Bragg Gratings, Photosensitivity and Poling in Glass Waveguides (BGPP)

Topical Meeting and Tabletop Exhibit

Collocated with
Nonlinear Photonics(NP)

September 2–6, 2007
Loews Le Concorde Hotel
Quebec City, Quebec, Canada

Postdeadline Submissions: BGPP/NP postdeadline submission deadline has been extended to August 16, 2007 at 12:00 p.m. noon EDT (16.00 GMT).
Hotel Reservation Deadline: August 13, 2007
Pre-Registration Deadline: August 10, 2007

Due to increasing delays in securing visas to the Canada, we strongly encourage international attendees to begin this process as early as possible (but no later than three months before the meeting) to ensure timely processing. Please refer to the Letters of Verification section of this website for additional information.

Support Provided By:

Centre for Photonics Fabrication Research (CPFR)

Centre for Ultrahigh bandwidth Devices for Optical Systems (CUDOS)

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Redfern Optical Components (ROC) supplies fiber Bragg grating (FBG) dispersion compensators and high reliability submarine FBGs. With it patented DirectRite (tm)FBG writing process, ROC provides FBGs with market leading performance and prices. ROC has recently released a complete suite of fully qualified athermal packages for both submarine and terrestrial applications.

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(See Teraxion on reverse)

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Exhibitors& Sponsors as of August 14, 2007

BGPP would like to thank our sponsors:

- Centre for Photonics Fabrication Research (CPFR)
- CUDOS (Centre for Ultrahigh bandwidth Devices for Optical Systems)
- LxSix Photonics Inc.
- Optiwave Corporation

Program Topics

This is a preliminary list of topics.

Grating Properties

- Bragg gratings for Optical Add-Drop Multiplexers and other WDM filters (including cladding mode suppressed gratings)
- Superstructured Bragg gratings
- Techniques to tune the wavelength and phase of Bragg gratings
- Bragg grating dispersion compensators
- Design of long period gratings for gain flattening, filtering, mode conversion and sensors
- Gratings and devices based on radiation-mode coupling
- Modelling of optical properties of new gratings and devices
- Grating synthesis (inverse scattering)
- Current limitations and how to improve these on optical properties of gratings, like PMD, PDL and delay ripple
- Gratings in new geometries
- Structured fibres, including effective-medium and photonic bandgap effects.

Grating Applications

- Advances in fibre-grating fabrication techniques, including automation and packaging techniques
- Novel device configurations and systems applications of gratings
- Applications of gratings in photonic crystal fibres
- Grating devices for OCDMA
- Fibre grating sensors and sensor systems
- Applications of planar waveguide gratings in sensing and integrated optics
- Direct UV and IR-light patterning or phase trimming of integrated optical devices
- Single-frequency fibre lasers incorporating gratings, including DFB and DBR lasers
- High-power, cladding-pumped fibre lasers and cascaded Raman lasers and amplifiers using grating
- Gain flattening in optical amplifiers
- Semiconductor lasers with Bragg gratings for stabilization or external cavity operation
- Comparative impact of grating-based technologies on optical communications systems
- Monitoring of the spectrum and polarization of communications systems with gratings
- Applications of long period gratings in systems
- Medical applications of Bragg gratings and long period gratings
- Bio-photonic devices, including internal sensors and external monitoring systems utilising gratings

Fundamentals of Photosensitivity

- Improvements in the understanding of photosensitivity in fibres and waveguides
- New glass compositions and processing methods for enhanced photosensitivity
- Gratings in new materials systems (like polymers or chalcogenide glasses)
- Modelling of the kinetics of UV-induced index changes occurring during grating writing
- Basic studies of point defects responsible for photosensitivity
- Role of Hydrogen in UV-induced index change mechanism
- Role of stress and structural change in UV-induced index change mechanisms
- Thermal stability of UV-induced index changes in glasses
- Effects of high optical power levels on grating properties
- Fundamental understanding of femtosecond laser-matter interaction

Poling, Spatial and Periodic Nonlinear Effects (joint with NP)

- Spatial optical solitons, self-trapping, and self-guiding effects:
    - Generation of bright and dark solitons via second order, third order and photorefractive effects
    - Longitudinal and transverse stability of solitary waves, modulation instability and spatio-temporal effects
    - Interaction of spatial solitons
- Nonlinear guided modes in waveguides and at nonlinear interfaces, self-trapping effects in waveguide arrays and discrete spatial solitons
- Nonlinear effects in periodic structures:
    - Bragg gratings in semiconductor waveguides
    - Nonlinear effects in photonic crystals and Bragg gratings
    - Bragg solitons, gap solitons and solitons in photonic crystals
    - Devices based on nonlinear interactions in gratings
- Spatial pattern formation in nonlinear cavities and waveguides
- Active and dissipative effects:
    - Nonlinear amplifiers and amplifier solitons
    - Spatial solitons in cavities containing nonlinear materials, vortex solitons
    - Parabolic and self-similar pulses and lasers
- Nonlinear modes and solitons in trapped Bose-Einstein Condensates and optical lattices; nonlinear guided-wave atom-optics
- Waveguide and glass poling
    - Physics and chemistry of poling
    - Advances in thermal and UV-assisted poling of fibres and waveguides
- Devices based on poled glass

Bragg Gratings, Photosensitivity and Poling (BGPP) 2007 Committees

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Stefano Trillo, *Univ. di Ferrara, Italy*

BGPP Invited Speakers

Joint Plenary

JMA1, Nonlinear Optics in Periodic Structures: Fundamentals and New Opportunities, *John Sipe; Univ. of Toronto, Canada.*

BGPP Plenary

BTuA1, Holographic Bragg Reflectors and Other Planar Waveguide Devices Enabled by Deep UV Photolithographic Patterning, *Thomas Mossberg, Christoph Greiner, Dmitri Iazikov; LightSmyth Technologies, Inc., USA.*

BWA1, Optofluidics, *Demitri Psaltis; Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland.*

Invited Speakers

JMC1, Nanostructures and Poling in Silica Fibres, *Peter G. Kazansky; Optoelectronics Res. Ctr., Univ. of Southampton, UK.*

BTuD1,Applications of Femtosecond Laser-Induced Self-Assembled Nanocracks in Fused Silica Glass, *Cyril Hnatovsky, Eli Simova, Rajeev P. Pattathil, David M. Rayner, Paul B. Corkum, Rod S. Taylor; Natl. Res. Council of Canada, Canada.*

BTuD6, Laser-Induced Precipitation and Dissolution of Nanoparticles in Glasses, *Jianrong Qiu; State Key Lab of Silicon Materials, Zhejiang Univ., China.*

BTuE3, Bragg Gratings in Multicore Optical Fibres for Sensor Applications, *Julian D. C. Jones[1], James S. Barton[1], William N. MacPherson[1], Lin Zhang[2], Ian Bennion[2]; [1]Heriot Watt Univ., UK, [2]Aston Univ., UK.*

BWB6, Device Fabrication by Femtosecond Laser Inscription, *Ian Bennion, Vladimir Mezentsev, Mykhaylo Dubov, David Nikogosyan, Jovana Petrovic, Yicheng Lai, Graham Smith, Kaiming Zhou, Kate Sugden; Photonics Res. Group, Aston Univ., UK.*

BWC1, Gratings and Grating Devices in Structured Fibres Using 193nm from an ArF Laser, *John Canning; Univ. of Sydney, Australia.*

BWC4, Photonic Crystal Fiber Gratings: Prospects for Label-Free Biosensors, *Lars Rindorf[1], Jesper Bo Jensen[1], Martin Dufva[2], Lars Hagsholm Pedersen[3], Poul Erik Høiby[3], Ole Bang[1]; [1]COM.DTU, Dept. of Communications, Optics, and Materials, Technical Univ. of Denmark, Denmark, [2]MIC-Dept. of Micro and Nanotechnology, Technical Univ. of Denmark, Denmark, [3]Bioneer A/S, Denmark.*

Exhibitors to BGPP

Tabletop Exhibit:
September 4 - 5, 2007

Tabletop exhibit space will be $970 for Corporate Members and $1020 for non-members and will include:

- One complimentary registration list
- One complimentary technical registration and two exhibit personnel registrations
- One copy of the meeting's proceedings

If you have questions about exhibiting at BGPP/NP, please contact our exhibit sales staff at 202.416.1428 or exhibitsales@osa.org.

Sponsorship Opportunities at BGPP/NP 2007

Increase your company's visibility among qualified attendees with a sponsorship at the event.

Current BGPP/NP Sponsorship Opportunities include:

- Coffee Break Sponsorships
- Reception Sponsorships
- Attendee Tote Bag Sponsorship
- Registration Material Inserts
- Advertising Signage Placements

Plus other customizable promotional opportunities
To find out more about one of the sponsorship opportunities listed above or to discuss a customized BGPP/NP promotional package or sponsorship, please contact Melissa Russell at 202.416.1957 or email exhibitsales@osa.org.

BGPP Special Events

TeraXion Sponsored Evening

Tuesday, September 4, 2007
7:00 pm

BGPP attendees are invited to a “jazzy evening” at TeraXion. You will have a chance to experience some of Quebec’s local specialities in a beautiful setting under a Victorian tent. Also, you will have the opportunity to visit TeraXion Laboratory and manufacturing plant while sampling wine and beer from Quebec’s micro brewery.

If you are interested in participating in the tour and reception, please RSVP at the registration desk by 3:00 p.m. Monday, September 3.

Event Sponsor:
TeraXion – Leadership in performance-defining OEM products for the generation and conditioning of light signals, TeraXion addresses the Telecom, Defense & Aerospace, and Industrial markets. TeraXion's developed world class capabilities in customized laser systems, fiber-optic filtering solutions and also customized laser conditioning Bragg filters for fiber laser cavity mirrors and pulse shapers. TeraXion is headquartered in Quebec, Canada and counts more then 100 employees.

Industry Visits

BGPP attendees will have the opportunity to take a walking tour of Laval University’s new Optics and Photonics Building. Laval University is located in Sainte-Foy, a neighboring city outside of Quebec. Tours will be conducted Monday, Tuesday and Wednesday over the Lunch Break time.

Tour space is limited to 20 participants per day (on a first-come first-served basis). Sign up at the Registration Desk onsite.

