly strained direct bandgap Germanium microbridge cavities, Francesco Taro Armand Pilon, Thomas Zabel, Paul Scherrer Institut (Switzerland); Christopher Bonzon, ETH Zurich (Switzerland); Alban Gassenq, Nicolas Pauc, CEA-INAC (France) and Univ. Grenoble Alpes (France); Julie Widiez, Vincent Reboud, CEA-LETI (France) and Univ. Grenoble Alpes (France); Vincent Calvo, CEA-INAC (France) and Univ. Grenoble Alpes (France); Jean-Michel Hartmann, Alexei Chelnokov, CEA-LETI (France) and Univ. Grenoble Alpes (France); Jérôme Faist, ETH Zurich (Switzerland); Hans Sigg, Paul Scherrer Institut (Switzerland). [10686-12]

Tensile-strained germanium microdisks on metallic pedestals, Anas Elbaz, Ctr. de Nanosciences et de Nanotechnologies (France) and STMicroelectronics S.A. (France); Moustafa El Kurdi, Abdelhanin Aassime, Xavier Checoury, Isabelle Sagnes, Cédric Villebasse, Etienne Herth, Ctr. de Nanosciences et de Nanotechnologies (France); Charles Baudot, Frédéric Boeuf, STMicroelectronics S.A. (France); Philippe Boucaud, Ctr. de Nanosciences et de Nanotechnologies (France). [10686-13]

Rare earth mode-locked lasers on silicon (*Invited Paper*), Franz X. Kärtner, Deutsches Elektronen-Synchrotron (Germany). [10686-14]

On-chip optical amplification at C-band in silicon nitride slot waveguides, John Rönn, Aalto Univ. (Finland); Weiwei Zhang, Univ. Paris-Sud 11 (France); Anton Autere, Aalto Univ. (Finland); Xavier Le Roux, Elena Durán-Valdeiglesias, Univ. Paris-Sud 11 (France); Lasse Pakarinen, Aalto Univ. (Finland); Charles Baudot, Sylvain Guerber, Frédéric Boeuf, STMicroelectronics S.A. (France); Carlos Alonso-Ramos, Univ. Paris-Sud 11 (France); Antti Säynätjoki, Aalto Univ. (Finland) and Univ. of Eastern Finland (Finland); Laurent Vivien, Eric Cassan, Univ. Paris-Sud 11 (France); Zhipei Sun, Aalto Univ. (Finland). [10686-15]

HOT TOPICS SESSION II. 16:30 TO 18:05

Coherent combination of fiber amplified ultrafast laser pulses
Jens Limpert, Institute of Applied Physics, Friedrich Schiller Univ. Jena, Germany

2D materials and their heterostructures: fundamentals, applications and prototypes
Frank Koppens, ICFO-The Institute of Photonic Sciences, Spain

For additional details, please see page 7

WEDNESDAY 25 APRIL

SESSION 5. WED 8:30 TO 10:40

III-V on Si Photonic Devices and Circuits

Session Chair: **Laurent Vivien**,
Ctr. de Nanosciences et de Nanotechnologies (France)

Hybrid indium phosphide-on-silicon nanolaser diode (*Invited Paper*), Fabrice Raineri, Lab. de Photonique et de Nanostructures (France). [10686-16]

Monolithic integration of lasers on silicon (*Invited Paper*), Huiyun Liu, Univ. College London (United Kingdom). [10686-17]

Repeaterless data transmission at 1310nm using silicon photonic integrated circuit, Robert Sheehan, Tyndall National Institute (Ireland); Ines Ghorbel, Antonin Gallet, III-V Lab. (France); Cormac Eason, Peter O'Brien, Tyndall National Institute (Ireland); Alexandre Shen, Guang-Hua Duan, III-V Lab. (France); Fatima Gunning, Tyndall National Institute (Ireland). [10686-18]

Ultrahigh efficiency III-V on Si MOS capacitor optical modulator (*Invited Paper*), Tatsuro Hiraki, Takuma Aihara, Koichi Hasebe, Koji Takeda, Takuro Fujii, Tai Tsuchizawa, Takaaki Kakitsuka, Hiroshi Fukuda, Shinji Matsuo, NTT Device Technology Labs. (Japan). [10686-19]

Toward a hybrid integration of a 4-wavelength InGaAsP laser array on the slotted silicon waveguide, Xing Dai, Tyndall National Institute (Ireland); Weixi Chen, Jiao-Qing Pan, Institute of Semiconductors, Chinese Academy of Sciences (China); Hua Yang, Frank Hudson Peters, Tyndall National Institute (Ireland). [10686-20]

SESSION 6. WED 11:05 TO 12:25

Mid-IR Photonics

Session Chair: **Gunther Roelkens**, Univ. Gent (Belgium)

Ge/SiGe photonic devices for the long mid-infrared, Jean-Marc Fédéli, Pierre Labeye, Adrien Marchant, Olivier Lartigue, Maryse Fournier, Jean-Michel Hartmann, CEA-LETI (France). [10686-21]

Mid-IR octave spanning supercontinuum generation in an air clad silicon germanium waveguide, Milan Sinobad, Institut des Nanotechnologies de Lyon (France); Christelle Monat, Institut de Nanotechnologies de Lyon (France); Pan Ma, Barry Luther-Davies, Stephen Madden, The Australian National Univ. (Australia); David J. Moss, Swinburne Univ. of Technology (Australia); Arnan Mitchell, RMIT Univ. (Australia); Alberto Della Torre, Régis Orobdtchouk, Institut de Nanotechnologies de Lyon (France); Salim Boutami, Jean-Michel Hartmann, Jean-Marc Fédéli, CEA-LETI (France); Christian Grillet, Institut de Nanotechnologies de Lyon (France). [10686-22]

7.5 μm wavelength fiber-chip grating couplers for Ge-rich SiGe photonics integrated circuits, Qiankun Liu, Joan Manel Ramírez, Vladyslav Vakarin, Daniel Benedikovic, Carlos Alonso-Ramos, Ctr. de Nanosciences et de Nanotechnologies (France); Jacopo Frigerio, Andrea Ballabio, Giovanni Isella, Politecnico di Milano (Italy); Laurent Vivien, Delphine Marris-Morini, Ctr. de Nanosciences et de Nanotechnologies (France). [10686-23]

Ge-rich SiGe waveguides for supercontinuum generation in the mid-IR, Joan Manel Ramírez, Samuel Serna, Vladyslav Vakarin, Qiankun Liu, Ctr. de Nanosciences et de Nanotechnologies (France); Jacopo Frigerio, Andrea Ballabio, Politecnico di Milano (Italy); Xavier Le Roux, Laurent Vivien, Eric Cassan, Ctr. de Nanosciences et de Nanotechnologies (France); Giovanni Isella, Politecnico di Milano (Italy); Nicolas Dubreuil, Institut d'Optique Graduate School (France); Delphine Marris-Morini, Ctr. de Nanosciences et de Nanotechnologies (France). [10686-24]

Lunch/Exhibition Break Wed 12:25 to 13:30

CONFERENCE 10686

SESSION 7..... WED 13:30 TO 15:10

Mode Diversity and Light Coupling

Session Chair: **Peter O'Brien**, Tyndall National Institute (Ireland)

Mode selecting switch using multimode interference for on-chip optical interconnects (*Invited Paper*), Rubana Priti, Odile Liboiron-Ladouceur, McGill Univ. (Canada).....[10686-25]

Mode converters based on periodically perturbed waveguides for mode division multiplexing, Diego Pérez-Galacho, Carlos Alonso-Ramos, Delphine Marris-Morini, Vladyslav Vakarin, Xavier Le Roux, Laurent Vivien, Ctr. de Nanosciences et de Nanotechnologies (France).....[10686-26]

Vertically-bent silicon waveguide for high-efficiency optical fiber coupling (*Invited Paper*), Youichi Sakakibara, Yuki Atsumi, Emiko Omoda, Tomoya Yoshida, National Institute of Advanced Industrial Science and Technology (Japan).....[10686-27]

Low-loss grating-coupled optical interfaces for large volume fabrication with deep ultraviolet optical lithography, Daniel Benedikovic, Ctr. de Nanosciences et de Nanotechnologies (France); Carlos Alonso-Ramos, Univ. Paris-Sud 11 (France); Sylvain Guerber, STMicroelectronics S.A. (France); Diego Pérez-Galacho, Vladyslav Vakarin, Xavier Le Roux, Guillaume Marcaud, Eric Cassan, Delphine Marris-Morini, Univ. Paris-Sud 11 (France); Pavel Cheben, National Research Council Canada (Canada); Frédéric Boeuf, Charles Baudot, STMicroelectronics S.A. (France); Laurent Vivien, Univ. Paris-Sud 11 (France).....[10686-28]

SESSION 9..... WED 15:40 TO 17:50

Wavelength Diversity Devices and Systems

Session Chair: **Andrea I. Melloni**, Politecnico di Milano (Italy)

Silicon nitride photonic circuits for phase array antennas (*Invited Paper*), Chris G. H. Roeloffzen, Univ. Twente (Netherlands).....[10686-29]

Low crosstalk and wavelength tunable silicon arrayed waveguide gratings for on-chip optical multiplexing, Claudio Castellano, Stefano Tondini, Mattia Mancinelli, Univ. degli Studi di Trento (Italy); Christophe Kopp, CEA-LETI (France); Lorenzo Pavesi, Univ. degli Studi di Trento (Italy).....[10686-30]

