The European Conference on Lasers and Electro-Optics and the International Quantum Electronics Conference (CLEO®/Europe-IQEC) is the largest, most comprehensive and prestigious gathering of optics and photonics researchers and engineers organized in Europe in 2007. IQEC incorporates the X Quantum Electronics Conference (EQEC) providing a world-wide international flavor. Moreover, the meeting is complemented by LASER. World of Photonics 2007, the world’s largest exhibition of laser and optical technology. All this will make the meeting a unique opportunity for learning, networking and business.

CLEO®/Europe 2007 will showcase the latest developments in a wide range of laser and photonics sectors including materials, device development, systems engineering, fabrication and applications. IQEC features the fundamentals of quantum and atom optics, quantum information, cold atoms and molecules, basic research in lasers and spectroscopy, nonlinear and ultra-fast optics and dynamics, instabilities and patterns. In 2007, it will be jointly organised by the International Committee on Quantum Electronics and the EPS, and will attract attendees from all around the world.

Three topical symposia and a Tech-Focus meeting will be held jointly organized by CLEO®/Europe and IQEC. Each symposium is dedicated to a particularly important topical development. One joint symposium addresses photonic cryptograpic techniques, another one will be on nanophotonics and metamaterials, while the third symposium is devoted to optical frequency combs and applications. The Tech-Focus meeting is on applications of ultrafast photonic techniques.

CLEO®/Europe-IQEC 2007 is integrated into the world’s largest trade fair on laser technology, LASER. World of Photonics 2007, and will be collocated with a number of smaller specialist conferences including the European Conference on Biomedical Optics, the WLT conference on Lasers in Manufacturing, the DGLM/ISLM congress on Medical Laser Applications, a SPIE conference on Laser Metrology and the Annual Meeting of the European Optical Society. All these collocated conferences, under the banner of "World of Photonics Congress 2007", will share a common registration and so delegates can attend all the sessions – but authors are expected to register with the conference to which they have submitted papers.

In order to better serve participants active in biomedical optics, it has been arranged that the biomedical optics content of CLEO®/Europe-IQEC 2007 be a joint activity with the European Conferences on Biomedical Optics (ECBO, http://www.spie.org/events/ecbo, which is sponsored by SPIE and the OSA and organized by SPIE). Joint sessions on novel optical instrumentation for biomedical applications will be held by ECBO and CLEO®/Europe. Papers concerning emerging technologies for biophotonics should be submitted to CLEO®/Europe-IQEC at: http://www.cleoeurope.org (CLEO®/Europe topic "Biophotonics and Applications"). All other papers concerning biomedical optics should be submitted to ECBO 2007.
**CLEO/Europe-IQEC 2007 Topics and Chairs**

**CLEO/Europe Topics**

**CA) Solid-state Lasers**
Advances in solid-state lasers: novel solid-state lasers; high-efficiency and small quantum defect lasers; high power operation (including amplifiers); solid-state micro-chip and nanolasers; random lasers; pulse generation; short wavelength lasers; mid-infrared lasers; intracavity wavelength conversion; upconversion lasers; tunable lasers; thermal handling, beam quality characterization and improvements; novel pump sources and pumping techniques; laser resonator design; spectroscopic characterization of solid-state gain media; advanced laser crystals and glasses; linewidth reduction and tuning techniques; amplitude and frequency stability; laser characterization and modelling.

**Chair:** Irina Sorokina, Technical University of Vienna, Austria

**CB) Semiconductor Lasers**
Technology, new devices and applications; nonlinear dynamics of semiconductor lasers: optical feedback, coupled lasers, spatial and temporal instabilities, synchronization, multimode dynamics; modelling of semiconductor lasers; vertical cavity surface emitting lasers, photonic crystal lasers, micro-cavity lasers; quantum dot/quantum dash lasers; optical amplifiers; high power and high brightness laser diodes; near-infrared long wavelength lasers; mid-infrared and far-infrared semiconductor lasers: quantum cascade lasers and THz lasers; short-pulse generation, mode locking, switching, clock recovery; harnessing nonlinear dynamics for novel applications: chaos communication, incoherent sources; short wavelength lasers: blue and green; semiconductor laser physics related investigations.

**Chair:** Ingo Fischer, Vrije Universiteit, VUB, Brussels, Belgium

**CC) Holography, Adaptive Optics, Optical Storage and Photorefractives**
Organic and inorganic materials and applications for dynamic optics; Wave mixing, dynamic holography and phase conjugation; Resonant and off-resonance optical effects, optical amplification, nonlinear scattering, photorefractive effect, photochromic effect and photopolymerization; Application to spatial and temporal dynamic optics, light polarization control, solitons, optical data storage, optical data processing, adaptive laser resonators...

**Chair:** Loïc Mager, CNRS, Institut de Physique et de Chimie des Matériaux de Strasbourg, France

**CD) Applications of Nonlinear Optics**
Novel applications of nonlinear optical phenomena and new devices; nonlinear frequency conversion for the UV, visible and IR; telecommunications applications and all-optical switching; all-optical delay lines and slow light; optical parametric devices such as optical parametric amplifiers and oscillators; nonlinear optics in waveguides and fibres, including photonic crystal structures and microstructured optical fibres; quasi-phasematched materials and devices; novel nonlinear materials and structures; stimulated scattering processes and devices; optical limiting; applications of spatial and spatio-temporal nonlinearities including localization phenomena; electro-optic and Kerr devices in crystals and semiconductors; Raman based devices including amplifiers and lasers, beam deflectors and spatial light modulators; nonlinear probing of surfaces; two-photon imaging.

**Chair:** Neil Broderick, University of Southampton, UK

**CE) Optical Materials, Fabrication and Characterization**
Crystal growth and epitaxy of optical materials; new crystalline and glass laser materials in bulk, fiber and waveguide geometry; micro- and nano-fabrication and -engineering techniques; optical characterisation of laser and nonlinear materials, micro-structured fiber and photonic crystal waveguides, quantum-wells, -wires and -dots, nano-crystalline materials, nano-tubes and innovative molecules such as fullerenes; optical modulators; polymer, organic, and related light absorbers, emitters, LEDs, and lasers

**Chair:** Markus Pollnau, University of Twente, Enschede, Netherlands

**CF) Ultrafast Optics and Applications**
Femtosecond and picosecond pulse generation from solid state, fiber and waveguide sources; mode-
locked and Q-switched lasers; optical few-cycle pulses; ultrashort-pulse semiconductor lasers and devices; ultrafast parametric and nonlinear optical conversion of short pulses; ultrashort-pulse mid-IR and THz radiation; pulse compression; super-continuum generation; dispersion compensation; pulse-shaping; carrier-envelope effects; ultrafast characterization methods and measurement techniques, ultrafast optoelectronic systems and devices; applications of ultrafast technology.

**Chair:** Günter Steinmeyer, Max-Born-Institute, Berlin, Germany

**CG) High-field Laser Physics and Applications**
Laser and parametric chirped-pulse amplification; compression and carrier-envelope phase (CEP) stabilisation of Terawatt pulses; carrier-envelope phase metrology; characterization and manipulation of high-intensity femtosecond light pulses; optical field ionization and attosecond xuv/x-ray pulse generation; generation of high brightness attosecond pulse trains using surface harmonic generation, optimal control of ultrafast non-linear processes, time-resolved measurement of Auger decay, XUV/soft x-ray spectroscopy, metrology, interferometry and microscopy; time-resolved Coulomb explosion imaging, electron dynamics in strongly driven molecules, attosecond and femtosecond electron diffraction imaging of molecular structures, dynamics in fixed-in-space molecules, ultrafast electron dynamics in bulk media and quantum-confined structures, probing of surface physiochemical processes via time-resolved UPS/soft XPS; time-resolved XAS, XANES & EXAFS; femtosecond-laser-produced plasmas; relativistic nonlinear optics; laser-driven particle acceleration.

**Chair:** Marc Vrakking, FOM Institute for Atomic and Molecular Physics (AMOLF), Amsterdam, Netherlands

**CH) Optical Sensing and Metrology**
Optical sensing and metrology allow for non-contact inspection of a wide range of objects, from the macroscopic to the nanometric scale. This topic area focuses on recent progress in all aspects of optical sensing and metrology, particularly in new photonic sensor technologies and applications. Papers are solicited on the following and related topics: new trends in optical remote sensing; fiber sensors using conventional and photonic crystal fibers; active multispectral and hyperspectral imaging; sensor multiplexing; novel spectroscopic techniques, applications and systems; optical precision metrology; novel measurement methods and devices based on interferometry, diffractometry or scatterometry; critical dimension metrology; virtual metrology; multiscale surface metrology; UV and DUV microscopy; resolution enhancement technologies in microscopy; inverse problems; phase retrieval.

**Chair:** Hanne Ludvigsen, Helsinki University of Technology, Espoo, Finland

**CI) Optical Technologies for Lightwave Communications and Networks**
Fibre devices including dispersion compensating fibres, non-linear fibres, fibre propagation effects, fibre amplifiers and fibre lasers, fibre gratings and fibre grating-based devices; semiconductor devices that may be employed in lightwave communications for generation, processing and detection of optical signals including laser sources, detectors and modulators, performance monitoring devices, switches, picosecond and femtosecond pulse sources; optical components for enabling WDM and OTDM systems including filtering and switching devices; optical sub-systems including clock recovery techniques, packet/burst switching subsystems, modulation formats, microwave photonic technologies and optical regeneration.

**Chair:** Liam Barry, Dublin City University, Ireland

**CJ) Fibre and Guided Wave Lasers and Amplifiers**
Waveguide and fibre laser oscillator and amplifiers including novel waveguide and fibre geometries; power scaling of waveguide and fibre lasers - including beam combination techniques (for both pump and signal beams) and new waveguide coupling approaches; upconversion lasers; nonlinear effects in waveguides and fibres - including nonlinear frequency conversion and pulse generation and compression; advances in fibre waveguide materials; fabrication techniques for doped waveguide and fibre devices; active microstructured fibre and waveguide laser devices; novel waveguide and fibre sources for industrial applications.

**Chair:** J.R. Taylor, Imperial College, UK

**CK) Photonic Crystals, Photonic Nanostructures and Integrated Optics**
The intensive research nowadays being carried out in the area of nanostructured materials for
Photonic applications has branched in many directions but keeps a common goal. This is learning and profiting form the novel phenomena occurring when light is created, transported and detected in environments where either dimensionality or size are reduced and, in particular, when light-matter interaction occurs in regions smaller than or similar to the wavelength of light. This trend has earned the term nanophotonics. Such a vast field includes but is not restricted to photonic band gaps in various dimensions and new phenomena originating from periodicity or quasi-periodicity; materials aspects and fabrication techniques, including single molecules and nanocrystals in photonic band gap environments; issues related to order/disorder in nanostructured materials; and applications tending to the integration into photonic devices for biology, generation, routing, switching, modulating and detecting light, etc.

**Chair:** Cefe Lopez, Instituto de Ciencia de Materiales de Madrid (CSIC), Madrid, Spain

**CL) Biophotonics and Applications**

This topic area addresses emerging concepts in biophotonics: single particle detection and tracking; spatio-temporal manipulation of light fields; enhanced linear and non linear detection; micro-fluidics and micro-optics; new optical probes for local measurements – including organic and inorganic nano-crystals, electric fields and temperature measurements etc; new routes for optical detection in biophotonics: non linear processes; squeezed states; twin photons; phase conjugation time reversal etc; physics of optical phenomena in biological media: scattering; coherence; polarization; symmetry and invariance; coupling of optical fields with flows and acoustic fields.

**Chair:** Benoît C. Forget, Université Pierre et Marie Curie, Paris France

**CM) Fundamentals and Modelling of Materials Processing with Lasers**

Fundamental physics during materials processing with lasers; welding; surface treatment; cutting; ablation; LPVD; LCVD; interaction light-matter; surface and plasma absorption; heat conduction and convection; phase transformations solid-liquid and liquid-vapour; metallurgy; chemical reactions and diffusion; plasma formation; fluid flow of melt, gas, vapour and plasma; stress formation and strain; mathematical modelling of the physical processes; interaction front; process geometry; analytical modelling; numerical methods and FEA.

**Chair:** Alexander Kaplan, Luleå University of Technology, Sweden

**TECH-FOCUS SESSION on:**

**TF1) Industrial Application of Ultrafast Technologies**

Ultrafast laser technologies are now reaching a stage of maturity such that they are having a significant impact on industry, and this Technical Focus Session will present a representative overview of both existing and emerging industrial applications. The Session will aim at providing a comprehensive introduction to the field for the non-specialist as well as identifying key new directions for future research. The invited speakers will cover topics including: ultrafast fiber and solid state lasers, the search for higher power and more compact sources, femtosecond micromachining applications, THz generation and imaging, optical communication systems, femtosecond biophotonics and more.

**Chair:** Wilson Sibbett, University of St. Andrews, UK

**JOINT CLEO/Europe-IQEC 2007 SYMPOSIA:**

**JS1) Cryptographic Techniques in Photonics**

This Joint Symposium welcomes contributions on any topic relevant to the application of photonic and optical technologies for cryptography. Topics include, but are not restricted to, the following: chaotic emitter and receiver sources; compact and integrated devices; optical chaos cryptography; quantum key distribution; schemes for information encryption; evaluation of transmission characteristics: bit rate, bit error rate, maximum transmission distance, dispersion compensation techniques; synchronization improvements; free-space and fiber implementations; security aspects: evaluation and characterization; information-theoretic security; key distribution; bidirectional communications; exploitation of correlations via public discussion protocol; single photon sources; use
of coherent states for cryptography.

**Co-Chairs:** Nobuyuki Imoto, Osaka University, Japan and Claudio Mirasso, Universitat de les Illes Balears, Palma de Mallorca, Spain

**JSII) Nanophotonics and Metamaterials: From Concepts to Devices**
Nanophotonics and Metamaterials are overlapping areas of photonics research that have rapidly grown in importance in recent years. The symposium will be concerned with wavelength scale and sub-wavelength scale photonics - and, more generally, with optical structures and devices where the response is determined by nanoscale features. Interest in metamaterials that operate at optical frequencies has increased greatly since deterministic fabrication technology that can produce specific properties reproducibly has now emerged. The symposium will cover basic physics, new phenomena, materials properties, fabrication technologies, modelling, device design and characterization - applied in a nanophotonics environment. The symposium will seek to capture the excitement and diversity of this field by gathering experts and newcomers alike to present their latest research developments (both fundamental and applied) in the above-mentioned areas. Submissions that address specific areas of potential application will be especially welcome.

**Co-Chairs:** Ted Sargent, University of Toronto, Canada and Nikolay I. Zheludev, Southampton University, UK

**JSIII) Optical Frequency Combs and Applications**
Optical frequency combs based on femtosecond mode-locked lasers have brought about a revolution in optical frequency metrology, providing a simple and robust means of connecting the optical and microwave domains of the electromagnetic spectrum. This has made possible the direct counting of optical cycles, which is a critical milestone in the creation of next-generation optical atomic clocks and techniques of precision spectroscopy. Indeed, the importance of these recent developments, as pioneered by T.W. Hänsch and J.L. Hall, was recognized in the award of the 2005 Nobel Prize in physics. Beyond applications in precise time/frequency metrology and tests of fundamental theories, such combs have opened new research avenues in precise length metrology, remote ranging and sensing, novel broadband spectroscopy techniques, and the synthesis of low-noise/low-jitter waveforms. Moreover, these applications have synergistically motivated important developments in carrier-envelope stabilized femtosecond lasers, coherent linking of multiple broadband sources and nonlinear broadening and frequency conversion techniques that have now pushed frequency combs into new spectral regimes from the XUV to far-IR. This joint symposium will seek to capture the excitement and diversity of this field by gathering experts and newcomers alike to present their latest research developments (both fundamental and applied) in the above-mentioned areas.

**Co-Chairs:** Scott Diddams, National Institute of Standards and Technology, Boulder, CO, USA and Harald Telle, Physikalisch-Technische Bundesanstalt (PTB), Braunschweig, Germany

**IQEC Topics**

**IA) Microstructured Devices for Quantum and Atom Optics**
Cold atoms and Bose Einstein condensates can be confined in extremely small magnetic traps and guides on atom chips, made using microfabricated current-carrying wires or micro-structured patterns of permanent magnetisation. Switched magnetic, electrostatic and radiofrequency fields add further options for atom manipulation. Alternatively atoms may be trapped and manipulated on the microscopic scale in optical lattices, which may be free-standing or integrated into an atom chip. When coupled to high-finesse optical micro-resonators, trapped atoms offer possibilities for quantum coherent control, including quantum logic gates and quantum memories and with an interconnect to flying optical qubits. This conference topic covers all such effort to miniaturise quantum atom optics and to realise applications such as interferometry, metrology and quantum information processing.

**Chair:** Ed Hinds, Imperial College, London, UK

**IB) Cold Atoms and Molecules**
Quantum degenerate Bose and Fermi gases -- Bose-Einstein condensation, multi-component and spinor gases, Fermi degeneracy, superfluid Bose and Fermi gases, the BEC-BCS crossover regime, gases in restricted geometries, effects of disordered potentials, effects of quantum degeneracy on atom-light interactions and atomic coherence, coherent and quantum atom optics, trapping and
cooling techniques; quantum gases in optical lattices -- internal state/spin dynamics, quantum phases and transitions, single- and multi-band gas models, controlled collisions and photoassociation; cold molecules -- production and detection methods, manipulating molecular motion, trapping schemes; ultracold polar molecules, scattering and chemistry; applications of quantum gases -- metrology, precision measurements, testing of fundamental symmetries.

**Chair:** Dan Stamper-Kurn, UC Berkeley, USA

### IC) Quantum Information

Quantum information processing has progressed rapidly in the past decade, and grown into a large interdisciplinary activity. The conference program will highlight recent innovations in all areas of the field, from algorithm development to experimental implementations of quantum computers. Of especial interest are results in quantum communications systems and in quantum cryptography, including entanglement distribution and distillation, conversion of information between static and flying qubits, and quantum memories, both for individual particles and ensembles. In addition, novel platforms, devices and materials for quantum information processing, such as photonic bandgaps, micro-mechanics, ion-trap arrays, superconducting structures, quantum dots and nonlinear optical processes will be covered.

**Chair:** Ian A. Walmsley, University of Oxford, UK

### ID) Photonics Applications in Fundamental Physics

Novel laser-spectroscopy techniques, high-resolution spectroscopy, nonlinear spectroscopy, nonlinear magneto- and electro-optical effects, and their applications to metrology; novel frequency standards; measurements of fundamental constants, and searches for their temporal variation; fundamental-symmetry tests.

**Chair:** Dmitry Budker, UC Berkeley, USA

### IE) Nonlinear Optics and Ultrafast Phenomena

Fundamentals of nonlinear optics; fundamentals of ultrashort optical fields; frequency conversion, parametric processes and wavemixing; novel nonlinear optical materials, processes and effects; temporal and spatial solitons; ultrafast spectroscopy; ultrafast dynamics in condensed matter and molecules; control of chemical reactions; electromagnetic induced transparency, lasing without inversion, slow light and dark states.

**Chair:** Steve Cundiff, JILA, University of Colorado and NIST, Boulder, USA

### IF) Quantum Optics

Photons in confined structures and cavity QED; quantum correlation and quantum noise reduction; entangled states and decoherence; single photon and nonclassical light sources and applications; QND measurements; quantum imaging, quantum metrology and quantum lithography.

**Chair:** Hans A. Bachor, The Australian National University, Canberra, Australia

### IG) Dynamics, Instabilities and Patterns

Pattern forming optical systems: localized and extended structures; novel optical systems for nonlinear dynamics such as quantum dot lasers, hybrid devices, microlasers, fiber lasers; dynamics of nonlinear optical systems such as lasers, OPOs, optical valves; instabilities in semiconductor lasers: injected signal, optical feedback, multimode dynamics; control, synchronisation and applications of chaos in optical systems.

**Chair:** Fedor Mitschke, University of Rostock, Germany
**CLEO®/Europe 2007 Invited Talks**

**Topic Area CA: Solid-State Lasers**

Continuous-wave self-Raman and intracavity doubled laser operation in Nd:GdVO4 at 586.5 nm  
Peter Dekker, Centre for Lasers & Applications, Macquarie University, North Ryde, NSW, Australia

Thin disk lasers  
Adolf Giesen, Stuttgart University, Stuttgart, Germany

High-power, high-repetition UV beam generation with an all-solid-state laser  
Tomotaka Katsura, Mitsubishi Electric Corporation, Advanced Technology R&D Center, Amagasaki, Japan

Tunable CW and Q-switched operation in Yb:CaF2 and Yb:SrF2  
Mathias Siebold, Institute for Optics and Quantum Electronics, Jena, Germany

**Topic Area CB: Semiconductor Lasers**

Terahertz quantum cascade laser source based on intra-cavity difference-frequency generation  
Mikhail A. Belkin, Harvard University, Cambridge, USA

Quantum dot lasers / reliability of quantum dot lasers and perspectives for industrial applications  
Alexey Kovsh, Innolume GmbH, Santa Clara, USA

Active mode control in VCSEL-based photonic crystal superlattices  
Lars Lundeberg, Ecole Polytechnique Fédérale de Lausanne (EPFL), Lausanne, Switzerland

Nonlinear dynamics in semiconductor lasers and VCSELs  
Junji Ohtsubo, Shizuoka University, Johoku, Hamamatsu, Japan

High-power, high-brightness, tunable GaSb-based VECSEL at 2.3 µm  
Marcel Rattunde, Fraunhofer IAF, Freiburg, Germany

Coupled nanocavity arrays  
Dirk Englund, Stanford University, Stanford, USA

**Topic Area CC: Holography, Adaptive Optics, Optical Storage and Photorefractives**

Nonlinear photonic structures in photorefractive media  
Cornelia Denz, Westfaelische Wilhelms-Universitat Muenster, Germany

Ultra-fast phase conjugate laser system  
Kouji Nawata, Chiba University, Chiba, Japan
Nanoparticle-photopolymer composites for holographic applications
Yasuo Tomita, University of Electro-Communications, Tokyo, Japan

**Topic Area CD: Applications of Nonlinear Optics**

Slow light in semiconductor waveguides: theory and experiment
Jesper Mørk, Technical University of Denmark, Kgs. Lyngby, Denmark

All-optical switching and control of ultrahigh-Q photonic-crystal nanocavities
Masaya Notomi, NTT Basic Research Laboratories, Atsugi, Japan

Stimulated Brillouin scattering beam cleanup of a pulsed multimode fiber master-oscillator power-amplifier at 1.55mm
Bastien Steinhausser, Thales Research and Technology, Palaiseau, France

**Topic Area CE: Optical Materials, Fabrication and Characterization**

Highly dispersive 100%-efficiency transmission gratings without reflection losses
Tina Clausnitzer, Friedrich-Schiller-University, Jena, Germany

Rare-earth-ion-doped sesquioxide laser materials
Klaus Petermann, Institute of Laser-Physics, University of Hamburg, Hamburg, Germany

High power and high external efficiency m-Plane InGaN LEDs
Mathiew Schmidt, UCSB Materials, University of California, Santa Barbara, USA

Are organic LEDs and lasers similar to inorganic devices?
Nir Tessler, Technion, Haifa, Israel

**Topic Area CF: Ultrafast Optics, Electrooptics and Applications**

Octave spanning 1GHz Ti:sapphire oscillator for HeNe CH4-based frequency combs and clocks
Andrew Benedick, Massachusetts Institute of Technology, Cambridge, USA

A nanometer-sized few femtosecond electron source at high repetition rates
Christoph Lienau, Universtitaet Oldenburg, Germany

Generation of terawatt sub-8 fs laser pulses using noncollinear optical parametric chirped pulse amplification
Amandine Renault, Laser Centre Vrije Universiteit, Amsterdam, Netherlands

Attosecond real-time observation of electron tunnelling and multi-electron dynamics in atoms
Martin Schultze, MPI f. Quantenoptik, Garching, Germany

Novel concepts in high-energy femtosecond fiber lasers
Frank Wise, Cornell University, Ithaca, USA

**Topic Area CG: High-field Laser Physics and Applications**
Generating isolated attosecond pulses by modulating light polarization
Eric Constant, CELIA, Université Bordeaux 1, Talence, France

Sub-20 fs time resolved EXAFS at the Si K edge
Enikoe Seres, EP1, University Würzburg, Germany

**Topic Area CH: Optical Sensing and Metrology**

New technologies in fiber sensors
Michel Digonnet, Stanford University, Stanford, USA

Fiber-optic nerve systems for materials that can feel pain
Kazuo Hotate, The University of Tokyo, Japan

Photochemical long-period grating fabrication in pure-fused-silica photonic crystal fiber
David Nikogosyan, University College, Cork, Ireland

**Topic Area CI: Optical Technologies for Lightwave Communications and Networks**

Reconfigurable dispersion trimming in an LCOS-based dynamic wavelength processor
Michaël Alberic Freddy Roelens, University of Sydney, Australia

Ultrafast optical transmission technologies
Reinhold Ludwig, FhG Heinrich-Hertz-Institute, Berlin, Germany

Applications of SOAs in ultra-high speed networking
Huug de Waardt, Eindhoven University of Technology, Eindhoven, Netherlands

**Topic Area CJ: Fibre and Guided Wave Lasers and Amplifiers**

High power pulsed sources
Jens Limpert, Friedrich Schiller University, Jena, Germany

Microstructured fibres and applications
Philippe Roy, Xlim, Limoges, France

**Topic Area CK: Photonic Crystals, Photonic Nanostructures and Integrated Optics**

Optical surface resonances hide the gap in photonic crystals!
Florencio Garcia-Santamaria, University of Illinois at Urbana-Champaign, Urbana, USA

Lensless focusing with subwavelength resolution by an array of nanoholes
Fu Min Huang, Optoelectronics Research Centre, Southampton, United Kingdom

P-Ink: intelligent color
Geoffrey Ozin, University of Toronto, Canada

Monolithic integrated Raman silicon lasers and amplifiers
Haisheng Rong, Intel Corp., Santa Clara, CA, USA

**Topic Area CL: Biophotonics and Applications**
Scattering phenomena in biomedical applications
Aristide Dogariu, CREOL, University of Central Florida, Orlando, USA

Sensitive optical biosensor based on whispering-gallery modes of dielectric microspheres
Julie Lutti, Cardiff University, United Kingdom

**Topic Area CM: Fundamentals and Modelling of Materials Processing with Lasers**

Nanoscale laser processing using near field optics
Costas P. Grigoropoulos, University of California, Berkeley, USA

Modelling of laser surface alloying and dispersing of ceramics
Magnus Rohde, Forschungszentrum Karlsruhe, Institute for Materials Research I, Eggenstein-Leopoldshafen, Germany

**CLEO®/Europe 2007 - IQEC 2007 Joint Symposium**

**Topic Area JSI: Cryptographic Techniques in Photonics**

Robustness of polarization entanglement for long distance QKD
Hannes Hübel, University of Vienna, Austria

Finding a needle in a haystack: chaos, noise and information
Rajarshi Roy, University of Maryland, College Park, USA

**Topic Area JSII: Nanophotonics and Metamaterials: From Concepts to Devices**

Plasmon-based optical manipulation
Romain Quidant, ICFO-Institut de Ciencies Fotoniques, Castelldefels (Barcelona), Spain

Single negative, double negative, low loss negative metamaterials-II
Vladimir M. Shalaev, Birck Nanotechnology Center, Purdue University, West Lafayette, IN, USA

Optical metamaterials and plasmonic devices
Zhang Xiang, University of California, Berkeley, USA

**Topic Area JSIII: Optical Frequency Combs and Applications**

Frequency comb laser spectroscopy at vacuum-ultraviolet wavelengths and beyond
Kjeld Eikema, Laser Centre Vrije Universiteit, Amsterdam, Netherlands

Spectral line-by-line pulse shaping
Andrew Weiner, Purdue University, West Lafayette, IN, USA

**IQEC 2007 Invited Talks**

**Topic Area IA: Microstructured Devices for Quantum and Atom Optics**
Strong atom-cavity coupling observed for trapped single atoms and Bose-Einstein condensates on an atom chip
Yves Colombe, Laboratoire Kastler Brossel de l'E.N.S., Paris, France

Microchips for single atom detection and spin squeezing
Igor Teper, Massachusetts Institute of Technology, Cambridge, USA

**Topic Area IB: Cold Atoms and Molecules**

Correlations in ultracold atomic gases
Michaël Köhl, University of Cambridge, United Kingdom

Excitation of Rydberg atoms in a Bose-Einstein condensate
Robert Löw, Stuttgart University, Stuttgart, Germany

Fermionic superfluidity with imbalanced spin populations
Martin Wolfram Zwierlein, Massachusetts Institute of Technology, Cambridge, MA, USA

**Topic Area IC: Quantum Information**

Radiation-pressure effects upon a micro-mirror in a high-finesse optical cavity
Pierre-Francois Cohadon, Laboratoire Kastler Brossel, Paris, France

Generation and detection of entangled light fields with negative Wigner functions
Philippe Grangier, Laboratoire Charles Fabry de l'Institut d'Optique, Orsay, France

Quantum jumps of light recording the birth and death of a photon in a cavity
Stefan Kuhr, Johannes Gutenberg University, Mainz, Germany

Optomechanical entanglement between a movable mirror and a cavity field
David Vitali, University of Camerino, Italy

Quantum information processing with superconducting qubits and cavities
Andreas Wallraff, ETH Zurich, Switzerland

**Topic Area ID: Laser and Precision Spectroscopy**

New measurement of the electron magnetic moment and the fine structure constant
Gerald Gabrielse, Harvard University, Cambridge, USA

Modern optical tests of special relativity
Achim Peters, Humboldt University Berlin, Germany

**Topic Area IE: Nonlinear Optics and Ultrafast Phenomena**

Femtosecond terahertz studies of excitons
Rupert Huber, University of Konstanz, Germany

Femtosecond imaging of the spin dynamics of CoPt3 nanostructures
Abdelghani Laraoui, Institute of Physics and Chemistry of Materials of Strasbourg, France
Strong field nonlinear optics with light pulses of "Subatomic" duration
Alexander Nazarkin, University of Erlangen, Germany

Ultrafast coherent control of magnetism
Theo Rasing, University of Nijmegen, Netherlands

**Topic Area IF: Quantum Optics**

Observation of Faraday rotation from a single quantum-dot spin
Jan Dreiser, ETH Zurich, Switzerland

Quantum measurement and feedback control
Hideo Mabuchi, California Institute of Technology, Pasadena, CA, USA

Quantum teleportation between light and matter
Eugene Polzik, Niels Bohr Institute, Copenhagen, Denmark

**Topic Area IG: Dynamics, Instabilities and Patterns**

Instabilities in quantum dot semiconductor lasers 1.3 um
Guillaume Huyet, Tyndall National Institute, Cork, Ireland

Tailored shapes of organic micro-lasers: a testbed for wave chaos physics
Mélanie Lebental, Ecole Normale Supérieure, Cachan, France

Thermalization of incoherent nonlinear wave-packets
Antonio Picozzi, CNRS, Institut Carnot de Bourgogne, Dijon, France

Experiments showing orbital angular momentum exchange with optical vortices
Luat Vuong, Cornell University, Ithaca, NY, USA
**CLEO®/Europe 2007 Plenary**
The Exawatt laser: from relativistic to ultra relativistic optics
Gérard Mourou, ENSTA, Laboratoire d'Optique Appliquée, Palaiseau, France
This plenary will be given on Monday 18 June from 09:30 to 10:30, Room 1

**IQEC 2007 Plenary**
A passion for precision
Theodor W. Hänsch, Max-Planck-Institute for Quantum Optics, Garching, Germany
This plenary together with the OSA and EPS Awards Ceremony will be given on Tuesday 19 June from 10:30 to 12:00, Room 1

**OSA Awards Ceremony**
Joseph H. Eberly, OSA President, will recognize the following recently elected OSA Fellows during the Conference Award Ceremony on Tuesday 19 June from 10:30 to 12:00, Room 1.

**Juan Campos**, Universidad Autonoma de Barcelona, Spain
For specific achievements in optical image processing, modeling of liquid crystal panels, development of optical deflectometry metrology, and service to the international optics community.

**Michael J. Damzen**, Imperial College London, United Kingdom
For contributions to optics and laser physics over more than 25 years through research into nonlinear optics and development of laser technology and through his inspired teaching.

**Richard De La Rue**, University of Glasgow, United Kingdom
For contributions to integrated optical device technology, from electro-optic switches through semiconductor lasers to photonic crystals.

**John D. Harvey**, University of Auckland, New Zealand
For pioneering contributions in biophotonics, nonlinear fiber optics and optical communications research.

**Wieslaw Z. Krolikowski**, Australian National University, Canberra, Australia
For important contributions to the physics of optical spatial solitons.

**Irina T. Sorokina**, Technische Universität Wien, Austria
For pioneering contributions to tunable and ultrashort-pulse solid-state lasers and their applications in spectroscopy, particularly based on novel laser crystals in the near- and mid-infrared spectral regions.

**Mitsuo Takeda**, The University of Electro-Communications, Tokyo, Japan
For outstanding contributions to the advancement of optical metrology especially through the invention of the Fourier transform method for fringe analysis.

**EPS Awards Ceremony:**

**EPS Quantum Electronics Prizes**
for outstanding contributions to quantum electronics and optics. There is one prize for fundamental aspects and one prize for applied aspects.

**Fresnel Prizes**
for outstanding contributions to quantum electronics and optics made by young scientists before the age of 35. There is one prize for fundamental aspects and one prize for applied aspects.

**QEOD Thesis Prizes**
for the best nominated PhD theses in the area of quantum electronics and optics submitted in the two years prior to the CLEO/Europe-IQEC meeting. These prizes (total of 4) will be awarded for fundamental and for applied aspects.
CLEO IQEC 2007 Walther Memorial Plenary

The late Professor Herbert Walther was instrumental in the organisation and success of CLEO Europe and in cementing international bonds between researchers in optics in many fields. In his honour, this special Memorial Session will consist of a number of invited presentations spanning the wide range of his technical interests.

Moderator and short introduction
Ferenc Krausz, Max Plank Institute of Quantum Optics, Garching, Germany

Quantum entanglement: a vanishing resource
Joseph Eberly, University of Rochester, USA

Title to be given later
Axel Schenzle, University of Munich, Germany

This memorial session will be presented on Thursday 21 June from 13:30 to 14:30, Room 1

CLEO®/Europe 2007 Tutorial

New directions in photonic crystal fibers
Philip Russell, University of Erlangen-Nürnberg, Erlangen, Germany

Negative index materials
Costas M. Soukoulis, Iowa State University, Ames, USA

IQEC 2007 Tutorial
Exploring ultracold quantum matter in artificial crystals of light
Immanuel Bloch, Johannes Gutenberg Universität Mainz, Germany

Slow-light in room-temperature optical waveguides
Daniel Gauthier, Duke University, Durham, USA

CLEO®/Europe 2007 Keynote

Attosecond spectroscopy comes of age
Reinhard Kienberger, Max-Planck-Institut für Quantenoptik, Garching, Germany
The all-photonic chip
Ben Eggleton, University of Sydney, CUDOS, Sydney, Australia
Diversity of fiber laser technology
David Richardson, University of Southampton, United Kingdom

Tailoring NanoMaterials for light-matter interactions
Jeremy Baumberg, University of Southampton, United Kingdom
Cold quantum gases: when atomic physics meets condensed matter
Jean Dalibard, Laboratoire Kastler Brossel, Paris, France

Chip-Scale Atomic Devices Based on Microfabricated Alkali Vapor Cells
John Kitching, NIST Boulder, CO, USA
The new high-Q physics: photonic clocks, back-action cooling, and micro-chip cavity QED
Kerry Vahala, California Institute of Technology Pasadena, CA, USA
Tech-Focus session 1: Industrial Applications of Ultrafast Technology

The all-optical THz oscilloscope
Albrecht Bartels, Gigaoptics GmbH, Konstanz, Germany

Femtosecond Micromachining
Patrick Chabassier, CEO, NOVALASE SA, Canejan, France

Ultrafast lasers for nanomaterial growth and processing
Samuel Mao, University of California, Berkeley, CA, USA

Next generation ultrafast telecommunications technologies
M. Nakazawa, Tohoku University, Japan

Industrial Perspectives on Ultrafast Fiber Lasers
Andreas Tünnermann, Fraunhofer Institute, Jena, Germany

Spectral coherence interferometry (SCI) for fast and rugged industrial applications
Alexander Knüttel, ISIS optronics GmbH, Mannheim, Germany
**Joint-Symposia**

A much appreciated feature of the CLEO®/Europe-IQEC meetings has always been the symposia that are organized to anticipate on emerging fields by putting emphasis on fast developing, well defined topics. Symposia rely on a large fraction of invited presentations but typically also accept contributed presentations. Unless the authors object, submissions may be transferred from "topic areas" to symposia and vice versa.

**Three symposia have been identified for CLEO®/Europe-IQEC 2007:**

**JSI - Cryptographic Techniques in Photonics**

**JSII - Nanophotonics and Metamaterials: From Concepts to Devices**

**JSIII - Optical Frequency Combs and Applications**

**JSI - Cryptographic Techniques in Photonics**

This Joint Symposium welcomes contributions on any topic relevant to the application of photonic and optical technologies for cryptography. Topics include, but are not restricted to, the following:

- Chaotic emitter and receiver sources; compact and integrated devices; optical chaos cryptography;
- Quantum key distribution; schemes for information encryption; evaluation of transmission characteristics: bit rate, bit error rate, maximum transmission distance, dispersion compensation techniques; synchronization improvements; free-space and fiber implementations; security aspects: evaluation and characterization; information-theoretic security; key distribution; bidirectional communications; exploitation of correlations via public discussion protocol; single photon sources; use of coherent states for cryptography.

**Programme Committee:**

Co-Chairs: Nobuyuki Imoto, Osaka University, Toyonaka, Japan and Claudio R. Mirasso, Universitat de les Illes Balears, Palma de Mallorca, Spain

Valerio Annovazzi Lodi, University of Pavia, Italy
Artur Ekert, University of Cambridge, UK
Nicolas Gisin, University of Geneva, Switzerland
Takuya Hirano, Gakushuin University, Tokyo, Japan
Ido Kanter, Bar-Ilan University, Ramat-Gan, Israel
Jia-Ming Liu, University of California, UCLA, Los Angeles, CA, USA
Hoi-Kwong Lo, University of Toronto, Canada
Norbert Lütkenhaus, University of Waterloo, Waterloo, ON, Canada
John Rarity, University of Bristol, UK
Marco Santagustinia, University of Padova, Italy
Alan Shore, University of Wales, Bangor, UK
Dimitris Syvridis, University of Athens, Greece
Mirvais Youseffi, University of Eindhoven, Netherlands

**Invited Speakers:**

Finding a needle in a haystack: chaos, noise and information
Rajarshi Roy, University of Maryland, College Park, MD, USA

**JSII - Nanophotonics and Metamaterials: From Concepts to Devices**

Nanophotonics and Metamaterials are overlapping areas of photonics research that have rapidly grown in importance in recent years. The symposium will be concerned with wavelength scale and sub-wavelength scale photonics - and, more generally, with optical structures and devices where the response is
determined by nanoscale features. Interest in metamaterials that operate at optical frequencies has increased greatly since deterministic fabrication technology that can produce specific properties reproducibly has now emerged. The symposium will cover basic physics, new phenomena, materials properties, fabrication technologies, modelling, device design and characterization - applied in a nanophotonics environment. The symposium will seek to capture the excitement and diversity of this field by gathering experts and newcomers alike to present their latest research developments (both fundamental and applied) in the above-mentioned areas. Submissions that address specific areas of potential application will be especially welcome.

Programme committee:
Co-Chairs: Nikolay I. Zheludev, Southampton University, UK and Ted Sargent, University of Toronto, Canada
F. Javier Garcia de Abajo, CSIC, San Sebastian, Spain
Joachim Krenn, University of Graz, Austria
Michal Lipson, Cornell University, Ithaca, NY, USA
David R. Smith, Duke University, Durham, NC, USA
Tomasz Szoplik, Warsaw University, Poland
Din Ping Tsai, National Taiwan University, Taipei, Taiwan
Niek F. van Hulst, ICFO - Institute of Photonic Sciences, Castelldefels (Barcelona), Spain

Invited Speakers:
Linear and Nonlinear Optics of Metamaterials
Vladimir M. Shalaev, Purdue University, West Lafayette, USA

Optical metamaterials and plasmonic devices
Xiang Zhang, University of California, CA, Berkeley, USA

JSIII - Optical Frequency Combs and Applications
Optical frequency combs based on femtosecond mode-locked lasers have brought about a revolution in optical frequency metrology, providing a simple and robust means of connecting the optical and microwave domains of the electromagnetic spectrum. This has made possible the direct counting of optical cycles, which is a critical milestone in the creation of next-generation optical atomic clocks and techniques of precision spectroscopy. Indeed, the importance of these recent developments, as pioneered by T.W. Hänsch and J.L. Hall, was recognized in the award of the 2005 Nobel Prize in physics. Beyond applications in precise time/frequency metrology and tests of fundamental theories, such combs have opened new research avenues in precise length metrology, remote ranging and sensing, novel broadband spectroscopy techniques, and the synthesis of low-noise/low-jitter waveforms. Moreover, these applications have synergistically motivated important developments in carrier-envelope stabilized femtosecond lasers, coherent linking of multiple broadband sources and nonlinear broadening and frequency conversion techniques that have now pushed frequency combs into new spectral regimes from the XUV to far-IR. This joint symposium will seek to capture the excitement and diversity of this field by gathering experts and newcomers alike to present their latest research developments (both fundamental and applied) in the above-mentioned areas.
Programme Committee:
Co-Chairs: Scott Diddams, National Institute of Standards and Technology, Boulder, USA and Harald Telle, Physikalisch-Technische Bundesanstalt, Braunschweig, Germany

Alexander Gaeta, Cornell University, Ithaca, NY, USA
David Jones, University of British Columbia, Vancouver, BC, Canada
R. Jason Jones, JILA/University of Colorado and NIST, Boulder, CO, USA
Franz Kärtner, Massachusetts Institute of Technology, Cambridge, MA, USA
Motonobu Kourogi, Optical Comb Institute, Tokyo, Japan
Stephen N. Lea, National Physical Laboratory, Teddington, UK
Kaoru Minoshima, National Institute of Advanced Industrial Science and Technology, Tsukuba, Japan
Giorgio Santarelli, BNM-Syrte, France
Florian Tauser, Toptica Photonics AG, Graefelfing/Munich, Germany
Thomas Udem, Max-Planck Institute for Quantum Optics, Garching, Germany
Lijun Wang, Max-Planck Research Group, Erlangen, Germany

Invited Speakers:
Frequency comb metrology at vacuum ultraviolet wavelengths and beyond
K.S.E. Eikema, Vrije Universiteit, Faculty of Sciences, Amsterdam, Netherlands

Spectral Line-by-Line Pulse Shaping
Andy Weiner, Purdue University, West Lafayette, USA
CLEO®/EUROPE 2007

Steering Committee

European Physical Society:

Chair: Sandro De Silvestri, Politecnico di Milano, Italy
Ennio Arimondo, INFN - University of Pisa, Pisa, Italy
Robert W. Boyd, University of Rochester, NY, USA
Richard De La Rue, University of Glasgow, United Kingdom
John Dudley, Université de Franche-Comté, Besançon, France
Paul French, Imperial College, London, United Kingdom
Ursula Keller, ETH Zurich, Zürich, Switzerland
Daan Lenstra, Delft University of Technology, Delft, Netherlands
Peter Loosen, Fraunhofer Institute of Laser Technology, Aachen, Germany
Ralf Menzel, University of Potsdam, Germany
Dieter Meschede, University of Bonn, Germany
Klaus Mølmer, University of Aarhus, Denmark
Eberhard Riedle, LMU Munich, Germany
Gérald Roosen, Laboratoire Charles Fabry, Institut d’Optique, Orsay, France
Ken-Ichi Ueda, University of Electro-Communications, Tokyo, Japan

IEEE/Lasers and Electro-Optics:

Silvano Donati, University of Pavia, Italy
Concetto Giuliano, US Airforce Research Laboratory, Kirtland, NM, USA
Giok-Djian Khoe, Eindhoven University of Technology, Netherlands
Richard Linke, IEEE/LEOS, Piscataway, NJ, USA

Optical Society of America:

Kari Apter, Optical Society of America, Palo Alto, CA, USA
Jean-Pierre Huignard, Thales Research & Technology, Palaiseau, France
Franz Kärtner, Massachusetts Institute of Technology, Cambridge, MA, USA
Jürg Leuthold, University of Karlsruhe, Germany
Elizabeth Rogan, Optical Society of America, Washington DC, USA

Comptroller:
Paul Mandel, Université Libre de Bruxelles, Brussels, Belgium

CLEO®/EUROPE 2007

Organising Committee

General Chairs
Ursula Keller, ETH Zurich, Zürich, Switzerland

Gérald Roosen, Laboratoire Charles Fabry de L’Institut d’Optique, Orsay, France

Programme Chairs
Richard De La Rue, University of Glasgow, UK
John Dudley, Université de Franche-Comté, Besançon, France

Local Chair
Eberhard Riedle, Ludwig-Maximilians-University, Munich, Germany

Programme Committees
CA - Solid-State Lasers
Chair: Irina Sorokina, Technical University of Vienna, Austria
Tasoltan T. Basiev, General Physics Institute Russian Academy of Sciences, Moscow Russia
Camille Bibeau, Lawrence Livermore National Laboratory, Livermore, CA, USA
Robert L. Byer, Stanford University, Ginzton Laboratory, Stanford, CA, USA
William A. Clarkson, University of Southampton, UK
Allister I. Ferguson, University of Strathclyde, Glasgow, UK
Patrick Georges, Institut d'Optique, Orsay, France
Thomas Graf, University of Stuttgart, Germany
Fredrik Laurell, Royal Institute of Technology, Stockholm, Sweden
Richard Moncorgé, Centre Interdisciplinaire de Recherches Ions et Lasers (CIRIL), ENSICAEN, Caen, France
Valentin A. Orlovich, B.I. Stepanov Institute of Physics, NASB, Minsk, Belarus
Rüdiger Paschotta, RP Photonics, Zürich, Switzerland
Hanno Scheife, Tesat-Spacecom GmbH & Co.KG, Backnang, Germany

CB - Semiconductor Lasers
Chair: Ingo Fischer, Vrije Universiteit, Brussels, Belgium
Eugene A. Avrutin, The University of York, Heslington, UK
Gadi Eisenstein, Technion, Haifa, Israel
Wolfgang Elsäßer, Darmstadt University of Technology, Germany
Götz Erbert, Ferdinand-Braun-Institut für Höchstfrequenztechnik, Berlin, Germany
Thomas Erneux, Université Libre de Bruxelles, Belgium
Andrea Fiore, Ecole Polytechnique Fédérale de Lausanne, Switzerland
Mark Hopkinson, University of Sheffield, Sheffield, UK
Francesco Marin, University Firenze and INFM and LENS, Sesto F.no (FI), Italy
Cristina Masoller, Universitat Politècnica de Catalunya, Barcelona, Spain
Geert Morthier, Centt University – IMEC, Gent, Belgium
Atsushi Uchida, Takushoku University, Tokyo, Japan
Ian White, University of Cambridge, Jesus College, Cambridge, UK
Hans-Jürgen Wünsche, Humboldt-Universität zu Berlin, Germany

CC - Holography, Adaptive Optics, Optical Storage and Photorefractives
Chair: Loïc Mager, CNRS, Institut de Physique et de Chimie des Matériaux de Strasbourg, France
Gaëtan Assanto, University of Rome, Roma Tre, Rome, Italy
Marc Georges, Université de Liège, Centre Spatial, Angleur (Liège), Belgium
Kazuo Kuroda, University of Tokyo, Japan
Gilles Pauliat, Laboratoire Charles Fabry de l’Institut d’Optique, Orsay, France
John T. Sheridan, University College Dublin, Ireland
Jingjun Xu, Nankai University, Tianjin, China

CD - Applications of Nonlinear Optics
Chair: Neil Broderick, University of Southampton, UK
Gaetano Assanto, University of Rome, Roma Tre, Rome, Italy
Ole Bang, Technical University of Denmark, Research Center COM, Lyngby, Denmark
Martijn de Sterke, University of Sydney New South Wales, Australia
Philippe Delaye, Centt d’Optique, Orsay, France
Philippe Grelu, LPUB, Université de Bourgogne, Dijon, France
Jonathan Knight, University of Bath, UK
Ulf Peschel, University Erlangen-Nuremberg, Erlangen, Germany
Peter G.R. Smith, University of Southampton, UK
Paul Westbrook, OFS Labs, Somerset, NJ, USA
Aleksei Zheltikov, M.V. Lomonosov Moscow State University, Moscow, Russia

CE – Optical Materials, Fabrication and Characterisation
Chair: Markus Pollnau, University of Twente, Enschede, Netherlands
Chantal Fontaine, LAAS-CNRS, Groupe Photonique, Toulouse, France
Christos Grivas, University of Southampton, UK
Eli Kapon, Swiss Federal Institute of Technology, Lausanne (EPFL), Switzerland
Anna Köhler, University of Potsdam, Germany
Yaroslav Romanyuk, Lawrence Berkeley National Laboratory, Berkeley, CA, USA
Witold Ryba-Romanowski, Polish Academy of Sciences, Wroclaw, Poland
Ifor D.W. Samuel, University of St. Andrews, St. Andrews Fife, UK
Wolfgang Sohler, University of Paderborn, Germany
Alessandra Toncelli, University of Pisa, NEST – INFM, Pisa, Italy

CF - Ultrafast Optics, Electrooptics and Applications
Chair: Günter Steinmeyer, Max-Born-Institute for Nonlinear Optics and Short Pulse Spectroscopy, Berlin, Germany
Luc Bergé, CEA-DAM / Ile de France, Bruyères-le-Châtel, France
Giulio Cerullo, Politecnico di Milano, INFM, Milan, Italy
Takao Fuji, Max-Planck-Institute of Quantum Optics, Garching, Germany
Pablo Loza-Alvarez, IFCO, Institute of Photonic Sciences, Castelldefels (Barcelona), Spain
Uwe Morgner, University of Hannover, Hannover, Germany
Derrycyk T. Reid, Heriot-Watt University, Edinburgh, UK
Jeff A. Squier, Colorado School of Mines, Golden, USA
John W.G. Tisch, Imperial College, London, UK
Kenji Torizuka, AIST, Tsukuba, Ibaraki, Japan

CG - High-field Laser Physics and Applications
Chair: Marc Vrakking, FOM Institute for Atomic and Molecular Physics, Amsterdam Netherlands
Joachim Burgdörfer, Vienna University of Technology, Vienna, Austria
Dimitris Charalambidis, FORTH – IESL, Heraklion, Greece
Reinhard Dörner, University of Frankfurt, Frankfurt am Main, Germany
Victor Malka, ENSTA, CNRS, Ecole Polytechnique, Palaiseau, France
Jon Marangos, Imperial College, London, UK
Mauro Nisoli, Politecnico di Milano, Italy
Jan Michael Rost, Max-Planck-Institut für Physik komplexer Systeme, Dresden, Germany
Pascal Salières, CEA Saclay, Gif sur Yvette, France
Henrik Stapelfeldt, Aarhus University, Aarhus C, Denmark

CH - Optical Sensing and Metrology
Chair: Hanne Ludvigsen, Helsinki University of Technology, Espoo, Finland
Ian Bennion, Aston University, Birmingham, UK
Andreas Erdmann, Fraunhofer Institute (IISB), Erlangen, Germany
Min Gu, Swinburne University of Technology, Victoria, Australia
Julian Jones, Heriot-Watt University, Edinburgh, UK
Tomasz Nasilowski, Vrije University Brussel, Belgium
Mitsuo Takeda, University of Electro-Communications, Tokyo, Japan
Luc Thevenaz, EPFL Swiss Federal Institute of Technology, Lausanne, Switzerland
Germán Vergara, Centro de Investigación y Desarrollo de la Armada, Madrid, Spain

CI - Optical Technologies for Lightwave Communications and Networks
Chair: Liam Barry, Dublin City University, Dublin, Ireland
Polina Bayvel, University College London, UK
Pascal Besnard, ENSSAT- FOTON / CNRS, Lannion, France
Harmen J.S. Dorren, Eindhoven University of Technology, Eindhoven, Netherlands
Andrew Ellis, University College Cork, Tyndall National Institute, Cork, Ireland
Dan Kilper, Bell Laboratories, Lucent Technologies, Holmdel, NJ, USA
Periklis Petropoulos, University of Southampton, UK
Christophe Peucheret, Technical University of Denmark, Research Centre COM, Lyngby, Denmark
Stefan Wabnitz, Université de Bourgogne, Dijon, France
Neil D. Whitbread, Bookham, Caswell Towcester, UK
**CJ - Fibre and Guided Wave Lasers and Amplifiers**

**Chair:** J.R. Taylor, Imperial College, London, UK  
Pierre A. Champert, Keopsys SA, Lannion, France  
Andrei A. Fotiadi, Faculté Polytechnique de Mons, Belgium  
Denis V. Gapontsev, IPG Photonics, Oxford, MA, USA  
Kim P. Hansen, Crystal Fibre A/S, Birkerod, Denmark  
Thomas Schreiber, Friedrich-Schiller University Jena, Germany  
William Wadsworth, University of Bath, UK

**CK - Photonic Crystals, Photonic Nanostructures and Integrated Optics**

**Chair:** Cefe Lopez, Instituto de Ciencia de Materiales de Madrid, Spain  
Lucio Claudio Andreani, Università di Pavia, Italy  
Gonçal Badenes, ICFI-Institut de Ciencies Fotòniques, Castelldefels, Spain  
U. Gösele, Max-Planck-Institute of Microstructure Physics, Halle, Germany  
L. (Kobus) Kuipers, FOM Institute for Atomic and Molecular Physics, Amsterdam, Netherlands  
Florian Kulzer, Huygens Laboratory, Leiden, Netherlands  
Ekmet Ozbay, Bilkent University, Ankara, Turkey  
Andrew R. Parker, Green College, Oxford, London, UK  
Michael Scalora, AMSRD-AMR-WS-ST, U.S. Army RDECOM, Redstone Arsenal, AL, USA  
Andrew J. Tuerberfield, University of Oxford, UK  
Willem Vos, University of Twente, Enschede, Netherlands  
Ralf B. Wehrspohn, University of Paderborn, Germany  
Diederik S. Wiersma, European Laboratory for Nonlinear Spectroscopy and INFM-MATIS, Sesto-Fiorentino (Florence), Italy  
Anatoly Zayats, Queens University, Belfast, UK

**CL - Biophotonics and Applications**

**Chair:** Benoît C. Forget, Université Pierre et Marie Curie, Paris, France  
Kishan Dholakia, University of St. Andrews, St. Andrews Fife, UK  
Alberto Diaspro, University of Genoa, Genova, Italy  
Andrew Dunn, University of Texas at Austin, USA  
Emmanuel Fort, ESPCI, Laboratoire de Physique des Solides, Paris, France  
Amir H. Gandjbakhche, National Institute of Child Health and Human Development, Bethesda, MD, USA  
Fritz Keilmann, Max-Planck-Institut für Biochemie, Martinsried, Germany  
Katrin Kneip, Wellman Center for Photomedicine, Harvard University, Medical School, Boston, MA, USA  
A.G.H. Podoleanu, University of Kent, Canterbury, UK  
Hervé Rigneault, Fresnel Institute, Marseille, France  
Bruno Sfez, Soreq NRC, Yavne, Israel  
Valery V. Tuchin, Saratov State University, Saratov, Russia

**CM - Fundamentals and Modelling of Materials Processing with Lasers**

**Chair:** Alexander Kaplan, Lulea University of Technology, Lulea, Sweden  
Peter Berger, University of Stuttgart, Germany  
Eckhard Beyer, Fraunhofer IWS, Dresden, Germany  
John M. Dowden, University of Essex, Colchester, UK  
Rémy Fabbro, Coopération Laser Franco-Allemande, Arcueil, France  
Costas Fotakis, FORTH – IESL, Heraklion, Greece  
Bernd Hüttner, DLR, Institute of Technical Physics, Stuttgart, Germany  
Seiji Katayama, Osaka University, Japan  
José Luis Ocaña, Madrid Polytechnical University, Spain  
Wolfgang Schulz, Fraunhofer Institut für Lasertechnik and RWTH, Aachen, Germany  
Armando J. Yáñez Casal, Universidade da Coruña, Ferrol, Spain  
Gang Yu, Chinese Academy of Sciences, Beijing, China

**Tech-Focus 1: Industrial Application of Ultrafast Technologies**

**Chair:** Wilson Sibbett, University of St. Andrews, UK
Programme committees

**JSI - Cryptographic Techniques in Photonics**  
**Co-Chairs:** Nobuyuki Imoto, Osaka University, Toyonaka, Japan and Claudio R. Mirasso, Universitat de les Illes Balears, Palma de Mallorca, Spain  
Valerio Annavazzi Lodi, University of Pavia, Italy  
Artur Ekert, University of Cambridge, UK  
Nicolas Gisin, University of Geneva, Switzerland  
Takuya Hirano, Gakushin University, Tokyo, Japan  
Ido Kanter, Bar-Ilan University, Ramat-Gan, Israel  
Jia-Ming Liu, University of California, UCLA, Los Angeles, CA, USA  
Hoi-Kwong Lo, University of Toronto, Canada  
Norbert Lütkenhaus, University of Waterloo, Waterloo, ON, Canada  
John Rarity, University of Bristol, UK  
Marco Santagostino, University of Padova, Italy  
Alan Shore, University of Wales, Bangor, UK  
Dimitris Syvridis, University of Athens, Greece  
Mirvais Youseffi, University of Eindhoven, Netherlands

**JSII - Nanophotonics and Metamaterials: From Concepts to Devices**  
**Co-Chairs:** Nikolay I. Zheludev, Southampton University, UK and Ted Sargent, University of Toronto, Canada  
F. Javier García de Abajo, CSIC, San Sebastian, Spain  
Joachim Krenn, University of Graz, Austria  
Michal Lipson, Cornell University, Ithaca, NY, USA  
David R. Smith, Duke University, Durham, NC, USA  
Tomasz Szoplik, Warsaw University, Poland  
Din Ping Tsai, National Taiwan University, Taipei, Taiwan  
Niek F. van Hulst, ICFO - Institute of Photonic Sciences, Castelldefels (Barcelona), Spain

**JSIII - Optical Frequency Combs and Applications**  
**Co-Chairs:** Scott Diddams, National Institute of Standards and Technology, Boulder, USA and Harald Telle, Physikalisch-Technische Bundesanstalt, Braunschweig, Germany  
Alexander Gaeta, Cornell University, Ithaca, NY, USA  
David Jones, University of British Columbia, Vancouver, BC, Canada  
R. Jason Jones, JILA/University of Colorado and NIST, Boulder, CO, USA  
Franz Kärnther, Massachusetts Institute of Technology, Cambridge, MA, USA  
Motonobu Kourogi, Optical Comb Institute, Tokyo, Japan  
Stephen N. Lea, National Physical Laboratory, Teddington, UK  
Kaoru Minoshima, National Institute of Advanced Industrial Science and Technology, Tsukuba, Japan  
Giorgio Santarelli, BNM-Syrte, France  
Florian Tauser, Toptica Photonics AG, Graefelfing/Munich, Germany  
Thomas Udem, Max-Planck Institute for Quantum Optics, Garching, Germany  
Lijun Wang, Max-Planck Research Group, Erlangen, Germany

**IQEC 2007**

**Organising Committee**

**General Chairs**  
Ennio Arimondo, INFM, University of Pisa, Italy  
Daan Lenstra, Delft University of Technology, Delft, Netherlands
Programme Chairs
Robert W. Boyd, University of Rochester, Rochester, NY, USA
Dieter Meschede, University of Bonn, Germany
Klaus Mølmer, University of Aarhus, Denmark
Ken-Ichi Ueda, University of Tokyo, Japan

Programme Committees

IA - Microstructured Devices for Quantum and Atom Optics
Chair: Ed Hinds, Imperial College, London, UK
Victor Balykin, Russian Academy of Sciences, Troitsk, Moscow, Russia
Francesco Saverio Cataliotti, University of Florence and University of Catania, European Laboratory for Non-Linear Spectroscopy, Sesto Fiorentino, (FI), Italy
Peter Hannaford, Swinburne University of Technology, Melbourne, Australia
Ifan G. Hughes, Durham University, Durham, UK
John Kitching, JILA, Boulder, Colorado, Gaithersburg, MD, USA
Markus Oberthaler, University of Heidelberg, Germany
Arno Rauschenbeutel, University of Bonn, Germany
Alastair Sinclair, Centre for Basic, Thermal and Length Metrology, Teddington, Middlesex UK
Robert J.C. Spreeuw, University of Amsterdam, Netherlands
Aephraim M. Steinberg, University of Toronto, Canada
Chris Westbrook, Laboratoire Charles Fabry, Orsay, France
Claus Zimmerman, University of Tübingen, Germany

IB - Cold Atoms and Molecules
Chair: Dan Stamper-Kurn, UC Berleley, USA
Jean Dalibard, Laboratoire Kastler Brossel, Paris, France
Nir Davidson, Weizmann Institute of Science, Rehovot, Israel
Axel Görlitz, Heinrich-Heine University, Düsseldorf, Germany
Hanns-Christoph Nägerl, University of Innsbruck, Austria
Luis A. Orozco, University of Maryland, USA
Jörg Schmiedmayer, University of Innsbruck, Heidelberg, Austria
Klaus Sengstock, University of Hamburg, Germany

IC - Quantum Information
Chair: Ian A. Walmsley, University of Oxford, UK
Gerard J. Milburn, The University of Queensland, Brisbane, Australia
Yasunobu Nakamura, NEC Corporation Tsukuba, Ibaraki, Japan
Martin Plenio, Imperial College, London, UK
Gerhard Rempe, Max-Planck-Institut für Quantenoptik, Garching, Germany
Goran Wendin, Chalmers University, Göteborg, Sweden

ID - Laser and Precision Spectroscopy
Chair: Dmitry Budker, UC Berkeley, USA
Marcis Auzins, University of Latvia, Riga, Latvia
Martial Ducloy, Laboratoire de Physique des Lasers, Villetaneuse, France
Wojciech Gawlik, Jagiellonian University, Krakow, Poland
Zheng-Tian Lu, University of Chicago, Argonne National Laboratory, Argonne, USA
Sadiq Rangwala, Raman Research Institute, Bangalore, India
Guglielmo M. Tino, Dipartimento di Fisica and LENS Laboratory - Universita' di Firenze Sesto Fiorentino, Firenze, Italy
Antoine Weis, University of Fribourg, Switzerland
Jun Ye, JILA, National Institute of Standards and Technology and University of Colorado Boulder, USA
IE - Nonlinear Optics and Ultrafast Phenomena

Chair: Steve Cundiff, JILA, University of Colorado and NIST, Boulder, CO, USA  
Nail Akhmediev, The Australian National University, Canberra, Australia  
Paola Borri, Cardiff University, UK  
Robert Kaindl, E.O. Lawrence Berkeley National Laboratory, Berkeley, CA, USA  
Martti Kauranen, Tampere Technical University, Tampere, Finland  
DaiSik Kim, Seoul National University, South Korea  
Makoto Kuwata-Gonokami, University of Tokyo, Japan  
Alfred Leitenstorfer, University of Konstanz, Germany  
Stefan Lochbrunner, Ludwig-Maximilians-Universität München, Munich, Germany  
Ilias Perakis, University of Crete, Heraklion, Crete, Greece  
John E. Sipe, University of Toronto, Canada

IF - Quantum Optics

Chair: Hans A. Bachor, The Australian National University, Canberra, Australia  
Rainer Blatt, University of Innsbruck, Austria  
Ignacio Cirac, Max-Planck-Institut für Quantenoptik, Garching, Germany  
Thomas Jennewein, University of Vienna, Austria  
Agnès Maître, Université Pierre et Marie Curie, Paris, France  
Alexander V. Sergienko, Boston University, MA, USA  
Victor Zadkov, M.V. Lomonosov Moscow State University, Moscow, Russia

IG - Dynamics, Instabilities and Patterns

Chair: Fedor Mitschke, Universität Rostock, Germany  
Thorsten Ackemann, University of Strathclyde, Glasgow, UK  
Pere Colet, IMDEA, Palma de Mallorca, Spain  
German de Valcarcel, Universitat de València, Burjassot, Spain  
Stefano Longhi, Politecnico di Milano, Italy  
Jorge Tredicce, Institut Non-linéaire de Nice, Valbonne, France  
Sergei K. Turitsyn, Aston University, Birmingham, UK  
Evgeny Viktorov, Université Libre de Bruxelles, Belgium
Short Course

Download location for short course and QEOD reception

CLEO/Europe-IQEC 2007 will present two short courses on:

- **Practical Optical Parametric Oscillators**, presented by Majid Ebrahim-Zadeh, ICFO, Barcelona, Spain
- **Micro- and Nano-Machined Optics**, presented by Ernst-Bernhard Kley, Friedrich-Schiller-University of Jena, Germany.

Advance registration is required in order to obtain the short course material. This material will not be available for purchase during the conference. These courses are intended for engineers and scientists. Each course is scheduled in two parts: Course Part I (1 hour ½), coffee break, Course Part II (1 hour ½).

**Short Course 1: Practical Optical Parametric Oscillators**
Instructor: Majid Ebrahim-Zadeh, ICFO, Barcelona, Spain

This course is intended for researchers with little or no background in OPOs as well as for those familiar with the subject area who wish to enhance their understanding and update their knowledge of the emerging developments in the field. The course will benefit researchers in both industry and academia.

**Course Description:**
This course aims to provide an overview of OPO devices from basic operation principles to advanced systems. The course will begin with a discussion of the fundamental concepts and the critical design issues, leading to a review of the current status of OPO technology. The discussion will encompass devices operating in all time-scales from the CW to the ultrafast femtosecond regime.

Specifically, the course participants will learn about the basic principles of parametric generation and amplification; OPO design issues, including material and pump laser selection criteria; birefringent and quasi-phase-matched materials and devices; OPO threshold conditions, resonator design, focusing and tuning behavior; CW OPOs, including singly- and multi-resonant oscillators; externally and internally pumped devices; stability requirements; amplitude and frequency control; pulsed OPOs, including compact all-solid-state oscillators, high- and low-energy devices, linewidth control, and material damage issues; picosecond OPOs, including high-repetition-rate CW and pulsed mode-locked OPOs; all-solid-state, Nd-based, and Ti:sapphire-pumped systems; visible to mid-infrared pulse generation; quasi-phase-matched devices; femtosecond OPOs, including Ti:sapphire-pumped oscillators, noncritical, noncollinear, and compact semi-monolithic devices, quasi-phase-matched and mid-infrared OPOs, spectral and temporal control; commercial developments in OPO devices from the CW to femtosecond operating regime; and the generation of THz radiation using OPOs.

**Benefits and Learning Objectives:**
- Understand the basic principles of optical parametric generation and amplification of light
- Learn the operating principles of optical parametric devices, in particular optical parametric oscillators (OPOs)
- Obtain a detailed understanding of nonlinear gain, phase-matching, threshold conditions, resonator design, tuning, spectral and temporal behavior
- Identify the critical issues, particularly material and laser pump source selection, in the design of optical parametric devices
- Acquire the practical skills and apply the necessary procedures in the construction of OPO devices
- Learn the necessary techniques for spatial, spectral, and temporal control of OPO devices
- Gain a perspective of current technology of OPO devices and the important recent developments in the field
Short Course 2: Micro- and Nano-Machined Optics
Instructor: Ernst-Bernhard Kley, Inst. of Applied Physics, Friedrich-Schiller-University of Jena, Germany

This course will explain the basics and provide the vision of micro- and nano-machined optics and give an overview (with an emphasis on lithography) of the relevant fabrication technologies. The course will benefit researchers in both industry and academia.

Course Description:
Miniaturization and microstructures are keywords in the modern technical world. Optical components and systems are affected by this trend, too. This means miniaturized optical lenses, prisms, gratings, and even artificial materials based on sub-wavelength structures have to be fabricated for a lot of applications. As a consequence micro- and nano-machining is challenged to realize complex micro-optical elements, as well as artificial materials, both on the base of 2-D and 3-D microstructures. In order to fabricate such optical elements and materials, special demands on lithography or micro- and nano-machining arise from the wave nature of light. This refers to the accuracy as well as to special 2-D and 3-D fabrication techniques.

Benefits and Learning Objectives:

• Understand the basics and vision of micro- and nano-machined optics
• Obtain an overview (with an emphasis on lithography) of the relevant fabrication technologies.
• Obtain an appreciation for specific problems and limitations of the technologies
• Keywords are continuous profiles, multilevel profiles, binary patterns, high aspect ration patterns, photo- and e-beam lithography, laser writing, analogue lithography (gray tone, half tone), dry etching, proportional etching, diamond turning, and replication.
• Obtain an overview of recent developments in the field
Advance Programme

Munich ICM

International Congress
Centre Munich, Germany

17 - 22 June 2007

www.cleoeurope.org

Sponsored by
- European Physical Society / Quantum Electronics and Optics Division
- IEEE/Lasers and Electro-Optics Society
- Optical Society of America

Co-sponsored by
- PHOREMOST Network of Excellence
- American Physical Society

18th International Congress on Photonics in Europe
co-located with LASER 2007. World of Photonics
Messe München GmbH, Messegelände, 81823 München, Tel. (+49 89) 949-114 68, info@ photonics-congress.com

www.photonics-congress.com
Rooms B0.R1 and B0.R2 are located in hall B0.
### GENERAL INFORMATION

<table>
<thead>
<tr>
<th>Topic</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Welcome to CLEO®/Europe—IQEC at Laser 2007</td>
<td>2</td>
</tr>
<tr>
<td>Foreword</td>
<td>3</td>
</tr>
<tr>
<td>Conference at a Glance</td>
<td>3–8</td>
</tr>
<tr>
<td>How to read the sessions codes?</td>
<td>8</td>
</tr>
<tr>
<td>Sessions at a Glance</td>
<td>9–11</td>
</tr>
<tr>
<td>Topics</td>
<td>12–14</td>
</tr>
<tr>
<td>Committees</td>
<td>14–17</td>
</tr>
<tr>
<td>Poster Sessions</td>
<td>18</td>
</tr>
<tr>
<td>Tech-Focus Session</td>
<td>18</td>
</tr>
<tr>
<td>Author’s Information</td>
<td>18</td>
</tr>
<tr>
<td>Short courses</td>
<td>18</td>
</tr>
<tr>
<td>Laboratory visits</td>
<td>18</td>
</tr>
<tr>
<td>Official Congress Opening</td>
<td>18</td>
</tr>
<tr>
<td>Prizes</td>
<td>18</td>
</tr>
<tr>
<td>Social Programme</td>
<td>18</td>
</tr>
<tr>
<td>Exhibition Information</td>
<td>19</td>
</tr>
<tr>
<td>Conference Venue</td>
<td>19</td>
</tr>
<tr>
<td>Technical digest</td>
<td></td>
</tr>
<tr>
<td>Conference Registration</td>
<td>20</td>
</tr>
<tr>
<td>Payment</td>
<td>20</td>
</tr>
<tr>
<td>Cancellation</td>
<td>20</td>
</tr>
<tr>
<td>Passport and Visa Requirements</td>
<td>20</td>
</tr>
<tr>
<td>Support</td>
<td>20</td>
</tr>
<tr>
<td>Student Helpers</td>
<td>20</td>
</tr>
<tr>
<td>On site Facilities</td>
<td>20</td>
</tr>
<tr>
<td>Hotel Information</td>
<td>21</td>
</tr>
<tr>
<td>Munich, Germany</td>
<td>21–22</td>
</tr>
<tr>
<td>Conference Management</td>
<td>22</td>
</tr>
<tr>
<td>Language</td>
<td>22</td>
</tr>
</tbody>
</table>

### TECHNICAL PROGRAMME

<table>
<thead>
<tr>
<th>Day</th>
<th>Oral Sessions</th>
<th>Poster Session</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday</td>
<td>32-47</td>
<td>48-57</td>
</tr>
<tr>
<td>Tuesday</td>
<td>58-71</td>
<td>72-81</td>
</tr>
<tr>
<td>Wednesday</td>
<td>82-101</td>
<td>102-111</td>
</tr>
<tr>
<td>Thursday</td>
<td>112-137</td>
<td></td>
</tr>
<tr>
<td>Friday</td>
<td>138-147</td>
<td></td>
</tr>
<tr>
<td>Authors’ Index</td>
<td>148-174</td>
<td></td>
</tr>
<tr>
<td>Registration Form</td>
<td>175</td>
<td></td>
</tr>
</tbody>
</table>
Welcome to CLEO®/Europe-IQEC at Laser 2007

Following on from the very successful previous conferences held in Amsterdam (1994), Hamburg (1996), Glasgow (1998), Nice (2000) and Munich (2003, 2005), the General and Programme Chairs would like to warmly welcome you to the seventh CLEO®/Europe-IQEC conference, which is being held in Munich from June 17-22, 2007. We extend a special welcome to postgraduate and PhD students attending, and we wish them every success, especially if this is their first participation in a major scientific conference. This year sees a particularly international flavour with the International Quantum Electronics Conference IQE, incorporating the Xth European Quantum Electronics Conference (EQEC), and we warmly welcome our visitors from America, Asia, Australasia and elsewhere.

CLEO®/Europe-IQEC 2007 has established a strong tradition as the largest, most comprehensive and prestigious gathering of optics and photonics researchers and engineers in Europe, and this year is no exception. CLEO®/Europe and IQEC reflect two strong symbiotic research traditions: CLEO®/Europe emphasizes applied physics, optical engineering and applications of photonics and laser technology. IQEC emphasizes basic research in laser physics, nonlinear optics and quantum optics. This combination provides a unique forum to obtain informative overviews and discuss recent advances in a wide spectrum of topics, from fundamental light-matter interaction and new sources of coherent light to technology development, system engineering and applications in industry, science and medicine. Over five days the CLEO®/Europe-IQEC conference will showcase 1244 technical contributions in the form of oral presentations and posters from industry, university and research organisations drawn from nearly 60 countries – and will provide an unparalleled opportunity to bring together scientists, engineers and end-users of laser and photonics technology under the same roof. As in 2005, the meeting will be complemented by LASER 2007 World of PHOTONICS, the world’s largest tradeshow of laser and optical technology under the same roof. As in 2005, the meeting will be complemented by LASER 2007 World of PHOTONICS, the world’s largest tradeshow of laser and optical technology, which will provide researchers with the particular opportunity to see the latest developments in a very wide range of laser sources, optical and photonics products - and components.

CLEO®/Europe-IQEC is collocated with a number of smaller specialist conferences and topical meetings, including the European Conference on Biomedical Optics (ECBO 2007), the WLT conference on Lasers in Manufacturing (LIM 2007), the DGLM/ISLM congress on Medical Laser Applications, the SPIE conference on Laser Metrology and a series of specialist conferences organised by the European Optical Society (EOS). All of the collocated conferences will share registration - and so delegates can attend all the sessions of all the conferences.

Conference Structure and Technical Sessions

CLEO®/Europe-IQEC consists of a large number of technical presentations in a number of different formats:

A Plenary talk is a broad-scope, one-hour long talk given by a world-leading scientist and accessible to a general technical audience including conference attendees, exhibitors, and exhibit visitors. Plenary talks are not held in parallel with other sessions, allowing maximum possible attendance. In 2007, it is our pleasure to feature plenary talks by Gérard Mourou (ENSTA, Laboratoire d’Optique Appliquée, Palaiseau, France) who will discuss the physics and applications of ultra-high power lasers in the Exawatt regime, and Theodor W. Hänsch (Max-Planck-Institute for Quantum Optics, Garching, Germany) who will discuss precision measurement techniques in quantum optics, work for which he shared the Nobel Prize in 2005. A third plenary session will be dedicated to the memory of Professor Herbert Walther who was instrumental in the previous success of CLEO®/Europe and in cementing international bonds between researchers in optics in many fields. In his honour, this special Memorial Session will consist of a number of invited presentations spanning the wide range of his technical interests by Ferenc Krausz (Max-Planck-Institute for Quantum Optics, Garching, Germany) Joseph Eberly (University of Rochester, USA) and Axel Schenzle (University of Munich, Germany).

Keynote Presentations and Tutorials are also one hour talks given by world leaders in particular technical areas, but are generally directed at a more specific audience, and are given in parallel.

CLEO®/EUROPE 2007
Conferences on Lasers and Electro-Optics/Europe

IQEC 2007
International Quantum Electronics Conference

Munich, ICM, Germany
17-22 June 2007

Sponsored by
• European Physical Society / Quantum Electronics and Optics Division
• IEEE/Lasers and Electro-Optics Society
• Optical Society of America

Co-sponsored by
• PHOREMOST Network of Excellence
• American Physical Society
will showcase this exciting field through cations of Ultrafast Technology, which has always been the special Tech-Focus session on Industrial Applications of Ultrafast Technology, which will showcase this exciting field through presentations from leading academic and industrial researchers.

Another much appreciated feature of the CLEO®/Europe-IQEC meetings has always been the special Symposia that are organized to anticipate on emerging fields by putting emphasis on fast developing, well defined topics. Three symposia have been identified for CLEO®/Europe-IQEC 2007: JSI - Cryptographic Techniques in Photonics; JSII - Nanophotonics and Metamaterials: From Concepts to Devices; JSIII - Optical Frequency Combs and Applications. A particular highlight of the last symposium will be some personal reflections from Professor Jan Hall who shared the 2005 Nobel Prize with Professor Hänsch.

CLEO®/Europe-IQEC 2007 will also present two Short Courses. The first course on Practical Optical Parametric Oscillators will be presented by Majid Ebrahim-Zadeh, ICFQ, Barcelona, Spain. The second one on Micro- and Nano-Machined Optics, will be presented by Ernst-Bernhard Kley, Friedrich-Schiller-University of Jena, Germany. Both courses will be given in parallel on Sunday afternoon 17 June 2007 at the Ludwig Maximilians University of Munich.

In addition to these technical sessions involving oral presentations, all scientific areas of both CLEO®/Europe and IQEC will be covered in Poster Sessions which provide an interactive and less formal way for researchers to discuss their work, to interact and to exchange ideas.

The technical programme consists of 3 plenary sessions, 74 invited papers, tutorials or keynote talks, and a record number of over 1170 contributed oral presentations and posters. The Conference Chairs would like to extend sincere thanks to the technical programme committee members for all their hard work.

A conference as large as CLEO®/Europe-IQEC requires two years of planning and organisation, and we would like to thank the staff of the European Physical Society and the local conference chair in Munich for invaluable professional assistance during this period. We would also like to thank all the Sponsoring Societies for oversight and support, and for their advice which ensures that this conference remains at the core of optics and photonics research in Europe.

Organisations, societies and committees, however, can only do so much. The real success of CLEO®/Europe-IQEC in 2007 is due to the efforts and commitment of researchers and students, who all contribute to the tremendous evolution of our research field and the high quality of the papers that will be presented. We thank you all!

---

**Member Societies of the European Physical Society**

<table>
<thead>
<tr>
<th>Albanian Physical Society</th>
<th>Latvian Physical Society</th>
</tr>
</thead>
<tbody>
<tr>
<td>Armenian Physical Society</td>
<td>Lithuanian Physical Society</td>
</tr>
<tr>
<td>Austrian Physical Society</td>
<td>Society of Physicists of Macedonia</td>
</tr>
<tr>
<td>Belarusian Physical Society</td>
<td>Moldovan Physical Society</td>
</tr>
<tr>
<td>Belgian Physical Society</td>
<td>The Netherlands’ Physical Society</td>
</tr>
<tr>
<td>Union of Physicists in Bulgaria</td>
<td>Norwegian Physical Society</td>
</tr>
<tr>
<td>Croatian Physical Society</td>
<td>Polish Physical Society</td>
</tr>
<tr>
<td>Czech Physical Society</td>
<td>Portuguese Physical Society</td>
</tr>
<tr>
<td>Danish Physical Society</td>
<td>Romanian Physical Society</td>
</tr>
<tr>
<td>Estonian Physical Society</td>
<td>United Physical Society of the Russian Federation</td>
</tr>
<tr>
<td>Finnish Physical Society</td>
<td>Physical Society of Serbia and Montenegro</td>
</tr>
<tr>
<td>French Physical Society</td>
<td>Slovak Physical Society</td>
</tr>
<tr>
<td>Georgian Physical Society</td>
<td>Soka Style of Mathematicians, Physicists and Astronomers of Slovenia</td>
</tr>
<tr>
<td>German Physical Society</td>
<td>Royal Spanish Physical Society</td>
</tr>
<tr>
<td>Hellenic Physical Society</td>
<td>Swedish Physical Society</td>
</tr>
<tr>
<td>Eötvös Loránd Physical Society</td>
<td>Swiss Physical Society</td>
</tr>
<tr>
<td>Icelandic Physical Society</td>
<td>Turkish Physical Society</td>
</tr>
<tr>
<td>Royal Irish Academy</td>
<td>Ukrainian Physical Society</td>
</tr>
<tr>
<td>Israel Physical Society</td>
<td>Institute of Physics</td>
</tr>
</tbody>
</table>

---

**General Information**

**Sunday at a Glance**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>14:30 - 18:00</td>
<td>SH1 Short Course I - Practical optical parametric oscillators</td>
</tr>
<tr>
<td>14:30 - 18:00</td>
<td>SH2 Short Course II - Micro- and nano-machined optics</td>
</tr>
<tr>
<td>17:30 - 18:30</td>
<td>Laboratory visit (1st tour)</td>
</tr>
<tr>
<td>18:30 - 19:30</td>
<td>Laboratory visit (2nd tour)</td>
</tr>
<tr>
<td>18:00 - 22:00</td>
<td>QEOD Reception</td>
</tr>
</tbody>
</table>

---

**Foreword**

The Welcome above has provided an overview of CLEO®/Europe-IQEC. Now established as the largest and most comprehensive gathering of optics and photonics researchers and engineers in Europe, the conference spans classical and quantum optical science, laser technology and photonics application.

The conference program has been organized thanks to the hard work of the 252 members of the 24 technical programme sub-committees who have assembled an excellent series of talks and posters that showcase a wide range of fields in optics and quantum electronics. The technical programme consists of 3 plenary sessions, 74 invited papers, tutorials or keynote talks, and a record number of over 1170 contributed oral presentations and posters. The Conference Chairs would like to extend sincere thanks to the technical programme committee members for all their hard work.

A conference as large as CLEO®/Europe-IQEC requires two years of planning and organisation, and we would like to thank the staff of the European Physical Society and the local conference chair in Munich for invaluable professional assistance during this period. We would also like to thank all the Sponsoring Societies for oversight and support, and for their advice which ensures that this conference remains at the core of optics and photonics research in Europe.

Organisations, societies and committees, however, can only do so much. The real success of CLEO®/Europe-IQEC in 2007 is due to the efforts and commitment of researchers and students, who all contribute to the tremendous evolution of our research field and the high quality of the papers that will be presented. We thank you all!
<table>
<thead>
<tr>
<th>ROOM 1</th>
<th>ROOM 2</th>
<th>ROOM 3</th>
<th>ROOM 11</th>
<th>ROOM 12</th>
<th>ROOM 13A</th>
<th>ROOM 13B</th>
<th>ROOM 14A</th>
<th>ROOM 14B</th>
<th>ROOM B11</th>
</tr>
</thead>
<tbody>
<tr>
<td>08:30</td>
<td></td>
<td></td>
<td></td>
<td>Opening Ceremony</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>09:00</td>
<td></td>
<td></td>
<td></td>
<td>PL1 (Plenary) CLEO IQEC 2007 Plenary 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>09:30</td>
<td>08:30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10:00</td>
<td>09:00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10:30</td>
<td>09:30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11:00</td>
<td>10:30</td>
<td>10:00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11:30</td>
<td>11:00</td>
<td>10:30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12:00</td>
<td>11:30</td>
<td>11:00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12:30</td>
<td>12:00</td>
<td>11:30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13:00</td>
<td>12:30</td>
<td>12:00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13:30</td>
<td>13:00</td>
<td>12:30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14:00</td>
<td>13:30</td>
<td>13:00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14:30</td>
<td>14:00</td>
<td>13:30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15:00</td>
<td>14:30</td>
<td>14:00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15:30</td>
<td>15:00</td>
<td>14:30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16:00</td>
<td>15:30</td>
<td>15:00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16:30</td>
<td>16:00</td>
<td>15:30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17:00</td>
<td>16:30</td>
<td>16:00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17:30</td>
<td>17:00</td>
<td>16:30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18:00</td>
<td>17:30</td>
<td>17:00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18:30</td>
<td>18:00</td>
<td>17:30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19:00</td>
<td>18:30</td>
<td>18:00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19:30</td>
<td>19:00</td>
<td>18:30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20:00</td>
<td>19:30</td>
<td>19:00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Monday at a Glance**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>08:30</td>
<td>Opening Ceremony</td>
</tr>
<tr>
<td>09:00</td>
<td>PL1 (Plenary) CLEO IQEC 2007 Plenary 1</td>
</tr>
<tr>
<td>11:00</td>
<td>Semiconductor cavity solitons</td>
</tr>
<tr>
<td>11:30</td>
<td>Joint session IC&amp;IF Quantum repeaters and memory</td>
</tr>
<tr>
<td>12:00</td>
<td>Nonlinear organic materials</td>
</tr>
<tr>
<td>12:30</td>
<td>Applications of solitons</td>
</tr>
<tr>
<td>13:00</td>
<td>Yb-doped lasers and amplifiers</td>
</tr>
<tr>
<td>13:30</td>
<td>Vertical external cavity surface emitting lasers</td>
</tr>
<tr>
<td>14:00</td>
<td>Femtosecond filamentation</td>
</tr>
<tr>
<td>14:30</td>
<td>Negative index materials</td>
</tr>
<tr>
<td>15:00</td>
<td>Semiconductor cavity solitons</td>
</tr>
<tr>
<td>15:30</td>
<td>Joint session IC&amp;IF Quantum repeaters and memory</td>
</tr>
<tr>
<td>16:00</td>
<td>Nonlinear organic materials</td>
</tr>
<tr>
<td>16:30</td>
<td>Applications of solitons</td>
</tr>
<tr>
<td>17:00</td>
<td>Yb-doped lasers and amplifiers</td>
</tr>
<tr>
<td>17:30</td>
<td>Vertical external cavity surface emitting lasers</td>
</tr>
<tr>
<td>18:00</td>
<td>Femtosecond filamentation</td>
</tr>
<tr>
<td>18:30</td>
<td>Negative index materials</td>
</tr>
<tr>
<td>19:00</td>
<td>Semiconductor cavity solitons</td>
</tr>
<tr>
<td>19:30</td>
<td>Joint session IC&amp;IF Quantum repeaters and memory</td>
</tr>
<tr>
<td>20:00</td>
<td>Nonlinear organic materials</td>
</tr>
<tr>
<td>20:00</td>
<td>Applications of solitons</td>
</tr>
<tr>
<td>20:00</td>
<td>Yb-doped lasers and amplifiers</td>
</tr>
<tr>
<td>20:00</td>
<td>Vertical external cavity surface emitting lasers</td>
</tr>
<tr>
<td>20:00</td>
<td>Femtosecond filamentation</td>
</tr>
<tr>
<td>20:00</td>
<td>Negative index materials</td>
</tr>
</tbody>
</table>

**EXHIBITION AND LUNCH BREAK**

CA, CF, CH, CK, IB, IG, JSIII POSTER SESSIONS - ICM FOYER

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>14:00</td>
<td>Optical frequency comb generation</td>
</tr>
<tr>
<td>14:30</td>
<td>Photon phonon interaction</td>
</tr>
<tr>
<td>15:00</td>
<td>Femtosecond laser sources</td>
</tr>
<tr>
<td>15:30</td>
<td>Nonlinear dynamics</td>
</tr>
<tr>
<td>16:00</td>
<td>Parametric processes and supercontinuum generation</td>
</tr>
<tr>
<td>16:30</td>
<td>3D photonic crystals</td>
</tr>
<tr>
<td>17:00</td>
<td>Bio and environmental sensing technology</td>
</tr>
<tr>
<td>18:00</td>
<td>Optical parametric devices</td>
</tr>
<tr>
<td>18:30</td>
<td>High-power laser systems</td>
</tr>
<tr>
<td>19:00</td>
<td>Microcavity and ring lasers</td>
</tr>
<tr>
<td>19:30</td>
<td>Mode-locked oscillators</td>
</tr>
<tr>
<td>20:00</td>
<td>Photonic nanostructures and devices</td>
</tr>
<tr>
<td>20:00</td>
<td>Photonic sensor technologies and applications</td>
</tr>
</tbody>
</table>

**COFFEE BREAK**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>14:00</td>
<td>Optical frequency comb generation</td>
</tr>
<tr>
<td>14:30</td>
<td>Photon phonon interaction</td>
</tr>
<tr>
<td>15:00</td>
<td>Femtosecond laser sources</td>
</tr>
<tr>
<td>15:30</td>
<td>Nonlinear dynamics</td>
</tr>
<tr>
<td>16:00</td>
<td>Parametric processes and supercontinuum generation</td>
</tr>
<tr>
<td>16:30</td>
<td>3D photonic crystals</td>
</tr>
<tr>
<td>17:00</td>
<td>Bio and environmental sensing technology</td>
</tr>
<tr>
<td>18:00</td>
<td>Optical parametric devices</td>
</tr>
<tr>
<td>18:30</td>
<td>High-power laser systems</td>
</tr>
<tr>
<td>19:00</td>
<td>Microcavity and ring lasers</td>
</tr>
<tr>
<td>19:30</td>
<td>Mode-locked oscillators</td>
</tr>
<tr>
<td>20:00</td>
<td>Photonic nanostructures and devices</td>
</tr>
<tr>
<td>20:00</td>
<td>Photonic sensor technologies and applications</td>
</tr>
</tbody>
</table>
## Tuesday at a Glance

<table>
<thead>
<tr>
<th>Time</th>
<th>Room 1</th>
<th>Room 4A</th>
<th>Room 4B</th>
<th>Room 12</th>
<th>Room 13A</th>
<th>Room 13B</th>
<th>Room 14A</th>
<th>Room 14B</th>
<th>Room B11</th>
<th>Room BOR1</th>
</tr>
</thead>
<tbody>
<tr>
<td>08:30</td>
<td>IB1</td>
<td>IF2</td>
<td>CE2</td>
<td>CA4</td>
<td>CB4</td>
<td>CG1</td>
<td>CK4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Condensed matter physics with quantum gases</td>
<td>Quantum imaging</td>
<td>Organic lasers and laser materials</td>
<td>Raman and parametric optical frequency conversion</td>
<td>VCSELs I: Device progress</td>
<td>Relativistic interactions</td>
<td>Plasmonic nanostructures</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>09:00</td>
<td>IE1</td>
<td>IF2</td>
<td>CE2</td>
<td>CA4</td>
<td>CB4</td>
<td>CG1</td>
<td>CK4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Strong light-matter interactions</td>
<td>Quantum imaging</td>
<td>Organic lasers and laser materials</td>
<td>Raman and parametric optical frequency conversion</td>
<td>VCSELs I: Device progress</td>
<td>Relativistic interactions</td>
<td>Plasmonic nanostructures</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>09:30</td>
<td>IF2</td>
<td>CE2</td>
<td>CA4</td>
<td>CB4</td>
<td>CG1</td>
<td>CK4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Quantum imaging</td>
<td>Organic lasers and laser materials</td>
<td>Raman and parametric optical frequency conversion</td>
<td>VCSELs I: Device progress</td>
<td>Relativistic interactions</td>
<td>Plasmonic nanostructures</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10:00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10:30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11:00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11:30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12:00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12:30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13:00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13:30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14:00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14:30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15:00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15:30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16:00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16:30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17:00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17:30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18:00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18:30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19:00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19:30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20:00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**COFFEE BREAK**

**EXHIBITION AND LUNCH BREAK**

**CE, CI, CJ, IA, IC, IE, IF POSTER SESSIONS - ICM Foyer**

**COFFEE BREAK**

**Happy Hour - ICM Foyer**
### Wednesday at a Glance

<table>
<thead>
<tr>
<th>Time</th>
<th>Room 1</th>
<th>Room 4A+B</th>
<th>Room 13A</th>
<th>Room 13B</th>
<th>Room 14A</th>
<th>Room 14B</th>
<th>Room 21</th>
<th>Room B11</th>
<th>Room BOR1</th>
</tr>
</thead>
<tbody>
<tr>
<td>08:30</td>
<td></td>
<td>IE4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Slow light and resonant systems</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>09:00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10:00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10:30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11:00</td>
<td></td>
<td>CD4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Generation and manipulation of wide bandwidth optical signals</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11:30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12:00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12:30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13:00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13:30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14:00</td>
<td></td>
<td>CA7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Laser materials and spectroscopy I</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14:30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15:00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15:30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16:00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16:30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17:00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17:30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18:00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18:30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19:00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19:30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20:00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### COFFEE BREAK

<table>
<thead>
<tr>
<th>Time</th>
<th>Room 1</th>
<th>Room 4A+B</th>
<th>Room 13A</th>
<th>Room 13B</th>
<th>Room 14A</th>
<th>Room 14B</th>
<th>Room 21</th>
<th>Room B11</th>
<th>Room BOR1</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### EXHIBITION AND LUNCH BREAK

### CB, CC, CD, CG, CL, CM, ID, JSI, JSII POSTER SESSIONS - ICM FOYER

<table>
<thead>
<tr>
<th>Time</th>
<th>Room 1</th>
<th>Room 4A+B</th>
<th>Room 13A</th>
<th>Room 13B</th>
<th>Room 14A</th>
<th>Room 14B</th>
<th>Room 21</th>
<th>Room B11</th>
<th>Room BOR1</th>
</tr>
</thead>
<tbody>
<tr>
<td>14:30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15:00</td>
<td></td>
<td>CE6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Nanostructured optical devices</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15:30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16:00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16:30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17:00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17:30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18:00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18:30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19:00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19:30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20:00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### COFFEE BREAK

<table>
<thead>
<tr>
<th>Time</th>
<th>Room 1</th>
<th>Room 4A+B</th>
<th>Room 13A</th>
<th>Room 13B</th>
<th>Room 14A</th>
<th>Room 14B</th>
<th>Room 21</th>
<th>Room B11</th>
<th>Room BOR1</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### CLEO®/Europe-IQEC 2007 Conference reception (end 23:00)

### COFFEE BREAK

<table>
<thead>
<tr>
<th>Time</th>
<th>Room 1</th>
<th>Room 4A+B</th>
<th>Room 13A</th>
<th>Room 13B</th>
<th>Room 14A</th>
<th>Room 14B</th>
<th>Room 21</th>
<th>Room B11</th>
<th>Room BOR1</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### CLEO®/Europe-IQEC 2007 Conference reception (end 23:00)
### Thursday at a Glance

<table>
<thead>
<tr>
<th>Time</th>
<th>Room 1</th>
<th>Room 2</th>
<th>Room 3</th>
<th>Room 4</th>
<th>Room 5</th>
<th>Room 6</th>
<th>Room 7</th>
<th>Room 8</th>
<th>Room 9</th>
<th>Room 10</th>
<th>Room 11</th>
<th>Room 12</th>
<th>Room 13</th>
<th>Room 14</th>
<th>Room 15</th>
<th>Room 16</th>
<th>Room 17</th>
<th>Room 18</th>
<th>Room 19</th>
<th>Room 20</th>
</tr>
</thead>
<tbody>
<tr>
<td>08:30</td>
<td>IF3</td>
<td>CC1</td>
<td>CD7</td>
<td>CB11</td>
<td>CE7</td>
<td>CF6</td>
<td>CK10</td>
<td>CJ3</td>
<td>JS11</td>
<td>IB4</td>
<td>CL1</td>
<td>CI4</td>
<td>JS1I</td>
<td>CJ5</td>
<td>CF8</td>
<td>CM1</td>
<td>CJ1</td>
<td>ID1</td>
<td>IA2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Joint session IA, IC &amp; IF Quantum dots</td>
<td>Data storage</td>
<td>Nonlinear optics for measurement and sources</td>
<td>New devices and applications - I</td>
<td>Nonlinear and laser-active optical waveguides</td>
<td>New pulse compression techniques and fibre lasers</td>
<td>Disorder in photonic nanostructures</td>
<td>Properties and dynamics of active fibres</td>
<td>Chaos-based cryptography</td>
<td>Spectroscopic applications of ultracold atoms and molecules</td>
<td>Enhanced bio sensing</td>
<td>All optical signal processing</td>
<td>Tailoring light-matter interactions</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>09:00</td>
<td>IF4</td>
<td>CC2</td>
<td>CD8</td>
<td>CB12</td>
<td>CE8</td>
<td>CF7</td>
<td>IG6</td>
<td>CJ4</td>
<td>JS12</td>
<td>IB5</td>
<td>CL2</td>
<td>CI5</td>
<td>IEI</td>
<td>CJ6</td>
<td>CF7</td>
<td>CM2</td>
<td>CJ6</td>
<td>IE6</td>
<td>CL3</td>
<td>CI6</td>
</tr>
<tr>
<td></td>
<td>Measurements at the quantum level</td>
<td>Solitons and photoinduced lattices</td>
<td>Engineered quasi phase matched materials</td>
<td>New devices and applications - II</td>
<td>Laser waveguide fabrication</td>
<td>Novel applications of femtosecond pulses</td>
<td>Instabilities in semiconductor lasers</td>
<td>High power fibre lasers</td>
<td>Quantum-based cryptography</td>
<td>Correlations in bosonic and fermionic quantum gases</td>
<td>Optical trapping, manipulation and modification</td>
<td>Signal monitoring and conditioning</td>
<td>Coherent dynamics</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10:30</td>
<td>COFFEE BREAK</td>
<td>COFFEE BREAK</td>
<td>EXHIBITION AND LUNCH BREAK</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11:30</td>
<td>IF5</td>
<td>CC3</td>
<td>CA9</td>
<td>CB13</td>
<td>CE9</td>
<td>CG6</td>
<td>CM1</td>
<td>CJ5</td>
<td>JS13</td>
<td>IE6</td>
<td>CL3</td>
<td>CI6</td>
<td>ID1</td>
<td>IA2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Squeezing</td>
<td>Adaptive laser cavities and mirrors</td>
<td>Mid-infrared laser sources</td>
<td>Short-pulse generation</td>
<td>Rare-earth doped laser materials</td>
<td>Ultra high power laser systems</td>
<td>Macroprocessing</td>
<td>Microstructured fibres and visible sources</td>
<td>Novel devices and methods for photonic cryptography</td>
<td>Pulse propagation and temporal solitons</td>
<td>Tissue optics</td>
<td>Optical signal generation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12:30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13:00</td>
<td>IF6</td>
<td>CC4</td>
<td>CA10</td>
<td>CB14</td>
<td>JS11 I</td>
<td>CF7</td>
<td>CM2</td>
<td>CJ6</td>
<td>IC6</td>
<td>ID2</td>
<td>IE7</td>
<td>CL4</td>
<td>CI7</td>
<td>IA2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Quantum optics with single emitters</td>
<td>Photorefractive and related materials</td>
<td>New laser architectures</td>
<td>High power diode lasers</td>
<td>Nano-Photonics</td>
<td>Material processing and structuring</td>
<td>Microprocessing</td>
<td>Fibre gratings and waveguide lasers</td>
<td>Quantum cryptography</td>
<td>High precision metrology</td>
<td>Spatial solitons</td>
<td>Multi photon fluorescence</td>
<td>Transient effects and packet switching</td>
<td>Microfabricated structures for atomic vapour</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13:30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14:00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14:30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15:00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15:30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16:00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16:30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17:00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17:30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18:00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18:30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19:00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19:30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20:00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Friday at a Glance

<table>
<thead>
<tr>
<th>Time</th>
<th>Room 11</th>
<th>Room 12</th>
<th>Room 13A</th>
<th>Room 13B</th>
<th>Room 14A</th>
<th>Room 14B</th>
<th>Room 14C</th>
<th>Room 21</th>
<th>Room 5</th>
<th>Room BOR2</th>
</tr>
</thead>
<tbody>
<tr>
<td>08:30</td>
<td>CCS</td>
<td>CJ7</td>
<td>CA11</td>
<td>CB15</td>
<td>CD9</td>
<td>CF9</td>
<td>JS13</td>
<td>CH3</td>
<td>IF7</td>
<td>ID3</td>
</tr>
<tr>
<td></td>
<td>Holographic devices</td>
<td>Fibre Raman lasers</td>
<td>Solid-state laser applications</td>
<td>THz lasers</td>
<td>Slow and fast light</td>
<td>Dispersion compensation and applications of femtosecond pulses</td>
<td>Metamaterials - I</td>
<td>Photonic crystal fibres for sensor applications</td>
<td>Joint Session IA, IC &amp; IF - QED with quantum dots</td>
<td>From spectroscopy to relativity</td>
</tr>
<tr>
<td>09:00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>09:30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10:00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10:30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11:00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11:30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12:00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12:30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13:00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13:30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### How to read the Session Codes?