BGPP Plenary Speakers

Monday, September 3, 2007

Holographic Bragg Reflectors and other Planar Waveguide Devices Enabled by Deep UV Photolithographic Patterning, *Thomas Mossberg, LightSmyth Technologies, Inc., USA*

Tuesday, September 4, 2007

Optofluidics, *Demetri Psaltis, Ecole Polytechnique Federale de Lausanne, Switzerland*

BGPP/NP Joint Plenary

Wednesday, September 5, 2007

Nonlinear Optics in Periodic Structures: Fundamentals and New Opportunities, *John Sipe, Univ. of Toronto, Canada*

Agenda of Sessions

	Krieghoff Room	Borduas Room
Sunday, September 2, 2007		
1:00 p.m.–5:00 p.m.	Registration, **Third Floor**	
Monday, September 3, 2007		
7:00 a.m.–5:30 p.m.	Registration, **Third Floor**	
8:00 a.m.–8:10 a.m.	Welcome and Opening Remarks	
8:10 a.m.–9:10 a.m.	JMA • Joint Plenary I	
9:15 a.m.–11:00 a.m.	JMB • Spatial Nonlinear Effects I	
11:00 a.m.–11:30 a.m.	Coffee Break, **Suzor-Colé**	
11:30 a.m.–1:00 p.m.	JMC • Poling and Nonlinear Effects	
1:00 p.m.–2:30 p.m.	Lunch (on your own)	
2:30 p.m.–4:30 p.m.	JMD • Joint Poster Session I, **Suzor-Colé and Foyer**	
4:00 p.m.–4:30 p.m.	Coffee Break, **Suzor-Colé**	
4:30 p.m.–6:30 p.m.	JME • Spatial Nonlinear Effects II	
7:00 p.m.–8:30 p.m.	Joint Conference Reception, **Jean Paul Lemieux Ballroom**	
Tuesday, September 4, 2007		
7:00 a.m.–5:30 p.m.	Registration, **Third Floor**	
8:00 a.m.–9:00 a.m.	BTuA • Plenary II	
9:00 a.m.–11:00 a.m.	BTuB • Bragg Grating Design and Applications	**NTuA • Nonlinear Devices and Systems I**
11:00 a.m.–11:30 a.m.	Coffee Break/Exhibits Open, **Suzor-Colé**	
11:30 a.m.–1:00 p.m.	BTuC • Gratings and Properties of Photosensitivity in Active and Passive Materials	**NTuB • Nonlinear Devices and Systems II**
1:00 p.m.–2:30 p.m.	Lunch (on your own)	
2:30 p.m.–4:30 p.m.	BTuD • Femtosecond Writing in Bulk Glass	**NTuC • Materials and Structures**
4:30 p.m.–5:00 p.m.	Coffee Break/Exhibits Open, **Suzor-Colé**	
5:00 p.m.–7:00 p.m.	BTuE • Fibre Grating Sensors (ends at 6:30 p.m.)	**NTuD • Nonlinear Devices and Systems III**
Wednesday, September 5, 2007		
7:00 a.m.–5:30 p.m.	Registration, **Third Floor**	
8:00 a.m.–9:00 a.m.	BWA • Plenary III	
9:00 a.m.–11:00 a.m.	BWB • Properties and Applications of Femtosecond Writing in Fibres (9:05 a.m.–11:05 a.m.)	NWA • Novel Propagation Effects and New Concepts
11:00 a.m.–11:30 a.m.	Coffee Break/Exhibits Open, **Suzor-Colé**	
11:30 a.m.–1:00 p.m.	BWC • Photonic Crystal Fibre Gratings	NWB • Spatial Nonlinear Effects III
1:00 p.m.–2:30 p.m.	Lunch (on your own)	
2:30 p.m.–5:00 p.m.	JWA • Joint Poster Session II, **Suzor-Colé and Foyer**	
4:30 p.m.–5:00 p.m.	Coffee Break/Exhibits Open, **Suzor-Colé**	
5:00 p.m.–7:00 p.m.	JWB • Joint Postdeadline Session	
PLEASE NOTE: BGPP Programming ends on Wednesday, September 5. BGPP attendees may attend NP sessions on Thursday, September 6.		
Thursday, September 6, 2007		
8:00 a.m.–3:00 p.m.	Registration, **Third Floor**	
9:00 a.m.–11:00 a.m.		NThA • Computational Analysis
11:00 a.m.–11:30 a.m.	Coffee Break, **Suzor-Colé**	
11:30 a.m.–1:00 p.m.		NThB • Temporal Effects and Analysis
1:00 p.m.–2:30 p.m.	Lunch (on your own)	
2:30 p.m.–4:30 p.m.		NThC • Nonlinear Effects in Fibres

Key to Shading

NP: Symposium on All-Optical Devices and Applications

Explanation of Session Codes

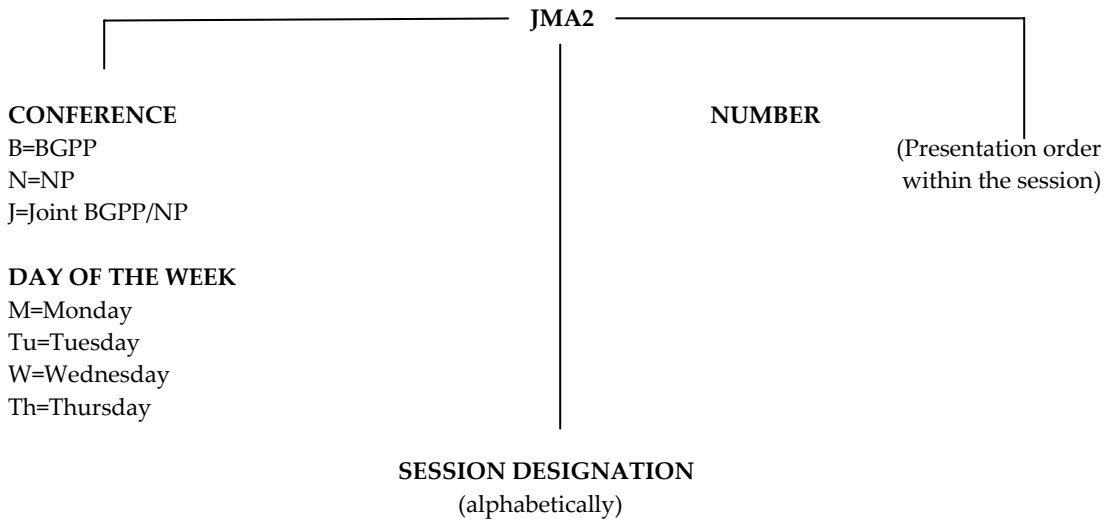
The first part of the code designates the topical meeting (B=BGPP, N=NP, J=Joint).

The next part designates the day of the week (Monday=M, Tuesday=Tu, Wednesday=W, Thursday=Th).

The next part indicates the session within the particular day the talk is being given. Each day begins with the letter A and continues alphabetically.

The number on the end of the code signals the position of the talk within the session (first, second, third, etc.).

For example, a presentation numbered JMA2 indicates that this joint paper is being presented on Monday during the 1st session (A) and that it is the second paper presented in session JMA.



•Sunday, September 2, 2007•

Third Floor
1:00 p.m.–5:00 p.m.
Registration Open

•Monday, September 3, 2007•

Third Floor
7:00 a.m.–5:30 p.m.
Registration Open

Borduas/Krieghoff
8:00 a.m.–8:10 a.m.
Welcome and Opening Remarks

JMA • Joint Plenary I

Borduas/Krieghoff
8:10 a.m.–9:10 a.m.
JMA • Joint Plenary I
Benjamin J. Eggleton; Univ. of Sydney, Australia, Presider

JMA1 • 8:10 a.m. **Plenary**
Nonlinear Optics in Periodic Structures: Fundamentals and New Opportunities, *John Sipe; Univ. of Toronto, Canada.* No abstract available.

JMB • Spatial Nonlinear Effects I

Borduas/Krieghoff
9:15 a.m.–11:00 a.m.
JMB • Spatial Nonlinear Effects I
Zhigang Chen; San Francisco State Univ., USA, Presider

JMB1 • 9:15 a.m. **Invited**
Waves in Photonic Lattices: From Interacting Photonic Quasi-Crystals to Anderson Localization, *Mordechai Segev[1], Tal Schwartz[1], Barak Freedman[1], Guy Bartal[1], Shmuel Fishman[1], Ron Lifshitz[2], Jason Fleischer[3]; [1]Technion–Israel Inst. of Technology, Israel, [2]Tel Aviv Univ., Israel, [3]Princeton Univ., USA.* The recent progress with linear and nonlinear waves in photonic lattices has led to many unprecedented experiments. This talk will present the recent progress in two directions: Anderson Localization and Photonic Quasi-crystals.

JMB2 • 9:45 a.m.
Spontaneous Pattern Formation upon Random Phase Waves: From Modulation-Instability to Dynamic Equilibrium, *Liad Levi, Tal Schwartz, Ofer Manela, Mordechai Segev; Technion–Israel Inst. of Technology, Israel.* We show that MI is the driving force bringing spatially-incoherent light to an equilibrium state, while propagating through non-instantaneous nonlinearities. The equilibrium state depends only on the initial coherence, and not on the nonlinearity strength.

JMB3 • 10:00 a.m.
Spatial Soliton Dynamics in Two-Dimensional Quadratic Photonic Crystals, *Katia Gallo[1], Salvatore Stivala[2], Alessia Pasquazi[2], Gaetano Assanto[2]; [1]Optoelectronics Res. Ctr., Univ. of Southampton, UK, [2]Nonlinear Optics and Optoelectronics Lab, Univ. of Roma Tre, Italy.* We present a theoretical and experimental investigation of soliton dynamics associated to twin-beam second harmonic generation in a purely nonlinear two-dimensional planar photonic lattice in $LiNbO_3$.

JMB4 • 10:15 a.m.
Nematicon Deflection at a Voltage Controlled Dielectric Interface, *Marco Peccianti, Gaetano Assanto; NooEL-Nonlinear Optics and OptoElectronics Lab, Italian Inst. for the Physics of Matter, Univ. Roma Tre, Italy.* We discuss and report refraction and total internal reflection of optical spatial solitons in nematic liquid crystals at the interface between two differently-biased regions, with angular steering as large as -18 and +22 degrees, respectively.

JMB5 • 10:30 a.m.
Polychromatic Gap Solitons and Breathers in Nonlinear Waveguide Arrays, *Andrey A. Sukhorukov[1], Dragomir N. Neshev[1], Alexander Dreischuh[1,2], Robert Fischer[1], Sangwoo Ha[1], Wieslaw Krolikowski[1], Jeremy Bolger[3], Benjamin J. Eggleton[3], Arnan Mitchell[4], Michael W. Austin[4], Yuri S. Kivshar[1]; [1]Australian Natl. Univ., Australia, [2]Sofia Univ., Bulgaria, [3]Univ. of Sydney, Australia, [4]RMIT Univ., Australia.* We predict the spatial localization of multiple wavelength components in the form of stationary polychromatic gap solitons and dynamic multi-gap breathers, and observe experimentally tunable spatio-spectral trapping of supercontinuum radiation in nonlinear periodic photonic structures.

JMB6 • 10:45 a.m.
Anderson Localization and Nonlinearity in One-Dimensional Disordered Waveguide Arrays, *Yoav Lahini[1], Assaf Avidan[1], Francesca Pozzi[2], Marc Sorel[2], Roberto Morandotti[3], Yaron Silberberg[1]; [1]Weizmann Inst. of Science, Israel, [2]Univ. of Glasgow, UK, [3]Inst. Natl. de la Recherche Scientifique, Canada.* We present direct experimental measurements of Anderson localized eigenmodes and of the suppression of beam expansion in the presence of disorder, using randomized one-dimensional waveguide arrays. We investigate the effect of nonlinearity on Anderson localization.

Suzor-Colé
11:00 a.m.–11:30 a.m.
Coffee Break

JMC • Poling and Nonlinear Effects

Borduas/Krieghoff
11:30 a.m.– 1:00 p.m.
JMC • Poling and Nonlinear Effects
Valerio Pruneri; ICFO-Inst. de Ciencies Fotoniques, Spain, Presider

JMC1 • 11:30 a.m. Invited
Recent Advances in Nanostructuring of Glass: From Poling to Femtosecond Laser Writing, *Peter G. Kazansky; Optoelectronics Res. Ctr., Univ. of Southampton, UK.* Recent progress in poling, femtosecond laser direct writing and related nanostructuring of glass is reviewed.