Integrated SiN on SOI dual photonic platform for advanced datacom solutions, Sylvain Guerber, STMicroelectronics S.A. (France); Carlos Alonso-Ramos, Daniel Benedikovic, Diego Pérez-Galacho, Xavier Le Roux, Ctr. de Nanosciences et de Nanotechnologies (France); Nathalie Vulliet, Sébastien Crémer, Laurene Babaud, Jonathan Planchot, Daniel Benoit, Paul Chantaine, Francois Leverd, Delia Ristoiu, STMicroelectronics S.A. (France); Philippe Grosse, MINATEC (France); Delphine Marris-Morini, Ctr. de Nanosciences et de Nanotechnologies (France); Charles Baudot, STMicroelectronics S.A. (France); Laurent Vivien, Ctr. de Nanosciences et de Nanotechnologies (France); Frédéric Boeuf, STMicroelectronics S.A. (France).....[10686-31]

Enhanced hybrid Si-SiN photonic platform and performances of passive components for CWDM applications, Quentin Wilmar, Daivid Fowler, Corrado Sciancalepore, Karim Hassan, Laetitia Adelmini, Stéphanie Garcia, Daniel Robin-Brosse, Stéphane Malhouitre, Ségolène Olivier, CEA-LETI (France).....[10686-32]

Silicon photonic microring resonator dedicated to an optoelectronic oscillator loop, Do Thi Phuong, Ecole normale supérieure Paris-Saclay (France); Carlos Alonso-Ramos, Xavier Le Roux, Diego Pérez-Galacho, Laurent Vivien, Ctr. de Nanosciences et de Nanotechnologies (France); Isabelle Ledoux-Rak, Bernard Journet, Ecole normale supérieure Paris-Saclay (France); Eric Cassan, Ctr. de Nanosciences et de Nanotechnologies (France).....[10686-33]

Subnanometer narrow bandwidth gratings using deeply etched SOI rib waveguides, Shafeek Abdul Samad, Gopal Hegde, Srinivas Talabattula, Indian Institute of Science (India).....[10686-34]

THURSDAY 26 APRIL

HOT TOPICS SESSION III 9:00 TO 10:35

From extreme nonlinear optics to ultrafast atomic physics
Anne L'Huillier, Lund Univ., Sweden

Quantum computations and quantum simulations with trapped ions
Rainer Blatt, Institute for Experimental Physics, Univ. of Innsbruck, Austria
For additional details, please see page 8

SESSION 9..... THU 11:00 TO 12:20

Quantum Photonics

Session Chair: **Laurent Vivien**, Ctr. de Nanosciences et de Nanotechnologies (France)

High complexity silicon photonic circuits for quantum signal processing (*Invited Paper*), Dirk R. Englund, Massachusetts Institute of Technology (United States).....[10686-35]

Hybrid quantum photonics at the single photon level (*Invited Paper*), Valery Zwiller, KTH Royal Institute of Technology (Sweden).....[10686-36]

Compromise between bandwidth and rejection in the design of silicon waveguide bragg filters: interest of subwavelength structures, Dorian Oser, Diego Pérez-Galacho, Carlos Ramos, Xavier Le Roux, Laurent Vivien, Ctr. de Nanosciences et de Nanotechnologies (France); Florent Mazeas, Sébastien Tanzilli, Lab. de Physique de la Matière Condensée (France); Laurent Labonté, Lab. de Physique de la Matière Condensée (France); Eric Cassan, Ctr. de Nanosciences et de Nanotechnologies (France).....[10686-37]

Lunch Break Thu 12:20 to 13:30

SESSION 10..... THU 13:30 TO 15:20

Reconfigurable and Tunable Photonic Devices

Session Chair: **Fabrice Raineri**,
Lab. de Photonique et de Nanostructures (France)

Harnessing photonic integrated circuits (*Invited Paper*), Andrea I. Melloni, Politecnico di Milano (Italy).....[10686-38]

Automatic alignment of photonic components of massive optical switch to ITU channels, Astghik Chalyan, Univ. degli Studi di Trento (Italy) and Russian-Armenian (Slavonic) Univ. (Armenia); Stefano Tondini, Giorgio Fontana, Lorenzo Pavesi, Univ. degli Studi di Trento (Italy); Nikola Zecevic, Michael Hofbauer, Bernhard Goll, Horst Zimmermann, Technische Univ. Wien (Austria); Francesco Testa, Stefano Stracca, Alberto Bianchi, Ericsson R&D (Italy); Costanza Manganelli, Philippe Velha, Scuola Superiore Sant'Anna (Italy) and Consorzio Nazionale Interuniversitario per le Telecomunicazioni (Italy); Paolo Pintus, Scuola Superiore Sant'Anna (Italy) and Consorzio Nazionale Interuniversitario per le Telecomunicazioni (Italy); Claudio Oton, Scuola Superiore Sant'Anna (Italy) and Consorzio Nazionale Interuniversitario per le Telecomunicazioni (Italy); Christophe Kopp, Laetitia Adelmini, Olivier Lemonnier, Gabriel Pares, Commissariat à l'Énergie Atomique (France); Guido Chiaretti, STMicroelectronics S.A. (Italy); Aina Serrano, Jose Ángel Ayucar, Giovanni Battista Preve, Univ. Politècnica de Valencia (Spain); Jong Moo Lee, Electronics and Telecommunications Research Institute (Korea, Republic of).....[10686-39]

Automatic hitless reconfiguration of silicon photonics microring filters, Douglas Aguiar, Mazyar Milanizadeh, Emanuele Guglielmi, Francesco Zanetto, Politecnico di Milano (Italy); Marco Sampietro, Francesco Morichetti, Andrea Melloni, Politecnico di Milano (Italy).....[10686-40]

Beam steering with optomechanical antennas on a silicon chip, Raphael Van Laer, Christopher Sarabalis, Okan Atalar, Amir Safavi-Naeini, Stanford Univ. (United States).....[10686-41]

Silicon photonic crystal beam steering and frequency splitting at telecom wavelengths based on the manipulation of surface states, Anna C. Tasolamprou, Foundation for Research and Technology-Hellas (Greece); Thomas Koschny, Ames Lab., Iowa State Univ. of Science and Technology (United States); Maria Kafesaki, Foundation for Research and Technology-Hellas (Greece); Costas Soukoulis, Ames Lab., Iowa State Univ. of Science and Technology (United States) and Foundation for Research and Technology-Hellas (Greece).....[10686-42]

CONFERENCE 10687

Tuesday–Thursday 24–26 April 2018 • Proceedings of SPIE Vol. 10687

Organic Electronics and Photonics: Fundamentals and Devices

Conference Chairs: **Sebastian Reineke**, TU Dresden (Germany); **Koen Vandewal**, TU Dresden (Germany)

Programme Committee: **Artem A. Bakulin**, Imperial College London (United Kingdom); **David Beljonne**, Univ. de Mons (Belgium); **Vladimir Dyakonov**, Julius-Maximilians-Univ. Würzburg (Germany); **Malte C. Gather**, Univ. of St. Andrews (United Kingdom); **Peter Ho**, National Univ. of Singapore (Singapore); **Kristiaan Neyts**, Univ. Gent (Belgium); **Markus Clark Scharber**, Johannes Kepler Univ. Linz (Austria); **Franky So**, North Carolina State Univ. (United States); **Natalie Stingelin**, Georgia Institute of Technology (United States); **He Yan**, Hong Kong Univ. of Science and Technology (Hong Kong, China); **Eli Zysman-Colman**, Univ. of St. Andrews (United Kingdom)

TUESDAY 24 APRIL

OPENING REMARKS 10:20 TO 10:30

SESSION 1 TUE 10:30 TO 12:50

Thermally Activated Delayed Fluorescence for OLEDs I

Session Chair: **Sebastian Reineke**, TU Dresden (Germany)

Recent progress in highly efficient TADF emitter materials for OLEDs (*Invited Paper*), David Ambrosek, Thomas Baumann, cynora GmbH (Germany) [10687-1]

Deep blue electroluminescence from D-A compounds with oxadiazole acceptor units exhibiting thermally activated delayed fluorescence, Simonas Krotkus, Univ. of St Andrews (United Kingdom); Michael Y. Wong, Gordon Hedley, David B. Cordes, Alexandra M. Z. Slawin, Caroline Murawski, Malte C. Gather, Univ. of St. Andrews (United Kingdom); Yoann Olivier, David Beljonne, Univ. de Mons (Belgium); Ifor D. W. Samuel, Eli Zysman-Colman, Univ. of St. Andrews (United Kingdom) [10687-2]

Deep blue organic TADF emitters for electroluminescent devices (*Invited Paper*), Eli Zysman-Colman, Univ. of St. Andrews (United Kingdom) [10687-3]

Twistable charge-transfer states for next-generation OLEDs, Dan Credgington, Univ. of Cambridge (United Kingdom) [10687-4]

On the nature of the singlet and triplet excitations mediating thermally activated delayed fluorescence, Yoann Olivier, Univ. de Mons (Belgium); Brett Yurash, Univ. of California, Santa Barbara (United States); Luca Muccioli, Univ. degli Studi di Bologna (Belgium); Gabriele D'Avino, Univ. Grenoble Alpes (France) and CNRS (France); Monica Moral, Univ. de Castilla-La Mancha (Spain); Oleksandr Mikhnenko, Univ. of California, Santa Barbara (United States); Juan-Carlos Sancho-Garcia, Univ. de Alicante (Spain); Chihaya Adachi, Kyushu Univ. (Japan); Thuc-Quyen Nguyen, Univ. of California, Santa Barbara (United States); David Beljonne, Univ. de Mons (Belgium) [10687-53]