The following pages are the abstracts of the papers which will be presented at CLEO®/Europe-IQEC 2007.

All CLEO®/Europe sessions are on a white background and have a code which begins with a C. All IQEC sessions are on a shaded background and have a code which begins with an I.

**Exceptions:**

The short courses are referenced with a SH, plenaries are referenced with a P, tech-focus sessions are referenced with a TF and joint symposia are referenced with a JS. These are on a dark background.

**Oral Presentations**

Oral presentations have a code made up of three parts separated by hyphens, e.g.

CD1-1-WED 8:30

The first part indicates the Conference, the topic title and the session title, e.g.

CD1  =  CLEO®/Europe  
CD1  =  Applications of nonlinear optics  
CD1  =  Applications of solitons

The second part indicates the placement of the presentation within the session.

The third part indicates the day on which the presentation takes place.

SUN  =  Sunday  
MON  =  Monday  
TUE  =  Tuesday  
WED  =  Wednesday  
THU  =  Thursday  
FRI  =  Friday

The figures on the right indicate at what time the talk begins (08:30).

**Posters**

Poster presentations have a code made up of three parts separated by hyphens, e.g.

IE-1-TUE

The first part indicates the Conference, and the topic title, e.g.

IE  =  IQEC  
IE  =  Nonlinear Optics and Ultrafast Phenomena

The second part indicates the order of the presentation within the topic.

The third part indicates the day on which the presentation takes place.
**SHORT COURSES**

**SH1** Short Course I on practical optical parametric oscillators
Madj Ebrahim-Zadeh, ICF, Barcelona, Spain
Sunday, 14:30 - 18:00 • Ludwig Maximilians University, Munich, Germany

**SH2** Short Course II on micro- and nano-machined optics
Bernhard Kley, Friedrich-Schiller-University of Jena, Germany
Sunday, 14:30 - 18:00 • Ludwig Maximilians University, Munich, Germany

**PLENARIES**

**PL1** CLEO®/Europe - IQEC 2007 Plenary 1
The Exawatt laser: from relativistic to ultra relativistic optics
Gérard Mourou, ENSTA, Laboratoire d’Optique Appliquée, Palaiseau, France
Monday, 09:30 - 10:30 • Room 1

**PL2** CLEO®/Europe - IQEC 2007 Plenary 2 - OSA, EPS/QED Awards Ceremony and Julius Springer Prize
A passion for precision
Theodor Hänisch, Max-Planck-Institute for Quantum Optics, Garching, Germany
Tuesday, 10:30 - 12:30 • Room 1

**PL3** CLEO®/Europe - IQEC 2007 Walther Memorial Plenary
Moderator and short introduction
Ferenc Krausz, Max-Planck-Institute for Quantum Optics, Garching, Germany
Wednesday, 10:30 - 12:30 • Room 1

**TUTORIAL TALKS**

**CK1** Negative index materials
Costas Soukoulis, Iowa State Univ., Ames, USA
Monday, 10:45 - 11:45 • Room 14b

**CK6** New directions in photonic crystal fibres
Philip Russell, Max-Planck Research Group, Erlangen, Germany
Tuesday, 16:30 - 17:30 • Room 14b

**IE4** Slow light in room-temperature optical waveguides
Daniel Gauthier, Duke University, Durham, North Carolina, USA
Wednesday, 08:30 - 09:30 • Room 13a

**IB2** Ultracold atoms in optical lattices
Immanuel Bloch, Johannes Gutenberg University, Mainz, Germany
Wednesday, 14:30 - 15:30 • Room BOR1

**KEYNOTE TALKS**

**IB1** Cold quantum gases: when atomic physics meets condensed matter
Jean Dalibard, Ecole Normale Supérieure, Paris, France
Tuesday, 09:00 - 10:00 • Room 1

**CG2** Attosecond spectroscopy comes of age
Reinhard Kienberger, Max-Planck-Institut für Quantenoptik, Garching, Germany
Tuesday, 14:30 - 15:30 • Room 14a

**CJ2** The diversity of fibre laser technology
David Richardson, Southampton University, United Kingdom
Wednesday, 11:00 - 12:00 • Room 14b

**CD6** The all-photon chip
Benjamin Eggleton, University of Sydney, Australia
Wednesday, 11:00 - 12:00 • Room 14b

**JSII1** Tailoring NanoMaterials for light-matter interactions
Jeremy Baumberg, University of Southampton, United Kingdom
Thursday, 08:30 - 09:30 • Room BOR2

**ID1** The new high-Q physics: photonic clocks and back-action cooling on a chip
Kerry Vahala, Caltech, Pasadena, CA, USA
Thursday, 14:30 - 15:30 • Room BOR2

**IA2** Chip-scale atomic devices based on microfabricated alkali vapor cells
John Kitching, NIST, Boulder, CO, USA
Thursday, 16:30 - 17:30 • Room BOR2

**TECH-FOCUS SESSIONS**

**TF1** Industrial applications of ultrafast technology – I
Tuesday, 14:30 - 16:00 • Room B11

**TF2** Industrial applications of ultrafast technology – II
Tuesday, 16:30 - 18:00 • Room B11

**CLEO®/Europe 2007 SESSIONS**

**CA** SOLID-STATE LASERS

**CA1** Yb-doped basers and amplifiers
Monday, 10:45 - 12:15 • Room 13a

**CA2** Femtosecond laser sources
Monday, 14:00 - 15:30 • Room 13a

**CA3** High-power laser systems
Monday, 16:00 - 17:30 • Room 13a

**CA4** Raman and parametric optical frequency conversion
Tuesday, 08:30 - 10:00 • Room 13a

**CA5** Ultraviolet and visible laser sources
Tuesday, 14:30 - 16:00 • Room 13a

**CA6** High-energy laser systems
Tuesday, 16:30 - 18:00 • Room 13a

**CA7** Laser materials and spectroscopy I
Wednesday, 14:30 - 16:00 • Room 1

**CA8** Laser materials and spectroscopy II
Wednesday, 16:30 - 18:00 • Room 1

**CA9** Mid-infrared laser sources
Thursday, 14:30 - 16:00 • Room 13a

**CA10** New laser architectures
Thursday, 16:30 - 18:00 • Room 13a

**CA11** Solid-state laser applications
Friday, 08:30 - 10:00 • Room 13a

**CB** SEMICONDUCTOR LASERS

**CB1** Vertical external cavity surface emitting lasers
Monday, 10:45 - 12:15 • Room 13b

**CB2** Nonlinear dynamics
Monday, 14:00 - 15:30 • Room 13b

**CB3** Microway and ring lasers
Monday, 16:00 - 17:30 • Room 13b

**CB4** VCSELs I: Device progress
Tuesday, 08:30 - 09:00 • Room 13b

**CB5** VCSELs II: Device physics
Tuesday, 14:30 - 16:00 • Room 13b

**CB6** Quantum dot lasers
Tuesday, 16:30 - 18:00 • Room 13b

**CB7** VCSELs III: dynamics and switching
Wednesday, 08:30 - 10:00 • Room 13b

**CB8** Communication lasers
Wednesday, 10:30 - 12:00 • Room 13b

**CB9** Semiconductor laser physics
Wednesday, 14:30 - 16:00 • Room 13b

**CB10** Quantum cascade lasers
Wednesday, 16:30 - 18:00 • Room 13b

**CB11** New devices and applications I
Thursday, 08:30 - 10:00 • Room 13b

**CB12** New devices and applications II
Thursday, 10:30 - 12:00 • Room 13b

**CB13** Short-pulse generation
Thursday, 14:30 - 16:00 • Room 13b

**CB14** High power diode lasers
Thursday, 16:30 - 18:00 • Room 13b

**CB15** THz lasers
Friday, 08:30 - 10:00 • Room 13b

**CC** HOLOGRAPHY, ADAPTIVE OPTICS, OPTICAL STORAGE AND PHOTOREFRACTIVES

**CC1** Data storage
Thursday, 08:30 - 10:00 • Room 12

**CC2** Solitons and photoinduced lattices
Thursday, 10:30 - 12:00 • Room 12

**CC3** Adaptive laser cavities and mirrors
Thursday, 14:30 - 16:00 • Room 12

**CC4** Photorefractive and related materials
Thursday, 16:30 - 18:00 • Room 12

**CC5** Holographic devices
Friday, 08:30 - 10:00 • Room 11

**CD** APPLICATIONS OF NONLINEAR OPTICS

**CD1** Applications of solitons
Monday, 10:45 - 12:15 • Room 12
CD2 | Photon phonon interaction  
Monday, 14:00 - 15:30 • Room 12

CD3 | Optical parametric devices  
Monday, 16:00 - 17:30 • Room 12

CD4 | Generation and manipulation of wide bandwidth optical signals  
Wednesday, 10:30 - 12:00 • Room 13a

CD5 | Nonlinear photonic materials  
Wednesday, 14:30 - 16:00 • Room 13a

CD6 | Photonic chips  
Wednesday, 16:30 - 18:00 • Room 13a

CD7 | Nonlinear optics for measurement and sources  
Thursday, 08:30 - 10:00 • Room 13a

CD8 | Engineered quasi phase matched materials  
Thursday, 10:30 - 12:00 • Room 13a

CD9 | Slow and fast light  
Friday, 08:30 - 10:00 • Room 14a

CD10 | Engineered supercontinua  
Friday, 10:30 - 12:00 • Room 14a

CE | OPTICAL MATERIALS, FABRICATION AND CHARACTERISATION

CE1 | Nonlinear organic materials  
Monday, 10:45 - 12:15 • Room 11

CE2 | Organic lasers and laser materials  
Tuesday, 08:30 - 10:00 • Room 12

CE3 | LEDs and semiconductor lasers  
Tuesday, 14:30 - 16:00 • Room 12

CE4 | Novel fabrication techniques  
Tuesday, 16:30 - 18:00 • Room 12

CE5 | Microstructured fibres, fibre devices and glass materials  
Wednesday, 14:30 - 16:00 • Room 4a+b

CE6 | Nanostructured optical devices  
Wednesday, 16:30 - 18:00 • Room 4a+b

CE7 | Nonlinear and laser-active optical waveguides  
Thursday, 08:30 - 10:00 • Room 14a

CE8 | Laser waveguide fabrication  
Thursday, 10:30 - 12:00 • Room 14a

CE9 | Rare-earth doped laser materials  
Thursday, 14:30 - 16:00 • Room 14a

CF | ULTRAFAST OPTICS, ELECTROOPTICS AND APPLICATIONS

CF1 | Femtosecond filamentation  
Monday, 10:45 - 12:15 • Room 14a

CF2 | Parametric processes and supercontinuum generation  
Monday, 14:00 - 15:30 • Room 14a

CF3 | Mode-locked oscillators  
Monday, 16:00 - 17:30 • Room 14a

CF4 | Pulse characterization  
Wednesday, 14:30 - 16:00 • Room 14b

CF5 | Supercontinua and nonlinear spatio-temporal shaping  
Wednesday, 16:30 - 18:00 • Room 14b

CF6 | New pulse compression techniques and fibre lasers  
Thursday, 08:30 - 10:00 • Room 14b

CF7 | Novel applications of femtosecond pulses  
Thursday, 10:30 - 12:00 • Room 14b

CF8 | Material processing and structuring  
Thursday, 16:30 - 18:00 • Room 14b

CF9 | Dispersion compensation and applications of femtosecond pulses  
Friday, 08:30 - 10:00 • Room 14b

CF10 | Semiconductor devices and Terahertz technology  
Friday, 10:30 - 12:00 • Room 14b

CG | HIGH-FIELD LASER PHYSICS AND APPLICATIONS

CG1 | Relativistic interactions  
Tuesday, 08:30 - 09:45 • Room 14a

CG2 | Ultrafast dynamics at XUV/ x-ray wavelengths  
Tuesday, 14:30 - 16:00 • Room 14a

CG3 | Attosecond metrology  
Tuesday, 16:30 - 18:00 • Room 14a

CG4 | High-harmonic generation and few-cycle laser technology  
Wednesday, 08:30 - 10:00 • Room 14a

CG5 | Strong field molecular dynamics  
Wednesday, 10:30 - 12:00 • Room 14a

CG6 | Ultra high power laser systems  
Thursday, 14:30 - 16:00 • Room 14b

CH | OPTICAL SENSING AND METROLOGY

CH1 | Bio and environmental sensing technology  
Monday, 14:00 - 15:15 • Room B11

CH2 | Photonic sensor technologies and applications  
Monday, 16:00 - 17:15 • Room B11

CH3 | Photonic crystal fibres for sensor applications  
Friday, 08:30 - 10:00 • Room 21

CH4 | Optical spectroscopy and precision metrology  
Friday, 10:30 - 12:00 • Room 21

CI | OPTICAL TECHNOLOGIES FOR LIGHTWAVE COMMUNICATIONS AND NETWORKS

CI1 | Differential phase-shift keying  
Tuesday, 08:30 - 10:00 • Room BOR1

CI2 | Optical regeneration  
Tuesday, 14:30 - 15:45 • Room BOR1

CI3 | Advanced communication devices  
Tuesday, 16:30 - 17:45 • Room BOR1

CI4 | All optical signal processing  
Thursday, 08:30 - 10:00 • Room BOR1

CI5 | Signal monitoring and conditioning  
Thursday, 10:30 - 12:00 • Room BOR1

CI6 | Optical signal generation  
Thursday, 14:30 - 15:45 • Room BOR1

CI7 | Transient effects and packet switching  
Thursday, 16:30 - 17:45 • Room BOR1

CI8 | Novel transmission techniques  
Friday, 10:30 - 12:00 • Room 13b

CJ | FIBRE AND GUIDED WAVE LASERS AND AMPLIFIERS

CJ1 | Short pulse fibre lasers I  
Wednesday, 08:30 - 10:00 • Room 14b

CJ2 | Short pulse fibre lasers II  
Wednesday, 10:30 - 12:00 • Room 14b

CJ3 | Properties and dynamics of active fibres  
Thursday, 08:30 - 09:45 • Room 22

CJ4 | High power fibre lasers  
Thursday, 10:30 - 12:00 • Room 22

CJ5 | Microstructured fibres and visible sources  
Thursday, 14:30 - 16:00 • Room 22

CJ6 | Fibre gratings and waveguide lasers  
Thursday, 16:30 - 18:00 • Room 22

CJ7 | Fibre Raman lasers  
Friday, 08:30 - 10:00 • Room 12

CJ8 | Fibre based sources  
Friday, 10:30 - 12:00 • Room 12

CK | PHOTONIC CRYSTALS, PHOTONIC NANOSTRUCTURES AND INTEGRATED OPTICS

CK1 | Negative index materials  
Monday, 10:45 - 12:15 • Room 14b

CK2 | 3D photonic crystals  
Monday, 14:00 - 15:30 • Room 14b

CK3 | Photonic nanostructures and devices  
Monday, 16:00 - 17:30 • Room 14b

CK4 | Plasmonic nanostructures  
Tuesday, 08:30 - 10:00 • Room 14b

CK5 | Imaging and spectroscopy in PCs  
Tuesday, 14:30 - 16:00 • Room 14b

CK6 | Photonic crystal fibres  
Tuesday, 16:30 - 18:00 • Room 14b

CK7 | Photonic states and propagation  
Wednesday, 10:30 - 12:00 • Room 21

CK8 | 2D Photonic crystals  
Wednesday, 14:30 - 16:00 • Room 21

CK9 | Nonlinear optical properties of PCs  
Wednesday, 16:30 - 18:00 • Room 21

CK10 | Disorder in photonic nanostructures  
Thursday, 08:30 - 10:00 • Room 21

CL | BIOPHOTONICS AND APPLICATIONS

CL1 | Enhanced bio sensing  
Thursday, 08:30 - 10:00 • Room B11
CL2 Optical trapping, manipulation and modification
Thursday, 10:30 - 12:00 • Room B11
CL3 Tissue optics
Thursday, 14:30 - 16:00 • Room B11
CL4 Multi-photon fluorescence
Thursday, 16:30 - 18:00 • Room B11
CM Fundamentals and Modelling of Materials Processing with Lasers
CM1 Macroprocessing
Thursday, 14:30 - 16:00 • Room 21
CM2 Microprocessing
Thursday, 16:30 - 18:00 • Room 21
CP CLEO®/Europe Postdeadlines I
Thursday, 18:00 - 19:30 • Room 13a
CP2 CLEO®/Europe Postdeadlines II
Thursday, 18:00 - 19:30 • Room 14b
JSII3 Metamaterials – I
Friday, 08:30 - 10:00 • Room 14c
JSII4 Metamaterials – II
Friday, 10:30 - 12:00 • Room 14c
JSIII Optical Frequency Combs and Applications
JSIII1 Optical frequency comb generation
Monday, 14:00 - 15:30 • Room 1
JSIII2 Applications of optical frequency combs
Monday, 16:00 - 17:30 • Room 1
JSP Joint CLEO®/Europe-IQEC Postdeadlines
JSP1 Joint CLEO®/Europe-IQEC Postdeadlines
Thursday, 18:00 - 19:30 • Room 14a
IQEC 2007 Sessions
IA Microstructured Devices for Quantum and Atom Optics
IA1 Atom chips
Tuesday, 14:30 - 16:00 • Room 4b
IA2 Microfabricated structures for atomic vapour
Thursday, 16:30 - 18:00 • Room BOR2
IB - Cold Atoms and Molecules
IB1 Condensed matter physics with quantum gases
Tuesday, 08:30 - 10:00 • Room 1
IB2 Optical lattices
Wednesday, 14:30 - 16:00 • Room BOR1
IB3 Novel trapping and cooling schemes
Wednesday, 16:30 - 18:00 • Room BOR1
IB4 Spectroscopic applications of ultracold atoms and molecules
Thursday, 08:30 - 10:00 • Room 4b
IB5 Correlations in bosonic and fermionic quantum gases
Thursday, 10:30 - 12:00 • Room 4b
IB6 Novel interactions in ultracold gases
Friday, 10:30 - 12:00 • Room BOR2
IC Quantum Information
IC1 Joint session IB, IC & IF Quantum information theory
Tuesday, 14:30 - 16:00 • Room 4a
IC2 Joint Session IC & IF Atoms and photons in a cavity
Tuesday, 16:30 - 18:00 • Room 4a
IC3 Control of matter qubits
Wednesday, 08:30 - 10:00 • Room BOR1
IC4 Conditional preparation of photonic quantum states
Wednesday, 10:30 - 12:00 • Room BOR1
IC5 Joint Session IA & IC & IF Optomechanical control and entanglement
Wednesday, 16:30 - 18:00 • Room B11
IC6 Quantum cryptography
Thursday, 16:30 - 18:00 • Room 4a
ID Photonic Applications in Fundamental Physics
ID1 Optics at the micro- and nano-scale
Thursday, 14:30 - 16:00 • Room BOR2
ID2 High precision metrology
Thursday, 16:30 - 18:00 • Room 4b
ID3 From spectroscopy to relativity
Friday, 08:30 - 10:00 • Room BOR2
IE Nonlinear Optics and Ultrafast Phenomena
IE1 Strong light-matter interactions
Tuesday, 08:30 - 10:00 • Room 4a
IE2 Frequency mixing and harmonic generation
Tuesday, 14:30 - 16:00 • Room 1
IE3 Ultrafast dynamics of excitonic systems
Tuesday, 16:30 - 18:00 • Room 1
IE4 Slow light and resonant systems
Wednesday, 08:30 - 10:00 • Room 13a
IE5 Coherent dynamics
Thursday, 10:30 - 12:00 • Room BOR2
IE6 Pulse propagation and temporal solitons
Thursday, 14:30 - 16:00 • Room 5
IE7 Spatial solitons
Thursday, 16:30 - 18:00 • Room 5
GF Dynamics - Instabilities and Patterns
IG1 Semiconductor cavity solitons
Monday, 10:45 - 12:15 • Room 2
IG2 Vortices and complexity
Tuesday, 16:30 - 18:00 • Room 4b
IG3 Dissipative solitons
Wednesday, 08:30 - 10:00 • Room B11
IG4 Dynamics in novel microsystems
Wednesday, 10:30 - 12:00 • Room B11
IG5 Dynamics in novel systems
Wednesday, 14:30 - 16:00 • Room B11
IG6 Instabilities in semiconductor lasers
Thursday, 10:30 - 12:00 • Room 21
IP IQEC Postdeadlines
IP1 IQEC Postdeadlines I
Thursday, 18:00 - 19:30 • Room 13b
CLEO®/Europe 2007 Conference Topics

**Tech-Focus Session**

**TFI) INDUSTRIAL APPLICATION OF ULTRAFAST TECHNOLOGIES**

Ultrafast laser technologies are now reaching a stage of maturity such that they have a significant impact on industry, and this Technical Focus Session will present a representative overview of both existing and emerging industrial applications. The Session will aim at providing a comprehensive introduction to the field for the non-specialist as well as identifying key new directions for future research. The invited speakers will cover topics including: ultrafast fiber and solid state lasers, the search for higher power and more compact sources, femtosecond micromachining applications, THz generation and imaging, optical communication systems, femtosecond biophotonics and more.

Chair: Wilson Sibbett, University of St. Andrews, United Kingdom

**CA) SOLID-STATE LASERS**

Advances in solid-state lasers: novel solid-state lasers; high-efficiency and small quantum defect lasers; high power operation (including amplifiers); solid-state micro-chip and nanolasers; random lasers; pulse generation; short wavelength lasers; mid-infrared lasers; intracavity wavelength conversion; upconversion lasers; tunable lasers; thermal handling, beam quality characterization and improvements; novel pump sources and pumping techniques; laser resonator design; spectroscopic characterization of solid-state gain media; advanced laser crystals and glasses; linewidth reduction and tuning techniques; amplitude and frequency stability; laser characterization and modelling.

Chair: Irina Sorokina, Technical University of Vienna, Austria

**CB) SEMICONDUCTOR LASERS**

Technology, new devices and applications; nonlinear dynamics of semiconductor lasers: optical feedback, coupled lasers, spatial and temporal instabilities, synchronization, multimode dynamics; modelling of semiconductor lasers; vertical cavity surface emitting lasers, phononic crystal lasers, micro-cavity lasers; quantum dot/quantum dash lasers; optical amplifiers; high power and high brightness laser diodes; near-infrared long wavelength lasers; mid-infrared and far-infrared semiconductor lasers: quantum cascade lasers and THz lasers; short-pulse generation, mode locking, switching, clock recovery; harnessing nonlinear dynamics for novel applications: chaos communication, incoherent sources; short wavelength lasers: blue and green; semiconductor laser physics related investigations.

Chair: Neil Broderick, University of Southampton, UK

**CD) APPLICATIONS OF NONLINEAR OPTICS**

Applications of nonlinear optical phenomena and new devices: nonlinear frequency conversion and parametric generation in the UV, visible and IR; telecommunication applications and all-optical switching; all-optical delay lines and slow light; optical parametric devices such as optical parametric amplifiers and oscillators; nonlinear optics in waveguides and fibres, including photonic crystal structures and microstructured optical waveguides and fibres; switches and add/drop devices; novel nonlinear materials and structures; stimulated scattering processes and devices; optical limiting; applications of spatial and spatio-temporal nonlinearities including localization phenomena; electro-optic and Kerr devices in crystals and semiconductors; Raman based devices including amplifiers and lasers, beam deflectors and spatial light modulators; nonlinear probing of surfaces; two-photon imaging.

Chair: Markus Pollnau, University of Twente, Enschede, The Netherlands

**CC) HOLOGRAPHY, ADAPTIVE OPTICS, OPTICAL STORAGE AND PHOTOREFRACTIVE**

Organic and inorganic materials and applications for dynamic optics; Wave mixing, dynamic holography and phase conjugation; Resonant and off-resonance optical effects, optical amplification, nonlinear scattering, photorefractive effect, photothermo-optic effects; Optical spatial and temporal properties, photolithography, optical data storage, optical data processing, adaptive laser resonators etc.

Chair: Loïc Mager, CNRS, Institut de Physique et de Chimie des Matériaux de Strasbourg, France

**CF) ULTRAFAST OPTICS AND APPLICATIONS**

Femtosecond and picosecond pulse generation from solid state, fiber and waveguide sources; mode-locked and Q-switched lasers; optical few-cycle pulses; ultrashort-pulse semiconductor lasers and devices; ultrafast parametric and nonlinear optical conversion of short pulses; ultra-fast pulse mid-IR and THz radiation; pulse compression; super-continuum generation; dispersion compensation; pulse-shaping; carrier-envelope pulse evolution; ultrafast characterization methods and measurement techniques, ultrafast optoelectronic systems and devices; applications of ultrafast technology.

Chair: Günter Steinmeyer, Max-Born-Institute, Berlin, Germany

**CG) HIGH-FIELD LASER PHYSICS AND APPLICATIONS**

Laser and parametric chirped-pulse amplification; compression and carrier-envelope phase (CEP) stabilisation of Terawatt pulses; carrier-envelope phase metrology; characterization and manipulation of high-intensity femtosecond light pulses; optical field ionization and attosecond xuv/x-ray pulse generation; generation of high brightness attosecond pulse trains using surface harmonic generation, optimal control of ultrafast non-linear processes, time-resolved measurement of Auger decay, XUV/soft x-ray spectroscopy, metrology, interferometry and microscopy; time-resolved Coulomb explosion imaging, electron dynamics in strongly driven molecules, attosecond and femtosecond electron diffraction imaging of molecular structures, dynamics in fixed-in-space molecules, ultracold electron dynamics in bulk media and quantum-confined structures, probing of surface physicochemical processes via time-resolved UPS/soft XPS; time-resolved XAS, XANES & EXAFS; femtosecond-laser-produced plasmas; relativistic nonlinear optics; laser-driven particle acceleration.

Chair: Marc Vrakking, FOM Institute for Atomic and Molecular Physics (AMOLF), Amsterdam, The Netherlands

**CH) OPTICAL SENSING AND METROLOGY**

Optical sensing and metrology allow for non-contact inspection of a wide range of objects, from the macroscopic to the nanometric scale. This topic focuses on recent progress in all aspects of optical sensing and metrology, particularly in new photonic sensor technologies and applications. Papers are solicited on the following and related topics: new trends in optical remote sensing; fiber sensors using conventional and photonic crystal fibers; active multispectral and hyperspectral imaging; sensor multiplexing; novel spectroscopic techniques, applications and systems; optical precision metrology; novel measurement methods and devices based on interferometry, diffractometry or scatterometry; critical dimension metrology; virtual metrology; multiscale surface metrology; UV and DUV microscopy; resolution enhancement technologies in microscopy; inverse problems; phase retrieval.

Chair: Hanne Ludvigsen, Helsinki University of Technology, Espoo, Finland

**CI) OPTICAL TECHNOLOGIES FOR LIGHTWAVE COMMUNICATIONS AND NETWORKS**

Fibre devices including dispersion compensating fibres, non-linear fibres, fibre propagation effects, fibre amplifiers and fibre lasers, fibre gratings and fibre grating-based devices; semiconductor devices that may be employed in lightwave communications for generation, processing and detection of optical signals including laser sources, detectors and modulators, performance monitoring, fibre-optic links, switches, and system performance.

Chair: Liam Barry, Dublin City University, Ireland

**CJ) FIBRE AND GUIDED WAVE LASERS AND AMPLIFIERS**

Waveguide and fibre laser oscillator and amplifiers including novel waveguide and fibre geometries; power scaling of waveguide and fibre lasers - including beam combination techniques (for both pump and signal beams) and new waveguide coupling approaches; upconversion lasers;...
**Topics**

**CM) FUNDAMENTALS AND MODELLING OF MATERIALS PROCESSING WITH LASERS**
Fundamental physics during materials processing with lasers; welding; surface treatment; cutting; ablation; LPVD; LCVD; interaction light-matter; surface and plasma absorption; heat conduction and convection; phase transformations solid-liquid and liquid-vapour; flows in optical lattices, which may be free standing or integrated into an atom chip. When coupled to high-finesse optical micro-resonators, trapped atoms offer possibilities for quantum coherent control, including quantum logic gates and quantum memories and with an interconnect to flying optical qubits, such an effort to miniaturise quantum atom opts and to realise applications such as interferometry, metrology and quantum information processing.

**Chair:** Ed Hinds, Imperial College London, UK

**Joint Symposia Topics**

**JSIII) OPTICAL FREQUENCY COMBS AND APPLICATIONS**
Optical frequency combs based on femtosecond mode-locked lasers have brought about a revolution in optical frequency metrology, providing a simple and robust means of connecting the optical and microwave domains of the electromagnetic spectrum. This has made possible the direct counting of optical cycles, which is a critical milestone in the creation of next-generation optical atomic clocks and techniques of optical time transfer. This symposium will highlight recent developments, as pioneered by T.W. Hänsch and J.L. Hall, was recognized in the award of the 2005 Nobel Prize in physics. Beyond applications in precise time/frequency metrology and tests of fundamental theories, such combs have opened new research avenues into coherent control, comb generation, ranging and sensing, novel broadband spectroscopy techniques, and the synthesis of low-noise/low-jitter waveforms. Moreover, these applications have synergistically motivated important developments in carrier-envelope-stabilized femtosecond lasers, coherent linking of multiple broadband sources and nonlinear broadening and frequency conversion techniques that have now pushed frequency combs into new spectral regimes from the XUV to far-IR. This joint symposium will seek to capture the excitement and diversity of this field by gathering experts and newcomers alike to present their latest research developments (both fundamental and applied) in the above-mentioned areas.

**Co-Chairs:** Ted Sargent, University of Toronto, Canada and Nikolay I. Zheludev, Southampton Univ, UK

**JSI) CRYPTOGRAPHIC TECHNIQUES IN PHOTONICS**
This Joint Symposium welcomes contributions on any topic relevant to the application of photonic and optical techniques to cryptographic systems. Topics include, but are not restricted to, the following: chaotic emitter and receiver sources; compact and integrated devices; optical chaos cryptography; quantum key distribution; schemes for information encryption; evaluation of transmission characteristics; chaotic number generator; transmission distance, dispersion compensation techniques; synchronization improvements; free-space and fibre implementations; security aspects: evaluation and characterization; information-theoretic security; key distribution; bidirectional communications; exploitation of correlated noise; public discussion topics; single photon sources; use of coherent states for cryptography.

**Co-Chairs:** Nobuyuki Imoto, Osaka Univ, Japan and Claudio Mirasso, Univ. de les Illes Balears, Palma de Mallorca, Spain

**JSII) NANOPHOTONICS AND METAMATERIALS: FROM CONCEPTS TO DEVICE**
Nanophotonics and Metamaterials are overlapping areas of photonics research that have rapidly grown in importance in recent years. The symposium will be concerned with wavelength scale and sub-wavelength scale photonics - and, more generally, with optical structures and devices where the response is determined by nanoscale features. Interest in metamaterials that operate at optical frequencies has increased greatly since deterministic fabrication technology that can produce specific properties reproducibly has now emerged. The symposium will cover basic physics, new phenomena, materials properties, fabrication technologies, modelling, device design and characterization - applied in a nanophotonics environment. The symposium will seek to capture the excitement and diversity of this field by gathering experts and newcomers alike to present their latest research developments (both fundamental and applied) in the above-mentioned areas. Submissions that address specific areas of potential application will be especially welcome.

**Co-Chairs:** Alexander Kaplan, Luleå University of Technology, Sweden

**IQEC 2007 Topics**

**IA) MICROSTRUCTURED DEVICES FOR QUANTUM AND ATOM OPTICS**
Cold atoms and Bose Einstein condensates can be confined in extremely small magnetic traps and guides on atom chips, made using microfabricated current-carrying wires or micro-structured patterns of permanent magnetisation. Switched magnetic, electrostatic and radiofrequency fields add further options for atom manipulation. Alternatively atoms may be trapped and manipulated on the microscale using optical tweezers, superfluorescence standing or integrated into an atom chip. When coupled to high-finesse optical micro-resonators, trapped atoms offer possibilities for quantum coherent control, including quantum logic gates and quantum memories and with an interconnect to flying optical qubits, such an effort to miniaturise quantum atom optics and to realise applications such as interferometry, metrology and quantum information processing.

**Chair:** Dan Stamper-Kurn, UC Berkeley, USA

**IB) COLD ATOMS AND MOLECULES**
Quantum degenerate Bose and Fermi gases — Bose-Einstein condensation, multi-component gases, coherence and phase, superfluid Bose and Fermi gases, the BEC-BCS crossover regime, gases in restricted geometries, effects of disordered potentials, effects of quantum degeneracy on atom-light interactions and atomic coherence, coherent and quantum atom optics, cold atomic gases and novel platforms, devices and materials for quantum information processing.

**Chair:** Benoit C. Forget, Université Pierre et Marie Curie, Paris, France

**CL) BIOPHOTONICS AND APPLICATIONS**
This topic area addresses emerging concepts in biophotonics: single particle detection and tracking; spatio-temporal manipulation of light fields; enhanced linear and non linear detection; microfluidics and micro-optics; new optical probes for local measurements — including organic and inorganic nanocrystals, electric fields and temperature measurements etc; new routes for optical detection in biophotonics; non-linear processes; squeezed states; twin photons; phase conjugation time reversal etc; physics of optical phenomena in biological media: scattering; coherence; polarization; symmetry and invariance; coupling of optical fields with flows and acoustic fields.

**Chair:** Cefe Lopez, Instituto de Ciencia de Materiales de Madrid (CSIC), Madrid, Spain

**GENERAL INFORMATION**

**Telle, Physikalisch-Technische Bundesanstalt (PTB), Telfs, Austria**

**INQEC 2007**

**INQEC 2007**

**INQEC 2007**
quantum information processing, such as photonic bandgaps, micro-mechanics, ion-trap arrays, superconducting structures, quantum dots and nonlinear optical processes will be covered.

**Chair:** Ian A. Walmsley, University of Oxford, United Kingdom

**ID) Photonics applications in fundamental physics**

Novel laser-spectroscopy techniques, high-resolution spectroscopy, nonlinear spectroscopy, nonlinear magneto- and electro-optical effects, and their applications to metrology; novel frequency standards; measurements of fundamental constants, and searches for their temporal variation; fundamental-symmetry tests.

**Chair:** Dmitry Budker, UC Berkeley, USA

**IE) Nonlinear optics and ultrafast phenomena**

Fundamentals of nonlinear optics; fundamentals of ultrafast optical fields; frequency conversion, parametric processes and wavemixing; novel nonlinear optical materials, processes and effects; temporal and spatial solitons; ultrafast spectroscopy; ultrafast dynamics in condensed matter and molecules; control of chemical reactions; electromagnetic induced transparency, lasing without inversion, slow light.

**Chair:** Steve Cundiff, JILA, University of Colorado and NIST, Boulder, USA

**IF) Quantum optics**

Photons in confined structures and cavity QED; quantum correlation and quantum noise reduction; entangled states and decoherence; single photon and nonclassical light sources and applications; QND measurements; quantum imaging, quantum metrology and quantum lithography.

**Chair:** Hans A. Bachor, The Australian National University, Canberra, Australia

**IG) Dynamics, instabilities and patterns**

Pattern forming optical systems: localized and extended structures; novel optical systems for non linear dynamics such as quantum dot lasers, hybrid devices, microlasers, fiber lasers; dynamics of nonlinear optical systems such as lasers, OPOs, optical valves; instabilities in semiconductor lasers: injected signal, optical feedback, multimode dynamics; control, synchronisation and applications of chaos in optical systems.

**Chair:** Fedor Matschke, University of Rostock, Germany

**CLEO®/Europe 2007 Committees**

**Steering Committee**

**European Physical Society**

**Chair:** Sandro De Silvestri, Politecnico di Milano, Italy

Ennio Arimondo, INFM - University of Pisa, Pisa, Italy

Gunnar Björk, Royal Institute of Technology, Kista, Sweden

Robert W. Boyd, University of Rochester, NY, USA

Richard De La Rue, University of Glasgow, UK

John Dudley, Université de Franche-Comté, Besançon, France

Paul French, Imperial College, London, UK

Ursula Keller, ETH Zurich, Zürich, Switzerland

Daan Lenstra, Delft Univ. of Technology, Delft, The Netherlands

Peter Loosen, Fraunhofer Inst. of Laser Technology, Aachen, Germany

Ralf Menzel, University of Potsdam, Germany

Dieter Meschede, University of Bonn, Germany

Klaus Mølmer, University of Aarhus, Denmark

Eberhard Riedle, LMU Munich, Germany

Gérald Roosen, Laboratoire Charles Fabry, Institut d’Optique, Orsay, France

**Programme Chairs**

Richard De La Rue, University of Glasgow, UK

John Dudley, Université de Franche-Comté, Besançon, France

**Organising Committee**

**General Chairs**

Ursula Keller, ETH Zurich, Zürich, Switzerland

Gérald Roosen, Lab. Charles Fabry de L’Inst. d’Optique, Orsay, France

**Programme Chairs**

Richard De La Rue, University of Glasgow, UK

John Dudley, Université de Franche-Comté, Besançon, France

**Local Chair**

Eberhard Riedle, Ludwig-Maximilians-University, Munich, Germany

**Programme Committees**

**CA - Solid-state lasers**

**Chair:** Irina Sorokina, Technical University of Vienna, Austria

Tasoltan T. Basiev, General Physics Inst. Russian Ac. of Sciences, Moscow, Russia

Camille Bibeau, Lawrence Livermore National Lab., Livermore, CA, USA

Robert L. Byer, Stanford University, Ginzton Lab., Stanford, CA, USA

William A. Clarkson, University of Southampton, UK

**CB - Semiconductor lasers**

**Chair:** Ingo Fischer, Vrije Universiteit, Brussels, Belgium

Eugene A. Avrutin, The University of York, Heslington, UK

Gadi Eisenstein, Technion, Haifa, Israel

Wolfgang Elsäßer, Darmstadt University of Technology, Germany

Götz Erbert, Ferdinand-Braun-Institut für Höchstfrequenztechnik, Berlin, Germany

Thomas Erneux, Université Libre de Bruxelles, Belgium

Andrea Fiore, Ecole Polytechnique Fédérale de Lausanne, Switzerland

Mark Hopkinson, University of Sheffield, Sheffield, UK

Francesco Marin, Univ. Firenze and INFM and LENS, Sesto F.no (FI), Italy

Cristina Masoller, Universitat Politècnica de Catalunya, Barcelona, Spain

Geert Morthier, Gent University – IMEC, Gent, Belgium

Atsushi Uchida, Takushoku University, Tokyo, Japan

**IEE/Lasers and Electro-Optics**

Rooi Baets, Ghent University - IMEC, Gent, Belgium

Silvano Donati, University of Pavia, Italy

Concetto Giuliano, US Airforce Research Laboratory, Kirtland, NM, USA

**Optical society of America**

Kari Apter, Optical Society of America, Palo Alto, CA, USA

Jean-Pierre Huignard, Thales Research & Technology, Palaiseau, France

Franz Kärnner, Massachusetts Inst. of Technology, Cambridge, MA, USA

Jürg Leuthold, University of Karlsruhe, Germany

Elizabeth Rogan, Optical Society of America, Washington DC, USA

William F. Ryan, Optical Society of America, Washington DC, USA

**IEEE/LEOS, Piscataway, NJ, USA**

**Optical society of America**

Kari Apter, Optical Society of America, Palo Alto, CA, USA

Jean-Pierre Huignard, Thales Research & Technology, Palaiseau, France

Franz Kärnner, Massachusetts Inst. of Technology, Cambridge, MA, USA

Jürg Leuthold, University of Karlsruhe, Germany

Elizabeth Rogan, Optical Society of America, Washington DC, USA

William F. Ryan, Optical Society of America, Washington DC, USA
CE – OPTICAL MATERIALS, FABRICATION AND CHARACTERISATION
CHAIR: Markus Polinau,
University of Twente, Enschede, The Netherlands
Chantal Fontaine,
LAAS-CNRS, Groupe Photonique, Toulouse, France
Christos Grivas,
University of Southampton, UK
Eli Kapon,
Swiss Federal Institute of Technology, Lausanne (EPFL), Switzerland
Anna Köhler,
University of Potsdam, Germany
Yaroslav Romanyuk,
Lawrence Berkeley National Lab., Berkeley, CA, USA
Witold Ryba-Romanowski,
Polish Academy of Sciences, Wrocław, Poland
Igor D.W. Samuel,
University of St. Andrews, St. Andrews Fife, UK
Wolfgang Sohler,
University of Paderborn, Germany
Alessandra Toncelli,
University of Pisa, NEST – INFN, Pisa, Italy

CF - ULTRAFAST OPTICS, ELECTROOPTICS AND APPLICATIONS
CHAIR: Günter Steinmeyer,
Max-Born-Institute für Nichtlineare Optik und Kurzzeitspektroskopie, Berlin, Germany
Luc Bergé,
CEA-DAM / Ile de France, Bruyères-le-Châtel, France
Giulio Cerullo,
Politecnico di Milano, INFN, Milan, Italy
Takao Fujii,
Max-Planck-Institut für Quantenoptik, Garching, Germany
Pablo Loza-Alvarez,
ICFO, Institute of Photonic Sciences, Castelldefels (Barcelona), Spain
Uwe Morgner,
University of Hannover, Hannover, Germany
Derryck T. Reid,
Heriot-Watt University, Edinburgh, UK
Jeff A. Squier,
Colorado School of Mines, Golden, USA
John W.G. Tisch,
Imperial College, London, UK

CG - HIGH-FIELD LASER PHYSICS AND APPLICATIONS
CHAIR: Marc Vrakking,
FOM Institute for Atomic and Molecular Physics, Amsterdam, The Netherlands
Joachim Burgdörfer,
Vienna University of Technology, Vienna, Austria
Dimitris Charalambidis,
FORTH – IESL, Heraklion, Greece
Reinhard Dörner,
University of Frankfurt, Frankfurt am Main, Germany
Víctor Malaka,
ENSTA, CNRS, Ecole Polytechnique, Palaiseau, France
Jon Marangos,
Imperial College, London, UK
Mauro Nisoli,
Politecnico di Milano, Italy
Jan Michael Rost,
Max-Planck-Institut für Physik komplexer Systeme, Dresden, Germany
Pascal Salières,
CEA Saclay, Gif sur Yvette, France
Henrik Steffelstadt,
Aarhus University, Aarhus C, Denmark

CH - OPTICAL SENSING AND METROLOGY
CHAIR: Hanne Ludvigsen,
Helsinki University of Technology, Espoo, Finland
Ian Bennion,
Aston University, Birmingham, UK
Andreas Erdmann,
Fraunhofer Institute (IISB), Erlangen, Germany
Min Gu,
Swinburne University of Technology, Victoria, Australia
Julian Jones,
Heriot-Watt University, Edinburgh, UK
Tomasz Nasilowski,
Frey University Brussel, Belgium
Mitsuo Takeda,
Waseda University, Tokyo, Japan
Wacław Urbanzynk,
Wrocław University of Technology, Wrocław, Poland
Luc Thévenaz,
EPFL Swiss Federal Inst. of Tech., Lausanne, Switzerland

CI - OPTICAL TECHNOLOGIES FOR LIGHTWAVE COMMUNICATIONS AND NETWORKS
CHAIR: Liam Barry,
Dublin City University, Dublin, Ireland
Polina Bayvel,
University College London, UK
Pascal Besnard,
ENSSAT-FOTON / CNRS, Lannion, France
Harmen J.S. Dorren,
Eindhoven Univ. of Tech., Eindhoven, The Netherlands
Andrew Ellis,
Univ. College Cork, Tyndall National Inst., Cork, Ireland
Dan Kilper,
Bell Laboratories, Lucent Technologies, Holmdel, NJ, USA
Periklis Petropoulos,
University of Southampton, UK
Christophe Puechret,
Technical University of Denmark, Research Centre COM, Lyngby, Denmark
Stefan Wabnitz,
Université de Bourgogne, Dijon, France
Neil D. Whitbread,
Bookham, Caswell Towcester, UK

CJ - FIBRE AND GUIDED WAVE LASERS AND AMPLIFIERS
CHAIR: J.R. Taylor,
Imperial College, London, UK
Pierre A. Champert,
Keopsys SA, Lannion, France
Andrei A. Fotiadi,
Faculté Polytechnique de Mons, Belgium
Denis V. Gapontsev,
IPG Photonics, Oxford, MA, USA
Kim P. Hansen,
Crystal Fibre A/S, Birkerod, Denmark
Thomas Schreiber,
Friedrich-Schiller University of Jena, Germany
William Wadsworth,
University of Bath, UK

CK - PHOTONIC CRYSTALS, PHOTONIC NANOSTRUCTURES AND INTEGRATED OPTICS
CHAIR: Cefe López,
Instituto de Ciencia de Materiales de Madrid, Spain
Lucio Claudio Andreani, 
Università di Pavia, Italy

Gonçal Badenes, 
ICFO-Institut de Ciencies Fotòniques, Castelldefels, Spain

U. Gieseke, 
Max-Planck-Institute of Microstructure Physics, Halle, Germany

L. (Kobus) Kuipers, 
FOM Institute for Atomic and Molecular Physics, Amsterdam, The Netherlands

Florian Kulzer, 
Huygens Laboratory, Leiden, The Netherlands

Ekmed Ozbay, 
Bilkent University, Ankara, Turkey

Andrew R. Parker, 
Green College, Oxford, London, UK

Michael Scalora, 
AMSRD-AMR-WS-ST, U.S. Army RDECOM, Redstone Arsenal, AL, USA

Andrew J. Turberfield, 
University of Oxford, UK

Willem Vos, 
University of Twente, Enschede, The Netherlands

Ralf B. Wehrspohn, 
University of Paderborn, Germany

Diederik S. Wiersma, 
University of Paderborn, Germany

Chairs:

**CL - BIOPHOTONICS AND APPLICATIONS**
- Benoît C. Forget, Université Pierre et Marie Curie, Paris, France
- Kishan Dholakia, University of St. Andrews, St. Andrews Fife, UK
- Alberto Diaspro, University of Genoa, Genova, Italy
- Andrew Dunn, University of Texas at Austin, USA
- Emmanuel Fort, ESPCI, Laboratoire de Physique des Solides, Paris, France
- Amir H. Gandjbakhche, National Institute of Child Health and Human Development, Bethesda, MD, USA

**CM - FUNDAMENTALS AND MODELLING OF MATERIALS PROCESSING WITH LASERS**
- Alexander Kaplan, Luleå University of Technology, Luleå, Sweden
- Peter Berger, University of Stuttgart, Germany
- Eckhard Beyer, Fraunhofer IWS, Dresden, Germany
- John M. Dowden, University of Essex, Colchester, UK
- Rémy Fabbro, Coopération Laser Franco-Allemande, Arcueil, France
- Costas Fotakis, FORTH – IESL, Heraklion, Greece
- Bernd Hüttner, DLR, Institute of Technical Physics, Stuttgart, Germany
- Seiji Katayama, Osaka University, Japan
- José Luis Ocaña, Madrid Polytechnical University, Spain
- Wolfgang Schulz, Fraunhofer Institut für Lasertechnik und RWTH, Aachen, Germany
- Armando J. Yáñez Casal, Universidade da Coruña, Ferrol, Spain
- Gang Yu, Chinese Academy of Sciences, Beijing, China

**TECH-FOCUS 1: INDUSTRIAL APPLICATION OF ULTRAFAST TECHNOLOGIES**
- Wilson Sibbett, University of St. Andrews, UK

**Joint Symposia Committees**

**Programme committees**

**JSI - CRYPTOGRAPHIC TECHNIQUES IN PHOTONICS**
- Nobuyuki Imoto, Osaka University, Japan
- Claudio R. Mirasso, Universitat de les Illes Balears, Palma de Mallorca, Spain
- Valerio Annovazzi Lodi, University of Pavia, Italy
- Artur Ekert, University of Cambridge, UK
- Nicolas Gisin, University of Geneva, Switzerland
- Takuya Hirano, Gakushuin University, Tokyo, Japan
- Ido Kanter, Bar-Ilan University, Ramat-Gan, Israel
- Jia-Ming Liu, University of California, UCLA, Los Angeles, CA, USA
- Hoi-Kwong Lo, University of Toronto, Canada
- Norbert Lütkenhaus, University of Waterloo, Waterloo, ON, Canada
- John Rarity, University of Bristol, UK
- Marco Santagiustina, University of Padova, Italy
- Alan Shore, University of Wales, Bangor, UK
- Dimitris Syvridis, University of Athens, Greece
- Mirvaios Yousefi, University of Eindhoven, The Netherlands

**JSII - OPTICAL FREQUENCY COMBS AND APPLICATIONS**
- Scott Diddams, National Institute of Standards and Technology, Boulder, USA
- Harald Telle, Physikalisch-Technische Bundesanstalt, Braunschweig, Germany
- Alexander Gaeta, Cornell University, Ithaca, NY, USA
- David Jones, University of British Columbia, Vancouver, BC, Canada
- R. Jason Jones, JILA/University of Colorado and NIST, Boulder, CO, USA
- Franz Kärtner, Massachusetts Institute of Technology, Cambridge, MA, USA
- Motonobu Kourogi, Optical Comb Institute, Tokyo, Japan
- Stephen N. Lea, National Physical Laboratory, Teddington, UK
- Kaoru Minoshima, National Institute of Advanced Industrial Science and Technology, Tsukuba, Japan
- Giorgio Santarelli, BNM-Syrte, Observatoire de Paris, France
- Florian Tauser, Toptica Photonics AG, Gräfelfing/Munich, Germany
- Thomas Udem, Max-Planck-Institute for Quantum Optics, Garching, Germany
- Lijun Wang, Max-Planck-Research Group, Erlangen, Germany

**JSIII - OPTICAL FREQUENCY COMBS AND MATERIALS**
- Nikolay I. Zheludev, Southampton University, UK
- and Ted Sargent, University of Toronto, Canada
- F. Javier García de Abajo, CSIC, San Sebastian, Spain
- Joachim Krenn, University of Graz, Austria

**Joint Symposia Committees**

**Programme committees**

**JSI - CRYPTOGRAPHIC TECHNIQUES IN PHOTONICS**
- Nobuyuki Imoto, Osaka University, Japan
- Claudio R. Mirasso, Universitat de les Illes Balears, Palma de Mallorca, Spain
- Valerio Annovazzi Lodi, University of Pavia, Italy
- Artur Ekert, University of Cambridge, UK
- Nicolas Gisin, University of Geneva, Switzerland
- Takuya Hirano, Gakushuin University, Tokyo, Japan
- Ido Kanter, Bar-Ilan University, Ramat-Gan, Israel
- Jia-Ming Liu, University of California, UCLA, Los Angeles, CA, USA
- Hoi-Kwong Lo, University of Toronto, Canada
- Norbert Lütkenhaus, University of Waterloo, Waterloo, ON, Canada
- John Rarity, University of Bristol, UK
- Marco Santagiustina, University of Padova, Italy
- Alan Shore, University of Wales, Bangor, UK
- Dimitris Syvridis, University of Athens, Greece
- Mirvaios Yousefi, University of Eindhoven, The Netherlands

**JSII - OPTICAL FREQUENCY COMBS AND APPLICATIONS**
- Scott Diddams, National Institute of Standards and Technology, Boulder, USA
- Harald Telle, Physikalisch-Technische Bundesanstalt, Braunschweig, Germany
- Alexander Gaeta, Cornell University, Ithaca, NY, USA
- David Jones, University of British Columbia, Vancouver, BC, Canada
- R. Jason Jones, JILA/University of Colorado and NIST, Boulder, CO, USA
- Franz Kärtner, Massachusetts Institute of Technology, Cambridge, MA, USA
- Motonobu Kourogi, Optical Comb Institute, Tokyo, Japan
- Stephen N. Lea, National Physical Laboratory, Teddington, UK
- Kaoru Minoshima, National Institute of Advanced Industrial Science and Technology, Tsukuba, Japan
- Giorgio Santarelli, BNM-Syrte, Observatoire de Paris, France
- Florian Tauser, Toptica Photonics AG, Gräfelfing/Munich, Germany
- Thomas Udem, Max-Planck-Institute for Quantum Optics, Garching, Germany
- Lijun Wang, Max-Planck-Research Group, Erlangen, Germany

**JSIII - OPTICAL FREQUENCY COMBS AND MATERIALS**
- Nikolay I. Zheludev, Southampton University, UK
- and Ted Sargent, University of Toronto, Canada
- F. Javier García de Abajo, CSIC, San Sebastian, Spain
- Joachim Krenn, University of Graz, Austria
### IQEC 2007 Committees

#### Organising Committee

**General Chairs**
- Ennio Arimondo, INFN, University of Pisa, Italy
- Daan Lenstra, Delft University of Technology, Delft, The Netherlands

**Programme Chairs**
- Robert W. Boyd, University of Rochester, Rochester, NY, USA
- Dieter Meschede, University of Bonn, Germany
- Klaus Mølmer, University of Bonn, Germany
- Weizmann Institute of Science, Rehovot, Israel

**Local Chair**
- Eberhard Riedle, Ludwig-Maximilians-University, Munich, Germany

#### Programme Committees

**IA - Microstructured Devices for Quantum and Atom Optics**
*Chair: Ed Hinds*
- Imperial College, London, UK
- Swiss University, Brussels, Belgium
- University of South Australia, Australia
- University of Technology, Sydney, Australia
- University of Queensland, Australia
- University of Oxford, UK
- Imperial College, London, UK
- Max-Planck-Institut für Quantenoptik, Garching, Germany
- University of Konstanz, Germany
- Institute for Quantum Optics and Quantum Information, Technical University of Austria, Vienna, Austria

**IB - Cold Atoms and Molecules**
*Chair: Dan Stamper-Kurn*
- UC Berkeley, USA
- Laboratoire Kastler Brossel, Paris, France
- Weizmann Institute of Science, Rehovot, Israel
- Stanford University, USA
- National Institute of Standards and Technology (NIST), Boulder, CO, USA
- JILA, National Institute of Standards and Technology and University of Colorado Boulder, USA

**IC - Quantum Information**
*Chair: Ian A. Walmsley*
- University of Oxford, UK
- NEC Corporation, Tsukuba, Ibaraki, Japan
- Imperial College, London, UK
- Max-Planck-Institut für Quantenoptik, Garching, Germany
- Chalmers University, Göteborg, Sweden
- University of Konstanz, Germany

**ID - Photonics Applications in Fundamental Physics**
*Chair: Dmitry Budker*
- UC Berkeley, USA
- University of Latvia, Riga, Latvia
- Laboratoire de Physique des Lasers, Villeteanue, France
- Imperial College, London, UK
- JILA, National Institute of Standards and Technology and University of Colorado Boulder, USA

**IE - Nonlinear Optics and Ultrafast Phenomena**
*Chair: Steve Cundiff*
- JILA, University of Colorado and NIST, Boulder, CO, USA
- NIST, Gaithersburg, MD, USA
- JILA, National Institute of Standards and Technology and University of Colorado Boulder, USA

**IF - Quantum Optics**
*Chair: Hans A. Bachor*
- The Australian National University, Canberra, Australia
- University of Innsbruck, Austria
- quantum optics, Garching, Germany
- University of Vienna, Austria
- University of Pierre and Marie Curie, Paris, France
- Boston University, MA, USA
- University of Technology, Sydney, Australia
- University of Manchester, UK

**IG - Dynamics, Instabilities and Patterns**
*Chair: Fedor Mitschke*
- Universität Rostock, Germany
- University of St Andrews, Scotland, UK
- University of Strathclyde, Glasgow, UK
- Institute Non-linéaire de Nice, France
- Politecnico di Milano, Italy
- Université Libre de Bruxelles, Belgium
General Information

Abstracts of the papers to be presented at CLEO®/Europe-IQEC 2007 appear in this advance programme. The presentation of the large number of contributed papers requires that there be up to fourteen parallel sessions during the 5 days of the conference. The programme includes two short courses, one tech-focus session, thirteen CLEO®/Europe symposia, seven IQEC topics, and three joint CLEO®/Europe-IQEC symposia. All sessions with the exception of the short courses will be held at the International Congress Centre (ICM) in Munich. The short courses will be held at the Ludwig Maximilians University of Munich.

The CLEO®/Europe-IQEC 2007 technical programme features 1244 presentations. These include 3 plenary sessions, 4 tutorial, 7 keynote, and 58 invited talks. The conference also features 1170 contributed papers including posters. Among them 26 contributions were upgraded to invited presentations. Postdeadline sessions were also added.

Poster Sessions
Poster Sessions for contributed papers have been a major attraction at recent conferences. To allow participants to see as many posters as possible, all posters will be displayed in the ICM Foyer. The conference will feature 3 poster sessions taking place from Monday to Wednesday after lunch time (Monday between 13:00 and 14:00, Tuesday and Wednesday between 13:30 and 14:30). There will be no oral presentations during this time.

All authors are requested to display posters on their allocated boards on the morning of their assigned poster day. In order to present their work and answer questions, they are requested to be present in the vicinity of their poster during that day between the assigned time schedule. The schedule of the poster sessions is presented on the respective pages of this programme.

Each author is provided with a bulletin board measuring 1 meter wide x 2 meter high on which to display a summary of the paper. Tape to fix the posters will be provided (pins cannot be applied). Poster paper presentation provides an intimate interaction between the presenter and the viewer.

Poster presenters will also have the possibility to electronically upload their presentations prior to the congress or on site. These uploads can then be viewed on site during the congress. Each poster presenter will receive an additional email directly from the company in charge of this task with all the detailed information including upload-link, log-in data, upload guide, etc. All files will be destroyed after the conference.

Tech-Focus Session
A feature of CLEO®/Europe-IQEC 2007 will be the half-day Tech-Focus Session which concentrates on selected Photonics Application topics. It consists of a combination of extended tutorial introductory material and authoritative technical reviews. CLEO®/Europe-IQEC 2007 will feature a Tech-Focus session on Industrial Applications of Ultrafast Technology taking place on Tuesday afternoon. CLEO®/Europe-IQEC 2007 paid registrants are invited to attend the Tech-Focus Sessions at no additional charge. Those wishing to attend the Tech-Focus who are not full fee registrants of the conference must pay the one day fee.

Authors’ Information
The presentations need to be uploaded prior to the beginning of the conference - or on site. Authors will receive an additional email from e-m events containing all detailed information including upload-link, log-in data, upload guide, etc. before the congress begins. Prior to performing the uploading please carefully read the user guide for the upload interface. Please note that all files will be destroyed after the conference.

Authors are asked to check-in with the session chair in the room of their relevant session, ten minutes before the beginning of the session.

Short Courses
Sunday 17 June 2007, Ludwig Maximilians University of Munich, 14:30 - 18:00
All sessions except the short courses will take place at the ICM congress centre. Additional information about the courses is to be found in the technical programme.

Short Course Location:
Ludwig-Maximilians-Universität München Lehrstuhl für BioMolekulare Optik, Fakultät für Physik Oettingenstrasse 67
See: www.bmo.physik.uni-muenchen.de/ under “General”

Laboratory Visits
Sunday 17 June 2007, Ludwig-Maximilians-University of Munich, 17:30 - 19:30. Departure from the Seminar Room (at 17:30 and 18:30)
There will be the opportunity to visit the laser laboratories of the Lehrstuhl für BioMolekulare Optik. At 17:30 the first tour begins with a short introduction. A second tour starts at 18:30. The number of participants will be limited. Interested participants need to send an email to s.jung@eps.org in order to be registered. Deadline to register: Tuesday 12 June 2007.

Additional lab tours are conducted at other groups of the Fakultät für Physik and the Max-Planck-Institut für Quantenoptik in Garching on Friday 22 June. See the local website http://cleoeurope2007.physik.uni-muenchen.de/ for details.

Official Congress Opening
The official congress will begin on Monday 18 June, Room 1, at 08:45 in the morning. The congress will be opened by Mr. R. Strohmeier, Head of Cabinet of European Commissioner Viviane Reding at 09:00. The CLEO®/Europe plenary given by Gérard Mourou will directly follow from 09:30 to 10:30.

Prizes
Prize and award ceremonies will take place after Theodor W. Hänsch’s plenary scheduled Tuesday from 10:30 to 11:30, Room 1.

11:30 - 11:50
• EPS/QEOD Awards Ceremony:
• EPS Quantum Electronics Prize (2 laureates)
• Fresnel Prize (2 laureates)
• QEO Thesi Prize (4 laureates)
11:55 - 12:15
• OSA Award Ceremony
• Fellow presentations (7 laureates)
• Announcement of the Walther Award
12:20 - 12:30
• Julius Springer Prize

Social Programme
QED members’ reception
Sunday 17 June 2007, Ludwig Maximilians University of Munich, 18:00 - 22:00
The European Physical Society Quantum Optics and Electronics Division (QED) will hold a special reception for members on Sunday evening. Drinks and a range of Bavarian style food – sufficient to even feed hungry grad students - will be served at no cost for you! The beer garden opens at 18:00 and the buffet will open at 19:00.

The reception will provide an exciting opportunity to meet colleagues and other members of the QED, and to learn about the benefits of QED membership in developing a career in optics and photonics in Europe.

Reception participation needs to be confirmed by e-mailing your name and affiliation to abascal@kth.se before 13 June 2007.

For details see http://cleoeurope2007.physik.uni-muenchen.de/ and for information about the venue, see Short Courses.

Not an EPS Individual Member? Not a Problem! Non-members of the EPS-QEOD are of course also very welcome! You will be able to join EPS-QEOD on site at a specially reduced rate.

If you have paid the non-member conference fee, you will be offered a free membership for 2007, including admission to the reception.

If you are a non-member of EPS, but paid a reduced fee, you can join EPS QED in 2007 and enter the reception for 5 Euros if you are a student, teacher, retired person, or under 30 years old. For anyone else, 10 Euros gives you a 2007 membership and admission to the reception.

If you intend to come, please confirm your reception participation by e-mailing your name and affiliation to abascal@kth.se before 13 June 2007.

Short course opportunity
The QED reception is being held at the same venue, and directly after the short courses on Practical OPOs and Micro- and Nano-Machined Optics, 14:30 - 18:00.

If you have registered for a short course, and you are not an EPS QED member, then we invite you to become a member for 2007 without any charge, including admission to the reception, but please confirm your participation by e-mailing your name and affiliation to abascal@kth.se before 13 June 2007.

Evening event with get-together
Monday 18 June, Room 1, 18:00 -20:00
John R. Ambroseo, CEO, Coherent Inc., will give a keynote speech.

All exhibitors and attendees of the World of Photonics Congress are cordially invited to attend the opening event with ensuing reception to meet colleagues and enjoy refreshments and live music.

Happy hour
Tuesday 19 June, Beer garden outside the ICM, 17:30 - 20:00
All attenders of the congress as well as exhibitors are welcome to enjoy free drinks in the beer garden outside the ICM.

Conference Reception
Wednesday 20 June, Downtown Munich, 19:00 - 23:00
The delegates registered with the CLEO®/Europe-IQEC 2007 are invited to the conference reception, which will be held in at the famous Löwenbräukeller.
By train: The ICM is about 20 minutes from Munich central station (Hauptbahnhof) by underground U2, exit "Messestadt West". From the airport: At Munich airport, the station for urban railway lines S1 and S8 is directly below the central area. Trains in the direction of the city centre run at 10-minute intervals. There are two routes from the airport to the ICM: Route S1 / U2: S1 from the airport to Feldmoching station or Munich Central Station (Hauptbahnhof). Change to underground U2 which takes you directly to the ICM - Messestadt West. Route S8 / U2: S8 from the airport to Munich central station (Hauptbahnhof). Change to underground U2 which takes you directly to the ICM - Messestadt West.

By taxi from the airport: Taxis are available in front of the terminals. The journey takes about 35 minutes, depending on the volume of traffic (cost around 50 EUR).

By hire car from the airport: All the major car rental firms are represented at Munich airport. The car rental centre with its own parking facilities is in front of module A, to the north of car park P6. Please take the following route: From Munich Airport follow the signs "Messe/ICM" on the A92 in the direction of Munich to the motorway intersection Eching/Neufahrn. Then take the A9 in the direction of Munich to the motorway intersection München-Nord. Continue on the motorway ring road A99 in the direction of Salzburg to the motorway intersection München-Ost. Then take the A94 in the direction of Munich to the exit Feldkirchen-West or München-Riem. The journey takes about 35 minutes, depending on the volume of traffic.

How to take a taxi from the ICM Centre to the airport You will find taxi ranks at all trade fair entrances and in front of the ICM going to the airport (Central Building).

Airport shuttle (organised in connection with the trade fair, cost € 7 one way):
Airport shuttle June 17, 2007 From: airport (central building) To: Trade Fair Centre (West Entrance). Every full hour from 8.00 a.m. through 12.00 p.m.
Airport shuttle June 18-21, 2007 From: airport (central building) To: Trade Fair Centre (West Entrance). Every 30 minutes from 8.00 a.m. through 6.00 p.m. From: Trade Fair Centre (West Entrance) To: airport (central building). Every 30 minutes from 9.30 a.m. through 7.00 p.m.
Technical Digest

The full registration fee for CLEO®/Europe-IQEC 2007 includes one technical digest in CD-format, provided this is ordered in advance. If not the case, then the organisers cannot guarantee to provide a digest. All the accepted papers of both conferences will be included in the digest. Additional copies of the digest may be ordered or bought at the meeting, using the appropriate section of the registration form, at a cost of Euro 50 per digest.

Conference Registration

For your own convenience, pre-registration is strongly encouraged to save time collecting your conference material. To pre-register you can proceed on-line via www.cleoeurope.org or return the enclosed registration form.

The registration fee for the meeting includes admission to all CLEO®/Europe-IQEC 2007 technical sessions, as well as to those of all conferences collocated with Laser 2007. It includes admission to the conference reception and the technical exhibition. One copy of the technical digest in CD-format is included for full fee payment. Coffee breaks are included.

Conference registration fees are available for those wishing to attend one particular session rather than the whole conference. Please note that the digest is not included in the one-day fees.

In connection with the fair, a transportation ticket for the Munich transportation network (MVV) will be handed out at the registration counters. Its validity corresponds to the duration of the trade fair: This means that it works from Monday to Thursday. On all other days, the participants have to get regular tickets. With this ticket, one can travel on the S-Bahn, U-Bahn (metro), Bus and Tram all around Munich during the fair duration. The ticket needs to be stamped each day.

Registration hours and location

Registration for technical sessions will take place at the ICM Centre. To enter the ICM Centre please take the main Entrance West (named “Haupteingang WEST”).

Sunday 17 June 12:00-16:00
Monday 18 June 08:00-17:00
Tuesday 19 June 08:00-17:00
Wednesday 20 June 08:00-17:00
Thursday 21 June 08:00-17:00
Friday 22 June 08:00-09:00

Conference hours

Sunday 17 June 14:30-18:00
(Short Courses only at LMU University)

Monday 18 June 09:00-17:30
Tuesday 19 June 08:30-18:00
Wednesday 20 June 08:30-18:00
Thursday 21 June 08:30-19:30
Friday 22 June 08:30-12:00

Payment

Conference payment can be initiated by one of the methods detailed below:

1. Cheque, bank draft, postal order in euros payable to: European Physical Society
2. Bank transfer- payment in euros only payable to:
   
   **Bank name**: B.N.P PARIBAS Alsace Franche Comté
   **Address**: 2 rue de Berne F - 67300 Schlittingheim, France
   **Bank code**: 30004
   **Office code**: 00440
   **Account N°**: 000 100 58 374
   **Key**: 76
   **IBAN**: FR 76 3004 4000 0100 5837 476
   **SWIFT/BIC**: BNPAFPCCST

   Account holder: European Physical Society

   Details of payment: Write the name of the participant and CLEO07

   If paying by bank transfer, please note that all bank fees are payable by the applicant. In all cases please quote the name of the participant and the reference CLEO. A copy of the instruction to the bank should be enclosed with the conference registration form.

3. By Visa/MasterCard credit card:
   
   Please complete the appropriate section of the conference registration form. (NB - American Express and Diners Club cannot be accepted).

   Registration forms received without payment, or information as to how payment is to be made, will not be accepted.

   Cancellation

   An administration charge of 46 Euros will be made for processing refunds. A request for cancellation must be made in writing. In the case of cancellation, requests received on or before Wednesday, 30 May 2007 will be refunded (less the administration charge). No refunds will be made if notice of cancellation is received after 30 May 2007.

   Passport and Visa Requirements

   Foreign visitors entering Germany must be in possession of a valid ID or passport. Delegates from countries requiring visas should apply to the German consular offices or diplomatic missions in their home countries. Participants requiring a letter of invitation to include with their visa application should contact the European Physical Society.

   Supports

   Young Physicist Fund and East West Task Fund: The deadline is over. All grants were distributed. No additional requests can be received.

   Student helpers

   Student helpers are needed to work as general helpers. In compensation their registration fees will be waived. They must be full time undergraduate or graduate students. Applications should be sent by email to eps.conf@uha.fr

   On site facilities for attendees

   **Web-database**

   The programme of the whole World of Photonics Congress is available in the internet at www.photonics-congress.com/program. The database offers versatile search functions and supports the composition of each individualized congress schedule that you can transmit to your PDA. The database provides information about all lectures and posters of a specific topic as well as the information about exhibitors at the show related to your inquiry.

   **EPoستر terminal**

   Due to the high number of posters shown, the physical poster topics change every day. But all posters are available electronically on the ePoster terminals in the internet area - where they can be printed as well.

   **W-LAN lounge and internet access**

   All attendees of the congress have free access to the internet in the internet area on the ground floor of the ICM Centre or with their own laptop in the W-LAN lounge on the 1st floor. The access times for the W-LAN lounge are from 08:00 to 18:00.

   The ICM centre is designed for flexible use. It offers first-class services such as:

   **International business-centre**

   Open from Monday to Thursday from 08:00 to 17:00 hour and on Friday from 08:00 to 16:00 hour, closed Saturday and Sunday. PC work stations, access to internet, internet connection for notebook, internet connection via wireless-LAN, fax, photocopiers, office services, briefing room, interpreting services. All these services are at cost.

   **Bank**

   No bank-counter but an ATM-machine to withdraw money; Banks are to be found in the centre of Munich or at the main railway station.

   **Public telephones**

   Two types are placed working either with coins or phone cards.

   **Catering**

   • All conference attendees are invited to attend free coffee breaks.
   • Between the coffee breaks a number of gastronomy facilities are available.
   • Depending on the weather the beer garden outside will be open.
   • Two self-service restaurants located on the first floor offer first-class international cuisine. Am See restaurant is the closest to the session rooms. Am Turm restaurant is located between Halls A3 and A4.
   • Other self-service restaurants located on the first floor can also be found in the exhibition halls offering international cuisine (Food Gardens between Halls A1 and A2), Bavarian cuisine (Valentins, between Halls B2 and B3) Asian cuisine (Asia Garden, between Halls B4 and B5), Italian cuisine (Paganini, between Halls A5 and A6).
   • Many snack bars located in the exhibition halls offer Alpine, American, Asian, Italian cuisine.
   • Four coffee shops can be found. The closest to the ICM centre is the West Side. Exact locations can be found at www.messemuechen.de (go to Visitor Services).
Munich, Germany
The celebrated capital of Bavaria is one of the major cities in Europe. The 1.3 million inhabitants city is famous for its science and industry environment, in particular in optics. Its historical monuments and cultural landmarks, including many fine arts museums, as well as its beer festival in October, are world famous. Tourist attractions include the Bavarian beer and South German cuisine tradition, and many half-day or one-day excursion opportunities to the nearby Bavarian Alps and geographical and historical landmarks of Southern Bavaria. At the end of June the weather is likely to be warm and the sun is likely to shine, although rain is not impossible. Munich enjoys an outstanding public transportation system, and the modern Münchner Messe complex where CLEO®/Europe-IQEC 2007 and all Laser 2007 events will be held is easy to reach from the airport, from the city centre and from most parts of the city by easy U-Bahn and S-Bahn lines. Shuttle bus service to the Munich airport will be available as well during most of the Laser 2007 week.

Munich’s churches: Munich is well-known for its many churches, among them:
> Frauenkirche (Church of our Lady), 1 Frauenplatz, Munich

Opening hours: 07:00-19:00, Thu 07:00-20:30, Fri 07:00-18:00 (no visits during the church services).
Getting there: all S-Bahn train, U-Bahn lines 3/6 to Marienplatz

> Heiliggeistkirche,
Tel. 77, 80331 Munich, Tel. 089/22 44 02
Opening hours: 7:00-18.00 (Midday from 12.00-15.00 and no visits during the church services)
Getting there: U-Bahn lines 3/6 to Marienplatz

Munich’s Museums:
Many museums can also be visited, among them:
> Glyptothek
Königplatz 3, 80333 München, Tel. 089/28 61 00
Opening hours: Tue, Wed, Fr-Su 10.00-17.00, Thu 10.00-20.00, Mo closed
Getting there: U-Bahn line 2 to Königsplatz

> Antikensammlung
Königplatz 1, 80333 München, Tel. 089/59 83 59
Opening hours: Tue and Thu-Su 10.00-17.00, Wed 10.00-20.00, Mo closed
Getting there: U-Bahn line 2 to Königsplatz

> Deutsches Museum Flugwerft Schleissheim
Effnerstr. 18, 85764 Oberschleißheim, Tel.089/3157140
Opening hours: daily 9.00-17.00
Getting there: S-Bahn line 1 to Oberschleißheim, Bus 292

> Deutsches Museum
Museumsinsel 1, 80538 München, Tel: 089 / 2179-0 oder 2179 433 (recorded information)

Opening hours: daily 9.00-17.00
Getting there: all S-Bahn trains, to Isartor; Tram 18, to Museuminsel

> Alter Peter,
1 Rindermarkt, Munich
Opening hours: daily 07:30-19:00, Wed 12:00-17:00 (no visits during the church services).
Opening hours of the tower: Mon-Sat 09:00-18:00, Sun and holidays 10:00-18:00 (depending on the weather).
Getting there: all S-Bahn trains, U-Bahn lines 3/6, Bus 52 to Marienplatz

General Information

- First aid service (paramedical service, emergency treatment) is found next to Hall B0.
- Post office, groceries with bakery, cloakroom, and travel service… are located in the Main Hall of the Entrance West leading to Halls A1 and B1.

Message board
A message board will be installed. Participants should consult it daily for internal messages. It will be placed at the entrance of the ICM.

Information desk
An information desk will be installed near the entrance of the ICM.

Press services
All members of the Press are requested to register. They will receive the conference material and badges that will admit them to all technical sessions and the exhibition.

Hotel information
Considering the large number of attendants to the exhibition, running in conjunction with the conference, we recommend to make your hotel reservation as soon as possible.
Messe Munich has arranged for an on-line hotel reservation which can also be used for the CLEO®/Europe-IQEC 2007 participants at:
www.messe-muenchen.de
Hotels can be directly booked via the Hotel Directory or Maritz, direct partner of Messe Munich for hotel reservations. Maritz direct on-line reservation with full description of hotels, including prices is published under the following URL address: www.smart-fairs.de
Hotels, pensions, apartments or youth hostels in Munich can also be found at:
www.munich-info.de/hotels/welcome_en.html
A complete list of affordable housing in Munich is to be found on the conference website www.cleoeurope.org.
Hotels, pensions, apartments or youth hostels in Munich can also be found at:
www.munich-info.de/hotels/welcome_en.html
Munich also offers the possibility to rent private rooms: www.zimmerundmehr.de
Economically priced hotels and private rooms; with recommendations from various travel guides are to be found at (only German version available): www.net4.com/muenchen-hotels
Hotels in the surrounding of Munich can be found at (only German version available): www.hotels-muenchen-umland.de

Munich’s Museums:
Many museums can also be visited, among them:
> Glyptothek
Königplatz 3, 80333 München, Tel. 089/28 61 00
Opening hours: Tue, Wed, Fr-Su 10.00-17.00, Thu 10.00-20.00, Mo closed
Getting there: U-Bahn line 2 to Königsplatz

> Antikensammlung
Königplatz 1, 80333 München, Tel. 089/59 83 59
Opening hours: Tue and Thu-Su 10.00-17.00, Wed 10.00-20.00, Mo closed
Getting there: U-Bahn line 2 to Königsplatz

> Deutsches Museum Flugwerft Schleissheim
Effnerstr. 18, 85764 Oberschleißheim, Tel.089/3157140
Opening hours: daily 9.00-17.00
Getting there: S-Bahn line 1 to Oberschleißheim, Bus 292

> Deutsches Museum
Museumsinsel 1, 80538 München, Tel: 089 / 2179-0 oder 2179 433 (recorded information)

Opening hours: daily 9.00-17.00
Getting there: all S-Bahn trains, to Isartor; Tram 18, to Museuminsel

> Alter Peter,
1 Rindermarkt, Munich
Opening hours: daily 07:30-19:00, Wed 12:00-17:00 (no visits during the church services).
Opening hours of the tower: Mon-Sat 09:00-18:00, Sun and holidays 10:00-18:00 (depending on the weather).
Getting there: all S-Bahn trains, U-Bahn lines 3/6, Bus 52 to Marienplatz
Conference Management

Conference management is provided by the European Physical Society, 6 rue des Frères Lumière, BP 2136, 68060 Mulhouse Cedex, France

Language

English will be the official language of the conferences.

Münchens famous places to be visited:

>Marienplatz
Named according to the column of the Virgin Mary at its centre, the square is famed for its neo-Gothic Town Hall, whose mechanical clock, or Glockenspiel, plays every day at 11.00, 12.00 and 17.00. The Marienplatz is a central place for the city’s Founding Festival as well as for Fasching (carnival) celebrations and the popular Christmas market. The major restaurants, cafes and shops are located in this area. Shops are completely closed on Sunday. The place is famous for its carillon in the New Town Hall Tower (Glockenspiel im Rathausturm). This is the largest carillon in Germany, with near-lifesize figures performing the traditional Coopers’ Dance and a jousting match. Three times a day at 11.00, 12.00 and 17.00.

> Konigsplatz
Commissioned by Ludwig I, this neo-Classical square boasts the Propyläen gateway and the Glyptothek, a small but enchanting collection of Greek and Roman sculpture. Also the sight of an annual summer outdoor concert series.

> Isartor (Isar Gate)
Most easterly of Munich’s three remaining town gates, dating from the 14th century. Careful restoration has recreated the dimensions and appearance of the original structure. The Isar Gate accommodates the Valentin Museum.

>Karlstor (Charles’ Gate)
Westerly town gate from 14th century. Incorporated at the end of the 18th century into the square known as “Stachus” (officially Karlsplatz). Today it marks one end of Munich’s primary pedestrian zone.

Sendlinger Tor (Sendlinger Gate)
Remaining towers of southerly fortifications from the 14th century.

> Beer Gardens
Nothing defines Munich more than its beer. You cannot talk about one without the other and you could never fully discover Munich without at least sampling its brews. Today the Munich breweries dispense 123 million gallons of beer annually. That is why many beer gardens are located in Munich:

> Augustiner-Großgaststätte
Pedestrian Zone, Neuhauser Straße 16, 80331 Munich, Tel. 089/2 60 41 06. The Augustiner Großgaststätte is one of the more traditional Munich establishments, with a history that reaches back to 1328. The Augustin Brothers began brewing something heavenly in Augustiner’s back rooms up until 1855 when the actual brewing plant was moved to Landsberger Straße. Today Augustiner Großgaststätte is a traditional beer hall with a small courtyard beer garden, smack dab in the middle of Munich’s Marienplatz pedestrian zone. The food is great and the beer is the best.

> Altes Hackerhaus
Sendlinger Str. 14, Munich, Tel. 089/2605026, www.hackerhaus.de
Opening hours: 9 am to midnight daily.
Located in Munich’s newspaper publishing district and near Sendlinger Tor, Altes Hackerhaus has a long history involving two of the City’s most renowned beer producing families, the Hackers and the Pschorrs. An entire wall in the restaurant is dedicated to the family tree, dating back to 1738 when the first Hackerhaus was founded. Highlights include a small butcomfortable interior courtyard beer garden, and an outstanding restaurant serving excellent Bavarian fare. Although average by Munich high standards, Altes Hackerhaus benefits from its proximity to the Marienplatz (just a few blocks away) and easy access from the nearby U-Bahn stop at Sendlinger Tor.

> Chinesischer Turm (Chinese Tower)
One of Munich’s largest beer gardens, and perhaps its most famous. With more than 7,000 seats around the famous eratz Chinese pagoda in the middle of Englischer Garten (900-acre park with shaded paths, brooks, ponds and swans), this place could hardly be overlooked. Location: Englischer Garten 3, open from 11.00 to midnight.

Munich is very famous for its theatres but also for its Olympic Park (www.olympiapark.de/index.html) located Spiridon-Louis-Ring 21, 80809 Munich, Tel: 089/30 67 - 0, Fax: 089/30 67 - 22 22
Getting there: U-Bahn line 3 to Olympiazentrum

Further information on Munich is available at www.muenchen-tourist.de/englisch/index_e.htm
Short courses

CLEO®/Europe-IQEC 2007 will present two short courses held in parallel. These courses will take place on Sunday afternoon 17 June 2007 at the Ludwig Maximilians University of Munich. The courses will be at an extra cost: € 150 for students, € 270 for others.

Advance registration is recommended in order to obtain the short course material. This material will not be available for purchase during the conference.

The courses are intended for engineers, scientists and graduate students with some general knowledge of optics and photonics who wish to improve their detailed understanding of the particular technical domains covered. Each course is scheduled in two parts: Course Part I (90 minutes), coffee break, Course Part II (90 minutes).

Detailed Programme:

SCHEDULE: SUNDAY, 14:30 - 18:00
Location: Ludwig Maximilians Universität München, Department für Physik, Lehrstuhl für Bio-Molekulare Optik, Oettingenstraße 67, Munich

Short Course 1:
Practical Optical Parametric Oscillators

Majid Ebrahim-Zadeh, IFCO, Barcelona, Spain

Course Description:
This course provides an overview of optical parametric oscillator (OPO) device technology from basic operation principles to advanced architectures. The course will begin with a description of the fundamental concepts in nonlinear frequency conversion, followed by a discussion of the critical design issues for OPO devices - and then a review of the current status of OPO technology. The discussion will encompass OPO systems operating in all time-scales, from the continuous-wave (cw) to the ultra-fast femtosecond regime.

Specifically, the course participants will gain knowledge of the basic principles of parametric generation and amplification; OPO design issues, including material and pump laser selection criteria; birefringent and quasi-phase-matched materials and devices; OPO threshold conditions, resonator design, focusing and tuning behavior; OPO resonance configurations, including singly- and multi-resonant oscillators; externally and internally pumped devices; stability requirements; amplitude and frequency control; pulsed OPOs, including compact all-solid-state oscillators, high- and low-energy devices, line-width control, and material damage issues; picosecond OPOs, including high-repetition-rate cw and pulsed mode-locked OPOs; all-solid-state, Nd-based, and Ti:sapphire-pumped systems; visible to mid-infrared pulse generation; quasi-phase-matched devices; femtosecond OPOs, including Ti:sapphire-pumped oscillators, noncritical, noncollinear, and compact semi-monolithic devices, quasi-phase-matched and mid-infrared OPOs, spectral and temporal control; commercial developments in OPO devices from the cw to femtosecond operating regime; and the generation of THz radiation using OPOs.

Benefits and Learning Objectives:
- Understand the basic principles of optical parametric generation and amplification of light
- Learn the operating principles of optical parametric devices, in particular optical parametric oscillators (OPOs)
- Obtain a detailed understanding of nonlinear gain, phase-matching, threshold conditions, resonator design, tuning, spectral and temporal behavior
- Identify the critical issues, particularly material and laser pump source selection, in the design of optical parametric devices
- Acquire the practical skills and apply the necessary procedures in the construction of OPO devices
- Learn the necessary techniques for spatial, spectral, and temporal control of OPO devices
- Gain a perspective of the current technology in OPO devices and the important recent developments in the field

Intended Audience:
This course is intended for researchers with little or no background in OPOs, as well as those more familiar with the subject area who wish to enhance their skills for updating and their knowledge of the emerging developments in OPO device technology. The course will benefit graduate students and other industrial and academic researchers already involved or in early stages in OPO development.

Biography:
Majid Ebrahim-Zadeh is an Institucio Catalana de Recerca i Estudis Avançats (ICREA) Professor at the Institute of Photonic Sciences (ICFO), Barcelona, Spain. His research in experimental nonlinear optics extends over 20 years and he has contributed to the advancement of OPO devices from the UV to mid-IR and in all temporal regimes from the continuous-wave to ultrafast femtosecond time-scales.

Professor Ebrahim-Zadeh has served on the technical program committees of several international conferences including sub-committee chair and technical program committees of CLEO/USA, CLEO/Europe, SPIE/Photonics West, and Nonlinear Guided Waves. He serves on the international Joint Council on Quantum Electronics (IQEC) and the International Conferences on Materials and Technologies (CIMTEC). He has served as advisory editor of Optics Letters, guest editor of J. Opt. Soc. Am. B, and is currently a topical editor of Optics Letters. His awards and honours include a Royal Society of London University Research Fellowship, the Royal Society of London Merit Award, and Innova Prize for commercial enterprise. He is a Fellow of the Optical Society of America.

Short Course 2:
Micro- and Nano-Machined Optics

Ernst-Bernhard Kley, Friedrich-Schiller-University of Jena, Germany

Course Description:
Miniaturization and microstructures are keywords in the modern technical world. Optical components and systems are affected by this trend, too, which means that miniaturized optical lenses, prisms, gratings, and even artificial materials based on sub-wavelength structures have to be fabricated for a lot of applications. As a consequence, micro- and nanolithography is challenged to realize complex optical elements, as well as artificial materials, both on the base of 2-D and 3-D microstructures. In order to fabricate such optical elements and materials, special demands on lithography or micro- and nano-machining arise from the wave nature of light. This refers to linearity as well as to special 2-D and 3-D fabrication techniques.

This course gives an introduction to micro- and nano-optics, will show the vision and give an overview of the relevant lithographic fabrication technologies. Specific problems and limitations of the technologies will be described as well. Keywords are: continuous profiles, multilevel profiles, binary patterns, high aspect ratio patterns, photo- and e-beam lithography, laser writing, analogue lithography (gray tone, half tone), dry etching, proportional etching, and replication.

Benefits and Learning Objectives:
- Understand the motivation for the application of micro- and nano-optics
- Understand the physical background of microstructured optics
- Select the suitable kind of element for the application
- Select the suitable technology for the element origin/fabrication
- Recognize typical fabrication problems and limitations
- Recognize the possibilities and potential of microstructured optics

Course Level:
Advanced Beginner (basic understanding of the topic is necessary to follow course material).

Category:
Photonics Basics.

Intended Audience:
This course is intended for beginners and users in the field of micro- and nanostructured optics, beginners in fabrication technologies, and people interested in micro-structured optics.

Biography:
Ernst-Bernhard Kley received his diploma in physics from the Friedrich-Schiller University in Jena, Germany. After a 3-year stay in the industry, he returned to Friedrich-Schiller University and received his Ph.D. Currently he is the head of the microlithography/ micro-optics group. His field of research is micro- and nano-lithography for various applications like micro-optics, integrated optics and cryoelectronics. The main part of his work is focused on electron- and photo-lithography and dry etching for optics.
Tech-focus sessions
An attractive feature of the CLEO®/Europe-IQEC technical programmes are special Tech-Focus Sessions that concentrate on selected Photonics Application topics. These feature a combination of Extended Tutorial/Short Course introductory material and authoritative technical reviews.

CLEO®/Europe-IQEC 2007 paid registrants are invited to attend the Tech-Focus Sessions at no additional charge. Those wishing to attend the Tech-Focus who are NOT FULL FEE registrants of the conference must pay the one day fee.

In 2007, there will be one half-day Tech-Focus session consisting of 6 invited presentations on Industrial applications of ultrafast technology by leading experts, as follows:

**SCHEDULE:** TUESDAY, 14:30-16:00 and 16:30-18:00
**Location:** ROOM B11

**14:30 – 16:00**
**TF1 Session:** Industrial applications of ultrafast technology – I

**Chair:** Wilson Sibbett, University of St. Andrews, UK

**TF1-1-TUE 14:30**
**Industrial perspectives on ultrafast fiber lasers**
A. Tünnermann, Fraunhofer-Institutefor AppliedOptics and Precision Engineering, Jena, Germany; J. Limpert, S. Nolte, Friedrich-Schiller-University, Jena, Germany

We will review the achievements of high average power and high energy ultrafast ytterbium-doped fiber laser systems and their potential to revolutionize the high precision production technology.

**TF1-2-TUE 15:00**
**Ultrafast lasers for nanomaterial growth and processing**
S. Mao, University of California, Berkeley, USA

Recent progress of ultrafast laser-based nanoscale material growth and processing will be discussed, along with selected emerging applications of laser-produced nanomaterials in the development of renewable energy technologies.

**TF1-3-TUE 15:30**
**Next generation ultrafast telecommunications technologies**
M. Nakazawa, Tohoku University, Sendai, Japan

Recent progress on ultrafast transmission technology, including a differential phase technique, is reviewed. Then, we describe a new scheme for 160 Gbit/s distortion-free high speed transmission which employs time-domain optical Fourier transformation and TL pulses.

**16:30 – 18:00**
**TF2 Session: Industrial applications of ultrafast technology – II**

**Chair:** Wilson Sibbett, University of St. Andrews, UK

**TF2-1-TUE 16:30**
**Spectral coherence interferometry (SCI) for fast and rugged industrial applications**
A. Knüttel, F. Rammrath, ISIS Sentriconics GmbH, Mannheim, Germany

ISIS sentriconics has introduced Spectral Coherence Interferometry (SCI) as powerful 3D metrology tool for use in industrial production. Inner diameters from 1 mm up to 30 mm can be evaluated with the sensor generation RayDex.

**TF2-2-TUE 17:00**
**All-optical THz oscilloscope**
A. Bartels, Gigaoptics GmbH, Konstanz, Germany

An all-optical oscilloscope based on high-speed asynchronous optical sampling (ASOPS) is presented. It acquires ultrafast optical signals of 1ns duration with 160fs resolution at a 10kHz scan rate. THz spectroscopy and picosecond ultrasound based thin-film characterization are discussed as applications.

**TF2-3-TUE 17:30**
**Laser micromachining workstations**
P. Chabassier, NOVALASE, Canejan, France

Ultra fast laser micro machining is becoming a very powerful process to get high precision work in many difficult conditions and materials. We will present some important design rules for industrial laser workstation in this field.

**Plenaries**

The CLEO®/Europe-IQEC 2007 programme includes 3 plenary sessions.

**Plenary session 1**
**MONDAY, 09:30 – 10:30, Room 1**
**Plenary chair:** Ursula Keller, ETH, Zürich, Switzerland

**The first plenary session will take place immediately after the Official Opening of the World of Photonics Congress 2007 scheduled Monday 18 June 2007, beginning at 09:30, Room 1. The Congress will be open at 09:00 by Mr. R. Strohmeier, Head of Cabinet for European Commissioner Viviane Reding.**

**PL1-1-MON**
**The Exawatt laser: from relativistic to ultra relativistic optics**

**Gérard Mourou,**
**ENSTA, Laboratoire d’Optique Appliquée, Palaiseau, France**

We will describe the European Extreme Light Infrastructure project (ELI) dedicated to the fundamental study of laser-matter interaction in a new and unpassasured regime of laser intensity: the ultra-relativistic regime. These investigations will rely on the development of an exawatt-class laser – 100-1000 times more powerful than either the Laser Mégajoule in France or the National Ignition Facility (NIF) in the US. In contrast to these other projects, ELI will attain its extreme power from the shortness of its pulses (femtosecond and attosecond). The infrastructure will serve to investigate a new generation of compact accelerators delivering energetic particle and radiation beams of femtosecond (10^-15 s) to attosecond (10^-18 s) duration. Relativistic compression offers the potential of intensities exceeding 10^20 W/cm^2, which will challenge the vacuum critical field, as well as provide a new avenue to ultrafast attosecond to zeptosecond (10^-21 s) studies of laser-matter interaction. ELI will afford wide benefits to society ranging from improvement of oncology treatment, medical imaging, fast electronics and our understanding of aging nuclear reactor materials - to development of new methods for the processing of nuclear waste.

**Biography:**
Gérard Mourou is the Director of the Laboratoire d’Optique Appliquée at ENSTA/Ecole Polytechnique/ CNRS and Professor at the Ecole Polytechnique.
He has pioneered a number of disciplines in the field of ultrafast lasers and applications, with his most important contribution being the invention of the technique known as Chirped Pulse Amplification (CPA). CPA is used on all Intense and Ultra-Intense lasers today. It has revolutionized laser-matter interaction and extended the field of classical optics to Relativistic Plasma Physics, Nuclear Physics, High Energy Physics, Astrophysics, Cosmology and Non-linear QED.

He received many awards, mainly in the field of Ultra high intensity laser including:
• Recipient of the 2005 Lamb Medal at the Physics of Quantum Electronics Conference
• Recipient of the 2004 Quantum Electronics Award from IEEE-LEOS
• Recipient of the 1999 D. Sarnoff Award from IEEE,
• Recipient of the 1997 H. Edgerton Award from the SPIE,
• Recipient of the 1995 R. W. Wood Prize.

He is a fellow of the Optical Society of America, a fellow of the IEEE, a member of the American Physical Society - and a member of the National Academy of Engineering (USA).

**Plenary session 2**
**TUESDAY, 10:30 – 12:30, ROOM 1**
**Plenary chair:** Ennio Arimondo, University of Pisa, Italy

The second plenary will begin at 10:30 and will be directly followed with the EPS, QED and OSA Awards and the Julius Springer Prize Ceremony

**PL2-1-TUE**
**A passion for precision**

**Theodor W. Hänisch,**
**Max-Planck-Institute for Quantum Optics, Garching, Germany**

For more than three decades, the quest for ever higher precision in laser spectroscopy of the simple hydrogen atom has inspired many advances in laser, optical, and spectroscopic techniques, culminating in femtosecond laser optical frequency combs as perhaps the most precise measuring tools known to man. Applications range from optical atomic clocks and tests of QED and relativity to searches for time variations of fundamental constants. Recent experi-
ments are extending frequency comb techniques into the extreme ultraviolet. Laser frequency combs can also control the electric field of ultrashort light pulses, creating powerful new tools for the emerging field of attosecond science.

Biography:
Professor Theodor W. Hänsch is a Director at the Max-Planck-Institute of Quantum Optics in Garching and Carl Friedrich von Siemens Professor at the Department of Physics of Ludwig-Maximilians-University in Munich, Germany. He was born in Heidelberg, Germany, where he received his doctorate in laser physics in 1969. In 1970, he joined Arthur L. Schawlow at Stanford University as a postdoc. Two years later, he accepted a faculty appointment at the Stanford Physics Department, where he worked as a Full Professor from 1975 until he returned to his native Germany in 1986. In 1974, Hänsch and Schawlow made a seminal proposal for laser cooling of atomic gases. 25 years later, Hänsch and his Munich team were the first to realize Bose-Einstein condensation on a microfabricated atom chip. In 2005, Theodor W. Hänsch shared half of the Physics Nobel Prize with John L. Hall for their contributions to the development of laser-based precision spectroscopy, including the optical frequency comb technique.

Plenary session 3 - Walther Memorial Plenary
Thursday, 13:30 – 14:30, Room 1
Plenary chair: Ferenc Krausz, Max-Planck Institute of Quantum Optics, Garching, Germany

Herbert Walther
(1935 –† 2006)

Professor Herbert Walther died on Saturday, the 22nd of July 2006 in Garching, Germany. Professor Walther was an internationally-renowned scientist and teacher, and for 10 years he chaired the World of Photonics Congress Steering Committee. This third plenary session will be dedicated to his memory and will consist of a number of invited presentations on topics spanning the wide range of his technical interests.

Ferenc Krausz will introduce the memorial session.

Biography:
Ferenc Krausz was awarded his M.S. in Electrical Engineering at Budapest University of Technology in 1985, his Ph.D. in Quantum Electronics at Vienna University of Technology in 1991, and his "Habilita-

tion" degree in the same field at the same university in 1993. He joined the Department of Electrical Engineering as Associate Professor in 1998 and became Full Professor in the same department in 1999. In 2003 he was appointed as Director of Max Planck Institute of Quantum Optics in Garching, Germany – as successor of Professor Herbert Walther – and since October 2004 he has also been Professor of Physics and Chair of Experimental Physics at Ludwig Maximilian's University of Munich. His research has included nonlinear light-matter interactions, ultrashort light pulse generation from the infrared to the X-ray spectral range, and studies of ultrafast microscopic processes. By using chirped multilayer mirrors, his group made intense light pulses comprising merely a few wave cycles available for a wide range of applications and utilized them for pushing the frontiers of ultrafast science into the attosecond regime. His most recent research focuses on attosecond physics: the control and real-time observation of the atomic-scale motion of electrons. He co-founded Femtolasers GmbH, a Vienna-based company specializing in cutting-edge femtosecond laser sources.

PL3-1-THU
Moderator and short introduction
13:30-13:40
Ferenc Krausz,
Max-Planck Institute of Quantum Optics, Garching, Germany

PL3-2-THU
Herbert Walther, distinguished scientist and remarkable teacher
13:40-14:05
Herbert Walther, distinguished scientist and remarkable teacher

PL3-3-THU
Quantum entanglement: a vanishing resource
14:05-14:30
Joseph Eberly,
University of Rochester, USA

Professor Shenzle will discuss Professor Walther's career as a renowned scientist and educator.

Tutorial talks
The CLEO®/Europe – IQEC 2007 programme includes 4 tutorial talks

Monday, 10:45 – 11:45, Room 14B

CK1-1-MON
Negative index materials
Costas M. Soukoulis,
Iowa State University, Ames, USA

The possibility of negative refraction has brought about a reconsideration of many fundamental optical and electromagnetic phenomena. This new degree of freedom has provided a tremendous stimulus for the physics, optics and engineering communities to investigate how these new ideas can be utilized. Many interesting and potentially important effects not possible in positive refracting materials, such as near-field focusing and subdiffraction limited imaging, have been predicted to occur when the refractive index changes sign. In this talk, I will give a historical appraisal of the field and also review our own work on negative refraction in metamaterials, and describe the possible impact of them as new types of optical elements. In particular, I will present theoretical and experimental results on engineered microstructures designed to have both epsilon and mu negative. Results for different polarizations and propagation directions will be presented. Recent results on microstructures operating at 100-200 THz will be discussed – and the role of losses will also be examined.

Most of the negative index materials (NIMs) sample implementations to date have utilized the topology proposed by Pendry, consisting of split ring resonators (SRRs) and continuous wires. Many groups have been able to fabrication NIMs with an index of refraction n = -1 – and with losses of less than 1dB/cm [1]. Recently different groups observed indirectly negative mu at the THz region. In most of the THz experiments, only one layer of SRRs was fabricated on a substrate and the transmission, T, was measured only for propagation perpendicular to the plane of the SRRs, exploiting the coupling of the electric field to the magnetic resonance of the SRR via asymmetry. This way it is not possible to drive the magnetic permeability negative. Also, no
negative n with small imaginary part has yet been observed in the THz region. One reason is that it is very difficult to measure with the existing topology of SRRs and continuous wires both the transmission, T, and reflection, R, along the direction parallel to the plane of the SRRs. So there is a need for alternative, improved and simplified designs that can be easily fabricated and characterized experimentally, especially in the infrared and optical regions of the spectrum. Such designs are offered by pairs of finite length wires (short-wire-pairs) and the fish-net structure, which will be discussed below.

A short-wire-pair can behave like an SRR, exhibiting a magnetic resonance followed by a negative permeability regime. Moreover, short-wire-pairs can give simultaneously a negative epsilon in the same frequency range, and therefore a negative n, without the need for additional continuous wires. Recent experiments have however not shown evidence of negative n at THz frequencies in the short wires-pair cases that were studied. This is in contrast with some claims that one can get negative n at THz frequencies. The negative n obtained at THz frequencies is most probably due to the large imaginary parts of epsilon and mu. Very recent work [1,2] introduced new designs of short-wire-pair based metallic structures to obtain negative index of refraction in the microwaves regime. In addition, the fish-net structure was used and demonstrated [2] negatively refracting at 1.5 microns with low losses. The basic structure of a single unit cell of this NIM was build from H-shaped wires or fish-net structures.

Work supported by US-DOE, DARPA, MURI and EU (PHOREMOST, and METAMORPHOSE projects).

References

Biography:
Costas Soukoulis is a Distinguished Professor of Liberal Arts and Sciences in the Department of Physics and Astronomy at Iowa State University and Senior Physicist at Ames Laboratory.

Research Interests:
Development of theoretical understanding of the properties of disordered systems, with emphasis on electron and photon localization, photonic crystals, random lasers, left-handed materials, random magnetic systems, nonlinear systems, and amorphous semiconductors. The theoretical models developed are often quite sophisticated, in order to accurately reflect the complexity of real materials.