JMC2 • 12:00 p.m.
Electric Surface Potential and Frozen-in Field Measurements in Thermally Poled Silica, *Didit Yudistira[1], Daniele Faccio[2], Costantino Corbari[3], Peter G. Kazansky[3], Sarah Benchabane[1], Valerio Pruneri[1]; [1]ICFO-Inst. de Ciencies Fotoniques, Spain, [2]Univ. dell'Insubria, Italy, [3]Optoelectronics Res. Ctr., Univ. of Southampton, UK.* Surface potential (SP) as well as nonlinear optical coefficients in thermally poled silica were measured and compared. It was found that the SP is directly related to the frozen-in voltage across the depletion layer.

JMC3 • 12:15 p.m.
Quasi-Phase-Matched Frequency Doubling in Femtosecond Laser-Written Waveguides in Lithium Niobate, *Jens Thomas[1], Jonas Burghoff[1], Matthias Heinrich[1], Stefan Nolte[1], Andreas Tünnermann[1,2], Antonio Ancona[3]; [1]Friedrich-Schiller-Univ. Jena, Germany, [2]Fraunhofer-Inst. für Angewandte Optik und Feinmechanik IOF, Germany, [3]CNR-INFM Regional Lab LIT3, Italy.* Optical waveguides were written in periodically poled lithium niobate using a femtosecond laser. Fundamental and second harmonic light is guided single mode at 1064 nm and 532 nm. A conversion efficiency of 66% was obtained.

JMC4 • 12:30 p.m.
Light Reflection of Broadband Nonlinear Optical Pulses in Narrowband Fiber Bragg Gratings, *Paul S. Westbrook, Jeffrey W. Nicholson, Kenneth S. Feder; OFS Labs, USA.* We compute nonlinear light reflection from fiber gratings using the coupled mode equations and an undepleted pump approximation. Our simulations show features similar to measurements of light reflection from fiber Bragg gratings during continuum generation.

JMC5 • 12:45 p.m.
Dispersionless Slow Light with 5-Pulse-Width Delay in a Long Fibre Bragg Grating, *Joe T. Mok[1], Morten Ibsen[2], C. Martijn de Sterke[1], Benjamin J. Eggleton[1]; [1]ARC Ctr. of Excellence for Ultrahigh-Bandwidth Devices for Optical Systems, School of Physics, Univ. of Sydney, Australia, [2]Optoelectronics Res. Ctr., Univ. of Southampton, UK.* We observe the excitation of gap solitons in a 30 cm fibre Bragg grating using 0.68 ns pulses, which emerge with a tunable delay of up to 3.2 ns, or almost 5 pulse-widths, without broadening.

1:00 p.m.–2:30 p.m.
Lunch (on your own)

JMD • Joint Poster Session I

Suzor-Colé Foyer
2:30 p.m.–4:30 p.m.
JMD • Joint Poster Session I

JMD1
All Optical Signal Processing Using Quadratic Nonlinear Photonic Crystals, *Ady Arie, Ayelet Ganany-Padowicz, Tal Ellenbogen, Alon Bahabad; Tel-Aviv Univ., Israel.* All optical processes, e.g. deflection and polarization rotation, can be realized using cascaded $\chi^{(2)}$: $\chi^{(2)}$ interactions in one-dimensional and two-dimensional nonlinear photonic crystals. Collinear and non-collinear interactions in periodically- and quasi-periodically-modulated crystals are studied.

JMD2
Soliton Transitions in Waveguide Arrays, *Konstantinos Makris[1], Demetrios N. Christodoulides[1], Or Peleg[2], Mordechai Segev[2]; [1]College of Optics, CREOL, Univ. of Central Florida, USA, [2]Technion–Israel Inst. of Technology, Israel.* It is theoretically demonstrated that interband and Rabi soliton transitions are possible in waveguide arrays. Such transitions can take place in optical lattices when the cell is periodically modulated along the propagation direction.

JMD3
Soliton Dynamics in Exponentially Nonlinear Nanosuspensions, *Ramy A. El-Ganainy[1], Konstantinos G. Makris[1], Demetrios N. Christodoulides[1], Carmel Rotschild[2], Moti Segev[2]; [1]College of Optics and Photonics, CREOL and FPCE, Univ. of Central Florida, USA, [2]Physics Dept., Technion–Israel Inst. of Technology, Israel.* We show that the interaction between laser light and particle nano-suspensions leads to an exponential nonlinearity which in turn allows cusp-like soliton solutions. The dynamics of this new class of waves are examined in detail.

JMD4
Analytic Theory of Narrow Lattice Solitons, *Yonatan Sivan[1], Gadi Fibich[1], Nikolaos K. Efremidis[2]; [1]Tel Aviv Univ., Israel, [2]Univ. of Crete, Greece.* We provide a complete theory of solitons in inhomogeneous medium which are narrower than the characteristic scale of the lattice. We quantify the stability/instability in the cases where the lattice's effect is dominant.

JMD5
Experimental Observation of One-Dimensional Saturable Discrete Vector Solitons, *Milutin Stepić[1], Eugene Smirnov[1], Christian E. Rüter[1], Vladimir Shandarov[1], Detlef Kip[1], Rodrigo A. Vicencio[2]; [1]Clausthal Univ. of Technology, Germany, [2]Univ. de Chile, Chile.* Strongly localized, iso-frequency, one-dimensional discrete vector solitons whose components have mutually orthogonal polarizations are studied experimentally and analytically. Dominating TE mode spreads in cascades in saturation while weaker TM mode splits into a double-hump structure.

JMD6
Fabrication of Microstructure in Ag^+-Containing Tellurite Glass via Thermal Poling, *Sonoko Kawase[1], Sakiko Ukon[1], Shunsuke Murai[1], Koji Fujita[1,2], Katsuhisa Tanaka[1]; [1]Dept. of Material Chemistry, Graduate School of Engineering, Kyoto Univ., Japan, [2]PRESTO, Japan Science and Technology Agency (JST), Japan.* We have developed a new method for forming micron-scale patterns of Ag nanoparticles on glass surface using a patterned cover glass fabricated by photolithography as an anode-side cover glass.

JMD7
Lab Trials of an Electricity Transmission Line Voltage Sensor Based on Thermally Poled Silica Fibre, *Andrew M. Michie[1], Philip Hambley[1], Ian M. Bassett[1], John H. Haywood[1], Peter Henry[1], John Ingram[2]; [1]Univ. of Sydney, Australia, [2]ABB-PTPH, Australia.* Voltage sensing using helically coiled lengths of thermally poled twin-hole silica optical fibre is presented. Lab accuracy test results showing good linearity and signal to noise performance are presented.

JMD8
Second-Harmonic Generation in Thermally Poled Tellurite Glass Containing Silver Nanoparticles, *Sakiko Ukon[1], Sonoko Kawase[1], Shunsuke Murai[1], Koji Fujita[1,2], Katsuhisa Tanaka[1]; [1]Dept. of Material Chemistry, Graduate School of Engineering, Kyoto Univ., Japan, [2]PRESTO, Japan Science and Technology Agency (JST), Japan.* Second-harmonic generation has been observed in thermally poled Na_2O-ZnO-TeO_2 glasses containing Ag nanoparticles. The value of d_{33} obtained is 0.29 pm/V for the glass sample poled at 300°C with 3 kV for 60 min.

JMD9
Higher-Band Modulational Instability in Photonic Lattices, *Christian E. Rüter, Jürgen Wisniewski, Milutin Stepić, Detlef Kip; Clausthal Univ. of Technology, Germany.* Propagation and stability of extended modes in higher-bands of one-dimensional photonic lattices is studied in defocusing $LiNbO_3$ waveguide-arrays. Discrete modulation instability is observed for anomalous diffraction, whereas modes propagate stable in the normal diffraction regime.

JMD10
Stationary Solutions in Bragg Grating of $\chi^{(3)}$, *Alain Villeneuve[1], Nicolas Bélanger[2], Jacques M. Laniel[2]; [1]Optav Solutions Inc., Canada, [2]INRS Énergie, Matériaux et Télécommunications, Canada.* Bragg gratings produced by a longitudinal modulation of $\chi^{(3)}$ support a novel type of stationary solutions. Simple analytical solutions are found under the assumption of no detuning and no linear grating.

JMD11
Midband Cavity Solitons in a Degenerate Optical Parametric Oscillator, *Oleg A. Egorov, Falk Lederer; Inst. of Condensed Matter Theory and Solid State Optics, Friedrich-Schiller-Univ. Jena, Germany.* We show the existence of counter-propagating midband cavity solitons in a quadratic nonlinear resonator with an embedded 1-D-photonic crystal and driven by an inclined holding beam at the second harmonic. The interaction dynamics was studied.

JMD12
Interaction-Induced Localization of Self-Defocusing Discrete Solitons, *Yoav Linzon[1], Yonatan Sivan[1], Shimshon Bar-Ad[1], Michael Zaezjev[2], Roberto Morandotti[2], Boris Malomed[3]; [1]School of Physics and Astronomy, Sackler Faculty of Exact Sciences, Tel Aviv Univ., Israel, [2]INRS-Energie et Matériaux, Univ. of Quebec, Canada, [3]School of Engineering, Tel Aviv Univ., Israel.* Tilted beams, propagating in the self-defocusing regime of a waveguide array, away from a soliton, are shown to refocus due to the nonlinear interaction, emerging in intermediate sites as function of the relative phase.

JMD13
Matter Wave Solitons in Low Dimensional Nonlinear Optical Lattices, *F. Kh. Abdullaev[1,2], A. Gammal[3], H. L. F. da Luz[3], Lauro Tomio[1]; [1]Inst. de Física Teórica, Brazil, [2]Physical-Technical Inst., Uzbek Acad. of Sciences, Uzbekistan, [3]Inst. de Física, Univ. de São Paolo, Brazil.* The existence and the stability regions for matter-wave solitons, considering 1-D nonlinear optical lattices in 2-D Bose-Einstein condensates are investigated. Predictions obtained from variational approach are confirmed by numerical simulations of the 2-D GP equation.

JMD14
Drift Instability of Multidimensional Solitons in Inhomogeneous Kerr Media, *Yonatan Sivan[1], Gadi Fibich[1], Boaz Ilan[2]; [1]Tel Aviv Univ., Israel, [2]Univ. of California at Merced, USA.* We show that violation of the "spectral condition" leads to a drift instability of a soliton from its initial location, and show how to determine the speed of the drift.

JMD15
Wave Guiding in a Circular Fiber Array Equipped with a Spiral Grating, *Hiroyuki Yoshida, Noriaki Tsukada; Hiroshima Inst. of Technology, Japan.* Wave guiding phenomena in a circular optical fiber array equipped with a spiral grating are numerically investigated. Two types of rotational-modes are predicted. One is a resonant-mode and the other is an adiabatic-mode.

JMD16
Modulational Instability of Waves in Media with Bragg Grating under Strong Nonlinearity Management, *Fatkhulla Abdullaev[1,2]; [1]Physical-Technical Inst., Acad. of Sciences of Uzbekistan, Uzbekistan, [2]Inst. de Fisica Teorica, UNESP, Brazil.* Modulational instability in media with the Bragg grating under nonlinearity management is investigated. The critical value of a map strength exists, changing character of instability for the case of focusing nonlinearity.

JMD17
Surface Solitons at the Interface between Two Different Lattices: Analytical Solutions, *Yannis Kominis, Aristeidis Papadopoulos, Panagiotis Papagiannis, Ilias Tsopelas, Sotiris Droulias, Lambros Halastanis, Kyriakos Hizanidis; Natl. Technical Univ. of Athens, Greece.* A novel phase-space method is employed for the construction of analytical stationary solitary waves located and robustly propagating at the interface between two different semi-infinite nonlinear Kronig-Penney lattices.