Lunch/Exhibition Break Tue 12:50 to 14:00

SESSION 2 TUE 14:00 TO 16:00

Thermally Activated Delayed Fluorescence for OLEDs II

Session Chair: **Sebastian Reineke**, TU Dresden (Germany)

Ultrafast reverse intersystem crossing and 100% PLQY in the same TADF molecule, really! (*Invited Paper*), Andrew P. Monkman, Durham Univ. (United Kingdom) [10687-5]

Warm-white hybrid emission from TADF and phosphorescence and its application in OLEDs, Ludwig Popp, Paul Kleine, TU Dresden (Germany); Ramunas Lygaitis, Kaunas Univ. of Technology (Lithuania); Reinhard Scholz, Simone Lenk, Sebastian Reineke, TU Dresden (Germany) [10687-6]

Spin states in organic light emitting diodes (*Invited Paper*), Vladimir Dyakonov, Andreas Sperlich, Nikolai Bunzmann, Sebastian Weißenseel, Ljudmila Kudriashova, Julius-Maximilians-Univ. Würzburg (Germany) [10687-7]

Kinetic Monte Carlo simulation studies of the efficiency and roll-off of 3rd and 3.5th generation TADF-based OLEDs, Reinder Coehoorn, Peter A. Bobbert, Technische Univ. Eindhoven (Netherlands); Stefano Gottardi, Siebe L. M. van Mensfoort, Harm van Eersel, Simbeyond B.V. (Netherlands) [10687-8]

HOT TOPICS SESSION II 16:30 TO 18:05

Coherent combination of fiber amplified ultrafast laser pulses
Jens Limpert, Institute of Applied Physics, Friedrich Schiller Univ. Jena, Germany

2D materials and their heterostructures: fundamentals, applications and prototypes
Frank Koppens, ICFO-The Institute of Photonic Sciences, Spain

For additional details, please see page 7

WEDNESDAY 25 APRIL

SESSION 3 WED 8:30 TO 10:30

Organic Photovoltaics and Photodetectors I

Session Chairs: **Vladimir Dyakonov**, Julius-Maximilians-Univ. Würzburg (Germany); **Koen Vandewal**, TU Dresden (Germany)

Morphology in dip-coated blend films for photovoltaics studied by static and dynamic fluorescence, Jan van Stam, Leif Ericsson, Dargie Deribew, Ellen Moons, Karlstad Univ. (Sweden) [10687-9]

The triplet-pair state in singlet fission materials (*Invited Paper*), Jenny Clark, University of Sheffield (United Kingdom) [10687-10]

Diketopyrrolopyrrole-based polymer solar cells: effect of alkyl branching point on phase purity, Rishi Shivhare, TU Dresden (Germany); Tim Erdmann, Petr Formanek, Leibniz-Institut für Polymerforschung Dresden e.V. (Germany); Mike Hamsch, TU Dresden (Germany); Anton Kiri, Leibniz-Institut für Polymerforschung Dresden e.V. (Germany); Koen Vandewal, Stefan Mannsfeld, TU Dresden (Germany) [10687-11]

Nonfullerene organic solar cells: importance of molecular interaction and vitrification (*Invited Paper*), Harald W. Ade, North Carolina State Univ. (United States) [10687-12]

SESSION 5 WED 11:00 TO 12:40

Organic Photovoltaics and Photodetectors II

Session Chairs: **Vladimir Dyakonov**, Julius-Maximilians-Univ. Würzburg (Germany); **Koen Vandewal**, TU Dresden (Germany)

Charge generation in bilayer polymer:non-fullerene solar cells (*Invited Paper*), Natalie Banerji, Univ. Bern (Switzerland); Yufei Zhong, Univ. of Bern (Switzerland); Martina Causa, Julien Réhault, Lisa Peterhans, Univ. Bern (Switzerland); Johannes Benduhn, Koen Vandewal, TU Dresden (Germany); Erjun Zhou, National Ctr. for Nanoscience and Technology of China (China) [10687-13]

Do triplet excited states impact nonradiative voltage losses in organic solar cells?, Johannes Benduhn, TU Dresden (Germany); Fortunato Piersimoni, Univ. Potsdam (Germany); Christian Körner, TU Dresden (Germany); Dieter Neher, Univ. Potsdam (Germany); Donato F. Spoltore, Koen Vandewal, TU Dresden (Germany) [10687-14]

Nonequilibrium and equilibrium operation of organic disordered semiconductor devices, Andreas Hofacker, TU Dresden (Germany); Dieter Neher, Univ. Potsdam (Germany); Karl Leo, TU Dresden (Germany) [10687-15]

A single component organic photovoltaic cell based on oligothiophene-fullerene conjugate, Han Young Woo, Korea Univ. (Korea, Republic of) [10687-16]

Lunch/Exhibition Break Wed 12:40 to 14:00

CONFERENCE 10687

SESSION 5. WED 14:00 TO 15:20

Organic Photovoltaics and Photodetectors III

Session Chairs: **Vladimir Dyakonov**, Julius-Maximilians-Univ. Würzburg (Germany); **Koen Vandewal**, TU Dresden (Germany)

Photo-current conversion in non-fullerene solar cells (*Invited Paper*), Nicola Gasparini, Xin Song, Joel Troughton, Derya Baran, King Abdullah Univ. of Science and Technology (Saudi Arabia) [10687-17]

Fast organic near-infrared detectors, Donato F. Spoltore, Sascha Ullbrich, Bernhard Siegmund, Johannes Benduhn, Koen Vandewal, TU Dresden (Germany) [10687-18]

Organic photodetectors for artificial retinal implants, Giulio Simone, Dario Di Carlo, Stefan Meskers, René Janssen, Technische Univ. Eindhoven (Netherlands); Gerwin Gelinck, Technische Univ. Eindhoven (Netherlands). [10687-19]

SESSION 6. WED 15:50 TO 17:30

Organic Optoelectronic and Photonic Devices

Session Chairs: **Wolfgang Brütting**, Univ. Augsburg (Germany); **Sebastian Reineke**, TU Dresden (Germany)

How microstructure defines function in organic electronics: modeling insights (*Invited Paper*), David Beljonne, Univ. de Mons (Belgium) [10687-20]

Wide field-of-view fluorescent antenna for visible light communications beyond the étendue limit, Pavlos Manousiadis, Univ. of St. Andrews (United Kingdom); Sujay Rajbhandari, Coventry Univ. (United Kingdom); Rahmat Mulyawan, Univ. of Oxford (United Kingdom); Dimali A. Vithanage, Univ. of St. Andrews (United Kingdom); Hyunhae Chun, Grahame Faulkner, Dominic C. O'Brien, Univ. of Oxford (United Kingdom); Graham A. Turnbull, Univ. of St. Andrews (United Kingdom); Stephen Collins, Univ. of Oxford (United Kingdom) [10687-21]

Room temperature polariton lasing from strongly coupled pentafluorene in a planar microcavity, Sai Kiran Rajendran, Arunandan Kumar, Arvydas Ruseckas, Mengjie Wei, Jonathan Keeling, Graham A. Turnbull, Ifor D. W. Samuel, Univ. of St. Andrews (United Kingdom) [10687-22]

The effects of being thick: light-emitting electrochemical cells and solution processing, E. Mattias Lindh, Petter Lundberg, Thomas Lanz, Umeå Univ. (Sweden); Jonas Mindemark, Uppsala Univ. (Sweden); Ludvig Edman, Umeå Univ. (Sweden) [10687-23]

POSTER SESSION WED 17:45 TO 19:30

Posters-Wednesday

Conference attendees are invited to attend the Photonics Europe poster session on Wednesday 17.45 to 19.30. Posters will be on display after 10.00 Wednesday morning in the Hall Rhin. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster authors, view poster presentation guidelines and set-up instructions at <http://spie.org/x34963.xml> and on page 96.

Hybrid light-emitting devices based on zinc oxide, titanium dioxide and tungsten trioxide nanorod arrays as the electron transporting layers, Sheng-Hsiung Yang, Wei-Chi Chen, Tsung-Yan Tsai, Chun-Kai Chang, National Chiao Tung Univ. (Taiwan) [10687-36]

A white random laser, Yu-Ming Liao, Shu-Wei Chang, Wei-Cheng Liao, Shih-Yao Lin, Wei-Ju Lin, Cheng-Han Chang, Hung-I Lin, Packiyaraj Perumal, Yang-Fang Chen, National Taiwan Univ. (Taiwan) [10687-37]

Optical and amplified spontaneous emission of neat films containing 2-cyanoacetic derivatives, Aivars Vembris, Julija Pervenecka, Univ. of Latvia (Latvia); Elmars Zarins, Valdis Kokars, Riga Technical Univ. (Latvia) [10687-38]

Solution-processable green phosphorescent iridium(III) complexes bearing 3,3,3-triphenylpropionic acid fragment for use in OLED devices, Kaspars Traskovskis, Riga Technical Univ. (Latvia); Aivars Vembris, Univ. of Latvia (Latvia); Valdis Kokars, Riga Technical Univ. (Latvia) [10687-39]

Time-resolved exciton and charge transport in donor-acceptor junction, Katawoura Beltako, Nicolas Cavassilas, Fabienne Michelini, Institut Matériaux Microélectronique Nanosciences de Provence (France) [10687-40]

Investigation of photoluminescence and amplified spontaneous emission properties of cyanoacetic acid derivative (KTB) in PVK amorphous thin films, Julija Pervenecka, Aivars Vembris, Univ. of Latvia (Latvia); Elmars Zarins, Valdis Kokars, Riga Technical Univ. (Latvia) [10687-41]