Short Curriculum Vitae:
Costas Soukoulis received his B.S. in Physics from Univ. of Athens in 1974. He obtained his doctoral degree in Physics from the Univ. of Chicago in 1978. From 1978 to 1981 he was visiting Assistant Professor at the Physics Dept. at Univ. of Virginia. He spent 3 years (1981-84) at Exxon Research and Engineering Co and since 1984 has been at Iowa State Univ. (ISU) and Ames Laboratory. He has been an associated member of FORTH since 1983 and since 2001 has been a Professor (part time) at Dept. of Materials Science and Engineering at Univ. of Crete. He has approximately 300 publications, more than 70 invited lectures at national and international conferences, and about 100 invited talks at institutions. More than 9000 citations, an h-factor of 50 and 3 patents for PBGs and LHMIs. Graduated 12 PhD students and co-advised 4 others. Has obtained several grants to support his research from DOE, NSF, DARPA, NATO, EPRl, and European Community. Has been a member or a chairman of various International Scientific Committees responsible for various International Conferences. Prof. Soukoulis is Fellow of the American Physical Society, Optical Society of America, and American Association for the Advancement of Science. He received the ISU Outstanding Achievement in Research in 2001, and the senior Humboldt Research Award in 2002; he shared the Descartes award for collaborative research on left-handed materials in 2005. He is the senior Editor of the new Journal "Photonic Nanostructures: Fundamentals and Applications"

Tuesday, 16:30 – 17:30, Room 14b

CK6-1-TUE
New directions in photonic crystal fibres

Philip Russell,
Max-Planck Research Group, Erlangen, Germany

Photonic crystal fibres are in many ways a success story [1]. Solid core versions have achieved losses that closely approach the best seen in conventional single-mode telecommunications fibre, and have been used in long-haul systems demonstrations in Japan. The lowest loss reported in hollow core PCF, which guides the photonic band gap effect, is 1.1 dB/km at 1550 nm (by NKT Photonics, Lenzing, Austria 2004), and there are good reasons to believe that with further development this could ultimately drop to 0.2 dB/km. The advantages of optical fiber made from just one material – usually pure silica glass – are seen in the –100+ better stability of optical fiber compared to conventional wire against changes in temperature; this is important for example in optical strain sensing and for in-fiber components made by thermal post-processing. The endlessly single-mode (ESM) PCF design permits one to operate at wavelengths shorter than the LP11 cut-off, where conventional single-mode fiber turns multimode; this allows access to unique flattened dispersion landscapes while offering a new way to design ultra-large mode area single-mode fibres with improved bend losses. The ability to control higher order dispersion in ESM-PCF has led to a new generation of entangled photon pair sources using four-wave mixing – by moving the modulational-instability sidebands far away from the pump frequency, Raman-induced noise is averted. The large air-gap index difference allows design of solid-core silica PCFs with small modal areas, offering very high nonlinearity along with the ability to place the dispersion zero at any point between ~500 nm and 1300 nm. These fibers have many applications, the most celebrated being supercontinuum generation. Although the first SC sources used fs Ti:sapphire lasers as pump, an approach that yields superb spectral purity, they have been replaced by Hänisch for ultra-high precision frequency me-
**Biography:**
Philip Russell holds the Alfred Krupp Chair in experimental physics at the University of Erlangen-Nuremberg, and is Director in the Max-Planck Research Group for Optics, Information and Photonics. From 1996 to 2005 he was professor in the Department of Physics at the University of Bath, where he founded and led the Photonics & Photonic Materials Group, which under his leadership became the Centre for Photonics & Photonic Materials in 2005. He obtained his M.A. (1976) and D.Phil. (1979) degrees at the University of Oxford, subsequently working as a Humboldt Fellow in Hamburg, at IBM Yorktown in the USA and at the universities of Nice, Southampton and Kent. Since 1977 he has specialized in the behaviour of light in periodic structures as well as nonlinear optics, waveguides and optical fibres. He was the founder of the start-up company BlazePhotonics Ltd (April 2001 to August 2004), whose aim was the development and commercial exploitation of photonic crystal fibre. He has over 600 publications and is inventor on 37 patents in many aspects of photonics. A Fellow of the Optical Society of America, in 2000 he won his Joseph Fraunhofer Award/Robert M. Burley Prize for the invention of photonic crystal fibre, which he first proposed in 1991. He is the founding chair of the Optical Society of America’s Topical Meeting Series on Bragg Gratings, Photodiscontinuity and Poling in Glass. In 2002 he won the Applied Optics Division Prize of the UK Institute of Physics. In 2004 he received a Royal Society/Wolfson Research Merit Award and in 2005 won the Thomas Young Prize of the Institute of Physics. In May 2005 he was elected Fellow of the Royal Society and in September he received the 2005 Körber Prize for European Science at a ceremony in Hamburg. From 2004 to 2006 he was an IEEE-LEOS Distinguished Lecturer, and he was elected Director-at-Large of the Optical Society of America in 2006.

**WEDNESDAY, 14:30 – 15:30, ROOM B01**

**IB2-1-WED**

**Ultracold atoms in optical lattices**

Immanuel Bloch,
Johannes Gutenberg University, Mainz, Germany

Ultracold atoms in optical lattices are proving to be powerful novel model systems for investigations in condensed matter physics, quantum information processing and atomic and molecular physics. They have begun to serve as versatile quantum simulators with novel and outstanding control possibilities. The underlying lattice geometry, the lattice strength and the interactions between the atoms can be tuned almost freely over a wider parameter range. Such a clean model environment – without lattice defects – can be used as a testbed for the investigation of strongly interacting quantum systems [1,2], which lie at the heart of e.g. High-Tc superconductivity and could possibly make it possible to elucidate many fundamental questions in these highly complex many-body phenomena. Furthermore, ultracold atoms in optical lattices have enabled unique opportunities for quantum information processing, where several massively parallel acting quantum gates can enable the generation of large scale entanglement and offer a unique environment for the realization of “one-way” quantum computers. Recent progress in high resolution addressing of single atoms on single lattice sites, is encouraging for the realization of such systems in the near future.

Optical lattices also offer the possibility to perform controlled "chemical reactions" at the quantum limit, between two or more particles stored on different lattice sites on several thousands of lattice sites in parallel. They thus form a novel micro-laboratory for the creation of e.g. hetero-nuclear molecules or more exotic bound states of particles, such as recently discovered Efimov states. Since such molecules are isolated from each other on different lattice sites and any collisional broadening mechanisms are absent, high precision spectroscopy can be carried out on them to realize novel atomic clocks or perform tests on the time variation of fundamental constants.

**References:**

**Biography:**
Daniel J. Gauthier received the B.S., M.S., and Ph.D. degrees from the University of Rochester, Rochester, NY, in 1982, 1983, and 1989, respectively. His Ph.D. research on "Instabilities and chaos of laser beams propagating through nonlinear optical media" was supported by an NSF Graduate Fellowship and a postdoctoral position at the University of Rochester Research  Initiative Fellowship. From 1989 to 1991, he developed the first CW two-photon optical laser as a Post-Doctoral Research Associate under the mentorship of Prof. T.W. Mossberg at the University of Oregon. In 1991, he joined the faculty of Duke University, Durham, NC, as an Assistant Professor of Physics and was named a Young Investigator of the U.S. Army Research Office in 1992 and the National Science Foundation in 1993. He is currently the Anne T. and Robert M. Bass Professor of Physics and Biomedical Engineering at Duke. His research interests include: applications of slow light in classical and quantum information processing and controlling and synchronizing the dynamics of complex electronic, optical, and biological systems. Prof. Gauthier is a Fellow of the Optical Society of America and the American Physical Society.

**JE1-4-WED**

**Slow light in room-temperature optical waveguides**

Daniel Gauthier,
Duke University, Durham, North Carolina, USA

Over the last decade, there has been great progress in devising methods for tailoring the dispersion of optical materials, such as electromagnetically induced transparency, photonic crystals, and nano-optic resonators [1]. By tailoring the dispersion using all-optical methods, it is possible to adjust the group velocity $v_g$, of a pulse. Large normal dispersion, where the refractive index of the material increases with frequency over some range, results in slow light, where the group index $n_g$ is greater than one and $v_g$ is less than the speed of light in vacuum. Slow light has potential applications for optical buffering, data synchronization, optical memories, and optical signal processing. The Stokes amplification resonance of width $2\Delta$ (dashed line) and the associated change in refractive index (solid line). (b) Large normal dispersion near the center of the line shown in panel (a) gives rise to a positive group index (slow light) at line centre.

**References:**
Cold quantum gases: when atomic physics meets condensed matter

Jean Dalibard, École Normale Supérieure, Paris, France

A decade ago, when Bose-Einstein condensation was achieved in a cold atomic vapour, it came as a nice confirmation of the well established theory of the ideal gas. Since this initial discovery, the research on cold quantum gases has undergone a tremendous advance. It provides experimentalists with a wide variety of tools allowing one to study many-body and strongly correlated quantum systems, with the high control and precision achievable in atomic physics and quantum optics. Atomic motion in the periodic potential of an optical lattice simulates the physics of electrons in solid-state devices. Feshbach resonances are specific tools of atomic physics which enable one to adjust the sign and strength of the interaction between atoms. Quantized vortices in rotating gases lead to physical phenomena strongly connected with the Quantum Hall effect. The talk will review some recent advances in the domain, and show how these cold atomic assemblies can be considered as quantum simulators, mimicking the rich dynamics of condensed-matter systems.

Biography:
Jean Dalibard is director of research at the CNRS and professor at the Ecole Polytechnique. He leads an experimental research group at the Ecole Normale Supérieure in Paris. Jean Dalibard graduated at the Ecole Normale Supérieure in 1986 under the supervision of Claude Cohen-Tannoudji. In his PhD work he investigated methods to cool and trap atoms with light. Over the years his research activities have covered topics ranging from quantum optics to condensed matter physics. At the beginning of his career he worked with Alain Aspect on the violation of Bell's inequality by correlated pairs of photons. Together with Claude Cohen-Tannoudji he proposed some novel cooling mechanisms, such as the Sisyphus effect, to elucidate the behaviour of optical molasses. At the beginning of the 90’s he developed with Yvan Castin and Klaus Moelmer a theoretical method that enables one to treat dissipative processes using wave functions, by incorporating some random elements in their evolution. More recently his research has been centred on the physics of quantum gases, in particular Bose-Einstein condensates. He has studied in particular the properties of quantized vortices in rotating systems, and investigated some specific features of low dimensional gases. Jean Dalibard is the author of 100 publications and is a member of the French Academy of Sciences.

References:

Attosecond spectroscopy comes of age

Reinhard Kienberger, Max-Planck-Institut für Quantenoptik, Garching, Germany

Fundamental processes in atoms, molecules, as well as condensed matter are triggered or mediated by the motion of electrons inside or between atoms. Electronic dynamics on atomic length scales tend to unfold within tens to thousands of attoseconds (1 attosecond $[as] = 10^{-18}$ s). Recent breakthroughs in laser science are now opening the door to watching and controlling these hitherto inaccessible microscopic dynamics. The key to accessing the attosecond time domain is the control of the electric field of (visible) light, which varies its strength and direction within less than a femtosecond (1 femtosecond $= 10^{-15}$ s). Atoms exposed to a few oscillations cycles of intense laser light are able to emit a single extreme ultraviolet (xuv) burst lasting less than one femtosecond. Full control of the evolution of the electromagnetic field in laser pulses comprising a few wave cycles have recently allowed the reproducible generation and measurement of isolated sub-femtosecond xuv pulses, demonstrating the control of microscopic processes (electron motion and photon emission) on an attosecond time scale. These tools have enabled us to visualize the oscillating electric field of visible light with an attosecond "oscilloscope" and to control single-electron and probe multi-electron dynamics in atoms, molecules and solids.

References:

Biography:
Reinhard Kienberger obtained his MSc. and Ph.D. degrees from Vienna University of Technology (TU Wien) in 1999 and 2002 respectively. Since then he has spent periods of research at Stanford and Vienna, and he is currently Leader of the Max-Planck Independent Junior Research Group on "Attosecond Dynamics" at the Max-Planck-Institut für Quantenoptik (MPQ) in Garching, Germany. He has received a number of prestigious fellowships and awards, including the APART fellowship of the Austrian Academy of Sciences and the Sofja Kovalevskaja Award of the Alexander von Humboldt Foundation. His research interests cover diverse topics in attosecond science, including the generation and characterization of attosecond XUV pulses, attosecond pulse metrology and applications - and the synthesis of tailored harmonic waves.
High power fibre laser technology has come of age over the past five years or so, due primarily to developments in fibre design and fabrication and semiconductor pump lasers. Fibre is now emerging as the technology of choice for a wide range of laser applications. Nowhere has the progress been more striking than in terms of the maximum continuous wave output power achievable from a single-mode fibre laser. Until the start of 2001 the maximum reported output power from such a laser was ~110W. However, since then the reported power levels have risen rapidly and steadily such that, by late 2006, values as high as 2.5kW were achieved with great prospects for further extension to the 10kW regime. Far higher power levels than this should be achievable, in due course, by using beam combination technology. Fibre lasers are thus consequently now strong competitors to KW-class ‘bulk’ and thin-disk solid state lasers (for example, Nd:YAG and Yb:YAG) and CO2 lasers for a wide range of industrial applications including materials processing, aerospace and defense. Relative to other technologies and fibre laser systems incorporating nonlinearity management techniques such as chirped pulse amplification (CPA) and Parabolic Pulse Amplification (PPA) can now be operated in the multi-10 W to multi-100 W regime. Moreover, pulse energies approaching 1µJ for CPA, and 1µJ for PPA have been reached, opening a host of potential further applications as diverse as materials processing through to X-ray generation. Likewise, the use of pulsed diode seed lasers operating in the GHz regime has enabled the development of picosecond systems operating at multi-100 W power levels, with pulse energies as high as 10mJ, and for frequency conversion using external frequency converters - and have been used, for example, to obtain power levels of nearly 100W in the visible regions of the spectrum. In the nanosecond regime multi-100 W systems have also been achieved with single mode pulse energies as high as 100mJ and by relaxing the mode quality, pulse energies approaching 100mJ are possible. The above examples, which in most instances can be achieved simply by changing the seed laser or by adding additional components to a suitable MOPA chain, emphasize the inherent flexibility, versatility and real power of the fibre approach.

To date most high power fibre laser work has focused on the Yb-doped system which operates at wavelengths around 1.1µm. This is mainly due to its high efficiency and the availability of high power semiconductor pump sources at the pump wavelengths of 915 and 976nm. Indeed, essentially all of the results referred to above were achieved with Yb-based systems. However, high-power fibre lasers operating in the eye-safe region (1.5 – 2 mm) are also now attracting a lot of attention for use in important free-space applications such as remote optical sensing, range-finding, and free-space optical communications. Eye-safe lasers are significantly less efficient than Yb-doped fibre lasers at 1.1 µm. Nevertheless output powers around 300 W have been reported recently at 1.57 µm from an erbium-ytterbium codoped fibre laser (EYDFL), and 200W around 2 µm using Thulium. Power levels will undoubtedly also scale further in due course.

In summary, fibre lasers are now competitive in terms of pure average output power performance relative to the more conventional bulk and disk high-power laser systems - and with potential for yet higher power levels. However, there is far more to this technology than raw power, as the above performance specifications show. The versatility and flexibility of the fibre approach from a truly unique combination – and, as a consequence, fibre lasers have a very bright future indeed.

David Richardson was born in Southampton, England in 1964 and obtained his B.Sc. and PhD in fundamental physics from Sussex University U.K. in 1985 and 1989 respectively. He joined the then recently formed Optoelectronics Research Centre (ORC) at Southampton University as a Research Fellow in May 1989. He was awarded a Royal Society University Fellowship in 1991 in recognition of his pioneering work on short pulse fibre lasers. David J. Richardson is now a Deputy Director of the ORC, where he is responsible for Optical Fibre Device and Systems research. His current research interests include, amongst others: microstructured fibres, high-power fibre lasers, short pulse lasers, optical fibre communications, and nonlinear fibre optics. Prof Richardson has published more than 350 conference and journal papers in his time at the ORC, and produced over 20 patents. He is a frequent invited speaker at the leading international optics conferences in the optical communications, laser and nonlinear optics fields and is an active member of both the national and international optics communities. Prof. Richardson was made a Fellow of the Optical Society of America in 2005.

Benjamin Eggleton is currently a Federation Fellow and Professor of Physics at the University of Sydney. He is Director of the Centre for Ultrahigh-bandwidth Devices for Optical Systems (CUDOS), an ARC Centre of Excellence. He studied at the University of Sydney, obtaining his BSc (Hons 1) in 1992 and his PhD in Physics in 1996. After graduation, he went to the United States to join Bell Laboratories, as a Postdoctoral Fellow in the Optical Physics Department. He then transferred to the Optical Fiber Research Department as a Member of Technical Staff and was subsequently promoted to Technical Manager of the Optical Fibre Grating group. Soon after this, he became the Research Director of the Specialty Fiber Business Division of Bell Labs parent company, Lucent Technologies; here, he led Lucent’s research program in optical fibre devices. He has co-authored more than 160 journal papers, has presented more than 40 invited and plenary presentations at international conferences, and has filed 35 patents. He has received several significant awards. Most notably, in 2004 he received the Prime Minister’s Malcolm McIntosh Science Prize for Physical Scientist of the Year, in 2003 the ICO Prize (International Commission for Optics), and in 1998 was awarded the Adolph Lomb Medal from the Optical Society of America. Other achievements include the award of the distinguished lecturer award from the IEEE/LEOS, a R&D100 award, and being made an OSA fellow in 2003. He is an Associate Editor for IEEE Photon Technology Letters, a member of the editorial advisory board for Optics Communications and serves as Vice-President of the Australian Optical Society.
When it comes to making sophisticated 3D nanostructures to enhance light-matter interactions, we will demonstrate new routes to confine electronic and confined photonic structures on the 100nm scale and nm-scale and reveal some of their new properties, as well as showing the prospects for metamaterials with novel NanoPhotonic properties. Metal nanostructures exhibit many unusual optical effects due to their size scale, including supporting plasmonic bandgaps and localised plasmons. Surface plasmons are efficiently excited due to the regular array of close-packed dishes; localised plasmons on the other hand reside in the deep cavities at larger sample thicknesses. By measuring the spectral response of the samples at different thickness and incident angles the full dispersion is revealed. We reveal a new strong coupling between the plasmonic-crystal modes and the localized plasmons, which allows plasmonic atoms to communicate. We show that such nanostructured plasmonic substrates have widespread application in molecular sensing.

We also show a new development for making nano-materials with structural colour on a potentially-industrial scale [6,7]. This exploits the shear-force assembly of polymer core-shell nanoparticles into elastomeric films during compression moulding or extrusion (Fig.2). By adding absorbing nanoparticles into the fabrication process which sit in the interstices of this structure, we create strongly coloured films with unusual properties. Such nanomaterials are at the heart of designing new interactions between light and matter, and reveal the promising state of such materials for unusual applications.

References:

Biography:
Jeremy J. Baumberg is the Director of NanoScience and NanoTechnology at the University of Southampton and a Professor in both the Schools of Physics and Electronics & Computer Science. He is an established innovator in NanoPhotonics, opening new areas for exploitation. As a result, he was awarded the 2004 Royal Society Mullard Prize, the 2004 Mott Lectureship of the Institute of Physics, as well as the Charles Vernon Boys medal in 2000. Strong experience in Hitachi (5 years), as an IBM Fellow (2 years) and recently with his $14M spin-off, MesoPhotonics (based on NanoPhotonics patents), gives him a unique position to combine academic insight with industry application in a two-way flow. He has a strong track record in the ultrafast properties of novel NanoMaterials such as photonic crystals, single semiconductor quantum dots, semiconductor microcavities, and self-assembled photonic and plasmonic nano-structures. He also frequently talks on NanoScience to the media, and is a strategic advisor to the UK Research Councils. He is a Fellow of the Optical Society of America, the Institute of Physics, and the Institute of NanoTechnology.

Recent years have witnessed a series of developments at the intersection of two, previously distinct subjects. Optical microcavities and micro (nano) mechanical resonators, each a subject in its own right with a rich scientific and technological history [1,2], have, in a sense, become entangled experimentally. The results have implications in a wide range of subjects including improved gravity-wave detection [3] and new tests of quantum theory [4]. They also suggest the beginning of an exciting period of experimental science.

Central to these new results have been two device geometries that enable structural coexistence of micro-mechanical and optical resonators. In one geometry, a micro-cantilever mechanical resonator also functions as a mirror in a high-finesse optical cavity. In a second, opto-mechanical co-existence takes the form of a micron-scale silica toroid that exhibits both high-Q radio-frequency mechanical resonances and optical resonances with Qs as high as 500 million [5]. In both cases, the pressure of photons circulating within the optical resonator couples the mechanical and optical degrees of freedom. Although the static effect of this coupling was measured nearly two decades ago [6], there exist dynamical phenomena that have only recently been observed and that enable new, opto-mechanical physics. The first of these is the onset of regenerative mechanical oscillation caused by radiation pressure. This so-called parametric instability [3] was first observed in silica microtoroids [7] and the resulting mechanical oscillations have now been observed from radio-frequency to micro-wave rates. This oscillation phenomenon is a manifestation of the more general principle of dynamic back action [3], and has a counterpart in which laser cooling of the mechanical mode is possible [3,7]. Recent demonstrations in cantilevers [8] and microtoroids [9] of radiation-pressure cooling from room temperature to 10°K will be reviewed. These techniques can potentially achieve ground-state cooling of a macro-scale oscillator.

In addition to providing a powerful set of tools for nano-mechanics [2], these results establish a new direction of basic studies in opto-mechanics. Beyond the new science, cooling and regenerative oscillation on a silicon chip (as in the case of a microtoroid) may also one day lead to applications in micro-chip technologies.

References:
Biography:
Kerry Vahala is Ted and Ginger Jenkins Professor of Information Science and Technology and Professor of Applied Physics at Caltech. He also received his Ph. D. (85) in Applied Physics at Caltech. His research on micro-resonators has led to wafer-based devices operating in the Q regime above 100 million and has also provided low-loss methods for coupling directly to optical fiber. These devices have enabled micro-scale Raman and Parametric sources as well as cavity QED on-a-chip systems. His current research is focused on a range of optomechanical phenomena associated with radiation pressure in microresonators. Kerry Vahala is a Fellow of the Optical Society of America, was the first recipient of the Richard P. Feynman Hughes Fellowship and has also received both the Presidential Young Investigator and Office of Naval Research Young Investigator Awards. He has been a topical editor for the Journal of the Optical Society of America and Photonics Technology Letters, and was program co-chair for CLEO 99 and General Chair for CLEO 2001. Vahala also co-founded, Xponent Photonics, a manufacturer of photonic access modules.

Thursday, 16:30 – 17:30, Room BOR2

[IA2-1-THU]

Chip-scale atomic devices based on microfabricated alkali vapor cells

John Kitching, NIST, Boulder, CO, USA

We describe recent progress in the development of millimeter-scale instruments based on alkali atom vapour cells implemented with microfabrication techniques. Because of their small size and correspondingly low power requirements, these “chip-scale” atomic clocks and magnetometers have the potential to bring atomically precise instrumentation to portable, battery-operated systems such as GPS receivers, remote sensors and wireless communication devices. In addition, the use of wafer-level processing and assembly potentially allows for very low cost per instrument, if high volumes are produced.

At the heart of the chip-scale atomic devices being developed in our group is an alkali vapor cell, shown in Figure 1(a). It is fabricated by injecting alkali atoms into a small etched hole in a Si wafer, and then bonding glass on the upper and lower surfaces to seal the cell [1]. These cells can be integrated into stacked physics packages [2], shown in Figure 1(b), in which a low-power semiconductor laser is used to probe the frequency of various atomic transitions. Finally, the physics package can be integrated with low-power RF oscillators and miniature control electronics to create a complete instrument, shown in Figure 1(c). Frequency references fabricated in this manner have been shown to be able to support a fractional frequency stability of $4 \times 10^{-11}$ at 1 second and near $10^{-11}$ for one hour of integration. Magneto-meter sensors can have sensitivities in the range of a few pT/√Hz.

We will describe the design, fabrication and performance of these types of instruments as well as the underlying optical and atomic physics on which their operation is based. Applications for such instruments will be discussed as well as prospects for further improvement, with regard to size, power and performance. Figure 1 (a) Microfabricated alkali vapor cell. (b) Chip-scale atomic magnetometer physics package. (c) Complete atomic frequency reference.

References:

Biography:
John Kitching received his BSc. in physics from McGill University in 1990. He went on to obtain an MSc and PhD in Applied Physics from the California Institute of Technology in 1992 and 1995, respectively. His thesis topic was an investigation of the amplitude and frequency noise properties of semiconductor lasers subjected to optical feedback. From 1995 to 2003, he was with JILA/The University of Colorado and also held a guest-researcher appointment in the Time and Frequency Division at the National Institute of Standards and Technology, NIST. Since 2003, he has been a physicist in the Time and Frequency Division at NIST. His research interests include atomic clocks and frequency standards, quantum interference effects in atomic systems, and applications of semiconductor lasers to problems in atomic physics and frequency control. Most recently, he and his team pioneered the development of microfabricated atomic devices for use as frequency references, magnetometers and other sensors. He has received several awards including the 2005 EFTF European Young Scientist Award, the 2006 ISSCC Jack Raper Award for Outstanding Technology Directions and the Department of Commerce Silver Medal. He has published over 40 papers in refereed journals, has given numerous invited talks and has been awarded two patents.
We will describe a laser system that will produce peak power at the exawatt \(10^{18}\) W/cm\(^2\) level. It will usher in a new regime in optics: the ultra-relativistic regime that will succeed to the already successful regime of relativistic optics.
10:45 – 12:15  
CA1 Session: Yb-doped basers and amplifiers  
Chair: Andy Clarkson, University of Southampton, United Kingdom

CA1-1-MON (Invited) 10:45  
Thindisk lasers  
A. Giesen, University of Stuttgart, Germany  
The latest status of the thin disk laser results will be discussed including cw and pulsed operation.

CB1-1-MON 10:45  
Microchip vertical-external cavity surface emitting laser using a concave-shaped diamond micromirror  
N. Launand, C.L. Lee, E. Gu, S. Calvez, M.O. Dawson, S. Giet, J.E. Hostie, University of Strathclyde, Glasgow, United Kingdom; S. Suomalainen, M. Guina, M. Pessa, O. Okhotnikov, Tampere University of Technology, ORC, Tampere, Finland  
This paper reports the operation of a 1050-nm microchip VECSEL, which uses a concave-shaped diamond acting both as the heatspreader and the output mirror. Full description and characterisation of the device are reported.

CB1-2-MON 11:00  
High power optically In-well pumped 850nm VECSEL  
W. Zhang, T. Ackemann, E. Riis, A.I. Ferguson, University of Strathclyde, Glasgow, United Kingdom  
A significant improvement of high-power (>1W) vertical-external-cavity surface-emitting lasers is demonstrated by using optical pumping directly into quantum-well states. The emission properties are characterized.

10:45 – 12:15  
CB1 Session: Vertical external cavity surface emitting lasers  
Chair: Wolfgang Stolz, Philipps-University Marburg, Germany

CB1-1-MON 10:45  
Spatio-temporally induced pulse self-compression in a white-light filament  
S. Skupin, L. Bergé, CEA/DAM Ile de France, Bruyères-le-Châtel, France; G. Stibenz, T. Sokollik, M. Schnürer, N. Zhavoronkov, G. Steinmeyer, Max-Born-Institut für Nichtlineare Optik und Kurzzeitspektroskopie, Berlin, Germany; F. Lederer, Friedrich-Schiller-Universität, Jena, Germany  
Self-compression in white-light filaments offers a remarkably simple way for generation of multi-mJ pulses with sub-10-fs duration. We show that both spatial and temporal dynamics are important for the compression mechanism.

10:45 – 12:15  
CF1 Session: Femtosecond filamentation  
Chair: Günter Steinmeyer, Max-Born Institute, Berlin, Germany

CF1-1-MON 10:45  
Spatio-temporally induced pulseself-compression in a white-light filament  
S. Skupin, L. Bergé, CEA/DAM Ile de France, Bruyères-le-Châtel, France; G. Stibenz, T. Sokollik, M. Schnürer, N. Zhavoronkov, G. Steinmeyer, Max-Born-Institut für Nichtlineare Optik und Kurzzeitspektroskopie, Berlin, Germany; F. Lederer, Friedrich-Schiller-Universität, Jena, Germany  
Self-compression in white-light filaments offers a remarkably simple way for generation of multi-mJ pulses with sub-10-fs duration. We show that both spatial and temporal dynamics are important for the compression mechanism.

CF1-2-MON 11:00  
Tunable ultrashort laser pulses generated through filamentation in gases  
A. Becker, Max Planck Institute for the Physics of Complex Systems, Dresden, Germany; F. Théberge, W. Liu, S.L. Chin, Université Laval, Québec, Canada; N. Aköz, Time Domain Corporation, Huntsville, Alabama, USA  
Tunable and ultrashort laser pulses in the visible spectrum are generated with high efficiency by four-wave mixing process during the filamentation of near-infrared and infrared laser pulses in gases.

10:45 – 12:15  
CK1 Session: Negative index materials  
Chair: Nikolay Zheludev, University of Southampton, United Kingdom

CK1-1-MON (Tutorial) 10:45  
Negative index materials  
C.M. Soukoulis, Iowa State University, Ames, USA and FORTH, Heraklion, Crete, Greece  
I will review and present the most recent advances of the field of negative index materials. Results on engineered microstructures designed to have both and negative, at THz and optical frequencies, will be presented.
Remote preparation of an atomic quantum memory
W. Rosenfeld, S. Berner, J. Volz, M. Weber, University of Munich, Germany; H. Weinfurter, University of Vienna, Austria; M. Scheidl, University of Innsbruck, Austria
We apply quantum teleportation protocol to a single trapped Rub atom entangled with a single photon. Here we imprint arbitrary quantum states on the photon which are then transferred to the distant atomic qubit.

Surface-enhanced Raman spectroscopy using silver impregnated polycarbonate substrates
L. Lagonigro, A.C. Peacock, P.L. Sazio, Optoelectronics Research Centre, Southampton, United Kingdom; T. Hasell, P.D. Brown, S.M. Howdle, University of Nottingham, United Kingdom
We report the fabrication of silver impregnated polycarbonate films for surface enhanced Raman spectroscopy. The structural and plasmonic properties of the nanoparticle composite samples are investigated, demonstrating robust, flexible and inexpensive SERS substrates.

Quantum teleportation between light and matter
E. Polzik, Niels Bohr Institute, Copenhagen, Denmark
Teleportation between light and matter, which respectively represent flying and stationary media, is demonstrated. A quantum state of a few-photon pulse is teleported onto a macroscopic object - an atomic ensemble containing billions of caesium atoms.

Continuous-wave and mode-locked laser operation of segmented grown Yb:KY(WO₄)₂/KY(WO₄)₂
Highly efficient continuous-wave laser operation and pulses as short as 99 fs in the mode-locked regime were demonstrated with a segmented grown 200-micron-thick Yb:KYW segment on undoped KYW.

Photochromic damage in nonlinear crystals for high-peak power blue light generation
V. Pasieka, R. Hirohashi, F. Laue, University of Technology, Stockholm, Sweden; N. Saito, S. Wada, RIKEN, Saitama, Japan; M. Kata, MegaOpto Co., Ltd., Saitama, Japan
Susceptibility to high-peak power blue-light induced infrared absorption is investigated in periodically poled and birefringence phase-matched nonlinear crystals most promising for blue-light generation. Physical mechanisms responsible for the photochromic damage are discussed.

Incoherent switching of Cavity Solitons in a vertical-cavity semiconductor laser amplifier: experimental observations and physical mechanisms
S. Barbay, R. Kuszelewicz, T. Elsass, X. Hachair, Y. Méneguez, I. Sagnes, Lab. de Photonique et de Nanostructures-CNRS, Marcoussis, France
We show experimentally the incoherent writing and erasure of Cavity Solitons in an optically-pumped vertical-cavity semiconductor optical amplifier, discuss the physical mechanisms involved, including local heating effects, and show numerical simulations.
High-power RT CW operation of an OP-VECSEL at 1.56 µm with hybrid metallic-metamorphic mirrors

J.P. Tourrenc, S. Bouchoule, A. Khadou, A. Miard, J.C. Harmand, J.L. Oudar, LPN-CNRS, Marcoussis, France; J. Decobert, Alcatel-Thales III-V Lab, Marcoussis, France

We demonstrate room-temperature continuous-wave operation of an optically-pumped vertical-external-cavity surface-emitting laser including hybrid metallic-metamorphic mirror with 27mW single transverse-mode output power and 80mW total power at 1.56µm.

Dynamic behavior of 1050nm semiconductor disk lasers on a nanosecond to microsecond time scale

W. Diehl, OSRAM Opto Semiconductors, Regensburg and Philipps-Universität Marburg, Germany; J. Pietzonka, P. Brick, M. Furtisch, S. Illek, J. Luft, OSRAM Opto Semiconductors, Regensburg, Germany

We report on the lasing and photoluminescence dynamics of 1050nm semiconductor disk lasers using well and barrier pumping. Spectral and temporal features are explained using a rate equation model including microscopic gain and luminescence.

Filament seeded high-energy IR parametric source with self stabilization of carrier-envelope phase

C. Vozi, F. Calegari, E. Benedetti, S. Gas lovers, G. Sansone, G. Cerullo, S. De Silvestri, M. Nisoli, S. Stagira, INFM - CNR Politecnico di Milano, Italy

We obtain passively carrier-envelope-phase stabilized pulses at 1.5 micron by difference-frequency generation driven by supercontinuum filament. The broadband IR pulses are amplified up to 15-microJ energy by optical parametric amplification.

Intense deep-ultraviolet 10-fs pulses generated through filamentation in gases

T. Fuji, T. Horig, T. Suzuki, RIKEN, Chemical Dynamics Laboratory, Saitama, Japan

Generation of intense and broadband deep-ultraviolet pulses by four-wave mixing through filamentation in neon gas is demonstrated. The pulses are successfully compressed down to 13 fs by a grating-based compressor.
We evaluated diode-pumped ytterbium-doped regenerative amplifiers as alternative pre-amplifiers for Nd:glass systems. Pump modeling and testing of Yb:KYW, Yb:glass and Yb:CaF$_2$ allowed for suitable 1053 nm operation.

**14:00 – 15:30**

**CA2 Session: Femtosecond laser sources**

**Chair:** Patrick Georges, Institut d’Optique, Palaiseau, France

**CA2-1-MON** 14:00

70-fs Yb:Glass-Yb:KGW laser with high average power

I. Manek-Hönninger, CELIA-PALA, Université Bordeaux I, Talence, France; M. Delaigue, CELIA-PALA, Université Bordeaux I, Talence and Amplitude Systèmes, Pessac, France.

We report a broadband mode-locked diode-pumped femtosecond laser using two different ytterbium-doped materials in the same cavity. Up to 440 mW average output power and pulse durations down to 70 fs are demonstrated.

**14:00 – 15:30**

**CD2 Session: Photon-phonon interaction**

**Chair:** Luc Thevenaz, Swiss Federal Institute of Technology, Lausanne, Switzerland

**CD2-1-MON** 14:00

Modes with kHz scale spacing in raman fibre lasers with ultra-long cavity

V. Karalekas, S.K. Turitsyn, J.D. Ania-Castanon, P. Harper, V.K. Mezentsev, Aston University, Birmingham, United Kingdom; S.A. Babin, E.V. Podivilov, Institute of Automation and Electrometry, Novosibirsk, Russia.

We present the first experimental demonstration of resolvable mode structure in the radio-frequency spectra of ultra-long Raman fibre lasers (up to 84 km) and the linear increase of the peak widths with growing intra-cavity power.

**14:00 – 15:30**

**JSIII1 Session: Optical frequency comb generation**

**Chair:** Thomas Udem, Max Planck Institute for Quantum Optics, Garching, Germany

**JSIII1-1-MON** 14:00

Lasers, clocks and combs

J.L. Hall, JILA, University of Colorado and NIST, Boulder, USA.

On the origin and success of optical precision frequency measurements. The symposium on frequency comb will be opened with scientific and personal reminiscences.

**14:00 – 15:30**

**CE1-MON** 12:00

Supercontinuum spatial gap solitons

A.A. Sukhorukov, D.N. Neshev, R. Fischer, S. Ha, W. Krolikowski, Yu.S. Kivshar, Australian National University, Canberra, Australia; A. Dreischuh, Sofia University, Sofia, Bulgaria and Australian National University, Canberra, Australia; I. Boiger, B.J. Eggleton, University of Sydney, Australia; A. Mitchell, M.W. Austin, L. Bui, RMIT University, Melbourne, Australia.

We predict theoretically and observe experimentally simultaneous spatio-spectral localization and formation of supercontinuum gap solitons in an optical waveguide array, demonstrating new possibilities for tunable reshaping of supercontinuum light in nonlinear periodic photonic structures.

**14:00 – 15:30**

**CE1-MON** 12:00

Controlling position and motion of cavity solitons


We show experimentally that cavity solitons can be controlled by means of parameter gradients. Using this control, we take advantage of the sensitivity of localized structures to inhomogeneities to probe the host medium.

**14:00 – 15:30**

**IG1-MON** 12:00

High-quality organic electro-optic single crystalline thin films for integrated optics based on configurationally locked polyene

O.P. Kwon, M. Jazbinsek, S. Kwon, H. Figi, A. Choubey, L. Mutter, P. Günter, ETH Zurich, Switzerland.

We present crystal-engineering approaches for newly developed configurationally locked polyene nonlinear optical crystals for integrated optics. We produced thin-film electro-optic single crystals with sharp and flat edges, area of up to 5x3 mm$^2$, and 0.2–5-micron thickness.

**14:00 – 15:30**

**CD1-MON** 12:00

Supercontinuum spatial gap solitons

A.A. Sukhorukov, D.N. Neshev, R. Fischer, S. Ha, W. Krolikowski, Yu.S. Kivshar, Australian National University, Canberra, Australia; A. Dreischuh, Sofia University, Sofia, Bulgaria and Australian National University, Canberra, Australia; I. Boiger, B.J. Eggleton, University of Sydney, Australia; A. Mitchell, M.W. Austin, L. Bui, RMIT University, Melbourne, Australia.

We predict theoretically and observe experimentally simultaneous spatio-spectral localization and formation of supercontinuum gap solitons in an optical waveguide array, demonstrating new possibilities for tunable reshaping of supercontinuum light in nonlinear periodic photonic structures.
<table>
<thead>
<tr>
<th>Time</th>
<th>Room 13b</th>
<th>Room 14a</th>
<th>Room 14b</th>
<th>Room B11</th>
</tr>
</thead>
<tbody>
<tr>
<td>14:00–15:30</td>
<td><strong>CB2 Session: Nonlinear dynamics</strong></td>
<td><strong>CF1-6-MON 12:00</strong></td>
<td><strong>CK1-3-MON 12:00</strong></td>
<td><strong>NOTES</strong></td>
</tr>
<tr>
<td></td>
<td>Chair: Cristina Masoller, Universitat Politecnica de Catalunya, Terrassa, Spain</td>
<td>Organizing and characterizing multiple femtosecond filaments C.P. Haeri, A. Trisoro, G. Mourou, Laboratoire d’Optique Appliquée, Palaiseau, France</td>
<td>Surface plasmon resonance effects in the magneto optical activity of noble metal-ferromagnet ultrathin films J.B. González-Díaz, A. García-Martín, G. Armelles, J.M. García-Martín, C. Clevé, Instituto de Microelectronica de Madrid, CSIC, Tres Cantos, Spain; A. Ceccaldi, Instituto de Microelectronic de Madrid, CSIC, Tres Cantos, Spain and University of Michigan, Ann Arbor, USA; R. Clarke, D. Kumah, University of Michigan, Ann Arbor, USA; R.A. Lukaszew, J. Skuza, University of Toledo, USA</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Multiple femtosecond filamentation (MF) are spatially organized by polarization control. Spatiotemporal characterization demonstrates a stable multi-filament pattern and compression to ultrashort pulses in individual co-propagating filaments.</td>
<td>We present a combined experimental and theoretical study elucidating the role of surface plasmon resonances in the enhancement of magneto optical activity. A comprehensive structural, magnetic and magneto-optical characterization of the different layers is provided.</td>
<td></td>
</tr>
<tr>
<td>14:00–15:30</td>
<td><strong>CB2-1-MON 14:00</strong></td>
<td><strong>CF2-1-MON 14:00</strong></td>
<td><strong>CK2-1-MON (Invited) 14:00</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Bifurcation and nonlinear dynamics accompanying polarization switching in a VCSEL subject to orthogonal optical injection I. Gatare, Supélec-LMOPS CNRS-UMR 7132, Metz, France and Vrije Universiteit Brussel, Brussels, Belgium; K. Panajotov, Vrije Universiteit Brussel, Brussels, Belgium; M. Sciamanna, Supélec-LMOPS CNRS-UMR 7132, Metz, France; M. Nizette, Universite Libre de Bruxelles, Brussels, Belgium</td>
<td>Tunable pulses from below 300 to 950 nm with durations down to 12 fs from a 2 MHz Yb-doped fiber system C. Schriever, E. Riedle, S. Lochbrunner, P. Krok, LS für BioMolekulare Optik, Munich, Germany</td>
<td>With a noncollinear optical parametric amplifier pumped by 10µJ pulses at 1053nm we efficiently generate sub 20fs pulses tunable from 600 to 950 nm and demonstrate their frequency conversion into the UV.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14:00–15:30</td>
<td><strong>CF2 Session: Parametric processes and supercontinuum generation</strong></td>
<td><strong>CK2 Session: 3D photonic crystals</strong></td>
<td><strong>CH1-1-MON 14:00</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Chair: Derryck Reid, Heriot-Watts University, Edinburgh, United Kingdom</td>
<td>Chair: Cefe Lopez, Instituto de Ciencia de Materiales, Madrid, Spain</td>
<td><strong>Optical sensing based on simultaneous ellipsometry, reflectivity and spectrometry profiles in sub-microholes structures for bio-applications</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Chair: Andreas Erdmann, Fraunhofer Institute, Erlangen, Germany</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>M. Holgado, R. Casquel, C. Molpeceres, M. Morales, J. Ocana, Laser Centre, Universidad Politecnica de Madrid, Spain</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>We have developed a refractive index sensor consisting of a submicron holes lattice. Simultaneous Reflectivity and Ellipsometry patterns are performed through a submicron spot laser in a single hole. Spectrometry profiles are also accomplished.</td>
<td></td>
</tr>
</tbody>
</table>
Coherent FTIR and THz enables a multi-heterodyne detection of thus a fast spectrometers spanning multi-circular spectroscopy

An optical frequency synthesizer is demonstrated from 2.9 to 3.5 micron, by difference frequency generation between a fiber-based comb and a continuous-wave laser, providing both an absolute frequency ruler and an optical frequency comb generation in microcavities.

Threshold for stimulated Brillouin scattering in optical fibers

Spectral broadening in Raman fiber amplifier pumped by partially coherent wave

Threshold for stimulated Brillouin scattering in optical fibers

Spectral broadening in Raman-fiber lasers

Harmonic-frequency-comb spectroscopy in the mid-infrared and THz regions
Electronically tunable photonic crystals
P.S. Ivanov, D.R.E. Snoswell, M.J. Cryan, N. Elsner, J.G. Rarity, B. Vincent, University of Bristol, United Kingdom; C.L. Bower, Kodak European Research, Cambridge, United Kingdom

Electronically tunable diffraction gratings based on 2D arrays of colloidal particles are presented and measured. Modelled results show good agreement. Modelled results for 3D arrays show tunable reflectivity is possible in the visible wavelength range.

Tunable, elastic, crack-free photonic crystals and polymer opal templates with pre-determined orientation for defect inscription
W. Wohlleben, S. Altmann, F. Bartels, S. Fischer, R.J. Leyrer, BASF Aktiengesellschaft, Ludwigshafen, Germany; M. Boyle, R. Kiyon, Laserzentrum Hannover e.V., Germany; K. Heggarty, N. Dissaux, GET-ENST Bretagne, Brest, France

We produce robust tunable photonic crystals in a single-step self-assembly of core-shell polymer dispersions. They feature 100% elongation (one optical octave) and crack-freeness. Laser diffraction finds cm-monomocrystals also with templates for defect inscription.

Fiber-optic nerve systems for materials that can feel pain
K. Hotate, The University of Tokyo, Japan

Fiber optic nerve systems have been studied to realize structures and materials that can feel pain. We have developed the nerve systems with mm-order spatial resolution or kHz-order measurement speed, using optical correlation domain techniques.

Laser-based isomer identification in the vapor phase
R. Bartlome, M. W. Sigrist, ETH Zurich, Switzerland

A continuously tunable laser between 3.2 and 3.6 micrometers and a novel high-temperature multipass cell are used to probe molecules in the vapor phase. This spectrometer enables differentiation between diastereoisomers like Ephedrine and Pseudoephedrine.
Energy-scalable mid-infrared femtosecond oscillators: positive vs. negative dispersion regimes
V.L. Kalashnikov, E. Sorokin, I.T. Sorokina, Technical University, Vienna, Austria
Energy-scaling of mid-IR femtosecond Cr²⁺-oscillators is being analyzed in negative and positive dispersion regimes. The latter is shown to pave the way towards microjoule energy level and to be advantageous above 25-50 nJ pulse energies.

InAs/InGaAs quantum-dot-based saturable absorber mirrors have been used for femtosecond pulse generation in the near-IR. Transform-limited pulses of 114 fs and 160 fs were generated around 1040 nm and 1280 nm from Yb:KYW and Cr:forsterite lasers, respectively.

All-optical time-delayed feedback control of semiconductor lasers
S. Schikora, H.-J. Wünsche, F. Henneberger, Humboldt-Universität zu Berlin, Germany
In proof-of-concept experiments, unstable regimes of a multisection laser are noninvasively stabilized by coherent optical feedback from a Fabry-Perot cavity. This approach is well adapted to devices with ultrashort timescales.

We investigate the impact of current noise on the delayed feedback dynamics of a single-mode vertical-cavity surface-emitting laser. We find suppression of feedback instabilities and a nontrivial interplay between the two external perturbations.

Generation of terawatt sub-8 fs laser pulses using noncollinear optical parametric chirped pulse amplification
Generation of 2TW few-cycle laser pulses (7.6 fs) is demonstrated using parametric chirped pulse amplification at a 30 Hz repetition rate. Aspects such as fluorescence, pulse contrast, phase stability, and applications are discussed.
Spectral redistribution in spontaneous emission from quantum dot infiltrated three-dimensional photonic crystals
J. Li, B. Jia, C. Bullen, J. Serbin, G. Zhou, M. Gu, Swinburne University of Technology, Melbourne, Australia

We infiltrated PbSe quantum dots into three-dimensional photonic crystals with a simple method. Band gaps of photonic crystals were tuned and spectral redistribution in spontaneous emission from quantum dots inside the photonic crystal was investigated.

Formation of high index three-dimensional inverse woodpile photonic crystals by single infiltration
B. Jia, S. Wu, J. Li, M. Gu, Swinburne University of Technology, Melbourne, Australia

We demonstrate a novel method to achieve high index inverse three-dimensional photonic crystals formed by a simple sol-gel process, which involves a single step infiltration of the TiO2 precursor into polymeric templates generated by two-photon polymerization.

Mid-IR laser-spectroscopic determination of isotope ratios at trace levels
H. Waechter, M.W. Sigrist, ETH Zurich, Switzerland

A high-precision mid-IR laser-spectrometer based on difference frequency generation is presented for determination of isotope ratios of N2O, CO and CO2 at concentrations in the ppm-range with a precision of a few per mille.
CD3-1-MON 16:00
High-energy noncollinear optical parametric amplifier in the visible
D. Polli, C. Manzioni, G. Cerullo, Politecnico di Milano, Italy; M. Mero, J. Zheng, P. Tzankov, Max
Born Institute for Nonlinear Optics and Short Pulse Spectroscopy, Berlin, Germany
Scaling of the pulse energy of a white-light-continuum-seeded two-stage noncollinear optical parametric
amplifier to the 500 µJ level is demonstrated. Sub-25-fs pulses tunable between 520 and 650 nm were generated
at 1 kHz.

CD3-2-MON 16:15
Near-IR femtosecond optical parametric amplifier at 1 MHz seeded by parametrically generated light
M. Marangoni, R. Osellame, R. Ramponi, G. Cerullo, Politecnico di Milano, Italy; U. Morgner, Leibniz University, Hannover,
Germany
An optical parametric amplifier at 1 MHz repetition rate delivering 190 nJ, 220 fs pulses tunable in the
1.3-1.6 micron range is realized starting from an Yb:KYW cavity-dumped oscillator.

CA3-1-MON 16:00
High-pulse-energy, rep.-rated diode-pumped slab laser technology: scalable architecture, thermal
management, and wavefront correction
T. Kurita, T. Sekine, R. Yasuhara, T. Ikegawa, T. Kawashima, O. Matsumoto, M. Miyamoto,
H. Kan, Hamamatsu Photonics K.K., Shizuoka, Japan; H. Yoshida, J. Kawarasaki, M. Nakatsuka,
Y. Izawa, Osaka University, Japan; T. Kanabe, University of Fuku, Japan
21-J output energy of 8.9-ns pulse with 213-W average power was demonstrated from a scalable
diode-pumped slab laser with the technology of thermally-edge-management and wavefront correction.
A SBS phase conjugator exhibited the diffraction-limited beam quality.

CA3-2-MON 16:15
Power scalability as a precise concept for the evaluation of laser architectures
R. Paschotta, RP Photonics Consulting GmbH, Zurich, Switzerland
This paper introduces power scalability as a precisely defined concept, and demonstrates that this creates
important insight particularly concerning the potential of architectures and isolated measures to be implemented at
very high power levels.

CB3-1-MON 16:00
Noise properties of semiconductor ring lasers
A. Pérez S., A. Scirè, P. Colet, R. Zambrini, IMDEA, Palma de Mallorca, Spain
Semiconductor Ring Lasers show bidirectional static emission, alternate oscillations (AOs), and bistability, with correspondent
noise properties. Which we have theoretically investigated enlightening the interplay of AOs, Relaxation Oscillations, quantum fluctuations and squeezing effects.

CB3-2-MON 16:15
The effect of delayed optical feedback on semiconductor ring lasers
G. Van der Sande, J. Danckaert, Vrije Universiteit Brussel, Brussel, Belgium; A. Scirè, Universitat de les Illes Balears, Palma de
Mallorca, Spain
We theoretically analyze the influence of double time-delayed optical feedback on the emergence of unidirectional solutions in a
two-mode model for a semiconductor ring laser. Both symmetric and asymmetric biderectional feedbacks are investigated.

JSIII2-1-MON 16:00
Frequency comparisons of optical frequency standards and new results on a long-distance carrier-phase
optical fiber link
H. Schnatz, G. Grosche, B. Lippardt, T. Niazarava, E. Peik, U. Sterr, Chr. Tamm, Physikalisch-Technische Bundesanstalt,
Braunschweig, Germany; G. Santorelli, LNE-SYRTE, Paris, France
The transmission of frequency information via fibre optic telecommunication networks offers an attractive option for
long distance frequency comparisons, as required to com-pare optical clocks at different locations. Our concept is based on
using a femtosecond frequency comb to convert the output of an optical frequency standard to an ultra-stable optical frequency in the telecom band at 200 THz, which is then transmitted through an optical fibre network. With relative uncertainty around 10^-17 or better, both the conversion process and the transmission through a long-distance fibre link outperform most available clocks.

JSIII2-2-MON 16:15
Precision measurement of the refractive indices of air and carbon dioxide using frequency comb
J. Zhang, Z. H. Lu, L. J. Wang, Max-Planck Research Group, Erlangen, Germany
We report high precision refractive index measurement of air and CO₂ using a Michelson interferometer setup with frequency combs as the light source. Our experiment has a sensitivity of 9.6 × 10^-9.

JSIII2-3-MON (Invited) 16:30
Spectral line-by-line pulse shaping

CD3-1-MON 16:00
High-energy noncollinear optical parametric amplifier in the visible
D. Polli, C. Manzioni, G. Cerullo, Politecnico di Milano, Italy; M. Mero, J. Zheng, P. Tzankov, Max
Born Institute for Nonlinear Optics and Short Pulse Spectroscopy, Berlin, Germany
Scaling of the pulse energy of a white-light-continuum-seeded two-stage noncollinear optical parametric amplifier to the 500 µJ level is demonstrated. Sub-25-fs pulses tunable between 520 and 650 nm were generated at 1 kHz.

CD3-2-MON 16:15
Near-IR femtosecond optical parametric amplifier at 1 MHz seeded by parametrically generated light
M. Marangoni, R. Osellame, R. Ramponi, G. Cerullo, Politecnico di Milano, Italy; U. Morgner, Leibniz University, Hannover,
Germany
An optical parametric amplifier at 1 MHz repetition rate delivering 190 nJ, 220 fs pulses tunable in the
1.3-1.6 micron range is realized starting from an Yb:KYW cavity-dumped oscillator.
CK3 Session: Photonic nanostructures and devices  
Chair: Gerd Leuchs, University of Erlangen-Nuremberg, Germany

CK3-1-MON (Invited) 16:00
Monolithic integrated Raman silicon lasers and amplifiers  
H. Rong, S. Xu, Y.-H. Kuo, V. Sih, M. Paniccia, Intel Corporation, Santa Clara, CA, USA; O. Cohen, O. Raday, Intel Corporation, Jerusalem, Israel

We present an efficient ring resonator Raman silicon laser and amplifier based on a silicon-on-insulator p-i-n rib waveguide, which allows for on-chip integration with other silicon photonics components to provide a monolithic integrated photonic device.

CH2 Session: Photonic sensor technologies and applications  
Chair: Luc Thevenaz, Swiss Federal Institute of Technology, Lausanne, Switzerland

CH2-1-MON (Invited) 16:00
New technologies in fiber sensors  
M. Digonnet, Stanford University, USA

This presentation will discuss a few important technologies that have recently emerged in the context of fiber sensors, including Bragg and photonic-bandgap fibers, micro-machined fiber tips, photonic crystals, and the potentials of slow light.
We discuss experiments in which pulse shapers resolve and address individual examples of waveforms, data demonstrating sensitivity to comb offset frequency, and requirements for high fidelity waveform generation.

Mid-infrared entangled cavity doubly resonant optical parametric oscillator is a powerful device for high resolution spectroscopy. Recent developments are reported here: micro-laser pumping and fully automatic fine frequency tuning.

Mid-infrared entangled cavity doubly resonant optical parametric oscillator based on MgO:PPLT pumpedin the green at 532nm for non-linear optical devices.

We present a compact and reliable MOPA laser with an average output power of 20W. The system is based on a passively q-switched, monolithic laser with a central wavelength tunability of such a system.
CK3-2-MON 16:30
Polymer photonic crystal band edge laser fabricated by nanoimprint lithography
V. Reboud, C.M. Soromayor Torres, P. Lovera, N. Kehagias, G. Redmond, Tyndall National Ins., Cork, Ireland; M. Zelmann, LTM – CEA, Grenoble, France; M. Fink, F. Reuther, G. Gruetzner, Micro Resist Technology GmbH, Berlin, Germany
We report the demonstration of a low-threshold, edge-emitting polymer distributed feedback laser fabricated by nanoimprint lithography. Our results show advantages of using nanoimprinted polymer photonic crystals for precise, simple tuning of lasing action.

CK3-3-MON 16:45
Enhanced electro-optic tuning in lithium niobate photonic crystals: the role of slow light
M.P. Benal-Asoto, M. Roussey, J. Anet, F. Roida, Institut FEMTO-ST, Besançon, France; G.W. Burr, IBM Almaden Research Center, San Jose, USA
Experimental measurements, FDTD simulations, and effective susceptibilities are combined to show that the unexpectedly large electrooptic tunability found in lithium niobate photonic crystals can be quantitatively explained by the field-enhancement associated with slow light.

CK3-4-MON 17:00
Electro-optically tunable microring resonators in LiNbO3 thin films
G. Poberaj, A. Guarino, P. Ganter, ETH Zurich, Institute of Quantum Electronics, Zurich, Switzerland
We present the first demonstration of electrooptically tunable microring wavelength filters in submicrometer-thick LiNbO3 films fabricated by crystal ion slicing and wafer bonding techniques. A tunability of 0.14 GHz/V has been measured at 1550 nm.

CH2-2-MON 16:30
THz grating sensors for investigation of thin dielectric layers
T. Goebel, D. Schoenher, M. Feiginov, P. Meissner, H.L. Hartnagel, Technical University of Darmstadt, Germany
Dielectric layers sandwiching a thin-film metal grating are studied theoretically. The resonant features of such structures are highly sensitive to the permittivity of the dielectric films. This allows the characterization of the attached dielectric material.

CH2-3-MON 16:45
THz sensing of doping concentrations in epitaxial semi-conductors and 2-D electron gases: theory and experiment
D.P. Kelly, J. Darma, K. Unterrainer, Vienna University of Technology, Vienna, Austria
THz pulses are used to determine the doping concentration in an epitaxial semi-conductor and 2-D electron gas confined at the interface between a GaAs/AlGaAs interface. Theoretical analysis and experimental results are provided.

CH2-4-MON 17:00
All-organic waveguide coupled solid-state distributed feedback laser
M. Pank, T. Woggon, M. Strauch, M.P. Heinrich, C. Kamutsh, U. Lemmer, University of Karlsruhe, Germany; S. Mozer, Technical University, Braunschweig, Germany; M. Bruendl, Forschungzentrum Karlsruhe, Germany; D.G. Robus, University of California, Santa Cruz, USA; T. Weimann, Physikalisch-Technische Bundesanstalt, Braunschweig, Germany
The coupling of an organic semiconductor solid-state distributed feedback laser into polymeric waveguides is demonstrated. By combining nanoimprint lithography, deep-UV waveguide patterning and vacuum deposition techniques the fabrication process is optimized regarding wafer-scale production.
Passively Q-switched core-doped ceramic Nd:YAG laser with Sm:YAG cladding
R. Huss, R. Wilhelm, J. Neumann, D. Kracht, Laser Zentrum Hannover eV, Germany
A core-doped ceramic Nd:YAG laser longitudinally pumped by a q-cw laser diode stack is presented. Applying passive Q-switching a pulse energy of 5.9 mJ in 3.9 ns was achieved.

Effect of higher-order dispersions on the chirped-pulse oscillator stability
V.L. Kalashnikov, Technical University, Vienna, Austria; A. Apolonski, Ludwig Maximilians University, Garching, Germany
We found that higher-order dispersions cause irregular pulsations of the chirped-pulse oscillator. The negative fourth-order dispersion improves substantially the oscillator stability and reduces its dependence on the pulse energy.

Highly-directional sources by periodic and non-periodic dielectric rods
J. Sánchez-Dehesa, A. Martínez, M.A. Piqueras, R. García, Polytechnic University of Valencia, Spain; A. Håkansson, International Center for Young Scientist, Tsukuba, Japan
Omnidirectional point sources emit highly-directional radiation by two different mechanisms. The first made use of a photonic crystal designed to posses a small and negative index of refraction. The second made use of inverse design.
Diode side-pumped, high efficiency Nd:YVO₄ laser and improvement in beam quality

F. A. Camargo, U. Wetter, IPEN/USP, São Paulo, Brazil

We demonstrate high efficiency with a side-pumped Nd:YVO₄ laser using total internal reflection at grazing incidence and improved beam quality, with a novel laser cavity with joint stability zones.

The quantum noise limits to simultaneous intensity and frequency stabilization of solid-state lasers

E.H. Huntington, University of New South Wales, Canberra, Australia; M. Heurs, Max-Planck-Institut für Gravitationphysik, Hannover, Germany; C. C. Harb, University of New South Wales and Australian National University, Canberra, Australia

We incorporate the coupling between pump intensity and laser frequency noise into a quantum mechanical model for a solid-state laser. A frequency feedback loop can reduce laser intensity noise to below the quantum noise limit.

Improved saturation in side pumped rod amplifiers using core doped Nd:YAG ceramic rods

A. Straßer, M. Ostermeyer, University of Potsdam, Germany

Core doped Nd:YAG ceramic rods are employed in an amplifier setup. SBS-phase conjugating mirrors are applied to compensate phase distortion of rods refractive index step. Brightness enhancement of two is demonstrated compared to crystal rod.

Simultaneous dual-wavelength emission on the 4F3/2 to 4I31/2 and 4F3/2 to 4I11/2 transitions employing Nd-based thin-disk lasers

N. Pavel, Solid-State Quantum Electronics Laboratory, Bucharest, Romania; K. Lusniedt, K. Petermann, G. Huber, University of Hamburg, Germany

Simultaneous dual-wavelength emission at 0.9-microns and 1.06-microns is demonstrated with Nd-laser materials in thin-disk configuration. Output powers of 1.7-W at 912-nm and 1.6-W at 1063-nm were obtained simultaneously from a 300-micrometers thick Nd:GdVO₄ crystal disk.

Compact, high peak power, diode pumped, Q-switched Trn:YLF laser

J.K. Jabczynski, W. Zenndzian, J. Kwiatkowski, Military University of Technology, Warsaw, Poland; H. Jelinkova, M. Nemec, J.K. Such, Czech Technical University Prague, Czech Republic

Using acousto-optic modulator the stable Q-switch regime was obtained with Trn:YLF diode pumped laser. Pulses 15-nsec long up to 300-kW peak power were generated on 1903-nm wavelength.

Highly thermal-shock-resistant operation of diode edge-pumped, composite all-ceramic Yb:YAG microchip lasers

M. Tsunekane, T. Taira, Institute for Molecular Science, Okazaki, Japan

414-W cw output power was obtained from a 3-mm-diameter, Yb-doped ceramic YAG core in diode edge-pumped microchip lasers and the thermal stress is estimated to be twice the tensile stress limit of single-crystal YAG.

Enhancing sun-pumped laser performance by a truncated fused silica elliptical pump cavity

L. Liang, R. Pereira, P. Bernardes, New University of Lisbon, Campus de Caparica, Portugal

Solar laser power is significantly enhanced by pumping a 4-mm Nd:YAG rod within a truncated fused silica elliptical pump cavity, resulting in the calculated collection efficiency of 10.5-W/m² and a nearly symmetrical laser beam profile.

2-mJ picosecond Nd:YAG slab laser passively Q-switched and mode-locked using multiple quantum well saturable absorbers

V. Kubecik, H. Jelinkova, Czech Technical University, Prague, Czech Republic; W. Zenndzian, J.K. Jabczynski, J. Kwiatkowski, Military University of Technology, Warsaw, Poland; A. Stintz, J.-C. Diels, University of New Mexico, Albuquerque, USA

Operation of Nd:YAG slab laser side pumped by quasi-continuous laser diode passively mode locked using semiconductor saturable absorber is reported. Trains with energy up to 2 mJ and pulse duration of 65 ps were generated.

High-power end-pumped lasers with Ybd:Ca_3 (BO_3) _4 and Ybd:Gd_3(WO_4) _3

J.E. Hellström, V. Pasikievicis, F. Laurell, KTH - Royal Institute of Technology, Stockholm, Sweden; V. Harvath, Research Institute for Solid State Physics and Optics, Budapest, Hungary; B. Denker, B. Galagan, L. Ivela, S. Sergey, General Physics Institute, Moscow, Russia

A comparative experimental and theoretical study between Ybd:GdCOB and Ybd:KGW under diode-bar pumping has been performed. Output powers of 7.3-W and 9-W were obtained from 4.34-mm and 3-mm long crystals, respectively. Self-frequency doubling experiments are also discussed.

Enhancing of 1kW PW laser beamline in SG-II facility

G. Xu, J.X. Zhu, Z.X. Lin, Shanghai Institute of Optics and Fine Mechanics, Shanghai, China; T. Wang, Y.P. Dai, Y. Gu, Shanghai Institute of Laser Plasma, Shanghai, China

With energy upgrade program of SG-II laser facility in Shanghai, a Petawatt laser system is under construction. According to the schedule, the installation of optics and mechanics will be finished by the middle of 2009.

Multichannel laser system with phase conjugation and interchannel phase locking by laser gain hologram

T.T. Basiev, V.V. Osiko, Laser Materials and Technology Research Center of GPI, Moscow, Russia; S.N. Smetanin, A. V. Fedin, A. V. Gavniov, Krovov State Technological Academy, Krovov, Russia

A method of phase locking of multichannel laser system by gain holograms in active media is developed. For different architecture of the multichannel laser system the oscillation dynamics and interchannel phase-locking conditions at a variation of the laser-channel gain mismatch are considered.

Laser operation at 1.3-µm of 2 at.% doped crystalline Nd:YAG in a bounce geometry and second harmonic generation

D. Sauder, A. Minassian, M.J. Danzen, Imperial College London, United Kingdom

Laser operation of 2 at.% doped crystalline Nd:YAG in a bounce amplifier geometry at 1.3 µm is demonstrated with 16.7-W multimode and 11-W single mode as well as Q-switched operation and second harmonic generation.

Pulse dynamics of Raman microchip-lasers

V.A. Orlovich, V.V. Voitikhov, A.S. Grabtchikov, V.A. Lisinskitki, Stepanov Institute of Physics Minsk Belarus; A.A. Demidovich, M.B. Danailov, Laser Lab Sincrotrone, Trieste, Italy

Pulse dynamics of microchip-lasers with intracavity stimulated Raman scattering has been investigated experimentally and theoretically. 90 to 180 ps two Stokes pulses with peak power up to 50 kW were generated and described theoretically.

New methods of mode conversion and brightness enhancement in high-power lasers

G. Machovanska, Y. Lumes, I. Moshe, A. Meir, S. Jackel, Sorag NRC, Yavne, Israel; N. Davidson, Weizmann Institute of Science, Rehovot, Israel

We present two new methods for conversion of a radially-polarized LG(0,1)* mode to a nearly-polarized nearly-Gaussian beam. As result of mode conversion, the laser beam brightness was enhanced by factors of ~2.5 and ~1.86.

Unstable resonator for diode pumped 3000W CW Nd:Yag laser

I.V. Glukhikh, S.S. Polikarpov, A.V. Stepanov, S.V. Frolov, D.V.Efremov Institute, St.-Petersburg, Russia

The original unstable resonator for diode pumped CW Nd:Yag laser is presented. Two diffraction limited laser beam divergence was achieved. The output power of laser beam is 3000W.

Timelaser material: growth, spectroscopy and laser results

F. Cornacchia, D. Parisi, M. Tonelli, Università di Pisa, Italy

We report the growth, spectroscopy and laser results of Tm:LiLuF₄ single crystals (doping density 0.3%, 8%, 12%, 16%). We obtained 55.7% as maximum slope efficiency with a maximum output power of 280 mW and a minimum threshold of 50 mW.

Synthetic diamond as an intracavity heatspreader in compact solid-state lasers

P. Millar, A. J. Kemp, F. van Loon, A.J. Maclean, D. Burns, University of Strathclyde, Glasgow, United Kingdom

Intracavity use of synthetic diamond for thermal management in compact diode-pumped
laser operation of highly doped TGT grown Nd:YAG in a bounce geometry. A. Minassian, D. Sauder, M.J. Damzen, Imperial College London, United Kingdom; B. Jiang, H. Li, J. Xu, Shanghai Institute of Optics and Fine Mechanics, Shanghai, China

We demonstrate for the first time laser operation of highly-doped temperature-gradient Technique grown 2-3 at.% Nd:YAG samples in the bounce amplifier geometry. 20W multimode and 11.6W of high beam quality output at 1064nm was obtained.

CA-19-MON
Efficient high energy Raman laser for troposphere ozone lidar
V.A. Orlovich, A.S. Grachtchikov, I.A. Lisinetskii, PI. Shpak, National Academy of Sciences, Minsk, Belarus

Raman laser generated 563 nm radiation was developed. Output energy was up to 90 mJ, quantum efficiency was 70%. Frequency doubling produced 281 nm radiation with energy up to 13 mJ for ozone lidar.

CA-20-MON
Quasi-continuous wave solid-state Raman laser system generating 22 lines from the ultraviolet to near infrared
A.J. Vodchits, A. Stepanov, Institute of Physics, Minsk, Belarus; H.J. Eckler, Technical University, Berlin, Germany

Low-threshold and efficient Raman laser based system generating highly repetitive nanosecond pulses from the ultraviolet to infrared is developed.

CA-21-MON
Quasi three level laser operation below 946 nm in Nd:YAG and blue light generation
M. Castaing, E. Herault, F. Boltenois, P. Georges, Laboratoire Charles Fabry de l'Institut d'Optique, Palaiseau, France

We present the first demonstration of a 899 nm laser-emission in a Nd:YAG-crystal, on the F_{2} + 1 transition. Average power of 630mW at 899nm and 100mW at 450nm after SHG operation have been performed.

CA-22-MON
Low-threshold deep-blue organic thin-film distributed feedback laser
H.C. Cheng, H.W. Lin, C.C. Wu, K.T. Wang, C.H. Kuan, National Taiwan University, Taipei, Taiwan

A low-threshold deep-blue distributed feedback organic solid-state lasers based on the terfluorene was made.

CA-23-MON
Factors affecting tunable second harmonic generation in a semiconductor-disk laser with an intracavity diamond heatspreader
A.J. Maclean, A.J. Kemp, M.D. Dawson, D. Burns University of Strathclyde, Glasgow, United Kingdom; K.S. Kim, J.Y. Kim, T. Kim, Samsung Advanced Institute of Technology, Gyeonggi-Do, South Korea

Second harmonic generation allows the design wavelength of the semiconductor disk laser to be extended to the visible and UV. Issues such as polarization and tuning have been investigated to improve performance.

CA-24-MON
Diode-pumped 1.06-µm Nd_{3+}:NaLa(MoO_{4})_{2} laser without pump-wavelength stabilization
K.A. Subbotin, D.A. Lis, M.N. Chromov, S.N. Ushakov, A.M. Prokhorov General Physics Institute of RAS, Moscow, Russia; A.M. Omishchenko, V.A. Roman’yuk, A.V. Shestakov, M.F. SteMaKh Polyus Research & Development Institute, Moscow, Russia; E.V. Zharikov, D.I. Mendeleev University of Chemical Technology, Moscow, Russia

The laser action of Nd_{3+}:NaLa(MoO_{4})_{2} crystal was obtained in free-running and Q-switch regimes with longitudinal diode-pumping. Very low sensitivity of lasing efficiency to diode pumping wavelength fluctuations has been demonstrated.

CA-25-MON
A direct generation of a high power (>7W) Laguerre-Gaussian output from a diode-pumped Nd:YVO_{4} 1.3 µm bounces laser
M. Okida, M. Itoh, Y. Taya, University of Tsukuba, Japan; A. Tonouchi, T. Oomatsu Chiba University, Chiba, Japan

We demonstrated a direct generation of a high power Nd:YVO_{4} 1.3µm bounce amplifier with an asymmetric cavity configuration. The maximum output of 7.7W was obtained.

CA-26-MON
Fourier-transform limited ns-pulses tunable over a wide spectral range using a Ti:Sapphire laser and non-linear frequency conversion processes
D.D. Depenheuer, H. Glässl, T. Walther, Technical University, Darmstadt, Germany

We report on a Fourier transform limited nanosecond Ti:Sapphire laser system with high conversion efficiencies in higher harmonic generation so as to stable and efficient sum frequency mixing with the pump pulse.

CA-27-MON
Magneto-optical elements shortening - the way towards Faraday isolators for high average laser power

The effect of the thermally induced depolarization of laser radiation in Faraday isolators suppression by the magneto-optical element shortening is investigated. The advantages of using the disk-shaped magneto-optical elements are shown.

CA-28-MON
Direct pumping of Nd:YAG at 946nm
S.G. Goldring, R.L. Vali, Soreq NRC, Yavne, Israel

Pumping of Nd:YAG at 946nm and lasing at 1064nm was demonstrated. A 20cm long 1% at. Nd:YAG rod along with end-pumping with Ti:Sapphire were used in order to cover the absorption coefficient of 0.06cm^{-1}.

CA-29-MON
High-energy diode-pumped picosecond multi-pass Nd:GdVO_{4} laser source for nonlinear optical spectroscopy
V.I. Shcheslavyiskiy, R. Leitgeb, T. Lasser, Ecole Polytechnique Fédérale de Lausanne, Switzerland; W.A. Clarkson, University of Southampton, United Kingdom

We report CW passive modelocking in a laser-diode-pumped Nd:GdVO_{4} laser. The system produces up to 500nJ, 4-ps pulses with an average power of 6W. High-power broadband continuous generation is demonstrated in a highly GeO_{2} doped fiber.

CA-30-MON
Eye-safe Nd:SmO_{4} Raman laser
J. Sulc, H. Jelínková, Czech Technical University, Prague, Czech Republic; T.T. Basieva, L.N. Nvea, M.E. Doroshenko, V.V. Osiko, P.G. Zverev, General Physics Institute, Moscow, Russia

Raman laser was constructed on the base of Nd:SmO_{4} material lasing at 1378 nm and Q-switched by YAG crystal. Emission at 1569.8 nm was obtained in 8.7 ns long pulse with peak power 92 kW.

CA-31-MON
Solid-state optical parametric oscillator with a closed-loop wavelength stabilization as a front-end of a high-power iodine laser system
L. Kral, Academy of Sciences, Prague, Czech Republic

We describe an automated wavelength stabilization system for a solid-state optical parametric oscillator. The stabilization enables us to use the oscillator as a front-end of a high-power gas laser system.

CA-32-MON
Thermally induced birefringence in edge-pumped microchip Yb:YAG ceramic
T. Dasari, Institute of Molecular Science Okazaki, Japan and Solid-State Quantum Electronics Laboratory, Bucharest, Romania; O. Oishi, Institute of Molecular Science Okazaki and RIKEN, Tokyo, Japan; M. Tsukane, T. Taira, Institute for Molecular Science, Okazaki, Japan; K. Midorikawa, RIKEN, Tokyo, Japan

Thermal-induced birefringence in edge-pumped ceramic composite gain media was investigated. The depolarization was 0.02 under non-pumping condition and increases to 0.09 at 437W pump power. Local variations of depolarization values were observed due to grain orientation.

CA-33-MON
Laser gain dependence on Yb:YAG ceramics temperature
J. Kawanaaka, A. Yoshida, Osaka University, Osaka, Japan; M. Fujijs, Institute for Laser Technology, Osaka, Japan; T. Kawashima, Hamamatsu Photonics, Shizuoka, Japan; H. Yagi, T. Yamagata, Konoshima Chemical Co. Ltd., Kagawa, Japan

Laser gain of a diode-pumped Yb:YAG ceramics has been measured at low pump intensity for various material temperatures by using a regenerative amplifier. A high small signal gain of g0=1.5cm^{-1} was obtained at 2kW/cm^{2}.

CA-34-MON
Continuous wave dual-wavelength operation at 1048 and 1386 nm in Nd^{3+}:LaBGeO_{4} for yellow laser light generation
M.L. Rico-Soliveres, Universidad de Alicante; Spain; J.L. Valdes, J. Martinez-Pastor, Instituto de Ciencia de Materiales, Valencia, Spain; J.A. Pereda, J. Capmany, Universidad Miguel Hernandez, Elche, Spain

We report continuous-wave simultaneous oscillation at 1048 and 1386 nm in a Nd^{3+}:LaBGeO_{4} nonlinear crystal with potential application in...
yellow laser light generator at 597 nm through intracavity sum-frequency mixing or by self-frequency conversion.

**CA-35-MON**

**Intracavity second harmonic generation of rapid and random wave-length tuned picosecond pulsed laser and its biological applications**

Y. Maeda, Y. Umoto, M. Yamashita, Tokyo University of Science, Chiba, Japan; N. Norihito, T. Ogawa, S. Wada, RIKEN, Saitama, Japan

We have achieved rapid and random wave-length tuned picosecond pulsed laser and intracavity second harmonic generation in the wavelength region from ultraviolet to blue region. The laser system was applied to the laser microscope with fluorescence protein.

**CA-36-MON**

**Frequency doubling of visible Pr-laser radiation in continuous wave and pulsed mode**

A. Richter, G. Huber, E. Heumann, University of Hamburg, Germany; Y. Ostroumov, W. Seermt, Coherent Lübeck GmbH, Lübeck, Germany

We report on efficient UV generation using visible Pr-lasers in cw and pulsed mode. 364 mW cw and 4.7 W UV peak power were achieved recently corresponding to conversion efficiencies of 61% and 43%, respectively.

**CA-37-MON**

**Power control of a low noise CW diode-pumped solid-state UV laser**

N. Aubert, T. Georges, C. Chauzat, R. Le Bras, Oxxius SA NAD Opt, Lannion, France; P. Fior, ENSAT, Lannion, France

Low noise lasers in the UV spectrum are important for many analytical applications. We report in this paper power control of a low noise Diode-Pumped-Solid-States-Laser operating at 355 nm by intra-cavity third harmonic.

**CA-38-MON**

**Fast eigenmode solution with a saturable-gain ABCD matrix**

E. J. Grace, Imperial College London, UK

An ABCD matrix based on an explicit solution to the gain saturation equation is reviewed. Acceleration of the steady-state solution for mode shape and power is demonstrated.
CF-12-MON
Enhancement of supercontinuum generation in microstructured optical fibers with periodic modulation of the core diameter
Y.A. Mashinina, L.A. Melnokov, A.I. Konyukhov, Saratov State University, Saratov, Russia
A new approach is proposed to enhance supercontinuum generation by periodical modulation of the diameter of microstructured optical fiber. Simulations show that this scheme allows to reduce spectral gaps and to increase bandwidth of supercontinuum.

CF-13-MON
Highly-chirped similaritons generation from a mode-locked fiber laser C. Chélot, G. Martel, A. Hider, Groupe d’Optique et d’Optronique, Saint Etienne du Rouvray, France; Ph. Grelu, Université de Bourgogne, Dijon, France
We report large-aperture volume holographic Chirped Bragg Reflectors recorded in a photopolymer material. It permits to realize compact optical pulse stretchers (230-ps) for femtoseconds lasers.

CF-16-MON
Toward programmable ultrashort pulse characterization N. Forget, T. Oksenenhnder, S. Coudreau, Fastlite, Palaisseau, France; M. Joffre, Eole Polytechnique, Palaisseau, France
We demonstrate a programmable pulse characterization device based on an acousto-optic programmable dispersive filter. Both SF-FROG and SPIDER signals are obtained with a single optical setup. Experimental demonstration is provided on an amplified femtosecond system.

CF-17-MON
Transverse phase-matched second-harmonic generation from counter-propagating beams for characterising ultrashort pulses R. Fischer, A.A. Sukhorukov, D.N. Neshev, V. Kröklowski, Yu.S. Kivshar, Australian National University, Canberra, Australia; S.M. Saltiel, Australian National University, Canberra, Australia and Sofia University, Sofia, Bulgaria
We demonstrate a novel technique for the characterisation of ultra-short pulses based on transverse phase-matched second-harmonic generation from counter propagating beams in crystals with random ferroelectric domains. Our technique proves simplicity, cost-effectiveness and compactness.

CF-18-MON
Holographic bulk grating in a photopolymer for pulse stretching in a CPA laser S. Laux, V. Rachet, B. Loiseau, JP Huignard, Thales Research and Technology, Palaisseau, France; G. Cheriaux, M. Merano, Laboratoire d’Optique Appliquée, Palaisseau, France

CF-19-MON
We experimentally demonstrate efficient spectral broadening of 200-nJ, chirped, 150-fs pulses in a single-mode fibre without damage problems. The achieved spectrum (also supported by simulations) corresponds to a 7-8 fs transform limited pulse duration.

CF-20-MON
MÉFISTO characterization of broadband pulse from a single mode fibre for in situ nonlinear microscopy A. Thayil, E.J. Gualda, I. Amat-Roldán, D. Artigas, P. Loza-Alvarez, ICFIO-Institut de Ciencies Fotoniques, Castelldefels, Spain
Standard single mode fibre is used to increase the available bandwidth of the pulses from a pulsed laser. These pulses were then fully characterized at the sample plane of a nonlinear microscope using MÉFISTO.

CF-21-MON
Thin-film dispersion compensator for mode-locked fibre lasers L. Ortuña, H. Herda, T. Hakulinen, O.G. Okhotnikov, Tampere University of Technology, Finland
We demonstrate a thin-film Fabry-Perot glass etalon operated as compact, easy to align and tunable dispersion compensator in a mode-locked ytterbium fibre-laser cavity. The anomalous group-delay dispersion is sufficient to ensure soliton operation.

CF-22-MON
Electroabsorption modulation based on intersubband transitions K.-M. Wong, D.W.E. Allsopp, University of Bath, United Kingdom
The scope for using intersubband absorption for electroabsorption modulation has been investigated. Rapid changes in intersubband absorption coefficient with electric field are predicted for modulation doped In0.53Ga0.47As/AlAs deep single and coupled quantum wells.

CF-23-MON
Towards an understanding of white-light generation in cubic media polarization properties across the entire spectral range I. Bucharov, A. Trifonov, F. Fiebig, Boston College, Chestnut Hill, USA
The polarization of the white-light generated in CaF2 shows strong spectral dependence which reveals the self-transformation dynamics of ultrashort laser pulses into white-light proposed technique of phase-matched excitation by a short optical pulse with tilted intensity front.

CF-27-MON
Micro structuring of photoresist with femtosecond laser pulses S. Zappe, Vienna University of Technology and Vorarlberg University of Applied Sciences, Dornbirn, Austria; C. Choleva, S. Partel, P. Hudek, Vorarlberg University of Applied Sciences, Dornbirn, Austria; G.A. Reder, Vienna University of Technology, Vienna, Austria; H. Huber, M. Lederer, J. Aus der Au, HighQlaser Production GmbH, Hohenems, Austria
We present recent results on selective laser ablation of thick photoresists from dielectric substrates as a critical process step in MEMS prototyping. The laser used was a ultrafast Yb:Glass regenerative amplifier (HighQlaser Inc.).

CH-1-MON
Inline cryogenic temperature sensors based on photonic crystal fiber Bragg gratings infiltrated with noble gases for Harsh space applications J. Floros, S. Vasheny, K. Saitoh, Y. Tsuchida, T. Murao, M. Koshiba, Hokkaido University, Sapporo, Japan
We propose the use of photonic-crystal-fiber Bragg-gratings as platforms for remote monitoring of cryogenic temperature variations especially for space applications. The overall performance was found to be superior compared to conventional fiber-Bragg-gratings.

CH-2-MON
Simultaneous three-wavelength depolarization Lidar using a coherent white light continuum T. Somekawa, C. Yamakato, Osaka University, Osaka, Japan; M. Fujita, Institute for Laser Technology, Osaka, Japan; M.C. Galvez, De La Salle University, Manila, Philippines
A white light continuum generated in a krypton gas cell at the atmospheric pressure was used to a Lidar light source. We have successfully
perform ultrasound 3-plane depolarization measurements of aerosols and clouds.

CH-3-MON
Low insertion-loss (1.8 dB) and vacuum-pressure all-fiber gas cell based on hollow-core PCF
F. Benabd, P.S. Light, F. County, University of Bath, United Kingdom
A novel Hollow-Core-PCF acrylens-cell fabrication-technique based on helium-diffusion through silica is reported. The gas cell combines low insertion loss (1.8 dB) and low pressure (0.001 mbar). Electromagnetically-Induced Transparency was used to determine the final acrylens-pressure.

CH-4-MON
Dynamic properties of integrated ring laser gyroscopes
S. Mikroulis, H. Mousos, D. Syridis, University of Athens, Greece; M. Hamacher, U. Tropenz, H. Heidrich, Fraunhofer Institute for Telecommunications, Berlin, Germany
The ring laser properties related to the single mode bidirectional operation and the lock-in limit, are investigated for angular velocity sensor applications using a multimode rate equation model.

CH-5-MON
Frequency measurement of the iodine transitions at 515 nm with a Cr:Forsterite comb
S.V. Cheparov, V.I. Denisov, S.A. Kuznetsov, M.V. Okhapkin, V.S. Pivtsov, M.N. Skvortsov, V.M. Klementyev, V.F. Zhakharyan, Institute of Laser Physics SB RAS, Novosibirsk, Russia
We present initial results on the frequency measurement of molecular iodine transitions in the wavelength range of 515 nm by means of a frequency comb generated from mode-locked Cr:Forsterite laser in highly nonlinear optical fiber.

CH-6-MON
Thermal lens spectroscopy gas sensing based on etalon-stabilized
A. Yarai, T. Nakamichi, Osaka Sangyo University, Osaka, Japan
We propose the gas-sensing apparatus based on an etalon-stabilized wavelength sweep technique for fiber laser. Our apparatus offers high performance compared with our conventional, especially in the measured dynamic range, which is ten times greater.

CH-7-MON
Laser-spectroscopic detection of methyleneimines for human breath analysis
D. Marinov, J. M. Rey, M. W. Sigrist, ETH Zurich, Switzerland
Comparison between near-IR (based on CRDS) and mid-IR (based on DFg and multipass absorption) laser-spectroscopic techniques for detection of methyleneimines in multi-component gas mixtures is presented. Possible improvements for in-situ human breath analysis are discussed.

CH-8-MON
Doppler global velocitometry with sinusoidal laser frequency modulation and a molecular absorption cell: error investigation
A. Fischer, L. Bittner, J. Czarske, Dresden University of Technology, Dresden, Germany; M. Eggert, H. Muller, PTB Braunschweig, Germany
For measuring flow velocity fields, the Doppler frequency shift of scattered light is detected using a laser with sinusoidal frequency modulation and a molecular absorption cell. The influence of scattered light fluctuations is described.

CH-9-MON
Flexible lock-in detection system based on synchronized computer plug-in boards applied in sensitive diode-laser gas spectroscopy
M. Andersson, L. Persson, T. Svensson, M. Cassel-Engquist, S. Svanberg, Lund University, Sweden
A computer- and software-based lock-in measurement system with balanced detection for sensitive diode laser spectroscopy is described. Application to the monitoring of gas in solid scattering media, such as plants, is demonstrated.

CH-10-MON
Remote gas detection in solid scattering media using differential absorption lidar
M. Cassel-Engquist, M. Andersson, R. Grönlund, L. Persson, S. Svanberg, Lund University, Sweden
We propose remote monitoring of free gas inside scattering solid media, detected with differential absorption lidar (DIAL). Possible applications include avalanche victim localization and monitoring of snow-covered natural gas pipes.

CH-11-MON
Vectorial characterization of single-shot high power microwave pulses using pigtailed electro-optic sensors under outdoor conditions
M. Bernier, L. Duvillaret, IMEP, Grenoble, France; G. Martin, J.L. Coutaz, G. Gaborit, Université de Savoie, Chambery, France; J.L. Lasserre, Centre d’Etudes de Gramat, France
We present pigtailed electro-optic sensors and first results of high power microwave pulses obtained in outdoor with long fibre links (> 20 m) and constraining environmental conditions (temperature variations and mechanical vibrations).

CH-12-MON
All-cavity-driven cw ringdown spectroscopy with regulation of intracavity doppler frequency shifts
J.Y Lee, Y.S Yoo, E.S Lee, Korea Research Institute of Standards and Science, Daejeon, South Korea
We present a new design of all-cavity-driven cw-CRDS to minimize the intracavity Doppler shift of a probe light in a controllable fashion, as well as a firm theoretical background for the ringdown signal formation.

CH-13-MON
Characterization of particulates using ultra-short laser pulses
C.J.Ee, P. Gross, P.J.M van der Slot, K.J Bolier, University of Twente, Enschede, Netherlands
We analyze the optical dispersion of random media for the purposes of characterizing pharmaceutical powders. The random walk model shows that the time-dependent photon flux depends on the particle size distribution, and density.

CH-14-MON
Micro-resonator-array for high-resolution spectroscopy
G. Schweiger, R. Nett, Ruhr-University Bochum, Germany
It is shown that an array of microspheres placed on a microscope glass, that serves as waveguide can be used to determine wavelength differences with a resolution better than 0.1 nm.

CH-15-MON
Detection of H2S based on off-axis integrated cavity output spectroscopy
W. Chen, D. Boucher, Université du Littoral, Dunkerque, France; A.A Kosterev, K.T.ittel, Rice Quantum Institute, Houston, TX, USA
Spectroscopic detection of H2S has been demonstrated by means of DBF diode laser-based off-axis integrated cavity output spectroscopy (OA-ICOS) at ~1571.6 nm. A minimum detectable H2S concentration of 700 ppb (SNR=3) was achieved.

CH-16-MON
Polymer optical coatings for moisture monitoring
J. Vaughan, P.J. Scully, N.P. Woodyatt, The University of Manchester, United Kingdom
Polymer optical coatings to detect moisture were developed to clad polymer optical fibres (POF). Claddings were sensitized to moisture to affect the evanescent field and thus the light guided within the fibre, for measuring sweat.

CK-1-MON
Frequency and time domain analysis of cavity plasmon waveguides
G. Gantziouni, N. Stefanou, University of Athens, Greece
Guiding of light through surface plasmons in chains of weakly coupled dielectric (silicon) spherical nanoparticles in a metallic material (gold) is studied by means of multiple-scattering frequency- and time-domain calculations.

CK-2-MON
Optical modes in coupled pillar microcavities
M. Karl, S. Li, T. Passow, W. Wolf, E. Muller, D. Gerthsen, H. Kalt, M. Hettich, University of Karlsruhe, Germany
We report on the fabrication and investigation of microcavities consisting of unequal coupled pillars with embedded quantum dots achieving optical modes either localized in one of the pillars or delocalized over the whole photonic structure.

CK-3-MON
Iridescent coleoptera as templates for fabrication of versatile SiO2/TiO2 multilayer mirrors and filters
O. Deparis, C. Vandenbem, V. Welch, M. Rassart, V. Louaye, J.P. Vigneron, V. De Vriendt, S. Lucas, Facultés Universitaires Notre-Dame de la Paix, Namur, Belgium
We report on reflectance of biology-inspired SiO2/TiO2 multilayer films deposited on glass substrate by dc magnetron sputtering. We show how radically different visual aspects can be obtained using the same materials but different multilayer designs.

CK-4-MON
Stable optical kinks at the edge of harmonic photonic lattice
V.A. Vysloukh, Universidad de las Americas, Puebla, Mexico; Y.V. Kartashov, L. Torner, Institut de Ciencies Fotòniques, Barcelona, Spain
We report formation of stable optical kinks at the edge of harmonic lattice imprinted in a
CK-5-MON
Photic effect study on polystyrene 3D-photonic crystals at near-field range: dependence on the wavelength and on the lattice parameter
J. Canet-Ferrer, J. Martinez-Pastor, J. Marques, Valencia University, Paterna, Spain; F. Meseguer, Valencia Politecnica University, Valencia, Spain; H.J. Shapie, T. Palberg Johannes Gutenberg University, Mainz, Germany
A scanning near-field optical microscope is used to acquire reflection and transmission images of 3D-photonic crystals. As a result, the near-field photonic effects can be compared with the far-field measurements at different wavelengths.

CK-6-MON
Interplay of major mechanisms of the light-induced transmission in one-dimensional Cu/SiO₂ photonic crystals
M. Halonen, A. Lehmusmara, M. Kuittinen, Y. Svirko, University of Joensuu, Finland
Femtosecond time-resolved measurements in Cu/SiO₂ layered structure reveal the difference in the response time of major mechanisms of optical nonlinearity results in the pronounced dependence of the nonlinear transmission spectrum on the pump–probe delay.

CK-7-MON
Random laser action in ZnO nanohybrids
A.S. Stassinopoulos, Foundation for Research and Technology and CretE University, Heraklion, Greece; D.P. Papazoglou, Crete University, Heraklion, Greece; S.A. Anastasiadis, D.A. Anglos, Foundation for Research and Technology, Heraklion, Greece; E.P.G. Giannelis, E.T. Tzagarakis, R.N. Das, Cornell University, Ithaca, NY, USA
Random laser action is demonstrated in organic/inorganic disordered hybrid materials consisting of ZnO semiconductor nanoparticles. Critical laser and materials parameters, which influence the observed laser-like emission behavior, are investigated in a series of nanocomposites.

CK-8-MON
Effect of lithography stitching errors on Silicon-on-Insulator photonic wires
M. Gnan, University of Glasgow, United Kingdom and University of Ferrara, Italy; M. Sorel, D.S. MacIntyre, P. Pottier, S. Thorns, R.M. De La Rue, University of Glasgow, United Kingdom
The effect of lateral offsets in Silicon-on-Insulator photonic wires was assessed by 3D-FDTD simulations and experimental transmission measurements. The results show that the device performance can be greatly enhanced by using lithography stitching correction techniques.

CK-9-MON
Transverse mode structure of hemispherical microcavities
G. D’Alessandro, R.C. Pennington, M. Kaczmarek, J.J. Baumberg, University of Southampton, United Kingdom
We grow arrays of micro-cavities formed by a hemispherical dimple and a planar mirror. We report the experimental and theoretical analysis of their mode structure and spectrum.

CK-10-MON
Dynamics and instabilities of non-linear Fano resonances in photonic crystals
A.E. Miroshnichenko, Y. Kivshar, Australian National University, Canberra, Australia; R. Iliev, C. Erich, F. Lederer, Friedrich Schiller University, Jena, Germany
We study the dynamics of nonlinear Fano resonances in photonic crystals. We recover the bistable transmission curves predicted in the stationary regime and show that the time-dependent problem demonstrates many novel phenomena including modal modulation instability.

CK-11-MON
Light emitting polymer nanofibers: energy transfer, waveguiding and photostability
A. Camposeo, R. Cingolani, E. Mele, F. Di Benedetto, L. Persano, D. Pisignano, National Nanotechnology Laboratory, Lecce, Italy
Conjugated polymer nanofibers are fabricated by electrospinning technique and their optical properties investigated. Nanofibers show photoluminescence in the whole visible and near infrared range, self-waveguiding of the emission and color tunability through Förster energy transfer.

CK-12-MON
Modification of planar waveguide facet reflectivity with subwavelength gratings
We demonstrate experimentally and by simulations the use of subwavelength gratings etched into the facets of planar waveguides as a means to control facet reflectivity over a wide range from antireflective to highly reflective.

CK-13-MON
Nanostructured metallic electrodes for optoelectronic devices
J. Hetterich, K. Huska, U. Geyer, U. Lemmer, Karlsruhe University, Germany; G. Bastian, Fachhochschule Trier, Germany; S.G. Tikhodeev, N.A. Gippius, A.M. Prokhorov General Physics Institute RAS, Moscow, Russia; G. von Plessen, RWTH Aachen University, Germany
We present an optimized design of subwavelength metallic electrodes for enhanced detection in metal-semiconductor-metal photodetectors and efficient light extraction from light emitting diodes by means of coupling of light to the plasmonic resonances.

CK-14-MON
Amplified spontaneous emission from a microtube cavity with whispering gallery modes
Y.F. Rakovich, S. Balakrishnan, Y. Gunko, T.S. Perova, A. Moore, J.F. Donegan, Trinity College Dublin, Ireland
A detailed study of the modes in small microwire cavity with quality factor up to 3500 is presented. Intensity dependent modification of the emission decay confirms the occurrence of amplified spontaneous emission from single microcavity.

CK-15-MON
Photonic bandgap guiding in an opal clad fibre
L.A. Stewart, G.D. Marshall, M.J. Withford, J.M. Dawes, A. Rahmani, Macquarie University, Sydney, Australia
We demonstrate bandgap guiding in a single mode optical fibre that is clad with a self-assembled photonic crystal. Increased transmission is observed for wavelengths within the photonic bandgap for light travelling down the cladding.

CK-16-MON
Near-field mapping of three-dimensional woodpile photonic crystals by using supercontinuum generation
B. Jia, J. Li, M. Gu, Swinburne University of Technology, Victoria, Australia
In this paper we demonstrate highly localized near-field characterization of three-dimensional photonic woodpile crystals by using supercontinuum generation in a multi-mode fibre as a bright broadband source in the near infrared region.

CK-17-MON
High band anomalous group velocity dispersion for the enhancement of the nonlinear interaction
M. Maymo, J. Martorell, IFCA- Instituto de Ciencias Fotoniques, Castelldefels (Barcelona) and Universitat Politècnica de Catalunya, Terrassa, Spain; A. Molinos-Gomez, IFCA-Instituto de Ciencias Fotoniques, Castelldefels (Barcelona), Spain; A. Mihi, H. Miguez, Instituto de Ciencia de Materiales de Sevilla, Spain
SHG in a centrosymmetric polystyrene opal is demonstrated. Taking advantage of the slow group velocity found at the flat bands opened at high energy levels, enhancement of this second order nonlinear interaction is possible.

CK-18-MON
Direct and inverse lattices of magneto-optical materials: a theoretical analysis
A. Garcia-Martin, J.B. Gonzalez-Diaz, G. Armelles, Instituto de Microelectronic de Madrid, CSIC, Tres Cantos, Spain
In this work we analyze the dependence of the magneto-optical properties of a system consisting on periodically arranged Ni nano-wires embedded in a dielectric environment as well as its counterpart: a perforated membrane.

CK-19-MON
Analytic photonic crystal cavity design
D. Englund, I. Fushman, J. Vuckovic, Stanford University, USA
We describe an inverse–approach method for deriving photonic crystal structures and apply it to high-Q cavities. Beginning with a Bloch mode of a photonic crystal or waveguide, we derive a perturbative two-dimensional structure to confine a targeted mode.

CK-20-MON
Measurement of the brillouin gain spectrum of hollow-core photonic band-gap fibers
E. Benkler, H.B. Teile, Physikalisch-Technische Bundesanstalt, Braunschweig, Germany
We measured Brillouin gain spectra of hollow-core photonic band-gap fibers. They consist of several lines around 7.5 GHz, which are 4–5 orders of magnitude weaker than the prominent 11 GHz line of standard fibers.

CK-21-MON
Optical forces on quantum dots in the near field region of resonant metallic nano-structures
We use an adaptive-mesh-refinement version of the Finite Difference Time Domain 3D Maxwell solver to study the forces on quantum dots induced by near-field excitations in the vicinity of nano-metallic structures.

CK-22-MON
Self-starting superradiant lasing in photonic crystals
E.R. Kocharovsky, N.S. Ginzburg, A.S. Sergeev, Institute of Applied Physics of Russian Academy of Sciences, Nizhny Novgorod, Russia
Self-starting superradiant lasing and modified superfluorescence regimes in a two-level active sample of one-dimensional photonic crystal responsible for resonance back-scattering are found and investigated numerically for various values of the light bandgap and the vicinity of nano-metallic structures.

CK-23-MON
Terahertz time-domain spectroscopy of surface plasmon polaritons on periodic metal arrays
M. Marti, J. Darma, J. Kröll, K. Unterrainer, Vienna University of Technology, Vienna, Austria
We studied terahertz surface plasmon polaritons on periodic metal arrays. Their generation and propagation with respect to different geometries were investigated.

CK-24-MON
Reversal of asymmetry of the resonance in the reflectivity of 2-D photonic crystals
E.F.C. Driessen, D. Stolwijk, M.J.A. de Dood, Leiden University, Netherlands
Measured angle-dependent reflection spectra of two-dimensional GaAs photonic crystals show typical asymmetric line shapes. A Fano analysis using a 3x3 scattering matrix naturally includes the observed reversal of the asymmetry for angles beyond Brewster’s angle.

CK-25-MON
Sidewall roughness measurement of photonic wires and photonic crystals
M. Svitggaard, J.H. Frandsen, COM-DTU, Lyngby, Denmark; J. Garnes, A. Kühle, Danish Fundamental Metrology Ltd., Lyngby, Denmark
Atomic force microscopy on tilted samples is used to obtain detailed sidewall roughness measurements on photonic wires and photonic crystals. Point-like defects, vertical curtains and horizontal bands are revealed with sub-nm vertical resolution.

CK-26-MON
Fabrication of Er\textsuperscript{3+} active silica direct and inverse opals with high quantum efficiency
A. Chiappini, C. Armellini, A. Chiasera, M. Ferrari, Y. Jestein, CNR-IFN, Institute of Photonics & Nanotechnology, Povo-Trento, Italy; E. Maser, Trento University, Povo-Trento, Italy; G. Nunzi Conti, Centro Fermi & CNR-IFAC, Roma, Italy; S. Pelli, G. C Righini, CNR-IFAC, Firenze, Italy; G.C. Righini, CNR, Materials and Devices Dept, Roma, Italy
Er\textsuperscript{3+} active 3D photonic crystal in direct and inverse opal configuration were realized, on silica substrate, by sol-gel routes. Optical and spectroscopic properties were investigated and a high quantum efficiency of the systems were estimated.