JMD18
Revealing Non-Collinear Five-Wave Bragg Coupled States and Studying Their Multi-Pulse Optical Components in Crystals, *Alexandre S. Shcherbakov[1], Arturo Aguirre Lopez[2], Sandra Eloisa Balderas Mata[1]; [1]Natl. Inst. for Astrophysics, Optics and Electronics, Mexico, [2]Mixteca Univ. of Technology, Mexico.* Five-wave Bragg weakly-coupled states, originating with a three-phonon non-collinear light scattering in square-law nonlinear crystals, are uncovered. The localization conditions and space-frequency distributions of their components are investigated theoretically and observed in tellurium dioxide crystal.

JMD19
Discrete Spatio-Temporal Vortices in Planar Waveguides Array, *Andrew K. Satarin, Anatoly P. Sukhorukov; M. V. Lomonosov Moscow State Univ., Russian Federation.* We first analyze features and evolution of spatio-temporal vortices in linear and nonlinear waveguides array for both focusing and defocusing nonlinearity. Dislocation generation and transformation was observed for wide and narrow pulsed beams.

JMD20
Fast Infrared Photorefractive Self-Focusing in InP:Fe Crystals, *Cristian Dan[1], Naïma Khelfaoui[1], Delphine Wolfersberger[1], Nicolas Fressengeas[1], Hervé Leblond[2]; [1]Lab Matériaux Optiques, Photonique et Systèmes, Unité de Recherche Commune à l'Univ. Paul Verlaine et Supélec, France, [2]Lab Propriétés Optiques des Matériaux et Applications, CNRS, France.* Photorefractive self focusing in InP:Fe is characterized as function of temperature and beam intensity. Transient self focusing is found to occur on two time scales. A theoretical model is developed and checked against experimental results.

JMD21
Formation of Complex Dark-Bright Soliton Pairs in Nonlocal Nonlinear Normal Dispersive Materials, *YuanYao Lin, Ray-Kuang Lee; Natl. Tsing Hua Univ., Taiwan.* The formation of complex dark-bright soliton pairs in vectorial nonlocal nonlinear medium was studied numerically. The formation and manipulation of soliton complex can be realized by the vectorial coupling and nonlocal nonlinearity.

JMD22
Induced Symmetry-Breaking and Polarization Switching of Spatial Solitons through Vector Collision, *Michaël Delqué, Gil Fanjoux, Thibaut Sylvestre; Lab d'Optique P.M. Duffieux, Inst. FEMTO-ST, Univ. de Franche-Comté, France.* We experimentally study two types of interaction between vector and scalar spatial solitons in a Kerr planar waveguide and show both the induced symmetry-breaking and polarization switching of vector solitons, respectively.

JMD23
Soliton Families in Highly Nonlocal Nonlinear Media, *Servando Lopez-Aguayo, Julio Cesar Gutierrez-Vega; Photonics and Mathematical Optics Group, Tecnológico de Monterrey, Mexico.* We explore two families of self-trapped modes in highly nonlocal nonlinear media. The first family relates interaction of solitons with the linear nondiffracting beams. The second family describes pure soliton solutions using elliptic coordinates.

JMD24
Collinear Three-Wave Acousto-Optical Coupled States in a Medium with a Square-Law Nonlinearity and Losses, *Alexandre S. Shcherbakov[1], Jewgenij Maximov[2], Eduardo Tepichin Rodriguez[1], Sandra Eloisa Balderas Mata[1]; [1]Natl. Inst. for Astrophysics, Optics and Electronics, Mexico, [2]Molecular Technology GmbH, Germany.* Three-wave Bragg coupled states, appearing with collinear light scattering in a periodic square-law nonlinear medium with losses, are revealed. The localization conditions and spatio-temporal distributions of their optical components are studied and observed in $CaMoO_4$-crystal.

JMD25
Nonlinear Long-Period Fiber Grating Coupler, *Noriaki Tsukada, Kensuke Fukushima, Hiroyuki Yoshida; Hiroshima Inst. of Technology, Japan.* The evanescent coupling dynamics between two nonlinear long-period fiber gratings has been theoretically investigated. The results of the calculations reveal intriguing phenomena that are useful for optical power combining, dividing, and optical mode converting.

JMD26
Efficient Method for Launching In-Gap Solitons in Fiber Bragg Gratings, *Amir Rosenthal, Moshe Horowitz; Technion–Israel Inst. of Technology, Israel.* We theoretically demonstrate a new method for efficient launching of in-gap solitons using a soliton-propagation effect. Our method is based on launching a soliton outside the bandgap and coupling it adiabatically into the bandgap.

JMD27
Slow-Light with Flat and Offset Band Edges in Multi-Mode Fibers with Superstructure Bragg Gratings, *Andrey A. Sukhorukov[1], C. Martijn de Sterke[2]; [1]Australian Natl. Univ., Australia, [2]Univ. of Sydney, Australia.* We show that, in a conventional fiber with a superstructure Bragg grating designed for mode mixing, the slow-light dispersion at band-gap edges can be made quartic, or the band-edges may appear for non-zero wave vectors.

JMD28
Dispersive Shock Waves in Nonlocal Nonlinear Media, *Christopher Barsi, Can Sun, Wenjie Wan, Jason Fleischer; Princeton Univ., USA.* We present numerical and initial experimental results of dispersive optical shock waves in nonlocal nonlinear media. The behavior of shocks and shock collisions is characterized as a function of the extent of the nonlocality.

JMD29
Forward Four-Wave Mixing with Defocusing Nonlinearity, *Shu Jia, Wenjie Wan, Jason W. Fleischer; Princeton Univ., USA.* We experimentally demonstrate degenerate, forward four-wave mixing in a self-defocusing photorefractive medium, in both one and two transverse dimensions. The cascaded evolution of new modes and potential asymptotic behavior are discussed.

JMD30
A New Design of Apodized Step-Chirped Gratings for Broadband Wavelength Converters, *Amirhossein Tehranchi, Raman Kashyap; Ecole Polytechnique de Montreal, Canada.* A novel apodized step-chirped gratings design for broadband converters with flat response based on second harmonic generation in lithium niobate waveguide is proposed. It has been theoretically modeled and simulated and compared with unapodized one.

JMD31
Helmholtz Solitons: A New Angle in Nonlinear Optics, *James M. Christian[1], Graham S. McDonald[1], Pedro Chamorro-Posada[2], Julio Sánchez-Curto[2]; [1]Joule Physics Lab, School of Computing, Science and Engineering, Inst. for Materials Res., Univ. of Salford, UK, [2]Dept. de Teoría de la Señal y Comunicaciones e Ingeniería Telemática, Univ. de Valladolid, ETSI Telecomunicación, Spain.* New exact analytical families of Helmholtz solitons (e.g. bistable and boundary) are presented for various material nonlinearities. Simulations confirm solution stability. Snell's Law for Kerr solitons is also reported. Nonparaxial corrections exceeding 100% are uncovered.

JMD32
Photonic Devices Based on Programmable Optical Nonlinearity: Tunable Bragg Grating, *Montasir Qasymeh, Michael Cada, Sergey Ponomarenko; Dalhousie Univ., Canada.* The electronic signal is used to control optical nonlinear properties of a third-order nonlinearity material. An example of a photonic device design utilizing such electronic control is discussed.

JMD33
Nonlinear Lateral Shift of Spatial Solitons at a Bias-Controlled Dielectric Interface, *Marco Peccianti, Gaetano Assanto; NooEL-Nonlinear Optics and OptoElectronics Lab, Italian Inst. for the Physics of Matter, Univ. Roma Tre, Italy.* Total internal reflection of spatial solitons can occur at the interface between two differently biased regions of nematic liquid crystal. We demonstrate a power dependent Goos-Hänchen-like shift with lateral filament displacements as large as 0.5mm.

Suzor-Colé
4:00 p.m.–4:30 p.m.
Coffee Break

JME • Spatial Nonlinear Effects II

Borduas/Krieghoff
4:30 p.m.–6:30 p.m.
JME • Spatial Nonlinear Effects II
Stefano Trillo; Univ. of Ferrara, Italy, Presider

JME1 • 4:30 p.m.
Multidimensional Solitons in Irregular-Lattice Media, *Boaz Ilan[1], Mark J. Ablowitz[2], Ethan Schonbrun[3], Rafael Piestun[2]; [1]Univ. of California at Merced, USA, [2]Univ. of Colorado at Boulder, USA, [3]Harvard Univ., USA.* Localized nonlinear modes, i.e., solitons, are computed for the two-dimensional nonlinear Schrodinger equation with external lattices that posses vacancy defects, edge dislocations, quasicrystal and Bessel structures. Their stability properties are elucidated using direct numerical simulations.

JME2 • 4:45 p.m.
Spatio-Temporal Antiphase Dynamics in Mutually Coupled Kerr Optical Media, *Eric Louvergneaux, Fabien Rogister, Pierre Glorieux; Lab de Physique des Lasers, Atomes et Molécules, UMS-CNRS, France.* We evidence experimentally and theoretically spatio-temporal antiphase dynamics in a system made of two liquid crystal slices optically pumped by two identical counterpropagating beams.

JME3 • 5:00 p.m.
Nonlinear Transport and Spectrum Reshaping of a Stripe Beam in Optically Induced Photonic Structures, *Xiaosheng Wang[1], Cibo Lou[1,2], Alex Samodurov[1], Zhigang Chen[1,2], Jiandong Wang[3], Jianke Yang[3]; [1]San Francisco State Univ., USA, [2]TEDA Applied Physical School, Nankai Univ., China, [3]Univ. of Vermont, USA.* Nonlinear spectrum reshaping of a stripe-beam in 2-D lattices leads to first demonstration of embedded and gap soliton-trains arising from Bloch-modes at band-edges and non-band-edges. Surface soliton-trains as periodic nonlinear Tamm states are also demonstrated.

JME4 • 5:15 p.m.
Nonlinear Diffusion and Self-Trapping of Light in Diffraction-Managed Photonic Lattices, *Ivan L. Garanovich[1], Andrey A. Sukhorukov[1], Yuri S. Kivshar[1], Alexander Szameit[2], Felix Dreisow[2], Thomas Pertsch[2], Stefan Nolte[2], Andreas Tünnermann[2]; [1]Nonlinear Physics Ctr. and Ctr. for Ultrahigh Bandwidth Devices for Optical Systems (CUDOS), Laser Physics Ctr., Australian Natl. Univ., Australia, [2]Friedrich-Schiller-Univ. Jena, Germany.* We study nonlinear propagation of light in diffraction-managed photonic lattices created with periodically-curved arrays of optical waveguides. We identify a novel regime of nonlinear light diffusion in self-collimating structures where linear diffraction is suppressed.

JME5 • 5:30 p.m.
Nonlinear Scattering and Trapping by Local Photonic Potentials, *Yoav Linzon[1], Shimshon Bar-Ad[1], Roberto Morandotti[2], Maïte Volatier[3], Vincent Aimez[3], Richard Ares[3]; [1]School of Physics and Astronomy, Sackler Faculty of Exact Sciences, Tel Aviv Univ., Israel, [2]INRS-Energie et Matériaux, Univ. of Quebec, Canada, [3]Univ. de Sherbrooke, Canada.* We study experimentally nonlinear scattering by local photonic potentials embedded in continuous Kerr media. We demonstrate nonlinear trapping in guiding potentials and resonant transmission in anti-guiding potentials.