3,3'-bicarbazole structural derivatives as charge transporting materials for use in OLED devices, Armands Ruduss, Kaspars Traskovskis, Elina Otkova, Riga Technical Univ. (Latvia); Aivars Vembris, Raitis Grzibovskis, Univ. of Latvia (Latvia); Valdis Kokars, Riga Technical Univ. (Latvia) [10687-42]

Design of an all-optical four bit binary to gray code converter based on beam interference principle in 2D photonic crystals, Sandip Swarnakar, Santosh Kumar, Sandeep Sharma, Santasri Koley, DIT Univ. (India) [10687-43]

Whispering gallery mode-assisted random lasing in dye-doped PVA coated silica microsphere, Priyanka S. Choubey, Shailendra K. Varshney, Shivakiran Bhaktha B. N., Indian Institute of Technology Kharagpur (India) [10687-44]

Spectroscopic characterization of organic films for integrated photonics applications, Isis Maqueira-Albo, Politecnico di Milano (Italy); Mario Caironi, Istituto Italiano di Tecnologia (Italy); Francesco Morichetti, Politecnico di Milano (Italy) [10687-45]

Improved thermal and mechanical stability of small molecule donor polymer acceptor-based organic solar cells, Sora Oh, Chang Eun Song, Univ. of Science and Technology (Korea, Republic of) and Korea Research Institute of Chemical Technology (Korea, Republic of); Hang Ken Lee, Korea Research Institute of Chemical Technology (Korea, Republic of); Won Suk Shin, Jong-Cheol Lee, Sang Kyu Lee, Univ. of Science and Technology (Korea, Republic of) and Korea Research Institute of Chemical Technology (Korea, Republic of) [10687-46]

Energy level determination of purine containing blue light emitting organic compounds, Raitis Grzibovskis, Aivars Vembris, Univ. of Latvia (Latvia); Armands Sebris, Armands Sebris, Zigfrids Kapilinskis, Maris Turks, Riga Technical Univ. (Latvia) [10687-47]

Refractive index profile characterization in polymer optical fibres using Raman spectroscopy, Mikel Azkune, Igor Ayesta, Gotzon Aldabaldetrek, Iñaki Bikandi, Eneko Arrospide, Joseba Zubia, Univ. del País Vasco (Spain) [10687-48]

Stacked dual narrowband organic near-infrared photodetectors, Yazhong Wang, Zheng Tang, Bernhard Siegmund, Zaifei Ma, Koen Vandewal, TU Dresden (Germany) [10687-49]

Efficient quantum dot light-emitting diodes, Shuming Chen, Southern Univ. of Science and Technology of China (China) [10687-50]

Ultracompact nonlinear microring resonator-based photonic crystal switch, Mayur K. Chhipa, Kamineni Srimannarayana, K L Univ. (India) [10687-51]

Enhanced color conversion efficiency of remote phosphor-converted light-emitting diodes using micro-concavity arrays, Shudong Yu, Junchi Chen, Yong Tang, Zongtao Li, South China Univ. of Technology (China); Uli Lemmer, Guillaume Gomard, Karlsruher Institut für Technologie (Germany) [10687-52]

THURSDAY 26 APRIL

HOT TOPICS SESSION III 9:00 TO 10:35

From extreme nonlinear optics to ultrafast atomic physics
Anne L'Huillier, Lund Univ., Sweden

Quantum computations and quantum simulations with trapped ions
Rainer Blatt, Institute for Experimental Physics, Univ. of Innsbruck, Austria

For additional details, please see page 8

SESSION 7. THU 11:00 TO 12:00

Organic Light-emitting Devices I

Session Chairs: **Andrew P. Monkman**, Durham Univ. (United Kingdom); **Sebastian Reineke**, TU Dresden (Germany)

Flexible and highly segmented OLED for automotive applications, Hermann Bechert, OSRAM OLED GmbH (Germany) [10687-24]

Improving the thermal stability of organic light-emitting diodes by doping the electron transport layer with a reactive metal, Changmin Keum, Nils M. Kronenberg, Caroline Murawski, Kou Yoshida, Yali Deng, Wenbo Li, Mengjie Wei, Ifor D. W. Samuel, Malte C. Gather, Univ. of St. Andrews (United Kingdom) [10687-25]

The effect of exciton confinement on the efficiency loss due to triplet-triplet annihilation in OLEDs, Arnout Ligthart, Le Zhang, Technische Univ. Eindhoven (Netherlands); Harm van Eersel, Simbeyond B.V. (Netherlands); Peter A. Bobbert, Reinder Coehoorn, Technische Univ. Eindhoven (Netherlands) [10687-26]

Lunch Break Thu 12:00 to 13:10

SESSION 8. THU 13:10 TO 15:10
Organic Light-emitting Devices II

Session Chairs: **Andrew P. Monkman**, Durham Univ. (United Kingdom); **Sebastian Reineke**, TU Dresden (Germany)

Molecular orientation as key parameter in organic optoelectronics
(Invited Paper), Wolfgang Brütting, Univ. Augsburg (Germany) [10687-27]

Effect of matrix anisotropy on the apparent emitter orientation in OLED,
Norbert Danz, Fraunhofer-Institut für Angewandte Optik und Feinmechanik
(Germany); Nils Haase, Christof Pflumm, Antonia Morherr, Merck KGaA
(Germany); Dirk Michaelis, Fraunhofer-Institut für Angewandte Optik und
Feinmechanik (Germany) [10687-28]

Angular resolved photoluminescence from nonideal emission spots,
Christian Hänisch, Sebastian Reineke, Simone Lenk, TU Dresden
(Germany) [10687-29]

Optical design of OLEDs: from ultimate efficiency to sensor applications
(Invited Paper), Seunghyup Yoo, Jinouk Song, Hyeonwoo Lee, Jaeho Lee,
Eunhye Kim, KAIST (Korea, Republic of) [10687-30]

SESSION 9. THU 15:40 TO 17:40
Organic Light-emitting Devices III

Session Chairs: **Andrew P. Monkman**, Durham Univ. (United Kingdom); **Sebastian Reineke**, TU Dresden (Germany)

OLED light extraction in nanostructured OLEDs (Invited Paper),
Franky So, North Carolina State Univ. (United States) [10687-31]

Organic light-emitting diodes as neurophotonics platform, Caroline
Murawski, Andrew Morton, Changmin Keum, Yali Deng, Ifor D. W. Samuel,
Stefan R. Pulver, Malte C. Gather, Univ. of St. Andrews
(United Kingdom) [10687-32]

**Improved light outcoupling of organic light-emitting diodes by
combined optimization of thin film layers and external textures,**
Milan Kovacic, Univ. of Ljubljana (Slovenia); Paul-Anton Will, TU Dresden
(Germany); Benjamin Lipovšek, Marko Topic, Univ. of Ljubljana (Slovenia);
Simone Lenk, Sebastian Reineke, TU Dresden (Germany); Janez Krc, Univ. of
Ljubljana (Slovenia) [10687-33]

**Optimizing the outcoupling efficiency and the radiation pattern of
organic light emitting devices by inkjet printing of microlens arrays,**
Martijn Cramer, Inge Verboven, Jeroen Drikkoningen, Wim Deferme, Univ.
Hasselt (Belgium) [10687-34]

**Organic light-emitting transistors with overlapping gate structure:
towards high efficiency at high current density,** Cedric Rolin, IMEC
(Belgium); Jeong-Hwan Lee, INHA Univ. (Korea, Republic of); Tung-Huei Ke,
IMEC (Belgium); Jan Genoe, Paul Heremans, IMEC (Belgium) and KU Leuven
(Belgium) [10687-35]

CONFERENCE 10688

Monday-Wednesday 23-25 April 2018 • Proceedings of SPIE Vol. 10688

Photonics for Solar Energy Systems

Conference Chair: **Ralf B. Wehrspohn**, Fraunhofer-Institut für Werkstoffmechanik (Germany)

Conference Co-Chair: **Alexander N. Sprafke**, Martin-Luther Univ. Halle-Wittenberg (Germany)

Programme Committee: **Benedikt Bläsi**, Fraunhofer-Institut für Solare Energiesysteme (Germany); **Christoph J. Brabec**, Friedrich-Alexander Univ. Erlangen-Nürnberg (Germany); **Mark Brongersma**, Geballe Lab. for Advanced Materials (GLAM) (United States); **Ning Dai**, Shanghai Institute of Technical Physics (China); **Jung-Ho Lee**, Hanyang Univ. (Korea, Republic of); **Martin P. Pfeiffer**, Heliatek GmbH (Germany)

MONDAY 23 APRIL

HOT TOPICS SESSION I 9:00 TO 11:00

From Einstein doubts to quantum bits: a second quantum revolution

Alain Aspect, Lab. Charles Fabry, Institut d'Optique, France

Pico-Photonics: watching and sensing single molecules by confining light to the atom scale

Jeremy J. Baumberg, NanoPhotonics Ctr., Univ. of Cambridge, United Kingdom

For additional details see page 6.