CK-27-MON
Thermal and optical properties of SiO\textsubscript{2}/GaN opals by photothermal deflection technique
G. Lesch, R. Li Voti, C. Sibilia, M. Bertolotti, Universita di Roma La Sapienza, Roma, Italy; S. Kaplan, V. Golubev, D. Kuryukov, Ioffe Physico-technical Institute, Russian Academy of sciences, St.Petersburg, Russia
The thermal and optical properties of the SiO\textsubscript{2}/GaN synthetic opals are studied by photothermal deflection technique. This technique, used in different configurations, allows to determine the effective thermal diffusivity and the absorption spectra.

CK-28-MON
Femtosecond versus picosecond all-optical switching of 3D silicon photonic crystals near telecom wavelengths
P.J. Harding, T.G. Eiuser, W.L. Vos, FOM Institute for Atomic and Molecular Physics (AMOLF), Amsterdam, Netherlands; W.L. Vos, University of Twente, Amsterdam, Netherlands
We present time-resolved reflectivity spectra of optically switched three-dimensional Si photonic crystals. A surprising competition between non-degenerate two-photon absorption and Kerr non-linearity is observed within femtoseconds, while dispersive free carrier effects occur at picosecond times.

CK-29-MON
Distribution and emission properties of fluorescing nanospheres on 2D photonic crystal slabs
Y. Nazinzhadeh, R. Bornemann, J.G. Müller, U. Lemmer, M. Gerken, G. Bastian, Light Technology Institute Karlsruhe, Germany; D. Schelle, A. Tünnermann, E.B. Kley, Institut für Angewandte Physik, Jena, Germany
We prepared and characterized a sparse distribution of fluorescing nanospheres on two-dimensional Nb2O5-photonic crystal slabs. The spontaneous emission properties of single nanospheres are measured using confocal microscopy combined with time correlated single photon counting.

CK-30-MON
Resonant Zener tunnelling in triangular two-dimensional photonic lattices
A.S. Desyatnikov, Y.S. Kivshar, Australian National University, Canberra, Australia; Y.S. Shchesnovich, J.M. Hickmann, S.B. Cavalcanti, Universidade Federal de Alagoas, Maceio, Brazil
We study the interband Zener transitions in two-dimensional triangular photonic lattices and derive analytical Landau-Zener-Majorana models capturing the essence of the wave tunnelling phenomena. This analysis is verified by solving the wave propagation equation.
IB-1-MON
Zeeman slower based on magnetic dipoles
Y.B. Ovchinnikov, National Physical Lab., Teddington, Middlesex, United Kingdom
A transverse Zeeman slower based on array of discrete permanent magnets is proposed. A theory of such a slower based on point-like magnetic moments has been developed. A theory of a Zeeman slower in a case of non-uniform light field in presence of strong absorption of light is presented.

IB-2-MON
First-principles quantum dynamics with 150,000 atoms: correlations in a BEC collision
P. Deuex, University of Amsterdam, Netherlands; P.D. Drummond, University of Queensland, Brisbane, Australia
The quantum dynamics of colliding macroscopic BECs was simulated directly from the Hamiltonian. Evolution of correlations between scattered atoms was calculated quantitatively. The simulation method (stochastic positive-P) is straightforward and almost a ‘black-box’.

IB-3-MON
Vortex lattices in highly anisotropic traps
S. McEndoo, Th. Busch, Univ. College Cork, Ireland
We investigate details of the distribution of angular momentum in highly anisotropic traps where, in contrast to the formation of Abrikosov lattices in isotropic space, linear arrangements of vortices are formed.

IB-4-MON
Experimental limits of an inertial sensor based on cold atoms interferometry
W. Chabini, A. Gauget, B. Canuel, A. Clairon, N. Dimarco, D. Hollevoere, A. Landragin, SYRTE - Observatoire de Paris, France
We investigate the limits of our cold atoms interferometer to rotation and acceleration measurements. Short term sensitivity is now limited by vibration for acceleration and detection for rotation.

IB-5-MON
Bloch oscillations of neutral atoms adsorbed on crystalline surfaces
T. Passerat de Silans, Université Paris 13, Villeurbanne, France; M. Chevonne, M. Oria
Cold HD+ ions adsorbed on a crystalline surface are submitted to its parallel periodic potential and can exhibit Bloch Oscillations when submitted to static forces. We theoretically investigate such phenomena for He atoms trapped on LiF.

IB-6-MON
Fibered laser system for rubidium laser cooling based on telecom technology at 1560 nm and frequency doubling
F. Lienhart, Y. Bidel, S. Boussen, A. Bresson, O. Carraz, N. Zahaem, ONERA, Palaiseau, France
We propose a new compact and reliable laser system for rubidium laser cooling in onboard experiments. Our system is based on the frequency doubling of a telecom fiber bend at 1560 nm.

IB-7-MON
Geometrical manipulation of two-level atoms on the Bloch sphere observed in a time-domain atom interferometer
H. Imai, A. Marunaga, Y. Otsuha, Tokyo University of Science, Noda, Japan
Geometrical manipulation of two-level atoms on the Bloch sphere has been investigated on cold ensemble of sodium atoms with stimulated Raman pulses and the geometrical phase shift was detected using a time-domain atom interferometer.

IB-8-MON
A fs-frequency comb referenced diode laser system for coherent spectroscopy of cold molecules
I. Ernsting, A. Wicht, N. Strauss, K. Döinghoff, B. Roth, J. Koelmej, S. Schiller Heinrich-Heine-University, Düsseldorf, Germany; R.H. Rinklef, K. Danzmann, Leibniz University, Hannover, Germany
A new type of diode laser system for precision spectroscopy is presented. Its excellent passive stability eases locking to fs-frequency combs, which is demonstrated with high resolution spectroscopy of cold HD+ ions.

IB-9-MON
Ab initio based calculations of cavity cooling including the ro-vibrational modes of the OH radical
M. Kowalewski, R. de Vive-Riedle, Ludwig-Maximilians-University, Munich, Germany; P.W. Pinke, MPI für Quantenoptik, Garching, Germany; M. Morig, Universitat Autonoma de Barcelona, Bellaterra, Spain
For OH we report detailed ab initio based calculations for cooling the ro-vibrational modes using laser excitation and photon emission into a resonator. The cooling mechanism and parameters to achieve high efficiency are presented.

IB-10-MON
Ionization of Rb and Na Rydberg atoms by blackbody radiation
I. Beterov, D.B. Tertyakov, I.J. Ryabtsev, Institute of Semiconductor Physics, Novosibirsk, Russia; N.N. Bezuglov, St. Petersburg State University, St. Petersburg, Russia; A. Ekers, University of Latvia, Riga, Latvia
The photoionization rates of Rb and Na s, nP and nD Rydberg atoms by blackbody-radiation (BBR) have been calculated for n=8-65 at the ambient temperatures of 77, 300 and 600 K. The obtained results are compared with our experimental data for Na s and nD Rydberg atoms with n=8-20.

IB-11-MON
High-resolution sagac interferometry with cold atoms
We present the concept and the current status of our Cold Atom Sagnac Interferometer (CASI). Details of our dual interferometry scheme and the different diode laser systems used for manipulating the atoms will be presented.

IB-12-MON
Interacting rubidium and caesium atoms
C. Weber, M. Haas, S. John, L. Steffens, D. Haubrich, D. Meschede, Univ. of Bonn, Germany; A. Rauschenbeutel, Univ. Mainz, Germany; V. Leung, Ins. d’Optique, Orsay, France
We present sympathetic cooling of a few thousand Caesium atoms by Rubidium to temperatures below one Microkelvin. Analysing the cooling dynamics we estimate a lower bound of the s-wave scattering length.

IB-13-MON
Dynamics of cavity cooling of trapped atoms
S. Zippilli, G. Morigi, Universitat Autonoma de Barcelona, Bellaterra (Barcelona), Spain; M. Bienert, M. Torres, Universidad Nacional Autonoma de Mexico, Guanaxacata, Mexico
We show that the cooling dynamics of an atom trapped by an external potential inside a high-Q cavity can be enhanced by quantum interference between the mechanical effects of cavity and driving fields.

IB-14-MON
Dynamics of Bose-Einstein condensates in an asymmetric double-well
S. Whitlock, University of Amsterdam, Netherlands; V. Hall, R. Anderson, P. Hannaford, A.J. Sidaros, Swinburne University of Technology, Melbourne, Australia
We report on the dynamic splitting of a Bose-Einstein condensate in a double well potential created above a perpendicularly magnetised Gd Tb FeCo atom chip including its sensitivity in the application of gravity field sensing.

IB-15-MON
Cooling of molecules in optical cavities
W.Lu, Y. Zhao, Heriot-Watt University, Edinburgh, United Kingdom; P.F. Barker, University College London, United Kingdom
We predict that a cavity scheme can cool CN molecules from hundreds of millikelvin to microkelvin temperature under experimentally accessible conditions. We further discuss the possibility of a general cavity cooling scheme for many polarizable species.

IB-16-MON
Future inertial atomic quantum sensors: state of art
The partnership is developing novel portable atomic inertial quantum sensors based on matter-wave optics and Raman interferometry. For this purpose we are implementing a gravimeter and a gyroscope using ultra cold atoms as test masses.

IB-17-MON
Simple cold-atoms systems as a probe for complex dynamics
J. Chabé, J.C. Garreau, M. Lepers, P. Sriftiger, V. Zehnle, PhLAM, Villeneuve d’Ascq, France; D. Delande, Laboratoire Kastler-Brossel, Paris, France; H. Lignier, Pisa University, Italy; H. Cavalcante,
Mondays/POSTERS

Using paradigms from spin glass theory mode-locking transitions of random lasers.

Tum chaos and quasi-classical chaos.

They represent a quantum dynamics that can display different chaotic behaviors like quantum chaos and quasi-classical chaos.

IB-18-MON

Dynamics of Bose-Einstein condensates in optical trap with internal degrees of freedom

S. Tojo, M. Iwata, A. Tornyiama, T. Hirano, Gakushuin University, Tokyo, Japan; T. Kuwamoto, Nihon University, Chiba, Japan

We have experimentally studied the dynamics of optically trapped 87Rb BEC. Thanks to its rich variety of internal degrees of freedom, we have observed polar behavior of spin-2 BEC and time-evolution of immissible binary BEC.

IG-1-MON

Complexity and coherence in random lasers

C. Conti, Research Center Enrico Fermi and Univ. La Sapienza, Rome, Italy; L. Angelani, G. Ruocco, Univ. La Sapienza, Rome, Italy; F. Zamponi, Lab. de Physique Théorique Ecole Normale Supérieure, Paris, France

We report on a statistical approach to mode-locking transitions of random lasers. Using paradigms from spin glass theory we determine the complexity as a function of temperature. FDTD simulations are performed to sustain our results.

IG-2-MON

Dynamics of a two-state quantum dot laser with saturable absorber

E.A. Viktorov, P. Mandel, Université Libre de Bruxelles, Brussels, Belgium; E.U. Rafailov, University of Dundee, United Kingdom; M.A. Cataluna, L. O’Faolain, T.F. Krauss, W. Sibbett, University of St Andrews, UK

We study the regime of selfpulsations in two-state QD laser with saturable absorber. Experiments demonstrate and theory explains the appearance of antiphase selfpulsations at low relaxation oscillation frequency and a period doubling route to chaos.

IG-3-MON

Square-wave switching by cross-polarization reinjection in VCSELs

M. Gaudi, Institut Non Linéaire de Nice (INLIN), Valbonne, France; J. Mulet, J. Javoylbes, S. Balli, Instituto Mediterrani d’Estudis Avancats (IMEDEA), Spain

Experimental observation of the optical switching in VCSELs under cross-polarization reinjection appears above a reinjection threshold, but its quality degrades as reinjection further increases. The Spin-Flip Model successfully explains the experimental observations.

IG-4-MON

Localized structures of light in nonlinear devices with intracavity photonic bandgap material

A.G. Vladimiriv, Weberstrass Institute for Applied Analysis and Stochastics, Berlin, Germany; D.V. Stryakin, University of Bath, United Kingdom; M. Tlidi, Université Libre de Bruxelles, Brussels, Belgium

We study transverse pattern formation in a Kerr cavity with a photonic crystal film inside. Using the coupled mode approach and direct numerical simulations we demonstrate the existence of modulational instability, resting and moving cavity solitons, and investigate the principle role played by defects in periodicity.

IG-5-MON

Analysis of the chaotic dynamics of counter-propagating solitons

C. Denz, S. Koke, Ph. Jander, T.D. Franke, R. Friedrich, University of Münster, Germany

The dynamics of counter-propagating spatial solitons based on a photorefractive nonlinearity is analysed. We focus on the transition from regularly to irregularly oscillating states and answer the question whether the irregularly oscillating solutions are chaotic.

IG-6-MON

Addressing optical pixel bits in a slab of dense optical material via intrinsic optical bistability

J.L. Font, R. Vilaseca, K. Stallanus, Universitat Politècnica de Catalunya, Terrassa, Spain; E. Roldan, G. Valcarcel, Universitat de València, Burjasot (Valencia), Spain

We show that a thin material slab with intrinsic optical bistability and irradiated with a uniform beam can sustain narrow localized structures, whose size is determined by the writing beam diameter and the diffusion strength.

IG-7-MON

Localized traveling waves in VCSELs with filtered optical feedback

P.V. Paulau, Institute of Physics, NASB, Minsk, Belarus and University of Strathclyde, Glasgow, United Kingdom; A. Naumenko, N.A. Loiko, Institute of Physics, NASB, Minsk, Belarus; W.J. Firth, T. Ackermann, A.J. Scroggie, University of Strathclyde, Glasgow, UK

Self-localized transverse traveling-wave states exist in a model of vertical-cavity surface-emitting lasers with frequency and wavevector-selective optical feedback. The results suggest a route to realization of a cavity soliton laser using standard semiconductor laser designs.

IG-8-MON

Separation of mixed chaotic signals in microchip lasers by independent component analysis

A. Uchida, M. Kuraya, S. Yoshimori, Takashuku University, Tokyo, Japan; K. Umeno, National Institute of Information and Communications Technology, Tokyo, Japan

We experimentally demonstrated blind source separation of mixed chaotic laser signals by using independent component analysis. Non-Gaussianity of chaotic signals is a crucial property to succeed signal separation.

IG-9-MON

Delay induced instabilities in a quantum dot semiconductor laser

E.A. Viktorov, P. Mandel, Université Libre de Bruxelles, Brussels, Belgium; O. Carroll, I. O’Driscoll, J. Houlihan, G. Huyet, S.P. Hegarty, Tyndall National Institute, Cork, Ireland

We analyze experimentally and theoretically, delay induced instabilities in quantum dot semiconductor lasers. These occur outside the parameter regime expected for conventional semiconductor lasers and include irregular power drops, periodic pulsations and a chaotic regime.

IG-10-MON

Jitter and dynamics in passively mode-locked quantum dot semiconductor laser

E.A. Viktorov, T. Emeux, P. Mandel, Université Libre de Bruxelles, Brussels, Belgium; S. O’Donoghue, F. Kéfiéan, B. Kelleher, G. Huyet, Tyndall National Institute, Cork, Ireland

We investigate the effect of the dynamics on the jitter in a quantum dot mode-locked laser. An increase of the jitter with the current, due to bistability, is predicted and experimentally confirmed.

IG-11-MON

Semiconductor lasers under orthogonal frequency-dependent optical feedback: experiments and theory

C. Masoller, Universitat Politècnica de Catalunya, Terrassa, Spain; T. Sorrentino, M. Chevrollier, M. Oria, Universidade Federal da Paraíba, Joao Pessoa, Brazil

A semiconductor laser under orthogonal frequency-dependent feedback is studied experimentally. Two different emission frequencies with almost the same output power are observed. A model including gain-saturation and thermal effects gives good agreement with the observations.

IG-12-MON

Spatio-temporal dynamics of free-electron lasers

C. Szewi, J.C. Soriano, J. Garcia Monreal, G.J. de Valcarcel, Universitat de València, Burjasot, Spain; A. Esteban Martin, Institut de Ciencies Fotoniques (ICFO) Castelldefels, Spain; K. Stallanus, ICREA, Universitat Politècnica de Catalunya, Terrassa, Spain

We present a combined theoretical/experimental study of longitudinal pulse dynamics, in Free-Electron Laser oscillators. The pulse internal structure exhibits in particular a transition to a “turbulent” regime, which appears to be correlated to the temporal dislocations.

IG-13-MON

Experimental evidence of hyperbolic transverse patterns in a nonlinear optical resonator

F. Silva, J.C. Soriano, J. Garcia Monreal, G.J. de Valcarcel, Universitat de València, Burjasot, Spain; A. Esteban Martin, Institut de Ciencies Fotoniques (ICFO) Castelldefels, Spain; K. Stallanus, ICREA, Universitat Politècnica de Catalunya, Terrassa, Spain

Independent manipulation of the diffraction properties of a very large Fresnel number optical resonator along two orthogonal directions is demonstrated. Specifically, a hyperbolic resonator is built, which is shown experimentally to support hyperbolic nonlinear patterns.

IG-14-MON

Cavity solitons in rocking class B lasers

M.F. Martinez Quesada, G.J. de Valcarcel, Universitat de València, Burjasot, Spain

We find theoretically dark-ring cavity solitons in rocking class B lasers due to the phase bistability induced by the associated bichromatic injection.
JSIII-1-MON
Absolute frequency comb mode number determination
J. Zhang, Z.H. Lu, Y.H. Wang, T. Liu, A. Stejskal, Y.N. Zhao, J.J. Wang, Max-Planck Research Group, Erlangen, Germany; R. Dumke, Nanyang Technological University of Singapore, Singapore
We report a method for determination of the frequency comb mode number without the help of wavemeters, by changing the repetition rate of the frequency comb in a two-step process.

JSIII-2-MON
Octave-spanning spectrum from a diode-pumped Yb:KYW fs-laser by nonlinear broadening
S.A. Meyer, University of Colorado and National Institute of Standards and Technology, Boulder, Colorado, USA; J.A. Squire, University of Colorado, Boulder, Colorado, USA; P.J. Diddams, National Institute of Standards and Technology, Boulder, Colorado, USA
With the goal of a compact, efficient, diode-pumped optical frequency comb capable of high repetition rates, we have built a Yb:KYW femtosecond laser and obtained an octave-spanning spectrum via nonlinear broadening in microstructured optical fiber.

JSIII-3-MON
Towards direct frequency comb spectroscopy on ions in a linear Paul trap
A.L. Wolf, K.S.E. Eikema, W. Ubachs, Laser Centre Vrije Universiteit, Amsterdam, Netherlands
To add to the debate on a possibly varying fine structure constant, we plan to do direct frequency comb spectroscopy on ions (Ca,Mn,Ti) in a linear Paul trap.

JSIII-4-MON
Doppler-limited multiplex sensitive spectroscopy with frequency combs
J. Mandon, N. Picqué, G. Guelachvili, CNRS Laboratoire de Photophysique Moléculaire, Orsay, France; F. Druon, P. Georges, Institut d’Optique Graduate School, Palaiseau, France
A femtosecond mode-locked laser is used for the first time as an infrared source for high resolution Fourier transform absorption spectroscopy. This offers new perspectives for high sensitivity broad spectral bandwidth spectroscopy.

JSIII-5-MON
Composite frequency comb spanning 0.4-2.4µm from a femtosecond Ti:sapphire laser and synchronously pumped optical parametric oscillator
B.J.S. Gale, J.H. Sun, D.T. Reid, Heriot Watt University, Edinburgh, United Kingdom
We demonstrate a composite frequency comb spanning 0.4-2.4µm from the outputs of a femtosecond optical parametric oscillator and Ti:sapphire pump laser in which the comb interval and offsets are locked to a radio-frequency clock.
08:30–10:00
IB1 Session: Condensed matter physics with quantum gases
Chair: Michael Köhl, University of Cambridge, United Kingdom

IB1-1-TUE 08:30
Spinor BEC in triangular optical lattices
C. Becker, K. Bongs, K. Sengstock, S. Stellmer, J. Kronjäger, P. Soltan-Panahi, University of Hamburg, Germany
We discuss the physics of spinor BEC in a triangular optical lattice, which can be transformed into a magnetic hexagonal lattice and present first data on the Mott insulator transition in this novel system.

IB1-2-TUE 08:45
Cavity QED with ultracold gases: probing quantum phases in optical lattices by light scattering
I.J. Mekhov, University of Innsbruck, Austria and St Petersburg State University, St Petersburg, Russia; C. Maschler, H. Ritsch, University of Innsbruck, Austria
Various quantum states of atoms in lattices show qualitatively different light scattering, which can be analysed by intensity or photon-statistics measurements. Atom distribution functions can be directly mapped on transmission spectra of a high-Q cavity.

08:30–10:00
IE1 Session: Strong light-matter interactions
Chair: Stefan Lochbrunner, Ludwig-Maximilians University of Munich, Germany

IE1-1-TUE (invited) 08:30
Strong field nonlinear optics with light pulses of “Subatomic” duration
A. Nazarkin, University of Erlangen, Erlangen, Germany
The interaction of intense light pulses with a multilevel atomic system in the regime of pulse durations shorter than the Bohr period of atomic electron is discussed. High harmonic generation, soliton effects, and nonlinear field amplification are predicted.

08:30–10:00
IF2 Session: Quantum imaging
Chair: Alexander Sergienko, Boston University, USA

IF2-1-TUE 08:30
Quantum limits in image processing
N. Treps, V. Delaubert, C. Fabre, Laboratoire Kastler Brossel, Paris, France; H.A Bachor, The Australian National University, Canberra, Australia; P. Référigier, Fresnel Institute, Marseille, France
We determine the bound to the maximum achievable sensitivity in the estimation of a parameter from the information contained in an optical image in the presence of quantum noise, either coherent or squeezed.

IF2-2-TUE 08:45
Experimental realization of spatial entanglement for bright optical beams
J. Janousek, The Australian National University, Canberra, Australia and Technical University of Denmark, Kgs Lynghøj, Denmark; K. Wagner, H. Zou, P.K. Lam, H.A Bachor, The Australian National University, Canberra, Australia; V. Delaubert, Laboratoire Kastler-Brossel, Paris, France and The Australian National University, Canberra, Australia; C.C. Harb, The University of NSW, Canberra, Australia
We present the latest results on the experimental generation of the position and momentum (x-p) entanglement for bright optical beams. We demonstrate the TEM10 quadrature entanglement. The degree of inseparability was measured to be 0.76.

08:30–10:00
CE2 Session: Organic lasers and laser materials
Chair: Ernst Heumann, University of Hamburg, Germany

CE2-1-TUE (invited) 08:30
Are organic LEDs and lasers similar to inorganic devices?
N. Tessler, Technion, Haifa, Israel
In this talk I would compare chemically prepared materials to those grown under high vacuum conditions. We will compare colloidal grown semiconducting nanocrystals to quantum dots and thin film organic devices to inorganic ones.

08:30–10:00
CA4 Session: Raman and parametric optical frequency conversion
Chair: Valdas Pasiskevicius, Royal Institute of Technology, Stockholm, Sweden

CA4-1-TUE (invited) 08:30
Continuous-wave self-Raman and intracavity doubled laser operation in Nd:GdVO₄ at 586.5 nm
P. Dekker, H.M Pask, D.J Spence, J.A Piper, Centre for Lasers & Applications, Macquarie University, North Ryde, NSW, Australia
We report continuous-wave powers at 586 nm up to 0.7 W and quasi-cw powers up to 1.9 W (50% duty cycle) from a diode-pumped Nd:GdVO₄ laser with intracavity frequency-doubling in LBO.
08:30 – 10:00

**CG 1 Session: Relativistic interactions**

Chair: Gérard Mourou, Laboratoire d’Optique Appliquée, Palaiseau, France

**CG 1-TUE (Invited)** 08:30

*Particle acceleration with high-intensity lasers*

H. Schwoerer, Optik und Quantenelektronik, University of Jena, Germany

Intense light fields can accelerate electrons and ions to energies of tens of MeV with narrow energy distribution and excellent beam parameters. Mechanisms and applications of this new technique will be discussed.

**CG 4-TUE** 08:30

*Densely packed VCSEL arrays tailored for optical particle manipulation*

A. Kroner, F. Rinaldi, R. Rösch, R. Michalzik, Institute of Optoelectronics, Ulm, Germany

To reduce cost and dimensions of optical particle manipulation systems significantly, we have fabricated specially adapted, densely packed arrays of vertical-cavity laser diodes using a novel, self-aligned process. High single-mode output powers are presented.

08:30 – 10:00

**CB 4 Session: VCSELS I: Device progress**

Chair: Francesco Marin, University Firenze, Sesto, Italy

**CB 4-1-TUE 08:30**

*Densely packed VCSEL arrays tailored for optical particle manipulation*

A. Kroner, F. Rinaldi, R. Rösch, R. Michalzik, Institute of Optoelectronics, Ulm, Germany

To reduce cost and dimensions of optical particle manipulation systems significantly, we have fabricated specially adapted, densely packed arrays of vertical-cavity laser diodes using a novel, self-aligned process. High single-mode output powers are presented.

**CB 4-2-TUE 08:45**

*High-power 1.55 μm VCSELS arrays*

W. Hofmann, M. Görblich, G. Böhm, M.C Amann, Walter Schottky Institute, Garching, Germany; M. Ortsiefer, Vertilas GmbH, Garching, Germany; H. Mulat, Institute for Technical Electronics, Munich, Germany

A VCSEL array at 1.55 μm with output-powers beyond 0.7 W is presented. The modulation bandwidth is potentially high and the wall-plug efficiency exceeds 25%. Output powers are scalable by chip area with 70 W/square-cm.

08:30 – 10:00

**CK 4 Session: Plasmonic nano-structures**

Chair: Gonçal Badenes, ICFO, Castelldefels, Spain

**CK 4-1-TUE (Invited) 08:30**

*Lensless focusing with subwavelength resolution by an array of nanoholes*

F.M Huang, N.I Zheludev, Optoelectronics Research Centre, Southampton, United Kingdom; Y. Chen, Rutherford Appleton Laboratory, Oxon, United Kingdom; F.J García de Abajo, Instituto de Optica, Madrid, Spain

We provide the first evidence of free-space subwavelength focusing without evanescent fields using a photonic nano-structure. Hot-spots smaller than half wavelength of light were observed at distances of tens of wavelengths from the structure.

08:30 – 10:00

**CI 1 Session: Differential phase-shift keying**

Chair: Christophe Peucheret, Technical University of Lyngby, Denmark

**CI 1-1-TUE 08:30**

*Performance analysis of 20 Gbit/s RZ-DPSK non-slope matched transoceanic submarine links*

B. Slater, S. Boscolo, S.K Turitsyn, T. Broderick, Aston University, Birmingham, United Kingdom; R. Freund, L. Molle, C. Caspar, Fraunhofer Institute for Telecommunications, Berlin, Germany; J. Schwartz, S. Barnes Azea, Networks Ltd., Romford, United Kingdom

Direct bit-error rate (BER) computation and experiments are used to assess the performance of a 20 Gbit/s return-to-zero differential phase-shift keying (RZ-DPSK) non-slope matched transoceanic submarine link. Using this system as an example, we also demonstrate the limitations of existing theoretical approaches to the BER estimation for RZ-DPSK.

**CI 1-2-TUE 08:45**

*Migration from periodic to lumped dispersion mapping in existing SMF/DCF links*

R.S Bhamber, C. French, S.K Turitsyn, V. Mezentsev, Aston University, Birmingham, United Kingdom; W. Forsiyik, J.H.B Nijhof, Ericsson Ltd, Coventry, United Kingdom

Studying performance of the existing terrestrial SMF/DCF link we demonstrate that transmission of 40Gbit/s RZ-DPSK signal is robust to lumped dispersion mapping, which results in significant cost savings in point-to-point links without greatly compromising system performance.
Cold quantum gases: when atomic physics meets condensed matter
J. Dalibard, Ecole Normale Supérieure, Paris, France
The talk will review recent advances in the manipulation of cold atomic gases, and show that these systems can be viewed as quantum simulators, mimicking the rich dynamics of condensed-matter physics.

Quantum image generation by c.w. optical parametric amplification
L. Lopez, N. Treps, C. Fabre, Laboratoire Kastler Brossel, Paris, France; A. Maître, Institut des Nanosciences de Paris, France
We experimentally show that a c.w. OPO inserted in a degenerate cavity is a noiseless quantum amplifier of input images, which produces amplitude-squeezed images and quantum-correlated clones of the input image.

Multi-dimensional photonic entanglement: tuning in the number of modes
We present the observation of high dimensional spatial entanglement of twin photons, in a setting where the number of participating modes can be tuned at will. The effect on coincidence events is investigated.

Spatial quantum correlations induced by random multiple scattering of squeezed light
P. Lodahl, Technical University of Denmark, Lyngby, Denmark
We predict that spatial quantum correlations are induced when quadrature squeezed light is multiple scattered through a random medium. The correlations should be observable for realistic experimental parameters.

Laser dynamics and optical switching in organic distributed feedback lasers
M. Zavelanis-Rossi, S. Persissinotto, G. Lanzani, Politecnico di Milano, Italy; M. Salerno, G. Gigli, Università degli Studi di Lecce, Italy
Distributed Feedback polymer lasers are realized by deposition or soft-lithography. Their dynamics is studied during lasing action by pump-probe experiments with femtosecond resolution. Ultrafast optical switching is demonstrated, potentially leading to hundred GHz repetition rate.

Continuous-wave high power green generation by intracavity frequency doubling of Nd-based thin-disk lasers
N. Pavel, Solid-State Quantum Electronics Laboratory, Bucharest, Romania; K. Lünstedt, K. Petermann, G. Huber, University of Hamburg, Germany
Intracavity frequency-doubling of Nd:YVO₄, Nd:GdVO₄, and Nd:YAG thin-disk lasers pumped at 0.81 microns yielded around 6 W of green light at 0.53 microns; more than 4 W was achieved from Nd:vanadates pumped at 0.88 microns.

Propagation of femtosecond filaments in air: (3+1) dimensional numerical simulations versus experiments
S. Charpeaux, L. Bregé, CEA/DAM, Bruyères-le-Châtel, France; D. Gordon, A. Ting, J. Penano, P. Sprangle, Plasma Physics Division, Naval Research Laboratory, Washington DC, USA
The three-dimensional dynamics of multiple filaments created from ultrashort laser pulses in air is investigated numerically and experimentally. Semi-quantitative agreement is achieved for appropriate nonlinear Kerr responses varying with the input pulse durations.
CB4-3-TUE  09:00

Compact 1.55 µm room-temperature optically pumped photonic crystal mirror – VCSEL
S. Boutami, B. Ben Bakir, P. Regreny, J.L Leclercq, P. Viktorovitch, Institut des Nanotechnologies de Lyon, Ecully, France
We present a new class of compact VCSEL which one of the DBRs is entirely replaced by a single-layer Photonic Crystal Mirror. Single-mode polarized laser emission was obtained around 1.55µm.

CB4-4-TUE  09:15

Record-low thermal resistance, 12.5 Gbit/s capable flip-chip bonded 850nm wavelength 2-D VCSEL arrays
H. Roscher, F. Rinaldi, R. Michalzik, A. Weigl, Institute of Optoelectronics, Ulm, Germany
We present a novel fully self-aligned fabrication scheme for high-speed flip-chip bonded 850nm wavelength two-dimensional VCSEL arrays enabling record-low thermal resistances as well as 3dB bandwidths of at least 14GHz and open 12.5Gbit/s eye patterns.

CB4-5-TUE  09:30

Red high-temperature AlGaNp-VCSEL
R. Rossbach, M. Eichfelder, M. Jetter, H. Schweizer, P. Michler, Universität Stuttgart, Germany
We present 660 nm high-temperature oxide-confined AlGaNp-based vertical-cavity surface-emitting lasers (VCSEL) at +170 °C in pulsed operation. We use a model to describe the behavior of the device which will be compared to measured data.

CG1-2-TUE  09:00

Controlled injection of electrons in a plasma wave
C. Rechatin, J. Faure, A. Lifschitz, A. Norlin, V. Malka, Laboratoire d’Optique Appliquée, Palaiseau, France
Injection of electrons in a laser-plasma accelerator was achieved by colliding two counter propagating laser pulses. It results in a stable monoenergetic, tunable electron beam (15-300 MeV). Simulations corroborate important physical processes at play.

CG1-3-TUE  09:15

Emerging applications of ultra-intense lasers in sciences
J. Zhang, Shanghai Jiaotong University, Shanghai and Institute of Physics, CAS, Beijing, China; YT Li, Z.M Sheng, X. Lu, Q.L Dong, Z.Y Wei, , Shanghai Jiaotong University, Shanghai, China
The recent advances on Emerging Scientific Applications of Ultra-Intense Lasers are reviewed in this talk, including fast-ignition, laser-acceleration of electrons and ions, laser-plasma optics etc.

CG1-4-TUE  09:30

Tunable DPSK wavelength converter using an SOA-MZI monolithically integrated with a sampled-grating distributed bragg reflector
M.P Fok, C. Shu The Chinese University of Hong Kong, Hong Kong; J.A Summers, M.L Masanovic, D.J Blumenthal, University of California, Santa Barbara, USA
We experimentally demonstrate 10-Gb/s DPSK signal wavelength conversion using a sampled-grating distributed Bragg reflector laser-integrated SOA-MZI wavelength converter. The converted output is tunable over a range of 32 nm.

NOtes

CleO® Europe-IQEC 2007 • Tuesday 19 June 2007

Room 13b

CB4-3-TUE  09:00

Compact 1.55 µm room-temperature optically pumped photonic crystal mirror – VCSEL
S. Boutami, B. Ben Bakir, P. Regreny, J.L Leclercq, P. Viktorovitch, Institut des Nanotechnologies de Lyon, Ecully, France
We present a new class of compact VCSEL which one of the DBRs is entirely replaced by a single-layer Photonic Crystal Mirror. Single-mode polarized laser emission was obtained around 1.55µm.

Room 14a

CG1-2-TUE  09:00

Controlled injection of electrons in a plasma wave
C. Rechatin, J. Faure, A. Lifschitz, A. Norlin, V. Malka, Laboratoire d’Optique Appliquée, Palaiseau, France
Injection of electrons in a laser-plasma accelerator was achieved by colliding two counter propagating laser pulses. It results in a stable monoenergetic, tunable electron beam (15-300 MeV). Simulations corroborate important physical processes at play.

Room 14b

CK4-2-TUE  09:00

Ultralong-range propagation of plasmon-polaritons in a thin metal film on a one-dimensional photonic crystal surface
N. Konopsky, V. Aleeva, Institute of Spectroscopy, Russian Academy of Sciences, Troitsk, Moscow region, Russia
We present experimental results on ultra-long-range surface plasmon polaritons, propagating in a thin metal film on a one-dimensional photonic crystal surface over a distance of several millimeters.

Room B01

CI1-3-TUE  09:00

High performance configuration of all-Raman Nx40 Gbit/s RZ-DPSK systems over Ultrawave (TM) maps
M.P Fedoruk, OL Shyshyna, A.V Yaksiv, Ins. of Computational Technologies SB RAS, Novosibirsk, Russia; A.I Latkin, Ins. of Automation and Electrometry SB RAS, Novosibirsk, Russia; I.D.Ana-Castanon, S.K Tunsyn, Aston Univ., Birmingham, UK; A. Tonella, S. Wabnitz, Lab. de Physique, Univ. de Bourgogne, Dijon, France; E. Pincemin, A. Tan, France Télécom, Division R&D, Lannion, France
We study the impact of optimal system configuration for Nx40 Gbit/s WDM transmissions with the RZ-DPSK format and different Ultrawave(TM) fibre dispersion maps. Error-free 5x40 Gbts transmission over 600 km is predicted by simulations.

CI1-4-TUE  09:15

Theoretical study on the performance of optical phase conjugation for ultra long-haul differential phase-shift-keyed transmission
N. Sarapa, P. Kaoepung, Chulalongkorn University, Bangkok Thailand
The performances of optical phase conjugation (OPC) in reducing the nonlinear phase noise accumulation in DPSK transmission is theoretically analyzed and compared with that in the periodic dispersion-compensated (DC) system.

CI1-5-TUE  09:30

Tunable DPSK wavelength converter using an SOA-MZI monolithically integrated with a sampled-grating distributed Bragg reflector
M.P Fok, C. Shu The Chinese University of Hong Kong, Hong Kong; J.A Summers, M.L Masanovic, D.J Blumenthal, University of California, Santa Barbara, USA
We experimentally demonstrate 10-Gb/s DPSK signal wavelength conversion using a sampled-grating distributed Bragg reflector laser-integrated SOA-MZI wavelength converter. The converted output is tunable over a range of 32 nm.
IE1 -5-TUE 09:45
Theory of photoluminescence in J-aggregate microcavities
J. Chovan, Foundation for Research and Technology-Hellas, Heraklion, Greece; I.E. Perakis, University of Crete and Foundation for Research and Technology-Hellas, Heraklion, Greece
We develop a microscopic theory of photoluminescence in J-aggregates microcavities in presence of exciton-phonon coupling. We discuss the polaronic effects and nature of mixed photon-exciton-phonon states, and show the control of photoluminescence by Rabi energy.

IF2 -6-TUE 09:45
Coherent imaging of a pure phase object with classical incoherent light
M. Bache, Technical University of Denmark, Lyngby, Denmark; E. Brambilla, L. A. Lugiato, F. Ferri, D. Magatti, A. Gatti, Università dell’Insubria, Como, Italy
A ghost imaging scheme is implemented experimentally to demonstrate coherent imaging of a pure phase object with classical incoherent light. A striking complementarity is pointed out between the ghost imaging and the Hanbury-Brown-Twiss scheme.

CE2 -5-TUE 09:45
New organic salts for electro-optics and THz generation
B. Ruiz, Z. Yang, M. Jazbinsek, P. Günter, Swiss Federal Institute of Technology, Zurich, Switzerland
New stilbazolium salts were synthesized, one with about 1.5 times the nonlinearity of the well-studied DAST (4’-dimethylamino-N-methyl-4-stilbazolium tosylate) and the other with considerably improved capabilities for large-area bulk and thin film crystal growth.

CA 4-5-TUE 09:45
Watt-level single-frequency tunable Nd:YLF/PPKTP red laser
R. Sarrouf, V. Sousa, T. Badr, G. Xu, J.J Zondy, Conservatoire National des Arts et Métiers, La Plaine Saint Denis, France
Intracavity second-harmonic generation of a diode-pumped unidirectional Nd:YLiF4 ring laser oscillating on the sigma-polarized F4 3/2 - 4I13/2 transition (lambda~1314nm) with a temperature-tuned PPKTP crystal is reported, yielding up to 0.92W tunable (656-658nm) single-frequency output.
Optical components for surface plasmon polaritons fabricated by two photon polymerization
S. Passinger, R. Kiyan, A. Stepanov, C. Reinhardt, B. Chichkov, Laser Zentrum Hannover e.V., Hannover, Germany

Applications of two-photon polymerization technique for the fabrication of optical components for surface plasmon polaritons are reported.

1.3 and 1.5 µm wavelength VCSELs fabricated by double wafer fusion with record high single mode output power are presented. These devices are suitable for telecommunication and gas sensing applications.
Pulse spectral mapping with frequency doubling in random media
M. Breuer, E. Riedle, S. Lochbrunner, C. Homann, J. Fischer, W. Krolikowski, Y. Kivshar, D. Neshev, Australian National University, Canberra, Australia; S. Saltiel, Sofia University, Sofia, Bulgaria
We demonstrate exact mapping of the spectrum of the ultra-short pulses into the spectrum of their second harmonic by use of broadband phase-matched noncollinear second-harmonic generation in crystals with random ferroelectric domains.

Strongly interacting polaritons in coupled arrays of cavities
M. Hartmann, F.G.S.L. Brandao, M.B. Plenio, Imperial College, London, United Kingdom
We show that polaritons, atom-photon excitations, in an array of coupled cavities can form a strongly interacting many-body system governed by a Bose-Hubbard Hamiltonian with repulsive or attractive interactions where single sites can be addressed.

Quantum processing photonic states in optical lattices
C. Muschik, I. de Vega, D. Porras, J.J. Cirac, Max Planck Institute for Quantum Optics, Garching, Germany
Cold atoms in an optical lattice are used to perform a two qubit gate for photons. Light states are transferred to a collective atomic excitation and then processed with controlled collisions.

Signatures for generalized macroscopic and S-scorpex superpositions
M.D. Reid, E.G. Cavalcanti, ARC Centre of Excellence for Quantum-Atom Optics, Brisbane, Australia
We consider constraints imposed on statistics if the density operator is a mixture of microscopic superpositions. We thus develop signatures for macroscopic superpositions that may be applied to squeezed and entangled fields and atomic ensembles.

Permanent magnet atom chips for BEC and microtrap arrays
S. Whitlock, University of Amsterdam, Netherlands and Swinburne Univ. of Technology, Melbourne, Australia; R.J.C. Spreeuw, R. Gerritsma, Th. Fernholz, Univ. of Amsterdam, Netherlands
Using a fully self-biasing permanent magnet atom chip we produce a Bose-Einstein condensate which we study by radio frequency spectroscopy. We report on our new chip, hosting ring structures and vast arrays of microtraps.

Microchips for single atom detection and spin squeezing
V. Vuletic, M. Schleier-Smith, I. Leroux, I. Teper, Y.J Lin, Massachusetts Institute of Technology, Cambridge, USA
We report on resonant-aided optical detection of atoms in a magnetic microtrap. Single atoms are detected with 75% efficiency. We report progress towards quasi-spin squeezing for operation of an atomic clock below the standard quantum limit.

Techniques to improve MWIR light emitting diode emission power
N.C. Das, W. Chang, Army Research Laboratory, Adelphi, USA
We used various techniques like substrate thinning, surface texturing, antirefection coating and side wall mirror to improve MWIR LED emission. Light emission power increased by ten times due to thinning and texturing of emission surface.

High-power and high external efficiency m-Plane InGaN LEDs
M.C. Schmidt, K.C. Kim, N. Fellows, H. Sato, H. Masui, S. Nakamura, S.P. DenBaars, J.S. Speck, UCSB Materials, University of California, Santa Barbara, USA
World record performance for m-plane GaN LEDs has been demonstrated, marking the first time nonpolar GaN LEDs have performed on par with state-of-the-art c-plane LEDs.

High-power GaN diode-pumped continuous wave Pr3+ doped LiYF4 laser
K. Hohimoto, F. Kannari, Keio University, Yokohama, Japan
We report GaN laser diode pumped CW laser emission of Pr:LiYF4. The laser emits more than 90 mW of output power at 639 nm. The threshold and slope efficiency were 8 mW and 38% respectively.

High-power and high repetition UV beam generation with an all-solid-state laser
We developed the linearly-polarized 300-W TEM00 Q-switched Nd:YAG laser. With high quality CLBO for fourth- and fifth-harmonic generation or CBO for third-harmonic generation, 27.9-W 266-nm, 10.2 W 213-nm at 10 kHz and 103-W 355-nm at 20 kHz were obtained.
Active mode control in VCSEL-based photonic crystal superlattices

L.D.A. Lundeberg, E. Kapon, Ecole Polytechnique Fédérale de Lausanne (EPFL), Lausanne, Switzerland

We demonstrate active control of photonic envelope functions in VCSEL-based, separate-contact photonic crystals (PhCs). Tuning the gain distribution across the three coupled PhC islands yields beam switching due to envelope function coupling and localization.

Protein detection with a planar photonic-crystal sensor

R. Kienberger, Max-Planck-Institut für Quantenoptik, Garching, Germany

Processes in atoms, molecules, and solids are triggered or mediated by the motion of electrons. Recent breakthroughs in laser science are opening the door to watching and controlling these electronic dynamics that unfold within tens of thousands of attoseconds.

High NA Fourier space imaging of planar photonic crystals

N. Le Thomas, R. Houdré, Ecole Polytechnique Fédérale de Lausanne, Switzerland; M.V. Kotlyar, T.F. Krauss, University of St Andrews, UK

Fourier space imaging is used to retrieve the intrinsic properties of planar photonic crystal structures. A superresolution technique based on size effects of the structures gives access to the dispersion curves below the light cone.

Imaging and manipulating confined electromagnetic fields in photonic crystal nanocavities with SNOM probes

B. Cluzel, Univ. de Bourgogne, Dijon, France; F. de Forme, L. Lalouat, CNRS, Dijon, France; P. Vehla, E. Picard, E. Hadiji, MINATEC, CEA, Grenoble, France; S. Callard, Ch. Seassal, X. Letartre, A. Rahmani, Ecole Centrale de Lyon, Ecully, France; P. Lalanne, D. Peyrade, CNRS, Palaiseau, France

By using the optical near-field microscopy technique coupled to microphotoluminescence or transmittance experiments, we investigate the optical near-field properties of photonic crystal nanocavities and evidence the near-field probe ability to manipulate their resonances.

Phase-preserving signal regeneration by a nonlinear amplifying loop mirror

K. Sponsel, B. Schmauss, K.Crecek, C. Stephan, G. Onishchukov, G. Leuchs, University of Erlangen-Nuremberg, Erlangen, Germany

The influence of different parameters on the shape of nonlinear amplitude and phase transfer characteristics of a nonlinear amplifying loop mirror and the physical limitations on its regeneration abilities have been numerically investigated.

Ultrafast lasers for nanomaterial growth and processing

S. Mao, University of California, Berkeley, USA

Recent progress of ultrafast laser-based nanoscale material growth and processing will be discussed, along with selected emerging applications of laser-produced nanomaterials in the development of renewable energy technologies.
<table>
<thead>
<tr>
<th>ROOM 1</th>
<th>ROOM 4a</th>
<th>ROOM 4b</th>
<th>ROOM 12</th>
<th>ROOM 13a</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>IE2-4-TUE 15:15</strong></td>
<td><strong>IC1-4-TUE 15:15</strong></td>
<td><strong>IA1-3-TUE 15:15</strong></td>
<td><strong>CE3-4-TUE 15:45</strong></td>
<td><strong>CA5-4-TUE 15:30</strong></td>
</tr>
<tr>
<td>Light self-confinement via second harmonic generation in a 2D nonlinear photonic crystal waveguide</td>
<td>Quantum computation and quantum simulation with Coulomb crystals</td>
<td>Microwave near-fields on atom chips</td>
<td>Near-field optical imaging of carrier localization in AlxGa1-xN alloys</td>
<td>High energy, single-mode, all-solid-state and tunable UV laser transmitter</td>
</tr>
<tr>
<td><strong>IE2-5-TUE 15:30</strong></td>
<td><strong>IC1-5-TUE 15:30</strong></td>
<td><strong>IA1-4-TUE (invited) 15:30</strong></td>
<td><strong>CE3-5-TUE 15:45</strong></td>
<td><strong>CA5-5-TUE 15:30</strong></td>
</tr>
<tr>
<td>Angle-dispersion compensation and phase characterization of multiple CARS signals in LiNbO3, towards extremely short optical pulse generation</td>
<td>A continuous-variable quantum memory for light</td>
<td>Strong atom-cavity coupling observed for trapped single atoms and Bose-Einstein condensates on an atom chip</td>
<td>Sic heteropolytype structures for optical applications</td>
<td>450 nm blue laser emission of an intracavity-doubled Nd:ASL crystal pumped by an extended-cavity tapered laser diode</td>
</tr>
<tr>
<td><strong>IE2-6-TUE 15:45</strong></td>
<td><strong>IC1-6-TUE 15:45</strong></td>
<td><strong>CE3-5-TUE 15:45</strong></td>
<td><strong>CA5-5-TUE 15:30</strong></td>
<td></td>
</tr>
<tr>
<td>Generation of multiply charged optical vortices and spatiotemporal helical beams using cascaded four-wave mixing</td>
<td>Photonic phase transitions, spin models, and QIF in coupled cavity arrays</td>
<td>Sic heteropolytype structures for optical applications</td>
<td>450 nm blue laser emission of an intracavity-doubled Nd:ASL crystal pumped by an extended-cavity tapered laser diode</td>
<td></td>
</tr>
<tr>
<td>A.V. Gorbach, D.V. Skryabin, University of Bath, United Kingdom</td>
<td>G. Angelakis, Centre for Quantum Computation, Cambridge, United Kingdom; M.F. Santos, Universidad Federal de Minas Gerais, Belo Horizonte, Brazil; S. Bose, University College London, United Kingdom</td>
<td>A.A. Lebedev, V.V. Zelenin, A.N. Kuznetsov, P.L. Abramov, S.Yu. Davydov, A.S. Tregubova, A.N. Smirnov, A.F. Ioffe Physico-Technical Institute, St.Petersburg, Russia</td>
<td>We have demonstrated how a Fabry-Perot cavity on an atom chip to obtain strong, extremely stable atom-cavity coupling for single atoms and Bose-Einstein condensates trapped inside the cavity. This enables qubit detection with near-unit efficiency.</td>
<td>We have developed a 798-nm-stabilized high-brightness tapered laser diode to pump a Nd:ASL crystal. We obtained an IR laser power of 230 mW and 42 mW at 450 nm by second harmonic generation.</td>
</tr>
</tbody>
</table>
Additionalspecklereductiontechniques.

WeobtainedmentswithapulsedBroad-Area-VCSELillumination source indifferent setups. Weimplemented electro-thermally tunable self-heterodyning technique are presented.

Specklephenomenainpulsedbroad-

Several novel approaches to adiabatic mode and spectral filtering of micromachined VCSELs are presented. Wehave achieved the narrowest linewidth for MEMSVCSELs of 32MHz.

Linewidth of electrically pumped long-wavelength MEMS VCSELs

Weinvestigated jitter (retiming) transfer function of the 3R regenerator in the presence of recovered clock signal. Jitter performance of a 3R significantly improves for square data signal pulses and decreasing control signal pulse width.

The control of the coherent radiation can be achieved through the use of superlenses. Regenerative properties of asynchronous digital optical regenerator using a single EAM.

Next generation ultrafast telecommunications technologies

A highly efficient SERS response is obtained when the excitation beam is guided in the core.
probetheinternalfinestructureofexcitons

Damping of Rabi oscillations in InAs quantum dots due to acoustic phonons

Trapping and observing single atoms in the dark

Experiments showing orbital angular momentum exchange with optical vortices

Two-step photolithographic technique for laterally coupled hybrid polymer microring resonators

Quantitative determination of photosensitivity proximity effects in multi exposure direct UV writing for high density integrated optics

Development of SOJ class repetitive laser based on Nd-doped silica glass

Tabletop 300 J Nd:glass laser with 3 diﬀraction-limited beam divergence

Chair: Ilias Perakis, Univ. of Crete, Greece

Chair: Rainer Blatt, Univ. of Innsbruck, Austria

Chair: Cornelia Denz, Univ. of Munich, Germany

Chair: Rosalba Serna, Ins. de Optica, Madrid, Spain

Chair: Andy Clarkson, University of Southampton, United Kingdom

Chair: Andy Clarkson, University of Southampton, United Kingdom

Chair: Rainer Blatt, Univ. of Innsbruck, Austria

Chair: T.|o sanit, Leiden University, Leiden, Netherlands

Chair: Phelps A., KOD, Tokyo, Japan


Comparative gain measurement study of high power quantum well and quantum dot lasers with high temperature stability of the emission wavelength

R. Debusmann, W. Kaiser, S. Höfling, A. Forchel, University of Würzburg, Germany

The high temperature stability of the emission wavelength of high power quantum dot lasers for uncooled pump applications is explained by comparative gain measurements of quantum dot and quantum well material.

Low threshold, very low noise, high temperature operation of 1.55 micrometre InP-based Fabry-Perot quantum dashes-in-a-well (DWell) lasers

P. Resneau, M. Colligara, B. Rousseau, F. Lelarge, M. Krakowski, Alcatel-Thales III-V Lab, Palaiseau, France

To investigate the reliability of our quantum dash lasers under continuous wave operation at 90 degrees Celsius we have performed static and dynamic measurements under continuous wave operation at 1.55 micrometre operation of 1.55 micrometre. Such low-alpha factor devices are suited for cross-gain modulation based signal processing.

Threshold clamping in quantum dot lasers

P. Spencer, E. Clarke, P. Howe, R. Murray, Imperial College London, United Kingdom

Threshold clamping and the effects of inhomogeneous broadening on quantum dot lasers have been studied using a derivative spectroscopy technique with the results questioning the validity of a quasi-Fermi level picture at room-temperature.

Generating isolated attosecond pulses by modulating light polarization

E. Constant, CELIA, Université Bordeaux 1, Talence, France

I will present how to generate attosecond pulses by modulating the polarization of a light pulse. I will also present how to control and use these pulses for performing high temporal resolution pump-probe experiment.

Generating isolated attosecond pulses in the few-cycle regime

G. Sansone, S. De Silvestri, S. Stagno, C. Vozi, F. Calegari, E. Benedetti, M. Nisoli, National Lab. for Ultrafast and Ultraintense Optical Science CNR-INFN, Milano, Italy; L. Avalldi, R. Fiammuni, CNR-IMIP Area della Ricerca di Roma I, Monterotondo Scoio, Italy; L. Poletta, P. Villreis, Lab. for Ultraviolet and X-ray Optics Res., Padova, Italy; C. Altucci, R. Velotta, CNISM- Univ. Federico II, Napoli, Italy

We present the generation of isolated attosecond pulses using phase-stabilized 5-fs pulses with time dependent ellipticity. Using a complete temporal characterization technique, we demonstrate compression of the pulses down to 130 as (<1.2 optical cycles).

New directions in photonic crystal fibres

P.S.J. Russell, Max-Planck Research Group, Erlangen, Germany

Photonic crystal fibres have given rise to numerous successful applications spanning many fields of science and technology, and opened up a number of new research directions. In this tutorial, key recent advances will be reviewed.

Gain and phase dynamics in an InAs/GaAs quantum dot amplifier at 1300nm


Strong 3ps gain variations with only weak phase changes were measured with a pump-probe setup on an InAs/GaAs quantum dot amplifier at 1300nm. Such low-alpha factor devices are suited for cross-gain modulation based signal processing.

New passive all-optical semiconductor device for bit-1 level noise reduction

H. Trung Nguyen, G. Aubin, J.L. Oudar, S. Bouchoule, Lab. de Photonique et de Nanostructures, CNRS-LPN, Marcoussis, France; S. Sauvage, Ins. d’Electronique Fondamentale, CNRS, Orsay, France

A novel approach for bit-1 noise reduction is demonstrated, based on ultrafast vertical microcavity device. It allows a simple scheme for complete 2R regeneration, when combined with a state-of-the-art saturable absorber device.

Impact of the electro-optical modulator on CAPS code dispersion tolerance

P. Boffi, M. Martelini, Politecnico di Milano, and CoreCom, Milano, Italy; L. Marazzi, P. Martelli, P. Parolai, A. Righetti, R. Siano, CoreCom, Milano, Italy

Combined Amplitude-Phase Shift code performance generated either by push-pull MZM or Phase Modulator are compared over uncompensated SSMF-links both experimentally and by simulations. The MZM solution over performs the PM solution achieving 225-km error-free propagation.

An all-optical THz oscilloscope

A.Barile, Gigaspots GmbH, Konstanz, Germany

An all-optical oscilloscope based on high-speed asynchronous optical sampling (ASOP) is presented. It acquires ultrafast optical signals of 1ns duration with 160fs resolution at a 10kHz scan-rate. THz spectroscopy and picosecond ultrasound based thin film characterization are discussed as applications.
IC2-4-TUE 17:15
Generation of entangled photon pairs in optical cavity-QED: operating in the bad cavity limit
R. Garcia, K. Eckert, J. Monpart, R. Carballo, Universität Autonoma de Barcelona, Spain
We propose an optical cavity quantum electrodynamics scheme for the deterministic generation of polarization entangled photon pairs that operate with high fidelity even in the bad cavity limit.

IC2-5-TUE (Invited) 17:30
Quantum jumps of light recording the birth and death of a photon in a cavity
We report on the first observation of photon number quantum jumps. Microwave photons stored in a high Q superconducting cavity are repeatedly probed by a stream of non-absorbing atoms performing a QND measurement.

IC2-4-TUE 17:30
Control of optical turbulence
C. Evain, S. Biedkowski, C. Szwej, Université des Sciences et Technologies de Lille, Villeneuve d'Ascq, France; A. Mochikashiz, M. Katah, USOR, IMS, Okazaki, Japan; M. Hosaka, Y. Takashina, Nagoya University Graduate School of Engineering, Nagoya, Japan; M.E. Coopie, Synchrotron SOLEIL, Gif-sur-Yvette, France
We demonstrate theoretically (Ginzburg-Landau equation) and experimentally (on a free electron laser) the suppression of the "turbulent" regimes that can appear in optical systems with advection.

IG2-4-TUE 17:30
Sensitivity of photo-thermo-refractive glass to IR femtosecond pulses: application for the recording of phase elements
L. Siman, J. Lumeau, L.B Glebou, University of Central Florida, Orlando, USA
We demonstrate the use of a Ti:sapphire amplified femtosecond laser to nonlinearly excite PTR glasses. Photosensitivity curves showing refractive index change versus intensity and dosage are presented. First Fresnel lens recorded in PTR is shown.

IG2-5-TUE 17:45
Rotating multipole vortex solitons in nonlocal media
D. Buccoliero, A. Desyatnikov, W. Krolikowski, Y. Kivshar, The Australian National Univ., Canberra, Australia
We introduce novel classes of soliton patterns with nontrivial phase structure in nonlocal nonlinear media. We demonstrate the rotational dynamics of tripole vortex solitons with nonzero angular momentum and the phase carrying two spiraling vortices.

CE4-6-TUE 17:45
Femtosecond direct laser writing of buried diffractive optical elements in glasses
M. Ng, S.M Eaton, D. Chanda, P.R Herman, University of Toronto, Canada
A high repetition rate (0.1-1.0 MHz) femtosecond laser was used for direct writing of 3-D diffractive optical elements in the bulk of various glasses by interfacing multi-layered periodic refractive index structures with submicron resolution.

CEA6-6-TUE 17:45
Power scaling on resonantly diode-pumped 1.6-µm Er-doped lasers
N. Ter-Gabrielyan, L. Merkle, J.O White, M. Dubinski, US Army Research Laboratory, Adelphi, USA
We present the results of design tradeoff study aimed at power scaling of resonantly diode-pumped eye-safe Er-doped lasers over a wide temperature range. Conclusions are based on a laser model anchored to experimental laser results.
Imaging of attosecond electron wave packets
Attosecond XUV-pulses were generated via the polarization-gating technique and used to ionize helium in the presence of a strong IR laser field. The dynamics of the resulting attosecond electron wave packets was recorded via velocity-map imaging.

Optical attosecond mapping by polarization selective detection
M. Kitzler, A. Scrinzi, A. Baltuska, Vienna University of Technology, Vienna, Austria
A general concept of using the spatial information encoded in the time-dependent polarization of high harmonic radiation generated by orthogonally polarized two-color laser fields is proposed and two applications to attosecond physics are demonstrated.

Influence of air-filling fraction on forward Brillouin scattering in highly birefringent PCF
A. Brenn, H. Hundertmark, P.S.J. Russell, University of Erlangen-Nuremberg, Germany; G.S. Wiederhecker, University of Erlangen-Nuremberg, Germany and Universidade Estadual de Campinas, Brazil; N. Joly, University of Erlangen-Nuremberg, Germany and Laboratoire PhLAM, Université de Lille, France
We report on the effects of cladding air-filling fraction on the forward Brillouin scattering spectrum in highly birefringent PCF. Good agreement is achieved between experimental measurements and numerical simulations using a full-vectorial finite-element approach.

Single attosecond pulse generation using a seed harmonic pulse train
K.I. Ishikawa, University of Tokyo, Japan; K. Midorikawa, E.J. Takahashi, RIKEN, Wako, Japan
We theoretically present a new scheme of single attosecond pulse generation which does not require few-cycle lasers, based on enhanced harmonic generation by simultaneous irradiation of driving laser and seed harmonic pulse train.

Reduction of guided acoustic wave Brillouin scattering in photonic crystal fibers
D. Elser, C. Marquardt, O. Glöckl, S. Lorenz, G. Leuchs, Ins. of Optics, Information and Photonics (Max-Planck Res. Group), Erlangen, Germany; U.I. Andersen, Technical Univ. of Denmark, Lingby, Denmark
By using Photonic Crystal Fibers, we modify the spectrum of Guided Acoustic Wave Brillouin Scattering. In a wide frequency range, this leads to a reduction of excess noise accumulated by quantum states propagating in fibers.

DWDM transparent FSO system for ultrahigh bit rate applications
D.M. Forin, ISCOM and Università di Roma, Italy; V. De Sanctis, M. Svolto Moreolo, V. Sacchieri, G. Cincotto, Università Roma Tre, Rome, Italy; F. Curtis, M. Guglielmiucci, G.M. Tosi Belletti, ISCOM, Italian Communication Ministry, Rome, Italy; A. Teixeira, Universidade de Aveira, Portugal
Free Space Optic is a key solution for addressing the last hundred meters of broadband requirements. Transparent FSO experiments operating with a DWDM configuration at bit rates up to 40 Gbit/s is reported.
Novel fabrication technique of proton-exchanged waveguide based on LiNbO₃ using inductively coupled plasma

Z. Ren, P.J. Heard, S.Yu, University of Bristol, Bristol, United Kingdom

A novel plasma-based technique has been developed for fabrication of Proton-exchanged nonlinear waveguides in LiNbO₃. High quality, uniform stripe waveguides with step-like proton-exchange profile and a low order crystal phase has been achieved.

Effect of GeO₂ additive on fluorescence intensity enhancement in bismuth-doped silica glass

Y. Fujimoto, Y. Kowada, M. Nakatsuuka, Osaka University, Suta, Japan; Y. Hirata, Kinki University, Higashi-Osaka City, Japan

We have observed the enhancement of fluorescence intensity due to the addition of GeO₂ in bismuth-doped silica glass. Only 5.0 mol% of GeO₂ additive brought the 26.3 times fluorescence intensity enhancement due to the addition of GeO₂ in bismuth-doped silica glass. We have observed the enhancement of fluorescence intensity compared with no additive.

Enhanced photoinduced birefringence in hydrogen-bonded polymer-dye complexes

A. Primagi, M. Kavola, Helsinki University of Technology, Espoo, Finland; F. J. Rodriguez, M. Kauranen, Tampere University of Technology, Tampere, Finland

Photoinduced birefringence in azo-dye-doped polymers is strongly enhanced by hydrogen bonding between the guest molecules and the polymer host, which we attribute to lower aggregation tendency and reduced mobility of the dye molecules.

Energy transfer in co-doped Pr³⁺ doped YF₅ under VUV excitation

S. Rücker, Physikalisch-Technische Bundesanstalt, Braunschweig, Germany; I. Sokolska, Peine, Germany

A general discussion of the dipole-dipole energy transfer between the Pr³⁺ - Y³⁺ transition in YF₅ and resonant transitions in different rare earth ions is given. Calculations and spectroscopic investigation are presented.

Photoluminescence of Nd³⁺:YLF crystalline nanofilms deposited on YLF substrates via pulsed laser ablation

S. Barsanti, P. Bichini, A. Anwar-Ul Haq, F. Corzacchia, M. Tonelli, A. Di Lieto, University of Pisa, Pisa, Italy

We report the first realization of monocrystalline nanofilms of Nd³⁺: YLF doped fluoride on YLF substrates by pulsed laser deposition. The films optical characteristics are discussed and a first morphological study via SEM analysis is shown.

Investigation of optical losses in visible and near-IR range in garnet epitaxial films doped with Cr and Nd-ions

V.B. Tsivetkov, I.A. Scherbakov, General Physics Institute, Moscow, Russia; M.Y. Gusev, I.A. Ivanov, N.A. Neustroev, R&D Institute for materials research, Moscow, Russia

The characterization results of liquid phase epitaxy grown GGG and GSAG films doped with Nd³⁺ and Cr³⁺ ions are presented. The optimal growth conditions were determined for minimizing the optical losses in the films.

Characterisation of multicore tellurite optical fibre


The fabrication and characterisation of three core tellurite glass fibre is reported. Near single-mode transmission is observed for each core. Multicore tellurite fibre has applications for devices in mid-infrared sensing and fibre laser arrays.

Fabrication by rf-sputtering and diagnostics of Er³⁺/Yb³⁺ - activated silica-hafnia waveguides

A. Chiasera, C. Armellini, M. Femia, Y. Jestin, CQR-CNRS, Institute Photonics & Nanotechnology, Povo-Trento, Italy; A. Chiappini, M. Montagna, E. Moser, C.Tosello, Trento University, Trento, Italy; V. Voglietti, A. Minotti, CQR-CNRS, Institute Photonics & Nanotechnology, Rama, Italy; G. Nunzi Conti, CQR-CNRS, Institute of Applied Physics, Firenze and Centro Fermi, Roma, Italy; S. Pellli, CQR-CNRS, Institute of Applied Physics, Firenze, Italia; G.C. Righini, CQR-CNRS, Institute of Applied Physics, Firenze and CNR, Roma, Italia SiO₂:HFO, planar waveguide activated with Er and Yb system was fabricated by the rf-sputtering technique. Optical and spectroscopic properties were measured and channel waveguide were fabricated by etching the active film.

Spectroscopic and scintillation performance of Ce:YAP single crystal fibres grown by µ-PD technique

M. Alshourbagy, D. Herbert, A. Del Guerra, A. Toncelli, M. Tonelli, Pisa University, Pisa, Italy

Growth, spectroscopic and scintillation performance of Ce:YAP single crystal fibres are described. The results demonstrate capability of the micro-pulling-down technique to produce the scintillator crystals to be device-ready shape.

Characterization of multicore tellurite optical fibre


In this work we report the growth and spectroscopy results of LiNbO₃ single crystals fibres doped with different concentration of Erbium. The samples were grown using the micro pulling down technique.

Photoluminescence, polarization, waveguiding and gain properties of organic semiconductor single crystals

A. Camposeo, M. Polo, R. Cingolani, D. Pizignano, National Nanotechnology Laboratory, Lecce, Italy; S. Tavazzi, L. Silvestri, P. Spearman, M. Campione, A. Papagni, A. Borghesi, Università di Milano Bicocca, Milano, Italy

Optical properties of organic semiconductor crystals are investigated. Self waveguiding and ASE is observed in quaterthiophene crystals. Tetracene crystals show superradiance at temperatures below 50 K, properties that make these materials suitable for laser devices.

Comparative results on the recording of Type IIA gratings in B-Ge optical fibres using femtosecond and picosecond 248nm laser radiation

S. Pissadakis, G. Violakis, M.KK. Konstantakis, Foundation for Research and Technology-HESL, Heraklion, Greece

Inscription of Type IIA gratings in B-Ge doped optical fiber is presented using 5ps, 50fs and 120fs, 248nm laser radiation. The photosensitivity behaviour dependence upon the intensity, energy density and accumulated energy is investigated.

Reducing the impact of charge carrier induced absorption in organic double heterostructure laser diodes

C. G. Carretero, C. Kamnitch, U. Lemmer, University of Karlsruhe, Karlsruhe, Germany

We investigate the behaviour of double heterostructure organic laser diodes under pulse excitation by numerical simulation. By applying a reverse pulse, excited states and polarons are separated hence reducing the impact of charge carrier absorption.

Free carrier lifetime measurements in SiGe/Si planar waveguides

A. Tita, I. Cristiani, V. Degiorgio, University of Pavia, Pavia, Italy; H. van Känel, D. Chastina, Polo Regionale di Como, Como, Italy

Minority carrier lifetime in SiGe/Si planar waveguides has been estimated measuring the free carrier absorption transient of an in-fraed probe beam. Electron-hole pair excitation is induced by a pulsed 810nm femtosecond laser beam.

Light emission from LPCVD silicon nanocrystals: the effect of composition and annealing


Efficient photoluminescence is obtained from silicon nanocrystals embedded in SiO₂ films, fabricated by LPCVD and subsequent annealing. From a systematic study of annealing conditions, we demonstrate that a RTA step after deposition enhances optical properties.

Scanning near-field optical microscopy (SNOM) of lithium niobate aperiodically poled during growth

E. Cantelar, J. Lamela, J.A. Sanz Garcia, G. Li-fante, F. Fusco, F. Jaque, Universidad Autonoma de Madrid, Madrid, Spain; J. Canet-Ferrer, J. Martinez-Pastor, Universitat de Valencia, Valencia, Spain

Scanning near-field microscopy (SNOM) of lithium niobate aperiodically poled during crystal growth is studied. Reflectivity variations across the domain walls and its dependence with domain size are discussed.

Ultra thin metal films for transparent conductive layers

S. Giorgiola, P. Vergani, F. Lucchi, Avanex Corp., San Donata, Milanese, Italy; V. Pruneri, ICFO - Institut de Ciencies Fotòniques, Castelldefels (Barcelona), Spain

We have obtained ultra thin metal films (thickness <5nm), suitable for transparent optical fibres.

Efficient photoluminescence is obtained from silicon nanocrystals embedded in SiO₂ films, fabricated by LPCVD and subsequent annealing. From a systematic study of annealing conditions, we demonstrate that a RTA step after deposition enhances optical properties.

Scanning near-field optical microscopy (SNOM) of lithium niobate aperiodically poled during growth

E. Cantelar, J. Lamela, J.A. Sanz Garcia, G. Li-fante, F. Fusco, F. Jaque, Universidad Autonoma de Madrid, Madrid, Spain; J. Canet-Ferrer, J. Martinez-Pastor, Universitat de Valencia, Valencia, Spain

Scanning near-field microscopy (SNOM) of lithium niobate aperiodically poled during crystal growth is studied. Reflectivity variations across the domain walls and its dependence with domain size are discussed.

Ultra thin metal films for transparent conductive layers

S. Giorgiola, P. Vergani, F. Lucchi, Avanex Corp., San Donata, Milanese, Italy; V. Pruneri, ICFO - Institut de Ciencies Fotòniques, Castelldefels (Barcelona), Spain

We have obtained ultra thin metal films (thickness <5nm), suitable for transparent optical fibres.

Efficient photoluminescence is obtained from silicon nanocrystals embedded in SiO₂ films, fabricated by LPCVD and subsequent annealing. From a systematic study of annealing conditions, we demonstrate that a RTA step after deposition enhances optical properties.

Scanning near-field optical microscopy (SNOM) of lithium niobate aperiodically poled during growth

E. Cantelar, J. Lamela, J.A. Sanz Garcia, G. Li-fante, F. Fusco, F. Jaque, Universidad Autonoma de Madrid, Madrid, Spain; J. Canet-Ferrer, J. Martinez-Pastor, Universitat de Valencia, Valencia, Spain

Scanning near-field microscopy (SNOM) of lithium niobate aperiodically poled during crystal growth is studied. Reflectivity variations across the domain walls and its dependence with domain size are discussed.
electrodes, with optical transmittance and electrical resistivity comparable to transparent conducting oxides. Influence of surface roughness on electrical and optical properties is discussed.

CE-18-TUE
Dispersion and thermo-optical parameters of KY(WO₄)₂: Yb:KY(WO₄)₂ and KGd(WO₄)₃ crystals in the visible spectral range
V.V. Filippov, I.T. Bodnar, B.I. Stepanov, National Academy of Sciences of Belarus, Minsk, Belarus; N.V. Kuleshov, Belarus National Technical University, Minsk, Belarus
Principal refractive indices and their temperature dependence were measured for KGW, KYW and Yb(20%)/KYW crystals in the visible. Thermo-optical coefficients and athermal directions were determined.

CE-19-TUE
A new UV laser media: Tb³⁺ and Yb³⁺ codoped oxyfluoride glass-ceramic containing CaF₂ nanocrystals
L. Huang, T. Yamashita, R. Jose, Y. Arai, T. Suzuki, Y. Ohishi, Toyota Technological Institute, Nagoya, Japan
We have developed a new ultraviolet laser media: transparent terbium and ytterbium ions codoped oxyfluoride glass-ceramic containing calcium-fluoride nanocrystals. Intense emission at 381 nm was observed containing calcium-fluoride nanocrystals.

CE-20-TUE
The influence of temperature on YVO₄ and GdVO₄ Raman laser parameters
P.G. Zverev, General Physics Institute of Russian Academy of Sciences, Moscow, Russia
The results on spontaneous Raman spectroscopy of SRS-active vibronic modes in YVO₄ and GdVO₄ crystals in 150–300 K temperature range are presented. The temperature sensitivity coefficients for the Raman gain and frequency shift are obtained.

CE-21-TUE
Growth and characterization of large single crystals Yb:GGG and Yb:YAG for high power thin disk lasers
I.A. Ivanov, A. M. Bulkanov, NISD Institute for materials research, Moscow, Russia; V.B. Tsvetkov, V. Seregin, I. Shcherbakov, General Physics Institute, Moscow, Russia
The results are presented of comparative investigations of growth conditions and spectral, thermal and laser characteristics of Czochralski grown Yb:YAG and Yb:GGG single crystals with 60 mm diameter and Yb-concentrations from 6 to 30 at. %.

CE-22-TUE
High precision fiber waveguide arrays for coherent light propagation
U. Röpke, S. Unger, J. Socher, K. Schuster, H. Bartelt, Institute for Photonic Technology, Jena, Germany
We report on the fabrication and investigation of new weakly coupled fiber arrays with coupling length and length of coherent light propagation above 50 mm. Application aspects in short pulse and laser technique are discussed.

CE-23-TUE
Spectroscopic study of bismuth-doped silica glass
L. Bigot, A.A. Choueiry, A.M. Jurdy, B. Jacquier, UMR-CNRS 5620 Université Claude Bernard, Villeurbanne d’Asqa, France; V.G. Truong, UMR-CNRS 8523, IRCCA-USTL, Villeurbanne d’Asqa, France; M. Douay, UMR-CNRS 5620, IRCCA-USTL, Villeurbanne d’Asqa, France; J. Razołdzeew, FR-CNRS 2416, USTL, Villeurbanne d’Asqa, France
Investigations of up-conversion, intensity dependence of luminescence and time-resolved luminescence on bismuth-doped silica glasses are proposed in order to identify the nature of the luminescence centre and to understand its fluorescence dynamics.

CE-24-TUE
Spectroscopy of the relaxation dynamics in Tm-Ho-fiber lasers
L. Orlita, S. Kivisto, R. Herda, O. Khoikhoitnikov, Tampere Univ. of Technology, Tampere, Finland
Relaxation oscillations in a tunable thulium-holmium-doped fiber lasers has been studied experimentally. We show that the laser transition type changes over gain bandwidth from four-level to a three-level scheme at 1960 nm, affecting Tm-Ho-laser dynamics.

CE-25-TUE
Emission characteristics of high power LEDs studied by confocal microscopy
L. Kunz, F.P. Wenzl, C. Sommer, E. Zinter, G. Leising, Institute of Nanostructured Materials and Photonics, Weiz, Austria; P. Pachler, P. Hartmann, S. Tasch, TridonicAtco Optoelectronics GmbH, Jennersdorf, Austria
We report on a confocal microscopy setup, which is presented as a powerful tool to study the light emission characteristics of millimeter-sized high-power LEDs with micron resolution.

CE-26-TUE
Excitation mechanism of blue and infrared emission in ZnSe:Cr
V. Sirheli, Moldova State University, Chisinau, Moldova and Lappeenranta Univ. of Technology, Lappeenranta, Univ. of Turku, Finland; D. Nedeaglo, R. Sobolevskaya, K. Sushelevich, Moldova State University, Chisinau, Moldova; N. Nedeaglo, Moldova State Univ., Chisinau, Moldova and Lappeenranta Univ. of Technology, Lappeenranta, Finland; R. Laiho, Univ. of Turku, Turku, Finland; E. Lähdeteranta, Lappeenranta Univ. of Technology, Lappeenranta, Finland; L. Kulyuk, O. Kulikova, A. Sinimel, Academy of Sciences of Moldova, Chisinau, Moldova
The mechanisms of high-temperature blue and infrared emission in ZnSe:Cr crystals are reported. Blue emission and the intra-shell transition of chromium Cr³⁺ are induced by ionization transition of chromium ions 2+ to 1+ states in ZnSe:Cr. We conclude that the photoionization excitation mechanism can be applied for optical pumping of 2.0 micrometer ZnSe:Cr-based laser.

CE-27-TUE
Comparative study of electronic transport of thin film nanocrystals prepared by low-temperature vacuum deposition
O. Ganegrova, V. Gremenev, National Academy of Sciences of Belarus, Minsk, Belarus
The relationship between the nanocrystal structure, which can be loosely divided into the surface and the core, and its properties needs to be understood. This study address the effects, which can characterize the nanocrystal surface.

CE-28-TUE
Short wavelength emission properties of highly doped Dy³⁺:YAG/YAG planar waveguides
M. Klimczak, P. Kijek, Institute of Microelectronics and Optoelectronics, Warsaw, Poland; L. Sarnecki, Institute of Electronic Materials Technology, Warsaw, Poland; R. Piramidowicz, Institute of Microelectronics and Optoelectronics, and Telekomunikacja Polska Research & Development Centre, Warsaw, Poland; M. Malinowski, Institute of Microelectronics and Optoelectronics and Institute for Electronic Materials Technology, Warsaw, Poland
Visible emission of highly doped (up to 10 % at.) Dy:YAG planar waveguides is investigated. Measured spectroscopic data is used in numerical analysis aimed at determining the most probable fluorescence quenching and energy transfer effects.

CE-29-TUE
Spectroscopic investigations of transparent glass- ceramics on the basis of Cr³⁺:LiGaSiO₄
K.A. Subbotin, V.A. Smirnov, A.M. Prokhorov, General Physics Institute of RAS, Moscow, Russia; E.V. Zharkov, D.I. Mendeleyev, Univ. of Chemical Technology of Russia, Moscow, Russia; L.D. Ishkhakova, Fiber Optics Research Center of Russian Academy of Sciences, Moscow, Russia
The fabrication and spectroscopic investigations of new promising Cr³⁺ doped material, transparent nano-sized glass-ceramics on the basis of Cr³⁺:LiGaSiO₄ have been reported. The material demonstrates strong fluorescence, peaking at 1.3 micron with lifetime 9 microseconds.

CI-1-TUE
Dispersion-tolerant picosecond flat-top waveform generation using a single uniform long-period fiber grating
R. Slavik, Institute of Photonics and Electronics, Prague, Czech Republic; P. Park, J. Azana, Institut National de la Recherche Scientifique, Montreal, Canada
We demonstrate that our recently-reported all-fiber scheme for generation of picosecond and subpicosecond flat-top optical pulses can be easily reconfigured to compensate for the flat-top shape degradation caused by different levels of dispersion.

CI-2-TUE
Mode-locking and all-optical clock recovery in a semiconductor fiber laser using cross-absorption modulation in an electro-absorption modulator
L.R. Chen, McGill University, Montreal, Canada; J.C. Cartledge, Queen’s Univ., Kingston, Canada
We demonstrate mode-locking at 5 GHz and all-optical clock recovery at 10 GHz in a semiconductor fiber laser using cross-absorption modulation in an electro-absorption modulator and inverse RZ pump pulses.

CI-3-TUE
Limits of terrestrial optical fiber systems for ultra-high bit rate RZ data transmissions (from 160 Gbit/s to 1.28 Tbit/s)
S. Pitots, J. Fatome, Université de Bourgogne, Dijon, France
In this work, we numerically evaluate the limits of the pre-installed terrestrial optical fiber systems based on SMF/DCF dispersion map regarding ultra high-bit rate RZ data transmission, from 160 Gbit/s to 1.28 Tbit/s.
CI-4-TUE
SOA and Lyot filter based multiwavelength actively mode-locked fibre ring laser with modulator birefringence compensation
C. O’Riordan, M.J. Connolly University of Limerick, Limerick, Ireland
A multiwavelength fibre ring laser is presented. Birefringence compensation of the lithium niobate modulator used to mode-lock the laser improves the stability and uniformity of the lasers spectrum and increases the number of lasing channels.

CI-8-TUE
100GHz electrically tunable planar Bragg gratings via liquid crystal overlay
F.R. Mahmod Adikan, J.C. Gates, B.D. Snow, H.E. Major, C.B.E. Gawith, P.G.R. Smith, A. Dyadyusha, M. Kaczmarek, University of Southampton, United Kingdom
We demonstrate 114.9GHz electrically tunable liquid crystal Bragg gratings using 170Vpp voltage. The devices were made using direct UV grating writing and use evanescent coupling into an electrically tuned nematic liquid crystal.

CI-9-TUE
Wavelength effects on a semiconductor optical amplifier based double-stage wavelength converter dynamics working with an assist light
F. Givonart, ENSSAIT - Rennes I University, Lannion, France
Using a temporal semiconductor optical amplifier (SOA) gain dynamics model, including amplified spontaneous emission, we study wavelength effects on a SOA based wavelength shifter dynamics under an assist light injection.

CI-10-TUE
Performance of gain-clamped EDFA's in channel routing and packet switched WDM optical transmissions
D.H. Thomas, J.P. von der Weid, Pontificiel Catholic University, Rio de Janeiro, Brazil
In wavelength division multiplexing (WDM) networks, routed channels and switched packets disturb erbium-doped fibre amplifier (EDFA) stable operation, requiring different solutions for each application.

CI-11-TUE
Sampling of RF signals with LTG-GaAs based MSM structures
J.-M. Delard, J. F. Roux, J.-L. Coutaz, Université de Savoie, LACH, Chambery, France; S. Forment, J. Chazelas, Thales TASS, Elancourt, France; A. Krotkus, Semiconductor Physics Institute, Vilnius, Lithuania; C. Canselier, Université Pierre et Marie Curie, LSF, Ivy sur Seine, France
We present complete optoelectrochemical characterization of photoductive switches that are used for optical sampling assisted of RF signals. High speed response of the devices is ensured by use of GaAs layers grown at moderate temperature.

CI-12-TUE
Patterning effects in WDM RZ-DBPSK SMF/DCF optical transmission at 40 Gbit/s channel rate
O.V. Shevchik, M.P. Fedoruk, Institute of Computational Technologies, Novosibirsk, Russia; S.K. Turitsyn, Aston University, Birmingham, United Kingdom
We demonstrate 114.9GHz electrically tunable liquid crystal Bragg gratings using 170Vpp voltage. The devices were made using direct UV grating writing and use evanescent coupling into an electrically tuned nematic liquid crystal.

CI-13-TUE
Variable rate and tunable central wavelength Therazhert repetition rate optical clock generation using variable bandwidth spectrum shaper
S.A. Anzai, Y.K. Komai, M.M. Mieno, K.K. Kodate, Japan Women’s University, Tokyo, Japan; N.W. Wada, T.M. Miyazaki, National Institute of Information and Communications, Tokyo, Japan; T.Y. Yoda, Optoquest Co., Ltd., Toyko, Japan
A new variable rate and tunable central wavelength terahertz (THz) optical clock generation technique is proposed. THz optical clocks with 2 and 3 sharp spectra components of 1.0-4.0 THz mode spacing are experimentally demonstrated.

CI-14-TUE
Fiber-based in-line regeneration scheme for multichannel operation at 40 Gb/s
Ch. Kouloumanas, National Technical University of Athens, Greece; I.Tomkos, Athens Information Technology Center, Athens, Greece
A scheme based on the use of multiple pieces of nonlinear fiber with anomalous dispersion, alternated with pieces of standardDCF is proposed for in-line WDM regeneration, and is evaluated in a 40-Gb/s transmission system.

CI-15-TUE
Towards Terabit/s wavelength conversion with a single semiconductor optical amplifier and an optical bandpass filter
Extensive simulations employing a comprehensive numerical model show the possibility of 1 Terabit/s wavelength conversion using a single semiconductor optical amplifier with an optical bandpass filter.

CI-16-TUE
Genetic algorithm-based optical fiber filter optimization for high speed wavelength conversion based on a semiconductor optical amplifier
Genetic algorithm was applied in optimizing an optical filter for high speed wavelength conversion based on a semiconductor optical amplifier. Eye opening of 33dB is achieved. The robustness of the optimized filter is explored.

CI-17-TUE
Impact of OPC insertion in a WDM link
L. Marazzi, P. Parolani, P. Martelli, CoreCom, Milan, Italy; A. Gatto, P. Minzioni, I. Cristiani, V. Degiorgio, University of Pavia, Pavia, Italy; M. Martinelli, CoreCom, Milan, and Politecnico di Milano, Italy
A systematic study on MNTI technique effectiveness is presented in a 6-span-60km-long 2-channel WDM SM fiber link, MNTI approach significantly improves system performances with respect to MSSI which would not allow 10Gb/s per-channel power.

CI-18-TUE
Stability investigation of bi-directional single-fiber reconfigurable transparent WDM ring network
K. Enriet, University of Swansea Wales, Swansea, United Kingdom; G. Della Valle, S. Taccheo, Politecnico di Milano, Milan, Italy
We report on the stability of bidirectional reconfigurable WDM ring network using bidirectional optical gain clamped Erbium-doped waveguide amplifiers. This architecture allows flexible traffic re-routing and network operation even in case of node failure or fiber cut.

CI-1-TUE
Radially polarized Yb-fiber laser with an intracavity axicon
J.L. Li, K.J. Ueda, University of Electro-Communications, Tokyo, Japan
Radially polarized Yb fiber laser by using an axicon is demonstrated with radial polarization extinction from 2.3 to 4.4. Experimental results on the evidence of the ring mode side gain fiber also is given.

CI-2-TUE
Core temperature measurement of an active optical fiber in lasing regime
V. Gainov, D. Demyanovk, NTO “IRE-Polus” and Moscow Institute of Physics and Technology, Moscow Region, Russia; O. A. Ryabushkin, NTO “IRE-Polus” and Moscow Institute of Physics and Technology, Moscow, Russia
A new method for measuring the core temperature of a lasing fiber by using an optical fiber interferometric sensor is presented. A technique for measuring the core temperature of a lasing fiber is presented.
Effect of 805 nm auxiliary pumping in a Tm-doped Bi2O3-SiO2-Based fiber for S-Band amplification
S.R. Loth, M.L. Sundheimer, A.S.L. Games, University of Federal de Pernambuco, Recife, Brazil

Dual-wavelength pumping using 803 nm is investigated for a thulium-doped bismuth-silicate fiber. Contrary to ZBLAN, 1426 nm is more effective than 1050 nm, giving 5.8 dB gain for 1.068 W total pump power.

CJ-3-TUE
Sidewall smoothing for Si/SiO2 waveguides by excimer laser reformation
S.C. Hung, C.F. Lin, National Taiwan University, Taipei, Taiwan; E.Z. Liang, Diwan, College of Management, Tainan, Taiwan

Smoothing as-etched Si/SiO2 waveguides by laser illumination results in less damage than furnace-treated one and atomic-force-microscopy measurement on the reformed surface gives root-mean-square roughness of 0.24 nm and leads to 0.1dB/cm of calculated scattering loss.

CJ-4-TUE
Efficient energy transfer from Yb3+ to Tb3+ for the 0.54 μm band laser
T. Yamashita, Y. Ohishi, Toyota Technological Institute, Nagoya, Japan

The energy transfer efficiency from Yb3+ to Tb3+ as high as about 60% was attained in a Tb3+-Yb3+-codoped borosilicate glass. This glass was a promising candidate for the 0.54 μm band lasing medium at pumping of 0.98 μm.

CJ-5-TUE
Nonlinear frequency conversion based on a fiber amplifier at 977 nm for the indium atom lithography
J.S. Kim, D. Meschede, D. Haubrich, University of Bonn, Bonn, Germany

The fiber amplifier system at 977 nm is constructed to generate 325 nm light for the manipulation of indium atoms. Non-linear frequency conversion based on the fiber amplifier through the enhancement cavity will be discussed.

CJ-6-TUE
Effect of 805 nm auxiliary pumping in a Tm-doped Bi2O3-SiO2-Based fiber for S-Band amplification
S.R. Loth, M.L. Sundheimer, A.S.L. Games, University of Federal de Pernambuco, Recife, Brazil

Dual-wavelength pumping using 803 nm is investigated for a thulium-doped bismuth-silicate fiber. Contrary to ZBLAN, 1426 nm is more effective than 1050 nm, giving 5.8 dB gain for 1.068 W total pump power.

CJ-7-TUE
Spontaneous rayleigh backscattering Raman lasing with fiber Bragg grating
S.L. Stevan Jr., A. Teixeira, P. Andre, R. Nogueira, Telecommunications Institute, Aveiro, Portugal; A. Pohl, UTFP; Curitiba, Brazil; G. M.Tosi-Belelli, ISCOM, Rome, Italy

A lasing control based on fiber Bragg gratings, and Rayleigh back scattering is demonstrated and characterized. The lasing occurs for pump powers higher than 350mW to 14kmDCF module. The results are compared with simulation.

CJ-8-TUE
Yb-fiber-amplification of harmonically mode-locked semiconductor-laser-pulses
A. Budz, H. Haugen, McMaster University, Hamilton, Canada

Ultra- short pulses are generated at multiple harmonics of the cavity round-trip frequency using a passively mode- locked semiconductor laser and are subsequently amplified in Yb-doped fiber amplifier.

CJ-9-TUE
Self-starting passive mode-locked fi- gure-eight laser using a symmetrical coupler in the loop
B. Ibarra-Escamilla, A.J. Kuzin, R. Grajales-Couino, INAOE, Puebla, Mexico; D. Pottiez, Centro de Investigaciones en Optica, Leon, Mexico; J.W. Haus, University of Dayton, Dayton, USA

We experimentally demonstrated self-starting operation of the figure-eight mode-locked fiber laser including the symmetrical coupler in the loop. The laser generates 30 ps pulses at the fundamental repetition frequency of 0.8 MHz.

CJ-10-TUE
Linearly polarized Yb-doped fiber amplifier with phase-conjugating mirror based on stimulated Brillouin scattering

Linearly polarized Yb-doped fiber amplifier with phase-conjugating mirror based on stimulated Brillouin scattering.

CJ-11-TUE
Stretched pulse and self-similar operation of an ultra-short pulse all-polarization maintaining fiber laser
M. Schultz, O. Prochnow, A. Ruhl, M. Engelbrecht, D. Wamb, K. Drach, Laser Zentrum Hannover e.V., Hannover, Germany

We report an ultra-short pulse Ytterbium doped all-polarization maintaining fiber laser operating in stretched pulse and self-similar regime. The mode-locking mechanism is based on the semiconductor saturable absorber mirror.

CJ-12-TUE
Highly efficient pico-second wave- guide dye laser based on a random active medium
H. Watanabe, Y. Oki, M. Maeda, Kyoto University, Japan; T. Oimatsu, Chiba University, Chiba, Japan

We have demonstrated highly efficient pico-second waveguide dye laser including a random active layer by pico-second pulse pumping. Experimental energy slope efficiency of 20.3% and maximum peak power of 380kW were obtained.

CJ-13-TUE
24-mJ, 2-kHz pulse generation with a Q-switched Nd:YAG laser oscillator and fiber amplifier hybrid system
K.F. Furuta, M.S. Seguchi, T.O. Okamoto, J.N. Shimae, K.T. Yasui Mitsubishi Electric Corporation, Hyogo, Japan

We demonstrated the high-energy operation with a solid-state laser oscillator and a fiber-based amplifier system. The maximum energy pulse of 24 ml was achieved with the repetition rate of 2 kHz.

CJ-14-TUE
Generation of widely tunable optical solitons in the infrared range by using dispersion decreasing fibers
S. Muraviev, A. Andrianov, A. Kim, Institute of Applied Physics of the Russian Academy of Sciences, Nizhny Novgorod; R. A. Yegorash, Fiber Optics Research Center of the Russian Academy of Sciences, Moscow, Russia

A compact fiber system for the generation of widely tunable soliton pulses using dispersion decreasing fibers (DDF) is presented. High quality 10 fs soliton pulse in the wavelength region of 1.5 - 2 μm was demonstrated.

CJ-15-TUE
Microfluidic dye lasers based on micro-structured optical fibres
G.A. Turnbull, A.E. Vasdekis, I.D.W. Samuel, University of St Andrews, St Andrews, UK; G.E. Town, Macquarie University, Sydney, Australia

We report the demonstration of microfluidic dye lasers based on photonic crystal optical fibres. We characterize their power and spectral properties and explain an unusual spectral selection mechanism based on a Vernier effect.

CJ-16-TUE
Q-switching of a distributed feedback laser by using longitudi- nal acoustic waves
M. Delgado-Pinar, A. Diez, J. L. Cruz, M. V. Andres, Universidad de Valencia, Valencia, Spain

We report a single frequency, single mode, actively Q switched distributed feedback fiber laser, based on the dynamic generation of defects in a uniform fiber Bragg grating, by using acoustic waves.

CJ-17-TUE
Effective gain clamping technique in a Raman amplifier with a resonant cavity
H.S. Seo, J.T. Ahn, B.J. Park, ETRI, Daemyung, South Korea; W.J. Chung, ETRI, Daemyung and Konju University, Konju, South Korea

We experimentally demonstrate a new gain clamping technique without a loss of gain bandwidth by generating a clamping laser out of signal band in a fiber Raman amplifier with a resonant cavity.

CJ-18-TUE
Actively Q-switched fiber ring laser employing a locally phase-shifted chirped grating
A. Gonzalez-Segura, J.L. Cruz, P. Perez-Millan, M.A. Andres, University of Valencia, Burjassot, Spain

A fiber ring laser that includes locally phase-shifted chirped gratings is presented. A technique to dynamically control the induced phase shift using a magnetostriective material permits both wavelength tuning and Q-switched pulse regime.

CJ-19-TUE
Third-order spectral phase compensation in parabolic pulse compression
Y. Zouater, CELIA and Amplitude Systemes, Bordeaux, France; E. Cormier, CELIA, Bordeaux, France; F. Druon, M. Hanna, P. Georges, Institut d’Optique, Palaiseau, France

Third order spectral phase compensation in parabolic pulse compression is studied. A hybrid gratings / prisms sequence compressor replacing standard gratings compressor leads to the improvement of the recompressed pulse quality.

CJ-20-TUE
Exact, implicit, integral solution of depletion and saturation in Raman and Brillouin fiber amplifiers
M. Santagiustina, Univ. of Padua, Padova, Italy

Exact, implicit, integral solutions for the equations governing Raman and Brillouin scattering amplifiers including pump depletion and different loss coefficients are given. Such solu-
tions avoid the necessity of recurring to non-linear boundary value problem algorithms.

CJ-21-TUE
Characterization of high power multimode combiners
J. Geiger, B. Erben, D. Hoffmann, Fraunhofer Institute for Laser Technology, Aachen, Germany; St. Altmeyer, Cologne University of Applied Sciences, Cologne, Germany
Fused, fiber-optic, multimode pump combiners, a key component to All-Fiber Lasers, are investigated by regards of brightness conservation and power efficiency. Over 500 W are coupled through one 100 micron input port.

CJ-22-TUE
Photosensitivity of Er/Yb-codoped Schott IOG1 phosphate glass using 248nm, 500fs laser radiation
S.P. Pissadakis, I.M. Michelakaki, M.L. Livitzis
FORTH-IESL, Heraklion, Greece
The photosensitivity of the Schott IOG1 phosphate glass to 500ps, 248nm laser radiation is investigated. Refractive index changes up to $2 \times 10^{-4}$ were calculated from Kramers-Kronig transformation.

CJ-23-TUE
All-fiber periodically Q-switched laser
G. E. Town, M. Fellew, Macquarie University, North Ryde, Australia
An all-fiber Q-switched laser is demonstrated using a simple passive loss modulation technique based upon a vibrating fiber cantilever. The Q-switch design combines the advantages of high dynamic range and high damage threshold.

CJ-24-TUE
Nanosecond-shaped optical pulse generation based on integrated all fiber systems
H.J. Lin, Z. Sui, J.J. Wang, Z. Zhang, M.Z. Li, F. Jing, Research Center of Laser Fusion, Mianyang, China
We demonstrate the work at LFRC to generate laser driven ICF required nanosecond shaped optical pulse based on integrated all fiber systems. Pulse shaping using fast electronic switches and optical pulse stacking are demonstrated.

CJ-25-TUE
DFB erbium-doped fiber laser with tunable phase shift induced in the laser cavity
Y. Barmenkov, Centro de Investigaciones en Optica, Leon, Mexico; P. Perez-Millan, J.L. Cruz, M. Andres, Universidad de Valencia, Valencia, Spain
We present a DFB erbium-doped fiber laser with a tunable phase shift induced in the middle point of a fiber Bragg grating forming the laser cavity. We demonstrate that in our experimental conditions lasing is observed at any phase grating shift value. The laser generates at one or two wavelengths depending on induced phase shift.

CJ-26-TUE
Enhanced mode coupling by local structuring of optical fibre cores with 800 nm femtosecond pulses
C.S. Smith, C.S. Balling, Institute of Physics and Astronomy, Aarhus, Denmark
We demonstrate the writing of long-period fibre gratings using femtosecond infrared pulses. The application of a large numerical aperture microscope objective allows for very localized changes of the refractive index.

CJ-27-TUE
1.91-1.99µm Tm³⁺/Yb³⁺ co-doped tellurite fibre laser pumped using a 1088 nm Yb³⁺ fibre laser
B. Richards, J. Loustau, A. Jha, The University of Leeds, Leeds, United Kingdom; D. Binks, Y. Tsang, The University of Manchester, Manchester, United Kingdom
A Tm³⁺/Yb³⁺ co-doped tellurite fibre laser operating at 1910-1994 nm pumped with a 1088 nm Yb³⁺ fibre laser is demonstrated. 67 mW of laser output and 10% slope efficiency has been achieved.

CJ-28-TUE
Ultra-low feedback fibre end termination geometry for high power fibre source applications
J. Chan, P. Wang, J. K. Sahu, W. A. Clarkson, University of Southampton, Southampton, United Kingdom
A novel fibre end termination geometry for reducing unwanted backreflection from end-facets to very low levels ($10^{-7}$) is reported. The advantages of this approach and its application in various high-power cladding-pumped fibres sources are discussed.

CJ-29-TUE
Characterization of delivered mid-infrared radiation spatial profile by hollow waveguide
M. Némec, H. Jelinkova, M. Fibrich, P. Koranda, Czech Technical University, Prague, Czech Republic; M. Miyagi, K. Iwai, Sendai National College of Technology, Sendai, Japan; Y.W. Sh, Fudan University, Shanghai, China; Y. Matsuda, Tohoku University, Sendai, Japan
The characterization of the laser beam spatial profile during the propagation through the COP/Ag hollow glass waveguide was investigated. As radiation sources, Er:YAG, Tm:YAG, and Tm:YAP laser systems were utilized.
Efficient channeling of cesium fluorescence into guided modes of a nanofiber

K. Farn, K. Hakuta, University of Electro-Communications, Tokyo, Japan; S. Dutta Gupta, University of Hyderabad, Hyderabad, India; V. Balykin, Ins. of Spectroscopy, Troitsk, Moscow Region, Russia

We show that fluorescent light from a cesium atom can be efficiently channelled into the guided modes of a nanofiber. The optical excitation spectrum of the atom is substantially modified by the atom-surface interaction.

Efficient channeling of cesium fluorescence into guided modes of a nanofiber

K. Farn, K. Hakuta, University of Electro-Communications, Tokyo, Japan; S. Dutta Gupta, University of Hyderabad, Hyderabad, India; V. Balykin, Ins. of Spectroscopy, Troitsk, Moscow Region, Russia

We show that fluorescent light from a cesium atom can be efficiently channelled into the guided modes of a nanofiber. The optical excitation spectrum of the atom is substantially modified by the atom-surface interaction.

Atomic absorption from the evanescent field of a sub-micron fibre taper


We report here on recent experiments studying the interactions between a cloud of cold rubidium atoms and the evanescent field of a sub-micron tapered fibre. Low-light level detection has been used to observe the signals.

Efficient channeling of cesium fluorescence into guided modes of a nanofiber

K. Farn, K. Hakuta, University of Electro-Communications, Tokyo, Japan; S. Dutta Gupta, University of Hyderabad, Hyderabad, India; V. Balykin, Ins. of Spectroscopy, Troitsk, Moscow Region, Russia

We show that fluorescent light from a cesium atom can be efficiently channelled into the guided modes of a nanofiber. The optical excitation spectrum of the atom is substantially modified by the atom-surface interaction.

Atomic absorption from the evanescent field of a sub-micron fibre taper


We report here on recent experiments studying the interactions between a cloud of cold rubidium atoms and the evanescent field of a sub-micron tapered fibre. Low-light level detection has been used to observe the signals.
Optical spectroscopy of charge-tunable quantum dots emitting at 1.2 μm
A. Kishihara, J. Fujioka, S. Kano, S. Yorozu, NEC Corporation, Tsukuba, Japan; S. Okkouchi, Ultrafast Photonic Devices Laboratory and NEC Corporation, Tsukuba, Japan; A. Tomita, NEC Corporation and JST-SORST, Tsukuba, Japan.