JME6 • 5:45 p.m.
Raman-Induced Slow Light on Spatial Soliton in Kerr Media, *Gil Fanjoux, Jérémy Michaud, Hervé Maillotte, Thibaut Sylvestre; Dept. d'Optique, Inst. FEMTO-ST, UMR CNRS/Univ. de Franche-Comté, France.* We report the experimental observation of the slow light phenomenon induced on spatial solitons in a Kerr CS_2 planar waveguide through Stimulated Raman scattering. Optical delay of 120-ps on 3-cm soliton propagation was achieved.

JME7 • 6:00 p.m.
Random-Phase Surface-Wave Solitons in Nonlocal Nonlinear Media, *Assaf Barak, Carmel Rotschild, Barak Alfassi, Mordechai Segev; Technion–Israel Inst. of Technology, Israel.* We demonstrate, theoretically and experimentally, random-phase (incoherent) surface-wave solitons localized at the boundary between a dielectric medium (air) and a nonlinear material with a large range of nonlocality.

JME8 • 6:15 p.m.
Gap Solitons and Defect Modes in Two-Dimensional Photonic Lattices, *Jiandong Wang[1], Zuoqiang Shi[2], Jianke Yang[1], Xiaosheng Wang[3], Cibo Lou[3,4], Zhigang Chen[3,4]; [1]Univ. of Vermont, USA, [2]Tsinghua Univ., China, [3]San Francisco State Univ., USA, [4]Nankai Univ., China.* We theoretically predict and experimentally demonstrate new types of gap solitons and linear defect modes in 2-D photonic lattices such as dipole-array gap solitons in higher bandgaps and vortex modes trapped by repulsive defects.

Jean Paul Lemieux Ballroom
7:00 p.m.–8:30 p.m.
Joint Conference Reception

NOTES

•Tuesday, September 4, 2007•

Third Floor
7:00 a.m.–5:30 p.m.
Registration Open

BTuA • Plenary II

Krieghoff
8:00 a.m.–9:00 a.m.
BTuA • Plenary II
Morten Ibsen; Optoelectronics Res. Ctr., UK.

BTuA1 • 8:00 a.m. Plenary
Holographic Bragg Reflectors and Other Planar Waveguide Devices Enabled by Deep UV Photolithographic Patterning, *Thomas Mossberg, Christoph Greiner, Dmitri Iazikov; LightSmyth Technologies, Inc., USA.* Precise control over individual diffractive elements ("lines") comprising a Bragg grating allows for advanced spectral programming and, for slab waveguides, incorporation of spatial beamshaping/routing. We discuss application of photolithographic patterning tools enabling line-by-line grating fabrication.

BTuB • Bragg Grating Design and Applications

Krieghoff
9:00 a.m.–11:00 a.m.
BTuB • Bragg Grating Design and Applications
Presider to Be Announced

BTuB1 • 9:00 a.m.
Iterative Method for the Design of Arbitrary Multi-Channel Fiber Bragg Gratings, *Yves Painchaud, Michel Morin; TeraXion, Canada.* A new method for designing complex FBGs is reported. The method allows imposing physical criteria such as smooth apodization and phase spectrum compatible with the use of complex phase masks. An experimental demonstration is shown.

BTuB2 • 9:15 a.m.
Repetition Rate Multiplication up to 320 GHz with Chirped-Sampled Fiber Bragg Gratings, *Julien Magné, Sophie LaRochelle; Ctr. d'Optique, Photonique et Laser (COPL), Dept. de Génie Électrique et de Génie Informatique, Univ. Laval, Canada.* We generate ultra high repetition rate pulse trains using chirped-sampled fiber gratings. We show that chirping the grating improves the train uniformity and the energetic efficiency. Repetition rates as high as 320 GHz were obtained.

BTuB3 • 9:30 a.m.
Chromatic Dispersion Measurement for Multi-Channel FBG Based on a Novel Asymmetrical Sagnac Loop Interferometer, *Ming Li, Hongpu Li; Dept. of Electrical and Electronic Engineering, Shizuoka Univ., Japan.* A novel all-fiber asymmetrical Sagnac loop interferometer is proposed to measure the chromatic dispersion of a multi-channel fiber Bragg grating(FBG). This method has the advantages of simple configuration, high accuracy for the characterization of FBG.

BTuB4 • 9:45 a.m.
Multicarrier Generator Using a Phase Modulated Laser Signal and Tailored Chirped Fiber Bragg Gratings, *Youngjae Kim, Serge Doucet, Sophie LaRochelle; Ctr. d'Optique, Photonique et Laser (COPL), Dept. of Electrical and Computer Engineering, Univ. Laval, Canada.* A phase modulated spectrum is flattened with apodized chirped fiber Bragg gratings. Multicarrier generation with 7 frequencies is achieved with less than 2 dB peak-to-peak variation and 40 dB signal-to-noise ratio.

BTuB5 • 10:00 a.m.
Experimental Measurements of Highly Reflecting Fiber Bragg Gratings Using Inverse Scattering, *Amir Rosenthal[1], Anatoly Sherman[1], Moshe Horowitz[1], Sven Kieckbusch[2], Ernst Brinkmeyer[2]; [1]Technion–Israel Inst. of Technology, Israel, [2]Technische Univ. Hamburg-Harburg, Germany.* We experimentally demonstrate two methods for reconstructing highly reflecting fiber Bragg gratings using inverse scattering. The instability of the inverse-scattering algorithms to noisy measurement is overcome by using regularization methods.

BTuB6 • 10:15 a.m.
Tunable Pure Dispersion Slope Compensators Realized with Novel Complex Gratings, *Xuewen Shu, Elena Turitsyna, Kate Sugden, Ian Bennion; Photonics Res. Group, Aston Univ., UK.* We present a novel tunable dispersion compensator that can provide pure slope compensation. In experiments, we achieve dispersion slope tuning range of +/-650ps/nm^2 with >0.9nm usable bandwidth.

BTuB7 • 10:30 a.m.
Dynamic Dispersion-Slope Compensator Using a Single-Element Tuning Technique, *Zhaowei Zhang, Morten Ibsen; Optoelectronics Res. Ctr., Univ. of Southampton, UK.* We develop a simple tuning scheme for dispersion slope compensation with fiber Bragg gratings. A dispersion slope tuning range between -12ps/nm^2 and -3ps/nm^2 is demonstrated within a bandwidth of ~3nm.

BTuB8 • 10:45 a.m.
Inter-Channel Residual Dispersion Compensator for 40 Gbit/s WDM Optical Systems, *Serge Doucet, Sophie LaRochelle; Ctr. d'Optique, Photonique et Laser (COPL), Dépt. de Génie Électrique et de Génie Informatique, Univ. Laval, Canada.* We present a tunable dispersion compensator which allows the equalization of residual inter-channel dispersion profiles. We discuss the complex FBG design, present the spectral response and demonstrate the reconfigurable capability of the device.

Suzor-Colé
11:00 a.m.–11:30 a.m.
Coffee Break/Exhibits Open

NTuA • Nonlinear Devices and Systems I

Borduas
9:00 a.m.–11:00 a.m.
NTuA • Nonlinear Devices and Systems I
Juerg Leuthold; Univ. of Karlsruhe (TH), Germany, Presider

NTuA1 • 9:00 a.m.
Ultra-High Nonlinear Chalcogenide Planar Waveguide for Four-Wave Mixing Based Time-Division Demultiplexing of a 160 Gb/s Optical Signal, *Mark D. Pelusi[1], Vahid G. Ta'eed[1], Michael R. E. Lamont[1], Steve Madden[2], Duk Y. Choi[2], Barry Luther-Davies[2], Benjamin J. Eggleton[1]; [1]Ctr. for Ultrahigh Bandwidth Devices for Optical Systems (CUDOS), School of Physics, Univ. of Sydney, Australia, [2]Ctr. for Ultrahigh Bandwidth Devices for Optical Systems (CUDOS), Laser Physics Ctr., Australian Natl. Univ., Australia.* All-optical time-division demultiplexing of a 160 Gb/s signal into its tributary 10 Gb/s channels is demonstrated by four-wave mixing in just a 50 mm length As_2S_3 waveguide exhibiting ultra-high optical Kerr nonlinearity over 2000 $W^{-1}km^{-1}$.

NTuA2 • 9:15 a.m.
Multi-Wavelength Mid-Infrared Light Source Using Multi-Quasi-Phase-Matched $LiNbO_3$ Waveguide and Tunable Laser Diode Array, *Masaki Asobe, Tsutomu Yanagawa, Osamu Tadanaga, Takeshi Umeki, Yoshiki Nishida, Hiroyuki Ishii, Hiroyuki Suzuki; NTT Photonics Labs, NTT Corp., Japan.* We constructed a novel mid-infrared light source that can generate multiple unequally spaced wavelengths. Utilizing the wavelength switching capability, we demonstrate the detection of multiple hydrocarbon gases, namely CH_4, C_2H_4, and C_2H_6.

NTuA3 • 9:30 a.m.
Generation of Aperiodic Picosecond Pulses Sequences from Incoherent Optical Waves, *Stéphane Pitois[1], Christophe Finot[1], Lionel Provost[2]; [1]Inst. Carnot de Bourgogne, France, [2]Optoelectronics Res. Ctr., Univ. of Southampton, UK.* We present an original method to generate optical pulses trains with random time-interval values from incoherent broadband sources. Our technique relies on the remarkable properties of a line made of cascaded SPM-based optical regenerators.

NTuA4 • 9:45 a.m. Invited
Nonlinear Carbon-Nanotube Photonics, *Youichi Sakakibara; Natl. Inst. of Advanced Industrial Science and Technology (AIST), Japan.* Nonlinear optical devices based on carbon nanotube-polyimide saturable absorbing material are demonstrated. Thin film mode-locker can achieve 165 fs for Er fiber laser. Nonlinear optical waveguide can be fabricated with photolithography and dry etching.

NTuA5 • 10:15 a.m.
Dual-Band Laser Transmitter for Above- and Under-Water Communications Using Third-Harmonic Generation of Fiber-Laser System at 1.5µm, *Pavel Polynkin[1], Rostislav Roussev[2], M. M. Fejer[2], Jerome Moloney[1], N. Peyghambarian[1]; [1]College of Optical Sciences, Univ. of Arizona, USA, [2]Edward L. Ginzton Lab, Stanford Univ., USA.* We report viable dual-band laser transmitter for emerging marine OCOMM applications. Eye-safe, picosecond fiber-laser system with pulse picking is frequency-tripled into transparency window of seawater in sequence of two PPLN crystals operating at room temperature.

NTuA6 • 10:30 a.m.
6.5-nJ Pulse Formation by Single-Walled Carbon Nanotubes
Yong-Won Song, Erik Einarsson, Shinji Yamashita, Shigeo Maruyama; Univ. of Tokyo, Japan. We generate picosecond 6.5-nJ pulses from a single-stage oscillator using carbon nanotube passive mode locker. Evanescent field interaction scheme guarantees high optical damage threshold of the nanotubes. The pulses are monitored for 200 hours.

NTuA7 • 10:45 a.m.
Deposition Process Monitoring for Optimum Carbon Nanotube Thinfilm Condition Control, *Ken Kashiwagi[1], Shinji Yamashita[1], Sze Y. Set[2]; [1]Dept. of Electronic Engineering, Graduate School of Engineering, The Univ. of Tokyo, Japan, [2]Alnair Labs Corp., Japan.* We propose and demonstrate a technique to deposit optimum amount of carbon nanotubes for passive modelocker applications. This technique reduced the insertion loss of carbon natnotube based modelocker by 2~3dB compared with typical ones.