OPENING REMARKS 11:25 TO 11:30

SESSION 1 MON 11:30 TO 12:50

Nanophotonics for Photovoltaics

Session Chair: **Ralf B. Wehrspohn**, Fraunhofer-Institut für Mikrostruktur von Werkstoffen und Systemen (Germany)

Light management and the dream of photovoltaic energy for 0.01 euro/kWh (Invited Paper), Albert Polman, FOM Institute AMOLF (Netherlands). [10688-1]

Photonic structures for III-V/Si multijunction solar cells (Invited Paper), Benedikt Bläsi, Oliver Höhn, Hubert Hauser, Romain Cariou, Jan Benick, Frank Feldmann, Paul Beutel, Fraunhofer-Institut für Solare Energiesysteme (Germany); Nasser Razek, Markus Wimplinger, EV Group (Austria); David Lackner, Martin Hermle, Gerald Siefert, Fraunhofer-Institut für Solare Energiesysteme (Germany); Stefan W. Glunz, Fraunhofer-Institut für Solare Energiesysteme (Germany) and Univ. of Freiburg (Germany); Andreas W. Bett, Fraunhofer-Institut für Solare Energiesysteme (Germany) [10688-2]

Photon recycling in solar cells under nonideal conditions, Muluneh G. Abebe, Guillaume Gomard, Karlsruher Institut für Technologie (Germany); Lin Zschiedrich, JCMwave GmbH (Germany) and Konrad-Zuse-Zentrum für Informationstechnik Berlin (Germany); Carsten Rockstuhl, Ulrich Paetzold, Aimi Abass, Karlsruher Institut für Technologie (Germany) [10688-3]

Lunch Break Mon 12:50 to 14:10

SESSION 2 MON 14:10 TO 15:30

Nanophotonics for Solar Modules

Session Chair: **Alexander N. Sprafke**, Martin-Luther-Univ. Halle-Wittenberg (Germany)

Advanced module optics of textured perovskite silicon tandem solar cells, Nico Tucher, Fraunhofer-Institut für Solare Energiesysteme (Germany) and Univ. of Freiburg (Germany); Oliver Höhn, Martin Hermle, Benedikt Bläsi, Jan Christoph Goldschmidt, Fraunhofer-Institut für Solare Energiesysteme (Germany) [10688-4]

Optimization of encapsulated invisibility cloaks for solar modules, Malte Langenhorst, Martin F. Schumann, Raphael Schmager, Jonathan Lehr, Uli Lemmer, Karlsruher Institut für Technologie (Germany); Bryce S. Richards, Karlsruhe Institute of Technology (Germany); Martin Wegener, Karlsruher Institut für Technologie (Germany) [10688-5]

Microcone structured encapsulations for light trapping in photovoltaics, Stephan Dottermusch, Raphael Schmager, Efthymios Klampafitis, Bryce S. Richards, Ulrich Paetzold, Karlsruher Institut für Technologie (Germany) [10688-6]

Viola flower for improved light harvesting in photovoltaics, Raphael Schmager, Benjamin Fritz, Karlsruher Institut für Technologie (Germany); Kaining Ding, Forschungszentrum Jülich GmbH (Germany); Ulrich Lemmer, Bryce S. Richards, Guillaume Gomard, Ulrich W. Paetzold, Karlsruher Institut für Technologie (Germany) [10688-7]

SESSION 3 MON 16:00 TO 17:50

Nanostructured Antireflection Coatings and Energy Saving in Buildings

Session Chair: **Benedikt Bläsi**, Fraunhofer-Institut für Solare Energiesysteme (Germany)

Broadband and omnidirectional antireflection coatings for III-V concentrating multijunction solar cells (Invited Paper), Lucio C. Andreani, Marco Liscidini, Marco Passoni, Maddalena Patrini, Univ. degli Studi di Pavia (Italy); Gianluca Timò, Franco Trespici, RSE SpA (Italy) [10688-8]

Antireflective nanotextures for perovskite-silicon tandem solar cells, Klaus Jäger, Helmholtz-Zentrum Berlin für Materialien und Energie GmbH (Germany); Duote Chen, Helmholtz-Zentrum Berlin für Materialien und Energie GmbH (Germany) and Zuse Institute Berlin (Germany); Philipp Tockhorn, David Eisenhauer, Grit Köppel, Helmholtz-Zentrum Berlin für Materialien und Energie GmbH (Germany); Phillip Manley, Helmholtz-Zentrum Berlin für Materialien und Energie GmbH (Germany) and Zuse Institute Berlin (Germany); Martin Hammerschmidt, Sven Burger, Zuse Institute Berlin (Germany) and JCMwave GmbH (Germany); Steve Albrecht, Christiane Becker, Helmholtz-Zentrum Berlin für Materialien und Energie GmbH (Germany) [10688-9]

Nanoimprinted sol-gel materials for antireflective structures on silicon solar cells, Laura Stevens, Hubert Hauser, Oliver Höhn, Fraunhofer-Institut für Solare Energiesysteme (Germany); Nico Tucher, Fraunhofer-Institut für Solare Energiesysteme (Germany) and Univ. of Freiburg (Germany); Christine Wellens, Fraunhofer-Institut für Solare Energiesysteme (Germany); Rainer Jahn, Walther Glaubitt, Fraunhofer-Institut für Silicatforschung ISC (Germany); Claas Müller, Univ. of Freiburg (Germany); Benedikt Bläsi, Fraunhofer-Institut für Solare Energiesysteme (Germany) [10688-10]

Optical optimization of a wideband antireflection coating using porous MgF₂ for ultrathin CIGS solar cells, Nasim Rezaei, Olindo Isabella, Delft University of Technology (Netherlands); Zeger Vroon, TNO-Brightlands Materials Center (Netherlands); Miro Zeman, Delft University of Technology (Netherlands) [10688-11]

A combined experimental and theoretical study into the performance of multilayer vanadium dioxide composite films for energy saving applications, Christian Sol, Johannes Schläfer, Tao Li, Ivan P. Parkin, Ioannis Papakonstantinou, Univ. College London (United Kingdom) [10688-12]

POSTER SESSION MON 17:30 TO 19:00

Posters-Tuesday

Conference attendees are invited to attend the Photonics Europe poster session on Monday 17.30 to 19.00. Posters will be on display after 10.00 Monday morning in the Hall Rhin. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

Poster authors, view poster presentation guidelines and set-up instructions at <http://spie.org/x34963.xml> and on page 96.

Ultrafast transport of plasmonic hot electron via graphene interface for efficient CO₂ photoconversion, Dong-Kwon Lim, Korea Univ. (Korea, Republic of) [10688-33]

Algorithm for precise positioning of the Sun's position in solar energy system using the GPS/GLONASS system, Kamil Plachta, Wrocław Univ. of Science and Technology (Poland) [10688-34]

Modeling of luminous stream in photovoltaic systems, Kamil Plachta, Wrocław Univ. of Science and Technology (Poland) [10688-35]

Analysis of mirrors geometry of V-trough solar concentrator in photovoltaic system, Kamil Plachta, Wrocław Univ. of Science and Technology (Poland) [10688-36]

Electronics and photonics towards plasmonics and new solar energy devices, Mihaela Girtan, Univ. d'Angers (France) [10688-37]

Improvement and regeneration of perovskite solar cells via methylamine gas post-treatment, Li Hong, Huazhong Univ. of Science and Technology (China) [10688-38]

SESSION 4..... TUE 8:50 TO 10:30

Thin-film and Tandem Solar Cells

Session Chair: **Lucio Andreani**, Univ. di Pavia (Italy)

Optical confinement in thin CIGS solar cells (*Invited Paper*), Marko Topic, Janez Krc, Univ of Ljubljani (Slovenia).....[10688-13]

Perovskite-silicon tandem solar cells: progress and challenges (*Invited Paper*), Thomas White, The Duong, Jun Peng, Yiliang Wu, Heping Shen, Klaus J. Weber, Kylie R. Catchpole, The Australian National Univ. (Australia).....[10688-14]

Nanophotonic perovskites for enhanced absorption in solar cells, Raphael Schmager, Philipp Brenner, Karlsruher Institut für Technologie (Germany); Dong Jae Lee, KAIST (Korea, Republic of); Tobias Abzieher, Somayeh Moghadamzadeh, Ihtezaz Muhaimeen Hossain, Ulrich Lemmer, Bryce Sydney Richards, Ulrich Wilhelm Paetzold, Karlsruher Institut für Technologie (Germany).....[10688-15]

Waveguide-based spectrum-splitting concept for parallel-stacked tandem solar cells, Tom P.N. Veeken, AMOLF (Netherlands); Jorik van de Groep, Stanford Univ. (United States); Mark W. Knight, A. Polman, AMOLF (Netherlands).....[10688-16]

SESSION 5..... TUE 11:00 TO 13:00

Spectral Conversion and Light Trapping

Session Chair: **Thomas White**, Australian National Univ. (Australia)

Present and future of spectral converters for solar energy harvesting (*Invited Paper*), Stefan Fischer, Karlsruhe Institute of Technology (Germany).....[10688-17]

Multiresonant light trapping in ultrathin solar cells (*Invited Paper*), Andrea Cattoni, C2N-CNRS, Université Paris-Sud, Université Paris-Saclay (France).....[10688-18]

Lambertian scattering metasurfaces for photovoltaics, Verena Neder, AMOLF (Netherlands); Younes Ra'di, Andrea Alù, The Univ. of Texas at Austin (United States); Albert Polman, AMOLF (Netherlands).....[10688-19]

Modified PV structures with a nanostructured top electrode, Marek Godlewski, Rafal Pietruszka, Bartłomiej Witkowski, The Institute of Physics (Poland); Monika Ozga, Centrum Badań i Rozwoju Technologii dla Przemysłu S.A. - CB RTP (Poland).....[10688-20]

Mie resonators as rearside structures for light trapping in solar cells, Alexander N. Sprafke, Martin-Luther-Univ. Halle-Wittenberg (Germany); Peter Michael Piechulla, Martin-Luther Univ. Halle-Wittenberg (Germany); Michael E. Pollard, The Univ. of New South Wales (Australia); Ralf B. Wehrspohn, Fraunhofer-Institut für Mikrostruktur von Werkstoffen und Systemen (Germany).....[10688-21]