We report photoluminescence spectroscopy of single charge-tunable InAs QDs emitting at 1.2 μm. For probing electronic properties, large QDs in our experiments are favorable in terms of deep confinement potentials and weak Coulomb interaction.

Calibration attack and defense in continuous variable quantum key distribution
A. Ferenczi, Laboratoire de Photonique Quantique et Moléculaire / ENS Cachan, Cachan, France; F. Grosshans, CNRS / ENS Cachan, Cachan, France; Ph. Grangier, Laboratoire Charles Fabry de l’Institut d’Optique, Paris, France.

We have found new attacks against Continuous Variable Quantum Key Distribution based on the accessibility of the phase reference beam by the adversary. We then give easy countermeasures to this attack and prove their security.

Design of photonic crystal microcavities in diamond for quantum information
C. Kreuzer, E. Neu, C. Becher, Universität des Saarlandes, Saarbrücken, Germany.

We investigate photonic crystal microcavities in diamond films for applications in quantum information. Using finite difference time domain simulations we design cavities with Q factors Q > 25000 and Purcell factors > 1900.

Polarization drift control in fibers for entangled polarization-encoded qubits
A. Poppe, B. Schrenk, A. Fedrizzi, H. Hubel, University of Vienna, Austria; A. Zeilinger, University of Vienna and Institute for Quantum Optics and Quantum Inf., Vienna, Austria.

We demonstrate a setup to compensate the polarization drift of telecom fibers. Two laser diodes together with a polarimeter are used to keep polarization states fixed on the Poincare-sphere. Subsequently, polarization-entangled qubits are transmitted without disturbance.

Photon number resolving detector with 0.3 μs recovering time
D.F. Fukuda, A.Y. Yoshizawa, H.T. Tsuchida, National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba, Japan.

A new photon number resolving detector with a titanium superconducing transition edge sensor has been developed. The device successfully showed 0.3 microsecond recovering time and 0.7 eV energy resolution for a pulsed telecommunication laser.

Nonlinear couplings and cooling dynamics in a large Paul trap designed for quantum information

We present experimental and numerical studies of ion dynamics in a large linear Paul trap designed for quantum information experiments: a motional coupling that depends on the cloud density is observed and compared to simulation.

Enhanced spin lifetime in semiconductors with applied electric fields
K. Iouakimid, C. Prescott, A. Brachmann, J. Clenclenen, E. Garwin, R. Kirby, T. Manuyama, Stanford Linear Accelerator Center, Menlo Park, USA; R. Prepost, University of Wisconsin, Wisconsin, USA; G. Mulholland, J. Bierman, Saxon Surface Science, Austin, USA.

We measured and simulated the effect of an accelerating field on the spin polarization of photo-generated electrons in a 100nm thick GaAs based semiconductor films. Preliminary results indicate 8% increase of polarization.

Stable two-dimensional spatial solitons in heavy metal oxide glasses
Pasquazi, S. Stivala, G. Assanto, University Roma Tre, Rome, Italy; M. Kauranen, CRES, Monreale, Italy; S. Riva-Sanseverino, University of Palermo and, CRES, Monreale, Italy.

We performed SHG in PQM Lithium Niobate waveguides realized by proton exchange and surface periodic poling, observing the resonance shift due to cascading.

Propagation of frequency-chirped laser pulses in a medium of Lambda-atoms
G. Demeter, D. Dzotjan, G.P. Djotyan, Research Institute for Particle and Nuclear Physics, Budapest, Hungary.

We study the propagation of frequency-chirped laser pulses in a medium of Lambda-atoms. We show that there is a regime of enhanced transparency of the medium, where the pulses are resistant to distortions during propagation.

Exploration of electromagnetically induced absorption with circular polarised lasers in a degenerate two-level system
L. Spani Molella, K. Dahl, R.H. Rinkleff, K. Danzmann, University Hannover, Leibnitz, Germany.

With a hetersodyne interferometer electromagnetically induced absorption was measured in a closed degenerate two-level system driven by circularly polarised probing and probe lasers of orthogonal polarisation as a function of the laser intensities.

Frequency doubling in surface periodically poled lithium niobate waveguide: competing effects
S. Stivala, University Roma Tre, Rome, Italy; M. Kauranen, Tampere Univ. of Technology, Tampere, Finland.

The multipolar optical second-harmonic generation of BK7 glass is measured by calibration against a quartz crystal using a two-beam technique. This can also be used as an alternative to Maker-fringe techniques.

Discrete midband cavity solitons
O. Egorov, F. Lederer, Friedrich Schiller University, Jena, Germany.

We investigate the light dynamics in arrays of coupled Kerr-nonlinear cavities driven by a strongly-inclined holding beam. Bright and dark moving discrete cavity solitons exist in the zero-diffraction point irrespective of the sign of nonlinearity.

Soliton content of pulses in lossy fibers
M. Böhm, F. Mitschke, University Rostock, Institut für Physik, Rostock, Germany.

What is the soliton content of pulses in optical fibers with realistic energy loss? We answer this with the novel ‘soliton-radia- tion beat analysis’ technique which does not require integrability as previous methods.

Supercontinuum generation in a highly birefringent photonic crystal fiber seeded by a low-repetition rate picosecond infrared laser
P. Blandin, Institut d’Optique Graduate School, Palaiseau and Laboratoire de Photonique Moléculaire, Orsay, France; F. Druan, M. Hanna, P. Georges, Institut d’Optique Graduate School, Palaiseau, France; S. Lévêque-Fort, P. Fontaine-Aupart, Laboratoire de Physique Moléculaire, Orsay, France; C. Lescvigne, V. Couderc, P. Leproux, XILIM, Limoges, France.

We demonstrate the generation of a picosecond, polarized, visible supercontinuum in a highly birefringent fiber. The polarization dependence of the spectrum is in-
vestigated, and the mechanisms responsible for the generation of visible light are described.

IE-9-TUE Coherent signal from incoherently cw-pumped singly resonant Ti:LiNbO₃ integrated optical parametric oscillator C. Montes, C.N.R.S. Laboratoire de Physique de la Matière Condensée, Nice, France; W. Sohler, H. Suche, W. Grundkötter, University Paderborn, Paderborn, Germany A singly resonant Ti:LiNbO₃ integrated optical parametric oscillator, operated with a broad-bandwidth pump at 1535 μm wavelength, can generate a coherent signal output at 3941 μm by the convection-induced phase-locking mechanism.

IE-10-TUE Vibrating temporal soliton pairs J M. Soto-Crespo, Ins. de Optica, Madrid, Spain; P. Grélu, Univ. de Bourgogne, Dijon, France; N. Akhmediev, Australian National Univ., Canberra, Australia Vibrating soliton pairs in dissipative systems are found numerically in cubic-quintic Ginzburg-Landau equation, and related to an experimental observation performed in a mode-locked fiber laser. Bifurcations between different soliton pair dynamics are presented.

IE-11-TUE Reflectivity oscillations of laser-excited Bi: imprint of atomic vibrations through electron-phonon coupling D. Boschetto, D. Glier, T. Gorl, O. Albert, A. Rousse, J. Echepare, ENSTA/École Polytechnique, Palaiseau, France; A.V. Rode, E.G. Gañály, B. Luther-Davies, The Australian National University, Canberra, Australia We demonstrate that the major force driving coherent phonon vibrations excited by femtosecond laser pulses in Bismuth is the thermal force, which is proportional to the electron and lattice temperature gradients.

Subdiffractive pulses in photonic crystals K. Staliunas, Y. Loika, C. Cojocaru, J. Trull, R. Herrero, Universitat Politècnica de Catalunya, Terrassa-Barcelona, Spain We investigate propagation of short pulses through photonic crystals close to the zero-diffraction (self-collimation) point. We demonstrate time-asymmetric dissipation of the pulses, and evaluate time and aperture broadening.

IE-13-TUE Experimental observation of electromagnetically induced transparency in Nd³⁺: LaF₃ crystal L.A. Gushchin, R.A. Akhmedzhanov, A.A. Bondartsev, A.G. Litvak, D.S. Sazanov, N.A. Zhavoronko, Institute of Applied Physics RAS, Nizhny Novgorod, Russia We report an experimental observation of electromagnetically induced transparency in a four-level quantum scheme in Nd:LaF₃ crystal. Transparency resonances at ground and excited state hyperfine sublevels (in a lambda- and V-schemes, respectively) are detected.

IE-14-TUE Moving discrete dissipative solitons in arrays of nonlinear cavities O. Egorov, F. Lederer, Friedrich-Schiller University, Jena, Germany; Y.S. Kivshar, Australian National University, Canberra, Australia We study light propagation in arrays of nonlinear cavities. We analyse modulational instability and find the families of moving discrete cavity solitons for arbitrary inclination of the driving field both in discrete and continuous models.

IE-15-TUE Broadening and shift of resonances in microsphere resonators due to thermo-optical nonlinearity A. Schmidt, A. Chipouline, T. Pertsch, Ultra-Optics Center, Jena, Germany; O. Egorov, F. Lederer, Friedrich-Schiller University, Jena, Germany; A. Tuennermann, Fraunhofer Institute for Applied Optics and Precision Engineering, Jena, Germany; L. Deych, Queens College of the City University of New York, New York, USA Resonance spectrum broadening and shifting have been observed in high-Q microresonators. It has been shown that the bistable response, caused by the thermo-optical nonlinearity, is responsible for both observed effects.

IE-16-TUE Experimental verification of the origin of conical emission during filamentation R.V. Volkov, D. Rakhkhlin, A.B. Savelev, O.G. Kosareva, D.S. Ustyupa, Moscow State University, Moscow, Russia The origin of white light conical emission is experimentally investigated by pump-probe method. It is concluded that it is more likely formed by the process of refraction index modulation, than by four-wave mixing.

IE-17-TUE Transient plasma dynamics and structural changes below and above the ablation threshold in glasses upon femtosecond laser irradiation J. Siegel, D. Puerto, J. Bone, G. Bachelier, J. Solis, Instituto de Optica, C.S.I.C., Madrid, Spain The interaction of femtosecond-laser pulses with glasses is studied using femtosecond-resolved microscopy. We discuss the temporal-spatial evolution of the transient plasma formed below and above the ablation threshold and its relation to structural changes induced.

IE-18-TUE Two-photon orientational wave packets as probing tool C. Mainos, G. Dutier, J. Grucker, F. Perales, J. Baudon, Univ. Paris 13, Villetteane, France Two-photon orientational wavepackets induced by short resonant polarized pulses in rotationally-frozen interacting molecules contain precise information on the orientational states. The dynamics of the induced dipole shows orientational recurrences which are relevant.

IE-19-TUE Evolution of temporal and spatial structure of tightly focused wave packets propagating in transparent condensed media V.T. Platonenko, M.V. Lomonosov Moscow State Univ., Moscow, Russia; J.M. Mikhailova, M.V. Lomonosov Moscow State Univ. and Russian Academy of Sciences, Moscow, Russia; J. Zheng, Res. Centre of Laser Fusion, CAER, Mountain, China and M.V. Lomonov Moscow State Univ., Moscow, Russia Results of numerical modeling of propagation of tightly focused light packets in transparent condensed media are presented. The emphasis is placed on the interplay between spatial and spectral-temporal structures of wave packets, undergoing nonlinear self-action.

IE-20-TUE Towards measuring structural dynamics in complex molecules by excited state circular dichroism A. Trifonov, T. Fiebig, Boston College, Chestnut Hill, USA; J. Buchowiec, Boston College, Chestnut Hill, USA We demonstrate a new approach to broad band circular dichroism spectroscopy using polarization controlled femtosecond white-light generation. The proposed method is evaluated by measuring the ground state circular dichroism spectrum of [Ru(bpy)₃]²⁺.

IE-21-TUE Spatio-temporal dynamics of generation of multicolor spatial Kerr solitons G. Fanjouz, J. Michaud, M. Delque, H. Mailiotte, T. Sylvestre, Université de Franche-Comté, Besançon, France We present experimental results showing the spatio-temporal dynamics of multicolor spatial soliton generation by stimulated Raman scattering in a Kerr planar waveguide. Raman component generation in the trailing edge of the pump pulse is reported.

IE-22-TUE Spectral and spatial analysis on near-field Fresnel coefficient using femtosecond laserD. J. Park, S.B. Choi, Seoul National University, Seoul, South Korea; O.H. Park, D.S. Kim Korea University, Seoul, South Korea We report on spatially and spectrally resolved near-field Fresnel coefficients in a plasmonic crystal, using broadband femtosecond laser. The measured a giant Fresnel coefficient exceeding 20, at the surface plasmon polariton resonance.

IF-1-TUE Sub-shot-noise photon-number correlation in the parties of a mesoscopic twin-beam A. Andreoni, A. Allevi, Università dell’Insipria Como, Como, Italy; M. Bondani, National Laboratory Ultrafast and Ultraintense Opt. Science, Como, Italy; G. Zambra, University of Milano and Universita dell’Insipria Como, Como, Italy; M. Paris, University of Milano, Milano, Italy In a 2p dichromatic twin-beam with thousands photons/pulse generated by traveling-wave spontaneous parametric downconversion, photon numbers detected separately for the two twin-beam parties display a variance of the difference below shot-noise limit by 3.25 dB.

IF-2-TUE Bright magneto-optical resonance sign reversal in Cs vapour confi-
ned in an extremely thin cell
A. Atvars, M. Auzinsh, K. Bluss, University of Latvia, Riga, Latvia; C. Andreeva, S. Carteleva, L. Petrov, Institute of Electronics, Sofia, Bulgaria; D. Sarkisyan, T. Varzhapetyan, Institute for Physical Research, Ashtrar, Armenia
An extremely thin cell was used to study cesium absorption spectra. The results strongly depend on the width of the cell. "Bright resonances" reversal to "dark resonances" were observed and explained.

IF-3-TUE
Realization of quantum decay control and Zeno dynamics in photonic structures
S. Longhi, Politecnico di Milano, Milano, Italy
An optical analog of quantum Zeno dynamics and control of quantum mechanical decay is theoretically proposed for photon tunneling in an engineered waveguide-array structure.

IF-4-TUE
Generation of narrowband photon-pairs at 1550 nm band using type-II periodically poled Lithium Niobate waveguide
G. Fujii, N. Namekata, S. Inoue, M. Motoya, Nihon University, Chiyoda-ku, Tokyo, Japan; S. Kurimura, National Institute for Materials Science, Tsukuba-shi, Ibaraki, Japan
We have demonstrated the generation of narrowband photon-pairs at 1550 nm band using a Periodically Poled Lithium Niobate waveguide. The measured bandwidth of the photon-pairs generated by the waveguide is only 1 nm.

IF-5-TUE
Cold ^87^Rb ensemble: non-Gaussian state detection and spin tomography
M.W. Mitchell, M. Kaschorreck, M. Kubasik, S.R. de Echavarz, IFCO-Institut de Ciencies Fotòniques, Castelldefels (Barcelona), Spain
We describe methods for making tomographic measurements and detecting non-Gaussian spin states in cold atomic ensembles.

IF-6-TUE
Theory of two-photon nonlinearity by a realistic matter system with many degrees of freedom in a cavity
A. Ishikawa, Japan Science and Technology Agency, Kagawuchi, Saitama, Japan; T. Isu, The Univ. of Tokushima, Tokushima, Japan; H. Ishihara, Osaka Prefecture Univ., Sakai, Osaka, Japan
We theoretically investigate effects of unbound two-exciton states on entangled-photon generation via cavity bipolaritons formed in a quantum well embedded in a high-Q semiconductor microcavity.

IF-7-TUE
Generation of entangled photons utilizing spatially correlated photon pairs from spontaneous parametric down-conversion
T. Yamaguchi, Tohoku Univ. Sendai, Japan; Y. Mitsumori, H. Kosaka, K. Edamatsu, Tohoku Univ. Sendai, and CREST, Honcho Kagawuchi, Japan; R. Shimizu, CREST, Honcho Kagawuchi, Japan
We propose a novel method to generate polarization-entangled photon pairs utilizing a spatial correlation effect in spontaneous parametric downconversion. We experimentally demonstrated the proposal by using a double slit and a polarization Michelson interferometer.

IF-8-TUE
Cold ytterbium atoms in high-finesse optical cavities: towards atom-photoinerface
M. Cristiani, J. Eschner, T. Valenzuela, IFCO - The Institute of Photonic Sciences, Castelldefels, Spain
We present a modular, versatile setup for various quantum optical and quantum information experiments, from collective interaction between an atomic cloud and the light field of a high-finesse cavity, to single atom - single photon interfaces.

IF-9-TUE
A solid state single photon source based on SiV centers in diamond
J. Bahe, C. Wang, H. Weinfruter, Ludwig-Maximilians-Universität, München, Germany; V. Chernyshev, B. Burchard, Ruhr-Universität, Bochum, Germany
We report on our work to realize a solid state single photon source based on color centers in diamond for the applications in practical quantum cryptography.

IF-10-TUE
Bessel-type interference patterns detected in single photon regime
R. Grunwald, M. Bock, Max-Born-Institute, Berlin, Germany
Quantum interference experiments were performed with Bessel beams at high detector efficiency. In contrast to Young’s double slit diffraction, interference from refracted photons was observed in the near-field. Non-local propagation of single photons was confirmed.

IF-11-TUE
Anisotropically high entanglement of biphotons
E.V. Moreva, Moscow Engineering Physics Institute, Moscow, Russia; M.A. Efremov, M.V. Fedorov, P.A. Volkov General Physics Institute of Russian Academy of Sciences, Moscow, Russia; S.P. Kulik, S.S. Straupe, Moscow State University, Moscow, Russia
We show that a wave packet of a biphoton generated via spontaneous parametric downconversion is strongly anisotropic. A method of biphoton detection which discloses a very high degree of entanglement is suggested.

IF-12-TUE
Quantum transport of single neutral atoms
L. Förster, W. Alt, A. Härter, D. Döring, M. Karski, D. Meschede, University of Bonn, Bonn, Germany; A. Rauschenbeutel, University of Mainz, Mainz, Germany
We present an experimental implementation of the state-selective (quantum) transport for caesium atoms in a one-dimensional optical lattice, allowing us to study applications based on quantum interference and atom-atom interactions for quantum information purposes.

IF-13-TUE
Orbital angular momentum of twisted cavity modes
S.J.M. Habraken, G. Nienhuis, Universiteit Leiden, Leiden, Netherlands
We use algebraic techniques to study the spatial structure of (possibly) twisted cavity modes. We focus on the orbital angular momentum of these modes and consider cavities that consist of physically rotating mirrors as well.

IF-14-TUE
Photon pair source based on periodically poled twin-hole silica fibre
K.P. Huy, S. Massar, A.T. Nguyen, E. Braimis, M. Haeltlman, P. Emplit, Université Libre de Bruxelles, Brussels, Belgium; C. Corbior, A. Canagasabey, P.G. Kazansky, University of Southampton, United Kingdom; D. Deparis, A. Fotiadi, P. Negret, Faculté Polytechnique de Mons, Belgium
We study parametric fluorescence in periodically poled twin-hole fibers. We demonstrate that this source produces photon pairs by using it to realize a Hong-Ou-Mandel dip experiment.

IF-15-TUE
Use of classical input for solving two-photon nonlinear dynamics
K. Koshino, Wakayama University, Wakayama, Japan and PRESTO, Japan Science and Technology Agency, Saitama, Japan
It is shown that the theoretical analyses of the two-photon nonlinear dynamics can be greatly simplified by considering a case where a classical light pulse (not a two-photon pulse) is used as the input.

IF-16-TUE
A pair photon source for heralded single-photon-single-atom interaction
A. Haase, N. Piro, J. Eschner, M.W. Mitchell, IFCO - The Institute of Photonic Science, Castelldefels (Barcelona), Spain
We present the design, construction, and first characterization of a down-conversion photon-pair source providing photons resonant with an atomic transition in
trapped Ca+ ions.

**IF-20-TUE**

**Two-photon optics: imaging below the diffraction limit**

D. Schlenk, Ludwig Maximilian University, Munich, Germany; H. Weinfurter, Ludwig Maximilian University, Munich, and Max-Planck Research Institut für Quantenoptik, Erlangen, Germany

Imaging properties of optical systems are limited by the wave nature of light. Entangled photons allow an improvement in resolution. We show an experimental realisation using entangled photons from a spontaneous parametric down conversion source.

**IF-21-TUE**

**Detection of orbital angular momentum superposition photon states using hologram and path interferometer**

Y. Miyamoto, M. Takeda, The University of Electro-Communications, Chofu, Tokyo, Japan; D. Kawase, K. Sasaki, Hokkaido University, Sapporo, Japan; A. Wada, Tokyo University of Science, Tokyo, Japan, S. Takeuchi, Hokkaido University, and JST CREST, Sapporo, Japan

We propose a scheme for the detection of orbital angular momentum superposition photon states consisting of a hologram and a path interferometer. The method utilizes multiple diffraction orders and is performed without shifting the hologram.

**IF-22-TUE**

**Quadrature and polarization squeezing in a vectorial Kerr cavity**

E. Roldan, G.J. de Valcarcel, F.V. Garcia-Ferrerr, University of Valencia, Burjassot, Spain; I. Perez-Arjona, Universitat Politècnica de Valencia, Gandia,

We study theoretically quantum fluctuations in a vectorial Kerr cavity, and show, in particular, that the output field exhibits not only quadrature squeezing but also large levels of polarization squeezing.

**IF-23-TUE**

**Two-photon spectral coherency matrix and multi-parameter optical entanglement**

V. Sergienko, B.E.A. Saleh, M. C. Teich, Boston University, Boston, MA, USA; C. Bonato, University of Padova, Padova, Italy and Boston University, Boston, MA, USA

We introduce the concept of two-photon spectral coherency matrix and the spectral two-photon Stokes parameters as a counterpart to the classical coherency matrix of broadband polarized light. We discuss its use for characterizing frequency-polarization entanglement.

**IF-24-TUE**

**Narrowband 87Rb resonant downconversion source for quantum memories**

A. Predojevic, J.M. Caballero, Z. Zhai, M.W. Mitchell, ICFI-Institute of Photonic Sciences, Barcelona, Spain; E.S. Polzik, ICFI-Institute of Photonic Sciences, Barcelona, Spain and Copenhagen University, Copenhagen, Denmark

In order to investigate quantum memories based on light-atom coupling we are developing a diode laser pumped downconversion source of nonclassical light capable of interacting with rubidium atoms.

**IF-25-TUE**

**Analysis of errors in an optical controlled-NOT gate with a high-precision testing bed**

T. Nagata, K. Sasaki, Hokkaido University, Sapporo, Japan; H. Hofmann, Hiroshima University, Hiroshima, Japan; R. Okamoto, S. Takeuchi, Hokkaido University and Japan Science and Technology Agency, Sapporo, Japan

We report the analysis of errors in an optical Controlled-NOT gate without path interference. For this purpose, we develop a special test-bed system with precise position controllers for highly accurate analysis.

**IF-26-TUE**

**Generation and detection of photonic qutrits**

Y. Chen, G. Björk, Royal Institute of Technology, Stockholm, Sweden

We propose a generation scheme, based on photon pairs from spontaneous down-conversion, and linear optical components, to generate any given state of any of the four mutually unbiased qutrit bases.

We also discuss, using the same components, the discrimination between the three basis state of any of the bases.

**IF-27-TUE**

**Factoring numbers with ultrashort laser pulses**

B. Chatel, E. Baynard, D. Bigourd, C. Meier, B. Girard, LCAH-IRSAMC, Toulouse, France; W. Merkel, W. Schleich, University of Ulm, Germany

Various schemes have been recently proposed to factor numbers with physical systems. Based on electromagnetic fields interacting with quantum systems, they operate as analog computers. Here we present several experimental demonstrations based on ultrashort pulses interacting with Rubidium atoms.
Topologically decoherence-protected qubits with trapped ions

N. Timoney, V. Elman, C. Weiss, M. Johanning, Ch. Wunderlich University of Siegen, Germany; W. Neuhauser, University of Hamburg, Germany

Shaped pulses developed using optimal control theory and composite pulses, both designed to provide robustness against errors in experimental parameters, are experimentally shown suitable to realise single and multi-qubit gates with trapped ions.

Spatial dissipative solitons with intra-cavity photonic crystals

D. Gomila, Instituto Mediterraneo de Estudios Avanzados, Palma de Mallorca, Spain; G.-L. Oppo, University of Strathclyde, Glasgow, United Kingdom

We study the effects of photonic crystals on bistable regimes in a nonlinear optical cavity. The introduction of an intra-cavity photonic crystal opens new useful bistable regimes supporting a novel class of cavity solitons.

Growth laws, pinning and localized structures: an experiment in sodium vapour

M. Pesch, W. Lange, Westfälische Wilhelms-Universität, Munich, Germany; D. Gomila, Instituto Mediterraneo de Estudios Avanzados, Palma de Mallorca, Spain; T. Ackemann, University of Strathclyde, Glasgow, United Kingdom

We study front dynamics experimentally in a 2D nonlinear optical system. We find a 11/2 growth law and observe the slowing down of fronts due to pinning when spatial dissipative solitons are formed.

Error-resistant single qubit gates with trapped ions

T. Coudreau, P. Milman, W. Mainheart, S. Guibal, L. Guidoni, Laboratoire Matériaux et Phénomènes Quantiques, Paris, France; B. Douçot, Laboratoire de Physique Théorique et Hautes Energies, Paris, France; L. Ioffe, Rutgers University, Piscataway, USA

We present a new long range spin coupling Hamiltonian which provides inherent protection against decoherence and show that it can be naturally implemented in trapped ions giving very long qubit lifetimes up to 10° s.
CJ1-1-WED 08:30
Optimized one-step compression of femtosecond fibre laser pulses to 30 fs in dispersion-flattened highly nonlinear fibre
R. Fischer, D. Neshev, Australian National University, Canberra, Australia; B. Kibler, P.A. Lacourt, F. Courvoisier, J. Dudley, Institut Femto-St, Besançon, France
We report compression of a commercial fiber laser source to the sub-30 fs regime using a single 7 cm length of highly nonlinear fiber spliced directly to the output laser pigtal.

CJ1-2-WED 08:45
Simultaneous amplification and compression of picosecond pulses to 50 kW in Er fiber
J. Jasapara, M. Andrejco, J.W. Nicholson, A.D. Yablon, OFS Laboratories, Somerset, USA; Z. Varályi, FETI, Budapest, Hungary
Picosecond pulses are amplified to 50-kW peak power in an Er fiber with a diffraction limited output. The interplay of nonlinear spectral broadening and anomalous fiber dispersion compresses the pulse to bandwidth limited 600-fs.
An all-optical ion-landing technique for scalable microtrap architectures
R.J. Hendricks, D.M. Grant, P.F. Herskind, A. Dantan, L.L. Sørensen, M. Drewsen, University of Aarhus, Denmark
We demonstrate the loading of an ion trap through photo-ionization of a pulsed atomic beam generated by laser ablation. The technique is compatible with the expected demands of scalable quantum information processing in ion traps.

Cavity light bullets in a prototype nonlinear optical resonator
S.D. Jenkins, CNR - INFM, Como, Italy; L. Columbo, F. Prati, L.A. Lugiato, Università dell’Insubria, Como, Italy
We demonstrate numerically the existence of propagating localized structures (cavity light bullets) in a model for a Kerr resonator. We consider also the effects of a slow material dynamics.

Polarization control and stabilization of VCSELs by means of optical feedback from an extremely short external cavity
M. Arizeta Arteaga, Public University of Navarra, Pamplona, Spain and Vrije Universiteit Brussel, Belgium; M. López-Amo, Public University of Navarra, Pamplona, Spain; H. Thienpont, Vrije Universiteit Brussel, Belgium; K. Panojotov, Vrije Universiteit Brussel, Belgium, Bulgaria
We present experimental evidences of polarization control and stabilization of the light emitted by VCSELs by means of optical feedback from an extremely short external cavity. Our numerical results are in good agreement with experiments.

Injection-induced polarization switching of a modulated-1.5 μm wavelength single-mode VCSEL
K.H. Jeong, K.H. Kim, M.H. Lee, Inha University, Incheon, South Korea; B.S. Yoo, J. Roh Raycan Co., Ltd., Daejeon, South Korea; K.A. Shore, University of Wales, Bangor, United Kingdom
This paper represents, to our knowledge, the first report of experimental observations of the polarization switching dynamics of a modulated 1.5μm wavelength single-mode vertical cavity surface emitting laser (VCSEL) under optical injection control. An injected optical beam with polarization orthogonal to that of the stand-alone VCSEL caused a dynamical instability of the laser polarization state near threshold. Successful switching of the polarization state of the output of the VCSEL modulated at 5 MHz was achieved.
We demonstrate theoretically that bidirectional lasers can support cavity solitons when cavity losses are slightly different for the two counterpropagating fields. These solitons can be written or erased by acting on only one field.

Crystalline cavities for quantum and nonlinear optics
I.S. Grudinin, A.B. Matsko, A.A. Savchenkov, L. Maleki, Jet Propulsion Laboratory, Pasadena, USA; E. Rubiola, FEMTO-ST Institute, Besançon, France
Ultra low threshold highly efficient whispering gallery mode (WGM) based Raman laser is demonstrated. We analyze Q factor limits and show that decay times exceeding 1 second may be expected for fluoride WGM resonators.

Self-sustained pulsation and signal peaking in the oxide-confined VCSELs based on submonolayer InGaAs quantum dots
G.S. Sokolovs’kiy, A.G. Deryagin, N.A. Maleev, S.A. Blokhin, V.I. Kuchinskii, Ioffe Physico-Technical Institute, St Petersburg, Russia; A.G. Kuzmenkov, V.M. Ustinov, Saint-Petersburg Physico-Technical Centre of Russian Academy of Sciences for Research and Education, St Petersburg, Russia; A.D. McRobbie, M.A. Cataluna, W. Sibbett, University of St Andrews, United Kingdom; A.S. Shulevskiy, S.V. Chumak, Minsk R&D Institute of Radiomaterials, Minsk, Belarus; S.S. Mikhin, A.R. Kovsh, NL-Nano-semiconductors GmbH, Dortmund, Germany; E.U. Rafailov, University of Dundee, UK
Self-sustained pulsation at frequencies in the range of 0.2-0.66GHz with pulse durations of 100-300ps and electrical-to-optical signal peaking of over 500 times was observed first time in the oxide-confined VCSELs based on submonolayer InGaAs quantum-dots.

Spatio-temporal characterization of sub-5fs pulses obtained by filamentation
A. Zait, A. Guandalini, S. Schapper, M. Halter, J. Biegert, L. Gallmann, U. Keller, ETH Zurich, Switzerland; A. Couairon, Centre de Physique Théorique, Palaiseau, France; M. Franco, A. Mysyrowicz, Laboratoire d’Optique Appliquée, Palaiseau, France
We demonstrate the spatial dependence of a 4.9 fs pulse profile obtained by filamentation, leading to a single pulse structure in the central core and a double pulse in the outer part of the beam.
**CJ1-5-WED 09:30**

**Hybrid mode-locking scheme for similariton fiber laser**

A. Ruehl, O. Prochnow, D. Wandt, D. Kracht,
Laser Zentrum Hannover e.V., Germany

We discuss a hybrid mode-locked scheme for similariton fiber lasers based on slow and fast saturable absorbers. Beside an enhanced self-starting capability, additional pulse shaping as well as the suppression of noise pulses is possible.

---

**CJ1-6-WED 09:45**

**Self-starting wave-breaking-free environmentally stable Yb-doped all-fiber laser**

M. Plötner, B. Ortaç, R. Kinney, J. Limpert,
A. Tünernann, Friedrich Schiller University,
Jena, Germany; T. Schreiber, Fraunhofer Institute for Applied Optics and Precision Engineering, Jena, Germany

We report the both numerically and experimentally generation of wave-breaking-free pulses from an environmentally stable Yb-doped all-fiber laser. Parabolic pulses with energies of 190 pJ at a repetition rate of 20.33 MHz were obtained. The pulses with a spectral bandwidth of 15 nm at center wavelength of 1035 nm could be externally compressed to 233 fs.
Realization and characterization of a 2-photon 4-qubit linear cluster state
G. Vallone, P. Mataloni, E. Pomarico, F. De Martini, University of Rome “Sapienza”, Rome, Italy; V. Berardi, University and Politecnico of Bari, Italy

We report on the realization and characterization of a 4-qubit linear cluster state via two photons entangled both in polarization and linear momentum. By this state we performed a novel nonlocality test of quantum mechanics.

Nonlinear landscape of optical trap potentials by the trapped objects
S. Bailiard, G. L. Lipps, R. Kaiser, Institut Non Linéaire de Nice, Valbonne, France; J.-M. Fournier, Swiss Federal Institute of Technology, Lausanne, Switzerland

We consider the trapping of thermal liquids and reveal that despite the infinite range of nonlocality, the nonlocal nonlinear response can be characterized by a finite response function independent of the material parameters.

Radiation pressure driven vibrational modes in ultra-high-Q silica microspheres
R. Ma, T.-Y. Kippenberg, A. Babian, P. Deluise, A. Schliesser, Max-Plank-Institute of Quantum Optics, Munich, Germany

We report two families of vibrational eigenmodes in ultra-high-Q silica microspheres, excited via radiation-pressure induced parametric oscillation. The measured frequencies agree well with numerical simulation, revealing linear dependence on the inverse sphere diameter.

Tailored shapes of organic micro-lasers: a testbed for wave chaos
M. Lebental, École Normale Supérieure, Cachan and Univ. Paris XI, Orsay, France; E. Bogomolny, Université Paris XI, Orsay, France; J. Zyss, C. A. A. Lauret, École Normale Supérieure, Cachan, France

Organic micro-lasers with different cavity shapes are investigated. Such open resonators exhibit emission features revealing strong connections between wave and geometrical optics. They expand the range of quantum chaos while opening perspectives in integrated optics.

Nonlinear response of thermal traps by the trapped objects
A.E. Minovich, D.N. Neshev, W.Z. Krälikowski, Y.S. Kivshar, Australian National University, Canberra, Australia; A. Dreischuh, Sofia University, Bulgaria

We study experimentally the thermal response of thermal liquids and reveal that despite the finite range of nonlocality, the nonlocal nonlinear response can be characterized by a finite response function independent of the material parameters.

Photorefractive-resistant Hafnium-doped lithium niobate crystals at very low dopant concentration
P. Minzioni, I. Cristiani, V. Deganiglio, University of Pavia, Italy; E.P. Kokkanyan, National Academy of Sciences of Armenia, Ashgarak-2, Armenia

We experimentally identify, as about 2 mol%, the threshold concentration for photorefractivity reduction in HF-doped lithium niobate crystals, through measurements of induced birefringence change and of the second-harmonic phase-matching temperature.

Broadband switching of polychromatic light using photorefractive nonlinear waveguide couplers
J.L. Ganavanovich, A.A. Sukhorukov, Yu.S. Kivshar, Australian National Univ., Canberra, Australia

We suggest a nonlinear waveguide coupler with optimized axis bending which has five times enhanced bandwidth compared to a conventional straight coupler, allowing for switching of polychromatic light covering the entire visible spectrum.

Transmission experiments using a 1.3 µm single mode InGaAs VCSELs
E. Söderberg, P. Modd, J.S. Gustavsson, A. Larsson, Chalmers Univ. of Technology, Göteborg, Sweden; M. Hammar, Z.Z. Zhang, J. Berggren, Royal Ins. of Technology, Stockholm, Sweden

Using a 1.3 µm InGaAs VCSEL with an integrated surface relief for single mode emission, successful transmission of OC-48 and 10GE data over 9 km of standard single mode fiber is demonstrated up to 85°C.

Control of alignment dynamics of asymmetric top molecules
L. Holmegaard, S.S. Velthuis, V. Kumparan, C.Z. Biaggio, H. Stoppelfedt, University of Aarhus, Denmark

We demonstrate, experimentally, a scheme to transform the non-periodic motion of an asymmetric top into stable periodic rotations about its slowest axis, providing a new tool to control the alignment dynamics of asymmetrical tops.

Probing orbital structure of polyatomic molecules by high-order harmonic generation
R. Torres, N. Kojumbe, J.S. Robinson, S. Baker, J.W.G. Tisch, J.P. Marangos, The Blackett Lab., Imperial College London, UK; L.G. Underwood, The Open Univ., Milton Keynes, UK; R. de Naude, Instituto de Quimica Fisica de Rosaloalma, Madrid, Spain; W.A. Bryan, I.C.E. Turcu, CCLRC Rutherford Appleton Lab., Chilton, Didcot, UK; R. Velotta, C. Altucci, Univ. di Napoli "Federico II", Napoli, Italy

Signatures of orbital structure are observed in high-order harmonic generation from laser aligned polyatomic molecules, in good agreement with calculations. This suggests the applicability of the molecular orbital imaging techniques to large molecular systems.

3D alignment by holding and spinning molecules
S.S. Velthuis, V. Kumparan, C.Z. Biaggio, H. Stoppelfedt, University of Aarhus, Denmark

We demonstrate, experimentally, a new method for obtaining 3-dimensional molecular alignment using two orthogonally polarized laser pulses. A femtosecond pulse spins the molecule about its symmetry axis, which is held fixed by a nanosecond pulse.
### CJ2-1-WED 10:30
**Ytterbium fiber laser producing 89-fs pulses directly at the fiber output**
R. Herda, O.G. Okhotnikov, Tampere University of Technology, Tampere, Finland

We present a practical ytterbium-doped mode-locked fiber source producing 89 fs pulses without external bulk compensator. Negatively chirped pulses taken from the cavity are then compressed in a standard output fiber resulting in high-quality pulses.

### CJ2-2-WED 10:45
**Bound state of hundreds pulses in the Er:Yb-doped double-clad fiber laser**
A. Haboucha, F. Sanchez, H. Leblond, Université d’Angers, France

We report experimental evidence of bound state of some hundreds of pulses obtained in the erbium-doped double-clad fiber laser operating in the anomalous dispersion regime. Theoretical results will be also presented.

### CK7-1-WED (Invited) 10:30
**Optical surface resonances hide the gap in photonic crystals!**
F. Garcia-Santamaria, E.C. Nelson, P.V. Braun, University of Illinois at Urbana-Champaign, Urbana, USA

An optical resonance on the surface of photonic crystals prevents the coupling of photons to the crystal for a wide range of wavelengths and masks the underlying photonic band structure, leading to potentially misleading measurements.

### CK7-2-WED 11:00
**Quasi-incoherent propagation in waveguide arrays using coherent light sources**
A. Szameit, F. Dreisow, M. Heinrich, T. Pertsch, S. Nolte, A. Tünnermann, Friedrich-Schiller-University, Jena, Germany

We present the effect of quasi-incoherent propagation of coherent light in fs laser written waveguide arrays. This was visualized by monitoring the fluorescence of NBOH colour centers generated during the writing process.
We show how the characteristic Bell inequality can be constructed for the recently experimentally observed symmetric four-qubit Dicke state. The inequality is characteristic in the sense that it is violated maximally by the Dicke state.

Implementation of quantum algorithms using optical cluster state
A. Stefanov, T. Jennewein, F. Tiefenbacher, Austrian Academy of Sciences, Vienna, Austria; P. Prevedel, P. Böhi, R. Kaltenbaek, University of Vienna, Austria; P. Walther, Austrian Academy of Sciences, Vienna, Austria; W. Laskowski, Instytut Fizyki Teoretycznej i Astrofizyki, Gdańsk, Poland
We present the implementation of several quantum algorithms using an optical realization of the one-way quantum computer model with active feed-forward. Results for Deutsch and Grover algorithms and applications to quantum games are presented.

Collective scattering of partially coherent light by cold atoms
G.R.M. Robb, W.J. Firth, SUPA, University of Strathclyde, Glasgow, United Kingdom
We investigate the effect of introducing pump phase noise into the Collective Atomic Recoil Laser (CARL) model. We demonstrate that the reduced coherence of the pump field can actually increase the intensity of backscattered light.

Analysis of fractal dimension of light scattering in polyhedral mirror structures
K. Amano, D. Narimatsu, S. Sotome, S. Tashiro, A. Uchida, S. Yoshimori, Takushoku University, Hachioji, Tokyo, Japan
We experimentally observed fractal patterns in polyhedral mirror-structured filters that consist of spherical reflectors located at the vertices of polyhedra. We obtained the fractal dimension of basin boundaries in a cubic mirror-ball structure is 1.597.

Modelling pulse compression in BBO using cascaded nonlinearity: the effects of self-steepening in quadratic media
N.G.R. Broderick, J.H.V. Price, M. Prager, University of Southampton, United Kingdom
We present the first systematic study of pulse compression in a chi-2 material including self steepening. These results show that for ultra-short pulses self steepening is detrimental to the pulse quality and we discuss their effects on possible experiments.

Active stabilization of external cavity diode laser rapidly chirped over 10 GHz by an optoelectronic digital servo-loop control
G. Gouli, A. Jucha, V. Crozatier, I. Lorgeré, J.L. Le Gouët, F. Bretenaker, Laboratoire Aimé Cotton, Orsay, France
We demonstrate an active stabilization scheme for frequency chirped laser thanks to an optoelectronic digital servo-loop control. The errors affecting a laser scanned over 10 GHz in 1 ms, are reduced below 100 kHz.

Correlated two-electron dynamics in ultrashort laser pulses
A. Becker, C. Ruiz, J. Baier, Max Planck Institute for the Physics of Complex Systems, Dresden, Germany; L. Plaza, L. Rosa, Universidad Salamanca, Spain
Ab-initio computations of the interaction of two-electron atoms and molecules with ultrashort Ti:sapphire laser pulses beyond the one-dimensional approximation exhibit a rich quantum dynamics with two pathways to nonsequential double ionization.

Multi-particle correlations and characteristic Bell inequalities
Ch. Schmid, N. Kiesel, W. Wieczorek, R. Pohlner, H. Weinfurter, Max-Planck-Institute of Quantum Optics, Garching and Ludwig-Maximilians University, Munich, Germany; W. Laskowski, Instytut Fizyki Teoretycznej i Astrofizyki, Gdańsk, Poland
We show how the characteristic Bell inequality can be constructed for the recently experimentally observed symmetric four-qubit Dicke state. The inequality is characteristic in the sense that it is violated maximally by the Dicke state.
**Scattering optical elements: towards complete control of light propagation on the wavelength scale**

A. Håkansson, H.T. Miyazaki, National Ins. for Material Science, Tsukuba, Japan; J. Sanchez-Dehesa, Polytechnic University of Valencia, Spain

We here present a library of photonic devices shaped using inverse design, to achieve full control of the scattering of light. These devices, named Scattering Optical Elements, introduce 'automatic photonic component design on demand'.

**Optical Corkscrew**

E.J. Grace, Imperial College London, UK

A novel, highly non-paraxial, helical beam is predicted. Dubbed a corkscrew beam, since the pitch is comparable to the wavelength, they offer the possibility of optically sculpting structures with a chiral response.

**Design and fabrication of long-period gratings in As$_2$S$_3$ Chalcogenide glass Rib waveguides**

K. Finsterbusch, V.G. To’eed, N.J. Baker, B.J. Eggleton, University of Sydney Australia; D.-Y. Choi, S. Madden, B. Luther-Davies, Australian National University, Sydney, Australia

Long-period gratings are written into highly nonlinear chalcogenide (As$_2$S$_3$) glass rib waveguides. Bragg gratings and modal analysis of the waveguide enable up to 20 dB forward mode coupling resonances to be designed at telecommunication wavelengths.
4:30 – 16:00

CA7 Session: Laser materials and spectroscopy I
Chair: Mark Dubinskii, U.S. Army Research Laboratory, Adelphi, USA

14:30 – 16:00

Spectroscopic and lasing properties of Ti:Sapphire at low temperature
M. Delaigue, I. Manek-Hönninger, D. Villate, F. Salin, T. Cardinal, F. Guillon, A. Garcia, Université Bordeaux 1, France; F. Paul, Amplitude Technologies, Evry, France; J.L. Doualan, R. Moncorgé, Université de Caen, France

We study the temperature dependence of the Ti:Sapphire gain properties. We explain the evolution of the lasing properties at low temperature with the changes in the fluorescence spectra and the emission cross section.

CA7-1-WED 14:30

Large pitch kagome-structured hollow-core PCF
F. Couny, F. Benabid, P.S. Light, University of Bath, United Kingdom

A new type of hollow-core-PCF based on large pitch kagome-lattice cladding is reported to exhibit broad visible and IR transmission bands with low chromatic dispersion and high core-light confinement.

CA7-2-WED 14:45

Comparative laser and spectroscopic properties of (1-x)CaF₂-(x)SrF₂ solid solutions doped with Yb³⁺ ions
M.E. Doroshenko, T.T. Basiev, S.V. Vassiliev, S.B. Kravtsov, P.P. Fedorov, V.V. Osiko, V.A. Konyushkin, S.V. Kouznetzov, O.V. Mikhailovskaya, General Physics Institute, Moscow, Russia

Laser and spectroscopic properties of fluoride crystals CaF₂:Yb³⁺, SrF₂:Yb³⁺ and solid solution of CaF₂-SrF₂:Yb³⁺ are compared. For CaF₂:Yb³⁺ (6%) solid solution oscillations at 1025 nm were obtained with the maximum slope efficiency of 85%.

14:30 – 16:00

CE5 Session: Microstructured fibres, fibre devices and glass materials
Chair: Kerstin Wörhoff, University of Twente, Netherlands

14:30 – 16:00

Large pitch kagome-structured hollow-core PCF
F. Couny, F. Benabid, P.S. Light, University of Bath, United Kingdom

A new type of hollow-core-PCF based on large pitch kagome-lattice cladding is reported to exhibit broad visible and IR transmission bands with low chromatic dispersion and high core-light confinement.

14:30 – 16:00

IB2 Session: Optical lattices
Chair: Martin Zwierlein, Massachusetts Institute of Technology, Cambridge, MA, USA

14:30 – 16:00

Thermalization of incoherent nonlinear wave-packets
A. Picozzi, S. Lagrange, S. Pitois, H.R. Jauslin, CNRS, Institut Carnot de Bourgogne, Dijon, France

We present theoretically and experimentally in an optical fiber system a novel phenomenon of velocity-locking of incoherent nonlinear waves. This intriguing process is explained by simple thermodynamic arguments based on the weak turbulence theory.

14:30 – 16:00

IG5 Session: Dynamics in novel systems
Chair: Michael Böhm, University of Rostock, Germany

14:30 – 16:00

Form birefringence and third-harmonic generation in nanostructured silicon oxide
L.A. Golovan, V.A. Melnikov, S.O. Kororov, A.B. Fedotov, V.V. Timoshenko, A.M. Zheltikov, P.K. Kashkarov, M.V. Lomonosov Moscow State Univ., Russia; D.A. Ivanov, Russian Academy of Sciences, Moscow, Russia; G.I. Petrov, V.V. Yakovlev, Univ. of Wisconsin-Milwaukee, USA

We report strong in-plane birefringence of oxidized porous silicon films caused by a network of preferentially oriented pores. The third-harmonic generation efficiency studied as a function of the pump wavelength evidences the phase-matched interaction.

14:30 – 16:00

CD5 Session: Nonlinear photonic materials
Chair: Frank Wise, Cornell University, Ithaca, NY, USA

14:30 – 16:00

Epitaxial growth of inverted GaP for quasi phase matching nonlinear optical devices
T. Matsushita, T. Kondo, The University of Tokyo, Bunkyo-ku, Tokyo, Japan; T. Yamamoto, The University of Tokyo, Kashiwa, Chiba, Japan

Spatially-inverted GaP epilayers have been successfully grown on Si intermediate epi-layers deposited on GaP (100) substrates using molecular beam epitaxy. This will open up a novel application of GaP to QPM nonlinear optical devices.
CB9-1-WED 14:30

Ultrafast carrier dynamics in p-doped InGaAs quantum dot amplifiers
V. Cesari, P. Borri, W. Langbein, Cardiff University, Cardiff, United Kingdom; S. Mikhrin, I. Krestnikov, A. Kovsh, Nanosemiconductor GmbH, Dortmund, Germany; M. Rossetti, A. Fiore, Ecole Polytechnique Fédérale de Lausanne, Switzerland

We measured the ultrafast gain and index dynamics in undoped and p-doped electrically-pumped InGaAs quantum-dot optical amplifiers emitting near 1.3 micron at room temperature and found faster gain dynamics in the undoped than in p-doped samples.

CB9-2-WED 14:45

Round-Robin measurements of linewidth enhancement factor of semiconductor lasers in COST 288 action
G. Giuliani, S. Donati, Univ. of Pavia, Italy; J.M. Rosiron, J. Pazo, Univ. of Bristol, UK; A. Villafafra, I. Garces, J. Lasobras, Univ. of Zaragoza, Spain; M. Chacinski, R. Schatz, Royal Ins. of Technology, Stockholm, Sweden; K. Koukouroulos, I. Tomkos, D. Klonidis, Athens Information Technology Center, Athens, Greece; P. Sandis, Dublin City Univ., Dublin, Ireland; A. Fiore, P. Moreno, M. Rossetti, Ecole Polytechnique Fédérale de Lausanne, Switzerland; W. Elsässer, J. Von Staden, Technical Univ. Darmstadt, Germany; M. Saarinen, M. Pessa, M. Leinonen, Tampere Univ. of Technology, Tampere, Finland; G. Huyet, Univ. College Cork, Ireland; M. Sciamanna, SUPELEC, Metz, France; J. Danckaert, K. Panajotov, Vrije Univ. Brussel, Brussels, Belgium; T. Fornell, A. Lindberg, Univ. of Helsinki, Finland; P. Besnard, J.-F. Hayau, J. Poette, FOTON-ENSSAT, Lannion, France; M.F. Pereira, Sheffield Hallam Univ., Sheffield, UK; A. Wacker, R. Neland, Univ. of Lund, Sweden; R. Escarhuela, Aragon Photonics Labs S.L., Zaragoza, Spain; V. Vilokkinen, Modulight, Tampere, Finland; F. Grillot, FOTON-INSA, Rennes, France; A. Tredicucci, R. Green, NEST - Scuola Normale Superiore, Pisa, Italy

Round-Robin measurements on the linewidth enhancement factor are carried out in many laboratories participating to EU COST 288 Action. Seven different techniques are applied to DFB, VCSELs, QCL, and QD lasers, and results are compared.
The coefficient of GdVO$_4$ and YVO$_4$ were carefully measured with the Yb:YAG and Yb:KGW lasers. The interferometric measurements were performed with the Yb:YAG and Yb:KGW laser crystals. Observed refractive index variations are related to the existence of polarizability changes induced by strong UV absorption bands.

The study of thermo-mechanical and optical properties of GdVO$_4$ and YVO$_4$ was presented. Thermal conductivity, thermal expansion coefficient, and thermal refractive index coefficient of GdVO$_4$ and YVO$_4$ were carefully evaluated. We also discussed thermo-mechanical and optical characteristics from the viewpoint of power scaling in the limited compact volume.

Optimization of repetition rate, pulse duration, and polarization for femtosecond-laser-writing of waveguides in borosilicate and fused silica glasses was discussed. Low-loss waveguides were fabricated in fused silica and borosilicate glasses using a femtosecond fiber laser. The effect of repetition rate, scan speed, pulse duration and polarization on waveguide properties will be discussed.

Continuous tuning of silicon Raman laser for molecular spectroscopy was presented. We demonstrate mode-hop-free tuning of a continuous-wave silicon laser at infrared wavelengths over a tuning range suitable for molecular spectroscopy. Absorption spectroscopy measurements of methane correspond well with a calculated reference spectrum.
The influence of carrier density non-pinning on the output power of 1.55 µm lasers at high temperature

I.P. Marko, S.J. Sweeney, A.R. Adams, University of Surrey, United Kingdom; N.D. Whitbread, D.J. Robbins, A.J. Ward, B. Asplin, Bookham, Twinnster, United Kingdom

We show that whilst losses are important in determining the power output of 1.55µm lasers, self-heating induced non-pinning of the carrier density above threshold increases non-radiative recombination processes and ultimately limits the maximum obtainable power.

A simple model for the intensity noise of single mode class-A lasers

G. Baili, M. Alouini, D. Dolfi, Thales Research and Technology, Palaiseau, France; I. Sagnes, Laboratoire de Photonique et de Nanostructures, Marcoussis, France; F. Bretenaker, Laboratoire Aimé Cotton, Orsay, France

A model is proposed for class-A lasers intensity noise. It describes low frequency RIN and SMSR at cavity modes frequencies. The model predictions fit well with the measurements performed on a class-A semiconductor laser.

Static gain saturation spectra of quantum dot optical amplifiers: the role of excited to ground state relaxation

M. Laemmlin, C. Meuer, J. Kim, D. Bimberg, Technical University Berlin, Germany; G. Eisenstein, Electrical Engineering Department Technion, Haifa, Israel

We describe static gain saturation spectra in quantum dot optical amplifiers. Highly populated excited states serve as carrier reservoirs for the replenishing of saturated ground state carriers yielding symmetric saturation spectra.

Towards A compact femtosecond spectrometer based on photonic crystal fibers with probe light in the near-UV

J. Léonard, N. Lecong, S. Haucke, O. Créguet, University Louis Pasteur, Strasbourg, France; P. Leproux, V. Couderc, University of Limoges, France

We use the supercontinuum generated in PCF’s for broadband femtosecond transient spectroscopy applied to studying small organic molecules in solution. A birefringent fiber allows us to probe wavelengths as short as 360 nm.

Full three dimensional intensity-and-phase retrieval of arbitrarily complex ultrashort laser pulses

F. Braghieri, L. Tartara, V. Degiorgio, University of Pavia, Italy; C. Liberale, University of Magna Graecia, Catanzano, Italy; D. Faccio, O. Jedrzejewicz, University of Insubria, Como, Italy; P. Di Trapani, Vilnius University, Lithuania

We present a new experimental technique to obtain the full, i.e. in space and time, characterization of a pulse both in amplitude and phase. The technique is applicable in case of cylindrically symmetric pulses.

Photoluminescence properties of vertical emitting InP nanopillars photonic crystal slab on silicon

L. Berrier, R. Rojo-Romeo, E. Drouard, X. Letartre, C. Seassal, P. Viktorovitch, Institut des Nanotechnologies de Lyon, Ecully, France

High quality factor Bloch modes around Gamma-point are observed around 1.43µm in compact 2D nanopillar arrays patterned in an InP membrane including InAs quantum dots. Vertical laser emission is expected in such structures with quantum wells.

Novel tuneable optical filter made of a polymer and liquid crystal holographic grating on glass

D. Donisi, R. Asquini, A. D’Alejandro, University of Rome “La Sapienza”, Rome, Italy; C. Umeton, L. De Sio, R. Caputo, UCRYL, University of Calabria, Rende (CS), Italy; R. Beccherelli, Consiglio Nazionale delle Ricerche - Istituto per la Microelettronica e Microsistemi, Rome, Italy

A novel tuneable optical filter made of a polymer and nematic liquid crystal grating on a channel glass waveguide is presented. A few microwatts driving power is able to tune the optical transmission response.

Photonic crystal tapers for coupling into slow-light photonic crystal channel waveguides

P. Pottier, R.M. De La Rue, University of Glasgow, United Kingdom; M. Gnan, University of Glasgow, United Kingdom and University of Ferrara, Italy

The simulated coupling efficiency of light from ridge waveguides into low group velocity photonic crystal channel guides (butter-coupling) has been improved significantly in the band-edge region via the introduction of photonic crystal tapers.
Pulse timing effects in bulk Er/Yb codoped diode-pumped eyesafe lasers
E. Georgiou, N. Lazarides, Technological Educational Institute of Crete, Heraklion, Greece; O. Musset, J.P. Boquillon, Université de Bourgogne, Dijon, France

Novel operating characteristics and uncommon input/output pulse timing effects for diode-pumped bulk Er/Yb systems, both in free-running and Q-switched modes, are reported. These results are directly applicable in eyesafe laser engineering and upscaling.

Continuous-wave 1076-nm lasing of the stoichiometric YbAG crystal
T. Takano, M. Sugimoto, M. Yoshikawa, Japan Atomic Energy Agency, Takasaki, Japan

We observed blue-light emission from Si ion implanted fused silica substrates after annealing. Blue PL peaks were located around a wavelength of 400 nm, and the intensities can be remarkable after annealing above 1150 degrees centigrade.

Continuous wave laser oscillation of stoichiometric YbAG crystal
S. Matsubara, S. Kawato, M. Inoue, T. Kobayashi, University of Fukui, Japan

Continuous-wave 1076-nm lasing of the stoichiometric YbAG was realized by 937-nm free-running and Q-switched modes, are reported. These results are directly applicable in eyesafe laser engineering and upscaling.

Continuous wave laser oscillation of stoichiometric YbAG crystal
S. Matsubara, S. Kawato, M. Inoue, T. Kobayashi, University of Fukui, Japan

Continuous-wave 1076-nm lasing of the stoichiometric YbAG was realized by 937-nm free-running and Q-switched modes, are reported. These results are directly applicable in eyesafe laser engineering and upscaling.

Continuous wave laser oscillation of stoichiometric YbAG crystal
S. Matsubara, S. Kawato, M. Inoue, T. Kobayashi, University of Fukui, Japan

Continuous-wave 1076-nm lasing of the stoichiometric YbAG was realized by 937-nm free-running and Q-switched modes, are reported. These results are directly applicable in eyesafe laser engineering and upscaling.

Continuous wave laser oscillation of stoichiometric YbAG crystal
S. Matsubara, S. Kawato, M. Inoue, T. Kobayashi, University of Fukui, Japan

Continuous-wave 1076-nm lasing of the stoichiometric YbAG was realized by 937-nm free-running and Q-switched modes, are reported. These results are directly applicable in eyesafe laser engineering and upscaling.

Continuous wave laser oscillation of stoichiometric YbAG crystal
S. Matsubara, S. Kawato, M. Inoue, T. Kobayashi, University of Fukui, Japan

Continuous-wave 1076-nm lasing of the stoichiometric YbAG was realized by 937-nm free-running and Q-switched modes, are reported. These results are directly applicable in eyesafe laser engineering and upscaling.

Continuous wave laser oscillation of stoichiometric YbAG crystal
S. Matsubara, S. Kawato, M. Inoue, T. Kobayashi, University of Fukui, Japan

Continuous-wave 1076-nm lasing of the stoichiometric YbAG was realized by 937-nm free-running and Q-switched modes, are reported. These results are directly applicable in eyesafe laser engineering and upscaling.

Continuous wave laser oscillation of stoichiometric YbAG crystal
S. Matsubara, S. Kawato, M. Inoue, T. Kobayashi, University of Fukui, Japan

Continuous-wave 1076-nm lasing of the stoichiometric YbAG was realized by 937-nm free-running and Q-switched modes, are reported. These results are directly applicable in eyesafe laser engineering and upscaling.

Continuous wave laser oscillation of stoichiometric YbAG crystal
S. Matsubara, S. Kawato, M. Inoue, T. Kobayashi, University of Fukui, Japan

Continuous-wave 1076-nm lasing of the stoichiometric YbAG was realized by 937-nm free-running and Q-switched modes, are reported. These results are directly applicable in eyesafe laser engineering and upscaling.

Continuous wave laser oscillation of stoichiometric YbAG crystal
S. Matsubara, S. Kawato, M. Inoue, T. Kobayashi, University of Fukui, Japan

Continuous-wave 1076-nm lasing of the stoichiometric YbAG was realized by 937-nm free-running and Q-switched modes, are reported. These results are directly applicable in eyesafe laser engineering and upscaling.

Continuous wave laser oscillation of stoichiometric YbAG crystal
S. Matsubara, S. Kawato, M. Inoue, T. Kobayashi, University of Fukui, Japan

Continuous-wave 1076-nm lasing of the stoichiometric YbAG was realized by 937-nm free-running and Q-switched modes, are reported. These results are directly applicable in eyesafe laser engineering and upscaling.
### ROOM 13b

**CB9-6-WED** 15:45  
**Nonlinear stability of quantum dot semiconductor lasers**  
T. Erneux, E.A. Viktorov, P. Mandel, Université Libre de Bruxelles, Brussels, Belgium  
We analytically show that the slow decay of the carriers as well as the strong capture rate of the empty dots are responsible for the unusual dynamical properties of quantum dot lasers.

### ROOM 14b

**CF4-6-WED** 15:45  
**Complete field measurement of segmented beams using quadri-wave lateral shearing interferometry**  
S. Velghe, D. Brahmi, B. Wattellier, PHASICS SA, Palaiseau, France; F. Boubault, P. Drabczuk, N. Blanchot, C. Rouyer, CEA/CESTA, Le Barp, France  
We present a new technique to fully characterize the wave front of segmented beams, using quadri-wave lateral shearing interferometry. It is applied to the metrology of synthetic aperture compressors used in petawatt scale lasers.

### ROOM B21

**CK8-6-WED** 15:45  
**Photonic crystal waveguides on InP membranes for slow light implementation**  
A. Talneau, K.H. Lee, I. Sagane, CN.R.S., Marcoussis, France  
Low propagation losses have been measured for a one missing row Photonic Crystal waveguide on InP membrane operating in the slow light regime. This opens the route to optical pulse processing.

### CB10 Session: Quantum cascade lasers  
Chair: Wolfgang Elsässer, Technical University Darmstadt, Germany

16:30 – 18:00

**CB10-1-WED** 16:30  
**Near-field imaging of the evanescent electric field on the surface of a quantum cascade laser**  
V. Moreau, M. Bahriz, R. Colombelli, Université Paris-Sud, Orsay, France; L. Wilson, A. Krysa, University of Sheffield, United Kingdom; P.-A. Lemoine, Y. De Wilde, Laboratoire d’Optique Physique, ESPCI, Paris, France; R. Perahia, P. Painter, California Institute of Technology, Pasadena, USA  
We report the imaging - obtained with apertureless scanning near-field microscopy - of the evanescent electric field at the surface of a quantum cascade laser. This suggests that the devices could be "surface" sensitive.

### CF5 Session: Supercontinua and nonlinear spatiotemporal shaping  
Chair: Alexander Apolonski, Ludwig-Maximilians University, Munich, Germany

16:30 – 18:00

**CF5-1-WED** 16:30  
**High energy vortices generation by volume phase holograms and breaking into spiraling beams in air**  
I.J. Solo, J. San Román, M.V. Collados, L. Plaja, C. Méndez, I. Arias, D. Delgado, V. Díaz, C. Ruiz, A. García, L. Rosa, University of Salamanca, Spain  
High power vortices have been generated by using home made volume phase holograms. When focused in air, vortices breaking into two spiraling beams have been observed and studied, experimental and theoretically, depending on propagation.

### CK9 Session: Nonlinear optical properties of PCs  
Chair: Concita Sibilia, University Roma La Sapienza, Rome, Italy

16:30 – 18:00

**CK9-1-WED** 16:30  
**Non-linear optical properties of hybridized surface plasmon polaritonic crystals: observation of optical bistability**  
G. Wurtz, R. Pollard, A. Zayats, The Queen’s University of Belfast, United Kingdom; L. Salomon, Université de Bourgogne, Dijon, France; K. Cho, Soagang University, Mapo-gu, South Korea  
We report on the non-linear optical properties of a hybrid plasmonic crystal made of a nanostructured metallic film coupled with a non-linear polymer. The non-linear transmission of the crystal is shown to be pump wavelength dependent and demonstrates bistability at selected probe wavelengths.
We demonstrate laser operation of Yb\(^3+\) in the acentric orthorhombic crystal RbTiOPO\(_4\) which exhibits large splitting of the ground level, achieving very low laser thresholds and broad tunability extending roughly from 1010 to 1080 nm.

We report on the recent experimental progresses towards the realization of chromium degenerate gases. At present, we continuously load metastable atoms in an optical Dipole Trap. Optimization of this loading scheme is expected to yield a good starting point for reaching degeneracy by optical means.

We report on our recent experimental progresses towards the realization of chromium degenerate gases. At present, we continuously load metastable atoms in an optical Dipole Trap. Optimization of this loading scheme is expected to yield a good starting point for reaching degeneracy by optical means.

We report on our recent experimental progresses towards the realization of chromium degenerate gases. At present, we continuously load metastable atoms in an optical Dipole Trap. Optimization of this loading scheme is expected to yield a good starting point for reaching degeneracy by optical means.

We report on all-electrical trapping of neutral Rb atoms in a macroscopic electric trap. Approximately hundred thousand atoms are stored for a few hundred milliseconds. The trapping results will be discussed in detail.

We report on our recent experimental progresses towards the realization of chromium degenerate gases. At present, we continuously load metastable atoms in an optical Dipole Trap. Optimization of this loading scheme is expected to yield a good starting point for reaching degeneracy by optical means.

We report on all-electrical trapping of neutral Rb atoms in a macroscopic electric trap. Approximately hundred thousand atoms are stored for a few hundred milliseconds. The trapping results will be discussed in detail.

We report on all-electrical trapping of neutral Rb atoms in a macroscopic electric trap. Approximately hundred thousand atoms are stored for a few hundred milliseconds. The trapping results will be discussed in detail.

We report on our recent experimental progresses towards the realization of chromium degenerate gases. At present, we continuously load metastable atoms in an optical Dipole Trap. Optimization of this loading scheme is expected to yield a good starting point for reaching degeneracy by optical means.

We report on our recent experimental progresses towards the realization of chromium degenerate gases. At present, we continuously load metastable atoms in an optical Dipole Trap. Optimization of this loading scheme is expected to yield a good starting point for reaching degeneracy by optical means.

We report on our recent experimental progresses towards the realization of chromium degenerate gases. At present, we continuously load metastable atoms in an optical Dipole Trap. Optimization of this loading scheme is expected to yield a good starting point for reaching degeneracy by optical means.

We report on our recent experimental progresses towards the realization of chromium degenerate gases. At present, we continuously load metastable atoms in an optical Dipole Trap. Optimization of this loading scheme is expected to yield a good starting point for reaching degeneracy by optical means.

We report on our recent experimental progresses towards the realization of chromium degenerate gases. At present, we continuously load metastable atoms in an optical Dipole Trap. Optimization of this loading scheme is expected to yield a good starting point for reaching degeneracy by optical means.

We report on our recent experimental progresses towards the realization of chromium degenerate gases. At present, we continuously load metastable atoms in an optical Dipole Trap. Optimization of this loading scheme is expected to yield a good starting point for reaching degeneracy by optical means.

We report on our recent experimental progresses towards the realization of chromium degenerate gases. At present, we continuously load metastable atoms in an optical Dipole Trap. Optimization of this loading scheme is expected to yield a good starting point for reaching degeneracy by optical means.

We report on our recent experimental progresses towards the realization of chromium degenerate gases. At present, we continuously load metastable atoms in an optical Dipole Trap. Optimization of this loading scheme is expected to yield a good starting point for reaching degeneracy by optical means.

We report on our recent experimental progresses towards the realization of chromium degenerate gases. At present, we continuously load metastable atoms in an optical Dipole Trap. Optimization of this loading scheme is expected to yield a good starting point for reaching degeneracy by optical means.

We report on our recent experimental progresses towards the realization of chromium degenerate gases. At present, we continuously load metastable atoms in an optical Dipole Trap. Optimization of this loading scheme is expected to yield a good starting point for reaching degeneracy by optical means.

We report on our recent experimental progresses towards the realization of chromium degenerate gases. At present, we continuously load metastable atoms in an optical Dipole Trap. Optimization of this loading scheme is expected to yield a good starting point for reaching degeneracy by optical means.

We report on our recent experimental progresses towards the realization of chromium degenerate gases. At present, we continuously load metastable atoms in an optical Dipole Trap. Optimization of this loading scheme is expected to yield a good starting point for reaching degeneracy by optical means.
Generation of high-energy sub-20 fs pulses at 248 nm
T. Nagy, M. Forster, P. Simon, Laser-Laboratorium Göttingen e.V., Germany
High-energy sub-20 fs DUV pulses are generated by the hollow-fiber compression technique applied to KrF laser pulses at 248 nm. The key issues relevant to the DUV operation are discussed and experimental results are presented.

Optical parametric oscillator in a lithium niobate photonic crystal membrane
R. Iliew, F. Leggetter, C. Ertsch, T. Pertsch, Friedrich-Schiller-University, Jena, Germany
We investigate theoretically the feasibility of an optical parametric oscillator in a realistic high-Q microcavity in a photonic crystal membrane with quadratic nonlinearity. We compare results from nonlinear finite-difference time-domain calculations with a modal model.

Tunable few-optical-cycle visible pulses with passive carrier-envelope phase stabilization from an optical parametric amplifier
C. Manzoni, G. Cerullo, D. Polli, G. Cirri, D. Brida, S. De Silvestri, Politecnico di Milano, Italy
The passively phase-stabilized idler of an IR optical parametric amplifier is spectrally broadened and seeds a blue-pumped non-collinear optical parametric amplifier. Few-optical cycle phase-stable pulses with broad tunability in the visible are generated.

Electromagnetically induced transparency in Rubidium-Filled HC-PCF
P.S. Light, F. Benabid, University of Bath, UK and University of Western Australia, Crawley, Australia; F. Couny, University of Bath, United Kingdom; M. Maric, A.N. Luiten, University of Western Australia, Crawley, Australia
We report the observation of electromagnetically induced transparency in rubidium-filled kagome-structure hollow-core photonic crystal fibre. Using a PDMS coating on the core wall of the fibre, a transparency peak width of 7 MHz was achieved.

Linear and possible non-linear suppression of near-UV emission in ZnO inverted opal structures
W. Khunsin, S.G. Romanov, C.M. Sotomayor Torres, Tyndall National Institute, Cork, Ireland; R.P.H. Chang, M. Scharrer, L. Aagesen, Northwestern University, Evanston, Illinois, USA
We report light emission in inverted opal ZnO structures possessing PBG with FWHM of 0.39 eV and a broad defect-related luminescence spectrum (~1.2 eV) at 2.35 eV were observed. Non-linear band-edge suppressions were observed at high excitation intensities.
Continuous-wave laser action of an Er:Sc$_2$O$_3$ bulk crystal at 1.58 µm
M. Fechner, A. Kahn, K. Petermann, H. Scheife, G. Huber, University Hamburg, Germany
We report on an Er:Sc$_2$O$_3$ laser emitting in the 1.6 µm region with a maximum output power of 16.1 mW. This material is also suitable for the fabrication of planar waveguiding films.

Tunable CW laser operation of Tm$^{3+}$ in locally disordered NaLa(WO$_4$)$_2$
We report on room-temperature laser operation of Tm$^{3+}$ in the locally disordered crystal NaLa(WO$_4$)$_2$ achieving output powers in excess of 200 mW and a tuning range from 1789 to 1953 nm with Tsapphire laser pumping.

Demagnetization cooling of a Chromium cold gas
T. Koch, M. Fattori, T. Lahaye, S. Goetz, A. Griesmaier, S. Hensler, J. Stuhler, T. Pfau, S. Physikalisches Institut, Stuttgart, Germany
A new approach for realizing highly-dispersive rectangular transmission gratings is presented, enabling theoretically 100% diffraction efficiency due to the complete suppression of reflection losses. A comprehensible explanation as well as experimental results is given.

Cavity cooling of internal and external degrees of freedom of molecules
P.W.H. Pinkse, Max-Planck-Institut für Quantenoptik, Garching, Germany; M. Kowalevski, R. de Vivie-Riedle, Ludwig Maximilians Universität, Munich, Germany; G. Morigù, Universitat Autònoma de Barcelona, Bellaterra, Spain
We report a scheme, which allows for simultaneously cooling internal and external degrees of freedom of molecules using laser excitation and photon emission into a resonator. The cooling efficiency is investigated numerically for OH.

Radiation-pressure effects upon a micro-mirror in a high-finesse optical cavity
P.F. Cohadon, O. Arcizet, C. Molinelli, T. Briant, M. Pinard, A. Heidmann, Laboratoire Kastler Brossel, Paris, France
We present an experiment where the motion of a micro-mechanical resonator is optically monitored with a quantum-limited sensitivity. Direct effects of intracavity radiation pressure are experimentally demonstrated. Applications to quantum optics are discussed.

1.25GHz repetition rate operation of a SOA-DFB laser diode based all-optical flip-flop
W. D’Oosterlinck, G. Morthis, R. Baets, Ghent University-IMEC, Ghent, Belgium; A. Perez Pardo, S. Sales, A. Ortigosa Blanch, G. Puerto, Universidad Politecnica de Valencia, Spain
All-optical flip-flop operation employing a SOA/DFB-laser diode optical feedback scheme is experimentally demonstrated. 1.25GHz repetition rate operation, with switch energies below 1 pJ, is demonstrated. On-off ratios of over 18 dB have been obtained.

Exclusive-OR gate for RZ-DPSK signals using four-wave mixing in a highly nonlinear Bismuth-Oxide fiber
M.P. Fok, C. Shu, The Chinese University of Hong Kong, Shatin, Hong Kong
We experimentally demonstrate an all-optical exclusive-OR gate for RZ-DPSK signals using four-wave mixing in a 35-cm highly nonlinear bismuth-oxide fiber. Detuning up to 12 nm is allowed between the input wavelengths.
**Dependence of the linewidth enhancement factor on the temperature induced detuning of a distributed feedback grating in a quantum cascade laser**

J. von Staden, T. Gensty, W. Elässer, Technical University of Darmstadt, Germany; Ch. Mann, Fraunhofer IAP, Freiburg, Germany; G. Giuliani, Università di Pavia, Italy

We present measurements of the linewidth enhancement factor (LEF) and the linewidth of distributed feedback quantum cascade lasers. Here, we investigate a temperature dependence of the LEF caused by the detuning of the grating.

**Index-coupled DFB quantum cascade lasers with high SMSR using metal grating**

M. Carriès, M. Garcia, O. Drisse, X. Marcadet, M. Krakowski, Alcatel Thales 3-5 Lab, Palaiseau, France; A. De Rossi, S. Bansropun, Thales Research and Technology, Palaiseau, France

We demonstrate a metal grating purely index coupled Distributed Feedback Quantum Cascade Lasers at around 7.5 microns. It presents a large tuning without broadband gain and side mode suppression ratio above 30 dB.

**Pulse compression and X wave generation by Cross-Phase-Modulation induced spatiotemporal reshaping**

D. Faccio, A. Averchi, University of Insubria, Como, Italy; M. Kolesik, University of Arizona, Tucson, USA; A. Couairon, École Polytechnique, Palaiseau, France; P. Polesan, G. Tamosauskas, A. Dubietis, P. Di Trapani, A. Piskarskas, University of Vilnius, Lithuania

We show that due to XPM, ultrashort laser pulse filaments may reshape a weak laser pulse seed, thus generating an X wave which may also be amplified in the presence of FWM or SRS.

**Generation of tailored supercontinuum from telecom wavelength femtosecond pulses: experiment and simulation**

A. Sell, F. Adler, A. Leitenstorfer, University of Konstanz, Germany

Simulations of ultrabroadband supercontinuum generation from femtosecond Er:fiber lasers quantitatively agree with experiment, allowing detailed insight into nonlinear pulse propagation. Kerr and Raman contributions are separated. Influences of dispersion and pump pulse parameters are discussed.

**Polarization dependent band structure mapping of photonic crystal mid infrared photodetectors**

S. Schartner, L. Hoffmann, S. Galka, M. Austerer, P. Pavel, A. M. Andrews, W. Schrenk, G. Strasser, Technical University Vienna, Austria

The photonic crystal enables response to surface incident radiation for intersubband-based QWIPs. The angular and polarization dependence of the spectral photocurrent is used to map the photonic band structure and to investigate polarization conversion effects.

**NbN nanowire superconducting single photon detectors fabricated on MgO substrates**

F. Marsili, D. Bitauld, S. Hold, M. Benkahoul, A. Fiore, F. Lévy, École Polytechnique Fédérale de Lausanne, Switzerland; A. Gaggero, R. Leoni, F. Mattioli, Istituto di Fotonica e Nanotecnologie, Rome, Italy

High performance NbN nanowire superconducting single photon detectors have been realized on a different substrate (MgO) and at lower deposition temperature than previously reported, opening the way to integration with advanced solid state optical structures.
CB-1-WED
Dynamic switching behaviour of bistable semiconductor ring lasers triggered by resonant optical pulse injection
G. Yuan, S. Yu, University of Bristol, United Kingdom

CB-2-WED
GainNAs/GaAs quantum-well semiconductor optical amplifiers for simultaneous multi-wavelength amplification
J. Pozo, N. Vogiatzis, JW Lu, PJ Heard, O. Ansell, J.M Rorison, University of Bristol, UK; P. Tumimeta, J. Kanttinen, M. Saarinen, C. Peng, J. Viheriala, T. Leinonen, M. Pessa, Tampere University of Technology, Tampere, Finland

CB-3-WED
Low-frequency modulation effects on the polarization dynamics of vertical-cavity surface-emitting lasers subject to optical feedback
Y. Hong, J. Paul, K.A.Shore, P.S. Spencer, University of Wales, Bangor, United Kingdom

CB-4-WED
Non-equilibrium quantum transport theory for quantum cascade lasers
T. Kubis, P. Vogl, Walter Schottky Institute, Garching, Germany
We present non-equilibrium Greens function calculations of quantum cascade laser structures including all relevant scattering mechanisms. Resulting I-V characteristics and emission spectra agree with experiment and demonstrate the balance between coherent and incoherent mechanisms.

CB-5-WED
Lasing dynamics in ZnO nanorods
J. Fallert, H. Zhou, R. Hauschild, M. Wissinger, F. Stelzl, C. Klingshirn, H. Kalt, Kharishve University, Germany

CB-6-WED
200 kHz linewidth of 780 nm high-power distributed feedback diode laser
T.P. Nguyen, O. Brix, A. Klehr, G. Erbert, G. Tränkle, Ferdinand-Braun-Institut für Höchstfrequenzzentrum, Berlin, Germany
We present experimental investigations on 780 nm high power distributed feedback (DFB) lasers in dependence on output power. The lasers emit in single lateral and longitudinal mode with a linewidth as low as 200 kHz.

CB-7-WED
High power pulse generation from a 10mm long monolithic multi-section mode locked semiconductor laser at 920nm
S. Schwertfeger, A. Klehr, J. Fricke, G. Erbert, G. Tränkle, Ferdinand-Braun Institut, Berlin, Germany
Active and passive mode locking of a four section 10mm long monolithic 920nm DBR laser was investigated. 10ps pulses are generated at a repetition rate of 4GHz with a peak power of 1.3W.

CB-8-WED
Numerical modelling of quantum dot superluminescent diodes
M. Gioannini, I. Mantrosset, Politecnico di Torino, Italy
We present a model for the analysis and design of quantum dot superluminescent diodes including the real characteristics of the nanostructure material. The model is used to design new superluminescent diodes with improved performance.

CB-9-WED
ECM-components in a VCSEL with optical feedback
K. Green, Vrije Univ., Amsterdam, Netherlands; B. Krauskopf, Univ. of Bristol, UK; D. Lenstra, Delft Univ. of Technology, Delft, Netherlands
We investigate the external-cavity-mode structure of a two mode VCSEL with optical feedback, where we identify qualitative changes as the feedback strength, phase and amount of cross-coupling of the fields via the feedback are varied.

CB-10-WED
Locking of two delay coupled semiconductor lasers: dependence on the pump current
H. Erzgraber, Vrije Universiteit, Amsterdam, Netherlands; B. Krauskopf, University of Bristol, United Kingdom and Vrije Universiteit, Amsterdam, Netherlands; D. Lenstra, Delft University of Technology, Delft, Netherlands
We investigate the dynamics within the locking region of two mutually delay-coupled semiconductor lasers. Hysteresis effects due to bistabilities between stable cw-emission and complicated dynamics, which appear for decreasing pump current, are observed.

CB-11-WED
Extremely low-threshold room-temperature electron beam pumped green semiconductor lasers grown by MBE
M.M. Zverev, E.V. Zdanova, N.A. Gamov, V.B. Studionov, D.V. Peregoaudd, Moscow State Institute of Radio Engineering, Moscow, Russia; S.V. Ivanov, S.V. Sorokin, I.V. Sedova, S.V. Gronin, P.S. Kopiev, Ioffe Physico-Technical Institute of RAS, St.-Petersburg, Russia
Room-temperature ZnS-based electron beam pumped lasers with thin top claddings were studied. Lasing was observed at electron energies exceeded 3.7 keV. Threshold current density of 0.4-0.5 A/cm² has been measured at the electron energies 8-9 keV.

CB-12-WED
Optical gain and recombination currents in a GaAsSb / InGaAs type-II W laser structures
J.D. Thomson, PM. Smowton, F. Blood, Cardiff University, United Kingdom; F. Klem Sandia, National Laboratories, Albuquerque, USA
Experimental modal gain and the radiative current of a type-II InGaAs/GaAsSb laser structure emitting at 1300 nm are presented. We discuss the non-radiative mechanisms present in this structure.

CB-13-WED
Measurement of the Linewidth Enhancement Factor of InGaAlAs and InGaAsP laser diodes using the Fourier Series Expansion of the ASE spectrum
D. Byrne, W.H. Guo, T. Lu, R. Phelan, J.F. Donegan, Trinity College Dublin, Ireland; B. Corbett, Tyndall National Institute, Cork, Ireland
A new method for determining the Linewidth Enhancement Factor for a semiconductor laser by Fourier Series Expansion is presented here. The Linewidth Enhancement Factor calculated by this method is independent of the OSA resolution bandwidth.

CB-14-WED
Quantum theory of the optical excitation of a semiconductor quantum dot
T. Feldmann, L. Schneebeli, M. Kira, S.W. Koch, Philipps University Marburg, Germany
We present a fully quantum-mechanical theory for the optical excitation of a semiconductor quantum-dot coupled to a phonon bath. The optically generated many-body configurations are characterized with respect to their correlated nature.

CB-15-WED
Design and simulation of a novel three-section widely-tunable slotted fabry-perot laser
A novel three-section widely-tunable FP laser diode with a channel spacing of 400 GHz is designed and simulated. A simplified numerical model using the scattering matrix technique is presented to analyze the tuning characteristics.

CB-16-WED
Narrow spectral linewidth between 10C and 90C for high-power all-free active region DBR operating at 852nm for atomic clocks applications
V. Ligeret, M. Lecomte, M. Calligaro, O. Parrilaud, M. Krakowski, Alcatel-Thales, Palaiseau, France; S. Bansropun, Thales Research and Technology, Palaiseau, France

CB-17-WED
High-power, high-brightness, index-guided tapered lasers, comparison between CW and pulsed operation
N. Michel, I. Hassioua, M. Calligaro, O. Parrilaud, M. Krakowski, Alcatel-Thales, Palaiseau, France
Index-guided tapered lasers at 975 nm deliver 1 W CW, with a low M2 of 1.6 at 1/e², which is a record for such a device, no measurable astigmatism, and a narrow far-field angle of 6.8 degrees FWHM.
CB-18-WED
Microscopic nonequilibrium simulations in semiconductor laser structures
E. Kuester, A. Throsenhardt, S. Chatterjee, C. Lange, S. Hort, K. Hancke, W. Stolz, W. Ruehle, J.W. Koch, Philips-Universität Marburg, Germany; W. Diehn, P. Brick OSRAM Opto Semiconductors, Regensburg, Germany
A microscopic theory of coherent optical excited surface emitting lasers and their thermal properties with special regard to nonequilibrium carrier distribution and microscopic scattering rates is presented. Simulations show good agreement with experiments.

CB-19-WED
High brightness single-mode 1060-nm diode lasers for demanding industrial applications
We demonstrate record kink-free output powers, over 1.2W, for 1060-nm single-mode lasers. Saturation powers of 1.9W are observed at room temperature that guarantee high-power and kink margins with respect to typical operation conditions.

CB-20-WED
Mapping of transverse mode locking and switching in VCSELs under orthogonal optical injection
I. Gatare, SUPELEC-LMPO CNRS-UMR, Metz, France and Vrije Universiteit Brussel, Brussels, Belgium; M. Sciamanna, SUPELEC-LMPO CNRS-UMR, Metz, France; A. Valle, Instituto de Física de Cantabria, Santander, Spain; K. Panojotov, Vrije Universiteit Brussel, Brussels, Belgium
We experimentally and theoretically show that the first order transverse-mode plays a key role in the switching mechanism between the fundamental linearly polarized modes of a vertical-cavity surface emitting laser subject to orthogonal optical injection.

CB-21-WED
Quantum design of a 1.3μm InGaPAs semiconductor laser
J.V. Moloney, J. Hades, Nonlinear Control Strategies and University of Arizona, Tucson, USA; M. Fallahi, L. Fan, University of Arizona, Tucson, USA; S.W. Koch, University of Marburg, Germany
The first closed-loop demonstration, from initial semiconductor epitaxial design and wafer growth validation to end laser L-1 characteristic for an electrically-pumped InGaPAs 1.3mm laser without using free fit parameters will be presented.

CB-22-WED
Optical bistability and nonlinear gain in a 1550nm-vertical cavity semiconductor optical amplifier (VC SOA) with high on-off contrast ratio
A. Hurtado, Universidad Politécnica de Madrid, Spain; I.D Henning, M.J Adams, University of Essex, Colchester, United Kingdom
We report a first experimental observation of high contrast ratio clockwise and anticlockwise optical bistability in a 1550nm-VC SOA operated in reflection.

CB-23-WED
A 1 THz quantum cascade laser in strong magnetic field
G. Scalari, C. Walther, L. Sirigu, J. Faist, Universität of Neuchâtel, Switzerland; H.E Beere, D.A Ritchie, University of Cambridge, UK
A quantum cascade laser emitting at the frequency of about 1 Terahertz in strong magnetic field is demonstrated. Laser emission as a function of the applied magnetic field together with detailed transport characteristics are analyzed.

CB-24-WED
High brightness laser diode array at 940 nm for Yb:YAG pumping
M. Siebold, J. Hein, Institute of Optics and Quantum Electronics, Jena, Germany; C. Wands, S. Karsch, F. Krauss, Max-Planck-Institute for Quantum Optics, Garching, Germany; D. Wolff, G. Bonati, S.S Beyert, Jenoptik Laserdiode GmbH, Jena, Germany
A novel design of a quasi-cw 13kW peak power diode array for Yb-doped solid state laser pumping with a repetition rate of 10Hz is presented. A high brightness is achieved by wave-guide and polarization coupling.

CB-25-WED
Frequency doubled tunable diode laser for excitation of Rydberg states in Rb atoms
V.M. Entin, I.I. Ryabtsev, I.I. Beterov, D.B. Tretyakov, Institute of semiconductor physics SB RAS, Novosibirsk, Russia
Paper describes current progress on developing of all-solid state single mode laser tunable in the range 479-481 nm. Experiments were made with semiconductor laser for 960 nm frequency doubled inside LBO-crystal using external enhancement cavity.

CB-26-WED
Effects of doping concentration on terahertz quantum-capsule lasers
Ch. Deutscher, J. Unterrainer, A. Benz, G. Fasching, A.M. Andrews, T. Roch, W. Schrenk, G. Strasser, Vienna University of Technology, Austria
This work presents the effects of the doping concentration on terahertz quantum-capsule lasers. We performed our measurements at four different doping concentrations with the focus on the temperature performance and the threshold current density.

CB-27-WED
All-optical logic OR gate based on cross gain modulation in semiconductor optical amplifiers
A. Sharaia, J. Le Bihan, M. Guegan, Laboratoire RESO / EINIB, Brest, France; A. Hamze, A. Hamidé, University College, Beirut, Lebanon
All-optical logic OR gate is performed by using two-cascaded SOAs in a counterpropagating configuration based on cross gain modulation. The experimental results present the logic OR gate with an extinction ratio of about 7 dB.

CB-28-WED
Designs of photonic-crystal vertical-cavity surface-emitting diode lasers assuring high performance with minimal technological effort
T. Czyszczowski, P. Panojotov, Vrije Universiteit, Brussels, Belgium; M. Demis, Technical University of Lodz, Poland
We determine the high performance of 1300 nm InP based photonic-crystal vertical-cavity surface-emitting diode laser configurations, which can be achieved with minimal technological effort assuring minimal modal losses and high beam quality.

CB-29-WED
Bistable vertical cavity laser as a truly random number generator
V.N. Chizhovsky, D.B. Haroshki, D.I. Pustakhod, S.Y. Kilin, S.I. Stepanov Institute of Physics, NASB, Minsk, Belarus
We show that spontaneous polarization switching in a bistable vertical cavity laser can generate random bits obtained from residence times. An effective algorithm of conversion into truly random binary numbers is proposed and statistically tested.

CB-30-WED
High power 980 nm tapered lasers with separate contacts: numerical simulation and comparison with experiments
H. Odnozalo, L. Borreel, J.M. Tijero, J. Esquivias, Universidad Politecnica de Madrid, Spain; H. Wenzel, F. Dittmar, K. Paschke, B. Sumpf, G. Erbert, Ferdinand-Braun-Institut für Höchstfrequenztechnik, Berlin, Germany
A compact master-oscillator power-amplifier was realized on a micro-optical bench. More than 3 W in a nearly diffraction limited beam with a narrow spectral line width was demonstrated.

CB-31-WED
6 Gbit/s T×Rx-leadframe-modules at -40 to 115 degrees C based on 1.1-micron VCSEL
We developed Transmitter and Receiver lead-frame-type modules using a 1.1-micron-range VCSEL and PIN-PD. 6 Gbit/s-operation under a temperature range from -40 to 115 degrees C was successfully achieved.

CB-32-WED
InGaAs sub-monolayer quantum dots VCSEL with extremely temperature insensitivity for 2.125 Gb/s application
F.J. Lai, Yuan Ze University, Chung-Li, Taiwan; H.C. Kuo, H.W Huang, S.C Wang, National Chiao Tung University, Hsinchu, Taiwan; J.Y. Chi, G.R Lin, Industrial Technology Research Institute, Chutung, Taiwan; N.A. Maleev, S.A. Blahin, Russian Academy of Sciences, St Petersburg, Russia
The InGaAs SML QD VCSEL with fully doped AIGaAs/GaAs DBRs was fabricated. The VCSEL exhibits a wide operation range and shows extremely temperature insensitivity under high speed operated in 2.125 Gb/s from -40°C~100°C.

CB-33-WED
High-power hybrid integrated master-oscillator power-amplifier on micro-optical bench at 980nm
K. Paschke, C. Dziki, J. Fricke, A. Ginolas, A. Knauer, G. Erbert, M. Malwald, P. Ressel, S. Schwertfeger, Ferdinand-Braun-Institut für Höchstfrequenztechnik, Berlin, Germany
A compact master-oscillator power-amplifier was realized on a micro-optical bench. More than 3 W in a nearly diffraction limited beam with a narrow spectral line width was demonstrated.

CB-34-WED
Tunable semiconductor narrowband reflection filters for single frequency sources
A. Garnache, Université Montpellier II, France; I. Sagnes, Laboratoire de Photonique et Nanosciences, CNRS UPR26, Marcoussis, France
We present a tunable metal-semiconductor narrowband reflection filter for the 0.8-3micron range, with a reflectivity >99%, a bandwidth <500GHz. The structures are based on a Al(Ga)As/GaAs multilayer, having a 5-15nm metal layer evaporated on top.

**CB-35-WED**

Tailoring single-mode DFB laser with integrated passive feedback section for direct modulation applications  
M. Radziunas, Weierstrass Institute for Applied Analysis and Stochastics, Berlin, Germany; U. Trappenz, J. Kreissl, Heinrich-Hertz-Institut, Berlin, Germany  
We consider a passive feedback laser consisting of a DFB and an integrated feedback sections. We discuss the choice of the DFB section that should allow an appropriate laser operation at 40 GHz direct modulation applications.

**CB-36-WED**

Transverse emission pattern of a vertical external cavity surface emitting laser with high Fresnel number: towards a cavity soliton laser?  
T. Elsas, R. Kuszlewicz, I. Sagnes, X. Hachair, S. Barbay, LPN-CNRS, Marcoussis, France  
An optically pumped Vertical External Cavity Surface Emitting Laser’s transverse emission is investigated experimentally in a high Fresnel number regime. Adding an intracavity saturable absorber could lead to a Cavity Soliton Laser...

**CB-37-WED**

Brightness scaling of high power laser diode bars  
Y.M Manz, M. Krejci, S. Weiss, A. Thies, D. Schulz, A. Fily, N. Lichtenstein Bookham, Zürich, Switzerland  
Bookham has developed Very High Brightness devices with filling factors of 80% with improved brightness by a factor of 4. Bars of 10 mm widths with 30% show 170 W at 190 A.

**CB-38-WED**

Time-resolved characterization of heating and dissipation processes in semiconductor lasers  
We demonstrate a non-destructive technique that allows the characterization of heating and dissipation processes in semiconductor lasers. Analysis of temperature-induced Fabry-Perot oscillations on an injected beam allows a time-resolved thermal characterization of the device.

**CB-39-WED**

Chaos synchronisation of self-pulsating laser diodes  
M.W Lee, J. Pierce, University of Wales, Bangor, United Kingdom  
Chaos synchronisation of self-pulsating laser diodes has been experimentally demonstrated. Optical feedback and external modulation configurations have been used to generate chaotic pulsations. Synchronisation of chaotic pulse-sequences has been achieved in both the configurations.

**CB-40-WED**

Synchronization regimes of unidirectionally coupled VCSELs with optical injection  
A. Loquet, UMR 2958 Georgia Tech – CNRS, Metz, France; M. Sciamanna, UMR 2958 Georgia Tech – CNRS and LMOPS CNRS UMR 7132, Metz, France; I. Gatore, LMOPS CNRS UMR 7132, Metz, France; K. Panaiaitov, Vrije Universiteit, Brussels, Belgium  
We characterize two regimes of chaos synchronisation occurring between a master VCSEL subjected to isotropic optical feedback and a slave VCSEL subjected to orthogonal optical injection from the master laser.

**CB-41-WED**

Bistability and optical switching in semiconductor ring lasers  
A. Scicé, T. Perez, C.R. Mirasso, R. Colet, IMEDEA, Palma de Mallorca, Spain  
We have theoretically investigated the bifurcation scenario that leads to the emergence of a bistable regime in a two-mode model for a Semiconductor Ring Laser, and analyzed its switching properties Ring Laser under coherent optical pulse injection.

**CC-1-WED**

Holographic volume absorption gratings in glass-like polymer recording materials  
V. Matusевич, A. Matusевич, R. Kaworskich, Institute of Applied Optics, Jena, Germany; L.P. Krul, Y.S. Krul, Institute of Physical and Chemical Problems, Minsk, Belarus  
We present investigations of the glass-like polymer recording mediums based on poly(methyl methacrylate) and its thermostable derivative (copolymer with acrylic acid) with regard to their application as storage materials for holographic gratings.

**CC-2-WED**

Interband dynamic holography at visible wavelengths in Sn, P, S  
R. Mosimann, M. Jazbinsk P. Gunter, ETH Zurich, Switzerland; G. Montemessoni, University of Metz and Supelac Metz, France  
Continuous-wave interband photoeffect in visible at 514nm in Sn, P, S was demonstrated. Grating response times of 100 μs were measured at 0.6W/cm² intensity, which is two orders of magnitude faster than in the conventional regime.

**CC-3-WED**

Gaussian beam output from a large-area higher-order-mode fiber  
N. Lindelein, G. Leuchs, Friedrich-Alexander University of Erlangen, Germany; S. Ramachandran, OFS Laboratories, Somerset, USA  
An alternative for converting higher-order LP_0_m fiber modes (m>1) into a nearly fundamental Gaussian shape at the output of a fiber is described. The conversion will be done by using a binary phase plate.

**CC-4-WED**

Investigation of photorefractive spatial bright soliton in lithium niobate by interferometric technique  
M. Paturzo, L. Miccio, S. De Nicola, P. De Natale, P. Ferraro, CNR-INO, Pozzuoli, Italy  
A spatial bright soliton is created in a z-cut lithium niobate sample. The temporal behaviour of the soliton formation is investigated by reconstructing its intensity and phase by a digital holography approach.

**CC-5-WED**

Propagation of an array of four Gaussian light beams in a SBN crystal  
V. Shepelevich, A. Zagosky, Mozay State Pedagogical University, Mazy, Belarus; D. Khmelnitsky, V. Matusевич, A. Kessler, Friedrich-Schiller University, Jena, Germany  
The peculiarities of propagation and interaction of four light beams in SBN crystal with thickness 20 mm under conditions of self-focusing are researched theoretically.

**CC-6-WED**

Polarization simultaneous readout for volume holographic storage in LiNbO_3  
W.C. Su, C.M. Chen, National Chianghua University of Education, Changhai, Taiwan; Y. Ouyang, R.O.C. Military Academy, Kaohsiung, Taiwan  
We demonstrated a holographic memory with two simultaneous but individual readout channels in a LiNbO_3 crystal. The simultaneous readout technique is achieved in a hybrid-multiplexed memory implemented by angular multiplexing and polarization multiplexing.

**CC-7-WED**

Space-and-time current spectroscopy of polyphyrrole nanostructures in chrysotile asbestos matrix  
I. Sokolov, M. Bryushinina, V. Semkin, Y. Kamze rov, A.F. Ioffe Physico-Technical Institute, St. Petersburg, Russia  
The non-steady-state photocurrent measurements of polypryrole nanostructures within chrysotile asbestos are presented. The diffusion length of carriers is estimated to be 0.18 microns for the illumination wavelength 532 nm.

**CC-8-WED**

Fast photorefractive self focusing in InP : Fe in near infrared  
C. Dan, N. Khelhoulou, D. Wolfersberger, N. Fressengeas, MOPS Lab, CNRS UMR 7132, Metz, France; H. Lefland, Angers University, Angers, France  
Transient photorefractive self focusing in InP:Fe is studied as a function of intensity and temperature; bending and self focusing are found to take place on a microseconds time scale.

**CC-9-WED**

Photo-induced patterning of birefringence and quadratic non linear optical properties in chromophore doped photopolymers  
L. Mager, D. Gindre, J.P. Bombenget, J.P. Voia, K.D. Dorkenoo, A. Fort, IPCMS/GONIO, Strasbourg, France  
We present the direct photopatterning of the birefringence and of the quadratic nonlinear optical properties of push-pull chromophore doped photopolymers. We demonstrate stability over to 10000 hours and 8 micrometers spatial resolution.

**CC-10-WED**

Ultra-broadband radial polarization conversion based on goos-hanchen shift  
P.B Phua, DSO National Laboratories, Singapore, Singapore; W.J. Lai, Nanyang Technological University, Singapore, Singapore  
We demonstrate, for the first time, a scheme that generates radially-polarized light using Goos-Hanchen shift of a cylindrically symmetric Total Internal Reflection. It allows ultra-broadband radial polarization conversion for wavelengths differing >1 micron.
CC-11-WED
Temperature-dependent anisotropic grating formation in a holographic polymer-dispersed liquid crystal
H. Iloka, W. Weng, A. Yamashita, Y. Tomita, University of Electro-Communications, Tokyo, Japan
We report on the observation of strong re-cording- and readout-temperature dependences of a transmission-type anisotropic Bragg grating formed in a holographic poly-mer-dispersed liquid crystal film. Temperature dependences of electrical switching characteristics are also described.

CC-12-WED
Intracavity adaptive optics optimization of an end-pumped Nd:YVO 4 laser
P. Welp, H.M. Heuck, U. Wittrock, Münster University of Applied Sciences, Steinfurt, Germany
A closed-loop adaptive-optics resonator is demonstrated, achieving a beam quality enhancement from M2 = 5 to M2 = 1.7 when compared to the same resonator without adaptive optics. Output power stays nearly constant at 5.3 W.

CC-13-WED
Spatial evolution of coupled-optical vortices
J. Hamazaki, Y. Mineta, R. Morita, Hokkaido University, Sapporo, Japan
The spatial evolution of phase-singularity points in complexes of two optical vortices with a topological charge +1, was investigated. Transverse motions like collision and scattering processes due to a vortex-vortex interaction were observed.

CC-14-WED
Optical read out of nanoparticle fluorescence using supercontinuum generation for optical data storage
B.J. Chick, J.W.M. Chan, M. Gu, Swinburne University of Technology, Hawthorn, Australia; R. Evans, Swinburne University of Technology, Hawthorn and CSIRO Molecular and Health Technologies, Clayton, Australia
We report on the use of Supercontinuum generation for the multicolor read out of nanoparticle fluorescence. Such read out is particular useful for spectrally encoded optical data storage.

CC-15-WED
Photorefractive and photochromic properties of Ru-doped lithium niobate crystal
C.H. Chiang, J.C. Chen, National Central University, Jhongli, Taiwan; H. Hu, Industrial Technology Research Institute, Lujia Shiang, Taiwan
We investigate a novel single doping photorefractive material, Ru doped lithium niobate, which offers photochromism for nonvolatile holographic storage.

CC-16-WED
A new reconstruction algorithm for in-line digital holography
G. Sitz, J.T. Sheridan, Univ. College, Dublin, Ireland
An algorithm based on algebraic manipulation of the recorded holograms in the Fou-rier frequency domain is reported for the reconstruction of in-line digital holography. Numerical simulation is carried out to demonstrate this concept.