Suzor-Colé
11:00 a.m.–11:30 a.m.
Coffee Break/Exhibits Open

BTuC • Gratings and Properties of Photosensitivity in Active and Passive Materials

Krieghoff
11:30 a.m.– 1:00 p.m.
BTuC • Gratings and Properties of Photosensitivity in Active and Passive Materials
Bertrand Poumellec; CNRS-UPS, France, Presider

BTuC1 • 11:30 a.m.
Thulium-Doped Distributed-Feedback Fiber Laser with > 0.3 W Output at 1935 nm, *Deyuan Shen, Zhaowei Zhang, Alex J. Boyland, Jayanta K. Sahu, W. Andrew Clarkson, Morten Ibsen; Optoelectronics Res. Ctr., Univ. of Southampton, UK.* An in-band pumped thulium-doped distributed-feedback fiber laser is reported. The laser produced 318 mW of output power at 1935 nm with a slope efficiency of 21% with respect to absorbed pump power.

BTuC2 • 11:45 a.m.
193nm Photodarkening of Ytterbium Doped Optical Fibre, *Nathaniel Groothoff[1,2], John Canning[1], Mattias Åslund[3], Stuart Jackson[3]; [1]School of Chemistry, Univ. of Sydney, Australia, [2]School of Physics, Univ. of Sydney, Australia, [3]Optical Fibre Technology Ctr., Univ. of Sydney, Australia.* Short wavelength attenuation from photodarkening was induced in ytterbium optical fibre by UV irradiation. Pristine and hydrogenated fibres were compared with latter showing resistance to photodarkening. High temperature annealing of irradiated pristine fibre reduced photodarkening.

BTuC3 • 12:00 p.m.
Photo-Thermal Gratings in Er^{3+}/Yb^{3+}-Doped Core Phosphate Glass Single Mode Fibers, *Rodica Matei Rogojan[1], Axel Schülzgen[2], Nasser Peyghambarian[2], Albane Laronche[1], Jacques Albert[1]; [1]Carleton Univ., Canada, [2]Arizona Univ., USA.* The thermal growth of high-quality Bragg fiber gratings with final reflectivities greater that 99.9% is studied for newly developed Er^{3+}/Yb^{3+}-doped core phosphate fibers previously irradiated with 193 nm excimer laser light through a phase mask.

BTuC4 • 12:15 p.m.
Strong Bragg Gratings made with IR Femtosecond Radiation in Heavily Doped Er^{3+} and Yb^{3+} Silica Fibers, *Dan Grobnic, Stephen J. Mihailov, Robert B. Walker, Christopher W. Smelser; Communications Res. Ctr. Canada, Canada.* Strong FBGs ($\Delta n>10^{-3}$) made with femtosecond IR radiation in a distribution of Er^{3+} and Yb^{3+} doped silica fibers have more rapid grating growth but lower maximum index modulations than FBGs made in silica core fibers.

BTuC5 • 12:30 p.m.
Writing of Fiber Bragg Gratings in Fluoride Glass Fibers, *Martin Bernier, Dominic Faucher, Réal Vallée, Ali Saliminia, Guillaume Androz, Yunlong Sheng, See Leang Chin; Ctr. d'Optique, Photonic et Laser (COPL), Univ. Laval, Canada.* FBGs written in fluoride fibers using femtosecond pulses are shown to originate from a negative index change as confirmed by both the measurements of the refractive index across the fiber and the grating spectral properties.

BTuC6 • 12:45 p.m.
Micromachining Long Period Gratings in Optical Fibres Using Focused Ion Beam, *Cicero Martelli[1], Paolo Olivero[2], John Canning[1], Nathaniel Groothoff[1], Steven Prawer[2], Shane Huntington[2], Brant Gibson[2]; [1]Univ. of Sydney, Australia, [2]Univ. of Melbourne, Australia.* Focused ion beam micromachining of long period gratings is demonstrated for the first time. Further, gratings are fabricated and characterised within both conventional step index and structured optical fibres.

1:00 p.m.–2:30 p.m.
Lunch (on your own)

NTuB • Nonlinear Devices and Systems II

Borduas
11:30 a.m.–1:00 p.m.
NTuB • Nonlinear Devices and Systems II
Karsten Rottwitt; COM Ctr., Denmark, Presider

NTuB1 • 11:30 a.m.
All-Optical Regenerative Memory Using a Single Loop Mirror with Feedback, *Nigel C. Johnson, James A. Harrison, Keith J. Blow; Aston Univ., UK.*. All-optical non-inverting regenerative dynamic memory device using a single loop mirror and semiconductor optical amplifier is demonstrated storing a 3kbit packet for 800μs. Packets are stored by continuously injecting regenerated data back into the loop.

NTuB2 • 11:45 a.m.
Regenerative Properties of Interferometric Cross-Gain and Cross-Phase Modulation DPSK Wavelength Converters, *Jin Wang, Ayan Maitra, Wolfgang Freude, Jürg Leuthold; Inst. of High-Frequency and Quantum Electronics, Univ. of Karlsruhe, Germany.* An interferometric scheme relying only on cross-gain modulation is introduced. It is important for usage with quantum-dot SOA having ultrafast gain dynamics, but weak phase response. The regenerative characteristics of the new scheme are discussed.

NTuB3 • 12:00 p.m. Invited
Optical Code-Label Processing Based OPS System and Related Technologies, *Naoya Wada, Hideaki Furukawa, Yoshinari Awaji, Tetsuya Miyazaki; Natl. Inst. of Information and Communications Technology (NICT), Japan.* We propose and experimentally demonstrate a prototype 160 Gbit/s/port colored optical packet switch with a novel transient response suppressed EDFA, multiple all-optical label processor, arrayed burst mode Tx./Rx., and IP/optical packet converter.

NTuB4 • 12:30 p.m.
Dispersion-Managed Multichannel 2R Regeneration with Large Anomalous Average Dispersion, *Taras I. Lakoba[1], Michael Vasilyev[2]; [1]Univ. of Vermont, USA, [2]Univ. of Texas at Arlington, USA.* Multichannel version of Mamyshev regenerator whose key component—periodic-group-delay device—has bandpass-filtering response, cannot operate in the regime reported earlier. We find a new regime where regenerator's performance is robust to such filtering.

NTuB5 • 12:45 p.m.
All-Optical Swap of Spectral Labels Using Cascaded Cross Gain Modulation in Semiconductor Fiber Ring Lasers, *Varghese Baby[1], Christian Habib[1], Lawrence Chen[1], Alexandre Deslie-Simard[2], Sophie LaRochelle[2]; [1]McGill Univ., Canada, [2]Univ. Laval, Canada.* We show static and dynamic operation of a tunable, all-optical dual-stage swapper for spectral amplitude labels based on cross-gain modulation in semiconductor optical amplifiers in fiber ring lasers. 24dB switching on/off ratios are obtained.

1:00 p.m.–2:30 p.m.
Lunch (on your own)

BTuD • Femtosecond Writing in Bulk Glass

Krieghoff
2:30 p.m.–4:30 p.m.
BTuD • Femtosecond Writing in Bulk Glass
Peter G. Kazansky; Optoelectronics Res. Ctr., UK, Presider

BTuD1 • 2:30 p.m. Invited
Applications of Femtosecond Laser-Induced Self-Assembled Nanocracks in Fused Silica Glass, *Cyril Hnatovsky, Eli Simova, Rajeev P. Pattathil, David M. Rayner, Paul B. Corkum, Rod S. Taylor; Natl. Res. Council of Canada, Canada.* Focused femtosecond laser light can produce grating structures consisting of self-assembled planar nanocracks inside fused silica. These arrayed nanocracks provide a unique capability for rewritable optical storage and fabricating microchannels and porous capillaries.

BTuD2 • 3:00 p.m.
Type II and Burst Methods for Ultrashort Laser Direct Fabrication of High-Strength Bragg Grating Waveguides inside Bulk Glasses: A Comparison, *Haibin Zhang, Shane M. Eaton, Peter R. Herman; Univ. of Toronto, Canada.* This paper compares the type II and burst methods for ultrashort laser direct writing of Bragg grating waveguides inside transparent materials, for their experimental implementation, mechanisms, and resulting BGW properties.

BTuD3 • 3:15 p.m.
Scissor and Pen Effect in Femtosecond Laser Writing in Silica, *Bertrand Poumellec, Matthieu Lancry, Jean-Claude Poulin, Santhi Ani-Joseph; Univ. Paris Sud, CNRS, France.* We show that nano structures in the focus of femtosecond laser are nano-shearings. It is a scissor effect. Part of the shearings is dependent on the direction of laser scanning. It is a pen effect.

BTuD4 • 3:30 p.m.
Femtosecond Laser Direct Writing of Chirped Bragg Grating Waveguides inside Fused Silica Glass, *Haibin Zhang, Peter R. Herman; Univ. of Toronto, Canada.* Chirped Bragg grating waveguides of up to 20-nm 3-dB bandwidth were inscribed inside fused silica glass in a single laser waveguide-writing step driven burst modulation of a high repetition rate femtosecond fiber laser.

BTuD5 • 3:45 p.m.
Demonstration of Possibility of 300-nm-Period Bragg Grating Inscription in a Pure Fused Silica, *Mykhaylo Dubov[1], Vladimir Mezentsev[1], Ian Bennion[1], David N. Nikogosyan[1,2]; [1]Aston Univ., UK, [2]Physics Dept., Univ. College Cork, Ireland.* 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.

BTuD6 • 4:00 p.m. Invited
Laser-Induced Precipitation and Dissolution of Nanoparticles in Glasses, *Jianrong Qiu; State Key Lab of Silicon Materials, Zhejiang Univ., China.* We report on laser-induced precipitation and dissolution of gold nanoparticles in glass. The mechanism and promising application of the observed phenomena are discussed.

Suzor-Colé
4:30 p.m.–5:00 p.m.
Coffee Break/Exhibits Open

NTuC • Materials and Structures

Borduas
2:30 p.m.–4:30 p.m.
NTuC • Materials and Structures
Michael Cada; Technical Univ. of Nova Scotia, Canada, Presider

NTuC1 • 2:30 p.m.
Dispersion-Compensation in High-*Q* Silica Microspheres for Parametric Oscillation, *Imad H. Agha, Yoshitomo Okawachi, Mark A. Foster, Jay E. Sharping, Alexander L. Gaeta; School of Applied Physics, Cornell Univ., USA.* We demonstrate that under suitable conditions high-*Q* silica microspheres can exhibit anomalous cavity-mode dispersion, which permits phase matching for nonlinear interactions. Such dispersion control is used to demonstrate low-threshold four-wave mixing parametric oscillation.

NTuC2 • 2:45 p.m.
Discrete Spatial Surface Solitons at the Interface Between Dissimilar Arrays, *Sergiy Suntsov[1], Konstantinos Makris[1], Demetrios Christodoulides[1], George Stegeman[1], Christian Rüter[2], Detlef Kip[2], Roberto Morandotti[3], Maïte Volatier[4], Vincent Aimez[4], Richard Arès[4], Haeyeon Yang[5], Gregory Salamo[5]; [1]College of Optics and Photonics, CREOL and FPCE, Univ. of Central Florida, USA, [2]Inst. of Physics and Physical Technologies, Clausthal Univ. of Technology, Germany, [3]Inst. Natl. de la Recherche Scientifique, Univ. du Quebec, Canada, [4]Ctr. de Recherche en Nanofabrication et en Nanocaractérisation, CRN[2], Univ. de Sherbrooke, Canada, [5]Physics Dept., Univ. of Arkansas, USA.* We have observed surface solitons guided by the interface between two dissimilar arrays of weakly coupled AlGaAs waveguides. Only one type of interface soliton was observed, different from those found between discrete and continuous media.