SESSION 6..... TUE 14:30 TO 16:00

Nanowire Solar Cells and Disordered Photonic Nanostructures I

Session Chair: **Marko Topič**, Univ. of Ljubljana, (Slovenia)

Nanophotonics in III-V nanowire arrays toward tandem solar cells (*Invited Paper*), Nicklas Anttu, Aalto Univ. (Finland); Lars Samuelson, Lund Univ. (Sweden).....[10688-22]

TBA1 (*Invited Paper*), Willem L. Vos, Univ. Twente (Netherlands) ...[10688-23]

Light's topology at the nanoscale: faithfulness, tragedy and usefulness (*Invited Paper*), Laurens Kobus Kuipers, Kavli Institute of Nanoscience Delft (Netherlands).....[10688-24]

HOT TOPICS SESSION II..... 16:30 TO 18:05

Coherent combination of fiber amplified ultrafast laser pulses
Jens Limpert, Institute of Applied Physics, Friedrich Schiller Univ. Jena, Germany

2D materials and their heterostructures: fundamentals, applications and prototypes
Frank Koppens, ICFO-The Institute of Photonic Sciences, Spain

For additional details, please see page 7

Solvent engineering enhances pore filling in fully printable mesoscopic perovskite solar cell, Yue Ming, Huazhong Univ. of Science and Technology (China).....[10688-39]

Excitation-intensity dependent charge carrier dynamics in methylammonium lead tri-iodide perovskite semiconductors, In-Sik Kim, Cheol Jo, Gwangju Institute of Science and Technology (Korea, Republic of); Rira Kang, Korea Atomic Energy Research Institute (Korea, Republic of); Dong-Yu Kim, Do-Kyeong Ko, Gwangju Institute of Science and Technology (Korea, Republic of).....[10688-40]

Stochastic modelling of hopping charge carrier transport mechanisms in organic photovoltaic structures, Ana Bărar, Doina Mănăilă-Maximean, Marian Vladescu, Paul Șchiopu, Octavian Dănilă, Univ. Politehnica of Bucharest (Romania).....[10688-41]

Static and dynamic transfer characteristics of high-efficiency photovoltaic converters for optical beaming, Arkadiy Blank, S.P. Korolev Rocket and Space Corp. Energia (Russian Federation); Stanislav Bogdanov, Roman Voropayev, Daniel Begday, M.V. Lomonosov Moscow State Univ. (Russian Federation); Anton Razuvaev, S.P. Korolev Rocket and Space Corp. Energia (Russian Federation); Natalia Suhareva, M.V. Lomonosov Moscow State Univ. (Russian Federation); Vjatcheslav Tugaenko, S.P. Korolev Rocket and Space Corp. Energia (Russian Federation); Gennady Untila, Alla Chebotareva, Tatiana Kost, M.V. Lomonosov Moscow State Univ. (Russian Federation).....[10688-42]

Formation of nanostructures on the surface of CIGS films by picosecond laser with different beam patterns, Huizhu Yang, Gedong Jiang II, Wenjun Wang, Xuesong Mei, Xi'an Jiaotong Univ. (China); Ming Li, Xi'an Institute of Optics and Precision Mechanics, CAS (China).....[10688-43]

Plasmonic nanoscale antireflective coating for efficient CZTS solar cells, Omar A. M. Abdelraouf, The American Univ. in Cairo (Egypt) and Ain Shams Univ. (Egypt); Ahmed Shaker, Ain Shams Univ. (Egypt); Nageh K. Allam, The American Univ. in Cairo (Egypt).....[10688-44]

Design methodology for selecting optimum plasmonic scattering nanostructures inside CZTS solar cells, Omar A. M. Abdelraouf, The American Univ. in Cairo (Egypt) and Ain Shams Univ. (Egypt); Ahmed Shaker, Ain Shams Univ. (Egypt); Nageh K. Allam, The American Univ. in Cairo (Egypt).....[10688-45]

Design of optimum back contact plasmonic nanostructures for enhancing light coupling in CZTS solar cells, Omar A. M. Abdelraouf, The American Univ. in Cairo (Egypt) and Ain Shams Univ. (Egypt); Ahmed Shaker, Ain Shams Univ. (Egypt); Nageh K. Allam, The American Univ. in Cairo (Egypt).....[10688-46]

Angle-selective reflection surface for energy efficiency, Kazutaka Isoda, Koki Nagata, Mizue Ebisawa, Tokyo Metropolitan Industrial Technology Research Institute (Japan); Yukitoshi Otani, Utsunomiya Univ. (Japan).....[10688-47]

Linear and nonlinear light sensors in SCC-based maximum power point search algorithms, Mariusz Ostrowski, Wrocław Univ. of Science and Technology (Poland).....[10688-48]

The multi-input photovoltaic maximum power point tracker with integrated linear light sensor, Janusz Mroczka, Mariusz Ostrowski, Wrocław Univ. of Science and Technology (Poland).....[10688-49]

Petrovskite solar cells: from materials to devices, Tanvi Pradhan, Karlsruher Institut für Technologie (Germany).....[10688-50]

Potassium-alumina-boron glasses doped with copper ions for solar cell down-convertors, Pavel Shirshnev, Alexey Romanov D.D.S., Vladislav Bougrov D.D.S., ITMO Univ. (Russian Federation).....[10688-51]

Large area graphexeter electrodes for photovoltaic applications, Kieran Walsh, Gareth Jones, Matthew Barnes, Conor Murphy, Adolfo De Sanctis, Saverio Russo, Monica Craciun, Univ. of Exeter (United Kingdom).....[10688-52]

Cost-effective solutions for dye sensitized solar cells, Ramshah Toor, Ghulam Ishaq Khan Institute of Engineering Sciences and Technology (Pakistan).....[10688-53]

Phase-separated scattering nanostructures for light trapping back reflectors in thin film solar cells, Yidenekachew J. Donie, Karlsruher Institut für Technologie (Germany); Michael Smeets, Forschungszentrum Jülich GmbH (Germany); Amos Egel, Karlsruher Institut für Technologie (Germany); Florian Lentz, Forschungszentrum Jülich GmbH (Germany); Jan B. Preinfalk, Adrian Mertens, Uli Lemmer, Karlsruher Institut für Technologie (Germany); Karsten Bittkau, Forschungszentrum Jülich GmbH (Germany); Guillaume Gomard, Karlsruher Institut für Technologie (Germany).....[10688-54]

Solar cell thin film technology transparent conductive aluminum doped zinc oxide, Victor Anyanwu, University of Kwa-Zulu Natal (South Africa).....[10688-55]

CONFERENCE 10688

WEDNESDAY 25 APRIL

SESSION 7.....WED 8:50 TO 10:30

Disordered Photonic Nanostructures II

Session Chair: **Aimi Abass**,
Karlsruhe Institute of Technology, (Germany)

Hyperuniform solar light absorbers (*Invited Paper*), Marian Florescu, George Gkantzounis, Richard Spalding, Univ. of Surrey (United Kingdom)[10688-25]

Self-assembly of nanoparticles into nearly hyperuniform 2D structures, rough interfaces of solar cells, Stefan Nanz, Martin-Luther Univ. Halle-Wittenberg (Germany); Peter Michael Piechulla, Martin-Luther Univ. Halle-Wittenberg (Germany); Alexander Sprafke, Martin-Luther-Univ. Halle-Wittenberg (Germany); Aimi Abass, Carsten Rockstuhl, Karlsruher Institut für Technologie (Germany); Ralf B. Wehrspohn, Martin-Luther Univ. Halle-Wittenberg (Germany) and Fraunhofer-Institut für Mikrostruktur von Werkstoffen und Systemen (Germany)[10688-26]

A strategy for tailoring the size distribution of nanospheres to optimize rough interfaces of solar cells, Stefan Nanz, Aimi Abass, Karlsruher Institut für Technologie (Germany); Peter M. Piechulla, Alexander Sprafke, Martin-Luther-Univ. Halle-Wittenberg (Germany); Ralf B. Wehrspohn, Martin-Luther Univ. Halle-Wittenberg (Germany) and Fraunhofer-Institut für Mikrostruktur von Werkstoffen und Systemen (Germany); Carsten Rockstuhl, Karlsruher Institut für Technologie (Germany)[10688-27]

Localization and correlations of light in disordered photonic systems for photovoltaic applications (*Invited Paper*), Francesco Riboli, LENS - Lab. Europeo di Spettroscopia Non-Lineari (Italy)[10688-28]

SESSION 8.....WED 11:00 TO 12:30

Disordered Photonic Nanostructures III

Session Chair: **Klaus Jäger**, Helmholtz-Zentrum Berlin, (Germany)

Photonic network random lasers (*Invited Paper*), Dhruv Saxena, Michele Gaio, Imperial College London (United Kingdom); Jacopo Bertolotti, Univ. of Exeter (United Kingdom); Dario Pisignano, Univ. del Salento (Italy); Andrea Camposeo, Istituto Nanoscienze (Italy); Riccardo Sapienza, Imperial College London (United Kingdom)[10688-29]

Polymer blend lithography: a versatile approach for the fabrication of disordered light harvesting nanostructures, Yidenekachew J. Donie, Anna Osypka, Karlsruher Institut für Technologie (Germany); Radwanul H. Siddique, California Institute of Technology (United States); Tsvetelina Merdzhanova, Forschungszentrum Jülich GmbH (Germany); Vikas R. Voggu, Brian A. Korgel, The Univ. of Texas at Austin (United States); Jan B. Preinfalk, Amos Egel, Hendrik Hölscher, Uli Lemmer, Guillaume Gomard, Karlsruher Institut für Technologie (Germany)[10688-30]