CC-17-WED
Unitary matrices for phase-coded holographic memories
W. Horn, G. Berger, M. Dietz, C. Denz, Westfälische Wilhelms-Universität, Münster, Germany; X. Zhang, TEDA Applied Physics School, Nankai, China
The crosstalk noise in phase coded holographic memories employing a novel type of unitary matrices is investigated. The unitary matrices ensure an optimal utilization of the SLM to obtain the maximum possible storage capacity.

CC-18-WED
Dye-doped polymer films for dynamic echo-holography applications
K. Khosanov, O. Fedotova, Belarus National Academy of Sciences, Minsk, Belarus; A. Leontiev, V. Lobkov, G. Safullin, V. Samartsev, K. Salikhov, Technical Institute KSC RAS, Kazan, Russia
We analyse the non-collinear scheme of echo-hologram recording in thin dye-doped polyvinylbutyral films in large temperature interval from liquid helium to room one. Temporal structure and spectrum of the two-pulse photon echo signals are discussed.

CC-19-WED
Application of a phase-SLM and low-pass Fourier filtering to generate spatial patterns simultaneously modulated in phase and amplitude
Holographic data storage techniques often require simultaneous spatial phase and amplitude modulation of the input light beams. We present results of modeling and experimen-tal verification of a novel method exhibiting excellent modulation characteristics and simplicity.

CC-20-WED
Characterization of volume gratings formed in ZrO 2 nanoparticle-dispersed photopolymers
S. Suzuki, Y. Tomita, University of ElectroCommunications, Chofu, Japan; K. Ohmori, M. Hi-daka, K. Chikama, Nissan Chemical Industries, Funabashi, Japan
We investigate the holographic grating formation in ZrO 2 nanoparticle-dispersed photopolymers by means of optical and physical analyses. The effect of surface treatment condition of ZrO 2 nanoparticles on the grating formation dynamics is also discussed.

CC-21-WED
Investigation of light induced material transport in azobenzene photo-polymer films with x-ray diffraction and laser light spectroscopy
O. Henneberg, C. Spitz, A. Betke, University of Potsdam, Germany
Laser light interference induces a material transport in the solid phase of azobenzene polymers. X-ray and laser light diffraction monitor the dynamics of surface relief grating formation.

CC-1-WED
Second-harmonic pulse shaping with engineered quasi-phase-matching gratings in the strongly deple-ted pump regime
U. Sapaev, G. Assanto, University Roma Tre, Rome, Italy
We develop a simulated-annealing algorithm for the design of arbitrary quasi-phase-matched nonlinear crystals capable of producing second-harmonic pulses of any chosen amplitude and phase profile under significant pump depletion.

CD-2-WED
Spectro-temporal dynamics of a nanosecond-pulsed, injection-seeded optical parametric oscillator
R.T. White, Energy Efficiency and Conservation Authority, Wellington, New Zealand; K.G.H. Baldwin, M. Kono, Australian National University, Canberra, Australia; Y. He, B.J. Orr, Macqua-rie University, Sydney, Australia
We simulate spectro-temporal processes in a nanosecond injection-seeded optical para-metric oscillator. Our simulations accurately predict the experimental behavior for the fre-quency chirp, optical bandwidth, and spectral purity, including effects that are not readily observed directly.

CD-3-WED
Near-stoichiometric LiTaO 3 for deep UV electro-optical applications
F. Javolta, M. Jazbinsek, P. Gunter, ETH Zurich, Switzerland; G. Montemezzani, LMOPS, Metz, France; K. Kitamura, National Institute for Mat-erial Science, Tsukuba, Japan
Electro-optic coefficients were measured in congruent and near-stoichiometric LiTaO 3 in the UV (β 33 >52pm/V at 275nm). We demonstrate dynamic deep-UV induced waveguides by electro-optic effect and interband electric field screening beneath the surface of the crystals.

CD-4-WED
Light stopping and time reversal in dynamic nano-photonic structures via bloch oscillations
S. Longhi, Politecnico di Milano, Milano, Italy
The possibility of stopping or time-reverse optical pulses in dynamically-tuned photonic structures is theoretically demonstrated. Pulse stopping and time-reversal exploits an optical analog of the periodic Bloch motion induced by an index gradient.

CD-5-WED
1.3 micron photonic crystal fiber Raman laser
S.K. Varshney, K. Sasaki, K. Sailooh, N.J. Floraus, M. Koshiba, Hokkaido University, Sapporo, Japan
An efficient, continuous wave Raman laser with a 20 m length of photonic crystal fiber, a low-threshold of 1.96 W, 47% of conversion efficiency, and 62% of slope efficiency is achieved at 1.3 micron.
Polariton laser generated by resonant excitation presents a bistability for a modulated excitation beam. We observed one or two crossing on the bistability curve due to the thermal and Kerr competition in the microcavity.

Wide-band wavelength conversion and Raman amplifier using a nonlinear microstructure fiber

A wavelength converter and a Raman amplifier with widely tunable operation wavelength range have been obtained in a 100m dispersion flattened nonlinear microstructure fiber pumped by CW lasers at 1521 nm and 1480 nm, respectively.

Ultra-wide bandwidth X-converter with regeneration properties

D.M. Farin, ISCOM - Tor Vergata and Universita di Roma, Rome, Italy; G.M. Tosi Beleffi, F. Curti, M. Mugnilemuci, ISCOM - Tor Vergata, Rome, Italy; S. Taccheo, Politecnico di Milano, Italy; K. Ennser, Swansea University, United Kingdom; M. Karasik, Academy of Science, Prague, Czech Republic; A.L.J. Teixeira, Instituto de Telecomunicacoes, Aveiro, Portugal

We present an unlimited bandwidth lambda-converter based on Supercontinuum generation with 2R capabilities in an high non linear fibre. Effect is based on cross-phase modulation between Supercontinuum and an out-of-band auxiliary carrier.

Enhanced light self-action in mesoporous silicon

L. Golovan, S.V. Zabotin, N.A. Piskunov, P.K. Kashkarov, V.Y. Timoshenko, A.M. Zhetikov, Moscow State University, Moscow, Russia; S. Yakunin, Y. Gromov, M. Kopylovsky, V.Y. Gayvorsky, National Academy of Science of Kiev, Ukraine; G.Y. Fang, C.F. Li, Harbin Institute of Technology, Harbin, China

Experiments on two-photon absorption and self-focusing in birefringent mesoporous silicon reveal three-orders-of-magnitude increase of the effective cubic susceptibility as well as modification of its polarization properties in comparison with crystalline silicon.

Elastic collisions and scattering of optical beams with three-wave parametric interactions

A.P. Sukhorukov, V.E. Lobanov, Lomonosov Moscow State University, Moscow, Russia

Elastic reflection of signal wave from power pump beam with three-wave mismatched interaction is first considered. Conditions of complete reflection and signal trajectories are found. In three-dimensional geometry reflection changes into scattering on parametric inhomogeneity.

Characterization of multilayer self-organized InAs quantum dot embedded waveguides at 1.3 and 1.5 μm

B.J. Akca, A. Dana, A. Aydiner, Bilkent University, Ankara, Turkey; N. Dagli, University of California at Santa Barbara, USA; A. Fiore, L. Li, M. Rossetti, Ecole Polytechnique Federale de Lausanne, Switzerland

The characterization of InAs quantum dot embedded waveguides have been performed at 1.3 and 1.5 μm. Enhanced electro-optic coefficients compared to bulk GaAs were observed at 1.5 μm and voltage dependent loss at 1.3 μm was measured.

Snell’s law for Kerr bright and dark solitons

J. Sanchez-Curto, P. Chamorro-Posada, Univ. of Valladolid, Spain; G.S. McDonald, Univ. of Salford, UK

The universal problem of Kerr soliton refraction at planar interfaces between different nonlinear materials is quantified in terms of a Snell’s law generalisation, shown valid for different soliton types (bright and dark) and arbitrary angles.

Whispering gallery mode for second-harmonic generation in microresonators

G. Roznyatov, ICFO Institut de Ciencies Fotòniques, Barcelona, Spain and DUT Université Libre de Bruxelles, Brussels, Belgium; LL Dominguez Juarez, ICFO Institut de Ciencies Fotòniques, Barcelona, Spain; S. Martorell, ICFO Institut de Ciencies Fotòniques, Barcelona, and Universitat de Catalunya, Terrassa, Spain

Whispering gallery modes are considered to enhance the quadratic nonlinear interaction at the surface of a micro-spherical resonators. The conditions to simultaneously satisfy resonance at all interacting frequencies and phase matching are found.

Generating highly-chirped frequency combs in microstructured fibers in a low-dispersion regime

A. Plotski, A.A. Sysoliatin, Fiber Optics Research Center, Moscow, Russia; A.I. Latkin, Institute of Automation and Electrometry, Novosibirsk, Russia; P. Harper, J. Harrison, S.K. Turunen, Aston University, Birmingham, United Kingdom

High powered chirped pulse propagation in tapered decreasing nanosecond dispersion fibre is studied experimentally. Wave breaking suppression is achieved by tailoring both fibre characteristics and launch conditions.
CD-25-WED
Modeling of spectral broadening in second-harmonic generation
R. Holzlöhner, L. Taylor, Y. Feng, D. Bonaccini Callia, W. Hackenberg, European Southern Observatory, Garching, Germany
We numerically model high-power cw second-harmonic generation in periodically-poled crystals using an optic-thermal iteration method. The conversion efficiency is limited by the bandwidth and spectral coherence of the pump laser.

CD-26-WED
All optical limiter based on self phase modulation and dispersive chirping
M. Holtmannspötter, B. Schmauss, Friedrich Alexander University, Erlangen, Germany
An all optical limiter is presented which exhibits a transfer function with low threshold for the optical system and B-integral parameter. The system is based on Ti:Sa pumping: damage threshold of amplifying material, beam transport (relay-image or homogenization) and coherence properties of pump lasers.

CG-1-WED
High power, 1-THz source based on a femtosecond laser-pumped DC to AC radiation converter scheme
N. Ohata, K. Li, H. Kawanaga, K. Yagiishi, T. Higashiguchi, N. Yugami, Utsunomiya University, Japan
We demonstrated a high power THz source using a 100-fs pumped DC to AC radiation converter (DARC) scheme. We observed a center frequency of 1.2 THz by use of an electro-optic sampling diagnostic.

CG-2-WED
Pump beams homogenization for Terawatt / Petawatt class Ti:Sapphire amplifiers
F. Canova, J.P. Chambaret, LOA - Ecole Polytechnique, Palaiseau, France; F. Reveret; S. Tisserand; Silaos Technologies, Peynier, France; F. Pétel, M. Pitton, ULM, Orsay, France.
Our goal is to design robust configurations for Terawatt/Petawatt-class power amplifiers. We investigate the processes involved in Ti:Sa pumping: damage threshold of amplifying material, beam transport (relay-image or homogenization) and coherence properties of pump lasers.

CG-3-WED
Wavefront correction and aberrations pre-compensation in the middle of Petawatt-class CPA laser chains
We describe preliminary experiences to validate correction of wavefront aberrations in middle of laser chain. This technique allows correction of aberrations from first part, and the pre-compensation of aberrations built in second part of laser.

CG-4-WED
Investigation of X-ray lasers on the SOKOL-P facility at RFNC-VNIITF
The paper gives results of experiments on generation of the laser X-radiation with non-stationary collisional pumping. The saturated lasing regime was obtained with the pumping by the traveling wave on 3p-3s transitions of Ne-like titanium (wavelength 326 A) and 4d-4p transitions of Ni-like molybdenum (wavelength 189 A).

CG-5-WED
Paradox in the measurement of the FM-to-AM conversion in high power lasers
FM-to-AM conversion can induce amplitude modulations at very high frequencies that cannot be measured. The spectral bandwidth of the measurement creates a paradox we will present and explain.

CG-6-WED
10 fs, high temporal contrast front-end for PW class laser system
A laser front-end delivering 10-fs pulses and exhibiting a temporal contrast higher than 10^11 will be presented. The system is based on CPA in TiSa and on cross-polarized-wave generation for contrast improvement and pulse shortening.

CG-7-WED
Soft X-ray Fresnel-like diffraction from thin films edges by an ultrafast laser plasma source
S. Stagira, D. De Silvestro, F. Calegari, J. Cabanillas-Gonzalez, G. Valentini, C. Vozi, M. Nisoli, S. Gasilov, Politecnico di Milano, Italy; A. Faenov, T. Pikuze, Russian Academy of Science, Moscow, Russia; R. Cerbino, Fribourg University, Fribourg, Switzerland; L. Polletta, P. Villarejo, CNR-INFN, Padua University, Italy.
Soft X-ray Fresnel-like diffraction experiments from thin films edges is performed using an ultrafast laser plasma source. Results show that coherence properties of the source can be manipulated by spectral filtering.

CG-8-WED
Optical guiding in gas-filled capillary discharge plasma waveguide for electron acceleration application
K. Li, T. Oshima, M. Hikita, T. Higashiguchi, N. Yugami, Utsunomiya University, Japan.
Optical guiding of intense, 130-fs laser pulse by gas-filled capillary slow-discharged plasma waveguide was demonstrated. Electron emission of 1.6 MeV was observed from the 1-cm plasma waveguide.

CG-9-WED
Influence of the chirp and repetition rate of ultrashort laser pulses on the Kα yield from laser-produced plasmas
M. Silles, H. Witte, T. Haarlambert, S. Linden, H. Zacharias, University of Münster, Germany.
The process of hard x-ray generation with ultrashort laser pulses is investigated concerning the influence of the chirp of the irradiating laser pulses and the influence of the repetition rate of the laser system.

CG-10-WED
Synchronization of three master oscillators for multi-petawatt OPCPA laser system
We present the design of a dual-beam petawatt-class chirped pulse amplification Ti:sapphire laser system. Relative radial delays of the optical system and B-integral parameter have been investigated.

CG-11-WED
Understanding laser stabilization using spectral hole burning
We introduce an analytical theory for frequency stabilization of lasers to spectral-hole-burning materials. The parameter settings of a stabilization feedback loop can thus be optimized for large signal-to-noise ratio and low frequency drift.

CG-12-WED
Two-photon resonance absorption of relativistic-intensity laser pulses in steep overcritical plasmas
J.M. Mikhailov, M.V. Lomonosov Moscow State University, and M. Prokhorov General Physics Institute, Moscow, Russia; V.I. Platonenko, M.V. Lomonosov Moscow State University, Moscow, Russia.
Resonant excitation of electron plasma waves at a double-laser frequency is shown to contribute strongly to plasma heating in the case, when the relativistic-intensity linearly-polarized laser pulse is normally incident on steep overdense plasma.

CG-13-WED
Optical design of astra gemini Petawatt amplification system
We present the design of a dual-beam petawatt-class chirped pulse amplification Ti:sapphire laser system. Relative radial delays of the optical system and B-integral parameter have been investigated.

CG-14-WED
Focusing of high power ultrafast Gaussian pulses to thin targets
K. Ozsvay, University of Szeged, Hungary and Max Born Institute, Berlin, Germany; Z.L. Horvath, University of Szeged, Hungary; M.P. Kaslaskhnikov, Max Born Institute, Berlin, Germany.
The intensity of a broadband laser pulse focused through a circular aperture changes periodically along the optical axis in the vicinity of the focal point, resulting in always minimum in the geometrical focus.

**CL-1-WED**
Enhancing Raman analysis in optical tweezers by phase-sensitive detection
G. Rusciano, A.C. De Luca, G. Pasce, A. Sasso, Universita’ di Napoli ‘Federico II’, Napoli, Italy
In this paper we report on a novel method for the acquisition of Raman spectra of an optically trapped particle. The obtained signal is free from any background contribution due to the environment.

**CL-2-WED**
Monitoring of xylem sap flow in trees by a non-intrusive, laser-based heat tracing technique and comparison with MRI flow imaging
C. Helfter, P.D. Hand, D. Shepherd, Heriot-Watt Univ., Edinburgh, UK; M. Mencuccini, The Univ. of Edinburgh, UK; C.W. Windt, H. Van As, Wageningen Univ., Netherlands
A novel, non-invasive laser-based heat pulse technique for the estimation of water flow rates in trees without damaging the plant has been developed. Xylem flow velocities are compared to MRI flow imaging data.

**CL-3-WED**
Holographic optical manipulation of hyphal growth in filamentous fungi
D. McGlone, D. Burnham, Univ. of St. Andrews, UK; G. Wright, N. Read, Univ. of Edinburgh, UK
We make use of holographic fields to perturb the growth of filamentous fungi. We observe branching, redirection and constriction of hyphal growth. We all measure the response of the fungi at different wavelengths.

**CL-4-WED**
Design and application of shaper-assisted collinear (SAC-) SPIDER for pulse compression in high-contrast multiphoton microscopy
B. von Vacano, T. Buckupp, M. Motzkuus, Philipps-University, Marburg, Germany
In a simplified approach, a shaper-assisted collinear (SAC-) SPIDER allows in situ pulse measurement and phase compensation in nonlinear microscopy. Here, design considerations and application examples are presented to show how SAC-SPIDER improves multiphoton imaging.

**CL-5-WED**
Micro-patterned microscope slides for position referencing in optical microscopy
P. Sandoz, R. Zeggen, L. Froehly, M.P. Bernal, Femto-ST/LOPMD CMN S 6174 / UFC, Besançon, France; J.L. Preter, C. Mougin, IFR 133 - EA3181 - UFC - CHU J. Minjaz, Besançon, France
We developed small microscope slides including a micro-patterned grid. Lateral position coordinates are retrieved from the grid image and used for the tissue selection images. The later are then superimposed numerically with sub-pixel accuracy.

**CL-6-WED**
Force microscopy using backscattered light
G. Volpe, IKFO, Castelldefels, Spain; K. Kozureff, IKFO, Castelldefels, Spain and Université Libre de Bruxelles, Brussels, Belgium; P. Petrov, IKFO, Castelldefels and ICREA, Barcelona, Spain
The Photonic Force Microscope performs in the forward-scattering and backward-scattering geometries are compared, calculating the total-scattered electromagnetic field from a dielectric bead in an optical trap using a Mie-Debye approach.

**CL-7-WED**
New method of laser beam energy distribution evaluation in biological tissue based on wavelet analysis
A.S. Zajac, L. Urbanski, D. Podniesinski, J. Sviderski, Military University of Technology, Warsaw, Poland
The problem of laser beam energy distribution in biological media is crucial within the laser tissue welding process. Unlike the classical deterministic calculus, the wavelet analysis based approach provides eligible results.

**CL-8-WED**
Integration of femtosecond laser fabricated optical waveguides and microfluidic channels for lab-on-chip devices
R. Martinez Vazquez, R. Osellame, INF – CNR, Milano, Italy; V. Masielli, R. Ramponi, G. Cerullo, Politecnico di Milano, Italy
A femtosecond laser is used to fabricate on a glass substrate both microfluidic channels and high quality optical waveguides, intersecting each other. Waveguide-channel integration opens new prospects for in-situ sensing in lab-on-chip devices.

**CL-9-WED**
Widening of high resolution area of fundus images
V. Dubinin, V. Kudryashov, Yu. Cherezova, Moscow State University, Moscow, Russia
We suggest different methods to enlarge the fundus-camera high-resolution area by applying isoplanatic patch size widening techniques.

**CL-10-WED**
Estimation of the polarization rotation in biological tissues using a Mueller OCT system
D. Pereda-Cubian, M. Todorovic, Texas A&M University, College Station, Texas, USA; F. Fan-Jul-Velez, J.L Arce-Diego, University of Cantabria, Santander, Spain
The polarization rotation of the light propagating through an Intralipid solution subjected to an external magnetic field has been estimated using the Jones and Mueller matrices obtained by a Mueller OCT system.

**CL-11-WED**
Highly emissive CdTe nanowires grown in a phosphate buffer solution
Y. Volkov, Molecular Medicine Centre and Department of Clinical Medicine, Dublin, Ireland
We present details on the CdTe nanowires formation and properties, which were found to grow in a standard phosphate-buffered solution, including micro-photoluminescence, fluorescence lifetime imaging, in-situ observation of growth with a confocal microscope and TEM.

**CL-13-WED**
Silicon micro- and nanostructures formed by femtosecond laser pulses
L. Golovan, S.V. Zobotnov, I.A. Ostapenko, A.A. Ezhov, M.A. Lastovkina, A.V. Cheryakov, Y.V. Ti-moshenko, V.I. Panov, P.K. Kashkarov, Moscow State University, Moscow, Russia; G.D. Shandy-bina, University of Information Technologies, St Petersburg, Russia
Femtosecond laser irradiation of crystalline silicon results in occurrence of both micron-size ripples and nanostructures (2-30 nm) at the treated surface. The formed nano- and microstructures demonstrate visible photoluminescence, Raman scattering enhancement, and modified third-harmonic signal.

**CL-14-WED**
DUV attenuating structures in fused silica induced by ultrashort laser radiation
S. Oshmukov, V. Dmitriev, E. Zait, G. Ben-Zvi, Pixel Technology, Karmiel, Israel
The possibility of producing DUV attenuating structures in the bulk of fused silica induced by pico- and femtosecond laser pulses is studied. Applicability of created structures for photomasks repair and modification is discussed.

CL-3-WED
Scaling of femtosecond laser induced breakdown threshold in TiSi1-xOx composite films
I.V. Cravetchi, D. Nguyen, W. Rudolph, University of New Mexico, Albuquerque, USA; M. Jupe, M. Lappschies, K. Starke, D. Ristau, Laser Zentrum Hannover e.V., Hannover, Germany
A linear scaling of the subpicosecond laser-induced breakdown threshold with respect to the material band gap energy and a power law with respect to pulse duration were observed for TiSi1-xOx films and explained theoretically.
CM-6-WED
Model based plasma monitoring methods for the predictive assessment of LSP applications
J.L. Ocaña, M. Morales, C. Molpeceres, R. Pecharramón, J.A. Parra, Universidad Politecnica de Madrid, Spain
Results obtained by the authors in model based monitoring methods for the experimental characterization of LSP applications are reported together with a critical evaluation of their capability for the validation of predictive assessment codes.

CM-7-WED
Deep hole drilling in metals by femtosecond laser pulses
D. Antonov, E. Weynant, Phasoptix inc, Sainte-Foy, Quebec, Canada; G. Petite, S. Guizard, Ecole Polytechnique – CEA, Palaiseau, France
We studied the high fluence deep-drilling efficiency of ultrashort laser pulses in different metals. The drilling velocity shows a saturation which depends on the metal nature, incident fluence and the hole depth.

CM-8-WED
Laser heating of metals: the question of reflectivity
B. Christensen, P. Balling, J. Byskov-Nielsen, University of Aarhus, Denmark
Coupling of energy to metallic samples relies on their finite relectivity. The absorption efficiency is thus critically dependent on the physical and chemical properties of the surface. We report experimental investigations that elucidate both effects.

CM-9-WED
The pulsed CO₂ laser induced ablation of quartz, fused silica and natural silicates
A.F. Mukhamedgalieva, Moscow State Mining University, Moscow, Russia; A.M. Bondar, A.A. Ionin, Y.M. Klimachev, D.V. Sinitzin V.D. Zverykin, Russian Academy of Sciences, Moscow, Russia
The laser ablation of quartz and natural silicates induced by pulsed CO₂ laser irradiation (total pulse time of 35 microseconds, pulse energy of 10 J) by use of high speed photography method has been studied.

CM-10-WED
Laser ablation threshold of cultural heritage metals
A. Lorusso, V. Nassisi, F. Belloni, A. Buccolieri, G. Buccolieri, A. Castellano, L.S. Lea, M. Di Giulio, University of Lecce, Italy; L. Torrisi, F. Caridi, A. Bonielli, University of Messina, Italy
In this work we studied the ablation process of copper, silver and their alloys in terms of laser fluence and crater depth. For every sample, we determined experimentally the ablation threshold at two different wavelengths.

CM-11-WED
Crystalline structure and surface morphologoy of CdTe thin films
K. Savchuk, I. Lesyuk, K. Kotlyarchuk, Institute for Applied Problems of Mechanics and Mathematics, Lviv, Ukraine; Y. Musiy, Institute of Physical Organic Chemistry and Coal Chemistry, Lviv, Ukraine; M. Oszalowski, Poznan University of Technology, Poznan, Poland
Problems related to growth of CdTe thin films by Pulsed Laser Deposition are described. The structural and morphological properties of grown films are examined and discussed for applications as a material for designing optoelectronic devices.
Dark-atomic resonances in
micrometric Rb-vapor layer
Y. Malakany, D. Sarkisyan, A. Sarkisyan, National Academy of Sciences, Ashtarak, Armenia; C. Leroy, Université de Bourgogne, CNRS, Dijon, France; Y. Pashayan-Leroy, National Academy of Sciences, Ashtarak, Armenia and Université de Bourgogne, CNRS, Dijon, France.

We present an accurate measurement of the Newtonian constant of gravity using optical atom interferometry and velocity-selective optical pumping (VSOP) resonances were measured for micrometric cells (MC). A theoretical model describing the behavior of EIT and VSOP in MC is developed.

Accurate measurement of the Newtonian constant of gravity using atom interferometry
A. Bertoldi, G. Lamporesi, INFN and University of Firenze, Sesto Fiorentino, Italy; L. Cacciapuoti, European Space Agency, ESTEC, Netherlands; M. Prevedelli, University of Torino, Italy; G. M. Tino, INFN and University of Firenze, Italy.

We present an accurate measurement of the Newtonian constant G using an atom interferometry based gravity-gradiometer.

Sensitive optical magnetometry based on nonlinear magneto-optical rotation with amplitude-modulated light
W. Gawlik, M. Gring, M. Kotyrba, S. Pustelnik, A. Wojciechowski, J. Zachorowski, Jagiellonian University, Krakow, Poland; D. Budker, A. Cingáž, N. Lefer, University of California at Berkeley, USA.

We report on new magnetometric technique based on nonlinear magneto-optical rotation with amplitude-modulated light. The method enables measurements of magnetic fields in a range including geomagnetic fields with a sensitivity exceeding $10^{-11}$ T Hz$^{-1}$.

Direct high precision measurement of optical Goos-Hänchen shift
H. G. J. Schwefel, Z. H. Lu, W. Köhler, L. J. Wang, University of Erlangen, Germany; J. Fan, National Institute of Standards and Technology, Gaithersburg, MA, USA.

We report a direct, high precision measurement of the optical Goos-Hänchen shift for all incident angles. The shift is measured for TE and TM polarization, after only one reflection.

Electronic spin lifetimes in alkali samples on the surface of helium nanodroplets
W. Ernst, G. Auböck, J. Nogli, C. Callegari, Graz University of Technology, Graz, Austria.

In a 2.9 kg magnetic field, the population ratio of Zeeman sublevels of potassium atoms and molecules on superfluid helium droplets at 0.4 K temperature was measured, indicating different spin relaxation for atoms and molecules.

A laser optically-pumped Rubidium vapour-cell frequency standard using a DFB laser diode
C. Affolderbach, G. Milet, Neuchatel University, Switzerland; F. Droz, Temex Neuchatel, Time, Neuchatel, Switzerland.

We present the realisation of a compact atomic frequency standard based on a Rubidium vapour-cell optically pumped by an intrinsically single-mode DFB laser diode. A frequency stability of $1.5 \times 10^{-12}$ at one second is reached.

Coherent effects in Cs (nD) states in the presence of an external electric field
A. Jarmola, F. Gahbauer, M. Tamanis, K. Bluss, M. Auzins, R. Ferber, University of Latvia, Riga, Latvia; M. Safronova, University of Delaware, Newark, Delaware, USA; U. Safronova, University of Nevada, Reno, Nevada, USA.

We present experimental and theoretical studies of coherent excitation of magnetic sublevels in nD states of cesium that cross in an external electric field. The $7,9D_{12}$ tensor polarizabilities and $7,9,10D_{5/2}$ hyperfine constants are obtained.

Direct high precision measurement of the optical Goos-Hänchen shift
H. G. J. Schwefel, Z. H. Lu, W. Köhler, L. J. Wang, University of Erlangen, Germany; J. Fan, National Institute of Standards and Technology, Gaithersburg, MA, USA.

We report a direct, high precision measurement of the optical Goos-Hänchen shift for all incident angles. The shift is measured for TE and TM polarization, after only one reflection.

Coherent Population Trapping (CPT) is a promising approach for developing compact frequency standards. We investigated experimentally and theoretically the CPT effect in a new light-atoms interaction scheme for application in vapour-cell-atomic-clocks.

Origin of the reaction of probe spectra on the coupling pump laser absorption
H. Friedmann, T. Zigdon, A.D. Wilson-Gordon, Bar-Ilan University, Ramat Gan, Israel.

An explanation is proposed for the similarities or differences between the probe and pump absorption spectra in V, Lambda and N systems, when both spectra are considered as a function of the probe detuning from resonance.

Statistical complexity analysis of the chaotic response of a semi-
subject to delayed optical feedback.

cation of deterministic chaotic behaviors. This allows for the detection and quantification of deterministic chaotic behaviors. Using this mathematical tool, we study the chaotic emission of a semiconductor laser subject to delayed optical feedback.

Using this mathematical tool, we study the synchronization of mutually coupled VCSELs. We investigate numerically chaos synchronization of mutually coupled VCSELs and relate the exchange of leader-laggard role to injection locking mechanism. High level of correlation (anticorrelation) between the modes with the same (orthogonal) polarization is demonstrated.

We investigate numerically chaotic synchronization of mutually coupled VCSELs and relate the exchange of leader-laggard role to injection locking mechanism. High level of correlation (anticorrelation) between the modes with the same (orthogonal) polarization is demonstrated.

We introduce and study metamaterial superlattices in the form of binary structures of wires and split-ring resonators. We study experimentally scattering of microwaves and demonstrate resonance-band broadening and splitting in sandwich-type composites.

We introduce and study metamaterial superlattices in the form of binary structures of wires and split-ring resonators. We study experimentally scattering of microwaves and demonstrate resonance-band broadening and splitting in sandwich-type composites.

We study the angular acceptance of surface plasmon Bragg mirrors. M. U. Gonzalez, IFCO – Institut de Ciencies Fotoniques, Castelldefels, Barcelona, Spain and Laboratoire de Physique de l’Université de Bourgogne, Dijon, France; R. Quidant, IFCO – Institut de Ciencies Fotoniques, Castelldefels, Barcelona, Spain; A. Dereux, Laboratoire de Physique de l’Université de Bourgogne, Dijon, France; A. Hoibou, J.R. Keen, A.L. Stepanyan, Karl-Franzens-Universität Graz, Austria

Using leakage radiation microscopy, we have analyzed the angular acceptance behaviour of surface plasmon Bragg mirrors. The results can be understood from the dispersion relation of the surface plasmon propagating on a corrugated film.

Full processing of colloidal photonic crystals by spin-coating H. Miguez, G. Lozano, M. Ocaña, A. Mihí, R. Pozas, Institute of Materials Science of Seville, Spain

Herein we will show how to use spin coating, a technique widespread employed in current optoelectronics technology, to fully process colloidal photonic crystals.

We propose KTIOPO4 nanometric-sized crystals as a perfectly photostable nonlinear probe of the electromagnetic field at nanometer scale. Crystals of 50 nm size are characterized using second-harmonic generation microscopy and a defocused imaging technique.

Theory of spectroscopy and microscopy with resonant radiation force T. Iida, H. Ishihara, Osaka Prefecture University, Sakai, Osaka, Japan

We theoretically study a novel microscopy using resonant interparticle radiation force (IRF) between a probe and a nanoscope sample. Results indicate the potential of IRF to analyze quantum properties of the sample from various directions.

Theory of spatial structure of nonlinear lasing modes N.E. Türeci, ETH Zurich, Switzerland; A.D. Stone, Yale University, New Haven, USA

A self-consistent semiclassical laser theory is formulated and solved iteratively which determines the steady-state lasing modes of open multi-mode lasers. We illustrate some surprising results which might be relevant to lasing in complex media.

Intraband InAs/InAlGaAs/InP quantum dot detectors for the MIR T. Gebhard, K. Unterrainer, W. Paz, Technical University, Vienna, Austria; M.P. Pomplona Pirez, UFRJ, Instituto de Física, Rio de Janeiro, Brazil; N. Studart, UFS, University of Essex, UK; Artur Jorge, P.L. Lustosa, CETUC, PUC, Rio de Janeiro, Brazil

A novel quantum dot structure for infrared photodetectors is proposed. Several peaks can be identified in the photocurrent for normal incidence and for temperatures above liquid nitrogen.
Giant optical non-linearity induced by a single quantum dot in a semi-conducting microcavity A. Mosset, A. Auffeves-Garnier, M. Munsch, J.P Pozait, J.M Gérard, CNRS-Institut Néel, Grenoble, France; C. Simon, GAP, Genève, Switzerland

A single quantum dot in a micropillar in Purcell regime provides a giant optical non-linearity. We will show that this effect should be observable using state-of-the-art devices, and present the ongoing experiments.

Optical transitions in a quantum dot pair with stark-field induced coupling S. Fält, A. Imamoglu, M. Atature, H. Tucek, A. Badolato, ETH Zurich, Switzerland

Tunnel and dipolar coupling of two vertically stacked quantum dots are studied with photoluminescence and differential transmission measurements. Single charge sensing and counter-intuitive interactions such as mixing of bright and dark excitons are demonstrated.


We demonstrate wavelength selectivity of a specially designed Two-Photon-Aborption microscopy structure, and investigate how it can be used for monitoring an optical pulses source at one wavelength channel when a second wavelength channel is present.
Room 14b
08:30 – 10:00
CF6 Session: New pulse compression techniques and fibre lasers
Chair: Luc Bergé, Commissariat Energie Atomique, Bruyères-le-Châtel, France

CF6-1-TH U 08:30
Generation of supercontinua with parabolic pulses
O. Prochnow, D. Wandt, A. Ruehl, M. Schultz, D. Kracht, Laser Zentrum Hannover e.V., Hannover, Germany
We report on the supercontinuum generation with parabolic pulses directly out of an ultrafast ytterbium fiber oscillator based on the soliton fission process.

Room 21
08:30 – 10:00
CK10 Session: Disorder in photonic nanostructures
Chair: Remi Carminati, Ecole Centrale, Paris, France

CK10-1-TH U 08:30
Structural disorder induced polarization and mode scrambling
S. Combris, A. De Rossi, N.V.Q Tran S. Cassette Thales Res. & Technology, Palaiseau, France; A. Talneau, CNRS, Lab. de Photonique et de nanosciences, Marcoussis, France; P. Hamel, Y. Jaouen, R. Gabet, GET Télécom Paris, France
Optical low-coherence reflectometry is applied to measure the group velocity in a line-defect slab photonic crystal waveguide. Evidence of the impact of structural disorder on the propagation is reported. The role of slow-light is discussed.

Room 22
08:30 – 10:00
CJ3 Session: Properties and dynamics of active fibres
Chair: Stefano Taccheo, Politecnico di Milano, Italy

CJ3-1-TH U 08:30
Photodarkening of an Ytterbium-doped silica double-clad LMA fiber
I. Marék-Hönninger, J. Boulet, CELIA-PAL, Talence, France; S. Érmenne, Alphalas, Talence, France; R. Bello Dova, M. Podgorski, F. Salin, Edite, Pessac, France; T. Cardinal, A. Guillet, ICMPB-CNRS, Pessac, France
We study the temporal behaviour of photodarkening in an Yb-doped LMA fiber and show photobleaching of the same fiber. The absorption spectra and the influence on the lasing properties are shown.

Room BOR1
08:30 – 10:00
CI4 Session: All optical signal processing
Chair: Liam Barry, Dublin City University, Ireland

CI4-1-TH U 08:30
All optical phase multiplexing from DPSK WDM signals to DQPSK using four-wave mixing in highly-nonlinear fiber
G.W Lu, K.S Abedin, T. Miyazaki, National Institute of Information and Communications Technology, Tokyo, Japan
We experimentally demonstrate all-optical phase multiplexing from two 10-Gb/s DPSK WDM channels to one spectrum-efficient 20-Gb/s DQPSK using FWM in a highly-nonlinear fiber with a 1-dB negative power penalty, enabling the cross-connection of different networks.

Room BOR2
08:30 – 10:00
JSII1 Session: Tailoring light-matter interactions
Chair: Cefk Lopez, Instituto de Ciencias de Materiales, Madrid, Spain
We demonstrate straightforward and scalable routes to cast novel nano-photonic materials with 10-100 nm periodicity in 2D and 3D. Applications include nanostructured materials for photonic-enhanced Raman sensing, enhanced elastic properties for structural colour which changes on deformation.

Room B11
08:30 – 10:00
CL1 Session: Enhanced bio-sensing
Chair: Benoit Forget, Université Pierre et Marie Curie, Paris VI, France
The polarisation dependence of infra-red surface plasmon resonances generated by tilted fibre Bragg gratings
D.P Allio, J. Webb, I. Bennion, Aston University, Aston, United Kingdom; D. Mapps, R. Neal, University of Plymouth, United Kingdom; S. Rehman, FiberLogix Ltd, Watford, United Kingdom
We demonstrate the generation and large polarisation-controlled spectral tunability (~100nm) of infra-red surface plasmon resonances produced by a lapped tilted fibre Bragg grating device operating in the aqueous index regime.

Room 14b
08:45
CF6-2-TH U 08:45
All-fibered high-quality low-duty cycle 20-GHz picosecond pulse source
C. Finot, J. Fatome, S. Pitois, G. Millot, Institut Carnot de Bourgogne, Dijon, France
We demonstrate an all-fibered 20-GHz picosecond pulse source with a duty cycle as low as 1/15. The pulse train is achieved via the high-quality compression of an initial sinusoidal beating through four segments of fibers.

Room 21
08:45
CK10-2-TH U 08:45
Light transport through Mie resonances in photonic glasses
R.S Sapenzza, P.D Garcia, C. Lopez, Ins. de Ciencia de Materiales de Madrid - CSIC Cantoblanco, Madrid, Spain; S. Stefanov, J. Bertolotti, S. Gottardo, LENS, Firenze, Italy; M.D Martin, L. Vina, Autonoma de Madrid, Spain; D.S Wiersma, LENS - and INFIM-MATIS, Firenze, Italy
We present novel photonic materials, photonic glasses, as solid, disordered, macroscopic assemblies of monodisperse dielectric spheres, and the first measures of resonances in the energy velocity of the diffused light, mean free paths and diffusion constant.

Room 22
08:45
CJ3-2-TH U 08:45
Temporal evolution of photodarkening and successive poetobleaching of an Ytterbium-doped silica double-clad LMA fiber
I. Manék-Hönninger, J. Boulet, CELIA-PAL, Talence, France; S. Ermenne, Alphalas, Talence, France; R. Bello Dova, M. Podgorski, F. Salin, Edite, Pessac, France; T. Cardinal, A. Guillet, ICMPB-CNRS, Pessac, France
We study the temporal behaviour of photodarkening in an Yb-doped LMA fiber and show photobleaching of the same fiber. The absorption spectra and the influence on the lasing properties are shown.

Room BOR2
08:45
CI4-2-TH U 08:45
40-Gb/s polarization multiplexed RZ-ASK-DPSK signal wavelength conversion using a 32-cm Bismuth-Oxide highly nonlinear fiber
M.P. Fok, C. Shu, The Chinese University of Hong Kong, Hong Kong; D.J Blumenthal, University of Southampton, United Kingdom
We demonstrate wavelength conversion of a polarization multiplexed RZ-ASK-DPSK signal using four-wave mixing in a bismuth-oxide highly nonlinear fiber incorporated in a polarization diversity loop. An optical signal-to-noise ratio of over 20 dB is obtained.

Room B11
08:45
CL1-2-TH U 08:45
Interaction between nanoparticles and metallic substrates: enhanced scattering detection and accurate vertical positioning
Metallic Nanoparticles have large scattering cross sections induced by the plasmon resonance, offering an alternative to fluorescence labelling. We’ll show how metallic substrates influences their resonance wavelength and scattering efficiency. Biosensing applications will be presented.
<table>
<thead>
<tr>
<th>Room</th>
<th>Session</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Room 1</td>
<td>IF3-3-THU (invited) 09:00</td>
<td>Observation of Faraday rotation from a single quantum-dot spin</td>
<td>J. Dreiser, M. Atature, A. Bado, A. Imamoglu, ETH Zurich, Switzerland</td>
</tr>
<tr>
<td>Room 4a</td>
<td>JS11-3-THU 09:00</td>
<td>Nonlinear dynamics reconstruction of chaotic cryptosystems based on delayed optoelectronic feedback</td>
<td>S. Ortin, L. Pesquera, Instituto de Fisica de Cantabria, Santander, Spain; M. Jaccout, M. Peil, L. Langer, Universite de Franche-Comté, Besancon, France</td>
</tr>
<tr>
<td>Room 4b</td>
<td>IB4-3-THU 09:00</td>
<td>Submegahertz infrared spectroscopy of trapped HD* molecular ions at millikelvin temperatures</td>
<td>B. Roth, J.C. Koemeyer, L. Ensing, A. Wicht, S. Schiller, Heinrich-Heine University, Dusseldorf, Germany</td>
</tr>
<tr>
<td>Room 12</td>
<td>CC1-2-THU 09:00</td>
<td>Nondestructive readout of volume hologram by use of the broadband light source</td>
<td>R. Fujimura, K. Kuroda, T. Shimura, University of Tokyo, Tokyo, Japan</td>
</tr>
<tr>
<td>Room 13a</td>
<td>CD7-3-THU 09:00</td>
<td>Mid-IR detection inside a near-IR broadband ring laser with cascaded down and upconversion</td>
<td>P. Gross, K.J. Boller, P. Bharadwaj, M.D. Leistikow, I.D. Lindsay, C.J. Lee, A.F. New Meredith, University of Twente, Enschede, Netherlands; M.E Klein, Art Innovation B.V., Oldenzaal, Netherlands</td>
</tr>
<tr>
<td>Room 13b</td>
<td>CB11-3-THU 09:00</td>
<td>High efficient single pass second harmonic generation of a broad area laser diode in an external cavity using a PPLN waveguide crystal</td>
<td>A. Jechow, D. Skoczowsky, A. Heuer, R. Menzel, University of Potsdam, Germany</td>
</tr>
<tr>
<td>Room 4a</td>
<td>JS11-4-THU 09:15</td>
<td>Nonlinear amplitude response of slave laser induces the chaos pass filtering effect in synchronized semiconductor laser diodes</td>
<td>S. Lea, P.S. Spencer, University of Wales-Bangor, United Kingdom</td>
</tr>
<tr>
<td>Room 4b</td>
<td>IB4-4-THU 09:15</td>
<td>Spectroscopy on high-density mesoscopic atom samples</td>
<td>H. Crepaz, J. Eschner, M. Kubasik, M. Kaschnowek, S.R de Echaz, IFOP - The Institute of Photonic Sciences, Castelldefels, Spain</td>
</tr>
<tr>
<td>Room 12</td>
<td>CC1-3-THU 09:15</td>
<td>High resolution optical data storage in composite polymeric blue sensitive materials</td>
<td>L. Ciprani, F. Vita, R. Castagna, D.E. Lucchetta, F. Simon, Universita Politecnica delle Marche, Ancona, Italy</td>
</tr>
<tr>
<td>Room 13a</td>
<td>CD7-4-THU 09:15</td>
<td>Application of second-harmonic generation to determine the structure of langmuir-blodgett films of low symmetry</td>
<td>M. Siltanen, M. Kaurnoren, Tampere University of Technology, Tampere, Finland</td>
</tr>
<tr>
<td>Room 13b</td>
<td>CB11-4-THU 09:15</td>
<td>Low threshold (Gain) (NAS) semiconductor disk laser emitting at 1260nm</td>
<td>W. Diehl, P. Brick, OSRAM Opto Semiconductors GmbH, Regensburg, Germany; S. Reinhard, B. Kunert, W. Stolz, Philips-Universitat Marburg, Germany</td>
</tr>
<tr>
<td>Room 14a</td>
<td>CE7-3-THU 09:00</td>
<td>Mg-doped congruent LiTaO₃ for high power quasi-phase matching device</td>
<td>H. Ishizuki, T. Take, Institute for Molecular Science, Okazaki, Japan</td>
</tr>
</tbody>
</table>

Characterization of optical- and thermal properties in Mg-doped congruent LiTaO₃ will be demonstrated, and compared with Mg-doped congruent LiNbO₃. The coercive field to invert the crystal polarization will be evaluated by realizing a periodically poled structure.
Novel concepts in high-energy femtosecond fiber lasers
F. Wise, Cornell University, Ithaca, USA
Fiber lasers based on new modes of pulse evolution, such as self-similar evolution, allow major increases in the stable pulse energy. These will be reviewed. Such lasers now compete with solid-state modelocked lasers.

Fiber lasers based on new modes of pulse evolution, such as self-similar evolution, allow major increases in the stable pulse energy. These will be reviewed. Such lasers now compete with solid-state modelocked lasers.

Transport of light in amorphous photonic materials
F. Scheiffeld, M. Reufer, C. Dagallier, University of Fribourg, Switzerland; L.S. Froula Perez, Ecole Centrale Paris, France; L.F Rojas J.J Saenz, Universidad Autonoma de Madrid, Spain; Ochoa, Cinvestav, Mexico City, Mexico and University of Fribourg, Switzerland.
We discuss the propagation of light in dense colloidal assemblies with liquid like order. By tuning the interaction potential we control the degree of order or disorder and thus can explore new photonic properties.

Properties of rare earth doped silica fibers obtained by silica powder sol gel technology and MCVD: a comparative study
V. Romano, L. Di Labio, R. Renner-Erny, W. Luthy, Th. Feurer, University of Bern, Switzerland; F. Sandza, Daetwyler Fiber Optics AG, Boudry, Switzerland. Nd³⁺ and Yb³⁺ doped preforms produced by the sol-gel or silica powder method have been drawn to fibers and characterised. Their properties are compared with those of fibers produced by standard MCVD technology.

Second harmonic generation in AlGaAs/AlOx random structures
M. Centini, M. Bertolotti, C. Sibilia, University of Roma “La Sapienza”, Rome, Italy; F. Fabrice, R. Raj, I. Sagnes, Laboratoire de Photonique et de Nanostructures (CNRS UPR 20), Marcoussis, France, D. Wiersma, European Laboratory for Non-linear Spectroscopy (LENS) and INFM-Matis, Sesto Fiorentina, Italy; D. Felbacq, Groupe d’Etude des Semi-Conducteurs UMR 5650, Montpellier, France; M. Michael, Charles Bowden Research Center, Redstone Arsenal, USA
We applied our theoretical results to design, realize and experimentally verify the predicted second harmonic enhanced efficiency on a sample made of AlGaAs/AlOx random layers grown in a GaAs substrate.

Phase-to-amplitude conversion using long period fiber grating for wavelength conversion at 160 Gb/s
P. Horzatkova, R. Slavik, A. Kumpen, P. Skoda, Institute of Photonics and Electronics, AS CR, Prague, Czech Republic
A newly-developed long period grating-based all fiber filter is demonstrated to perform a phase-to-amplitude modulation conversion. This feature is tested in an ultrafast (160 GHz shown here) SOA-based wavelength converter.

Sensitive optical biosensor based on whispering-gallery modes of dielectric microspheres
J. Lutti, W. Langbein, P. Borri, Cardiff University, United Kingdom
We have developed an optical biosensor that exploits photonic resonances of polystyrene microspheres held in aqueous buffer by a novel optical tweezers setup. We estimate sensitivity 40 times better than surface plasmon resonance methods.
We report on the concurrent preparation of many spin-polarized electrons in single InGaAs/GaAs quantum dots with high fidelity. This is done electrically in a diode structure with the semimagnetic spin-aligner ZnMnSe on top.

We analyse the coherence properties of ultra-cold gases by means of direct first-principles quantum simulations. This leads to new definitions of condensation measures and center-of-mass quantum limits for bosons and fermions.
Introducing a quadratic soliton mode-locked Lownoise femtosecond laser system of colloidal particles with quantitative agreement with reported experiments and unveil a non-exponential transmission tail in the nonlinear regime.

We study the properties of a random laser consisting of a single-mode Er/Ge-doped optical fiber with an optical cavity formed by Bragg gratings written in random positions along the fiber core. Results for the output spectrum as a function of pump are presented.

We report on the optical tuning of InP-based planar photonic crystals infiltrated with a photosensitive liquid crystal system. Preliminary results on the local tuning of infiltrated structures are also presented.

With a saturable absorber mirror incorporating nanotubes we have drastically decreased the noise level and improved the output characteristics of an energetic self-started mode-locked femtosecond erbium-doped fiber laser.

We propose a self-calibration approach to compensate the response dispersion on biochips due to the non homogeneous surface layers. Such effect of probe concentration has been quantified in the case of a DNA biochip.
Quantum measurement and feedback control
H. Matbuchi, L. Bouten, R. van Handel, A.E Miller, G. Sarma, California Institute of Technology, Pasadena, CA, USA
We discuss emerging themes in quantum feedback control: the use of control theory to improve experimental strategies in quantum optics, theory and applications of measurement-based quantum feedback, and control via coherent feedback of quantum fields.

Effect of double pair emission to entangle based QKD
S. Bettelli, T. Lörnser, M. Peep, E. Queisser, Austrian Research Centers Wien, Austria; M. Dusek, L. Bartusko, Uni. Pardubice, Olomouc, Czech Repub­lic; A. Poppe, H. Häbel, Bloom­stein, Univ. Wien, Austria; A. Zei­linger, Univ. Wien and Austrian Academy of Sciences, Wien, Austria
We investigated the relevance of multi-pairs in a quantum cryptography scheme based on entangled photons from spontaneous parametric down-conversion, and found the security risk is very weak with respect to competing schemes.

Simple RGB source based on simultaneous quasi­phase­matched second and third harmonic generation in periodically poled lithium niobate
M. Robles-Aguado, R.S Cudney, L.A Rios, CIESE, Ensenada, Mexico
We present a simple source of red, green and blue light based on PPLN with two poling periodicities pumped by a Nd:YAG laser. These colors are produced by cascaded nonlinear interactions within the PPLN crystal.

Near infrared steady state photo­refractive self focusing in SnP2S6Te crystals
C. Dan, D. Woltersberger, N. Fres­sengeas, G. Montemezzani, “Paul Verlaine” University and Supelec, Metz, France; A.A Grabar, Uzhgo­rod National University, Uzhgo­rod, Ukraine
We present experimental results about the phenomenon called dynamical localization observed in a simple quantum chaos experiment (Kicked Rotor). In this work, we study the destruction of dynamical localization by a perturbation showing that this destruction is progressive with well-defined scaling laws.

Simple RGB source based on simultaneous quasi­phase­matched second and third harmonic generation in periodically poled lithium niobate
M. Robles-Aguado, R.S Cudney, L.A Rios, CIESE, Ensenada, Mexico
We present a simple source of red, green and blue light based on PPLN with two poling periodicities pumped by a Nd:YAG laser. These colors are produced by cascaded nonlinear interactions within the PPLN crystal.

Near infrared steady state photo­refractive self focusing in SnP2S6Te crystals
C. Dan, D. Woltersberger, N. Fres­sengeas, G. Montemezzani, “Paul Verlaine” University and Supelec, Metz, France; A.A Grabar, Uzhgo­rod National University, Uzhgo­rod, Ukraine
We present experimental results about the phenomenon called dynamical localization observed in a simple quantum chaos experiment (Kicked Rotor). In this work, we study the destruction of dynamical localization by a perturbation showing that this destruction is progressive with well-defined scaling laws.

Cascaded poling period for in­tracavity frequency doubling of an optically pumped semiconductor disk lasers
R. Hartke, K. Seger, E. Heumann, Manyticemismatchreductioningar­row force microscopy indicate that this work, we study the destruction of dynamical localization by a perturbation showing that this destruction is progressive with well-defined scaling laws.
CF7-1-THU (Invited) 10:30
A nanometer-sized few femtosecond electron source at high repetition rates
C. Lienau, Universität Oldenburg, Germany; C. P. Schulz, C. Ropers, D. R. Solli, T. Elsaesser, Max-Born Institute, Berlin, Germany
We demonstrate a novel approach towards realizing an atom-sized ultrafast electron source. By illuminating ultrasharp gold tips with 7-fs pulses from a Ti:sapphire oscillator, we induce emission of up to $10^7$ electrons per second.

CI5-1-THU (Invited) 10:30
Instabilities in quantum dot semiconductor lasers 1.3 µm
G. Huyet, S. Melnik, O. Rasskazov, S. P. Hegarty, Tyndall National Institute and Cork Institute of Technology, Cork, Ireland; D. Goulding, Tyndall National Institute, Cork, Ireland; D. Rachinski, University College, Cork, Ireland
We describe instabilities in quantum dot lasers with optical injection where we observe multipulse excitability. We also show that similar behaviour can be observed in mutually coupled QD lasers.

CI4-2-THU 10:45
Two-stage linearly-polarized ytterbium-doped fibre superfluorescent source with 106 W output power
P. Wang, W. A. Clarkson, University of Southampton, UK
High-power single-mode and linearly-polarized operation of a two-stage ytterbium-doped fibre superfluorescent source is reported. The source yielded 106W of output centred at 1067 nm with a slope efficiency of 67% and a 3dB bandwidth of 21 nm
IF4-2-THU 11:00

High-sensitivity imaging with quantum spatial correlation of twin beams

E. Brambilla, L. Caspani, A. Gatti, L.A. Lugliato, O. Jedrkiewicz, Universita' dell’Insubria, Como, Italy

We propose a novel imaging technique which exploits the multi-mode correlation of twin beams produced through spontaneous down-conversion to measure the spatial distribution of weak objects with sensitivity beyond the standard quantum limit.

ROOM 1

IF4-3-THU 11:15

Resolution in image rotation measurements

R. Zambolini, IMDEA (IUB-CSIC), Palma de Mallorca, Spain; S.M. Barnett, University of Strathclyde, Glasgow, United Kingdom

We propose two experiments to measure the rotation of a light beam about an axis. We show how the limiting resolution depends on the total number of quanta of orbital angular momentum of the beam.

ROOM 4a

JS12-3-THU (invited) 11:00

Robustness of polarization entanglement for long distance QKD

M. Koehl, University of Cambridge, United Kingdom; T. Esslinger, T. Donner, A. Ott, S. Ritter, T. Bourdel, ETH Zurich, Switzerland

We present a fully functional QKD setup based on polarization entanglement and routinely operate it at 25km with a secure rate of >1500bit/second. Additionally we demonstrate distribution of entanglement up to 100km.

ROOM 4b

IBS-3-THU (invited) 11:00

Correlations in ultracold atomic gases

M. Koehl, University of Cambridge, United Kingdom; T. Esslinger, T. Donner, A. Ott, S. Ritter, T. Bourdel, ETH Zurich, Switzerland

We have observed critical fluctuations of the order parameter near the phase transition of Bose-Einstein condensation. This allowed us to determine the critical exponent of the correlation length of a trapped interacting Bose gas.

ROOM 12

CC2-3-THU (invited) 11:00

Nonlinear photonic structures in photorefractive media


We obtained a high efficiency SHG of a Ti:Sa laser at 852nm (Cesium D2 line), using a PPKTP. This doubler will pump an OPO thought as source of non-classical light for a quantum memory.

ROOM 13a

CDB-3-THU 11:00

Design considerations for the manufacture of temperature-stable periodically-poled nonlinear crystals


We have observed critical fluctuations of the order parameter near the phase transition of Bose-Einstein condensation. This allowed us to determine the critical exponent of the correlation length of a trapped interacting Bose gas.

ROOM 13b

CDB-12-4-THU 11:15

Stabilisation of a vertical external-cavity surface-emitting laser using an intra-cavity high-reflectivity grating

M. Koehl, University of Cambridge, United Kingdom; T. Esslinger, T. Donner, A. Ott, S. Ritter, T. Bourdel, ETH Zurich, Switzerland

We report the stabilisation of a 1069nm Vertical External-Cavity Surface-Emitting Laser using an intra-cavity high-reflectivity grating. Polarisation stable, narrow-linewidth operation with up to 485mW of output power is demonstrated.

ROOM 14a

CE8-8-THU 11:15

Efficient luminescence response from nanoscale controlled Er-Yb distribution in Al2O3 waveguides

J. Toudert, S. Nunez-Sanchez, M. Jimenez de Castro, CSIC- Instituto de Optica, Madrid, Spain; A. Petford-Long, M. Tanase, B. Kubis, ANL-Materials Science Division, Argonne, USA

The emission at 1.54 um of Al2O3 films codoped with Si-nanoparticles and Er3+ ions is analyzed as a function of the separation between the dopants. Controlled doping distribution is performed by alternate pulsed laser deposition.
Femtosecond electron diffractometry: a new approach and first steps
E.E. Fill, M. Centurion, P. Recknagel, S. Naumov, L. Vesz, F. Krausz, Max-Planck-Institut für Quantenoptik, Garching, Germany
V. Tannetsky, Budker G. Kurkin, Institute of Nuclear Physics, Novosibirsk, Russia; A. Apolonski, Ludwig-Maximilians-University, Munich, Germany
Simulations and first experimental results for significantly improving the temporal resolution of ultrafast electron diffraction are presented. Low-charge electron pulses are generated at a MHz repetition rate and bunched by means of an RF-cavity.

Photonic device particle accelerators and light sources
T. Plettner, R.L. Byer, P.P. Lu, K. Sun, Stanford University, Stanford, USA
We present a proposed vacuum channel photonic device that can function as a laser-driven particle accelerator or as an active undulator. We will test a prototype structure with 60 MeV electrons in the near future.

Excitability of chaotic transients in a semiconductor laser
O. Ushakov, H.J. Wünsche, F. Hennegger, Humboldt University, Berlin, Germany; M. Radziunas, Weierstrass-Institut für Angewandte Analysis und Stochastik, Berlin, Germany
A multisection semiconductor laser is used to combine two fundamental phenomena observed so far only separately: excitability and chaotic transients. Prerequisite is a boundary crisis of a chaotic attractor colliding with a saddle-focus.

High power pulsed sources
J.L. Limpert, Friedrich Schiller University, Jena, Germany
A review of state-of-the-art rare-earth-doped fiber based laser sources in pulsed operation (ns to fs) will be given. Furthermore scaling concepts are discussed to overcome current performance limitations.

Optical channel monitoring using two photon absorption
J.O. Dowd, J.F. Donegan, W.H. Guo, CTVR, Trinity College Dublin, Ireland; D.C. Kilper, S. Chandrasekhar, ALCATEL-Lucent, Bell Laboratories, Holmdel, USA
A GaAs microcavity two-photon absorption detector is used in an optical channel monitor to distinguish signal bearing channels of varying bit rates, modulation formats and signal quality.

Femtosecond wave-packet interferometry in all-trans retinal analyzed by high-performance liquid chromatography
K. Misawa, T. Kojiri, R. Lang, Tokyo University of A&T, Koga- nei, Japan
We demonstrate wave-packet interferometry in all-trans retinal using phase-locked pulses, combined with high-performance liquid chromatography. The decoherence of the excited-state wave-packet was found to be faster than 80 fs.

Stability of the modelocking regime in quantum dot laser
We study the stability of the modelocking regime in quantum dot lasers and explain the appearance of instabilities as a tangency of the ML cycle to the basin of attraction of the unstable steady state.

Wideband all-order PMD emulation via ultrafast pulse shaping
A.M. Weiner, H. Miao, Purdue University, West Lafayette, USA
We demonstrate a pulse shaper based polarization mode dispersion (PMD) emulator with the capability of generating arbitrary desired frequency-dependent PMD profiles.

Three-pulse photon echo peak shift spectroscopy in a dense potassium vapour
V.O. Lorenz, JILA and Dpt of Physics, University of Colorado, Boulder, CO, USA; J.T. Cundiff, JILA, University of Colorado, Boulder, CO, USA; S. Mukamel, University of California, Irvine, CA, USA
Experimental three-pulse photon echo peak shifts in a dense potassium vapor exhibit bi-exponential behavior at high temperatures and densities. The slow component is attributed to long-range resonant interactions through calculated peak shifts in an exciton picture.

Neuronal filopodia respond to distant femtosecond pulses
M. Mathew, I. Amat-Roldan, I. G. Cormack, P. Loza-Alvarez, ICF0 - Institut de Ciencies Fotoniques, Castelldefels (Barcelona), Spain; R. Andres, E. Soriano, Parc Cientific de Barcelona, Spain; D. Artigas, Universitat Politecnica de Catalunya, Barcelona, Spain
We show that filopodia of neurons from primary cell cultures, can be remotely attracted by the presence of focused femtosecond light. This has the potential to replace the use of traditional biomolecules to accomplish guidance.
Spectral entanglement and precise measurement of optical dispersion

A. Sergienko, Boston University, MA, USA; C. Bonato, P. Villoresi, University of Padua, Italy

We discuss advantages that broadband spectral entanglement in parametric down conversion provides for precise determination of optical dispersion.

Low cost quantum secret key growing for consumer transactions

G. Rarity, M.S. Goodfrye, A.M. Lynch, University of Bristol, United Kingdom; J.J. Duggan, W.J. Munro, K.J. Harrison, Hewlett-Packard Laboratories, Bristol, United Kingdom

We review our low cost and short range quantum key exchange system designed for consumers to generate a store of secret key bits and discuss improvements in the receiver and miniturisation of electronics.

The interaction of photorefractive solitons in a SBN crystal

O. Kashan, A. Kiesling, V. Matsievich, D. Khmelevskiy, R. Kowarschik, Friedrich-Schiller-University Jena, Germany

The experimental and theoretical investigation of coherent interaction of photorefractive solitons in a SBN crystal is presented. The threshold values of distance between centers of input beams, to observe independent solitons, are obtained.

Suppression of discrete diffraction within modulated one-dimensional photorefractive photonic lattices in lithium niobate

V. Shandarov, K. Shandarova, E. Smirnov, State University of Control Systems and Radioelectronics, Tomsk, Russia; D. Kip, C. Rueter, Clausthal University of Technology, Clausthal-Zellerfeld, Germany

We propose an inexpensive continuous variable quantum key distribution system, easily scalable to large bandwidths, based on the splitting of thermal light between Alice and Bob. This protocol has positive secrecy capacity with reverse reconciliation.

Stable dual-wavelength operation of InGaAs diode laser with volume Bragg gratings

S.A. Zolotovskaya, N. Daghestani, T. Okada, Kyushu University, Fukuoka, Japan

Novel waveguide SHG device for green laser was proposed and demonstrated. Simple concatenation of PPLN waveguides and two EO modulators can provide modulation of conversion efficiency. Numerical calculations and experimental results were presented.

High power monolithic two mode DFB laser diodes for the generation of Terahertz radiation

A. Klehr, G. Erbert, J. Fricke, A. Knauer, Ferdinand-Braun-Institut, Berlin, Germany; R. Wilk, M. Waler, M. Koch, Institut für Hochfrequenztechnik, Braunschweig, Germany

We report on high power DFB lasers emitting simultaneously on two longitudinal modes. The mode spacing is 0.45 nm corresponding to 0.12 THz. We demonstrate THz emission by mixing the two line laser emission in a LTGaAsSb photomixer.
We report the first real-time observation of light-induced electron tunneling. The process is found to deplete atomic bound states in several steps lasting several hundred attoseconds, providing a means of probing short-lived, transient states of atoms with potentially atto-second temporal resolution.
This plenary session is dedicated to the memory of Professor Herbert Walther who died on the 22nd of July 2006 in Garching, Germany.

Renowned scientist and educator, Professor Walther chaired the World of Photonics Congress Steering Committee during 10 years leading it to a successful high scientific level congress. He was a director and Professor Emeritus at the Max-Planck-Institute of Quantum Optics in Garching, Germany.

Professor Herbert Walther

F. Krausz, Max-Planck Institute of Quantum Optics, Garching, Germany

Introductory words to the Memorial session dedicated to Professor Herbert Walther.

A. Schenzle, University of Munich, Germany

J. Eberly, University of Rochester, Rochester, NY, USA

Experts have said: “...it seems fair to say that the study of entanglement is in its infancy... it is not entirely clear what... can be expected as a result of the study of quantitative measures of entanglement.” In an ideal world, entanglement of small and isolated quantum systems would be stable and uncorrupted. But in reality no physical system can be isolated completely. We will discuss the qualitatively and quantitatively surprising effects that weak noise can have on entangled pairs of quantum objects, even when they relax individually very slowly.
Measuring photon anti-bunching from sideward squeezing with continuous-variable techniques

N.B Grosse, Tym, P.K.Lam, Australian National Univ., Canberra, Australia; M. Stobinska, Univ. Warszawski, Warsaw, Poland; T.C. Ralph, Univ. of Queensland, St Lucia, Australia

We used a continuous-variable measurement scheme to experimentally probe the second-order temporal coherence function of quantum states of light. We prepared an appropriately displaced squeezed state, and were able to confirm strong photon anti-bunching.

Multimode squeezing of frequency combs

G.J. Volcarcel, Universitat de València, Burjassot, Spain; M. Radziunas, Weierstraß-Ins.fürAngewandteAnalysisundStochastik, Berlin, Germany; H.J. Wünsche, F.Henneberger, Humboldt- Univ., Berlin, Germany; J. Fischer, Vrije Univ., Brussels, Belgium

The full multimode theory of a synchronously pumped 1 optical parametric oscillator (SPPO) is considered. In the degenerate case, significant squeezing is found, approaching threshold from below, for a set of frequency combs.

Enhancement of the quantum efficiency of chaotic communications based on all-optical feedback chaos generation by means of subcarrier modulation

A. Bognis, K.E Chioverakis, A. Argyris, D. Syvridis, University of Athens, Greece

The significant enhancement of the encryption efficiency of a chaos communication system based on all-optical feedback accompanied by successful message decoding at the receiver is numerically demonstrated utilizing subcarrier modulation.

Synchronization of chaotic unidirectionally coupled multisection laser

J. Moses, F.W Wise, Cornell University, Ithaca, USA; B.A Malomed, Tel Aviv University, Tel Aviv, Israel

A first optical manifestation of the Chen-Lee-Liu-type derivative nonlinear Schroedinger equation results in self-sweeping of ultrashort pulses and shock formation without simultaneous self-phase modulation. Experiments verify theory.

Self-injection locking of a self-adaptive loop resonator

S. Richard, A. Brignon, Thales Research & Technology, Palaiseau, France

We present a Nd:YAG self-adaptive laser resonator with intra-cavity four-wave mixing driving up to 350 mW at 100 Hz with M² of 2. Self-injection seeding of this laser is demonstrated to control its optical frequency.
on KD*P crystals has been created. 24J of energy of compressed pulses at 43 fs pulses duration has been achieved experimentally.

The scale OPAL lasers system based in Rossendorf, Dresden, Germany Sauerbrey, Forschungszentrum University, Jena, Germany; R. Kaluza, J. Hein, Friedrich-Schiller University, Jena, Germany

We will present our 200TW lasers, the limits of conversion efficiency, the temperatures sensitivity of the device and ways towards high-power operation are explored.

The new high-Q physics: photonic clocks and back-action cooling on a chip K.V Vahala, Caltech, Pasadena, CA, USA

The union of optical micro-cavities and micro-mechanical resonators in certain devices has enabled radiation-pressure cooling to Kelvin temperatures and realization of new micro-mechanical oscillators. These results, their importance and future prospects are reviewed.

Moving towards 100 GHz from a passively mode-locked Er:Yb:glass laser at 1.5 micron A.E.H Dohler, U. Keller S.C Zeller T. Südmeyer ETH Zurich, Switzerland K.J Weingarten, Time-Bandwidth Products, Zurich, Switzerland

An ultrafast Er:Yb:glass laser generates a record high repetition rate of 90GHz and initial results at 99GHz. Its compactness and stability are attractive for future high-speed data transmission systems in the 1.5 micrometer telecom window.


We present an 11-channel comb generator with channel spacing of 42.6GHz, flatness better than 2dB and side-mode suppression better than 12dB using low-drive voltage electro-optic polarisation modulators, for high information spectral density systems.
Polarization squeezing with photonic crystal fibers

J. Milanovic, A. Huck, J. Joel, Ch. Marquardt, U. Andersen, G. Leuchs, University of Erlangen-Nuremberg, Erlangen, Germany
We present Photonic Crystal Fibers as an efficient polarization squeezing source. Using these highly nonlinear fibers, polarization squeezing of -3.3 dB was measured and an increased state purity was observed.

Observation of nonlinear dynamics and transitions to chaos in photonic integrated circuits

M. Yousefi, S. Beni, Y. Barbarin, M. Smitt, E. Bente, COBRA, TU Eindhoven, Netherlands; D. Lenstra, Technical University, Delft, Netherlands
We present a period doubling route in and out of chaos in a photonic integrated circuit using a novel method of analysis, which relies on statistical information.
Development of 10 PW OPCPA capability on the Vulcan laser
We present the progress made in developing 10PW OPCPA capability for the Vulcan laser to produce pulses with focused intensities >10^{23} W/cm^{2}. This power level will be delivered by generating pulses with >300J in 30fs.

Microstructured fibres and applications
P. Roy, L. Lavoute, S. Février, J.L Auguste, J.M Blondy, P. Leproux, D. Gaponov, M. Devautour, A. Roy Xlín, Limoges, France; L. Bigot, G. Bouwmans, V. Pureur, PhLAM, Lille, France
We investigate several new promising optical fibre designs for high power fibre lasers and amplifiers. Single-mode propagation is possible in a large and highly rare-earth-doped fibre core. Resonant cladding advantages are exploited.

Model based optimization criteria for the generation of deep compressive residual stress limits by laser shock processing
M. Morales, J.L. Ocana, C. Molpeceres, R. Pecharroman, J.A Porro, Universidad Politecnica de Madrid, Spain
A model based systematization of optimization criteria for LSP is presented along with practical results on its application to high elastic limit alloys, showing induced residual stresses fields and corresponding results on mechanical properties improvement.

Performance evaluation of a compact 10-GHz pulse compressor based on a highly nonlinear Bismuth-Oxide fibre
S. Asimakis, M.A.F. Roelefs, T.T. Ng, P. Petropoulos, D.J. Richardson, University of Southampton, United Kingdom; G. Meloni, A. Bogni, L. Poti, Integrated Research Centre for Photonics Networks and Technologies, Pisa, Italy
A 2-m long bismuth-oxide fibre is used to facilitate 5-fold compression of 2ps pulses at a repetition rate of 10GHz. The compressed pulses are characterized both in intensity and phase using a linear FROG technique.

Influence of scattering anisotropy on reflected diffuse light probed by diffusing-wave spectroscopy
R. Carminati, R. Pierat, Ecole Centrale Paris, CNRS, Chatenay-Malabry, France; N. Ben Braham, L. Rojas-Ochoa, F. Scheffold, University of Fribourg, Switzerland
We study the diffuse reflection of light on scattering media, probed by diffusing-wave spectroscopy. We show that improved models allow to go beyond the diffusion approximation and compare theoretical results to measurements on model systems.
Quantum dynamics of polarisation squeezing in optical fibres
J.J.Corney, P.D. Drummond, The University of Queensland, Brisbane, Australia; L.L. Andersen, J. Heersink, R. Dong, G. Leuchs, University of Waterloo, Canada; U.L. Andersen, L.Salvail, B.B.R. Van der Ziel, Universita di Pisa, Italy; M. Giudici, Esporles, Spain; M. Tonelli, Universita di Pisa, Italy

Comparing stochastic simulations and experimental measurements, we study the quantum dynamics of polarisation squeezing in optical fibres. Squeezing of -6.6 dB is measured, with Raman effects limiting squeezing for higher pulse energies and longer fibres.

A quantum key distribution network: integrated design and prototypical implementation
M. Peele, Th. Langer, Austrian Research Centers GmbH – ARC, Vienna, Austria; N. Lütkenhaus, Institute of Quantum Computing, Univ. of Waterloo, Canada; L. Salvail, BRICS, Univ. of Aarhus, Denmark; R. Alleaume, Ecole Nationale Supérieure des Télécommunications, Paris, France

We present the design of a quantum key distribution network developed within the EU project SECOQC. We further outline the current implementation status of the SECOQC prototype, to be built in Vienna and Lower Austria.

Temporal soliton molecule: experimentally determined phase profiles
A. Hause, H. Hartwig, M. Böhm, F. Mitschke, University Rostock, Germany

The binding mechanism of soliton molecules in dispersion managed fibres depends on phase dynamics. Measurement of phase structure with FROG fails for these complex shapes; we demonstrate that VAMPIRE is successful.

Secure quantum key distribution over 40 km of fiber with a pulsed heralded single photon source
A. Sugiyama, S. Takeuchi, Research Institute for Electronic Science, Hokkaido Univ. and CREST, Sapporo, Japan; K. Sasaki, Research Institute for Electronic Science, Hokkaido Univ., Sapporo, Japan; M. Matsui, T. Hasegawa, T. Nishihara, T. Tsurumaru, Mitsubishi Electric Corporation, Information Technology R&D Center, Ofuna, Japan

Using a pulsed heralded single photon source emitting at 1550 nm, we performed quantum key distribution over 40 km of fiber with unconditional security. We will also report latest experimental progress over longer distance.

Ultra-fast phase conjugate laser system
K. Nishimura, J. Hagiwara, T. Omatsu, Chiba University, Japan

We present power scalability of a pico-second Nd doped vandate booster amplifier with a photorefractive phase conjugate mirror. We also mention design issues of the phase conjugate mirror in ultra-fast regime.

Discrete-continuous spatio-temporal light localization in nonlinear fiber arrays
F. Eilenberger, T. Pertsch, A. Szameit, S. Nolte, F. Lederer, Friedrich Schiller University, Jena, Germany; U. Rollek, J. Kobelke, K. Schuster, H. Bartelt, IPHT Jena, Germany; A. Tunnemann, Fraunhofer Institute, Jena, Germany

We study experimentally and theoretically the formation of spatial and spatio-temporal localization in hexagonal arrays of mutually coupled optical fibers.

Mid-infrared ZnSe:Cr diodes based on optically enhanced impact ionization process
J. Jöckel, R. Haidar, E. Rosencher, ONERA, Palaiseau, France; J.L. Peñouard, S. Colin, N. Bardou, S.A. Said Hassani, F. Pardo, CNRS/IPN, Marcoussis, France

We report temperature- and mid-infrared electroluminescence in ZnSe:Cr. The diode runs in an avalanche regime dominated by impact ionization processes. Photocurrent studies show that optical seeding may enhance the electro-optical conversion efficiency.

1-W novel Tm:LiLuF laser with wide tunability around 1.93 µm
N. Coluccelli, G. Galzerano, P. Laporta, Politecnico di Milano, Milan, Italy; F. Cornacchia, D. Paone, Università di Pisa, Italy

Continuous wave laser action was demonstrated in a novel Tm:LiLuF active crystal. Maximum output power in excess of 1 W and tunability wavelength range from 1828 nm to 2040 nm were obtained.

Effect of spectrum filtering on the performances of Quantum-Dash modelocked lasers emitting at 1.55 µm
K. Merghem, C. Gosset, A. Martinez, G. Moreau, A. Aubin, A. Ramdane, C.N.R.S. Marcoussis, France; F. Lelarge, Alcatel-Thales III-V Laboratory, Marcoussis, France

After specific spectrum filtering, 3.5 ps pulses at ~40GHz are demonstrated using one-section self-pulsating quantum dash mode locked lasers emitting at 1.55 micrometer. A 17dB extinction ratio is evidenced.

A quantum key distribution network: integrated design and prototypical implementation
M. Peele, Th. Langer, Austrian Research Centers GmbH – ARC, Vienna, Austria; N. Lütkenhaus, Institute of Quantum Computing, Univ. of Waterloo, Canada; L. Salvail, BRICS, Univ. of Aarhus, Denmark; R. Alleaume, Ecole Nationale Supérieure des Télécommunications, Paris, France

We present the design of a quantum key distribution network developed within the EU project SECOQC. We further outline the current implementation status of the SECOQC prototype, to be built in Vienna and Lower Austria.

Secure quantum key distribution over 40 km of fiber with a pulsed heralded single photon source
A. Sugiyama, S. Takeuchi, Research Institute for Electronic Science, Hokkaido Univ. and CREST, Sapporo, Japan; K. Sasaki, Research Institute for Electronic Science, Hokkaido Univ., Sapporo, Japan; M. Matsui, T. Hasegawa, T. Nishihara, T. Tsurumaru, Mitsubishi Electric Corporation, Information Technology R&D Center, Ofuna, Japan

Using a pulsed heralded single photon source emitting at 1550 nm, we performed quantum key distribution over 40 km of fiber with unconditional security. We will also report latest experimental progress over longer distance.

Ultra-fast phase conjugate laser system
K. Nishimura, J. Hagiwara, T. Omatsu, Chiba University, Japan

We present power scalability of a pico-second Nd doped vanadate booster amplifier with a photorefractive phase conjugate mirror. We also mention design issues of the phase conjugate mirror in ultra-fast regime.

Discrete-continuous spatio-temporal light localization in nonlinear fiber arrays
F. Eilenberger, T. Pertsch, A. Szameit, S. Nolte, F. Lederer, Friedrich Schiller University, Jena, Germany; U. Rollek, J. Kobelke, K. Schuster, H. Bartelt, IPHT Jena, Germany; A. Tunnemann, Fraunhofer Institute, Jena, Germany

We study experimentally and theoretically the formation of spatial and spatio-temporal localization in hexagonal arrays of mutually coupled optical fibers.

Mid-infrared ZnSe:Cr diodes based on optically enhanced impact ionization process
J. Jöckel, R. Haidar, E. Rosencher, ONERA, Palaiseau, France; J.L. Peñouard, S. Colin, N. Bardou, S.A. Said Hassani, F. Pardo, CNRS/IPN, Marcoussis, France

We report temperature- and mid-infrared electroluminescence in ZnSe:Cr. The diode runs in an avalanche regime dominated by impact ionization processes. Photocurrent studies show that optical seeding may enhance the electro-optical conversion efficiency.

1-W novel Tm:LiLuF laser with wide tunability around 1.93 µm
N. Coluccelli, G. Galzerano, P. Laporta, Politecnico di Milano, Milan, Italy; F. Cornacchia, D. Paone, Università di Pisa, Italy

Continuous wave laser action was demonstrated in a novel Tm:LiLuF active crystal. Maximum output power in excess of 1 W and tunability wavelength range from 1828 nm to 2040 nm were obtained.

Effect of spectrum filtering on the performances of Quantum-Dash modelocked lasers emitting at 1.55 µm
K. Merghem, C. Gosset, A. Martinez, G. Moreau, A. Aubin, A. Ramdane, C.N.R.S. Marcoussis, France; F. Lelarge, Alcatel-Thales III-V Laboratory, Marcoussis, France

After specific spectrum filtering, 3.5 ps pulses at ~40GHz are demonstrated using one-section self-pulsating quantum dash mode locked lasers emitting at 1.55 micrometer. A 17dB extinction ratio is evidenced.
Design of pump beam homogenizers for Petawatt class Ti:Sapphire systems using MIRO code

F. Canova, J.P Chambaret, LOA - Ecole Polytechnique, Palaiseau, France
We have studied and designed pump beam homogenizer for PW class Ti:Sapphire systems, using MIRO propagation code. The performances of diffractive systems used to smoothen the spatial and temporal profiles are evaluated through extensive simulation.

High power polarization maintaining supercontinuum source

F.D. Nielsen, C.I. Thommen, Koheras A/S, Birkerod, Denmark; M.O. Pedersen, T.V. Andersen, Y. Qian, L. Leick, C.F. Pedersen, NKT Research and Innovation A/S, Birkerod, Denmark; K.P. Hansen, Crystal Fibre A/S, Birkerod, Denmark
In this paper we present a fiber based tunable high-power polarization-maintaining supercontinuum source which covers the wavelength range from 460 to above 200 nm with a high power spectral density.

Self-adaptive WDM transmitter operating under temporary ASE-injection

N. Dubreuil, G. Roosen, G. Pauliat, Laboratoire Charles Fabry de l’Institut d’Optique, Palaiseau, France; P. Boucard, J.L. Clavel, F. Verluise, Kyla, Paris, France
We present a transmitter with a memory effect of the operating wavelength set under temporary optical injection using a filtered ASE-fibre source. A 12 nm tuning range is reported with a SMSR of 35 dB.

Two photon microscopy in millimeter scale for investigation of skin damage from laser irradiation

C. Spitz, A. Garz, R. Menzel, University of Potsdam, Germany; A. Krink, H.P Berlien, Elisabeth Klinik, Berlin, Germany
Two photon microscopy of tissue with images of several millimeter sizes allows to connect the signals to locally varying diseases or tissue damage which is generated by erbium laser irradiation in our example.

Q-switched Nd-doped depressed clad hollow optical fiber laser operating at 927 nm and its frequency doubling to blue light

J.K. Sahu, J. Kim, Y. Jeong, J. Nilsen, University of Southampton, United Kingdom
A Q-switched, cladding-pumped, Nd:Al-doped fiber laser producing 1.3 kW of peak power at 927 nm with a diffraction-limited output was frequency-doubled in BiB3O6 crystal to generate 50 mW of average power at 463.5 nm.

Sub-doppler spectroscopy of a vapour confined in an extremely thin cell: saturation effects and interplay between coherent resonances and incoherent

C. Andreeva, S. Cartaleva, L. Petrov, Ins. of Electronics, BAS, Sofia, Bulgaria; S.M Saltiel, Sofia Univ., Sofia, Bulgaria; D. Sarkisyan, T. Varzhpetyan, Ins. for Physical Research, NAS of Armenia, Ashatanak-2, Armenia; D. Bloch, M. Ducloy, Univ. Paris-13, Villetteunue, France
In a vapour nanocell, sub-Doppler spectra are observed because the contribution of slow atoms is relatively enhanced as due to transient processes, and because of a (Dicke-type) transient linear coherent response. These competing effects partly survive under saturation.
Strong light extinction by a single molecule

J. Hwang, G.C. Wigge, J. Gerhardt, V. Sandoghdar, ETH Zürich, Switzerland
We present cryogenic experiments where the direct signature of a single molecule on an incident laser beam is demonstrated. Strong extinction larger than 10% is achieved in near and far-field geometries.

ID2-1-THU 16:30

Experimental demonstration of free-space decoy-state quantum key distribution over 144 km
T. Schmitt-Manderbach, H. Weier, M. Fürst, H. Weinfurter, Ludwig-Maximilians-Univers., Munich, Germany; J. Rarity, Univ. of Bristol, UK; R. Ursin, Uni. of Vienna, Austria; J. Perdigue, S. Azadi, ESA, Noordwijk, Netherlands; F. Tiefenbacher, Th. Schledt, A. Zelingier, Univ. Wien and Austrian Academy of Sciences, Wien, Austria; Chr. Kurtsiefer, National Univ. of Singapore, Singapore
We report on successful experimental quantum key distribution over a 144 km free-space link using weak coherent laser pulses and decoy state analysis. This outdoor experiment demonstrates the feasibility of global key distribution via satellites.

ID2-2-THU 16:45

Towards optical frequency metrology of the electron-to-phonon mass ratio
F. Bielsa, A. Douillet, T. Valenzuela, J.P.H. Kor, L. Hilico, Lab. Kastler-Brossel, Paris, France; V. Korobov, BobignyLab, Joint Ins. for Nuclear Research, Dubna, Russia
We investigate experimentally and theoretically dual-frequency spatial solitons in non local birefringent reorientational media and report their first observations, including walkoff and power-dependent breathing, in liquid crystals.

IE7-2-THU 16:45

Nonlocal bi-color vector solitons in liquid crystals
A. Alberucci, G. Assanto, M. Pecianti, University Roma Tre, Rome, Italy; A. Dyadyusha, M. Kaczmarek, University of Southampton, United Kingdom
We observed afterpulsing-free 80MHz single-photon detection at 1550 nm using an InGaAs/InP avalanche photodiode operated with sinusoidal gating. A detection efficiency of 11% with dark count probability of 3x10^{-10} and afterpulsing probability of 0.5%.

IE7-1-THU 16:30

Photonic systems acting as magnetic solids
A. Ferrando, Universidad de Valencia, Spain; P. Fernandez de Cordoba, M. Zacarés, Universitat Politècnica de Valencia, Spain; M.A. García-March, Universidad de Castilla-La Mancha, Valencia, Spain
We numerically and analytically demonstrate the equivalence between soliton crystals and magnetic systems. We show how to obtain the equivalent of a solid with antiferromagnetic properties by means of light supported by a photonic crystal.

CC4-1-THU 16:30

Two-photon induced refractive index change in quantum dot doped photorefractive polymer
X. Li, R.A Evans, M. Gu, B. Bullen, J.W.M. Chon, Swinburne University of Technology, Hawthorn, Australia
Quantum-dot surfaces were engineered for two-photon induced localized photorefractivity. The use of sulfur rich surfaces QBs not only optimized charge transfer and resultant refractive index change but expanded the optical recording thresholds.

CB14-1-THU 16:30

Broad area single emitter (BASE) modules with improved brightness
S. Pawlik, B. Sverdlov, J. Müller, R. Bättig, B. Schmidt, H.U. Pfeiffer, S. Ailt, B. Valk, N. Lichtenstein, Boo- kham Switzerland AG, Zurich, Switzerland
Two approaches to increase the brightness in a multimode fiber with a 105 μm core diameter will be presented. Their combination allows the realization of reliable broad area modules with outstanding brightness.

CC4-2-THU 16:45

SnP3S5 crystals with enhanced sensitivity for photorefractive applica- tions at 1.06μm
T. Bach, M. Jazbinsek, P. Günter, ETH Zürich, Switzerland; A. Ribeiro, U. Baumann, Stuttgart, Germany; G. Assanto, M. Pecianti, University Roma Tre, Rome, Italy; A. Dyadyusha, M. Kaczmarek, University of Southampton, United Kingdom
We investigate experimentally and theoretically dual-frequency spatial solitons in non local birefringent reorientational media and report their first observations, including walkoff and power-dependent breathing, in liquid crystals.

CB14-2-THU 16:45

Toward diffraction-limited high-average-power radially-polarized lasers
I. Mohse, A. Mei, S. Jockel, G. Machovani, Y. Lumer, Soreq NRC, Yavne, Israel
Wavefront correction by stepped wave-plates was demonstrated in multi-kW rod-based amplifiers. These wave-plates have strongly improved the output wavefront and beam-quality for radially polarized beams, from PV=3.8 microns to PV=0.3 microns and from M²=24 to M²=3.8.

CB14-3-THU 16:45

High-power 980-nm monolithically integrated master-oscillator power-amplifier
A semiconductor-based master-oscillator power-amplifier consisting of a distributed Bragg reflector laser and a flared amplifier is demonstrated to emit more than 10W continuous wave in a nearly diffraction limited beam with a narrow spectral bandwidth.
Femtosecond laser-induced forward transfer: a technique for versatile micro-printing applications
D.P. Banks, C. Grivas, R.W. Eason, University of Southampton, United Kingdom; I. Zergioti, National Technical University of Athens, Greece
We report on the use of surface plasmon fields at homogeneous and patterned metal surfaces for optical manipulation of micro-objects. Our experimental observations are well corroborated by simulations based on the green dye-doped PM fibers as well as LMA fibers.

Novel concept for an integrated optical waveguide isolator for picosecond pulse operation
M. Bernier, S.L. Chin, R. Vallée, G. Andraz, D. Faucher, Y. Sheng, CPIL, Université Laval, Quebec, Canada
We report on the writing of Bragg gratings in ZBLAN fibers and demonstration emission at 1480 nm in an all-fiber Ti:sapphire laser pumped at 1070 nm based on a FBG as an input coupler.

Bragg gratings written in ZBLAN fibers and all-fiber laser applications
M. Bernier, S.L. Chin, R. Vallée, G. Andraz, D. Faucher, Y. Sheng, CPIL, Université Laval, Quebec, Canada
We report on the writing of Bragg gratings in ZBLAN fibers and demonstrate emission at 1480 nm in an all-fiber Ti:sapphire laser pumped at 1070 nm based on a FBG as an input coupler.

Performance impairments due to gain transients in a Raman-based bi-directional long-reach PON link
R. Kjaer, I.T. Monroy, J. Bevenour, OFS Fitel Denmark ApS, Broendby, Denmark
The sensitivity penalty due to gain transients in a Raman-amplified recirculating loop experiment for different surviving channels defined in a 109 channel Raman-amplified transmission experiment.

Chip-scale atomic devices based on microfabricated alkali vapor cells
T.J. Kitching, S. Knappe, J. Moreland, L.A. Liew, V. Gergis, A. Thayil, P. Loza-Alvarez, E.J. Wolf, University of Geneva, Switzerland; F. Courvoisier, Université de Franche Comté, Besançon, France; R. Le DanteC, Y. Mugnier, C. Galez, Université de Savoie, Annecy, France
Fe(101), crystals can be efficiently employed as probes for SHG microscopy. Possessing a permanent dipole moment, they bear information about crystal orientation, and may be used as sensors of local electric field in bio-samples.
Coherent control of excitons in a single InAs/GaAs quantum dot

Counterpropagating twin photons in the telecom range: a narrow-bandwidth semiconductor source

We present a novel laser system based on an injection-seeded Ti:Sapphire oscillator. Frequency measurements on atomic and molecular resonance transitions are performed with a frequency comb, reaching accuracies at the MHz level for deep UV wavelengths.

Stabilization of counterpropagating solitons in periodic photonic lattices
S. Koke, C. Denz, Ph. Jander, D. Träger, Westfälische Wilhelms University, Münster, Germany; D. Neshov, M. Chen, W. Krollowski, Y. Yirshar, Australian National University, Canberra, Australia
We demonstrate theoretically and experimentally the suppression of instabilities of counterpropagating solitons in one- and two-dimensional periodic photonic lattices created by optical induction in a biased photorefractive crystal.

A novel SBS-laser oscillator scheme with active and passive mode locking
M. Ostermeyer, P. Kappe, University of Potsdam, Germany
A phase conjugating Nd:YAG SBS-laser oscillator is presented in an actively and a passively mode locked variant emitting 400ps pulses with 7W average output power in variable pulse train structures with up to 5MW peak power.
Accurate measurement of the transition dipole moment of self-assembled quantum dots
S. Stobbe, J. Johansen, T. Lund-Hansen, P.T. Kristensen, J.M. Hvam, P. Lodahl, COM-DTU, Technical University of Denmark, Kgs. Lyngby, Denmark; S. Nikolov, WL Vos, FOM Institute for Atomic and Molecular Physics (AMOLF), Amsterdam, Netherlands
We have measured time-resolved spontaneous emission from quantum dot ground state excitons in modified local density of states. Using a theoretical model without free parameters we accurately determine the quantum dot transition dipole moment.

Broadband near-field optical spectrometer for the observation of structural phase contrast in organic semiconductors
D. Polli, L. Lüer, G. Cerullo, Politecnico di Milano, Italy; C. Ropers, J. Nonlinear Optics and Short Pulse Spectroscopy, Berlin, Germany; R. Pomraenke, C. Lienau, Carlvon Ossietzky University, Oldenburg, Germany; D. Walter, F. Fedoruk, Ins. of Computational Electrometry, Novosibirsk, Russia
We present a simple ps source suitable for material processing applications. It combines a stable low repetition rate oscillator and efficient 3D multipass amplifier and produces pulse trains between 1Hz and 1MHz with energy up to 70 μJ.

Efficient versatile-repetition-rate ps source for material processing applications
C. Gerhard, P. Georges, P. Blandin, F. Druon, M. Hanna, F. Balembois, Institut d’Optique, Palaiseau, France; F. Falcoz, Thales Laser, Orsay, France
We present a simple ps source for material processing applications. It combines a stable low repetition rate oscillator and efficient 3D multipass amplifier and produces pulse trains between 1Hz and 1MHz with energy up to 70 μJ.

Nonlinear diffraction in sub-critical femtosecond inscription
S.K. Turtyn, M. Dubov, UKMazenter- se, Aston Univ., Birmingham, UK; A.M. Rubenchik, Lawrence Livermore National Lab, Lawrence, USA; M.P. Fedoruk, Ins. of Computational Technologies, Novosibirsk, Russia; E.V. Podivilov, Ins. of Automation and Electrometry, Novosibirsk, Russia
We have re-examined nonlinear diffraction theory in context of sub-critical regime of fs laser inscription in dielectric materials. Semi-analytical expression for the pulse power and spatial pre-focusing parameter required to achieve inscription threshold is derived.

Fabrication of photonic devices in heavy metal oxide glass by femtosecond laser direct writing
W. Yang, C. Corbani, P. Kazansky, O.R.C., Southampton, United Kingdom; K. Sakaguchi, National Institute of Advanced Telecommunications, Japan
Low loss, 0.2 dB/cm, channel waveguides were fabricated by fs-laser irradiation in highly nonlinear bismuth-borate glass. Directional couplers and y-junctions at 1550nm are presented. Second-order-nonlinearity can be induced by poling in these structures.

Charged nano-particles generated at ablation in air and their role in pulsed microdrilling
S.M. Klimentov, V.J. Konon, P.A. Pivo- varov, General Physics Institute RSAS, Moscow, Russia; D. Walter, F. Dausinger, Institut für Strahlwerk- zeuge, Pfullenwaldring, Stuttgart, Germany
Ablation by ultrashort pulses in air form a cloud of electrically charged nano-particles, extended residence of which can introduce screening of incident radiation. Plasma ignition, morphology of particles, their statistics and electric properties are investigated.

1.5 micron high-power robust single-frequency waveguide laser
S. Zaccheo, A. Festa, G. Della Valle, P. Laporta, Politecnico di Milano, Milan, Italy; K. Ennsr, Institute of Advanced Telecommunications, University of Wales Swansea, United Kingdom; G. Sorbello, DIT-Universita’ di Catania, Italy; C. Cossagnetes, D. Barbier, Teem- photonics, Grenoble, France
We demonstrate laser waveguide with over 20 mW output power in robust single-frequency operation. The highly doped Er:Yb doped phosphate glass waveguide was only 9 mm long. Power scaling towards 100 mW is discussed.

Packet clock recovery at 40 Gb/s and beyond, using a Fabry-Pérot filter and an optical power limiter based on a bismuth oxide fibre
Ch. Kouloumentas, N. Pleros, P. Zakynthinos, D. Petranotakis, D. Apostolopoulos, O. Zourarakis, H. Avramopoulos, National Technical University of Athens, Greece; A. Tanokaki, I. Tomkos, Athens Information Technology Center, Athens, Greece
We demonstrate packet clock recovery at 40 Gbps using a Fabry-Pérot-Filter and a power limiter based on self-phase modulation inside a bismuth-oxide fibre. Successful application of the technique at ultra-high data rates is predicted.
Quantum correlated polaritons in a semiconductor triple vertical microcavity: C. Leyder, C. Diederichs, D. Taj, P. Roussignol, J. Tignon, C. Cunliffe, C. Delalande, E. Gascobina, A. Bra mati, Ecole Normale Supérieure, Paris, France; A. Lemaitre, J. Bloch, Laboratoire Photonique et Nanostructures, Marcoussis, France. We study the statistics of twin photons emitted by a vertical triple microcavity by measuring the intensity correlations of the signal and idler. Quantum correlated polaritons are observed for the first time in these systems.

Continuous variable quantum cryptography: C. Wittmann, D. Elser, G. Leuchs, University Erlangen-Nuremberg, Erlangen, Germany; U.L. Andersen, Technical University of Denmark, Lyngby, Denmark; R. Filip, Palacky, P. Marek, Palacky University, Olomouc, Czech Republic. We present a scheme for noiseless filtering of non-Gaussian noise from continuous-variable quantum information. Characteristics of on/off detection and homodyne detection methods will be compared and an optimal device will be discussed.

New measurement of the electron magnetic moment and the fine structure constant: G. Gabrielse, Harvard University, Cambridge, USA. For the first time since 1985, the electron magnetic moment and the fine structure constant have been measured with improved accuracy. A one-electron quantum cyclotron is used.

Soliton attraction by the edge of chirped optical lattice: Y. Kartashov, L. Trophy, IFC-Institut de Ciencias Fotonicas, Castelldefels (Barcelona), Spain; V. Vyslovukh, Universidad de las Americas, Puebla, Mexico. We address soliton formation at the surface of chirped optical lattice. We find families of power thresholdless surface waves that do not exist at other lattice interfaces. Surfaces of chirped lattices act as soliton attractors.

Amorphization dynamics of Ge\textsubscript{2}Sb\textsubscript{2}Te\textsubscript{5} films under nano- and femtosecond laser pulse irradiation: J. Siegel, D. Puerto, J. Solis, CN AFonso, Instituto de Optica, CASINC, Madrid, Spain; A. Pravanov, R. Be, STMicroelectronics, Agrate Brianza, Italy; C. Wiemer, MDM laboratory, CNR-INFM, Agrate Brianza, Italy. The amorphization process in Ge\textsubscript{2}Sb\textsubscript{2}Te\textsubscript{5} under pulsed laser irradiation has been studied using reflectivity measurements with high temporal resolution. The role of the pulse duration and laser fluence on the phase change dynamics is discussed.

Self-Q-switched adaptive laser with quasi-CW diode-pumping: G. Smith, M.J. Damzen, Imperial College London, United Kingdom. We present quasi-cw diode-pumped adaptive lasers, based on induced gain gratings using self-intersecting loops. The systems produce self-Q-switched output pulses with ~5.6mJ energy, <7ns duration and ~1MW peak power with TEM\textsubscript{00} and single mode operation.

High temperature operation of 640nm wave-length high power laser diode arrays: D. Imamish, S. Hirata, K. Naganuma, K. Wakabayashi, Y. Takiguchi, S. Ito, H. Nakajima, Sony corporation, Atsugi, Japan. We have achieved 0.3W operation for a single emitter broad area red laser at 45 degrees centigrade for the first time, and highly reliable 25 emitter array operation of 6.6W at 25 degrees centigrade.

Continuousvariable lasers using pump-power locking of microchip lasers: M. Brunel, M. Vallet, Université de Rennes 1, Rennes, France. The pump power is shown to be an efficient thermo-optical wave-length controller in Er-Yb glass microcalors at 1.5 microns. We demonstrate the locking to C\textsubscript{2}H\textsubscript{2} lines of either cw or passively Q-switched microcalors with 10\textsuperscript{4} stability.

Closed-loop quantum design of a multi-watt 1178nm VECSEL: J.V. Moloney, J. Hader Nonlinear Control Strategies and University of Arizona, Tucson, USA; C. Hesienius, L. Fan, M. Fallahi, University of Arizona, Tucson, USA; W. Stolz, S.W. Koch, University of Marburg, Marburg, Germany. Combining a fully microscopic quantum design with full-scale optical/thermal simulation, we design and experimentally demonstrate a high-power optically-pumped VECSEL cavity capable of generating multi-Watt yellow light at 589 nm via second harmonic generation.
We mechanically tune the feedgap of a single gold bowtie antenna by precise nanomanipulation with the tip of an atomic force microscope. At the same time, its optical response population with the tip of an antenna by precise nanomanipulation with the tip of an optical antenna. Subwavelength ripple-like periodic structures and mushroom-like nanoneedles have been formed after single beam femtosecond laser pulses irradiation of tungsten. The period of ripple can be controlled by pulse energy, pulse numbers, and incident angle. We discuss the mechanisms of optical waveguiding in femtosecond laser-structured LiNbO3 and present experimental and theoretical results of waveguide fabrication techniques. As an application, efficient second harmonic generation is demonstrated in these structures.

We have fabricated high-Q pillar-cavities in lithium niobate. At the same time, its optical response population with the tip of an antenna by precise nanomanipulation with the tip of an optical antenna. We use linearly chirped fiber gratings to achieve a periodic signal recovery by reflecting a PRBS pulse train. We show that fluorescence of a very small number of atoms around the optical nanofiber can be measured efficiently by detecting the photons coupled to the guided mode of the nanofiber. We also show that atoms around the nanofiber behave like molecules due to formation of an atom-surface bound state.
Photon antibunching from a single quantum dot-microcavity system in the strong coupling regime

C. Hofmann, S. Reitzenstein, A. Forchel, A. Löffler, M. Kamp, University Würzburg, Germany; S. Götzinger, Y. Yamamoto, D. Press, Stanford University, USA

We present photon antibunching in the photorefractive diffraction holograms multiplexed in CdTe:V crystal.

R.V. Romashka, Yu.N. Kulchin, Institute of Automation & Control Processes, FEB RAS, Vladivostok, Russia; S. Di Girolamo, Centro de Investigación Científica y de Educación Superior de Ensenada, Mexico

Adaptive interferometer based on reflection hologram recorded in fast photorefractive crystal without external electric field using low-power light source was used as an active medium of the interferometer.

J.-C. Launay, C.N.R.S. Bordeaux, France

High-sensitive and fast-adaptive fiber-optic interferometer based on photorefractive diffusion holograms multiplexed in CdTe:V crystal.