NTuC3 • 3:00 p.m. Invited
High Speed Optical Amplification Based on Quantum Dots for the 100 G Ethernet, *Matthias Laemmlin, Dieter H. Bimberg; Technical Univ. Berlin, Germany.* Static cross gain and dynamic high speed characteristics like 80 GHz pulse amplification and 40 Gb/s data transmission of quantum dot semiconductor optical amplifiers at 1.3 μm for future optical networks are reported.

NTuC4 • 3:30 p.m.
Transverse Second Harmonic Generation in Random Nonlinear Photonic Structures, *Solomon M. Saltiel[1,2], Robert Fischer[2], Dragomir N. Neshev[2], Wieslaw Krolikowski[2], Andrey A. Sukhorukov[2], Yuri S. Kivshar[2]; [1]Univ. of Sofia, Bulgaria, [2]Australian Natl. Univ., Australia.* We identify the special phase-matching conditions for transverse second-harmonic generation from *counterpropagating pulses* in random nonlinear photonic structures. Experiments confirm the predicted characteristics of the second-harmonic emission for different geometries and point to possible applications.

NTuC5 • 3:45 p.m.
2D+1 Spatial Solitons in Heavy Metal Oxide Glass, *Alessia Pasquazi[1], Salvatore Stivala[1], Gaetano Assanto[1], José Gonzalo[2], Javier Solis[2], Carmen N. Afonso[2]; [1]NooEL-Nonlinear Optics and OptoElectronics Lab, Italian Inst. for the Physics of Matter, Univ. "Roma Tre", Italy, [2]Laser Processing Group, Inst. de Optica, CSIC, Italy.* Two-dimensional self-confinement of near-infrared picosecond pulsed beams is demonstrated in a novel heavy metal-oxide glass, three-photon absorption being the stabilization mechanism to prevent catastrophic collapse.

NTuC6 • 4:00 p.m.
Criterion for Removing a Delayed Peak from the Ultrafast Nonlinear Response of Photonic Crystal / Quantum Dot Waveguides, *Ferran Salleras[1], Masanori Honma[1], Jun Sakaguchi[1], Yoshiyasu Ueno[1], Nobuhiko Ozaki[2], Yoshinori Kitagawa[2], Kiyoshi Asakawa[2], Naoki Ikeda[3], Yoshimasa Sugimoto[3]; [1]Univ. of Electro-Communications, Japan, [2]Ctr. for Tsukuba Advanced Res. Alliance (TARA), Univ. of Tsukuba, Japan, [3]Natl. Inst. for Materials Science (NIMS), Japan.* Two photon absorption accompanied by a 25-ps-delayed nonlinear response was observed in nonlinear photonic crystal/quantum dot waveguides. Criterion for preventing such a delay time is studied for applications in ultrafast all-optical gates.

NTuC7 • 4:15 p.m.
Dependence of Discrete Surface Soliton Power Thresholds on Inter-Channel Coupling and Distance into Array, *Sergiy Suntsov[1], Konstantinos Makris[1], Demetrios Christodoulides[1], George Stegeman[1], Roberto Morandotti[2], Haeyeon Yang[3], Gregory Salamo[3], Marc Sorel[4]; [1]College of Optics and Photonics, CREOL and FPCE, Univ. of Central Florida, USA, [2]Inst. Natl. de la Recherche Scientifique, Universite du Quebec, Canada, [3]Physics Dept., Univ. of Arkansas, USA, [4]Dept. of Electrical and Electronic Engineering, Univ. of Glasgow, UK.* We have investigated experimentally the dependence of the power threshold of discrete Kerr surface solitons on the distance from the boundary, and the inter-channel coupling strength. Experiment and theory are in excellent agreement

Suzor-Colé
4:30 p.m.–5:00 p.m.
Coffee Break/Exhibits Open

BTuE • Fibre Grating Sensors

Krieghoff
5:00 p.m.–6:30 p.m.
BTuE • Fibre Grating Sensors
Lin Zhang; Aston Univ., UK, Presider

BTuE1 • 5:00 p.m.
Generation and Characterization of Fiber Bragg Gratings with Bragg Wavelengths in VIS and Their Application in Sensor Technology, *Eric Lindner, Martin Becker, Manfred Rothhardt, Kerstin Schröder, Wolfgang Ecke, Hartmut Bartelt; Inst. of Photonic Technology, Jena, Germany.* We have generated fiber Bragg gratings with Bragg wavelengths in VIS from 700 nm down to 480 nm. Peak reflectivities of over 99 % were achieved. Potential applications are in the field of sensor technology.

BTuE2 • 5:15 p.m.
Ultra-Narrow Bragg Grating for Active Semiconductor Laser Linewidth Reduction through Electrical Feedback, *Jean-François Cliche, Yves Painchaud, Christine Latrasse, Marie-Josée Picard, Isabelle Alexandre, Michel Têtu; TeraXion Inc., Canada.* A 15 MHz-wide pi-phase shifted Bragg grating is used in an electronic feedback loop to reduce the linewidth of a DFB semiconductor laser down to 2 kHz.

BTuE3 • 5:30 p.m. Invited
Bragg Gratings in Multicore Optical Fibres for Sensor Applications, *Julian D. C. Jones[1], James S. Barton[1], William N. MacPherson[1], Lin Zhang[2], Ian Bennion[2]; [1]Heriot Watt Univ., UK, [2]Aston Univ., UK.* Bragg gratings written in multicore fiber are particularly suitable for curvature measurement by response to differential strain. We outline grating writing techniques and applications of such fibers to sensing shape, deformation, vibration, acceleration, transverse load.

BTuE4 • 6:00 p.m.
Long-Period Fibre Grating Based Biosensor for Detection of DNA Hybridisation, *Xianfeng Chen, Marcus Hughes, Kaiming Zhou, Edward Davies, Lin Zhang, Anna Hine, Ian Bennion; Aston Univ., UK.* We implement an optical biosensor using long-period fibre grating immobilised with probe DNA. It has been used to detect hybridisation of target DNA, showing a high sensitivity and reusability function.

BTuE5 • 6:15 p.m.
Cladding Reduced Long-Period Grating In-Fiber Michelson Interferometer as Immunosensor, *Jian Yang[1], Pawan Sandhu[1], Wanguo Liang[1], Chang-Qing Xu[1], Yingfu Li[2,3]; [1]Dept. of Engineering Physics, McMaster Univ., Canada, [2]Dept. of Biochemistry and Biomedical Science, McMaster Univ., Canada, [3]Dept. of Chemistry, McMaster Univ., Canada.* A sensitivity enhanced long period grating Michelson interferometer with diameter reduced cladding on fiber arm has been developed as an antibody/antigen immunosensor sensor. Stepwise and dynamic immunoassay with such a device shows 9-fold sensitivity increase.

NTuD • Nonlinear Devices and Systems III

Borduas
5:00 p.m.–7:00 p.m.
NTuD • Nonlinear Devices and Systems III
Steven Cundiff; NIST, USA, Presider

NTuD1 • 5:00 p.m.
All-Optical Delay Line Based on Semiconductor Cavity Solitons, *Francesco Pedaci[1], Stephane Barland[1], Emilie Caboche[1], Patrice Genevet[1], Massimo Giudici[1], Jorge R. Tredicce[1], Thorsten Ackemann[2], Andrew Scroggie[2], William J. Firth[2], Gian-Luca L. Oppo[2], Giovanna Tissoni[3], Roland Jaeger[4]; [1]Inst. Nonlinéaire de Nice, Univ. de Nice Sophia Antipolis/CNRS, France, [2]SUPA, Dept. of Physics, Univ. of Strathclyde, UK, [3]CNISM and INFM-CNR, Dept. di Fisica e Matematica, Univ. dell'Insubria, Italy, [4]ULM Photonics, Germany.* A novel all-optical delay line based on the lateral drift of cavity solitons in semiconductor microresonators is proposed and experimentally demonstrated. The delay-bandwidth product is competitive with "slow-light" based buffers and can be widely optimized.

NTuD2 • 5:15 p.m.
Random-Phase Spatial Solitons in Effectively-Instantaneous Nonlocal Nonlinear Media, *Carmel Rotschild[1], Tal Schwartz[1], Mordechai Segev[1], Oren Cohen[2]; [1]Technion Israel, Israel, [2]JILA and Dept. of Physics, Univ. of Colorado, USA.* We demonstrate random-phase spatial solitons in effectively-instantaneous nonlocal nonlinear media. These "ensemble-average solitons" display new features (e.g., the instantaneous self-trapped beams experience randomly deflections), making them different from all previously-observed coherent and incoherent solitons.

NTuD3 • 5:30 p.m.
Compact Tunable Narrow-Band IR Source Based on a Microchip Pump Laser and Periodically Poled Lithium Niobate, *Sergey M. Klimentov[1], Alexander V. Kir'yanov[1,2] , Igor V. Mel'nikov[2,3], Peter E. Powers[4], Yuri N. Korkishko[2]; [1]A M Prokhorov General Physics Inst. of the Russian Acad. of Sciences, Russian Federation, [2]Optolink Ltd., Russian Federation, [3]High Q Labs, Inc., Canada, [4]Dept. of Physics and Electro-Optics Program, Univ. of Dayton, USA.* The PPLN crystal is combined with a narrow-line DFB and microchip lasers to come up with a compact device that demonstrates high-stability output through near- to mid-IR range at repetition rate up to 10 kHz.

NTuD4 • 5:45 p.m.
High-Efficiency, Low-Loss AlGaAs/AlOx Waveguides for Parametric Down-Conversion, *Marco Ravaro, Melanie Le Dû, Jean-Pierre Likforman, Sara Ducci, Vincent Berger, Giuseppe Leo; Lab Matériaux et Phénomènes Quantiques, Univ. Paris VII-Denis Diderot, France.* Birefringent selectively oxidized AlGaAs waveguides designed for parametric generation are nonlinearly characterized by frequency up- and down-conversion. By high-reflectivity facet coating oscillation threshold is expected to be within reach.

NTuD5 • 6:00 p.m. Invited
Entanglement Generation and Propagation in Optical Fiber, *Prem Kumar; Northwestern Univ., USA.* Progress on telecom-band in-fiber entanglement generation and long-distance transmission (> 100km) will be described, including generation of entangled photon-pairs at 10GHz pulse rates for WDM operation. Characterization and applications of the distributed entanglement will be discussed.

NTuD6 • 6:30 p.m. Invited
Nonlinear Functionalities Implemented in Silicon-Compatible Materials: The PHOLOGIC Project Vision, *Marti Javier; Univ. Politecnica de Valencia, Spain.* No abstract available.

NOTES

•Wednesday, September 5, 2007•

Third Floor
7:00 a.m.–5:30 p.m.
Registration Open

BWA • Plenary III

Krieghoff
8:00 a.m.–9:00 a.m.
BWA • Plenary III
Jacques Albert; Carleton Univ., Canada, Presider

BWA1 • 8:00 a.m. Plenary
Optofluidics, *Demitri Psaltis; Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland.* Optofluidics refers to a class of adaptive optical-circuits that integrate optical and fluidic devices. Dr. Psaltis will discuss how the emergence of fluidic transport-technologies down to nanometer-scale levels opens possibilities for novel adaptive optical devices..