Design of a near-infrared random spectrometer, Paris Varytis, Max-Born-Institut für Nichtlineare Optik Kurzzeitspektroskopie (Germany); Dan-Nha Huynh, Humboldt-Univ. zu Berlin (Germany); Wladislaw Hartmann, Wolfram Pernice, Westfälische Wilhelms-Univ. Münster (Germany); Kurt Busch, Max-Born-Institut für Nichtlineare Optik Kurzzeitspektroskopie (Germany)[10688-31]

Waveguide-integrated single photon spectrometer based on tailored disorder, Wladislaw Hartmann, Westfälische Wilhelms-Univ. Münster (Germany); Paris Varytis, Kurt Busch, Humboldt-Univ. zu Berlin (Germany); Wolfram Pernice, Westfälische Wilhelms-Univ. Münster (Germany)[10688-32]

CONFERENCE 10689

Monday 23 April 2018 • Proceedings of SPIE Vol. 10689

Neuro-inspired Photonic Computing

Conference Chairs: **Marc Sciamanna**, CentraleSupélec (France); **Peter Bienstman**, Univ. Gent (Belgium)

MONDAY 23 APRIL

HOT TOPICS SESSION I 9:00 TO 11:00

From Einstein doubts to quantum bits: a second quantum revolution

Alain Aspect, Lab. Charles Fabry, Institut d'Optique, France

Pico-Photonics: watching and sensing single molecules by confining light to the atom scale

Jeremy J. Baumberg, NanoPhotonics Ctr., Univ. of Cambridge, United Kingdom

For additional details see page 6.

WELCOME AND INTRODUCTION 11:25 TO 11:30

SESSION 1 MON 11:30 TO 12:40

Scalability of Photonic Computing

Session Chair: **Marc Sciamanna**, CentraleSupélec (France)

Photonic reservoir computing (*Invited Paper*), Jean-Pierre Locquet, KU Leuven (Belgium) [10689-1]

Towards integrated parallel photonic reservoir computing based on frequency multiplexing, Wosen Kassa, Evangelia Dimitriadou, Marc Haelterman, Serge Massar, Univ. Libre de Bruxelles (Belgium); Erwin Bente, Technische Univ. Eindhoven (Netherlands) [10689-2]

Parallel optical reservoir computing: towards a high-performance scalable implementation, Jaël Pauwels, Guy Van der Sande, Vrije Univ. Brussel (Belgium); Arno Bouwens, KU Leuven (Belgium); Marc Haelterman, Serge Massar, Univ. Libre de Bruxelles (Belgium) [10689-3]

Lunch Break Mon 12:40 to 14:00

SESSION 2 MON 14:00 TO 15:30

Improved Performances of Optical Reservoir Computing

Session Chair: **Peter Bienstman**, Photonics Research Group (Belgium)

Reservoir computing with delay in structured networks (*Invited Paper*), André Röhm, Technische Univ. Berlin (Germany) [10689-4]

Scaling up reservoir computing with multiple light scattering, Jonathan Dong, Lab. Kastler Brossel (France); Gilles Wainrib, Ecole Normale Supérieure (France); Sylvain Gigan, Lab. Kastler Brossel (France); Florent Krzakala, Ecole Normale Supérieure (France) [10689-5]

Integrated dielectric scatterers for fast optical classification of biological cells, Alessio Lugnan, Univ. Gent (Belgium); Joni Dambre, Peter Bienstman, Univ. Ghent (Belgium) [10689-6]

Toward neuro-inspired computing using a small network of micro-ring resonators on an integrated photonic chip., Florian Denis-le Coarer, CentraleSupélec (France); Andrew Katumba, Matthias Freiberger, Joni Dambre, Peter Bienstman, Photonics Research Group (Belgium); Marc Sciamanna, Damien Rontani, CentraleSupélec (France) [10689-7]

SESSION 3 MON 16:00 TO 17:10

Laser Dynamics and Reservoir Computing

Session Chair: **Marc Sciamanna**, CentraleSupélec (France)

Pulse train control in excitable micropillar lasers with optical delayed feedback (*Invited Paper*), Sylvain Barbay, Ctr. de Nanosciences et de Nanotechnologies (France); Foued Selmi, Louis Andréoli, Rémy Braive, Isabelle Sagnes, Grégoire Beaudoin, Ctr. de Nanosciences et de Nanotechnologies (France); Soizic Terrien, Neil Broderick, Bernd Krauskopf, The Univ. of Auckland (New Zealand) [10689-8]

Generalized synchronization of a population of semiconductor lasers in one- and all-to-all coupling configurations, Axel Dolcemascolo, Univ. de Nice Sophia Antipolis (France); Francesco Marino, Istituto Nazionale di Fisica Nucleare (Italy) and Univ. degli Studi di Firenze (Italy); Stéphane Barland, Univ. de Nice Sophia Antipolis (France) [10689-9]

Dual-mode semiconductor lasers in reservoir computing, Krishan Harkhoe, Guy Van der Sande, Vrije Univ. Brussel (Belgium) [10689-10]

MONDAY POSTER SESSION MON 17:30 TO 19:00

Posters-Monday

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Poster authors, view poster presentation guidelines and set-up instructions at <http://spie.org/x34963.xml> and on page 96.

Design and simulation of optoelectronic neuron equivalents as hardware accelerators of self-learning equivalent convolutional neural structures (SLECNS), Vladimir G. Krasilenko, Vinnitsa Social Economy Institute (Ukraine); Alexander Lazarev, Diana Nikitovich, Vinnitsa National Tech. Univ. (Ukraine) [10689-11]

FOCUS SESSION

Monday 23 April 2018

Light Shaping Focus Session

Conference Chairs: **Frank Wyrowski**, Friedrich-Schiller-Univ. Jena (Germany); **Youri Meuret**, KU Leuven (Belgium); **John T. Sheridan**, Univ. College Dublin (Ireland)

MONDAY 23 APRIL

HOT TOPICS SESSION I 9:00 TO 11:00

From Einstein doubts to quantum bits: a second quantum revolution

Alain Aspect, Lab. Charles Fabry, Institut d'Optique, France

Pico-Photonics: watching and sensing single molecules by confining light to the atom scale

Jeremy J. Baumberg, NanoPhotonics Ctr., Univ. of Cambridge, United Kingdom

For additional details see page 6.

WELCOME AND INTRODUCTION 11:25 TO 11:30

SESSION 1 MON 11:30 TO 12:20

Light Shaping I

Micro-optics for light shaping, Reinhard Voelkel, SUSS MicroOptics SA (Switzerland) [WS200-1]

Lunch Break Mon 12:20 to 13:30

SESSION 2 MON 13:30 TO 17:20

Light Shaping II

Tailored illumination with freeform optics for lighting applications, Youri Meuret, KU Leuven (Belgium) [WS200-2]

Bringing freeform optics into real-world applications, Jürgen Van Erps, Michael Vervaeke, Fabian Duerr, Hugo Thienpont, Vrije Univ. Brussel (Belgium) [WS200-3]

A physical-optics based concept for geometric and diffractive light shaping, Frank Wyrowski, LightTrans International UG (Germany) and Univ. of Jena (Germany) [WS200-4]

Volume holographic elements for light shaping, John T. Sheridan, Univ. College Dublin (Ireland) [WS200-5]

DISCUSSION 17:20 TO 18:00

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Poster Setup Instructions

Monday 23 April 17:30 to 19:00

Conferences 10671, 10675, 10682, 10683, 10684, 10686, 10688, 10689

Tuesday 24 April 18:00 to 19:30

Conferences 10672, 10674, 10676, 10679

Wednesday 25 April 17:45 to 19:15

Conferences 10677, 10678, 10680, 10681, 10685, 10687

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SPIE has arranged special discounted hotel rates for SPIE conference attendees.

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To receive special hotel rates for this meeting, you must use the SPIE Official Hotel Supplier "Conference Direct". SPIE strongly recommends you DO NOT book housing from any other company that contacts you via phone or email.



- The reservation system that SPIE uses for this event is available only via the Hotel page on the event website.
- SPIE Official Housing Vendors use an Official SPIE Contractor logo to verify they are authorized by SPIE
- Our hotel suppliers DO NOT reach out to you with solicitations.
- Our hotel suppliers may follow up with you about housing once you have begun booking via our website, but NOT as an initial solicitation.
- SPIE cannot be liable for any claims made by unofficial entities or for any damages suffered by you if you use any supplier or service that is not an SPIE Official Hotel Supplier.

Join us in Strasbourg

One of Europe's primary business and event destinations, located at the junction of France's North-South and East-West high-speed rail lines, close to 4 international airports, and on the banks of Europe's main commercial waterway. Strasbourg is home to many European institutions and known for its impressive architecture and museums.

Event Location

Strasbourg Convention & Exhibition Centre
(Palais de la musique et des congrès)
Place de Bordeaux, 67082
Strasbourg, France



The Strasbourg Convention Centre is ideally situated in the heart of the European district, accessible via two direct tram lines from the city centre. Only minutes from Strasbourg's historic centre, the TGV rail station, and less than 5 minutes from 3 tram stations.

Tram passes will be available from MyStrasbourg upon arrival at the event. See website for Strasbourg Area Information – tourism, shopping, restaurants.

PARKING

250 free parking spaces on-site and a 570-space park-and-ride nearby.