R.V. Romashka, Yu.N. Kulchin, Institute of Automation & Control Processes, FEB RAS, Vladivostok, Russia; S. Di Girolamo, Centro de Investigación Científica y de Educación Superior de Ensenada, Mexico

Simple interferometer was enough sensitive to measure the light pressure and the Casimir force.

M. Petrov, J. Petter, T. Tschudi, Darmstadt University, Germany and A.F. Ioffe Physical Technical Institute, St. Petersburg, Russia; A.V. Khomenko, Centro de Investigación Científica y de Educación Superior de Ensenada, Mexico

A super-sensitive linear adaptive interferometer based on photorefractive BaTiO3:Co crystal.

We report a novel technique of an artificial linearization of the interferometer based on photorefractive materials with the diffusion mechanism of grating formation. The proposed interferometer was enough sensitive to measure the light pressure and the Casimir force.

V.M. Petrov, J. Petter, T. Tschudi, Darmstadt University, Germany and A.F. Ioffe Physical Technical Institute, St. Petersburg, Russia; A.V. Khomenko, Centro de Investigación Científica y de Educación Superior de Ensenada, Mexico

All-fiber pulsed Raman source pumped by Yb:Bi fiber laser.

A.S. Kurkov, V.V. Dvoynir, V.M. Paramonov, E.M. Dianov, O.I. Medvedkov, Russian Academy of Sciences, Moscow, Russia

We have realized all-fiber pulsed Raman source emitting at 1254 nm. The source was pumped by Yb:Bi fiber pulsed laser. P-doped fiber was used as an active medium of the converter. The conversion slope efficiency was of 70%.


Recent progress of the prototype laser for Shenguang-III.


We demonstrate the characteristics and recent progress of the prototype facility of Shenguang III laser fusion driver. It has operated target-shooting and will provide crucial data for the design and construction of Shenguang III.

M.A. Belkin, F. Capasso, Harvard University, Cambridge, USA; A. Belyanin, Texas A&M University, College Station, USA; D.L. Sivco, Bell Laboratories, Lucent Technologies, Murray Hill, USA

We demonstrate intra-cavity terahertz difference-frequency generation in quantum cascade lasers. A two-wavelength quantum cascade laser with monolithically integrated optical nonlinearity emitting at 7.6 and 8.7 micrometers was used to generate difference frequency at 62 micrometers.

M.A. Belkin, F. Capasso, Harvard University, Cambridge, USA; A. Belyanin, Texas A&M University, College Station, USA; D.L. Sivco, Bell Laboratories, Lucent Technologies, Murray Hill, USA

Narrow line-width, high-energy, 2-micron laser for coherent wind lidar.

U.N. Singh, J. Yu, NASA Langley Research Center, Hampton, USA

A diode-pumped, narrow linewidth 2-micron laser comprising a seed laser, an oscillator, and a double pass amplifier delivering in excess of 300mJ, Q-switched pulse at 10 Hz for wind and carbon dioxide measurement is described.

U.N. Singh, J. Yu, NASA Langley Research Center, Hampton, USA
CD9 Session: Slow and fast light
Chair: Christophe Finot, Université de Bourgogne, Dijon, France

CD9-1-FRI (Invited) 08:30
Slow light in semiconductor waveguides: theory and experiment

We present experimental and theoretical results on slow light in semiconductor waveguides. Multi-section waveguides for achieving a large and controllable phase shift at gigahertz frequencies as well as quantum dot structures are discussed.

CF9-1-FRI 08:30
68-fs passively mode-locked diode-pumped Yb⁺⁺:CaGdAlO₄ laser with an average power of 520 mW
J. Boudeile, Laboratoire Charles Fabry de l’Institut d’Optique, Palaiseau, France; P. Goldner, J. Petit, B. Viana, LCAES-ENSCP, Paris, France; F. Druon, M. Hanna, P. Georges, Laboratoire Charles Fabry de l’Institut d’Optique; Palaiseau, France; Y. Zouter, Amplitudes Systèmes, Pessac, France

We demonstrate the generation of 68-fs pulses with an average power of 520 mW from a diode-pumped Yb⁺⁺:CaGdAlO₄ mode-locked laser. This represents the highest average power ever obtained for a sub-70 fs diode-pumped Yb-bulk laser.

CF9-2-FRI 08:45
Resonant saturable absorbers for dispersion compensation in compact femtosecond lasers
G. Steinmeyer, U. Griebner, F. Saas, M. Moenster, Max-Born-Institute, Berlin, Germany; W. Richter, BATOP GmbH, Weimar, Germany

We discuss resonant saturable absorber mirrors as a novel concept, simultaneously enforcing mode-locking with their deep modulation depth and providing substantial amounts of dispersion. This concept may pave the way towards fully integrated femtosecond lasers.
Vertically emitting AlAs/GaAs microcavities with quality factors exceeding 110,000.

Record high quality factors exceeding 100,000 and 25,000 for quantum dot micropillar cavities with diameters of 4 µm and 2 µm were achieved for experiments in the field of cavity quantum electrodynamics.

Normal mode splitting induced by a local Rayleigh scatterer in a microsphere resonator: transition from weak to strong coupling.

Similarly to a coupled system composed of an atom and a microcavity mode, a transition from weak to strong coupling is observed when controllably inducing the coupling between two counterpropagating modes in a microsphere resonator.
We reveal novel opportunities for power-controlled switching and slowing down of optical pulses in waveguide couplers with phase-shifted Bragg gratings, combined with suppression of dispersion-induced pulse broadening through enhanced nonlinear self-action in the slow-light regime.

時間が変化を制御して、光の速度を遅くする極めて単純、コンパクト、容易にチューニングできるパルスコンプレッサーを示しました。これにより、2.2-fs プルスが示されました。

The control of time delays of large bandwidth microwave signals for radar applications is demonstrated through slowlight in SOA. Time delays ranging from 5 to 50 ps were measured within 15 GHz bandwidth.

Slow light as sharply as a lens.

動作が光学変調器、応力センサーや液体化学分離器に互換的であることを示しました。個々のデータの検出精度は、R2室で97%以上の原子を含んでいます。
Entanglement-assisted delayed-choice experiment
X. Ma, A. Qarry, N. Tetik, T. Jennewein, A. Zeilinger, Institute for Quantum Optics and Quantum Information, Vienna, Austria
The wave and particle duality of light is illustrated in a counterintuitive way by Wheeler's delayed-choice Gedankenexperiment. Here we report an experimental realization of that assisted by polarization entanglement of photon pairs.

10:30 – 12:00
IF8 Session: Quantum optics in matter
Chair: Thomas Puppe, Max-Planck-Institut für Quantenoptik, Garching, Germany

Deflection of slow light in a Stern-Gerlach magnetic field
L. Karpa, M. Weitz, Bonn University, Germany
Associated with light propagation under EIT conditions are dark polaritons, which are hybrid atom-light quasiparticles. With a Stern-Gerlach-like beam deflection experiment we demonstrate that these excitations have an effective magnetic moment.

10:30 – 12:00
CJ8: Fibre based sources
Chair: Philippe Roy, Faculté des Sciences et Techniques, Limoges, France

Low cost 60 ps, 1.33 MW peak power, 50 kHz repetition rate, pulsed microchip laser fiber amplifier system
D. Nodop, O. Schmidt, J. Limpert, A. Tünnermann, Friedrich-Schiller University, Jena, Germany; M. Guina, Tampere University of Technology and Reflektron Ltd., Tampere, Finland; R. Hoth, D. Richter, BATOP GmbH, Semiconductor optoelectronic devices, Weimar, Germany
We present an inexpensive and compact picosecond laser source. A passively q-switched microchip laser is amplified by an ytterbium doped PCF fiber in double-pass configuration to 60 ps pulses, 50 kHz repetition rate and 1.33 MW peak power.

Tunable operation of a high spectral purity continuous singly resonant optical parametric oscillator between 606 and 640 nm
T.H. My, F. Bretenaker, C. Drag, Laboratoire Aimé Cotton, Orsay, France; J.-M. Melkonian, Office National d’Etudes et de Recherches Aérospatiales, Palaiseau, France
A continuous wave 532-pumped singly resonant optical parametric oscillator using a MgO-doped periodically poled stoichiometric lithium tantalite crystal is developed. The signal frequency is tunable from 606 to 640 nm and stabilized on an external reference.

Efficient THz source using GaAs and InGaAs nip nip photomixers
S. Preu, F. Penner, S. Malzer, G.H. Döbler, L.J. Wang, University Erlangen-Nuremberg, Erlangen, Germany; M. Hanson, T.L. Wilkinson, R.C. Gossard, E.R. Brown, University of California, Santa Barbara, USA
We report on efficient ballistic-transport enhanced GaAs and InGaAs nip nip superlattice CW-THz sources with a transit-time 3dB-frequency up to 1 THz and independently designable RC-roll-off. 1 microwatt output power at 400 GHz has been achieved.
**Slow light and all-optical delay lines using cavity solitons in semiconductor lasers**

F. Pedaci, S. Barland, P. Genevet, E. Coboche, M. Giudici, J.R. Tredicce, Institut Non Linéaire de Nice, Valbonne, France; G. Tissoni, Università dell’Insubria, Como, Italy; W.J. Firth, A.J. Scroggie, T. Ackemann, G.-L. Oppo, University of Strathclyde, Glasgow, United Kingdom

Cavity solitons, besides their bistability and mutual independence, have unique plasticity properties. We take advantage of these to demonstrate an all-optical delay line based on cavity solitons in a semiconductor laser with optical injection.

---

**Supercontinuum generation of femtosecond filaments at different laser wavelengths in air**

L. Bergé, S. Skupin, CEA/DAM Ile de France, Bruyères-le-Châtel, France

Supercontinuum generation by femtosecond filaments in air is investigated numerically for different laser wavelengths ranging from ultraviolet to infrared. Maximal broadening is observed for large wavelengths and long filamentation ranges.

---

**Collisional properties of ultracold Chromium: towards a purely dipolar quantum gas**

T. Koch, B. Fröhlich, T. Lahaye, M. Fattori, A. Griesmaier, T. Pfau, 5. Physikalisches Institut, Stuttgart, Germany

Besides the usual contact interaction, Chromium BECs show magnetic dipole-dipole interactions. We report on experiments towards a purely dipolar quantum gas using a Feshbach resonance to tune the scattering length to zero.
A novel type of matter wave interferometer for molecules
S. Gerlich, L. Hackermüller, F. Goldfarb, A. Stibor, H. Ulbricht, M. Arndt, University of Vienna, Austria; K. Hamberger, Ludwig-Maximilians-University, Munich, Germany; T. Sivas, Massachusetts Institute of Technology, Cambridge, USA
We have realized a new type of matter-wave interferometer which is especially promising for applications with highly polarizable molecules in the mass range of up to several thousand atomic mass units.

Two-mode entangled radiation from single atoms
G. Morillo, Universitat Autonoma de Barcelona, Bellaterra, Spain; D. Vitali, S. Mancini, University of Cambridge, Italy; J. Eschner, ICFO-Institute of Photonic Sciences, Castelldefels (Barcelona), Spain; L. Davidovich, Universidade Federal do Rio de Janeiro, Rio de Janeiro, Brazil; S. Pielawa, Universitat Autonoma de Barcelona, Bellaterra and ICFO-Institute of Photonic Sciences, Castelldefels (Barcelona), Spain; P. Cañizares, Universitat Autonoma de Barcelona, Bellaterra, Spain and University of Camerino, Italy
We present and analyse several schemes to quantum-coherently generate two-mode squeezed (EPR-entangled) radiation in the pulsed or continuous regime, based on single atoms excited by an external field, which pump coherently a high-finesse resonator.

Optimization of a passively Q-switched double clad Yb:Cr+ all fibre laser
B. Dussardier, L. Labonté, A. Saijys, Université de Nice Sophia Antipolis, Nice, France
We report on the optimization through modeling of a passively Q-switched (PQS) all-fiber laser built around spliced Yb-doped amplifier and Cr-doped saturable-absorber (SA) fibers. The PQS stability versus pump power and SA concentration is investigated.

New transmitter-side dispersion compensation technique using analog predistorsion for 10 Gbit/s signals
L.M. Ranzani, B. Boffi, M. Martinelli, Politecnico di Milano, Italy
We propose a simple optical chromatic dispersion compensation technique, operating in the microwave domain at the transmitter by using a linear nested modulator. Preliminary performance results on 10 Gbit/s NRZ signals are described.

Numerical simulation of continuum generation in a multimode nonlinear waveguide
T. Chaipiboonwong, W.S. Brocklesby, P. Horak, J.D. Mills, University of Southampton, United Kingdom
Numerical simulations are utilised to study pulse propagation in a nonlinear multimode waveguide. Spatial and spectral interferences leading to unique features in the nonlinear spectral broadening are discussed.

Distributed gain in a Tm-doped silica fiber - experiment and modelling
S.R. Lüthi, M.L. Sundheimer, A.S.L. Gomes, Universidade Federal de Pernambuco, Recife, Brazil; B. Dussardier, W. Blanc, Université de Nice Sophia Antipolis, Nice, France; P. Peterka, Academy of Sciences of the Czech Republic, Prague, Czech Republic
Gain spectra and distributed gain at 1490 nm in a thulium-doped aluminosilicate fiber are measured and numerically modeled for several pump schemes. The model predicts that 20-dB gain is possible for an optimized fiber design.

Ultrafast optical transmission technologies
The paper reviews ultrahigh-speed data transmission in optical fibers based on optical time division multiplexing. Optical signal processing in the transmitter and receiver as well as the requirements on ultrahigh-speed data transmission are discussed.

Light reflection from a Bragg grating during continuum generation
P.S. Westbrook, J.W. Nicholson, K.S. Feder, OFS Labs, Somerset, USA
We measure the light reflected from a fiber Bragg grating when a highly nonlinear pulse generates a continuum in the fiber. Significant reflected light is observed both inside and outside of the grating bandgap.

Ultrafast gain recovery in quantum dot based semiconductor optical amplifiers
J. Gomis, Universitat de Valencia, Spain and University of Dortmund, Germany; S. Dommers, V.V. Temnov, U. Woggon, University of Dortmund, Germany; J. Martinez-Pastor, Universitat de Valencia, Spain; M. Laemlin, D. Bimberg, Technische Universität, Berlin, Germany
We study the gain dynamics in QD-based SOAs after excitation with fs-pulse trains of THz repetition rates. Direct capture from the wetting layer is identified as the dominant capture mechanism in the high current regime.
<table>
<thead>
<tr>
<th>Room 14c</th>
<th>Room 21</th>
<th>Room BOR2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>JSII-2-FRI 11:00</strong></td>
<td><strong>CH4-2-FRI 10:45</strong></td>
<td><strong>IB6-2-FRI 10:45</strong></td>
</tr>
<tr>
<td>A double cell metamaterial for independent tuning of the magnetic and electric response</td>
<td>Infrared mapping of material and doping contrasts in microelectronic devices at nanoscale spatial resolution</td>
<td>Ultracold heteronuclear molecules created from quantum gases</td>
</tr>
<tr>
<td>We present an effective approach to tune the resonances in double-wire metamaterials. The influence of additional metal stripes is investigated to modify independently the electric and magnetic response.</td>
<td>We demonstrate that infrared scattering-type scanning near-field optical microscopy (s-SNOM) allows mapping of different materials and electron concentrations in cross-sectional samples of industrial integrated circuit device structures at nanoscale spatial resolution.</td>
<td>We present the first realization of ultracold heteronuclear molecules in an optical lattice and discuss novel theoretical results on the binding energies and lifetimes of the molecules in comparison to experimental data.</td>
</tr>
<tr>
<td><strong>CH4-3-FRI 11:00</strong></td>
<td><strong>IB6-3-FRI 11:00</strong></td>
<td></td>
</tr>
<tr>
<td>Femto-Newton sensitivity opto-mechanical force measurement</td>
<td>Transport properties in a Mott-like state of molecules</td>
<td></td>
</tr>
<tr>
<td>We use a high-Q macroscopic torsional oscillator for measuring radiation pressure with a sensitivity at the femto-Newton force level. We discuss opto-mechanical coupling, its effects and thermal limit.</td>
<td>We study the transport properties in a Mott-like state of molecules with a single Feshbach molecule on each site of an optical lattice. A loss-induced suppression of tunneling is indicated by the experiment.</td>
<td></td>
</tr>
<tr>
<td>Room</td>
<td>Session Time</td>
<td>Title</td>
</tr>
<tr>
<td>------</td>
<td>--------------</td>
<td>----------------------------------------------------------------------</td>
</tr>
<tr>
<td>5</td>
<td>11:15</td>
<td>Bell states generation within the bandwidth of spontaneous parametric down-conversion</td>
</tr>
<tr>
<td>12</td>
<td>11:15</td>
<td>High power broadband Tm-doped superfluorescent fibre source at 2 μm</td>
</tr>
<tr>
<td>13</td>
<td>11:15</td>
<td>Long period fibre gratings for tunable spectral enhancement of a supercontinuum</td>
</tr>
<tr>
<td>14a</td>
<td>11:15</td>
<td>Tunable Terahertz emission from an electron bunch interacting with modulated laser pulses</td>
</tr>
<tr>
<td>14b</td>
<td>11:15</td>
<td>Wire pair negative-index material at Terahertz frequencies</td>
</tr>
<tr>
<td>8-FRI</td>
<td>11:30</td>
<td>Experimental mesoscopic coherence by parametric amplification of a single photo</td>
</tr>
<tr>
<td>9-FRI</td>
<td>11:30</td>
<td>Theory of monochromatic light amplification in multicore fibre lasers</td>
</tr>
<tr>
<td>6-FRI</td>
<td>11:45</td>
<td>Spectral combining of fibre amplified pulsed diode lasers</td>
</tr>
<tr>
<td>8-FRI</td>
<td>11:45</td>
<td>Spectral combining of fibre amplified pulsed diode lasers</td>
</tr>
<tr>
<td>6-FRI</td>
<td>11:45</td>
<td>Theory of the radiation trapping at the blue edge of supercontinuum and two-frequency quasi-solitons existing across the zero dispersion point</td>
</tr>
</tbody>
</table>

Note: The above table is a partial list of presentations from CLEO®/Europe-IQEC 2007. For a complete list, please refer to the conference program.
<table>
<thead>
<tr>
<th>Session</th>
<th>Time</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>JSII-3-FRI</td>
<td>11:15</td>
<td>Long pulse delays in thin metamaterial slabs</td>
<td>N. Papasimakis, V.A. Fedotov, N.I. Zheludev, University of Southampton, United Kingdom; S.L. Prosvirnin, National Academy of Sciences of Ukraine, Kharkov, Ukraine</td>
</tr>
<tr>
<td>JSII-4-FRI</td>
<td>11:30</td>
<td>Far-field investigation of slow-light propagating below the light cone in planar photonic structures</td>
<td>N. Le Thomas, R. Houdré, École Polytechnique Fédérale de Lausanne, Switzerland; L.H. Frandsen, J. Fage-Pedersen, A.V. Lavrinienko, P.I. Borel, Com Dtu, Technical Univ., Lyngby, Denmark</td>
</tr>
<tr>
<td>JSII-5-FRI</td>
<td>11:45</td>
<td>Achieving sharp resonances in metamaterials through symmetry breaking</td>
<td>V.A. Fedotov, N. Papasimakis, N.I. Zheludev, M. Rose, University of Southampton, United Kingdom; S.L. Prosvirnin, National Academy of Science of Ukraine, Kharkov, Ukraine</td>
</tr>
<tr>
<td>CH4-4-FRI</td>
<td>11:15</td>
<td>Precision measurements of weak forces and small mechanical deformations with the adaptive holographic interferometer</td>
<td>V.M. Petrov, Darmstadt Univ. of Technology, Darmstadt, Germany and A.F. Ioffe Physical Technical Ins., St. Petersburg, Russia; M.P. Petrov, V.V. Bryskin, A.F. Ioffe Physical Technical Ins., St. Petersburg, Russia; J. Petter, T. Tschudi, Darmstadt Univ. of Technology, Darmstadt, Germany</td>
</tr>
<tr>
<td>CH4-5-FRI</td>
<td>11:30</td>
<td>Development of a ground prototype of a quantum cascade laser heterodyne radiometer operating in the mid infrared</td>
<td>D. Weidmann, W.J. Rebun, K.M. Smith, Rutherford Appleton Laboratory, Oxfordshire, UK</td>
</tr>
<tr>
<td>CH4-6-FRI</td>
<td>11:45</td>
<td>Heterodyne interferometer with sub-nm sensitivity in translation measurement and sub-μrad sensitivity in tilt measurement for the LISA inertial sensor</td>
<td>T. Schuldt, EADS-Astrium GmbH, Friedrichshafen, Humboldt Universität zu Berlin and Hochschule für Technik, Wirtschaft und Gestaltung, Konstanz, Germany; D. Weise, U. Johann, EADS-Astrium GmbH, Friedrichshafen, Germany; M. Gohlke, EADS-Astrium GmbH, Friedrichshafen and Humboldt Universität zu Berlin, Germany; A. Peters, Humboldt-Universität zu Berlin, Germany; C. Braxmaier, Hochschule für Technik, Wirtschaft und Gestaltung, Konstanz and EADS-Astrium GmbH, Friedrichshafen, Germany</td>
</tr>
<tr>
<td>IB6-4-FRI (invited)</td>
<td>11:15</td>
<td>Excitation of Rydberg atoms in a Bose-Einstein condensate</td>
<td>R. Löwe, U. Raitzsch, R. Heidemann, V. Bendkowsky, B. Butcher, T. Pfau, Stuttgart University, Germany</td>
</tr>
<tr>
<td>Authors' Index</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>----------------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baets R.</td>
<td>CD6-2-WED</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bahbah S.</td>
<td>CA6-1-TUE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bahe J.</td>
<td>IF-12-TUE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bahritz M.</td>
<td>CB10-1-WED, CB15-3-FRI</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bai B.</td>
<td>JSID-3-FRI</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baida EJ.</td>
<td>CK3-3-MON</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bailer S.</td>
<td>CG3-5-WED</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bailer J.</td>
<td>CJ5-1-THU, CJ5-2-THU</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Galí G.</td>
<td>CB9-4-WED</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bain F.</td>
<td>CA2-5-MON</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baker S.</td>
<td>CG3-9-WED</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baker N.J.</td>
<td>CK7-5-WED</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bakkers E.P.A.M.</td>
<td>CEB-3-WED</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bakunor M.I.</td>
<td>CF-26-MON</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Balakrishnan S.</td>
<td>CK-14-MON</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baldwin K.G.H.</td>
<td>CD-2-WED</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Balkembois F.</td>
<td>CA-21-MON, CA8-4-WED, CA10-1-THU, CF8-3-THU</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Balle S.</td>
<td>IG-3-MON, CB13-6-THU</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Balling C.S.</td>
<td>CJ-26-TUE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Balling P.</td>
<td>CM-8-WED</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Balatuka A.</td>
<td>CG3-4-TUE, CJ4-1-WED</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Balyskin V.</td>
<td>IA-1-TUE, IA2-2-THU, IA2-3-THU</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bandelov U.</td>
<td>CF-3-MON</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bandi T. N.</td>
<td>IA-3-TUE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bang O.</td>
<td>CD1-2-MON, CJ1-3-WED, CF6-4-THU</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Banks D.P.</td>
<td>CF8-1-THU</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bansropun S.</td>
<td>CB-16-WED, CB10-6-WED</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bär C.R.E.</td>
<td>CF3-2-MON</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bär S.</td>
<td>CEB-2-THU</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barat D.</td>
<td>CB12-1-THU</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barbarin Y.</td>
<td>CF8-2-THU, JS13-3-THU</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barbay S.</td>
<td>IG1-5-MON, CB-36-WED</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barber D.</td>
<td>CJ6-4-THU</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barbari S.</td>
<td>CB15-4-FRI</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bardou N.</td>
<td>CA9-5-THU</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barker P. F.</td>
<td>IB-15-MON</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barland S.</td>
<td>IG1-1-MON, IG1-6-MON, IG4-1-WED, CD9-5-FRI</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barmenkov Yu.</td>
<td>CJ-25-TUE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barnes S.</td>
<td>CI-1-TUE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barnett S.M.</td>
<td>IC-19-TUE, IF4-3-THU</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barry L.P.</td>
<td>CJ-7-TUE, CB8-1-WED, CB12-2-THU, CD7-1-THU</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Authors' Index**

<table>
<thead>
<tr>
<th>Authors’ Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barsanti S.</td>
</tr>
<tr>
<td>Bartalini S.</td>
</tr>
<tr>
<td>Bartels F.</td>
</tr>
<tr>
<td>Bartels A.</td>
</tr>
<tr>
<td>Bartelt H.</td>
</tr>
<tr>
<td>Barthou G.</td>
</tr>
<tr>
<td>Bartlome R.</td>
</tr>
<tr>
<td>Baro J.</td>
</tr>
<tr>
<td>Bartuskova L.</td>
</tr>
<tr>
<td>Barviaux B.</td>
</tr>
<tr>
<td>Bashevoy M.</td>
</tr>
<tr>
<td>Basiev T.T.</td>
</tr>
<tr>
<td>Bassi A.</td>
</tr>
<tr>
<td>Bastian G.</td>
</tr>
<tr>
<td>Bättig R.</td>
</tr>
<tr>
<td>Baudon J.</td>
</tr>
<tr>
<td>Bauer D.M.</td>
</tr>
<tr>
<td>Baumberg J.J.</td>
</tr>
<tr>
<td>Baxter G.</td>
</tr>
<tr>
<td>Baynard E.</td>
</tr>
<tr>
<td>Beaufils Q.</td>
</tr>
<tr>
<td>Beaugeois M.</td>
</tr>
<tr>
<td>Beurepaire E.B.</td>
</tr>
<tr>
<td>Beccherelli R.</td>
</tr>
<tr>
<td>Becker C.</td>
</tr>
<tr>
<td>Becker A.</td>
</tr>
<tr>
<td>Becker C.</td>
</tr>
<tr>
<td>Becker Th.</td>
</tr>
<tr>
<td>Bedel-Pereira E.</td>
</tr>
<tr>
<td>Bére H.</td>
</tr>
<tr>
<td>Beha K.</td>
</tr>
<tr>
<td>Belkin M.A.</td>
</tr>
<tr>
<td>Bellanca G.</td>
</tr>
<tr>
<td>Bellancourt A.-R.</td>
</tr>
<tr>
<td>Bello Doua R.</td>
</tr>
<tr>
<td>Belloni F.</td>
</tr>
<tr>
<td>Belotti M.</td>
</tr>
<tr>
<td>Belyamin A.A.</td>
</tr>
<tr>
<td>Ben Bakir B.</td>
</tr>
<tr>
<td>Ben Braham N.</td>
</tr>
<tr>
<td>Benabid F.</td>
</tr>
<tr>
<td>Benalloul P.</td>
</tr>
<tr>
<td>Benalloul P.</td>
</tr>
</tbody>
</table>

**Authors’ Index**

<table>
<thead>
<tr>
<th>Authors’ Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bendkowsky V.</td>
</tr>
<tr>
<td>Bendoulas R.</td>
</tr>
<tr>
<td>Benedetti E.</td>
</tr>
<tr>
<td>Benedetti M.</td>
</tr>
<tr>
<td>Benedick A.</td>
</tr>
<tr>
<td>Bengrovicha J.</td>
</tr>
<tr>
<td>Benkahoul M.</td>
</tr>
<tr>
<td>Benikler E.</td>
</tr>
<tr>
<td>Bennion F.</td>
</tr>
<tr>
<td>Benson O.</td>
</tr>
<tr>
<td>Bente E.A.J.M.</td>
</tr>
<tr>
<td>Benz A.</td>
</tr>
<tr>
<td>Ben-Zvi G.</td>
</tr>
<tr>
<td>Berardi V.</td>
</tr>
<tr>
<td>Bergé L.</td>
</tr>
<tr>
<td>Berger G.</td>
</tr>
<tr>
<td>Berger P.</td>
</tr>
<tr>
<td>Berger S.</td>
</tr>
<tr>
<td>Berger V.</td>
</tr>
<tr>
<td>Berggren J.</td>
</tr>
<tr>
<td>Bergmanns F.</td>
</tr>
<tr>
<td>Beri S.</td>
</tr>
<tr>
<td>Berkvins T.</td>
</tr>
<tr>
<td>Berlien H.P.</td>
</tr>
<tr>
<td>Bernardes P.</td>
</tr>
<tr>
<td>Berner S.B.</td>
</tr>
<tr>
<td>Bernier M.</td>
</tr>
<tr>
<td>Bernu J.</td>
</tr>
<tr>
<td>Berrier A.</td>
</tr>
<tr>
<td>Berrou A.</td>
</tr>
<tr>
<td>Bertsch C.</td>
</tr>
<tr>
<td>Berthe L.</td>
</tr>
<tr>
<td>Bertoldi A.</td>
</tr>
<tr>
<td>Bertolotti J.</td>
</tr>
<tr>
<td>Bertolotti M.</td>
</tr>
<tr>
<td>Bertolotti A.</td>
</tr>
<tr>
<td>Bloch D.</td>
</tr>
</tbody>
</table>

**Authors’ Index**

<table>
<thead>
<tr>
<th>Authors’ Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bez R.</td>
</tr>
<tr>
<td>Bezuklov N.N.</td>
</tr>
<tr>
<td>Bhamber R.S.</td>
</tr>
<tr>
<td>Bhardwaj P.</td>
</tr>
<tr>
<td>Biaggio L.</td>
</tr>
<tr>
<td>Biagioni P.</td>
</tr>
<tr>
<td>Bicchi P.</td>
</tr>
<tr>
<td>Bidel Y.</td>
</tr>
<tr>
<td>Biegert J.</td>
</tr>
<tr>
<td>Bielawski S.</td>
</tr>
<tr>
<td>Bielsa F.</td>
</tr>
<tr>
<td>Bienert M.</td>
</tr>
<tr>
<td>Bierman J.</td>
</tr>
<tr>
<td>Bign L.</td>
</tr>
<tr>
<td>Bign J. Y-B.</td>
</tr>
<tr>
<td>Bigourd D.</td>
</tr>
<tr>
<td>Bimberg D.</td>
</tr>
<tr>
<td>Binks D.</td>
</tr>
<tr>
<td>Birge J.</td>
</tr>
<tr>
<td>Birks T.A.</td>
</tr>
<tr>
<td>Biruukov A.A.</td>
</tr>
<tr>
<td>Bisgaard C.Z.</td>
</tr>
<tr>
<td>Bissell L.</td>
</tr>
<tr>
<td>Bitald D.</td>
</tr>
<tr>
<td>Björk G.</td>
</tr>
<tr>
<td>Blaga C.I.</td>
</tr>
<tr>
<td>Blak J.</td>
</tr>
<tr>
<td>Blais A.</td>
</tr>
<tr>
<td>Blanc W.</td>
</tr>
<tr>
<td>Blanche P. A.</td>
</tr>
<tr>
<td>Blanchot N.</td>
</tr>
<tr>
<td>Blandin P.</td>
</tr>
<tr>
<td>Blaser S.</td>
</tr>
<tr>
<td>Blassensteiner B.</td>
</tr>
<tr>
<td>Bloch D.</td>
</tr>
<tr>
<td>Bloch L.</td>
</tr>
<tr>
<td>Bloch J.</td>
</tr>
<tr>
<td>Bloemer M.J.</td>
</tr>
<tr>
<td>Blonkin S.A.</td>
</tr>
<tr>
<td>Blonde D.</td>
</tr>
<tr>
<td>Blondy L.M.</td>
</tr>
<tr>
<td>Blood P.</td>
</tr>
</tbody>
</table>
Calligaro M. CB-16-WED, CB-6-2-TUE, CB-17-WED, CB-38-WED, CB11-2-THU, CB15-2-FRI
Calvez S. CB1-1-MON, CB12-3-THU
Camargo F.A. CA-1-MON
Camenisch U. CL2-3-THU
Camerer S. CB1-1-MON, CB12-3-THU
Campbell C.J. IFI-4-MON
Campbell S. CD8-5-THU
Campione M. CE-11-TUE
Camposeo A. CE1-2-MON, CK-11-MON, CE-11-TUE
Camy P. CA7-4-WED, CE8-5-THU
Canagasabey A. IF-17-TUE
Canalias C. CD8-5-THU
Cancio P. JSIII2-4-MON
Canet-Ferrer J. CK-5-MON, CE-16-TUE
Canfield B.K. JSII-1-WED, JSII3-3-FRI
Caniard T. IC5-3-WED
Cañizares P. IF8-3-FRI
Cano-Torres J. CF3-3-MON
Canova F. CG-2-WED, CG-3-WED, CG6-5-THU
Canova L. CG-3-WED
Canseviet C. CI-11-TUE
Canuel B. IB-4-MON
Canva M. CL1-5-THU
Capasso F. CB15-1-FRI
Capek P. CE3-4-TUE
Capmany J. CA-34-MON
Caputo R. CK8-4-WED
Caran D. CA-16-MON
Carbó J. CB18-4-WED
Carbó A. CE2-3-MON
Cardinal T. CA7-1-WED, CJ3-2-THU
Cardoso L. CA1-5-MON, CG6-4-TUE
Cargarrem V. CB-19-WED
Caridi F. CM-10-WED
Carminati R. CK5-4-TUE, CL3-2-THU
Cardia M. CK4-4-TUE, CB10-6-WED
Carrazo O. IB-6-MON
Carrere H. CB8-5-WED
Carroll O. IG-9-MON
Cartalesa S. IF2-2-TUE, ID1-3-THU
Carter A. CJ4-5-THU
Cartledge J.C. CI-2-TUE
Cascales C. CF3-3-MON
Caspani L. IF4-2-TUE
Caspar C. CI1-1-TUE
Casquiel R. CH1-1-MON
Casasnegres C. CG6-4-TUE
Cassel Engquist M. CH-9-MON, CH-10-MON
Cassemiro K.N. IC1-1-TUE
Cassetti S. CK10-1-TUE
Castagna R. CC1-3-THU
Castangi M. CA-21-MON, CA1-10-THU
Castellano A. CM-10-WED
Catalána M.A. CF6-6-MON, IG-2-MON, CB11-2-THU, CB38-WED
Cavalanci S.B. CK-30-THU
Cavalanci E.G. CK1-3-THU
Cerdá-Méndez E. CB-17-MON
Cerquero D. CB5-5-TUE
Cerezo T. CB5-5-TUE
Cerulli G. CD3-1-MON, CD3-2-THU, CF1-4-MON, CF5-3-WED, CL-8-WED, JSII-2-MON, JSII3-3-THU, CG6-5-THU
Cerutti G. CB8-5-TUE
Cesari V. CB9-1-WED
Chabber P. TF2-3-TUE
Chabé J. IB-17-MON, IB5-2-THU
Chacinski M. CB9-2-WED
Chabauty E. IB5-2-THU
Chabuti E. IB5-2-THU
Chabut M. CA11-1-FRI
Chacinska M. CF1-4-MON, CF5-3-WED, CL-8-WED, JSII-2-MON, JSII3-3-THU, CG6-5-THU
Chabut M. CA11-1-FRI
Chacinska M. CF1-4-MON, CF5-3-WED, CL-8-WED, JSII-2-MON, JSII3-3-THU, CG6-5-THU
Chabut M. CA11-1-FRI
Chacinska M. CF1-4-MON, CF5-3-WED, CL-8-WED, JSII-2-MON, JSII3-3-THU, CG6-5-THU
Chabut M. CA11-1-FRI
Chacinska M. CF1-4-MON, CF5-3-WED, CL-8-WED, JSII-2-MON, JSII3-3-THU, CG6-5-THU
Chabut M. CA11-1-FRI
Chacinska M. CF1-4-MON, CF5-3-WED, CL-8-WED, JSII-2-MON, JSII3-3-THU, CG6-5-THU
Chabut M. CA11-1-FRI
Chacinska M. CF1-4-MON, CF5-3-WED, CL-8-WED, JSII-2-MON, JSII3-3-THU, CG6-5-THU
Chabut M. CA11-1-FRI
Chacinska M. CF1-4-MON, CF5-3-WED, CL-8-WED, JSII-2-MON, JSII3-3-THU, CG6-5-THU
Chabut M. CA11-1-FRI
Chacinska M. CF1-4-MON, CF5-3-WED, CL-8-WED, JSII-2-MON, JSII3-3-THU, CG6-5-THU
Chabut M. CA11-1-FRI
Chacinska M. CF1-4-MON, CF5-3-WED, CL-8-WED, JSII-2-MON, JSII3-3-THU, CG6-5-THU
Chabut M. CA11-1-FRI
Chacinska M. CF1-4-MON, CF5-3-WED, CL-8-WED, JSII-2-MON, JSII3-3-THU, CG6-5-THU
Chabut M. CA11-1-FRI
<table>
<thead>
<tr>
<th>Authors' Index</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Authors' Index</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eilenberger F.</td>
<td>IE6-6-THU</td>
</tr>
<tr>
<td>Eiro T.</td>
<td>CA5-3-TUE</td>
</tr>
<tr>
<td>Eisenstein G.</td>
<td>CB9-5-WED</td>
</tr>
<tr>
<td>Ekers A.</td>
<td>IB-10-MON</td>
</tr>
<tr>
<td>Elad E.R.</td>
<td>IF2-4-TUE, IG2-3-TUE</td>
</tr>
<tr>
<td>El-Kallasi P.</td>
<td>JSII-3-THU</td>
</tr>
<tr>
<td>Elkin N.N.</td>
<td>CI8-5-FRI</td>
</tr>
<tr>
<td>Ell R.</td>
<td>CF3-1-MON</td>
</tr>
<tr>
<td>Ellis A.D.</td>
<td>CI2-2-TUE, CI-3-1-TUE, CI6-2-THU, CI8-4-FRI, CI8-5-FRI</td>
</tr>
<tr>
<td>Elman V.</td>
<td>IC2-2-TUE, CI-3-1-TUE, CI6-2-THU, CI8-4-FRI, CI8-5-FRI</td>
</tr>
<tr>
<td>Elsaesser T.</td>
<td>CF7-1-THU</td>
</tr>
<tr>
<td>Elsaass T.</td>
<td>CB-36-WED, IG1-5-MON</td>
</tr>
<tr>
<td>Elsässer W.</td>
<td>CB5-2-TUE, CB7-5-WED, CB9-2-WED, CB10-5-WED</td>
</tr>
<tr>
<td>Elser D.</td>
<td>CK6-3-TUE, IG6-6-THU</td>
</tr>
<tr>
<td>Elsmere S.P.</td>
<td>CF10-6-FRI</td>
</tr>
<tr>
<td>Elsner N.</td>
<td>CK2-2-MON</td>
</tr>
<tr>
<td>Emplit Ph.</td>
<td>IF-17-TUE</td>
</tr>
<tr>
<td>Engelbrecht M.</td>
<td>CJ-11-TUE</td>
</tr>
<tr>
<td>Ennser K.</td>
<td>CI-18-TUE, CD-13-WED, CI5-5-THEU, CJ6-1-THU</td>
</tr>
<tr>
<td>Erben B.</td>
<td>CB-23-WED, CB10-3-WED</td>
</tr>
<tr>
<td>Erdei G.</td>
<td>CC-19-WED</td>
</tr>
<tr>
<td>Eremerkin O.N.</td>
<td>CA7-4-WED</td>
</tr>
<tr>
<td>Emerencius S.</td>
<td>CJ-2-5-THU</td>
</tr>
<tr>
<td>Erneus T.</td>
<td>IG-10-MON, CB9-6-WED</td>
</tr>
<tr>
<td>Ernst P.</td>
<td>IB6-2-FRI</td>
</tr>
<tr>
<td>Ernst W.E.</td>
<td>ID-5-WED</td>
</tr>
<tr>
<td>Ernsting L.</td>
<td>IB-8-MON, IB4-3-THEU, IB5-4-WED, IB6-5-FRI</td>
</tr>
<tr>
<td>Ernt C.</td>
<td>CA9-1-THEU</td>
</tr>
<tr>
<td>Ertmer W.</td>
<td>IB-11-MON, IB4-3-THEU, IB4-4-WED, IB6-5-FRI</td>
</tr>
<tr>
<td>Erzgraber H.</td>
<td>CB-10-WED</td>
</tr>
<tr>
<td>Eschner J.</td>
<td>CI11-5-TUE, IF19-9, IB4-4-WED, IF8-3-FRI</td>
</tr>
<tr>
<td>Escorihuela R.</td>
<td>CB9-2-WED</td>
</tr>
<tr>
<td>Esquivias I.</td>
<td>CB-30-WED</td>
</tr>
<tr>
<td>Eslingner T.</td>
<td>IB3-3-THEU</td>
</tr>
<tr>
<td>Estable E.</td>
<td>CA7-1-WED</td>
</tr>
<tr>
<td>Esteban-Betegón F.</td>
<td>CB-6-WED</td>
</tr>
<tr>
<td>Esteban-Martín A.</td>
<td>IG-13-MON, IG3-6-WED</td>
</tr>
<tr>
<td>Esumi Y.</td>
<td>CG4-4-WED</td>
</tr>
<tr>
<td>Etchepare J.</td>
<td>IE-11-TUE</td>
</tr>
<tr>
<td>Etrich C.</td>
<td>CK-10-MON, CK9-2-WED</td>
</tr>
<tr>
<td>Euser T.G.</td>
<td>CK-28-MON</td>
</tr>
<tr>
<td>Evain C.</td>
<td>IG2-4-TUE, CF10-4-FRI</td>
</tr>
<tr>
<td>Evans R.</td>
<td>CC-14-WED</td>
</tr>
<tr>
<td>Evans R.A.</td>
<td>CC4-1-THEU</td>
</tr>
<tr>
<td>Extermann J.</td>
<td>CLA-1-THEU</td>
</tr>
<tr>
<td>Ezih A.A.</td>
<td>CM-1-WED</td>
</tr>
<tr>
<td>Fabbro R.</td>
<td>CM-4-WED</td>
</tr>
<tr>
<td>Fabre C.</td>
<td>IF2-1-TUE, IF2-3-TUE, IF5-2-TUE</td>
</tr>
<tr>
<td>Fabricio F.</td>
<td>CK10-4-WED</td>
</tr>
<tr>
<td>Facch D.</td>
<td>IC1-2-TUE</td>
</tr>
<tr>
<td>Faenov A.</td>
<td>CG4-4-WED, CF5-5-WED</td>
</tr>
<tr>
<td>Faiz J.</td>
<td>CB-23-WED, CB10-3-WED</td>
</tr>
<tr>
<td>Falcao Filho E.L.</td>
<td>CD-10-WED</td>
</tr>
<tr>
<td>Falcozer E.</td>
<td>CB-3-WED</td>
</tr>
<tr>
<td>Falahzi M.</td>
<td>CB-21-WED, CB11-1-WED</td>
</tr>
<tr>
<td>Fallato D.</td>
<td>CC5-6-FRI</td>
</tr>
<tr>
<td>Fallend M.</td>
<td>CB-5-WED</td>
</tr>
<tr>
<td>Falt S.</td>
<td>IF3-2-TUE</td>
</tr>
<tr>
<td>Farn Le Kien</td>
<td>IA-1-TUE</td>
</tr>
<tr>
<td>Fan J.</td>
<td>ID-4-WED</td>
</tr>
<tr>
<td>Fan L.</td>
<td>CB-21-WED, CB11-1-WED</td>
</tr>
<tr>
<td>Fang G.Y.</td>
<td>CD-14-WED</td>
</tr>
<tr>
<td>Fanouman G.</td>
<td>IE-21-TUE</td>
</tr>
<tr>
<td>Fanjul-Vélez F.</td>
<td>CL-10-WED</td>
</tr>
<tr>
<td>Farrón I.</td>
<td>CJ-4-THEU</td>
</tr>
<tr>
<td>Fasching G.</td>
<td>CB-26-WED, CK8-2-WED</td>
</tr>
<tr>
<td>Fatome J.</td>
<td>CF-8-MON, CI-3-1-WED, CI6-2-THU</td>
</tr>
<tr>
<td>Fazekas G.</td>
<td>CB-5-WED, IB6-1-FRI</td>
</tr>
<tr>
<td>Fausti M.</td>
<td>IB3-5-WED</td>
</tr>
<tr>
<td>Faucher A.</td>
<td>CB10-3-WED, IB4-3-WED, IB6-5-FRI</td>
</tr>
<tr>
<td>Fechner M.</td>
<td>CB7-3-WED, CA8-5-WED</td>
</tr>
<tr>
<td>Feder K.S.</td>
<td>CD10-3-FRI</td>
</tr>
<tr>
<td>Fedin A.V.</td>
<td>CA-11-MON</td>
</tr>
<tr>
<td>Fedorov M.V.</td>
<td>IF-14-TUE</td>
</tr>
<tr>
<td>Fedorov P.P.</td>
<td>CA7-2-WED</td>
</tr>
<tr>
<td>Fedoruk M.P.</td>
<td>CI-12-TUE, CH1-3-TUE, CM2-1-TUE</td>
</tr>
<tr>
<td>Fedotov A.B.</td>
<td>CD5-1-WED</td>
</tr>
<tr>
<td>Fedotov V.A.</td>
<td>JSII-3-2-FRI, JSII4-3-FRI</td>
</tr>
<tr>
<td>Fedotova O.</td>
<td>CC-18-WED</td>
</tr>
<tr>
<td>Fedrizzi A.</td>
<td>IC-15-TUE</td>
</tr>
<tr>
<td>Feiginov M.</td>
<td>CH2-2-MON</td>
</tr>
<tr>
<td>Fekete J.</td>
<td>CF-19-MON</td>
</tr>
<tr>
<td>Fellbacq D.</td>
<td>CK10-4-TUE</td>
</tr>
<tr>
<td>Feldmann T.</td>
<td>CB-14-WED</td>
</tr>
<tr>
<td>Felinto D.</td>
<td>IF1-1-MON, CI-3-1-TUE</td>
</tr>
<tr>
<td>Fellow M.</td>
<td>CJ-23-TUE</td>
</tr>
<tr>
<td>Fellows N.</td>
<td>CE3-3-TUE</td>
</tr>
<tr>
<td>Feng B.</td>
<td>CA11-1-FRI</td>
</tr>
<tr>
<td>Feng Y.</td>
<td>CD-25-WED</td>
</tr>
<tr>
<td>Ferber R.</td>
<td>ID-7-WED</td>
</tr>
<tr>
<td>Ferenczi A.</td>
<td>IC1-3-TUE</td>
</tr>
<tr>
<td>Ferguson A.I.</td>
<td>CB1-2-MON</td>
</tr>
<tr>
<td>Fernández A.</td>
<td>CF3-3-MON, CG4-2-WED, CJ1-4-WED</td>
</tr>
<tr>
<td>Fernández de Córdoba P.</td>
<td>IE7-1-TUE</td>
</tr>
<tr>
<td>Fernholz Th.</td>
<td>IA1-1-TUE</td>
</tr>
<tr>
<td>Féron P.</td>
<td>CA-37-MON, CJ6-6-TUE</td>
</tr>
<tr>
<td>Ferrand B.</td>
<td>CA5-5-TUE</td>
</tr>
<tr>
<td>Ferrando A.</td>
<td>IE7-1-TUE</td>
</tr>
<tr>
<td>Ferrando-May E.</td>
<td>CL2-3-TUE</td>
</tr>
<tr>
<td>Ferrari A.C.</td>
<td>CB-10-THU</td>
</tr>
<tr>
<td>Ferrari G.</td>
<td>ID2-4-TUE</td>
</tr>
<tr>
<td>Ferrari M.</td>
<td>CK-26-MON, CE-8-TUE</td>
</tr>
<tr>
<td>Ferrari R.</td>
<td>CD-24-WED</td>
</tr>
<tr>
<td>Ferrario M.</td>
<td>CE5-4-WED, CE6-4-WED</td>
</tr>
<tr>
<td>Ferrario P.</td>
<td>CC-4-WED, CH3-5-FRI</td>
</tr>
<tr>
<td>Ferreira A.</td>
<td>CD4-5-WED, IC3-1-WED</td>
</tr>
<tr>
<td>Ferrei E.</td>
<td>IF4-6-TUE</td>
</tr>
<tr>
<td>Ferrier M.</td>
<td>CK8-3-WED</td>
</tr>
<tr>
<td>Ferrini R.</td>
<td>JSII-3-1-TUE</td>
</tr>
<tr>
<td>Fichert M.</td>
<td>CD-13-WED, CI9-5-TUE</td>
</tr>
<tr>
<td>Fichet M.</td>
<td>ID-1-2-TUE</td>
</tr>
<tr>
<td>Fiebig T.</td>
<td>CA-23-MON, JE-20-TUE</td>
</tr>
<tr>
<td>Figi H.</td>
<td>CE1-6-MON</td>
</tr>
<tr>
<td>Figueira G.</td>
<td>CA1-5-MON, CG6-4-TUE</td>
</tr>
<tr>
<td>Filip R.</td>
<td>IC6-6-WED</td>
</tr>
<tr>
<td>Filippov V.V.</td>
<td>CE-18-TUE</td>
</tr>
<tr>
<td>Fill E.E.</td>
<td>CF7-2-TUE</td>
</tr>
<tr>
<td>Fily A.</td>
<td>CB-37-WED</td>
</tr>
<tr>
<td>Finazzi M.</td>
<td>JSII-2-WED</td>
</tr>
<tr>
<td>Finazzi V.</td>
<td>CB3-1-FRI</td>
</tr>
<tr>
<td>Fink M.</td>
<td>CK3-2-MON</td>
</tr>
<tr>
<td>Finog R.</td>
<td>CF-8-MON, CI2-1-TUE, CI6-2-TUE</td>
</tr>
<tr>
<td>Finterbusch K.</td>
<td>CK7-5-WED</td>
</tr>
<tr>
<td>Fiu G.</td>
<td>CB8-2-WED, IG6-3-TUE</td>
</tr>
<tr>
<td>Fiore A.</td>
<td>CB9-1-WED, CB9-2-WED, CD-16-WED, CK9-6-WED</td>
</tr>
<tr>
<td>Firth W.J.</td>
<td>IG7-7-MON, IG3-4-WED, IG4-4-WED, CD9-5-FRI</td>
</tr>
<tr>
<td>Fischer A.</td>
<td>CR2-5-MON, CH-8-MON</td>
</tr>
<tr>
<td>Fischer I.</td>
<td>CB5-3-TUE, CB7-5-WED, JSII-2-TUE</td>
</tr>
<tr>
<td>Fischer R.</td>
<td>CD1-6-MON, CF17-1-MON, IE2-1-TUE, CJ1-1-WED</td>
</tr>
<tr>
<td>Fischer S.</td>
<td>CK2-3-MON</td>
</tr>
<tr>
<td>Flammini R.</td>
<td>CG3-2-TUE</td>
</tr>
<tr>
<td>Fleischman Z.</td>
<td>CE9-1-TUE</td>
</tr>
<tr>
<td>Floros N.J.</td>
<td>CH-1-MON, CD-5-WED</td>
</tr>
<tr>
<td>Foglietti V.</td>
<td>CE-8-TUE, IG5-2-WED</td>
</tr>
<tr>
<td>Fok M.P.</td>
<td>CA1-1-TUE, CD6-3-WED, CH2-4-TUE</td>
</tr>
<tr>
<td>Folliot H.</td>
<td>CD7-1-TUE</td>
</tr>
<tr>
<td>Font J.L.</td>
<td>IG-6-MON</td>
</tr>
<tr>
<td>Fontaine-Aupart M.P.</td>
<td>IE-8-TUE</td>
</tr>
<tr>
<td>Forchel A.</td>
<td>CB3-4-MON, CB6-1-TUE, IF7-1-FRI, IF3-7-FRI</td>
</tr>
<tr>
<td>Forin D.M.</td>
<td>CF4-5-WED, CG6-6-TUE</td>
</tr>
<tr>
<td>Forget N.</td>
<td>CF-16-MON, CF4-5-WED, CG6-6-TUE</td>
</tr>
<tr>
<td>Fidele M.</td>
<td>CD-13-WED, CI9-5-TUE</td>
</tr>
<tr>
<td>Firal M.</td>
<td>IF7-1-FRI, IF3-7-FRI</td>
</tr>
<tr>
<td>Fordell T.</td>
<td>CB9-2-WED</td>
</tr>
<tr>
<td>Fontijn A.</td>
<td>CF-16-MON, CF4-5-WED, CG6-6-TUE</td>
</tr>
<tr>
<td>Fornas S.</td>
<td>CD-13-WED, CI9-5-TUE</td>
</tr>
<tr>
<td>Formont S.</td>
<td>CI1-11-TUE</td>
</tr>
<tr>
<td>Forster M.</td>
<td>CF3-2-WED</td>
</tr>
<tr>
<td>Förster L.</td>
<td>IF-15-TUE</td>
</tr>
<tr>
<td>Fort A.</td>
<td>CD-9-WED</td>
</tr>
<tr>
<td>Forte E.</td>
<td>CL-2-TUE</td>
</tr>
<tr>
<td>Forysza W.</td>
<td>CI1-2-TUE</td>
</tr>
<tr>
<td>Authors' Index</td>
<td></td>
</tr>
<tr>
<td>----------------</td>
<td></td>
</tr>
<tr>
<td>Hammar M.</td>
<td>CB8-3-WED</td>
</tr>
<tr>
<td>Hamaz A.</td>
<td>CB27-WED</td>
</tr>
<tr>
<td>Hanaiizumi O.</td>
<td>CB6-1-WED</td>
</tr>
<tr>
<td>Hancock S.</td>
<td>CG-13-WED</td>
</tr>
<tr>
<td>Hand D.P.</td>
<td>CL-2-WED, CD8-5-THU, CH3-2-FRI</td>
</tr>
<tr>
<td>Hanna M.</td>
<td>CJ-19-TUE, IE-8-TUE, CF8-3-THU, CP9-1-FRI</td>
</tr>
<tr>
<td>Hannaford P.</td>
<td>IB-14-MON</td>
</tr>
<tr>
<td>Hannemann S.</td>
<td>ID2-3-THU</td>
</tr>
<tr>
<td>Hänisch T.W.</td>
<td>IA-5-TUE IA1-3-TUE, IA1-4-TUE, PL2-1-TUE, CH4-1-FRI</td>
</tr>
<tr>
<td>Hansel T.</td>
<td>CC5-6-FRI</td>
</tr>
<tr>
<td>Hansen K.P.</td>
<td>CJ5-4-THU</td>
</tr>
<tr>
<td>Hans-Georg von Ribbeck H.</td>
<td>JSIII1-2-MON</td>
</tr>
<tr>
<td>Hanson M.</td>
<td>CB15-5-FRI</td>
</tr>
<tr>
<td>Hantke K.</td>
<td>CB1-4-MON, CB18-WED</td>
</tr>
<tr>
<td>Harb C.C.</td>
<td>CF10-4-FRI</td>
</tr>
<tr>
<td>Harding P.J.</td>
<td>CK-28-MON</td>
</tr>
<tr>
<td>Härkönen A.</td>
<td>CB11-5-THU, CB13-2-THU</td>
</tr>
<tr>
<td>Harman J.C.</td>
<td>CB1-3-MON</td>
</tr>
<tr>
<td>Haroche S.</td>
<td>IC2-5-TUE</td>
</tr>
<tr>
<td>Harper P.</td>
<td>CD2-1-MON, CD2-2-MON, CD20-6-WED</td>
</tr>
<tr>
<td>Harrison J.</td>
<td>CD3-6-MON, CD20-6-WED</td>
</tr>
<tr>
<td>Harrison R.J.</td>
<td>CD20-6-WED</td>
</tr>
<tr>
<td>Harrison R.G.</td>
<td>CD2-4-MON, IE-3-THU</td>
</tr>
<tr>
<td>Harrison K.J.</td>
<td>JSI2-4-THU</td>
</tr>
<tr>
<td>Härter A.</td>
<td>IF-15-TUE</td>
</tr>
<tr>
<td>Hartke R.</td>
<td>CD8-2-THU</td>
</tr>
<tr>
<td>Hartmann P.</td>
<td>CE-25-TUE</td>
</tr>
<tr>
<td>Hartmann M.J.</td>
<td>ICI-1-TUE</td>
</tr>
<tr>
<td>Hartnagel H.L.</td>
<td>CH2-2-MON</td>
</tr>
<tr>
<td>Hartung T.</td>
<td>CE7-1-THU</td>
</tr>
<tr>
<td>Hartwig H.</td>
<td>IE6-5-TUE</td>
</tr>
<tr>
<td>Harvey J.D.</td>
<td>CD7-2-THU</td>
</tr>
<tr>
<td>Hasegawa T.</td>
<td>JS3-6-THU</td>
</tr>
<tr>
<td>Hasegawa T.</td>
<td>CE1-4-MON</td>
</tr>
<tr>
<td>Hashimoto S.</td>
<td>CF3-2-MON</td>
</tr>
<tr>
<td>Hashmi F.A.</td>
<td>IE4-2-WED</td>
</tr>
<tr>
<td>Hasler K.-H.</td>
<td>CB11-1-THU</td>
</tr>
<tr>
<td>Hassioua L.</td>
<td>CB17-1-WED, CB11-2-THU</td>
</tr>
<tr>
<td>Hastie J. E.</td>
<td>CB1-1-MON</td>
</tr>
<tr>
<td>Hatakeyama H.</td>
<td>CB31-2-WED</td>
</tr>
<tr>
<td>Haubrich D.</td>
<td>CJ-3-TUE</td>
</tr>
<tr>
<td>Haubrich D.</td>
<td>IB12-MON</td>
</tr>
<tr>
<td>Haugen H.</td>
<td>CJ8-TUE</td>
</tr>
<tr>
<td>Hauri C.P.</td>
<td>CF1-3-MON, CF1-6-MON, CG4-5-WED</td>
</tr>
<tr>
<td>Haus J.W.</td>
<td>CJ9-TUE</td>
</tr>
<tr>
<td>Hauschild R.</td>
<td>CB5-2-WED</td>
</tr>
<tr>
<td>Hause A.</td>
<td>IE6-5-TUE</td>
</tr>
<tr>
<td>Havermann K.</td>
<td>IG2-1-TUE</td>
</tr>
<tr>
<td>Hawkes S.J.</td>
<td>CG13-WED</td>
</tr>
<tr>
<td>Haworth C.</td>
<td>CG4-3-WED</td>
</tr>
<tr>
<td>Hayau J.-F.</td>
<td>CB9-2-WED</td>
</tr>
<tr>
<td>He S.</td>
<td>CA11-1-FRI</td>
</tr>
<tr>
<td>He Y.</td>
<td>CD-2-WED</td>
</tr>
<tr>
<td>Healy T.</td>
<td>CJ8-4-FRI, CJ8-5-FRI</td>
</tr>
<tr>
<td>Heard P.J.</td>
<td>CE1-TUE, CB2-WED</td>
</tr>
<tr>
<td>Hebling J.</td>
<td>CD7-2-THU</td>
</tr>
<tr>
<td>Heck M.J.R.</td>
<td>CF8-2-THU</td>
</tr>
<tr>
<td>Heersink J.</td>
<td>IC6-4-THU, IF5-2-FRI</td>
</tr>
<tr>
<td>Hector K.</td>
<td>IG6-1-FRI</td>
</tr>
<tr>
<td>Heim J.</td>
<td>CA1-5-MON, CA2-3-MON, CB24-WED, CG6-1-THU</td>
</tr>
<tr>
<td>Heizner Z.</td>
<td>CF3-2-MON</td>
</tr>
<tr>
<td>Heinrich M.</td>
<td>CK2-2-WED</td>
</tr>
<tr>
<td>Heinrich M.</td>
<td>CH2-2-WED</td>
</tr>
<tr>
<td>Heinrich M.P.</td>
<td>CH2-4-MON</td>
</tr>
<tr>
<td>Heinzmann U.</td>
<td>CF7-4-THU</td>
</tr>
<tr>
<td>Heitler C.</td>
<td>CI-2-WED</td>
</tr>
<tr>
<td>Hellert C.</td>
<td>JSID-3-FRI, JSIIA-2-FRI</td>
</tr>
<tr>
<td>Heßler J.H.</td>
<td>CA9-MON</td>
</tr>
<tr>
<td>Hellstrom J.E.</td>
<td>CA3-MON</td>
</tr>
<tr>
<td>Helmholz M.</td>
<td>CA3-MON</td>
</tr>
<tr>
<td>Hellwig M.</td>
<td>CA3-MON</td>
</tr>
<tr>
<td>Hendel S.</td>
<td>CF7-4-THU</td>
</tr>
<tr>
<td>Hendricks R.J.</td>
<td>IC3-3-WED</td>
</tr>
<tr>
<td>Henneberg O.</td>
<td>CC-21-WED</td>
</tr>
<tr>
<td>Henneke K.</td>
<td>IG6-2-THU, JSIIA-3-2-FRI</td>
</tr>
<tr>
<td>Henning L.D.</td>
<td>CB2-2-WED</td>
</tr>
<tr>
<td>Hensler S.</td>
<td>IB3-5-WED</td>
</tr>
<tr>
<td>Henriksen M.</td>
<td>IC2-2-FRI</td>
</tr>
<tr>
<td>Henriquez M.</td>
<td>CJ12-TUE</td>
</tr>
<tr>
<td>Henriquez Hernandez E.</td>
<td>CJ3-3-TUE</td>
</tr>
<tr>
<td>Hernandez-Gomez C.</td>
<td>CG6-3-TUE</td>
</tr>
<tr>
<td>Herr W.</td>
<td>IB11-MON</td>
</tr>
<tr>
<td>Herrero R.</td>
<td>IE12-TUE</td>
</tr>
<tr>
<td>Herrmann S.</td>
<td>ID3-3-FRI</td>
</tr>
<tr>
<td>Herskind P.F.</td>
<td>IC3-3-WED</td>
</tr>
<tr>
<td>Herzog Ch.</td>
<td>CE4-2-TUE</td>
</tr>
<tr>
<td>Hesse M.</td>
<td>IB3-6-THU</td>
</tr>
<tr>
<td>Heteg T.</td>
<td>IF5-3-TUE</td>
</tr>
<tr>
<td>Hetternich J.</td>
<td>CK13-MON</td>
</tr>
<tr>
<td>Hettemich M.</td>
<td>CK2-4-MON, IF3-4-TUE</td>
</tr>
<tr>
<td>Heuck M.-H.</td>
<td>CC12-2-THU</td>
</tr>
<tr>
<td>Heuer A.</td>
<td>CB11-3-THU</td>
</tr>
<tr>
<td>Heugel S.</td>
<td>CH4-3-FRI</td>
</tr>
<tr>
<td>Heumann E.</td>
<td>CA36-MON, CA5-2-TUE, CD8-2-THU</td>
</tr>
<tr>
<td>Heurs M.</td>
<td>CA2-MON</td>
</tr>
<tr>
<td>Heusler G.</td>
<td>CJ5-2-TUE</td>
</tr>
<tr>
<td>Hickmann J.M.</td>
<td>CK30-MON</td>
</tr>
<tr>
<td>Hidaka M.</td>
<td>CC20-WED</td>
</tr>
<tr>
<td>Hidetsugu H.</td>
<td>CF15-4-THU</td>
</tr>
<tr>
<td>Hepp N.</td>
<td>IF14-4-TUE</td>
</tr>
<tr>
<td>Heßler J.H.</td>
<td>CA9-MON</td>
</tr>
<tr>
<td>Hidemitsu H.</td>
<td>CA3-MON</td>
</tr>
<tr>
<td>Higashiguchi T.</td>
<td>CG1-WED, CG8-4-WED</td>
</tr>
<tr>
<td>Hijlkema M.</td>
<td>IC7-2-THU</td>
</tr>
<tr>
<td>Hikita M.</td>
<td>CG8-4-WED</td>
</tr>
<tr>
<td>Hildrico L.</td>
<td>ID2-2-THU</td>
</tr>
<tr>
<td>Hill C.</td>
<td>CE7-7UE</td>
</tr>
<tr>
<td>Hillenbrand R.</td>
<td>CH4-2-FRI</td>
</tr>
<tr>
<td>Hirano T.H.</td>
<td>IB18-MON, IC5-TUE, IC10-4-TUE</td>
</tr>
<tr>
<td>Hirata S.</td>
<td>CB14-3-THU, CB14-5-THU</td>
</tr>
<tr>
<td>Hirata Y.</td>
<td>CE2-2-THU</td>
</tr>
<tr>
<td>Hirohashi J.</td>
<td>CE1-5-MON</td>
</tr>
<tr>
<td>Hirtz J.P.</td>
<td>CB19-2WED</td>
</tr>
<tr>
<td>Hou S.</td>
<td>CE5-5-WED, CF8-6-THU</td>
</tr>
<tr>
<td>Hu K.</td>
<td>C17-1-THU</td>
</tr>
<tr>
<td>Howel S.</td>
<td>IC5-2-TUE</td>
</tr>
<tr>
<td>Hofmann A.</td>
<td>CE7-4-THU</td>
</tr>
<tr>
<td>Hoffmann D.</td>
<td>CB10-4-WED, CK9-5-WED</td>
</tr>
<tr>
<td>Hoffmann L.</td>
<td>CB7-6-THU</td>
</tr>
<tr>
<td>Hoffmann M.</td>
<td>CB8-4-THU</td>
</tr>
<tr>
<td>Hoffrogge I.</td>
<td>IA1-3-TUE</td>
</tr>
<tr>
<td>Hofling S.</td>
<td>CB8-1-TUE, CE7-3-FRI</td>
</tr>
<tr>
<td>Hofmann C.</td>
<td>IF7-1-FRI, IF7-3-FRI</td>
</tr>
<tr>
<td>Hofmann H.</td>
<td>IF25-2-WED</td>
</tr>
<tr>
<td>Hofmann W.</td>
<td>CB4-2-TUE</td>
</tr>
<tr>
<td>Hogervorst W.</td>
<td>CF2-5-MON, JSIII1-3-MON</td>
</tr>
<tr>
<td>Hogg R.A.</td>
<td>CB6-4-THU</td>
</tr>
<tr>
<td>Holen A.</td>
<td>JSI6-WED</td>
</tr>
<tr>
<td>Holmuth M.</td>
<td>CJ1-8-FRI</td>
</tr>
<tr>
<td>Hold S.</td>
<td>CK9-6-WED</td>
</tr>
<tr>
<td>Holgado M.</td>
<td>CH1-1-MON</td>
</tr>
<tr>
<td>Hollberg L.</td>
<td>IA2-1-TUE</td>
</tr>
<tr>
<td>Huller M.</td>
<td>CG4-4-WED, CG4-6-WED</td>
</tr>
<tr>
<td>Holleville D.</td>
<td>IB4-MON</td>
</tr>
<tr>
<td>Holmegaard L.</td>
<td>CG5-2-WED</td>
</tr>
<tr>
<td>Holmes C.H.</td>
<td>CE4-4-WED</td>
</tr>
<tr>
<td>Holmtoftsonpoetter M.</td>
<td>CD26-WED</td>
</tr>
<tr>
<td>Holzhöfer R.</td>
<td>CD25-2-WED</td>
</tr>
<tr>
<td>Holzwarth R.</td>
<td>JSIII1-3-MON</td>
</tr>
<tr>
<td>Homann C.</td>
<td>IE23-TUE</td>
</tr>
<tr>
<td>Honda Y.</td>
<td>CA3-3-TUE</td>
</tr>
<tr>
<td>Hong Y.</td>
<td>CB3-3-WED, CB2-7-2-WED</td>
</tr>
<tr>
<td>Honzatko P.</td>
<td>CA4-3-THU</td>
</tr>
<tr>
<td>Hooker C.J.</td>
<td>CG13-2-WED</td>
</tr>
<tr>
<td>Höpcke N.</td>
<td>IF3-4-TUE</td>
</tr>
<tr>
<td>Hopfer E.</td>
<td>CB8-2-WED</td>
</tr>
<tr>
<td>Hopkins J.-M.</td>
<td>CB1-5-MON</td>
</tr>
<tr>
<td>Hopkinson M.</td>
<td>CB6-4-TUE, IF7-4-FRI</td>
</tr>
<tr>
<td>Horak P.</td>
<td>CD1-5-MON, CD44-WED, CD10-2-FRI</td>
</tr>
<tr>
<td>Horio T.</td>
<td>CF1-5-MON</td>
</tr>
<tr>
<td>Horlein R.</td>
<td>CG4-1-WED</td>
</tr>
<tr>
<td>Horn W.</td>
<td>CC17-2-WED</td>
</tr>
<tr>
<td>Hornberger K.</td>
<td>IF8-2-FRI</td>
</tr>
<tr>
<td>Hornung M.</td>
<td>CA2-3-MON, CG6-1-THU</td>
</tr>
<tr>
<td>Horoslak D.B.</td>
<td>CB29-2-WED</td>
</tr>
<tr>
<td>Horst S.</td>
<td>CB1-4-MON, CB18-16-WED</td>
</tr>
<tr>
<td>Horvath V.</td>
<td>CA9-MON</td>
</tr>
<tr>
<td>Horvath Z.L.</td>
<td>CG4-16-WED</td>
</tr>
<tr>
<td>Hosaka M.</td>
<td>IG12-MON, IG2-4-TUE, CF10-4-FRI</td>
</tr>
<tr>
<td>Hotate K.</td>
<td>CH1-3-MON</td>
</tr>
<tr>
<td>Author</td>
<td>Index</td>
</tr>
<tr>
<td>--------</td>
<td>-------</td>
</tr>
<tr>
<td>Lin C.F.</td>
<td>CJ-3-TUE</td>
</tr>
<tr>
<td>Lin G.R.</td>
<td>CB-32-WED</td>
</tr>
<tr>
<td>Lin H.H.</td>
<td>CJ-24-TUE</td>
</tr>
<tr>
<td>Lin H.W.</td>
<td>CA-22-MON</td>
</tr>
<tr>
<td>Lin Y.</td>
<td>IA1-2-TUE</td>
</tr>
<tr>
<td>Lin Z.Q.</td>
<td>CA-10-MON</td>
</tr>
<tr>
<td>Lindberg A.</td>
<td>CB-9-2-WED</td>
</tr>
<tr>
<td>Linden S.</td>
<td>CG-9-WED</td>
</tr>
<tr>
<td>Lindlein N.</td>
<td>CC-3-WED</td>
</tr>
<tr>
<td>Lindsay I.D.</td>
<td>CD3-6-MON, CD7-3-ThU</td>
</tr>
<tr>
<td>Lindseh B.</td>
<td>IA2-1-MON</td>
</tr>
<tr>
<td>Lipphardt B.</td>
<td>JSII2-1-MON</td>
</tr>
<tr>
<td>Lippi G.L.</td>
<td>IG4-1-WED</td>
</tr>
<tr>
<td>Lis D.A.</td>
<td>CA-24-MON</td>
</tr>
<tr>
<td>Lisnetskii V.A.</td>
<td>CA-13-MON, CA-19-MON, CA-20-TUE, CA-20-MON, CA4-2-TUE</td>
</tr>
<tr>
<td>Litvak A.G.</td>
<td>IE-13-TUE</td>
</tr>
<tr>
<td>Liu H.Y.</td>
<td>Cb6-4-MON</td>
</tr>
<tr>
<td>Liu J.-S.</td>
<td>IA10-3-THU</td>
</tr>
<tr>
<td>Liu L.</td>
<td>CI15-TUE</td>
</tr>
<tr>
<td>Liu T.</td>
<td>JSIII-1-MON, ID2-1-THU</td>
</tr>
<tr>
<td>Liu W.</td>
<td>CF1-2-MON</td>
</tr>
<tr>
<td>Liu X.-J.</td>
<td>IB5-1-TUE</td>
</tr>
<tr>
<td>Liu Y.</td>
<td>CI16-TUE, CI4-5-THE</td>
</tr>
<tr>
<td>Liu Z.</td>
<td>CM2-5-THE</td>
</tr>
<tr>
<td>Livi R.</td>
<td>IB2-2-WED</td>
</tr>
<tr>
<td>Livitzis M.L.</td>
<td>CJ-22-TUE</td>
</tr>
<tr>
<td>Livshits D.A.</td>
<td>CA2-5-MON, CB8-2-WED</td>
</tr>
<tr>
<td>Liz Marzin L.M.</td>
<td>CK3-5-TUE</td>
</tr>
<tr>
<td>Lizarraga N.</td>
<td>CK10-6-TUE</td>
</tr>
<tr>
<td>Lo H.-K.</td>
<td>JSI-2-WED, JSI2-1-THU</td>
</tr>
<tr>
<td>Lobanov V.E.</td>
<td>CD15-5-TUE</td>
</tr>
<tr>
<td>Lobkov Y.</td>
<td>CC-18-WED</td>
</tr>
<tr>
<td>Loboda E.A.</td>
<td>CG-4-WED</td>
</tr>
<tr>
<td>Lochbrunner S.</td>
<td>CF2-1-MON, IE2-3-TUE, IE3-5-TUE</td>
</tr>
<tr>
<td>Locquet A.</td>
<td>CB-48-WED, JSI2-5-THE</td>
</tr>
<tr>
<td>Lodahl P.</td>
<td>IF2-5-TUE, JSII2-2-TUE</td>
</tr>
<tr>
<td>Löffler A.</td>
<td>CB3-4-MON, IF7-1-FRI, IF7-3-FRI</td>
</tr>
<tr>
<td>Löffler W.</td>
<td>CK-2-MON, IF3-4-THE</td>
</tr>
<tr>
<td>Loho Yu.</td>
<td>IE-12-TUE</td>
</tr>
<tr>
<td>Loko N.A.</td>
<td>IG-7-MON, IG6-5-THE</td>
</tr>
<tr>
<td>Loiseau P.</td>
<td>CA5-5-TUE</td>
</tr>
<tr>
<td>Loiseaux B.</td>
<td>CF18-MON</td>
</tr>
<tr>
<td>Lokstein H.</td>
<td>CL4-5-THE</td>
</tr>
<tr>
<td>Longhi S.</td>
<td>IF3-3-TUE, CD4-4-WED, IG5-2-WED</td>
</tr>
<tr>
<td>Lopes N.</td>
<td>CA1-5-MON</td>
</tr>
<tr>
<td>Lopex C.</td>
<td>CK10-2-TUE</td>
</tr>
<tr>
<td>Lopez L.</td>
<td>IF2-3-TUE</td>
</tr>
<tr>
<td>López-amo M.</td>
<td>CBT-3-THU</td>
</tr>
<tr>
<td>LópezMartins R.B.</td>
<td>CF1-3-MON, CG5-5-THE</td>
</tr>
<tr>
<td>Lorenz R.</td>
<td>CL2-1-THU</td>
</tr>
<tr>
<td>Lorenz S.</td>
<td>CK6-3-THE</td>
</tr>
<tr>
<td>Lorenz V.O.</td>
<td>IES-3-THE</td>
</tr>
<tr>
<td>Lorgere I.</td>
<td>CB8-4-WED</td>
</tr>
<tr>
<td>Lóricz E.</td>
<td>CC19-WED, CC1-4-THE</td>
</tr>
<tr>
<td>Lorimer F.</td>
<td>JSI2-2-THE, JSI2-3-THU</td>
</tr>
<tr>
<td>Lorussio A.</td>
<td>CM5-5-WED, CM10-5-WED</td>
</tr>
<tr>
<td>Loussie V.</td>
<td>CK-3-MON</td>
</tr>
<tr>
<td>Lousette J.</td>
<td>CE7-TUE, CJ3-7-TUE</td>
</tr>
<tr>
<td>Louvregneaux E.</td>
<td>IG2-2-TUE, CD9-9-THE</td>
</tr>
<tr>
<td>Lovera P.</td>
<td>CK3-2-MON</td>
</tr>
<tr>
<td>Löw R.</td>
<td>IB6-4-FRI</td>
</tr>
<tr>
<td>Loza-Alvarez P.</td>
<td>CF20-MON, CL2-4-TUE, CLA1-2-THU, CF9-5-FRI</td>
</tr>
<tr>
<td>Lozano G.</td>
<td>JSI-7-WED</td>
</tr>
<tr>
<td>Loez-Dupuy F.</td>
<td>CE15-TUE, CB8-5-WED</td>
</tr>
<tr>
<td>Leokhizimov V.</td>
<td>CG1-2-THU</td>
</tr>
<tr>
<td>Lu G.-W.</td>
<td>CB4-1-TUE</td>
</tr>
<tr>
<td>Lu J.W.</td>
<td>CB-2-WED</td>
</tr>
<tr>
<td>Lu P.P.</td>
<td>CF7-3-THE</td>
</tr>
<tr>
<td>Lu Q.Y.</td>
<td>CB13-WED, CB15-5-TUE</td>
</tr>
<tr>
<td>Lu W.</td>
<td>IB15-MON</td>
</tr>
<tr>
<td>Lu X.</td>
<td>CG1-3-TUE</td>
</tr>
<tr>
<td>Lu Z.H.</td>
<td>JSIII-1-MON, JSIII2-2-MON, ID4-4-WED, JSII2-5-WED</td>
</tr>
<tr>
<td>Lucas S.</td>
<td>CK-3-MON</td>
</tr>
<tr>
<td>Lucas-Leclin G.</td>
<td>CA5-5-TUE, CB12-4-TUE</td>
</tr>
<tr>
<td>Luchetta D.E.</td>
<td>CG1-3-TUE</td>
</tr>
<tr>
<td>Lucchi F.</td>
<td>CE17-7-TUE</td>
</tr>
<tr>
<td>Luchini G.A.</td>
<td>CA5-3-TUE, CG10-10-WED, CG2-6-THE</td>
</tr>
<tr>
<td>Ludwig R.</td>
<td>CG18-3-FRI</td>
</tr>
<tr>
<td>Lüer L.</td>
<td>JSI2-3-TUE</td>
</tr>
<tr>
<td>Luft J.</td>
<td>CB14-1-MON</td>
</tr>
<tr>
<td>Lugan P.</td>
<td>IB16-MON</td>
</tr>
<tr>
<td>Lugigato L.A.</td>
<td>IG1-1-MON, IG4-1-MON, IF2-6-TUE, IG3-3-WED, IF4-2-TUE</td>
</tr>
<tr>
<td>Luiten A.N.</td>
<td>CK9-3-WED</td>
</tr>
<tr>
<td>Lukaszew R.A.</td>
<td>CK1-3-MON</td>
</tr>
<tr>
<td>Lukhnova S.G.</td>
<td>IC6-5-TUE</td>
</tr>
<tr>
<td>Luumea A.</td>
<td>CE4-5-TUE</td>
</tr>
<tr>
<td>Lumer Y.</td>
<td>CA-14-MON, CA10-2-THU</td>
</tr>
<tr>
<td>Lundeberg L.D.A.</td>
<td>CB5-1-TUE</td>
</tr>
<tr>
<td>Lund-Hansen T.</td>
<td>JSII2-2-THE</td>
</tr>
<tr>
<td>Lunnemann Hansen P.</td>
<td>CD9-4-FRI</td>
</tr>
<tr>
<td>Lünstedt K.</td>
<td>CA4-5-MON, CA4-4-TUE</td>
</tr>
<tr>
<td>Luo R.</td>
<td>CE8-4-THU</td>
</tr>
<tr>
<td>Lustosa de Souza P.L.</td>
<td>JSIII-11-THU</td>
</tr>
<tr>
<td>Luther-Davies B.</td>
<td>IE11-1-TUE, CE5-6-WED, CE7-5-WED</td>
</tr>
<tr>
<td>Lüthi S.R.</td>
<td>CJ6-4-TUE, CJ6-3-FRI</td>
</tr>
<tr>
<td>Lüthy W.</td>
<td>CJ3-3-TUE</td>
</tr>
<tr>
<td>Lüthkenhaus N.</td>
<td>JSIII-5-TUE</td>
</tr>
<tr>
<td>Lutti J.</td>
<td>CL1-3-TUE</td>
</tr>
<tr>
<td>Lykov V.A.</td>
<td>CG-4-WED</td>
</tr>
<tr>
<td>Lynch A.M.</td>
<td>JSII2-4-TUE</td>
</tr>
<tr>
<td>Lynch M.</td>
<td>CD7-1-FUE</td>
</tr>
<tr>
<td>Ma R.</td>
<td>IG4-2-WED</td>
</tr>
<tr>
<td>Ma X.</td>
<td>JSI2-1-TUE, IF7-6-FRI</td>
</tr>
<tr>
<td>Maas D.J.H.C.</td>
<td>CB13-1-TUE</td>
</tr>
<tr>
<td>Mabuchi H.</td>
<td>IF4-1-TUE</td>
</tr>
<tr>
<td>Machavariani G.</td>
<td>CA-14-MON, CA12-1-THU</td>
</tr>
<tr>
<td>Machnikowski P.</td>
<td>IC-11-TUE</td>
</tr>
<tr>
<td>Macintyre D.S.</td>
<td>CK-8-MON</td>
</tr>
<tr>
<td>Maclean A.J.</td>
<td>CA-17-MON, CA-23-MON, CB1-5-MON</td>
</tr>
<tr>
<td>MacPherson W.N.</td>
<td>CE7-TUE, CH3-2-FRI</td>
</tr>
<tr>
<td>Maddaloni P.</td>
<td>JSII1-4-MON</td>
</tr>
<tr>
<td>Maddsen S.</td>
<td>CE5-6-WED, CK7-3-WED</td>
</tr>
<tr>
<td>Maeda M.</td>
<td>CJ12-TUE</td>
</tr>
<tr>
<td>Maeda Y.</td>
<td>CA-35-MON, CA9-2-THU</td>
</tr>
<tr>
<td>Maetzke A.</td>
<td>CL2-5-TUE</td>
</tr>
<tr>
<td>Magatti D.</td>
<td>IF2-6-TUE</td>
</tr>
<tr>
<td>Mager L.</td>
<td>CE9-9-WED</td>
</tr>
<tr>
<td>Maggipinto T.</td>
<td>IG3-4-WED</td>
</tr>
<tr>
<td>Maguire P.J.</td>
<td>CD7-1-TUE</td>
</tr>
<tr>
<td>Mahamid Adakan F.R.</td>
<td>CE4-4-TUE, CE4-3-TUE</td>
</tr>
<tr>
<td>Major J.</td>
<td>IC3-5-WED</td>
</tr>
<tr>
<td>Majic A.</td>
<td>CE7-5-TUE</td>
</tr>
<tr>
<td>Major H.E.</td>
<td>CI8-8-TUE, CD6-3-THE</td>
</tr>
<tr>
<td>Majar Zs.</td>
<td>CG4-1-WED</td>
</tr>
<tr>
<td>Malakyan Yu.</td>
<td>IC2-1-TUE, ID-1-TUE</td>
</tr>
<tr>
<td>Malar P.</td>
<td>JSIII-4-MON</td>
</tr>
<tr>
<td>Maleev N.A.</td>
<td>CB3-32-WED, CB7-6-WED</td>
</tr>
<tr>
<td>Malei L.</td>
<td>IE4-3-TUE</td>
</tr>
<tr>
<td>Maletinsky P.M.</td>
<td>IF3-5-TUE</td>
</tr>
<tr>
<td>Malinowski M.</td>
<td>CE-28-TUE</td>
</tr>
<tr>
<td>Malins D.B.</td>
<td>CF-6-MON</td>
</tr>
<tr>
<td>Mallka V.</td>
<td>CG1-2-TUE</td>
</tr>
<tr>
<td>Malomed B.A.</td>
<td>IE6-2-THU</td>
</tr>
<tr>
<td>Mal'shakov A.N.</td>
<td>CA6-3-TUE, CG6-2-TUE</td>
</tr>
<tr>
<td>Maltev V.V.</td>
<td>CA3-9-MON</td>
</tr>
<tr>
<td>Malzer S.</td>
<td>CM2-4-THE, CB15-5-FRI</td>
</tr>
<tr>
<td>Mancini S.</td>
<td>IF8-3-TUE</td>
</tr>
<tr>
<td>Mandel P.</td>
<td>IG10-4-MON, IG-9-MON, CB9-6-WED, IG6-3-THE</td>
</tr>
<tr>
<td>Mandon J.</td>
<td>JSIII-4-MON, ID3-2-FRI</td>
</tr>
<tr>
<td>Mandre S.K.</td>
<td>CB5-8-WED, CB7-5-WED</td>
</tr>
<tr>
<td>Marek-Hönninger I.</td>
<td>CA2-1-MON, CA7-1-WED, CJ3-7-TUE, CJ4-4-TUE</td>
</tr>
<tr>
<td>Mann Ch.</td>
<td>CB10-5-WED</td>
</tr>
<tr>
<td>Manners I.</td>
<td>CK2-1-MON</td>
</tr>
<tr>
<td>Manning R.J.</td>
<td>CK7-4-MON</td>
</tr>
<tr>
<td>Manz C.</td>
<td>CB1-5-MON</td>
</tr>
<tr>
<td>Manz Y.M.</td>
<td>CB3-7-WED</td>
</tr>
<tr>
<td>Manzioni C.</td>
<td>CD-3-1-MON, CF5-3-WED</td>
</tr>
<tr>
<td>Mao S.</td>
<td>TF1-2-TUE</td>
</tr>
<tr>
<td>Mappas D.</td>
<td>CL1-1-TUE</td>
</tr>
<tr>
<td>Maragoni M.</td>
<td>CD3-2-MON</td>
</tr>
<tr>
<td>Marangos J.P.</td>
<td>CG4-3-WED, CG5-3-WED</td>
</tr>
<tr>
<td>Marazzi L.</td>
<td>CJ17-1-TUE, CJ3-3-TUE</td>
</tr>
<tr>
<td>Marcadet X.</td>
<td>CB-38-WED, CB10-6-WED, IC6-3-TUE, CB15-2-FRI</td>
</tr>
<tr>
<td>March A.M.</td>
<td>CG4-5-WED</td>
</tr>
<tr>
<td>Marchese S.V.</td>
<td>CF3-2-MON</td>
</tr>
<tr>
<td>Marciniak H.</td>
<td>IE3-5-TUE</td>
</tr>
<tr>
<td>Marechal E.</td>
<td>IB3-3-WED</td>
</tr>
<tr>
<td>Marek P.</td>
<td>IC6-5-THU</td>
</tr>
<tr>
<td>Marem'yian K.V.</td>
<td>CB10-2-WED</td>
</tr>
<tr>
<td>Margarone D.</td>
<td>CM-5-WED</td>
</tr>
<tr>
<td>Maric M.</td>
<td>CK9-3-WED</td>
</tr>
<tr>
<td>Marie X.</td>
<td>CB8-5-WED</td>
</tr>
<tr>
<td>Marinov D.</td>
<td>CH-7-MON</td>
</tr>
</tbody>
</table>
Authors' Index

Prescott C.  IC-18-TUE
Press D.  IF7-1-FRI
Pre.et J.L.  CL-5-WED
Preu S.  CB15-5-FRI
Prevedel P.  IC4-4-WED
Prevedelli M.  IB-16-MON,
Prevedelli M.  ID-2-WED, ID2-4-ThU
Price J.H.V.  CD4-6-WED
Primaggi A.  CE-3-TUE
Prochow O.  CJ-11-TUE,
Prochow O.  CJ1-5-WED, CF6-1-thU
Proin A.V.  CG-4-WED
Prosvetin S.L.  JSII4-3-Fri, JSII4-5-Fri
Proostov L.A.  CI2-1-TUE
Pruneri Y.  CE-17-TUE, CH3-1-FRI
Pshenay-Severin E.  JSI2-4-Fri
Pudo D.  CI7-5-Thu
Puerto D.  IE-17-TUE, CC4-5-Thu
Puerto G.  CD6-2-Wed
Punke M.  CH2-4-MON
Puppe T.  IC2-3-TUE
Purere V.  CJ5-3-ThU
Pustakhol D.I.  CB-29-Wed
Pusteln S.  ID-3-WED
Puzzo D.P.  CK2-1-MON
Quarry A.  IF7-6-Fri
Qbi B.  JSI-2-Wed
Qian L.  JSI-2-Wed
Qian Y.  CI5-4-Thu
Qin C.  Qin C.
Quartermann A.  CF10-6-Fri
Querasser E.  JSI2-2-ThU
Quidant R.  JSII-6-WED, JSII1-2-ThU
Quiring V.  CJ3-5-Thu
Rabos D.G.  CH2-4-MON
Rabi S.  CA11-3-Fri
Rachet V.  CF-18-Mon
Rachinski D.  IG6-1-Thu
Raday O.  CK3-1-MON, CD9-4-Wed
Radzinskas M.  CB-35-WED,
Radzinskas M.  IG6-2-ThU, JSI3-2-ThU
Rafailov E.U.  CA2-5-MON, CF-6-Mon,
Rafailov E.U.  IG-2-MON, CB7-6-WED, CB12-6-ThU
Rahmani A.  CK-15-MON, CK5-3-TUE
Raimond J.M.  IC2-5-Thu
Raitzsch U.  IB6-4-Fri
Raj R.  CK10-4-ThU
Rakovich Y.P.  CK-14-MON, CI-12-WED
Ralph T.C.  CA-2-MON,
Ramachandran S.  CC-3-WED
Ramdane A.  CB12-1-ThU, CB13-5-Thu
Ramrath F.  TF2-1-TUE
Rampouni R.  CD3-2-MON, CL-8-Wed
Ramsay E.  CD5-5-Wed
Randoux S.  CJ7-6-Fri
Ranzani L.M.  CJ8-2-Fri
Rarity J.G.  CK2-2-MON, ICA-5-Wed,
Rexas E.  IB-11-MON, IB-16-Mon,
Rasing T.  IE5-1-Thu
Rassart M.  CK-3-Mon
Rassakazh O.  IG6-6-Thu
Rattiva R.  CD-10-Wed
Rattunde M.  CB1-5-Mon
Rauschenberger J.  CF7-4-ThU
Rauschenbeutel A.  IB-12-Thu,
Rauttainen J.  IC2-2-ThU, IF-15-ThU
Ravet G.  CD2-3-Mon, CJ7-4-Fri
Razdobre viscosity.  CE-23-Thu
Reed N.  CL-3-Wed
Reenaust A.  JSIII-5-Thu
Rebondu V.  CK3-2-Mon
Reburn WJ.  CH4-5-Fri
Rechatin C.  CG1-2-Tue
Reckenthainer P.  CF7-2-Thu
Redmond G.  CK3-2-Mon
Réfrégier P.  IF2-1-Tue
Regency S.  CB4-3-Thu
Rehbein N.  IBS-4-Wed
Rehreman S.  CL1-1-Thu
Reichel J.  IA1-3-ThU, IA1-4-ThU,
Reichel M.  CK-21-Mon
Reich S.  IC2-2-Tue
Reid D.T.  CD3-4-Mon, JSII2-5-Mon,
Reid M.D.  IC1-3-ThU
Rieger G.  CF-27-Mon
Reimer H.  IF3-4-ThU
Reinhard S.  CB11-4-ThU
Reinhardt C.  CK4-5-Tue
Reitzstein S.  CJ4-5-Mon,
Remenyi L.  CG-19-Wed
Remetter T.  CG3-3-Tue
Removile S.  IC-17-ThU
Rempe G.  IC2-1-ThU, IC2-3-Thu,
Ren Z.  CE-1-ThU
Renard J.  JSII-3-Thu
Renault A.  CF2-5-Mon
Renner F.  CB1-5-Thu
Renner-Erny R.  CJ3-3-Thu
Resneau P.  CB6-2-Thu
Ressell P.  CB-33-Wed,
Retzer A.  IC-4-ThU
Reuter M.  CJ10-3-ThU
Reuther F.  CK3-2-Mon
Reverser F.  CG-2-Wed
Reym J.M.  CH-7-ThU
Reyna K.  CJ-12-Thu
Rexa S.  CJ3-5-Thu
Renzonico D.  CE4-2-Thu
Rhee H.  CD-21-Wed
Richard S.  CC3-2-Thu, CC3-4-Thu
Richards B.  CJ-27-Thu
Richardson D.J.  CD1-5-Mon, CI2-1-Thue,
Richardson S.  CE2-2-Thu
Richter A.  CA-36-Mon, CA5-2-Thue
Richter W.  CJ9-3-Fri, CJ8-2-Fri
Ricka J.  CF9-6-Fri
Ricken R.  CJ3-5-Thu
Ricoleau C.R.  CL1-2-Thu
Rico-Soliveres M.L.  CA-34-Mon
Riechert F.  CB5-3-Thue
Riede E.  CF2-1-Mon, IEC-2-Thu
Riedmann M.  CB-4-Wed
Rieger T.  CB2-3-Wed
Righetti A.  CJ3-3-Thu
Righini G.  CK-26-Mon,
Righini M.  JSI2-1-Thu
Riis E.  CB1-2-Mon
Rinaldi E.  CB4-1-Tue, CB4-4-Tue
Rinklaff R.-H.  IB-8-Mon, IE-4-Thu
Rios L.A.  CD1-3-Thu
Rippe L.  CG-11-Thu
Ristau D.  CM-3-Thu
Ritchie D.  CB-23-Wed, CB15-4-Fri
Ritch M.  IB1-2-Thu
Ritter S.  IB3-3-Thu
Ritzenthaler C.  CJ1-5-Mon
Riva-Sanseverino S.  IE2-3-Thu
Rivier S.  CJ4-1-Mon,
Rizk R.  CB5-3-Thu
Robb G.R.M.  IG4-4-Wed
Robbins D.J.  CB9-3-Thue
Robert J.S.  CF10-1-Fri, CF10-6-Fri
Robinson J.S.  CG4-3-Thu, CG5-3-Wed,
Robles-Aguado M.  CD8-1-Thu
Roch T.  CB-26-Wed, CKB-2-Wed
Roch J. F.  JSI-8-Wed, IF6-6-Thu
Rochatull C.  JSI3-5-Thue, JSI4-2-Fri
Rode A.V.  IE-11-Thu,
Rodriguez E.I.  CE5-6-Wed, CC1-5-Thu
Rodriguez Montero P.  CE-3-Tue, IE-5-Tue
Roedig C.  CG4-5-Wed
Roelens M.A.F.  CI5-1-Thu, CI6-4-Thu
Rogach A.L.  CL-12-Wed, JSI5-5-Thue
Roger G.  CL-5-Thue
Register F.  IEC-2-Thu
Roh. J.  CB7-4-Wed
Rohde M.  CM1-1-Thu
Rohzin A.  CJ-6-Thu
Rojas Ochoa L.F.  CK10-3-Thue, CL3-2-Thu
Rojo-Romeo P.  CK8-3-Wed
Roland Nielsen T.  CD9-1-Fri
Roldan E.  IG6-8-Wed, IF2-2-Wed,
Romanov S.G.  IG3-5-Wed, IG3-6-Wed
Romanyuk V.A.  CA-24-Mon
Romashko R.V.  CC5-1-Fri
Romero I.  JSII1-2-Thu
Rong H.  CK3-1-Mon, CD5-4-Wed
Authors' Index
SECTION A  Badge Information

Last (family) Name: Prof/Dr/Mr/Mrs/Ms/Miss (circle relevant title)
First (given) Name: 
Middle Initial(s): 
Company/Institute: 
Department: 
Address: 
City: 
Postcode (ZIP NO): 
Country: 
Phone: (with country code) 
Fax: (with country code) 
Email: 

SECTION B: Society Membership (Tick all that apply)

- European Physical Society (Individual Member)
- IEEE/LEOS
- Optical Society of America
- National Physical Society that is a member of the European Physical Society *
  * Name of Society

SECTION C: Registration Fees

The registration fee includes admission to all CLEO®/Europe-IQEC 2007 technical sessions as well as all conferences collocated with Laser 2007. It includes admission to the technical exhibition. It includes coffee breaks (Monday through Friday morning) and a free conference reception which will take place downtown on Wednesday evening 20 June 2007 provided registration is done. One copy of the technical digest in CD-format is included for the full paying fee. The one-day registration does not include the digest.

(*) Applications for the student rates must include a photocopy of an official student identity card, which must also be presented on-site when collecting registration materials.

<table>
<thead>
<tr>
<th>EPS/OSA/IEEE/LEOS Members</th>
<th>Regular</th>
<th>Full fee €</th>
<th>One day fee €</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Student</td>
<td>510</td>
<td>240</td>
</tr>
<tr>
<td></td>
<td></td>
<td>135</td>
<td></td>
</tr>
<tr>
<td>Non-Members</td>
<td>Regular</td>
<td>630</td>
<td>240</td>
</tr>
<tr>
<td></td>
<td>Student</td>
<td>165</td>
<td></td>
</tr>
</tbody>
</table>

Payment

All forms must be accompanied by payment, purchase order or bank transfer details. (See page 20 for banking details.)

Method of Payment:

- Cheque in euros
- Bank transfer (euros only) Please note that the bank fees are payable by the applicant.
- Visa/Mastercard
- American Express and Diners Club cannot be accepted

Card No: ____________________________ Signature: ____________________________
Expiration Date: [mm/yyyy]: _________ / _________

SECTION D: Short Courses

CLEO®/Europe-IQEC 2007 will present two short courses held in parallel on Sunday 17 June 2007 at the LMU Univ. of Munich. These courses require registration in order to have the short course material and will be charged at extra cost.

- I register for SH1 "Practical OPOs"
- I register for SH2 "Micro- and Nano-Machined Optics"

<table>
<thead>
<tr>
<th></th>
<th>Regular</th>
<th>One day fee €</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student</td>
<td>270</td>
<td></td>
</tr>
<tr>
<td></td>
<td>150</td>
<td></td>
</tr>
</tbody>
</table>

TOTAL: Section C + D € _______
CLEO®/Europe - IQEC 2007

Postdeadline Papers

Munich ICM
International Congress
Centre Munich, Germany

17 - 22 June 2007

www.cleoeurope.org

Sponsored by
- European Physical Society / Quantum Electronics and Optics Division
- IEEE/Lasers and Electro-Optics Society
- Optical Society of America

Co-sponsored by
- PHOREMOST Network of Excellence
- American Physical Society

18th International Congress on Photonics in Europe
co-located with LASER 2007. World of Photonics
Messe München GmbH, Messegelände, 81823 München, Tel. (+49 89) 949-114 68, info@photronics-congress.com

www.photonics-congress.com
TABLE OF CONTENTS

CP1 Session: CLEO®/Europe Postdeadlines I .......................................................... 2

CP2 Session: CLEO®/Europe Postdeadlines II ...................................................... 2

JSP1 Session: Joint CLEO®/Europe-IQEC Postdeadlines .................................... 3

IP1 Session: IQEC Postdeadlines I ......................................................................... 3

Authors’ Index ......................................................................................................... 4

Notes ....................................................................................................................... 6
Few-optical-cycle pulses in the near-IR from a non-collinear optical parametric amplifier
G. Cirmi, C. Manzon, D. Brida, M. Marangoni, S. De Silvestri, G. Cerullo, Politecnico di Milano, Milan, Italy
We extend the non-collinear optical parametric amplifier (NOPA) concept to the near-IR. In an 800-nm pumped NOPA using lithium tantalate we amplify spectra spanning the 1.1-1.7 micron range and compress a limited portion to 16 fs.

Short-pulse optical parametric chirped-pulse amplification for the generation of high-power few-cycle pulses
J. A. Fülöp, Z. Major, A. Henig, S. Kruber, J. Osterhoff, R. Hörlein, F. Krausz, S. Karsch, Max-Planck-Institut für Quantenoptik, Garching, Germany
We propose optical parametric chirped-pulse amplification in the sub-picosecond range for high-power few-cycle pulse generation. Ultrabroadband amplification with 100 fs pulses in the 100 microjoule range has been demonstrated.

Stricter seed for a multiterawatt few-cycle pulse OPCPA
F. Tavella, T. Wittmann, B. Horvath, A. Cavalleri, L. Yeis, Max Planck Institute of Quantum Optics, Garching, Germany; K. Schmid, F. K. Krausz, Ludwig Maximilian Universität, Munich, Germany; A. M. Martinickevicius, IMRA inc., Ann Arbor, USA
The output of a high contrast Ti:sapphire amplifier with sequence hollow-core fiber broadening and cross-polarized wave generation for contrast cleaning is used to seed a multiterawatt sub-10-fs optical parametric chirped pulse amplifier.

An efficient Ni Ka-line X-ray source driven by a high energy fiber CPA system
K. H. Liao, G. Mordovanakis, B. Hou, G. Chang, G. Mourou, J. Nees, A. Galvanauskas, University of Michigan, Ann Arbor, USA
The first femtosecond fiber laser based hard X-ray source is demonstrated with efficient emission in Ni K-line (7.48keV). This was achieved with pulse energies starting below 100-microjoule and at focused intensities > 1x10^13 W/cm^2.

Highly efficient mid-infrared OPO GaAs based on low-loss orientation-patterned GaAs samples
D. Faye, A. Grisard, B Gérard, E. Lallier, Thales Research & Technology, Palaiseau, France; C. Kieleck, A. Hirth, Institut Franco-Allemand de Recherches de St-Louis, Saint-Louis, France
We report on what is to our knowledge the highest efficiency (57%) and average power (1.2W) obtained with a GaAs OPO in the mid-infrared region.

65-mW 3.4-µm tunable difference frequency generation source using damage resistant ZnLiNbO3 waveguide
M. Aobe, Y. Nishida, O. Tadanaga, T. Yanagawa, T. Umei, H. Suzuki, NTT Photonics Laboratories Atsugi, Kanagawa, Japan
We describe high-power 3.4-micron difference frequency generation using a quasi-phase matched ZnLiNbO3 waveguide fabricated with direct bonding. A 65-mW mid-infrared output was obtained by using a continuous wave high-power fiber amplifier as a pump source.

High power thin disk laser operation of Yb:Lu2O3 with 80% slope efficiency
R. Peters, C. Kränkel, K. Petermann, G. Huber, University of Hamburg, Hamburg, Germany
We report on 80% slope-efficiency high-power thin-disk laser operation of high quality heat-exchanger-method grown Yb:Lu2O3. The laser delivers 32.6W of output-power at 1034nm under 45.3W of incident pump-power at 976nm resulting in 72% optical-to-optical efficiency.

A new Dysprosium laser: 5.5-µm oscillation in the Dy3+:RbPb2Cl5 crystal at room temperature
A.G. Okhrimchuk, L.N. Butvina, E.M. Dianov, I.A. Shestakova, Fiber Optics Research Center, Moscow, Russia; N. V. Lichkova, V. Zagorodnev, Institute of Microelectronics Technology RAS, Chernogolovka Moscow Region, Russia; A.V. Shestakov, Elements of Laser Systems Co., Russia
Lasing at 5.5 µm wavelength was obtained on a new laser transition in the RbPb2Cl5: Dy3+ crystal. This is to our knowledge the longest oscillation wavelength in a moisture-resistant rare earth doped crystal at room temperature.

Diode-pumped passively mode-locked Er Yb:YAl3(BO3)4 laser at 1.5 - 1.6 µm
A.A. Lagatsky, W. Sibbett, University of St Andrews, St Andrews, United Kingdom; E.U. Rafailov, University of Dundee, United Kingdom; N.J. Vlock, Moscow State University, Moscow, Russia; A.E. Zhukov, Ioffe Physico-Technical Institute, St Petersburg, Russia; V.E. Kisel, A.E. Troshin, N.A. Tolstik, N.V. Kuleshov, Institute for Optical Materials and Technologies, Minsk, Belarus
Efficient passive mode locking in a diode-pumped Er Yb:YAl3(BO3)4 laser in range of 1.5-1.6um is demonstrated. Pulses of 3.8-ps duration were generated at 1531nm with an average power of 270mW.

Efficient Terahertz room-temperature photonic crystal laser
D. Englund, J. Vuckovic, I. Fushman, Stanford University, Stanford, USA; H. Altug, Boston University, Boston, USA
We demonstrate a photonic crystal cavity laser with near-uW threshold at low temperature. The surface-passivated laser operates at room temperature and produces pulses with FWHM shorter than 3 ps (detector response limited).

Narrow (100 pm) linewidth fibre laser operating in excess of 50 W
N. Jovanovic, A. Fuerbach, G. van Dijk, J. Osterhoff, Macquarie University, Sydney, Australia; M. Aslund, S. D. Jackson, Sydney University, Sydney, Australia
We present a 50 W ytterbium fibre laser with an intra-active-core Bragg grating. To the best of our knowledge this is the narrowest linewidth (~100 pm) fibre laser operating in this power range.

415W Single-Mode CW Thulium fiber laser in all-fiber format
D. Gaponsetsev, N. Platunov, M. Meleshkevich, A. Drozhzhin, IPG Photonics, Oxford, USA; V. Sergeev, IPG Laser GmbH, Burbach, Germany
415W CW output power at 1940nm was demonstrated in all-fiber format Ti fiber laser. This power is the highest reported to date for 2um single mode lasers. Output linewidth was measured to be <1nm at maximum power.

Inscription of a 300-nm-period nanostructure in a pure fused silica
D. Nikogosyan, Y. Mendelev, M. Duvov, I. Bennion, Aston University, Birmingham, United Kingdom
We report on the first recording of a 150-nm pitch periodical structure in a permanently moving sample of a pure fused silica using the tightly-focused 82 nJ 267 nm 300 fs 1 kHz laser pulses.

Generation of 63-fs 4-MW pulses from a fiber parabolic amplifier
D.N. Papadopoulos, M. Hanna, F. Druon, P. Georges, Institut d’Optique, Palaiseau, France; E. Cormier, Y. Zouuter, CELIA, Bordeaux, France; E. Mottay, Amplitude Structures, Bordeaux, France
We report the generation of 63-fs 4-MW average power pulses using a fiber parabolic amplifier. This is the highest peak power reported so far for such amplifiers.
We present an experimental demonstration of a transparent optical switch using Bragg scattering frequency conversion in a nonlinear optical loop mirror.

We report on the demonstration of the chirp transform algorithm for the optical processing of RF signals over a 1.5 GHz instantaneous bandwidth together with more than 20 000 independent channels.

We identify a novel application of switched photonic metamaterials.

We present time-resolved octave-broad reflectivity of optically switched Si waveguide photonic bandgap crystals. The gap shows a large and ultrafast shift in good agreement with theory. We identify a novel application of switched photonic metamaterials.

We report on an unusual permanent recording of temporally imaged phased array) based spectrometer.

We report a self-referenced 5 GHz Ti:sapphire femtosecond fiber laser based on dual 250ω CW Ti:sapphire laser. The results are relevant to ultrafast QED.

Ultrafast evolution of photon eigenstates tracked in k-space

Turning optically Achiral materials Chiral

We present results on the fabrication and characterization of a novel type of whispering-gallery-mode microresonator combining high Q factor small mode volume and tunability. Tuning over more than one free-spectral-range was demonstrated.

We used long crystals to narrow the bandwidth of entangled photon pairs allowing chromatic dispersion free transmission of qubits in a WDM environment with 100 GHz spacing between quantum and classical channels in same fiber.

We report on an unusual permanent recording of temporally imaged phased array) based spectrometer.

We report on a self-referenced 5 GHz Ti:sapphire femtosecond laser and directly observe the individual emitted frequency comb elements using a VIPA (virtually imaged phased array) based spectrometer.

We present an experimental demonstration of a transparent optical switch using Bragg scattering frequency conversion in a nonlinear optical loop mirror.

We report on the demonstration of the chirp transform algorithm for the optical processing of RF signals over a 1.5 GHz instantaneous bandwidth together with more than 20 000 independent channels.

We identify a novel application of switched photonic metamaterials.

We present time-resolved octave-broad reflectivity of optically switched Si waveguide photonic bandgap crystals. The gap shows a large and ultrafast shift in good agreement with theory. We identify a novel application of switched photonic metamaterials.

We report on an unusual permanent recording of temporally imaged phased array) based spectrometer.

We report a self-referenced 5 GHz Ti:sapphire femtosecond fiber laser based on dual 250ω CW Ti:sapphire laser. The results are relevant to ultrafast QED.

Ultrafast evolution of photon eigenstates tracked in k-space

Turning optically Achiral materials Chiral

We report on an unusual permanent recording of light helicity on optically achiral metals.

We present results on the fabrication and characterization of a novel type of whispering-gallery-mode microresonator combining high Q factor small mode volume and tunability. Tuning over more than one free-spectral-range was demonstrated.

We used long crystals to narrow the bandwidth of entangled photon pairs allowing chromatic dispersion free transmission of qubits in a WDM environment with 100 GHz spacing between quantum and classical channels in same fiber.

We report on an unusual permanent recording of temporally imaged phased array) based spectrometer.

We report a self-referenced 5 GHz Ti:sapphire femtosecond laser and directly observe the individual emitted frequency comb elements using a VIPA (virtually imaged phased array) based spectrometer.

We present an experimental demonstration of a transparent optical switch using Bragg scattering frequency conversion in a nonlinear optical loop mirror.
We report on the recent demonstration of a continuous flux of $6 \times 10^9$ laser cooled chromium atoms/s in a magnetic guide. The flux is achieved by continuous operation of a MOT within the magnetic guide.

**IP1-3-THU 18:20**

**Dynamical control of tunneling in periodic potentials**

O. Morsch, E. Arimondo, Y. Singh, A. Zenesini, C. Sias, D. Ciampini, H. Lignier, CNR-INFM, Pisa, Italy

We report on the experimental observation of the dynamical suppression of tunneling of a Bose condensate in an optical lattice by sinusoidally shaking the lattice. Our results are in perfect agreement with theoretical calculations.

**IP1-4-THU 18:30**

**Individual addressing with trapped Yb+ Ions**

M. Johannings, A. Braun, V. Elman, C. Wunderlich, Universität Siegen, Siegen, Germany; W. Neuhauser, Universität Hamburg, Hamburg, Germany

Addressing individual ions using an inhomogeneous magnetic field that creates spatially varying Zeeman shifts is demonstrated for the first time. We report results of rf-optical double-resonance-spectroscopy applied to laser-cooled $^{172}$Yb$^+$-ions in a linear Paul trap.

**IP1-5-THU 18:40**

**Quantum engineering of photon states with atomic ensembles**

D. Porras, J.I. Cirac, Max-Planck-Institut für Quantenoptik, Garching, Germany

We propose to map atomic entangled states into photonic channels to generate entangled states of photons for Quantum Information. This can be accomplished with current quantum engineering techniques in trapped ions/atoms and atomic ensembles.

**IP1-6-THU 18:50**

**A Single-photon server with just one atom**

M. Hjilkema, B. Weber, H.P. Specht, G. Rempe, Max-Planck-Institute for Quantum Optics, Munich, Germany; S. C. Webster, A. Kuhn, University of Oxford, Oxford, United Kingdom

We trap a single atom in a cavity and use it to produce a stream of up to $30\,000$ single photons. Such a single-photon server is useful for quantum information science.

**IP1-7-THU 19:00**

**Novel type of one-dimensional discrete vector solitons**

R. A. Vicencio, Universidad de Chile, Santiago, Chile; M. Stepic, National Metrology Institute, Braunschweig, Germany; E. Smirnov, V. Shandarov, C. E. Rüter, D. Kip, Clausthal University of Technology, Clausthal-Zellerfeld, Germany

Localized vectorial modes with mutually orthogonal polarizations are investigated experimentally and analytically in a one-dimensional photonic lattice. Dominating TE mode spreads in cascades in saturation while weaker TM mode exhibits splitting into a two-hump structure.

**IP1-8-THU 19:10**

**High-visibility multi-photon interference for classical light**

T. S. Ishkakov, M. V. Chekhova, I. N. Agafonov, Lomonosov Moscow State University, Moscow, Russia

The classical limit of two-photon interference visibility is 50% but we demonstrate that it is much higher for multi-photon case. In particular coherent radiation provides third-order and fourth-order interference with 81.8% and 94% visibility respectively.

**IP1-9-THU 19:20**

**Entanglement swapping with independent CW-sources**

M. Halder, V. Scarani, C. Simon, H. Zbinden, C. Jores, A. Beveratos, N. Gisin, University of Geneva, Geneva, Switzerland

An entanglement swapping experiment realized for the first time with independent sources in continuous wave mode is presented. Timing is achieved by the temporal resolution of the detectors much shorter than the photons coherence length.
<table>
<thead>
<tr>
<th>Authors' Index</th>
<th>Paper ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gralak B.</td>
<td>CP2-8-THU</td>
</tr>
<tr>
<td>Greiner A.</td>
<td>IP1-2-THU</td>
</tr>
<tr>
<td>Griesmaier A.</td>
<td>IP1-2-THU</td>
</tr>
<tr>
<td>Grisard A.</td>
<td>CP1-5-THU</td>
</tr>
<tr>
<td>Guo C.</td>
<td>JSP1-9-THU</td>
</tr>
<tr>
<td>Halder M.</td>
<td>IP1-9-THU</td>
</tr>
<tr>
<td>Hanna M.</td>
<td>CP2-3-THU</td>
</tr>
<tr>
<td>Harvey J.D.</td>
<td>CP2-6-THU</td>
</tr>
<tr>
<td>Henig A.</td>
<td>CP1-2-THU</td>
</tr>
<tr>
<td>Hjılıkema M.</td>
<td>IP1-6-THU</td>
</tr>
<tr>
<td>Hirth A.</td>
<td>CP1-5-THU</td>
</tr>
<tr>
<td>Hörllein R.</td>
<td>CP1-2-THU</td>
</tr>
<tr>
<td>Horvath B.</td>
<td>CP1-3-THU</td>
</tr>
<tr>
<td>Hou B.</td>
<td>CP1-4-THU</td>
</tr>
<tr>
<td>Huber G.</td>
<td>CP1-7-THU</td>
</tr>
<tr>
<td>Huber R.</td>
<td>JSP1-3-THU</td>
</tr>
<tr>
<td>Ikeda N.</td>
<td>JSP1-8-THU</td>
</tr>
<tr>
<td>Inguscio M.</td>
<td>IP1-1-THU</td>
</tr>
<tr>
<td>Iskhakov T.Sh.</td>
<td>IP1-8-THU</td>
</tr>
<tr>
<td>Jackson S.D.</td>
<td>CP2-2-THU</td>
</tr>
<tr>
<td>Johanning M.</td>
<td>IP1-4-THU</td>
</tr>
<tr>
<td>Jörle C.</td>
<td>IP1-9-THU</td>
</tr>
<tr>
<td>Jovanovic N.</td>
<td>CP2-2-THU</td>
</tr>
<tr>
<td>Jun Y.</td>
<td>JSP1-7-THU</td>
</tr>
<tr>
<td>Kalkman J.</td>
<td>JSP1-7-THU</td>
</tr>
<tr>
<td>Karlsson A.</td>
<td>JSP1-6-THU</td>
</tr>
<tr>
<td>Karsch S.</td>
<td>CP1-2-THU</td>
</tr>
<tr>
<td>Kieleck C.</td>
<td>CP1-5-THU</td>
</tr>
<tr>
<td>Kinsler P.</td>
<td>JSP1-4-THU</td>
</tr>
<tr>
<td>Kip D.</td>
<td>IP1-7-THU</td>
</tr>
<tr>
<td>Kirchner M.S.</td>
<td>JSP1-2-THU</td>
</tr>
<tr>
<td>Kisel V.E.</td>
<td>CP1-9-THU</td>
</tr>
<tr>
<td>Kränkel C.</td>
<td>CP1-7-THU</td>
</tr>
<tr>
<td>Krausz F.</td>
<td>CP1-2-THU</td>
</tr>
<tr>
<td>Krausz F.K.</td>
<td>CP1-3-THU</td>
</tr>
<tr>
<td>Kruber S.</td>
<td>CP1-2-THU</td>
</tr>
<tr>
<td>Kühn A.</td>
<td>IP1-6-THU</td>
</tr>
<tr>
<td>Kuipers L.</td>
<td>JSP1-8-THU</td>
</tr>
<tr>
<td>Kuleshov N.V.</td>
<td>CP1-9-THU</td>
</tr>
<tr>
<td>Lagatsky A.A.</td>
<td>CP1-9-THU</td>
</tr>
<tr>
<td>Lallier E.</td>
<td>CP1-5-THU</td>
</tr>
<tr>
<td>Le Gouët J.-L.</td>
<td>CP2-7-THU</td>
</tr>
<tr>
<td>Leitenstorfer A.</td>
<td>JSP1-3-THU</td>
</tr>
<tr>
<td>Leonvuk N.I.</td>
<td>CP1-9-THU</td>
</tr>
<tr>
<td>Li L.</td>
<td>CP2-9-THU</td>
</tr>
<tr>
<td>Liao K.-H.</td>
<td>CP1-4-THU</td>
</tr>
<tr>
<td>Lichkova N.V.</td>
<td>CP1-8-THU</td>
</tr>
<tr>
<td>Lignier H.</td>
<td>IP1-3-THU</td>
</tr>
<tr>
<td>Ljunggren D.</td>
<td>JSP1-6-THU</td>
</tr>
<tr>
<td>López C.</td>
<td>JSP1-1-THU</td>
</tr>
<tr>
<td>Lorgeré J.</td>
<td>CP2-7-THU</td>
</tr>
<tr>
<td>Major Zs.</td>
<td>CP1-2-THU</td>
</tr>
<tr>
<td>Manzioni C.</td>
<td>CP1-1-THU</td>
</tr>
<tr>
<td>Marangoni M.</td>
<td>CP1-1-THU</td>
</tr>
<tr>
<td>Marcinkevicius A.M.</td>
<td>CP1-3-THU</td>
</tr>
<tr>
<td>Marshall G.D.</td>
<td>CP2-2-THU</td>
</tr>
<tr>
<td>McKinstrie C.J.</td>
<td>CP2-6-THU</td>
</tr>
<tr>
<td>Méchin D.</td>
<td>CP2-6-THU</td>
</tr>
<tr>
<td>Meleshekvich M.</td>
<td>CP2-3-THU</td>
</tr>
<tr>
<td>Meschede D.</td>
<td>JSP1-5-THU</td>
</tr>
<tr>
<td>Mezentsev V.</td>
<td>CP2-4-THU</td>
</tr>
<tr>
<td>Modugno G.</td>
<td>IP1-1-THU</td>
</tr>
<tr>
<td>Modugno M.</td>
<td>IP1-1-THU</td>
</tr>
<tr>
<td>Molenaar A.J.</td>
<td>CP2-8-THU</td>
</tr>
<tr>
<td>Mordovanakis A.G.</td>
<td>CP1-4-THU</td>
</tr>
<tr>
<td>Morsch O.</td>
<td>CP1-3-THU</td>
</tr>
<tr>
<td>Mottay E.</td>
<td>CP2-5-THU</td>
</tr>
<tr>
<td>Mourou G.</td>
<td>CP1-4-THU</td>
</tr>
<tr>
<td>Nees J.</td>
<td>CP1-4-THU</td>
</tr>
<tr>
<td>Neuhauser W.</td>
<td>IP1-4-THU</td>
</tr>
<tr>
<td>New G.H.C.</td>
<td>JSP1-4-THU</td>
</tr>
<tr>
<td>Nikogosyan D.</td>
<td>CP2-4-THU</td>
</tr>
<tr>
<td>Nishida Y.</td>
<td>CP1-6-THU</td>
</tr>
<tr>
<td>Norris D.J.</td>
<td>JSP1-7-THU</td>
</tr>
<tr>
<td>Okhirzmanukh A.G.</td>
<td>CP1-8-THU</td>
</tr>
<tr>
<td>Osterhoff J.</td>
<td>CP1-2-THU</td>
</tr>
<tr>
<td>Papadopoulos D.N.</td>
<td>JSP1-5-THU</td>
</tr>
<tr>
<td>Petermann K.</td>
<td>IP1-7-THU</td>
</tr>
<tr>
<td>Peters R.</td>
<td>CP1-7-THU</td>
</tr>
<tr>
<td>Pfau T.</td>
<td>IP1-2-THU</td>
</tr>
<tr>
<td>Platonov N.</td>
<td>CP2-3-THU</td>
</tr>
<tr>
<td>Pollinger M.</td>
<td>JSP1-5-THU</td>
</tr>
<tr>
<td>Polman A.</td>
<td>CP2-8-THU</td>
</tr>
<tr>
<td>Porras D.</td>
<td>IP1-5-THU</td>
</tr>
<tr>
<td>Provo R.</td>
<td>CP2-6-THU</td>
</tr>
<tr>
<td>Radnor S.B.P.</td>
<td>JSP1-4-THU</td>
</tr>
<tr>
<td>Rafaelov E.U.</td>
<td>CP1-9-THU</td>
</tr>
<tr>
<td>Rauschenbeutel A.</td>
<td>JSP1-5-THU</td>
</tr>
<tr>
<td>Rempe G.</td>
<td>IP1-7-THU</td>
</tr>
<tr>
<td>Rehme P.</td>
<td>IP1-2-THU</td>
</tr>
<tr>
<td>Roati G.</td>
<td>IP1-1-THU</td>
</tr>
<tr>
<td>Rossetti M.</td>
<td>CP2-9-THU</td>
</tr>
<tr>
<td>Rütter C.E.</td>
<td>IP1-7-THU</td>
</tr>
<tr>
<td>Sauge S.</td>
<td>JSP1-6-THU</td>
</tr>
<tr>
<td>Scarani V.</td>
<td>IP1-9-THU</td>
</tr>
<tr>
<td>Schmid K.</td>
<td>CP1-3-THU</td>
</tr>
<tr>
<td>Sebastian J.</td>
<td>IP1-2-THU</td>
</tr>
<tr>
<td>Sell A.</td>
<td>JSP1-3-THU</td>
</tr>
<tr>
<td>Sergeev V.</td>
<td>CP2-3-THU</td>
</tr>
<tr>
<td>Shandarov V.</td>
<td>CP1-7-THU</td>
</tr>
<tr>
<td>Shestakov A.V.</td>
<td>CP1-8-THU</td>
</tr>
<tr>
<td>Shestakova I.A.</td>
<td>CP1-8-THU</td>
</tr>
<tr>
<td>Sias C.</td>
<td>IP1-3-THU</td>
</tr>
<tr>
<td>Sibbett W.</td>
<td>CP1-9-THU</td>
</tr>
<tr>
<td>Simon C.</td>
<td>IP1-9-THU</td>
</tr>
<tr>
<td>Simon A.</td>
<td>IP1-1-THU</td>
</tr>
<tr>
<td>Singh Y.</td>
<td>IP1-3-THU</td>
</tr>
<tr>
<td>Smirnov E.</td>
<td>IP1-7-THU</td>
</tr>
<tr>
<td>Specht H.P.</td>
<td>IP1-6-THU</td>
</tr>
<tr>
<td>Stepic M.</td>
<td>IP1-7-THU</td>
</tr>
<tr>
<td>Sugimoto Y.</td>
<td>JSP1-8-THU</td>
</tr>
<tr>
<td>Suzuki H.</td>
<td>CP1-6-THU</td>
</tr>
<tr>
<td>Swillo M.</td>
<td>JSP1-6-THU</td>
</tr>
<tr>
<td>Tadanaga O.</td>
<td>CP1-6-THU</td>
</tr>
<tr>
<td>Tavella F.</td>
<td>CP1-3-THU</td>
</tr>
<tr>
<td>Tengner M.</td>
<td>CP1-6-THU</td>
</tr>
<tr>
<td>Tolstik N.A.</td>
<td>CP1-9-THU</td>
</tr>
<tr>
<td>Troshin A.E.</td>
<td>CP1-9-THU</td>
</tr>
<tr>
<td>Umeki T.</td>
<td>CP1-6-THU</td>
</tr>
<tr>
<td>Veisz L.</td>
<td>CP1-3-THU</td>
</tr>
<tr>
<td>Vicenzo R.A.</td>
<td>IP1-7-THU</td>
</tr>
<tr>
<td>Vos W.L.</td>
<td>JSP1-7-THU, CP2-8-THU</td>
</tr>
<tr>
<td>Vuckovic I.</td>
<td>CP2-1-THU</td>
</tr>
<tr>
<td>Waldeback J.</td>
<td>JSP1-6-THU</td>
</tr>
<tr>
<td>Wang J.</td>
<td>JSP1-9-THU</td>
</tr>
<tr>
<td>Warken F.</td>
<td>JSP1-5-THU</td>
</tr>
<tr>
<td>Weber B.</td>
<td>IP1-6-THU</td>
</tr>
<tr>
<td>Webster S.C.</td>
<td>IP1-6-THU</td>
</tr>
<tr>
<td>Wei H.</td>
<td>JSP1-7-THU</td>
</tr>
<tr>
<td>Withford M.J.</td>
<td>CP2-2-THU</td>
</tr>
<tr>
<td>Wittmann T.</td>
<td>CP1-3-THU</td>
</tr>
<tr>
<td>Wunderlich Chr.</td>
<td>IP1-4-THU</td>
</tr>
<tr>
<td>Xavier G.B.</td>
<td>JSP1-6-THU</td>
</tr>
<tr>
<td>Yanagawa T.</td>
<td>CP1-6-THU</td>
</tr>
<tr>
<td>Zaccanti M.</td>
<td>IP1-1-THU</td>
</tr>
<tr>
<td>Zagorodnev V.</td>
<td>CP1-8-THU</td>
</tr>
<tr>
<td>Zouter Y.</td>
<td>CP2-5-THU</td>
</tr>
<tr>
<td>Zhinden H.</td>
<td>IP1-9-THU</td>
</tr>
<tr>
<td>Zenesini A.</td>
<td>IP1-3-THU</td>
</tr>
<tr>
<td>Zhukov A.E.</td>
<td>CP1-9-THU</td>
</tr>
</tbody>
</table>
17 – 22 June 2007
Munich, Germany

Europe’s premier joint conference on lasers, electro-optics and fundamental quantum electronics.

The conference will be held at the Munich International Congress Centre (ICM) in conjunction with Laser 2007 World of Photonics, the largest European exhibition of laser and electro-optic equipment and services.

Deadline for submissions: 15 January 2007

More on: www.cleoeurope.org

SPEAKERS

Short Courses
- Majid Ebrahimbadeh, ICFO - Institut de Ciències Fotòniques, Barcelona, Spain
- Bernhard Kley, Friedrich-Schiller University of Jena, Germany

Plenary
- Theodor W. Hänsch, Max-Planck-Institute for Quantum Optics, Garching, Germany
- Gérard Mourou, ENSTA, Laboratoire d’Optique Appliquée, Palaiseau, France

Tutorial
- Immanuel Bloch, Johannes Gutenberg Universität Mainz, Germany
- Dan Gauthier, Duke University, Durham, USA
- Philip Russell, University of Erlangen-Nürnberg, Erlangen, Germany
- Costas M. Soukoulis, Iowa State University, Ames, USA

Keynote
- Jeremy Baumberg, University of Southampton, United Kingdom
- Paul Corkum, National Research Council of Canada, Ottawa, ON, Canada
- Jean Dalibard, Laboratoire Kastler Brossel, Paris, France
- Ben Eggleton, CUDOS University of Sydney, Australia
- John Kitching, NIST Boulder, Boulder, CO, USA
- David Richardson, University of Southampton, United Kingdom
- Kerry Vahala, California Institute of Technology, Pasadena, CA, USA

Tech Focus
- Don Arnone, TeraView Ltd, Cambridge, United Kingdom
- Samuel Mao, University of California at Berkeley, CA, USA
- M. Nakazawa, Tohoku University, Sendai-shi, Miyagi-ken, Japan
- Andreas Tünnemann, Fraunhofer Institute, FhG-IOF, Jena, Germany
CLEO®/Europe - IQEC 2007

Summary & Abstract Deadline: 15 January 2007

Final Call for Papers

Munich ICM
International Congress
Centre Munich, Germany

17 - 22 June 2007

www.cleoeurope.org

Organised and sponsored by:
European Physical Society/Quantum Electronics and Optics Division
IEEE/Lasers and Electro-Optics Society
Optical Society of America

18th International Congress on Photonics in Europe
co-located with "Laser 2007 - World of Photonics" Trade Show
Messe München GmbH, Messegelände, 81823 München, Tel. (+49 89) 949-114 68, info@photonics-congress.com
www.photonics-congress.com
CLEO®/Europe 2007
Conference on Lasers and Electro-Optics/Europe

IQEC 2007
International Quantum Electronics Conference

Munich ICM – International Congress Centre Munich, Germany
17–22 June 2007

Dates to Remember

Monday 15 January 2007
Summary and Abstract Deadline

Monday 30 April 2007
Pre-Registration Deadline

Sunday 17 - Friday 22 June 2007
CLEO®/Europe–IQEC 2007

Monday 18 - Thursday 21 June 2007
Laser 2007. World of Photonics Exhibition

General Information and Enquiries
Further information on arrangements for the meeting may be obtained from:

European Physical Society
BP 2136
F-68060 Mulhouse Cedex FRANCE
Phone: +33 389 32 94 42
Fax: + 33 389 32 94 49
Email: conferences@eps.org
Website: www.eps.org
# TABLE OF CONTENTS

## Overview
- Foreword ........................................................................................................................................................................... 2
- EPS Prizes Announcement .................................................................................................................................................. 3

## Committees
- CLEO®/Europe 2007 Committees ....................................................................................................................................... 3
- IQEC Committees ............................................................................................................................................................... 5

## Conference Topics
- ......................................................................................................................................................................................... 7

## Technical Programme
- Short Courses ......................................................................................................................................................................... 10
- CLEO®/Europe-IQEC 2007 Plenaries .................................................................................................................................. 10
- CLEO®/Europe-IQEC 2007 Tutorial Talks .......................................................................................................................... 10
- CLEO®/Europe-IQEC 2007 Keynote Talks .......................................................................................................................... 10
- CLEO®/Europe 2007 Tech-Focus Talks .............................................................................................................................. 10
- CLEO®/Europe 2007 Invited Talks ..................................................................................................................................... 10
- CLEO®/Europe-IQEC 2007 Symposia Talks .......................................................................................................................... 11
- IQEC 2007 Invited Talks ...................................................................................................................................................... 11

## General Information
- Online Submissions .............................................................................................................................................................. 12
- Registration ............................................................................................................................................................................ 13
- Laser 2007. World of Photonics Exhibition ......................................................................................................................... 15
- Munich: Venue, Accommodation, and Travel ....................................................................................................................... 15
- Copyright Form .................................................................................................................................................................... 17
- Conference Registration Form ............................................................................................................................................... 19
The European Conference on Lasers and Electro-Optics and the International Quantum Electronics Conference (CLEO®/Europe-IQEC) is the largest, most comprehensive and prestigious gathering of optics and photonics researchers and engineers organized in Europe in 2007. IQEC incorporates the Xth European Quantum Electronics Conference (EQEC) providing a world-wide international flavour. Moreover, the meeting is complemented by LASER 2007. World of Photonics, the world’s largest, most comprehensive and prestigious gathering of optics and photonics researchers and engineers organized in Europe in 2007. IQEC features the fundamentals of quantum and atom optics, quantum information, cold atoms and molecules, basic research in lasers and spectrophotometry, nonlinear and ultra-fast optics and dynamics, instabilities and patterns. In 2007, it will be jointly organised by the International Committee on Quantum Electronics and the EPS, and will attract attendees from all around the world.

Three topical symposia and a Tech-Focus meeting will be held jointly organized by CLEO®/Europe and IQEC. Each symposium is dedicated to a particularly important topical development. One joint symposium addresses photonic cryptographic techniques; another one will be on nonphotonics and metamaterials, while the third symposium is devoted to optical frequency combs and applications. The Tech-Focus meeting is on applications of ultrafast photonic techniques.

CLEO®/Europe-IQEC 2007 is integrated into the world’s largest trade fair on laser technology, LASER 2007. World of Photonics, and will be collocated with a number of smaller specialist conferences including the European Conference on Biomedical Optics, the WLT conference on Lasers in Manufacturing, the DGLM/ISLM congress on Medical Laser Applications, a SPIE conference on Laser Metrology and the Annual Meeting of the European Optical Society. All these collocated conferences, under the banner of “World of Photonics Congress 2007”, will share common registration fees and so delegates can attend all the sessions – but authors are expected to register with the conference to which they have submitted papers.

In order to better serve participants active in biomedical optics, it has been arranged that the biomedical optics content of CLEO®/Europe-IQEC 2007 be a joint activity with the European Conferences on Biomedical Optics (ECBO, http://spie.org/conferences/calls/07/eobo/, which is sponsored by SPIE and the OSA and organized by SPIE). Joint sessions on novel optical instrumentation for biomedical applications will be held by ECBO and CLEO®/Europe. Papers concerning emerging technologies for biophotonics should be submitted to CLEO®/Europe-IQEC at: http://www.cleoeurope.org (CLEO®/Europe topic “Biophotonics and Applications”). All other papers concerning biomedical optics should be submitted to ECBO 2007.

The CLEO®/Europe-IQEC 2007 technical programme will include invited and selected contributed papers encompassing all fields of quantum electronics, lasers and photonics. Contributed papers are solicited in the areas listed hereafter. All aspects of the technologies will be covered, including fundamentals, device development, systems, and applications.

CLEO®/Europe 2007 will emphasise applied physics, engineering and applications of lasers and electro-optics, while the emphasis of IQEC 2007 will be on fundamental science including laser physics, nonlinear optics and fundamentals of quantum optics.

It is expected that one or more sessions of CLEO®/Europe-IQEC 2007 will feature poster papers. During these sessions, presenters remain in the vicinity of their posters for informal discussions and explanations.

An attractive feature of the CLEO®/Europe technical programme are the special all day or half-day “Tech-Focus” sessions, which concentrate on selected Photonics Application topics. The Tech-Focus sessions try to
bridge the gap between academia and industry. These feature a combination of Extended Tutorial/Short Course introductory material, authoritative technical reviews, workshops and panel discussions, with a combination of invited talks by leading experts only. One Tech-Focus topic has been selected on Industrial Applications of Ultrafast Technology.

Joint-Symposia

A much appreciated feature of the CLEO®/Europe-IQEC meetings has always been the symposia that are organized to anticipate on emerging fields by putting emphasis on fast developing, well defined topics. Symposia rely on a large fraction of invited presentations but typically also accept contributed presentations. Unless the authors object, submissions may be transferred from "topic areas" to symposia and vice versa.

Three symposia have been identified for CLEO®/Europe-IQEC 2007:

JSI - Cryptographic Techniques in Photonics
JSII - Nanophotonics and Metamaterials: From Concepts to Devices
JSIII - Optical Frequency Combs and Applications

EPS Prizes Announcement

The Quantum Electronics and Optics division (QEOD) of the European Physical Society is presently soliciting nominations for their biennial prizes, which are to be presented in 2007 at the CLEO®/Europe-IQEC meeting in Munich in June 2007.

EPS Quantum Electronics Prize

These are the two senior EPS/QEOD prizes awarded on a biennial basis for outstanding contributions to quantum electronics and optics. There is one prize for fundamental aspects and one prize for applied aspects. The prize winners are each to receive a medal and € 5000.

Fresnel Prize

These are the two EPS/QEOD prizes awarded on a biennial basis for outstanding contributions to quantum electronics and optics made by young scientists before the age of 35. There is one prize for fundamental aspects and one prize for applied aspects. The prize winners are each to receive a medal and € 3000.

There is no nomination form for these prizes, but letters of nomination should contain a one page CV, a brief description of the nominee’s achievements, a list of key publications, patents, etc., and at least two letters of endorsement of the nomination. The letter should be prepared in PDF-format.

Additionally from 2007, QEOD announces a PhD thesis prize:

QED Thesis Prize

Up to four EPS/QEOD prizes will be awarded on a biennial basis for the best nominated PhD theses in the area of quantum electronics and optics submitted in the two years prior to the CLEO/Europe-IQEC meeting. These prizes will be awarded for fundamental and for applied aspects. The prize winners are each to receive a medal and € 2000 and EPS will also pay the winners’ reasonable travel expenses to attend the CLEO®/Europe-IQEC conference.

These prizes are nominated on the basis of recommendation from at least one of the PhD-thesis examiners (who should not be the nominated student's supervisor or from the same institution). Such letters of recommendation should be written in English, submitted electronically in pdf-format. They should contain a short summary of the achievements reported in the nominated thesis together with a list of associated publications and reasons why the thesis is particularly deserving of the appropriate thesis prize.

All nominations should be emailed to Sarah Jung (s.jung@eps.org) on or before, 5th March, 2007. Also, please note that the prize receivers need to be an EPS QEOD member at the time of the nomination.

For further information about the prizes, former prize winners, and QEOD, please go to the QEOD home-page http://www.quuniverse.sk/qeod/index.php?x=intro

CLEO®/Europe 2007 Committees

CLEO®/Europe Steering Committee

> European Physical Society:

Chair: Sandro De Silvestri, Politecnico di Milano, Italy
Ennio Arimondo, INFN - University of Pisa, Pisa, Italy
Robert W. Boyd, University of Rochester, NY, USA
Richard De La Rue, University of Glasgow, UK
John Dudley, Université de Franche-Comté, Besançon, France
Paul French, Imperial College, London, UK
Ursula Keller, ETH Zurich, Switzerland
Daan Lenstra, Delft University of Technology, Delft, The Netherlands
Peter Loosen, Fraunhofer Institute of Laser Technology, Aachen, Germany
Ralf Menzel, University of Potsdam, Germany
Dieter Meschede, University of Bonn, Germany
Klaus Molmer, University of Aarhus, Denmark
Eberhard Riedle, LMU Munich, Germany
Gérald Roosen, Lab. Charles Fabry, Institut d’Optique, Orsay, France
Ken-Ichi Ueda, University of Electro-Communications, Tokyo, Japan

> IEEE/Lasers and Electro-Optics:

Silvano Donati, University of Pavia, Italy
Concetto Giuliano, US Airforce Research Laboratory, Kirtland, NM, USA
Giok-Djan Khoe, Eindhoven University of Technology, The Netherlands
Richard Linke, IEEE/LEOS, Piscataway, NJ, USA

> Optical Society of America:

Kari Apter, Optical Society of America, Palo Alto, CA, USA
Jean-Pierre Huignard, Thales Research & Technology, Palaiseau, France
Franz Kärtner, Massachusetts Institute of Technology, Cambridge, MA, USA
Jürg Leuthold, University of Karlsruhe, Germany
Elizabeth Rogan, Optical Society of America, Washington DC, USA

Organising Committee

General Chairs

Ursula Keller, ETH Zurich, Zürich, Switzerland
Gérald Roosen, Lab. Charles Fabry de L’Institut d’Optique, Orsay, France

Programme Chairs

Richard De La Rue, University of Glasgow, UK
John Dudley, Université de Franche-Comté, Besançon, France

Local Chair

Eberhard Riedle, Ludwig-Maximilians-University, Munich, Germany

Programme Committee

CA - Solid-State Lasers
Chair: Irina Sorokina, Technical University of Vienna, Austria
Committees

CB - Semiconductor Lasers
Chairs: Ingo Fischer, Vrije Universiteit, Brussels, Belgium
Eugene A. Avrutin, The University of York, Heslington, UK
Gadi Eisenstein, Technion, Haifa, Israel
Wolfgang Elsaß, Darmstadt University of Technology, Germany
Götz Erbert, Ferdinand-Braun-Institut für Höchstfrequenztechnik, Berlin, Germany
Thomas Erneux, Université Libre de Bruxelles, Belgium
Andrea Fiore, École Polytechnique Fédérale de Lausanne, Switzerland
Mark Hopkinson, University of Sheffield, Sheffield, UK
Francesco Marin, University Firenze and INFM and LENS, Sesto Eno (FI), Italy
Cristina Masoller, Universitat Politècnica de Catalunya, Barcelona, Spain
Geert Mortier, Gent University – IMEC, Gent, Belgium
Atsushi Uchida, Tsuchioka University, Tokyo, Japan
Ian White, University of Cambridge, Jesus College, Cambridge, UK
Hans-Jürgen Wünsche, Humboldt-Universität zu Berlin, Germany

CC - Holography, Adaptive Optics, Optical Storage and Photorefractive Materials
Chairs: Loïc Mager, CNRS, Institut de Physique et de Chimie des Matériaux de Strasbourg, France
Arnaud Brignon, Thales Research & Technology, Palaiseau, France
Marc Georges, Université de Liège, Centre Spatial, Angleur (Liège), Belgium
Kazuo Kuroda, University of Tokyo, Japan
Gilles Pauliat, Lab. Charles Fabry de l’Institut d’Optique, Orsay, France
John T. Sheridan, University College Dublin, Ireland
Jingjun Xu, Nankai University, Tianjin, China

CD - Applications of Nonlinear Optics
Chairs: Neil Broderick, University of Southampton, UK
Gaetano Assanto, University of Rome, Roma Tre, Rome, Italy
Ole Bang, Technical University of Denmark, Research Center COM, Lyngby, Denmark
Martijn de Sterke, University of Sydney New South Wales, Australia
Philippe Delave, Institut d’Optique, Orsay, France
Philippe Greul, LPUB, Université de Bourgogne, Dijon, France
Jonathan Knight, University of Bath, UK
Ulf Peschel, University Erlangen-Nürnberg, Erlangen, Germany
Peter G.R. Smith, University of Southampton, UK
Paul Westbrook, OFS Labs, Somerset, NJ, USA
Alekszhi Zheltikov, M.V. Lomonosov Moscow State University, Moscow, Russia

CE – Optical Materials, Fabrication and Characterisation
Chairs: Markus Pollnau, University of Twente, Enschede, The Netherlands
Chantal Fontaine, LAAS-CNRS, Groupe Photonique, Toulouse, France
Christos Grivas, University of Southampton, UK

CF - Ultrafast Optics, Electrooptics and Applications
Chairs: Günter Steinmeyer, Max-Born-Institute for Nonlinear Optics and Short Pulse Spectroscopy, Berlin, Germany
Luc Bergé, CEA-DAM / Ile de France, Bruyères-le-Châtel, France
Giulio Cerullo, Politecnico di Milano, INFM, Milan, Italy
Takao Fujii, Max-Planck-Institute of Quantum Optics, Garching, Germany
Pablo Loza-Alvarez, ICFO, Institute of Photonic Sciences, Castelldefels (Barcelona), Spain
Uwe Morgner, University of Hannover, Hannover, Germany
Derryck T. Reid, Heriot-Watt University, Edinburgh, UK
Jeff A. Squier, Colorado School of Mines, Golden, USA
John W.G. Tisch, Imperial College, London, UK
Kenji Torizuka, AIST, Tsukuba, Ibaraki, Japan

CG - High-field Laser Physics and Applications
Chairs: Marc Vrakking, FOM Institute for Atomic and Molecular Physics, Amsterdam, The Netherlands
Joachim Burgdörfer, Vienna University of Technology, Vienna, Austria
Dimitris Charalambidis, FORTH – IESL, Heraklion, Greece
Reinhard Dörner, University of Frankfurt, Frankfurt am Main, Germany
Victor Malka, ENSTA, CNRS, Ecole Polytechnique, Palaiseau, France
Jon Marangos, Imperial College, London, UK
Mauro Nisoli, Politecnico di Milano, Italy
Jan Michael Rost, Max-Planck-Institut für Physik komplexer Systeme, Dresden, Germany
Pascal Salières, CEA Saclay, Gif sur Yvette, France
Henrik Stapelfeldt, Aarhus University, Aarhus C, Denmark

CH - Optical Sensing and Metrology
Chairs: Hanne Ludvigsen, Helsinki University of Technology, Espoo, Finland
Ian Bennion, Aston University, Birmingham, UK
Andreas Erdmann, Fraunhofer Institute (IISB), Erlangen, Germany
Min Gu, Swinburne University of Technology, Victoria, Australia
Julian Jones, Heriot-Watt University, Edinburgh, UK
Tomasz Nasilowski, Vrije University Brussel, Belgium
Mitsuo Takeda, University of Electro-Communications, Tokyo, Japan
Luc Thevenaz, EPFL Swiss Federal Inst. of Technology, Lausanne, Switzerland
Waclaw Urbanzky, Wrocław University of Technology, Wrocław, Poland
Germán Vergara, Centro de Investigación y Desarrollo de la Armada, Madrid, Spain

CI - Optical Technologies for Lightwave Communications and Networks
Chair: Liam Barry, Dublin City University, Dublin, Ireland
Polina Bayvel, University College London, UK
Pascal Besnard, ENSSAT-FTON / CNRS, Lannion, France
Harmen J.S. Dorren, Eindhoven Univ. of Technology, Eindhoven, The Netherlands
Andrew Ellis, University College Cork, Tyndall National Inst., Cork, Ireland
Dan Kilper, Bell Laboratories, Lucent Technologies, Holmdel, NJ, USA
Periklis Petropoulos, University of Southampton, UK
Christophe Peecheret, Technical University of Denmark, Research Centre COM, Lyngby, Denmark
Stefan Wabnitz, Université de Bourgogne, Dijon, France
Neil D. Whitbread, Bookham, Caswell Towcester, UK
**CLEO®/Europe-IQE2007 Joint Symposium 2007**

**Programme Committees**

**JSII - Cryptographic Techniques in Photonics**
- **Co-Chairs:** Nobuyuki Imoto, Osaka University, Toyonaka, Japan and Claudio R. Mirasso, Universitat de les Illes Balears, Palma de Mallorca, Spain
- **Valerio Annovazzi Lodi,** University of Pavia, Italy
- **Artur Ekert,** University of Cambridge, UK
- **Nicos Gisin,** University of Geneva, Switzerland
- **Takuya Hirano,** Gakushuin University, Tokyo, Japan
- **Ido Kanter,** Bar-Ilan University, Ramat-Gan, Israel
- **Jia-Ming Liu,** University of California, UCLA, Los Angeles, CA, USA
- **Hoi-Kwong Lo,** University of Toronto, Canada
- **Norbert Lütkenhaus,** University of Waterloo, Waterloo, ON, Canada
- **John Rarity,** University of Bristol, UK
- **Marco Santagostino,** University of Padova, Italy
- **Alan Shore,** University of Wales, Bangor, UK
- **Dimitris Syvridis,** University of Athens, Greece
- **Mirvais Yousefii,** University of Eindhoven, The Netherlands

**JSIII - Nanophotonics and Metamaterials: From Concepts to Devices**
- **Co-Chairs:** Nikolay I. Zheludev, Southampton University, UK and Ted Sargent, University of Toronto, Canada
- **F. Javier García de Abajo,** CSIC, San Sebastian, Spain
- **Joachim Krenn,** University of Graz, Austria
- **Michal Lipson,** Cornell University, Ithaca, NY, USA
- **David R. Smith,** Duke University, Durham, NC, USA
- **Tomasz Szoplik,** Warsaw University, Poland
- **Ding Ping Tsai,** National Taiwan University, Taipei, Taiwan
- **Nie F. van Hulst,** ICFO - Institute of Photonic Sciences, Castelldefels (Barcelona), Spain

**JSIII - Optical Frequency Combs and Applications**
- **Co-Chairs:** Scott Diddams, National Institute of Standards and Technology, Boulder, USA and Harald Telle, Physikalisch-Technische Bundesanstalt, Braunschweig, Germany
- **Alexander Gaeta,** Cornell University, Ithaca, NY, USA
- **David Jones,** University of British Columbia, Vancouver, BC, Canada
- **R. Jason Jones,** JILA/ University of Colorado and NIST, Boulder, CO, USA
- **Franz Kärtner,** Massachusetts Institute of Technology, Cambridge, MA, USA
- **Motonobu Kourogi,** Optical Comb Institute, Tokyo, Japan
- **Stephen N. Lea,** National Physical Laboratory, Teddington, UK
- **Koaru Minoshima,** National Institute of Advanced Industrial Science and Technology, Tsukuba, Japan
- **Giorgio Santarelli,** BNM-Syrte, Observatoire de Paris, France
- **Florian Tauer,** Toptica Photonics AG, Gräfelfing/Munich, Germany
- **Thomas Udem,** Max-Planck Inst. for Quantum Optics, Garching, Germany
- **Lijun Wang,** Max-Planck Research Group, Erlangen, Germany

**IQEC 2007 Committees**

**Organising Committee**
- **General Chairs:** Ennio Arimondo, INFN, University of Pisa, Italy
- **Daan Lenstra,** Vrije Universiteit, FEW, Amsterdam, The Netherlands

**Programme Chairs**
- **Robert W. Boyd,** University of Rochester, Rochester, NY, USA
- **Dieter Meschede,** University of Bonn, Germany

---

**Committees**

**CJ - Fibre and Guided Wave Lasers and Amplifiers**
- **Chair:** Pierre A. Champert, Keopsys SA, Lannion, France
- **Andrei A. Fotiadis,** Faculté Polytechnique de Mons, Belgium
- **Denis V. Gapontsev,** IPG Photonics, Oxford, MA, USA
- **Kim P. Hansen,** Crystal Fibre A/S, Birkedor, Denmark
- **Thomas Schreiber,** Friedrich-Schiller University of Jena, Germany
- **William Wadsworth,** University of Bath, UK

**CL - Biophotonics and Applications**
- **Chair:** Lucio Claudio Andreani, University of Pavia, Italy
- **Gonçal Badenes,** ICF0-Inst. de Ciències Fotóniques, Castelldefels, Spain
- **U. Gösele,** Max-Planck-Institute of Microstructure Physics, Halle, Germany
- **L. (Kobus) Kuipers,** University of Twente, Enschede, The Netherlands
- **Florian Kulzer,** Huygens Laboratory, Leiden, The Netherlands
- **Ekrem Ozbay,** University of Istanbul, Ankara, Turkey
- **Andrew R. Parker,** Green College, Oxford, London, UK
- **Michael Scalora,** AMSRD-AMR-WS-ST, U.S. Army RDECOM, Redstone Arsenal, AL, USA
- **Andrew J. Turberfield,** University of Oxford, UK
- **Willem Vos,** University of Twente, Enschede, The Netherlands
- **Ralf B. Wehrspohn,** University of Paderborn, Germany
- **Diederik S. Wiersma,** European Laboratory for Non-Linear Spectroscopy and INFIM-MATIS, Sesto-Fiorentino (Florence), Italy
- **Anatoly Zayats,** Queens University, Belfast, Ireland

**CM - Fundamentals and Modelling of Materials Processing with Lasers**
- **Chair:** Alexander Kaplan, Lulea University of Technology, Lulea, Sweden
- **Peter Bonetti,** University of Stuttgart, Germany
- **Eckhard Beyer,** Fraunhofer IWS, Dresden, Germany
- **John M. Dowden,** University of Essex, Colchester, UK
- **Rémy Fabro,** Coopération LaserFranco-Allemande, Arcueil, France
- **Costas Fotakis,** FORTH – IESL, Heraklion, Greece
- **Bernd Hüttner,** DLR, Institute of Technical Physics, Stuttgart, Germany
- **Seiji Katayama,** Osaka University, Japan
- **José Luis Ocaña,** Madrid Polytechnical University, Spain
- **Wolfgang Schulz,** Fraunhofer Institut für Lasertechnik and RWTH, Aachen, Germany
- **Armando J. Yáñez Casal,** Universidade da Coruña, Ferrol, Spain
- **Gang Yu,** Chinese Academy of Sciences, Beijing, China

**Tech-Focus 1: Industrial Application of Ultrafast Technologies**
- **Chair:** Wilson Sibbett, University of St. Andrews, UK
Klaus Mølmer, University of Aarhus, Denmark
Ken-Ichi Ueda, University of Tokyo, Japan
Eberhard Riedle, Ludwig-Maximilians-University, Munich, Germany

Programme Committee

IA - Microstructured Devices for Quantum and Atom Optics
CHAIR: Ed Hinds, Imperial College, London, UK
Victor Balykin, Russian Academy of Sciences, Troitsk, Moscow, Russia
Francesco Saverio Cataliotti, University of Florence and University of Catania, European Laboratory for Non-Linear Spectroscopy, Sesto Fiorentino, (FI), Italy
Peter Hannaford, Swinburne University of Technology, Melbourne, Australia
Ifan G. Hughes, Durham University, Durham, UK
John Kitching, JILA, Boulder, Colorado, Gaithersburg, MD, USA
Markus Oberthaler, University of Heidelberg, Germany
Arno Rauschenbeutel, University of Bonn, Germany
Alastair Sinclair, Centre for Basic, Thermal and Length Metrology, Teddington, Middlesex UK
Robert J.C. Spreeuw, University of Amsterdam, The Netherlands
Aephraim M. Steinberg, University of Toronto, Canada
Chris Westbrook, Laboratoire Charles Fabry, Orsay, France
Claus Zimmermann, University of Tübingen, Germany

IB - Cold Atoms and Molecules
CHAIR: Dan Stamper-Kurn, UC Berkeley, USA
Jean Dalibard, Laboratoire Kastler Brossel, Paris, France
Nir Davidson, Weizmann Institute of Science, Rehovot, Israel
Axel Görlitz, Heinrich-Heine University, Düsseldorf, Germany
Hanns-Christoph Nägerl, University of Innsbruck, Austria
Luis A. Orozco, University of Maryland, USA
Jörg Schmiedmayer, University of Innsbruck, Heidelberg, Austria
Klaus Sengstock, University of Hamburg, Germany

IC - Quantum Information
CHAIR: Ian A. Walmsley, University of Oxford, UK
Gerard J. Milburn, The University of Queensland, Brisbane, Australia
Yasunobu Nakamura, NEC Corporation, Tsukuba, Ibaraki, Japan
Martin Plenio, Imperial College, London, UK
Gerhard Rempe, Max-Planck-Institut für Quantenoptik, Garching, Germany
Goran Wendin, Chalmers University, Göteborg, Sweden

ID - Photonics Applications in Fundamental Physics
CHAIR: Dmitry Budker, UC Berkeley, USA
Marcis Auzinsh, University of Latvia, Riga, Latvia
Martial Ducloy, Laboratoire de Physique des Lasers, Villetaneuse, France
Wojciech Gawlik, Jagiellonian University, Krakow, Poland
Zheng-Tian Lu, University of Chicago, Argonne National Laboratory, Argonne, USA
Sadig Rangwala, Raman Research Institute, Bangalore, India
Guglielmo M. Tino, Dipartimento di Fisica and LENS Laboratory - Universita’ di Firenze Sesto Fiorentino, Firenze, Italy
Antoine Weis, University of Fribourg, Switzerland
Jun Ye, JILA, National Institute of Standards and Technology and University of Colorado Boulder, USA

IE - Nonlinear Optics and Ultrafast Phenomena
CHAIR: Steve Cundiff, JILA, Univ. of Colorado and NIST, Boulder, CO, USA
Nail Akhmediev, The Australian National University, Canberra, Australia

Paola Borri, Cardiff University, UK
Robert Kaindl, E.O. Lawrence Berkeley National Laboratory, Berkeley, CA, USA
Martti Kauranen, Tampere Technical University, Tampere, Finland
Daïsik Kim, Seoul National University, South Korea
Makoto Kuwata-Gonokami, University of Tokyo, Japan
Alfred Leitenstorfer, University of Konstanz, Germany
Stefan Lochbrunner, Ludwig-Maximilians-Universität München, Munich, Germany
Ilias Perakis, University of Crete, Heraklion, Crete, Greece
John E. Sipe, University of Toronto, Toronto, Canada

IF - Quantum Optics
CHAIR: Hans A. Bachor, Australian National University, Canberra, Australia
Rainer Blatt, University of Innsbruck, Austria
Ignacio Cirac, Max-Planck-Institut für Quantenoptik, Garching, Germany
Thomas Jennewein, University of Vienna, Austria
Agnès Maïtre, Université Pierre et Marie Curie, Paris, France
Alexander V. Sergienko, Boston University, MA, USA
Victor Zadkov, M.V. Lomonosov Moscow State University, Moscow, Russia

IG - Dynamics, Instabilities and Patterns
CHAIR: Fedor Mitschke, Universität Rostock, Germany
Thorsten Ackemann, University of Strathclyde, Glasgow, UK
Pere Colet, IMDEA, Palma de Mallorca, Spain
German de Valcarcel, Universitat de Valencia, Burjassot, Spain
Stefano Longhi, Politecnico di Milano, Italy
Jorge Tredicce, Institut Non-linéaire de Nice, France
Sergei K. Turitsyn, Aston University, Birmingham, UK
Evgeny Viktorov, Université Libre de Bruxelles, Brussels, Belgium

NOTES
Tech-Focus Topic

TFI) Industrial Application of Ultrafast Technologies
Ultrafast laser technologies are now reaching a stage of maturity such that they are having a significant impact on industry, and this Technical Focus Session will present a representative overview of both existing and emerging industrial applications. The Session will aim at providing a comprehensive introduction to the field for the non-specialist as well as identifying key new directions for future research. The invited speakers will cover topics including: ultrafast fiber and solid state lasers, the search for higher power and more compact sources, femtosecond micromachining applications, THz generation and imaging, optical communication systems, femtosecond biophotonics and more.

CHAIR: Nei Broderick, University of Southampton, UK

CE) Optical Materials, Fabrication and Characterization
Crystal growth and epitaxy of optical materials; new crystalline and glass laser materials in bulk, fiber and waveguide geometry; micro- and nano-fabrication and -engineering techniques; optical characterisation of laser and nonlinear materials, micro-structured fiber and photonic crystal waveguides, quantum-wells, -wires and -dots, nano-crystalline materials, nano-tubes and innovative molecules such as fullerenes; optical modulators; polymer, organic, and related light absorbers, emitters, LEDs, and lasers.

CHAIR: Markus Pollnau, University of Twente, Enschede, The Netherlands

CF) Ultrafast Optics and Applications
Femtosecond and picosecond pulse generation from solid state, fiber and waveguide sources; mode-locked and Q-switched lasers; optical few-cycle pulses; ultrashort-pulse semiconductor lasers and devices; ultrafast parametric and nonlinear optical conversion of short pulses; ultrashort-pulse mid-IR and THz radiation; pulse compression; super-continuum generation; dispersion compensation; pulse-shaping; carrier-envelope effects; ultrafast characterization methods and measurement techniques, ultrafast optoelectronic systems and devices; applications of ultrafast technology.

CHAIR: Günter Steinmeyer, Max-Born-Institute, Berlin, Germany

CG) High-field Laser Physics and Applications
Laser and parametric chirped-pulse amplification; compression and carrier-envelope phase (CEP) stabilisation of Terawatt pulses; carrier-envelope phase metrology; characterization and manipulation of high-intensity femtosecond light pulses; optical field ionization and attosecond xuv/x-ray pulse generation; generation of high brightness attosecond pulse trains using surface harmonic generation, optimal control of ultrafast non-linear processes, time-resolved measurement of Auger decay, XUV/soft x-ray spectroscopy, metrology, interferometry and microscopy; time-resolved Coulomb explosion imaging, electron dynamics in strongly driven molecules, attosecond and femtosecond electron diffraction imaging of molecular structures, dynamics in fixed-in-space molecules, ultrafast electron dynamics in bulk media and quantum-confined structures, probing of surface physiochemical processes via time-resolved UPS/soft XPS; time-resolved XAS, XANES & EXAFS; femtosecond-laser-produced plasmas; relativistic nonlinear optics; laser-driven particle acceleration.

CHAIR: Marc Vrakking, FOM Institute for Atomic and Molecular Physics (AMOLF), Amsterdam, The Netherlands
CII) Optical Technologies for Lightwave Communications and Networks
Fibre devices including dispersion compensating fibres, non-linear fibres, fibre propagation effects, fibre amplifiers and fibre lasers, fibre gratings and fibre grating-based devices; semiconductor devices that may be employed in lightwave communications for generation, processing and detection of optical signals including laser sources, detectors and modulators, performance monitoring devices, switches, picosecond and femtosecond pulse sources; optical components for enabling WDM and OTDM systems including filtering and switching devices; optical sub-systems including clock recovery techniques, packet/burst switching subsystems, modulation formats, microwave photonic technologies and optical regeneration.

Chair: Hanne Ludvigsen, Helsinki University of Technology, Espoo, Finland

CII) Fibre and Guided Wave Lasers and Amplifiers
Waveguide and fibre laser oscillator and amplifiers including novel waveguide and fibre geometries; power scaling of waveguide and fibre lasers - including beam combination techniques (for both pump and signal beams) and new waveguide coupling approaches; upconversion lasers; nonlinear effects in waveguides and fibres - including nonlinear frequency conversion and pulse generation and compression; advances in fibre waveguide materials; fabrication techniques for doped waveguide and fibre devices; active microstructured fibre and waveguide laser devices; novel waveguide and fibre sources for industrial applications.

Chair: J.R. Taylor, Imperial College London, UK

CIII) Photonic Crystals, Photonic Nanostructures and Integrated Optics
The intensive research nowadays being carried out in the area of nanostructured materials for photonic applications has branched in many directions but keeps a common goal. This is learning and profitting form the novel phenomena occurring when light is created, transported and detected in environments where either dimensionality or size are reduced and, in particular, when light-matter interaction occurs in regions smaller than or similar to the wavelength of light. This trend has earned the term nanophotonics. Such a vast field includes but is not limited to, the study of light-matter interactions, physics of optical phenomena in biological media: scattering; coherence; polarization; symmetry and invariance; coupling of optical fields with flows and acoustic fields.

Chair: Benoit C. Forget, Université Pierre et Marie Curie, Paris, France

CM) Fundamentals and Modelling of Materials Processing with Lasers
Fundamental physics during materials processing with lasers; welding, surface treatment; cutting; ablation; LPVD; LCVD; interaction light-matter; surface and plasma absorption; heat conduction and convection; phase transformations solid-liquid and liquid-vapour; metallurgy; chemical reactions and diffusion; plasma formation; fluid flow of melt, gas, vapour and plasma; stress formation and strain; mathematical modelling of the physical processes; interaction front; process geometry; analytical modelling; numerical methods and FEA.

Chair: Alexander Kaplan, Luleå University of Technology, Sweden

Joint CLEO®/Europe-IQEC 2007 Topics

JSII) Cryptographic Techniques in Photonics
This Joint Symposium welcomes contributions on any topic relevant to the application of photonic and optical technologies for cryptography. Topics include, but are not restricted to, the following: chaotic emitter and receiver sources; compact and integrated devices; optical chaos cryptography; quantum key distribution; schemes for information encryption; evaluation of transmission characteristics: bit rate, bit error rate, maximum transmission distance, dispersion compensation techniques; synchronization improvements; free-space and fiber implementations; security aspects: evaluation and characterization; information-theoretic security; key distribution; birefringent communications; exploitation of correlators via public discussion protocol; single photon sources; use of coherent states for cryptography.

Chair: Nobuyuki Imoto, Osaka University, Japan and Claudio Mirasso, Universitat de les Illes Balears, Palma de Mallorca, Spain

JSII) Nanophotonics and Metamaterials: From Concepts to Devices
Nanophotonics and Metamaterials are overlapping areas of photonics research that have rapidly grown in importance in recent years. The symposium will be concerned with wavelength scale and sub-wavelength scale photonics - and, more generally, with optical structures and devices where the response is determined by nanoscale features. Interest in metamaterials that operate at optical frequencies has increased greatly since deterministic fabrication technology that can produce specific properties reproducibly has now emerged. The symposium will cover basic physics, new phenomena, materials properties, fabrication technologies, modelling, device design and characterization - applied in a nanophotonics environment. The symposium will seek to capture the excitement and diversity of this field by gathering experts and newcomers alike to present their latest research developments (both fundamental and applied) in the above-mentioned areas. Submissions that address specific areas of potential application will be especially welcome.

Chair: Ted Sargent, University of Toronto, Canada and Nikolay I. Zheludev, Southampton University, UK

JSIII) Optical Frequency Combs and Applications
Optical frequency combs based on femtosecond mode-locked lasers have brought about a revolution in optical frequency metrology, providing a simple and robust means of connecting the optical and microwave domains of the electromagnetic spectrum. This has made possible the direct counting of optical cycles, which is a critical milestone in the creation of next-generation optical atomic clocks and techniques of precision spectroscopy. Indeed, the importance of these recent developments, as pioneered by T.W. Hänsch and J.L. Hall, was recognized in the award of the 2005 Nobel Prize in physics. Beyond applications in precise time/frequency metrology and tests of fundamental theories, such combs have opened new research avenues in precision length metrology, remote ranging and sensing, novel broadband spectroscopy techniques, and the synthesis of low-noise/low-jitter waveforms. Moreover, these applications have synergistically motivated important developments in carrier-envelope
stabilized femtosecond lasers, coherent linking of multiple broadband sources and nonlinear broadening and frequency conversion techniques that have now pushed frequency combs into new spectral regimes from the XUV to far-IR. This joint symposium will seek to capture the excitement and diversity of this field by gathering experts and newcomers alike to present their latest research developments (both fundamental and applied) in the above-mentioned areas.

CO-ChAIRS: Scott Diddams, National Institute of Standards and Technology, Boulder, CO, USA and Harald Telle, Physikalisch-Technische Bundesanstalt (PTB), Braunschweig, Germany

IQEC 2007 Topics

IA) Microstructured Devices for Quantum and Atom Optics
Cold atoms and Bose Einstein condensates can be confined in extremely small magnetic traps and guides on atom chips, made using microfabricated current-carrying wires or micro-structured patterned of permanent magnetisation. Switched magnetic, electrostatic and radiofrequency fields add further options for atom manipulation. Alternatively, atoms may be trapped and manipulated on the microscopic scale in optical lattices, which may be free-standing or integrated into an atom chip. When coupled to high-finesse optical micro-resonators, trapped atoms offer possibilities for quantum coherent control, including quantum logic gates and quantum memories and with an interconnect to flying optical qubits. This conference topic covers all such effort to miniaturise quantum atom optics and to realise applications such as interferometry, metrology and quantum information processing.

CHAIR: Ed Hinds, Imperial College London, UK

IB) Cold Atoms and Molecules
Quantum degenerate Bose and Fermi gases — Bose-Einstein condensation, multi-component and spinor gases, Fermi degeneracy, superfluid Bose and Fermi gases, the BEC-BCS crossover regime, gases in restricted geometries, effects of disordered potentials, effects of quantum degeneracy on atom-light interactions and atomic coherence, coherent and quantum atom optics, trapping and cooling techniques; quantum gases in optical lattices — internal state/spin dynamics, quantum phase transitions, single- and multi-band gas models, controlled collisions and photoassociation; cold molecules — production and detection methods, manipulating molecular motion, trapping schemes; ultracold polar molecules, scattering and chemistry; applications of quantum gases — metrology, precision measurements, testing of fundamental symmetries.

CHAIR: Dan Stamper-Kurn, UC Berkeley, USA

IC) Quantum Information
Quantum information processing has progressed rapidly in the past decade, and grown into a large interdisciplinary activity. The conference program will highlight recent innovations in all areas of the field, from algorithm development to experimental implementations of quantum computers. Of special interest are results in quantum communications systems and in quantum cryptography, including entanglement distribution and distillation, conversion of information between static and flying qubits, and quantum memories, both for individual particles and ensembles. In addition, novel platforms, devices and materials for quantum information processing, such as photonic bandgaps, micro-mechanics, ion-trap arrays, superconducting structures, quantum dots and nonlinear optical processes will be covered.

CHAIR: Ian A. Walmsley, University of Oxford, UK

ID) Photonics Applications in Fundamental Physics
Novel laser-spectroscopy techniques, high-resolution spectroscopy, nonlinear spectroscopy, nonlinear magneto- and electro-optical effects, and their applications to metrology; novel frequency standards; measurements of fundamental constants, and searches for their temporal variation; fundamental-symmetry tests.

CHAIR: Dmitry Budker, UC Berkeley, USA

IE) Nonlinear Optics and Ultrafast Phenomena
Fundamentals of nonlinear optics; fundamentals of ultrashort optical fields; frequency conversion, parametric processes and wavemixing; novel nonlinear optical materials, processes and effects; temporal and spatial solitons; ultrafast spectroscopy; ultrafast dynamics in condensed matter and molecules; control of chemical reactions; electromagnetic induced transparency, lasing without inversion, slow light and dark states.

CHAIR: Steve Cundiff, JILA, University of Colorado and NIST, Boulder, USA

IIG) Dynamics, Instabilities and Patterns
Pattern forming optical systems: localized and extended structures; novel optical systems for non linear dynamics such as quantum dot lasers, hybrid devices, microlasers, fiber lasers; dynamics of nonlinear optical systems such as lasers, OPOs, optical valves; instabilities in semiconductor lasers: injected signal, optical feedback, multimode dynamics; control, synchronisation and applications of chaos in optical systems.

CHAIR: Fedor Mitschke, University of Rostock, Germany

NOTES

9
Technical Programme

Short Courses
Practical OPOs
Majid Ebrahimzadeh, ICFO - Inst. de Ciències Fotòniques, Barcelona, Spain

Micro- and nano-machined optics
Bernhard Kley, Friedrich-Schiller University Jena, Germany

CLEO®/Europe 2007 Plenary
The Exawatt laser
Gérard Mourou, ENSTA, Lab. d’Optique Appliquée, Palaiseau, France

IQEC 2007 Plenary
A passion for precision
Theodor W. Hänisch, Max-Planck-Inst. for Quantum Optics, Garching, Germany

CLEO®/Europe 2007 Tutorials
New directions in photonic crystal fibers
Philip Russell, University of Erlangen-Nürnberg, Erlangen, Germany

Negative index materials
Costas M. Soukoulis, Iowa State University, Ames, USA

IQEC 2007 Tutorials
Exploring ultracold quantum matter in artificial crystals of light
Immanuel Bloch, Johannes Gutenberg Universität Mainz, Germany

Slow-light in room-temperature optical waveguides
Daniel Gauthier, Duke University, Durham, USA

CLEO®/Europe 2007 Keynotes
High field optics
Paul Corkum, National Research Council of Canada, Ottawa, ON, Canada

The all-photonics chip
Ben Eggleton, University of Sydney, CUDOS, Sydney, Australia

Diversity of fiber laser technology
David Richardson, University of Southampton, UK

IQEC 2007 Keynotes
Tailoring NanoMaterials for light-matter interactions
Jeremy Baumberg, University of Southampton, UK

Cold quantum gases: when atomic physics meets condensed matter
Jean Dalibard, Laboratoire Kastler Brossel, Paris, France

Chip-scale atomic devices based on microfabricated alkali vapor cells
John Kitching, NIST Boulder, CO, USA

The new high-Q physics: phonic clocks, back-action cooling, and micro-chip cavity QED
Kerry Vahala, California Institute of Technology Pasadena, CA, USA

CLEO®/Europe 2007 Tech-Focus Talks
Tech-Focus session 1: Industrial Applications of Ultrafast Technology

Terahertz technology in industry
Don D. Arnone, TeraView Ltd, Cambridge, UK

Femtosecond Micromachining
Patrick Chabassier, CEO, NOVALASE SA, Canejan, France

Ultrafast lasers for nanomaterial growth and processing
Samuel Mao, University of California, Berkeley, CA, USA

Next generation ultrafast telecommunications technologies
M. Nakazawa, Tohoku University, Japan

Industrial perspectives on ultrafast fiber lasers
Andreas Tünnermann, Fraunhofer Institute, Jena, Germany

One additional speaker for this topic will be announced at a later date.

CLEO®/Europe 2007 Invited Talks
Topic Area CA: Solid-State Lasers

Power scalability over 10 kW of the thin-disk lasers
Adolf Giesen, University of Stuttgart, Germany

High power, tunable microchip lasers
Takunori Taira, Institute for Molecular Myodaiji, Okazaki, Japan

Topic Area CB: Semiconductor Lasers

Quantum dot lasers / reliability of quantum dot lasers and perspectives for industrial applications
Alexey Kovsh, NL Nanosemiconductor GmbH, Dortmund, Germany

Coupled nanocavity arrays
Jelena Vuckovic, Stanford University, CA, USA

Topic Area CC: Holography, Adaptive Optics, Optical Storage and Photorefractives

Nonlinear photonic structures in photorefractive media
Cornelia Denz, University of Münster, Westfalen, Germany

Nanoparticle-photopolyer composites for holographic applications
Yasuo Tomita, University of Electro-Communications, Tokyo, Japan

Topic Area CD: Applications of Nonlinear Optics

Slow light in semiconductor waveguides: Theory and experiment
Jesper Moerk, Technical University of Denmark, Lyngby, Denmark

Switching in silicon photonics crystals
Masaya Notomi, NTT Basic Research Laboratories, Atsugi, Japan

Topic Area CE: Optical Materials, Fabrication and Characterization

Rare-earth-ion-doped sesquioxide laser materials
Klaus Petermann, University of Hamburg, Germany

Are organic LEDs and Lasers similar to inorganic devices?
Nir Tessler, Technion, Haifa, Israel

Topic Area CF: Ultrafast Optics, Electrooptics and Applications

A nanometer-size few-femtosecond electron source at high repetition rates
Christoph Lienau, Max-Born-Institute, Berlin, Germany

Novel concepts in high-energy femtosecond fiber lasers
Frank Wise, Cornell University, Ithaca, NY, USA

Topic Area CG: High-field Laser Physics and Applications

Generating isolated attosecond pulses by modulating light polarization
Eric Constanit, University of Bordeaux, France

Particle acceleration with high intensity lasers
Heinrich Schwoerer, Friedrich-Schiller-University of Jena, Germany
**CLEO®/Europe - IQEC 2007 Joint Symposia**

**Topic Area JS1: Cryptographic Techniques in Photonics**

Finding a needle in a haystack: chaos, noise and information
Rajarshi Roy, University of Maryland, College Park, MD, USA

A second speaker for this Joint Symposium will be announced at a later date.

**Topic Area JS2: Nanophotonics and Metamaterials: From Concepts to Devices**

Linear and nonlinear optics of metamaterials
Vladimir M. Shalaev, Purdue University, West Lafayette, USA

Optical metamaterials and plasmonic devices
Xiang Zhang, University of California, CA, Berkeley, USA

**Topic Area JS3: Nanophotonics Optical Frequency**

Frequency comb metrology at vacuum ultraviolet wavelengths and beyond
K.S.E. Eikema, Vrije Unv., Faculty of Sciences, Amsterdam, The Netherlands

Spectral line-by-line pulse shaping
Andy Weiner, Purdue University, West Lafayette, USA

**IQEC 2007 Invited Talks**

**Topic Area IA: Microstructured Devices for Quantum and Atom Optics**

Strong atom-photon coupling on an atom chip
Jakob Reichel, Laboratoire Kastler-Brossel, Paris, France

Single-atom detection on a microchip
Vladan Vuletic, Massachusetts Inst. of Technology, NE, Cambridge, USA

**Topic Area IB: Cold Atoms and Molecules**

Correlations in ultracold atomic gases
Michael Köhl, University of Cambridge, UK

Fermionic superfluidity with imbalanced spin populations
Martin Zwierlein, Johannes-Gutenberg University of Mainz, Germany

**Topic Area IC: Quantum Information**

Generation and detection of entangled light fields with negative Wigner functions
Philippe Grangier, CNRS Institut d’Optique, Orsay, France

Quantum information processing with superconducting qubits and cavities
Andreas Walraff, ETH Zurich, Lab. for Solid State Physics, Zürich, Switzerland

**Topic Area ID: Laser and Precision Spectroscopy**

New measurement of the electron magnetic moment and the fine structure constant
Gerald Gabrielse, Harvard University, Cambridge, USA

Modern optical tests of special relativity
Achim Peters, Humboldt-University of Berlin, Germany

**Topic Area IE: Nonlinear Optics and Ultrafast Phenomena**

Femtosecond terahertz studies of excitonic correlations
Rupert Huber, Lawrence Berkeley, National Laboratory, Berkeley, USA

Ultrafast coherent control of magnetism
Theo Rasing, University of Nijmegen, The Netherlands

**Topic Area IF: Quantum Optics**

Quantum measurement and feedback control
Hideo Mabuchi, Caltech, Pasadena, USA

Quantum teleportation between light and matter
Eugene Polzik, University of Copenhagen, Denmark

**Topic Area IG: Dynamics, Instabilities and Patterns**

Dynamics of quantum dot semiconductor lasers
Guillaume Huyet, Tyndall National Institute, Cork, Ireland

Tailored shapes for polymer based micro-billard lasers: a testbed for wave chaos physics
Joseph Zyss, Ecole Normale Supérieure de Cachan, Cachan, France
A number of contributed papers covering original, unpublished work on the conference topics will be accepted for presentation.

Papers should be submitted to only one conference. The CLEO®/Europe 2007 and IQEC 2007 programme committees will transfer papers from one conference to the other where appropriate unless written instructions to the contrary are given by the author at the time of submission.

The online submission is already open and the deadline for submission of the papers is Monday 15 January 2007, 12pm French Time. Absolute no papers will be accepted after this deadline.

Authors will be notified whether their papers have been accepted by 15 March 2007.

Registration is open to all members of the scientific and technical community. Authors must obtain appropriate approval to have their paper reviewed by and presented to an international audience.

The first two types of contribution can be chosen:
- Oral or Poster
- Poster only

The first option will automatically be entered unless you change it.

Choosing the first option (Oral or Poster) will mean that your submission is automatically submitted as an oral contribution to the refereeing process. However, the programme committee can decide to affect it as a poster.

Choosing the second option (Poster only) will mean that your submission is only eligible for a poster presentation.

The other options are only authorized for presenters who were pre-invited. Do not choose them unless you were explicitly formerly pre-invited to present a plenary/keynote/tutorial or invited talk at the Conference.

Authors are requested to:
- 1. Electronically submit their paper:
  - a submission form, a 35-word abstract and a one page summary in pdf format at www.epsconferences.org/cleo/

- 2. Email a copy of the one page summary in PDF format with the copyright form to EPS office at s.jung@eps.org

**Required documents:**

1. A 35-word abstract in ASCII text
   The use of scientific and engineering symbols and acronyms is not permitted. More than 35 word-abstract will not be accepted.

2. A single page summary in PDF format (less than 1 Mo)
   Please follow the following layout recommendations:
   - paper size: A4 (210mm X 297mm); material formatted for 8 ½” x 11” paper will be converted to A4
   - margins: left & right = 20mm, top = 37mm, bottom = 19mm
   - format: Acrobat (*.pdf) file
   - title: use 14pt Times bold letters centred on the page
   - text fonts: use only 10pt Times (roman, bold or italic) symbols
   - list all author’s names, organisation/affiliation & mailing address in 10pt Times italic, grouped by affiliation
   - include equations, drawings, figures and references within the one page limit
   - avoid asterisks, acknowledgements, job descriptions or footnotes
   - cite references at the end of the summary (maximum of two)
   - do not add any page number

**Directories for the electronic submission:**

1. Creation of an account in order to log on.
   You need to create an account in order to log on. This account can then be used for all further papers you may register. As soon as you have registered in order to obtain an account you will receive an email giving you your username and password which will allow you to electronically send your submission. The person who registers will be considered as the “corresponding author” and all further correspondence will only be sent to him/her.

2. Log on with your username and password.

3. Add a paper (also to be used for the first submission of a paper)
   Please type in the title of the paper, the topical area; in case the pre-selected type of presentation (oral or poster) is not appropriate, tick one of the other options (poster only or invited in case you were formally pre-invited). Include your 35-word abstract and the one page summary. Submit data.

4. Authors’ list
   Submit all the authors’ information and add as many authors as required. The corresponding author is entirely responsible for entering the full and correct list of all the authors. EPS will not make any change.

   The corresponding author is automatically entered among the authors and becomes the “main author”. However, this can be modified (green mark). In that case, that author will appear at the first place in the list of authors.

   In case the corresponding author is the only author, do not enter any data in the “Author form” (you are already entered in the data base) but directly click on “My paper list” and then log out.

**Instructions to follow in order to have a successful submission:**

- Be sure to not exchange the first name and the surname. Otherwise you will be listed by your first name in the authors’ index.

- Do not use capital words (bold characters) in the title of the contribution, in the authors’ names, or in the affiliations (except for common acronyms).

**Examples:**
- Do not write CONJUGATED POLYMER LIGTH SOURCE but Conjugated polymer light source
- Do not write SMITH but Smith
- Do not write PETER but Peter
- Do not write EUROPEAN PHYSICAL SOCIETY but European Physical Society
- Do not write MULHOUSE but Mulhouse
- However, write C.N.R.S.

- Write the abbreviations of your first name(s) (initials):

**Examples:**
- For David Robert enter D.R.
- For Jean-Paul enter J-P.
- For George William enter G.W.
- For Paul write P.

- The abstract text is limited to 35 words.

- Upload a single page abstract in PDF format (less than 1 Mo). This extended version of the abstract will be included in the conference CD.

**Notes:**

The given password can be changed: Go to “My profile” and click on “Edit”, change your password and then click on “Submit data”.

Click on “My paper list” to view the complete list of your submitted papers. Any change can be brought up to 15 January 2007.
The corresponding author is authorized to bring any change (single page summary, 35-word abstract, list of authors) until the 15 January 2007. After that deadline the review process will begin and no change can any longer be brought.

These recommendations are intended to avoid technical problems in the transferal of your paper to the conference digest. Failure to follow these recommendations may result in papers being returned to authors. Please note that the EPS will not manipulate or edit papers.

The summary will be reduced and published in the Technical Digest. No additional manuscript will be required. Since contributed papers are selected on the basis of the summary, it should convey the original results in a succinct manner rather than describe the research topic.

Any of the following conditions may result in rejection of a paper:

- failure to submit the paper by the deadline date
- failure to complete the required fields on the web based submission form
- failure to follow the compulsory layout recommendations (a 35-word abstract without scientific signs, a single page summary in pdf format)
- failure to send the copyright form.

A list of all the submitted papers will be published online by end of January 2007 allowing the authors to check whether their submissions were well received.

The date and time for presentation will be determined after the programme committee has reviewed the papers.

Authors will be notified whether their papers have been accepted by the end of March 2007. Notification will be sent to the corresponding author as listed on the electronic submission form.

Electronic submission is now available.

**Poster sessions**

The programme committee will schedule both oral and poster sessions. For poster sessions each author is provided with a poster board on which to display a summary of the paper. At least one author must remain in the vicinity of each poster board for the duration of the poster session to answer the questions of the attendees.

**Registration Fees**

The full registration fee includes admission to all CLEO®/Europe-IQEC 2007 technical sessions, as well as to those of all conferences collocated with Laser 2007. It includes admission to the technical exhibition. One copy of the technical digest in CD-format is included for the full paying fee. It includes coffee breaks (Monday through Friday morning) and a free conference reception which will take place downtown on Wednesday evening 20 June 2007 provided registration is done.

One-day registration fees are available for those wishing to attend one particular session rather than the whole conference. Please note that the digest is not included.

Pre-registration is strongly recommended to speed up your pick-up of registration materials at the conference and to save money. The pre-registration deadline is 31 March 2007.

To pre-register please read the following information and then you can proceed online via the online registration system

<table>
<thead>
<tr>
<th>Registration Fees</th>
<th>Before 31 March</th>
<th>After 31 March</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPS/OSA/IEEE Member (*) with digest</td>
<td>€ 440</td>
<td>€ 510</td>
</tr>
<tr>
<td>Non-Member with digest</td>
<td>€ 550</td>
<td>€ 630</td>
</tr>
<tr>
<td>EPS/OSA/IEEE Student Member (**) with digest</td>
<td>€ 95</td>
<td>€ 135</td>
</tr>
<tr>
<td>Student Non-Member (***) with digest</td>
<td>€ 130</td>
<td>€ 165</td>
</tr>
<tr>
<td>One Day without digest</td>
<td>€ 190</td>
<td>€ 240</td>
</tr>
<tr>
<td>Short Course (unit extra fee) Student</td>
<td>€ 100</td>
<td>€ 150</td>
</tr>
<tr>
<td>Short Course (unit extra fee)</td>
<td>€ 220</td>
<td>€ 270</td>
</tr>
<tr>
<td>Conference reception per accompanying person</td>
<td>€ 35</td>
<td>€ 35</td>
</tr>
</tbody>
</table>

All registration fees are net prices exempt from Value Added Tax. The European Physical Society is a French registered association for non-profit and is not liable to VAT. For this reason, the Society does not possess a VAT number.

(*) Applications for the EPS/OSA/IEEE membership fee must indicate their Society and provide their membership number when making their online registration.

Not yet EPS Individual Member? Then join us by filling the online form at http://www.eps.org/documents/application_form.pdf and benefit from the lower registration fees.

(**) Applications for the student members’ rate must indicate their Society and provide their membership number and send a copy of an official student identity card, which must also be presented on-site when collecting registration materials.

(***) Applications for the student non-members’ rate must send a copy of an official student identity card, which must also be presented on-site when collecting registration materials.

**Technical Digest**

The full registration fee includes one technical digest in CD-format, provided this is ordered in advance on the registration form. If not the case, then the organisers cannot guarantee to provide a digest.

Additional copies of the digest may be ordered at a cost of € 50,- per digest.

**Laboratory Visits**

Local laboratory visits will be organised. The number of participants will be limited. Further details will appear on the conference website at http://www.cleoeurope.org/.

**CLEO®/Europe-IQEC 2007 Conference Reception**

The delegates registered with the CLEO®/Europe-IQEC 2007 are invited to the free conference reception, which will be held in downtown Munich at the Löwenbräukeller (http://www.loewenbraeukeller.com/) on Wednesday, June 20th, 19:00-23:00. A rich selection of fine Bavarian food and beverages will be provided. The reception requires pre-registration. Accompanying persons may attend at an additional cost of € 35,- per guest.

**Payment**

For all payments due evidence must be given that payment has been initiated by one of the methods detailed below:

1. Cheque, bank draft, postal order in euros payable to: European Physical Society
Adress: European Physical Society
BP 2136, 6 rue des Frères Lumière
F-68060 Mulhouse Cedex / France
A limited amount of funding will be available for those most in need of support.

**Supports**

**East West Task Fund:**
Participants from Eastern countries may apply to the East West Task Fund and are directly requested to check whether they fulfil all the conditions at http://www.fzu.cz/varia/ewtf/. The conditions have to be strictly respected.

**Young Physicist Fund:**
Young Physicists may apply to the Young Physicist Fund. Those wishing to apply should send an email to conferences@eps.org outlining the reasons for the support request. **The deadline for requests is 30 March 2007.**

In both cases participants need to pre-register for the conference.

**PhOREMOST support:**
Through the generous support of the network of Excellence PhOREMOST supporting the Symposium on Photonic Crystals, Photonic Nanostructures and Integrated Optics (CK), conference organizers will be able to offer limited partial support for young researchers (graduate students and post-docs) who plan to contribute to this symposium with an oral/poster presentation. Priority will be given to young researchers from new EU countries and accession countries. The partial support will consist of registration fee waiver to the qualified participants. The list will be finalized by the mid of April 2007 and the successful applicants will be informed via e-mail.

The application form to be downloaded from the conference website should be submitted by 30 March 2007 at the latest.

**Contact details**

**EPS Conferences, European Physical Society**
BP 2136, 6 rue des Frères Lumière
F-68060 Mulhouse cedex, France
Tel.: +33 3 89 32 94 42 - Fax: +33 3 89 32 94 49
Email: conferences@eps.org

---

**Laser 2007. World of Photonics Exhibition**

A major exhibition of laser and electro-optic equipment and services, LASER 2007. World of Photonics will be held in conjunction with the congress.

All the CLEO*/Europe-IQEC 2007 registrants will have free entrance to the technical exhibition. Longer lunch breaks are organised to allow visits at the exhibition.

The exhibition gives an in-depth look at the “state of the art” and future prospects of innovative optical technologies and their many uses. That includes components and systems as well as their applications. The latest technology first hand will be exhibited.

The range of products exhibited will cover laser and optronics, optics, production technology for optics, sensors, optical measurement systems, lasers and laser systems for manufacturing, imaging, and optical information technology.

For more information on the exhibition, please check the website http://www.global-electronics.net or http://www.laser.de

**Organiser:**

Messe München GmbH
Messegelände
81823 München
Hotline: (+49 89) 9 49-1 14 68
Fax: (+49 89) 9 49-1 14 69

**Opening hours of the exhibition:**

The exhibition will be open from Monday through Wednesday 09:00 - 17:00 and on Thursday 09:00 - 16:00.

---

**Munich, Germany**

The celebrated capital of Bavaria is one of the major cities in Europe. The 1.3 million inhabitants city is famous for its science and industry environment, in particular in optics. Its historical monuments and cultural landmarks, including many fine arts museums, as well as its beer festival in October, are world famous.

Tourist attractions include the Bavarian beer and South German cuisine tradition, and many half-day or one-day excursion opportunities to the nearby Bavarian Alps and geographical and historical landmarks of Southern Bavaria. At the end of June the weather is likely to be warm and the sun is likely to shine, although rain is not impossible.

Munich enjoys an outstanding public transportation system, and the modern Münchner Messe complex where CLEO*/Europe-IQEC 2007 and all Laser 2007 events will be held is easy to reach from the airport, from
the city centre and from most parts of the city by easy U-Bahn and S-Bahn lines. Shuttle bus service to the Munich airport will be available as well during most of the Laser 2007 week.

**Hotel Accommodation and Travel**

Are you looking for a hotel, a guest house, a private accommodation, or a boarding house for your stay in Munich?

Messe Munich has arranged for an on-line hotel reservation which can also be used for the CLEO®/Europe-IQEC 2007 participants at: http://www.messe-muenchen.de/

The Hotel Guide of the Munich Trade Fairs offers you a large variety of accommodation possibilities for a pleasant stay. Whether near the New Munich Trade Fair grounds, the M,O,C, or the International Congress Centre ICM, centrally located and in the middle of the nightlife of Munich’s trendy neighbourhoods or close to the mountains with a high recreation value - here you will find a comprehensive offer of accommodation in and around Munich as well as in the alpine upland - meeting your personal criteria.

Hotels can be directly searched and booked via the Hotel Directory.

Hotels, pensions, apartments or youth hostels in Munich can also be found at: http://www.munich-info.de/hotels/welcome_en.html

Considering the large number of attendants to the exhibition, running in conjunction with the conference, we recommend to make your hotel reservation as soon as possible.

A list of cheap accommodation and youth hostels will be put on line.

**The Conference Venue**

The CLEO®/Europe-IQEC 2007 conference will take place in the ICM Center of the New Munich Trade Fair Centre. (http://www.messe-muenchen.de/)

The ICM centre offers first-class services such as business-centre, post office, bank, travel service, restaurants, snack bars, groceries ....

**How to reach the ICM centre:**
http://www.global-electronics.net/id/44013

**By car:**
Simply follow the trade fair signs from the outskirts and throughout the city to the ICM. There you will find plenty of parking spaces.

**By train:**
The ICM is about 20 minutes from Munich Central Station (Hauptbahnhof) by underground U2, exit “Messestadt West”.

**From the airport:**
At Munich Airport, the station for urban railway lines S1 and S8 is directly below the Central Area. Trains in the direction of the city centre run at 10-minute intervals. There are two routes from the airport to the ICM:

**Route S1 / U2:**
S1 from the airport to Feldmoching station or Munich Central Station (Hauptbahnhof). Change to underground U2 which takes you directly to the ICM - Messestadt West.

**Route S8 / U2:**
S8 from the airport to Munich Central Station (Hauptbahnhof). Change to underground U2 which takes you directly to the ICM - Messestadt West.
By taxi from the airport to the ICM:
If you want to take a taxi from the airport to the ICM, you will find plenty of taxis in front of the terminals. The journey takes about 35 minutes, depending on the volume of traffic. Messe München and the Munich taxi companies have agreed on a fixed fare of €48.- throughout the year.

By taxi from the ICM to the airport:
If you want to take a taxi from the ICM to the airport (Central Building), you will find taxi ranks at all trade fair entrances and in front of the ICM.

By hire car from the airport to the ICM:
All the major car rental firms are represented at Munich Airport. The Car Rental Centre with its own parking facilities is in front of module A, to the north of car park P6.

Please take the following route: From Munich Airport follow the signs "Messe/ICM" on the A92 in the direction of Munich to the motorway intersection Eching/Neufahrn. Then take the A9 in the direction of Munich to the motorway intersection München-Nord. Continue on the motorway ringroad A99 in the direction of Salzburg to the motorway intersection München-Ost. Then take the A94 in the direction of Munich to the exit Feldkirchen-West or München-Riem. The journey takes about 35 minutes, depending on the volume of traffic.

Conference management

Conference management is provided by:

European Physical Society
BP 2136, 6 rue des Frères Lumière
F-68060 Mulhouse cedex, France
Tel.: +33 3 89 32 94 42 - Fax.: +33 3 89 32 94 49
Email: conferences@eps.org

Language

English will be the official language of the conferences.

For more information on CLEO®/Europe-IQEC 2007, please visit the conference website: http://www.cleoeurope.org/
IEEE COPYRIGHT FORM

To ensure uniformity of treatment among all contributors, other forms may not be substituted for this form, nor may any wording of the form be changed. This form is intended for original material submitted to the IEEE and must accompany any such material in order to be published by the IEEE. Please read the form carefully and keep a copy for your files.

TITLE OF PAPER/ARTICLE/REPORT/PRESENTATION/SPEECH (hereinafter, “the Work”):

COMPLETE LIST OF AUTHORS:

IEEE PUBLICATION TITLE (Journal, Magazine, Conference, Book):

Copyright Transfer

The undersigned hereby assigns to the Institute of Electrical and Electronics Engineers, Incorporated (the “IEEE”) all rights under copyright that may exist in and to the above Work, and any revised or expanded derivative works submitted to the IEEE by the undersigned based on the Work. The undersigned hereby warrants that the Work is original and that he/she is the author of the Work; to the extent the Work incorporates text passages, figures, data or other material from the works of others, the undersigned has obtained any necessary permissions. See reverse side for Retained Rights and other Terms and Conditions.

Author Responsibilities

The IEEE distributes its technical publications throughout the world and wants to ensure that the material submitted to its publications is properly available to the readership of those publications. Authors must ensure that their Work meets the requirements as stated in section 8.2.1 of the IEEE PSPB Operations Manual, including provisions covering originality, authorship, author responsibilities and author misconduct. The full policy may be viewed at http://www.ieee.org/organizations/pubs/pab/opsmanual.pdf#page=53. Authors are advised especially of IEEE PSPB Operations Manual section 8.2.1.B12: "It is the responsibility of the authors, not the IEEE, to determine whether disclosure of their material requires the prior consent of other parties and, if so, to obtain it." Authors are also advised of IEEE PSPB Operations Manual section 8.1.1B: "Statements and opinions given in work published by the IEEE are the expression of the authors."

General Terms

- The undersigned represents that he/she has the power and authority to make and execute this assignment.
- The undersigned agrees to indemnify and hold harmless the IEEE from any damage or expense that may arise in the event of a breach of any of the warranties set forth above.
- In the event the above work is not accepted and published by the IEEE or is withdrawn by the author(s) before acceptance by the IEEE, the foregoing copyright transfer shall become null and void and all materials embodying the Work submitted to the IEEE will be destroyed.
- For jointly authored Works, all joint authors should sign, or one of the authors should sign as authorized agent for the others.

(1) ___________________________  ___________________________
Author/Authorized Agent for Joint Authors  Date

U.S. Government Employee Certification (where applicable)

This will certify that all authors of the Work are U.S. government employees and prepared the Work on a subject within the scope of their official duties. As such, the Work is not subject to U.S. copyright protection.

(2) ___________________________  ___________________________
Authorized Signature  Date

(Authors who are U.S. government employees should also sign signature line (1) above to enable the IEEE to claim and protect its copyright in international jurisdictions.)

Crown Copyright Certification (where applicable)

This will certify that all authors of the Work are employees of the British or British Commonwealth Government and prepared the Work in connection with their official duties. As such, the Work is subject to Crown Copyright and is not assigned to the IEEE as set forth in the first sentence of the Copyright Transfer Section above. The undersigned acknowledges, however, that the IEEE has the right to publish, distribute and reprint the Work in all forms and media.

(3) ___________________________  ___________________________
Authorized Signature  Date

(Authors who are British or British Commonwealth Government employees should also sign line (1) above to indicate their acceptance of all terms other than the copyright transfer.)

rev. 060606
IEEE COPYRIGHT FORM (continued)

RETAINED RIGHTS/TERMS AND CONDITIONS

1. Authors/employers retain all proprietary rights in any process, procedure, or article of manufacture described in the Work.

2. Authors/employers may reproduce or authorize others to reproduce the Work, material extracted verbatim from the Work, or derivative works for the author’s personal use or for company use, provided that the source and the IEEE copyright notice are indicated, the copies are not used in any way that implies IEEE endorsement of a product or service of any employer, and the copies themselves are not offered for sale.

3. Authors/employers may make limited distribution of all or portions of the Work prior to publication if they inform the IEEE in advance of the nature and extent of such limited distribution.

4. In the case of a Work performed under a U.S. Government contract or grant, the IEEE recognizes that the U.S. Government has royalty-free permission to reproduce all or portions of the Work, and to authorize others to do so, for official U.S. Government purposes only, if the contract/grant so requires.

5. For all uses not covered by items 2, 3, and 4, authors/employers must request permission from the IEEE Intellectual Property Rights office to reproduce or authorize the reproduction of the Work or material extracted verbatim from the Work, including figures and tables.

6. Although authors are permitted to re-use all or portions of the Work in other works, this does not include granting third-party requests for reprinting, republishing, or other types of re-use. The IEEE Intellectual Property Rights office must handle all such third-party requests.

INFORMATION FOR AUTHORS

IEEE Copyright Ownership

It is the formal policy of the IEEE to own the copyrights to all copyrightable material in its technical publications and to the individual contributions contained therein, in order to protect the interests of the IEEE, its authors and their employers, and, at the same time, to facilitate the appropriate re-use of this material by others. The IEEE distributes its technical publications throughout the world and does so by various means such as hard copy, microfiche, microfilm, and electronic media. It also abstracts and may translate its publications, and articles contained therein, for inclusion in various compendiums, collective works, databases and similar publications.

Author/Employer Rights

If you are employed and prepared the Work on a subject within the scope of your employment, the copyright in the Work belongs to your employer as a work-for-hire. In that case, the IEEE assumes that when you sign this Form, you are authorized to do so by your employer and that your employer has consented to the transfer of copyright, to the representation and warranty of publication rights, and to all other terms and conditions of this Form. If such authorization and consent has not been given to you, an authorized representative of your employer should sign this Form as the Author.

Reprint/Republication Policy

The IEEE requires that the consent of the first-named author and employer be sought as a condition to granting reprint or republication rights to others or for permitting use of a Work for promotion or marketing purposes.

PLEASE DIRECT ALL QUESTIONS ABOUT THIS FORM TO:
Manager, IEEE Intellectual Property Rights Office, 445 Hoes Lane, P.O. Box 1331, Piscataway, NJ 08855-1331. Telephone +1 (732) 562-3966
**SECTION A: Badge Information**

<table>
<thead>
<tr>
<th>Last (family) Name:</th>
<th>Prof / Dr / Mr / Mrs / Ms / Miss (circle relevant title)</th>
</tr>
</thead>
<tbody>
<tr>
<td>First (given) Name:</td>
<td>Middle Initial(s):</td>
</tr>
<tr>
<td>Company/Institute:</td>
<td></td>
</tr>
<tr>
<td>Department:</td>
<td></td>
</tr>
<tr>
<td>Address:</td>
<td></td>
</tr>
<tr>
<td>City:</td>
<td>Postcode (ZIP NO):</td>
</tr>
<tr>
<td>Country:</td>
<td></td>
</tr>
<tr>
<td>Phone:</td>
<td>Fax: (with country code)</td>
</tr>
<tr>
<td>Email:</td>
<td></td>
</tr>
</tbody>
</table>

**SECTION B: Society Membership (Tick all that apply)**

- European Physical Society (Individual Member)
- IEEE/LEOS
- Optical Society of America
- National Physical Society that is a member of the European Physical Society *
  * Name of Society

**SECTION C: Registration Fees**

The registration fee includes admission to all CLEO®/Europe-IQEC 2007 technical sessions as well as all conferences collocated with Laser 2007. It includes admission to the technical exhibition. It includes coffee breaks (Monday through Friday morning) and a free conference reception which will take place downtown on Wednesday evening 20 June 2007 provided registration is done. One copy of the technical digest in CD-format is included for the full paying fee. The one-day registration does not include the digest.

(*) Applications for the student rates must include a photocopy of an official student identity card, which must also be presented on-site when collecting registration materials.

<table>
<thead>
<tr>
<th></th>
<th>Prior to 30 April</th>
<th>After 30 April</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPS/OSA/IEEE/LEOS Members</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regular</td>
<td>440</td>
<td>510</td>
</tr>
<tr>
<td>Student</td>
<td>95</td>
<td>135</td>
</tr>
<tr>
<td>Non-Members</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regular</td>
<td>550</td>
<td>630</td>
</tr>
<tr>
<td>Student</td>
<td>130</td>
<td>165</td>
</tr>
</tbody>
</table>

**Payment**

All forms must be accompanied by payment, purchase order or bank transfer details. (See page 14 for banking details.)

**Method of Payment:**

- Cheque in euros
- Bank transfer (euros only) Please note that the bank fees are payable by the applicant.
- Visa/Mastercard

NB. American Express and Diners Club cannot be accepted

<table>
<thead>
<tr>
<th>Card No:</th>
<th>Expiration Date: (mm/yy):</th>
<th>Signature:</th>
</tr>
</thead>
</table>

**SECTION D: Short Courses**

CLEO®/Europe-IQEC 2007 will present two short courses held in parallel on Sunday 17 June 2007 at the LMU Univ. of Munich. These courses require registration in order to have the short course material and will be charged at extra cost.

- I register for SH1 “Practical OPOs”
- I register for SH2 “Micro- and Nano-Machined Optics”

<table>
<thead>
<tr>
<th></th>
<th>Prior to 30 April</th>
<th>After 30 April</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regular</td>
<td>200</td>
<td>250</td>
</tr>
<tr>
<td>Student</td>
<td>100</td>
<td>150</td>
</tr>
</tbody>
</table>

**TOTAL: Section C + D €**
Please return form to:

EPS Conferences
6, rue des Frères Lumière
BP 2136
F-68060 Mulhouse cedex
FRANCE
Fax: +33 389 329 449