CAR RENTAL



Hertz Car Rental is the official car rental agency for this event. To reserve a car, call the Hertz International Reservation Center at 1-800-654-3001 in the USA or your local Hertz Reservations Center to receive a special discount for SPIE. Reservations may also be placed on-line at www.hertz.com. You will receive 15% off qualifying rates at participating locations in France.

Be sure to identify yourself as a SPIE attendee. The PC# below must be on your advance reservation to receive this special offer. You must present online coupon at the time of rental in order to receive this discount.

This special offer is available for rentals from April 15-30, 2018.

Book Hertz Online: <https://www.hertz.com/rentacar/reservation>

Acceptance of Policies and Registration Conditions

The following Policies and Conditions apply to all SPIE Events. As a condition of registration, you will be required to acknowledge and accept the SPIE Registration Policies and Conditions contained herein.

Attendee Registration and Admission Policy

SPIE, or their officially designated event management, in their sole discretion, reserves the right to accept or decline an individual's registration for an event. Further, SPIE, or event management, reserves the right to prohibit entry or to remove any individual whether registered or not, be they attendees, exhibitors, representatives, or vendors, whose conduct is not in keeping with the character and purpose of the event. Without limiting the foregoing, SPIE and event management reserve the right to remove or refuse entry to anyone who has registered or gained access under false pretenses, provided false information, or for any other reason whatsoever that they deem is cause under the circumstances.

Payment Policy

Registrations must be fully paid before access to the conference is allowed. SPIE accepts VISA, MasterCard, American Express, Discover, Diner's Club, checks and wire transfers. Onsite registrations can also be paid with cash.

SPIE Safe Meeting and Misconduct Policy

SPIE is a professional, not-for-profit society committed to providing valuable and safe conference and exhibition experiences. SPIE is dedicated to equal opportunity and treatment for all its members, meeting attendees, staff, and contractors. Attendees are expected to be respectful to other attendees, SPIE staff, and contractors. Harassment and other misconduct will not be tolerated; violations will be addressed promptly and seriously. Consequences up to and including expulsion from the event as appropriate may be implemented immediately.

The SPIE anti-harassment policy can be found at <http://spie.org/policy>

Reporting of Unethical or Inappropriate Behavior

Onsite at an SPIE meeting, contact any SPIE Staff with concerns or questions for thorough follow-up. If you feel in immediate danger, please dial the local emergency number for police intervention.

SPIE has established a confidential reporting system for staff and all meetings participants to raise concerns about possible unethical or inappropriate behavior within our community. Complaints may be filed by phoning toll-free to +1-888-818-6898 from within the United States and Canada, or online at www.SPIE.ethicspoint.com and may be made anonymously.

Identification Requirement Policy

To verify registered participants and provide a measure of security, SPIE will ask attendees to present a government-issued photo identification at registration to collect registration materials.

Individuals are not allowed to pick up badges for other attendees. Further, attendees may not have some other person participate in their place at any conference-related activity. Such other individuals will be required to register on their own behalf to participate.

Access to Conference Events / Children Younger than 18

All conference technical and networking events require a badge for admission. Registered attendees may bring children with them as long as they have been issued a badge. Registration badges for children under 18 are free and available at the SPIE registration desk onsite. Children under 14 years of age must be accompanied by an adult at all times, and guardians are asked to help maintain a professional, disturbance-free conference environment.

Unauthorized Solicitation Policy

Unauthorized solicitation in the Exhibition Hall is prohibited. Any nonexhibiting manufacturer or supplier observed to be distributing information or soliciting business in the aisles, or in another company's booth, will be asked to leave immediately.

Recording Policy

Conferences, courses, and poster sessions: For copyright reasons, recordings of any kind are prohibited without prior written consent of the presenter or instructor. Attendees may not capture or use materials presented in any meeting/course room or in course notes on display without written permission. Consent forms are available at Speaker Check-In or SPIE Registration. Individuals not complying with this policy will be asked to leave a given session and/or asked to surrender their recording media. Refusal to comply with such requests is grounds for expulsion from the event.

Capture and Use of a Person's Image

By registering for an SPIE event, you grant full permission to SPIE to capture, store, use, and/or reproduce your image or likeness by any audio and/or visual recording technique and create derivative works of these images and recordings in any SPIE media now known or later developed, for any legitimate SPIE marketing or promotional purpose.

By registering for an SPIE event, you waive any right to inspect or approve the use of the images or recordings or of any written copy. You also waive any right to royalties or other compensation arising from or related to the use of the images, recordings, or materials. By registering, you release, defend, indemnify and hold harmless SPIE from and against any claims, damages or liability arising from or related to the use of the images, recordings or materials, including but not limited to claims of defamation, invasion of privacy, or rights of publicity or copyright infringement, or any misuse, distortion, blurring, alteration, optical illusion or use in composite form that may occur or be produced in taking, processing, reduction or production of the finished product, its publication or distribution.

Laser Pointer Safety Information/Policy

SPIE supplies tested and safety-approved laser pointers for all conference meeting rooms. For safety reasons, SPIE requests that presenters use provided laser pointers.

Use of a personal laser pointer represents the user's acceptance of liability for use of a non-SPIE-supplied laser pointer. If you choose to use your own laser pointer, it must be tested to ensure <5 mW power output. Laser pointers in Class II and IIIa (<5 mW) are eye safe if power output is correct, but output must be verified because manufacturer labeling may not match actual output. You are required to sign a waiver releasing SPIE of any liability for use of potentially non-safe, personal laser pointers. Waivers are available at Speaker Check-In.

Unsecured Items Policy

Personal belongings should not be left unattended in meeting rooms or public areas. Unattended items are subject to removal by security. SPIE is not responsible for items left unattended.

Wireless Internet Service Policy

At most events, SPIE provides wireless access for attendees. Properly secure your computer before accessing the public wireless network. SPIE is not responsible for computer viruses or other computer damage.

No-Smoking Policy

Smoking, including e-cigarettes, is not permitted at any SPIE event.

Agreement to Hold Harmless

Attendee agrees to release and hold harmless SPIE from any and all claims, demands, and causes of action arising out of or relating to your participation in the event you are registering to participate in and use of any associated facilities or hotels.

Event Cancellation Policy

If for some unforeseen reason SPIE should have to cancel an event, processed registration fees will be refunded to registrants. Registrants will be responsible for cancellation of travel arrangements or housing reservations and the applicable fees.



SPIE International Headquarters

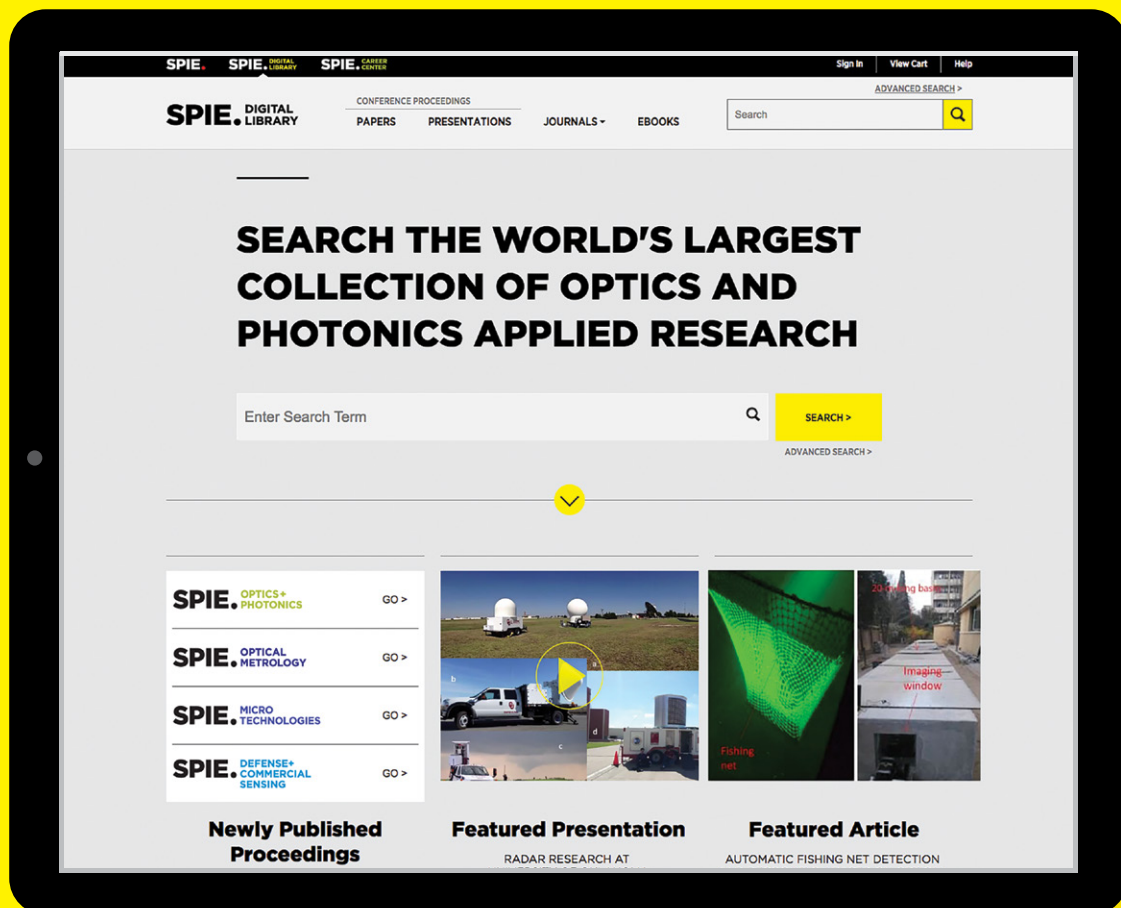
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