NWA • Novel Propagation Effects and New Concepts

Borduas
9:00 a.m.–11:00 a.m.
NWA • Novel Propagation Effects and New Concepts
John Dudley; Univ. de Franche-Comté, France, Presider

NWA1 • 9:00 a.m. Invited
Extreme Temporal Pulse Propagation in Quadratic Nonlinear Media, *Frank Wise; Cornell Univ., USA.* The interplay of quadratic and cubic nonlinearities underlies new effects in short-pulse propagation. Pulse propagation governed by an integrable derivative nonlinear Schrodinger equation is studied for the first time in any physical setting.

NWA2 • 9:30 a.m.
Microscopic Cascading in Fifth-Order Nonlinearity Induced by Local-Field Effects, *Ksenia Dolgaleva[1], Robert W. Boyd[1], John E. Sipe[2]; [1]Inst. of Optics, Univ. of Rochester, USA, [2]Univ. of Toronto, Canada.* Using Maxwell-Bloch approach to study nonlinear response of a collection of two-level atoms, we show that there are cascaded contributions of the third-order hyperpolarizability to the fifth-order susceptibility induced by local-field effects.

NWA3 • 9:45 a.m.
Cascaded Quadratic Soliton Compression at 800 nm, *Morten Bache[1], Ole Bang[1], Jeffrey Moses[2], Frank W. Wise[3]; [1]COM.DTU, Technical Univ. of Denmark, Denmark, [2]Optics and Quantum Electronics Group, MIT, USA, [3]Dept. of Applied and Engineering Physics, Cornell Univ., USA.* We study soliton compression in quadratic nonlinear materials at 800 nm, where group-velocity mismatch dominates. We develop a nonlocal theory showing that efficient compression depends strongly on characteristic nonlocal time scales related to pulse dispersion.

NWA4 • 10:00 a.m.
Thermalization of Incoherent Nonlinear Wave-Packets, *Silvère Lagrange, Stéphane Pitois, Hans Jauslin, Antonio Picozzi; Inst. Carnot de Bourgogne, France.* We present both 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.

NWA5 • 10:15 a.m.
Waveguide Arrays for Mode-Locking X-Wave Lasers, *J. Nathan Kutz[1], Claudio Conti[2], Stefano Trillo[3]; [1]Dept. of Applied Mathematics, Univ. of Washington, USA, [2]Ctr. Studi e Ricerche "Enrico Fermi", Univ. di Roma "La Sapienza", Italy, [3]Dept. di Ingegneria, Univ. di Ferrara, Italy.* We demonstrate the spontaneous formation of X-waves which are generated by mode-locking of a laser cavity in the normal dispersion regime where the nonlinear discrete diffraction dynamics is mediated by a waveguide array.

NWA6 • 10:30 a.m.
Similariton Interactions in Nonlinear Gain Media, *Sergey Ponomarenko[1], Govind P. Agrawal[2]; [1]Dalhousie Univ., Canada, [2]Univ. of Rochester, USA.* We obtain exact self-similar solutions to a generalized nonlinear Schrödinger equation, (GNLSE). We show that despite the exact integrability of the GNLSE, single-similariton interactions can lead to the formation of the two-similariton bound states.

NWA7 • 10:45 a.m.
Multi-Wave Mixing and Decoherence Suppression in Semiconductors, *Tadashi Kishimoto[1], Fujio Minami[1], Atsushi Hasegawa[2], Masahide Sasaki[2]; [1]Tokyo Inst. of Technology, Japan, [2]Natl. Inst. of Information and Communications Technology, Japan.* We performed multi-wave mixing experiments in GaSe by using successive femtosecond pulses. The suppression of the decoherence of excitons was found by optical pulse irradiations. The experimental results are reproduced perfectly by a model analysis.

Suzor-Colé
11:00 a.m.–11:30 a.m.
Coffee Break/Exhibits Open

BWB • Properties and Applications of Femtosecond Writing in Fibres

Krieghoff
9:05 a.m.– 11:05 a.m.
BWB • Properties and Applications of Femtosecond Writing in Fibres
Stephen J. Mihailov; Communications Res. Ctr. Canada, Canada, Presider

BWB1 • 9:05 a.m.
Growth Behavior of Type I-IR Ultrafast Laser Induced Gratings in Hydrogen Loaded SMF-28 Fiber, *Christopher W. Smelser, Stephen J. Mihailov, Dan Grobnic; Communications Res. Ctr., Canada.* In this study the growth of ultrafast induced fiber Bragg gratings in hydrogen loaded fiber is shown to behave differently than would be expected for gratings written with UV sources.

BWB2 • 9:20 a.m.
Fourier Components of Type I-IR Ultrafast Induced Fiber Bragg Gratings, *Christopher W. Smelser, Stephen J. Mihailov, Dan Grobnic; Communications Res. Ctr., Canada.* 'ac' and 'dc' coupling coefficients are related to the Fourier spectrum of a grating's profile. In this study the Fourier components of ultrafast induced fiber Bragg gratings are characterized and their intensity dependence is investigated.

BWB3 • 9:35 a.m.
Fiber Bragg Gratings Based on 1D Filamentation of Femtosecond Pulses, *Réal Vallée, Martin Bernier, Ali Saliminia, See Leang Chin; Ctr. d'Optique, Photonique et Laser (COPL), Univ. Laval, Canada.* A precise refractive index measurement of femtosecond-written Fiber Bragg gratings (FBGs) is presented. The FBGs are shown to be made of periodic streaks induced by optical filaments.

BWB4 • 9:50 a.m.
High Birefringence Induced in SMF-28 Fiber by Femtosecond IR Laser Exposure of the Cladding with a Phase Mask, *Dan Grobnic, Stephen J. Mihailov, Christopher W. Smelser; Communications Res. Ctr. Canada, Canada.* High core birefringence in SMF-28 fiber (~8×10^{-4}) was obtained by inscribing a Type II-IR grating in the cladding near the core. The birefringence is likely stress induced rather than due to asymmetric index modification.

BWB5 • 10:05 a.m.
Long-Period Gratings in Near-Single-Mode GeO_2 Glass Fiber by IR Femtosecond Laser Inscription, *Rui Suo[1], Yicheng Lai[1], Kaiming Zhou[1], Lin Zhang[1], Ian Bennion[1], Xin Jiang[2], Joris Lousteau[2], Animesh Jha[2]; [1]Photonics Res. Group, Aston Univ., UK, [2]Inst. for Materials Res., Houldsworth Building, Univ. of Leeds, UK.* We report for the first time the fabrication of long-period gratings in near-single-mode GeO_2 glass fiber by 800nm-femtosecond-laser inscription, revealing grating resonances strongly polarisation dependent and their temperature sensitivities varying significantly from 96pm/°C to 11pm/°C.

BWB6 • 10:20 a.m. Invited
Device Fabrication by Femtosecond Laser Inscription, *Ian Bennion, Vladimir Mezentsev, Mykhaylo Dubov, David Nikogosyan, Jovana Petrovic, Yicheng Lai, Graham Smith, Kaiming Zhou, Kate Sugden; Photonics Res. Group, Aston Univ., UK.* Microfabrication of photonic devices by means of femtosecond (fs) laser pulses is reviewed. Submicron structures are demonstrated in infrared and UV range. Applications to fibre based devices and prototypes for integrated planar devices are shown.

BWB7 • 10:50 a.m.
100 W CW Yb^{3+}-Doped Silica Fiber Laser Utilizing an Active-Core Inscribed Point-by-Point Bragg Grating, *Nemanja Jovanovic[1], Mattias Åslund[2], Alexander Fuerbach[1], Stuart D. Jackson[2], Graham D. Marshall[1], Michael J. Withford[1]; [1]Macquarie Univ., Australia, [2]Optical Fibre Technology Ctr., Sydney Univ., Australia.* We report stable high-power (100 W level), narrow linewidth (<100 pm) continuous wave output from a double clad fiber laser incorporating a point-by-point fiber-Bragg grating inscribed into the active core with 800 nm femtosecond radiation.

Suzor-Colé
11:05 a.m.–11:30 a.m.
Coffee Break/Exhibits Open

BWC • Photonic Crystal Fibre Gratings

Krieghoff
11:30 a.m.– 1:00 p.m.
BWC • Photonic Crystal Fibre Gratings
Martin Kristensen; Aarhus Univ., Denmark, Presider

BWC1 • 11:30 a.m. Invited
Gratings and Grating Devices in Structured Fibres Using 193nm from an ArF Laser, *John Canning; Univ. of Sydney, Australia.* Developments in grating writing using the 193nm output of an ArF exciplex laser is reviewed. 193nm irradiation offers an opportunity to apply well developed techniques for writing gratings in germanosilicate, non-germanosilicate and pure silicate fibre.

BWC2 • 12:00 p.m.
Long Period Fiber Grating Polarizer Written on Photonic Crystal Fiber, *Dongning Wang, Yiping Wang, Yange Liu, Jin Wei; Hong Kong Polytechnic Univ., Hong Kong.* An in-fiber polarizer based on a long period fiber grating on photonic crystal fiber is presnted. It exhibits a high polarization extinction ratio of more than 20dB and a low temperature sensitivity of 3.9pm/°C.

BWC3 • 12:15 p.m.
Gratings in Large Diameter Air-Clad Optical Fibre Using a Femtosecond Laser, *Nathaniel Groothoff[1,2], John Canning[1], Nemanja Jovanovic[3], Graham D. Marshall[3], Michael J. Withford[3]; [1]School of Chemistry, Univ. of Sydney, Australia, [2]School of Physics, Univ. of Sydney, Australia, [3]Ctr. for Ultrahigh-Bandwidth Devices for Optical Systems (CUDOS), Ctr. of Lasers and Applications (CLA), Div. of Information and Communication Sciences, Macquarie Univ., Australia.* Fibre Bragg gratings were written in large diameter (~300μm) air-clad optical fibre using an amplified femtosecond Ti:sapphire laser with a point-by-point method.

BWC4 • 12:30 p.m. Invited
Photonic Crystal Fiber Gratings: Prospects for Label-Free Biosensors, *Lars Rindorf[1], Jesper Bo Jensen[1], Martin Dufva[2], Lars Hagsholm Pedersen[3], Poul Erik Høiby[3], Ole Bang[1]; [1]COM.DTU, Dept. of Communications, Optics, and Materials, Technical Univ. of Denmark, Denmark, [2]MIC-Dept. of Micro and Nanotechnology, Technical Univ. of Denmark, Denmark, [3]Bioneer A/S, Denmark.* We study long-period gratings in photonic crystal fibers in the application as biosensors. The analyte can be infiltrated into the holes of the fiber and measured using evanescent-wave sensing principle.

1:00 p.m.–2:30 p.m.
Lunch (on your own)

NWB • Spatial Nonlinear Effects III

Borduas
11:30 a.m.–1:00 p.m.
NWB • Spatial Nonlinear Effects III
Andrey A. Sukhorukov; Australian Natl. Univ., Australia, Presider

NWB1 • 11:30 a.m.
Observation of All-Optical Bump-on-Tail Instability, *Dmitry V. Dylov, Jason W. Fleischer; Princeton Univ., USA.* We consider an all-optical bump-on-tail instability. For weak nonlinearity, there is momentum transfer with no variation in intensity. Above a threshold, modulations appear. Borrowing plasma language, these represent weak and strong regimes of optical turbulence.

NWB2 • 11:45 a.m.
Control of the Filamentation Distance and Pattern in Long Range Atmospheric Propagation, *Yonatan Sivan[1], Gadi Fibich[1], Shmuel Eisenmann[2], Einat Louzon[2], Yiftach Katzir[2], Arie Zigler[2]; [1]Tel Aviv Univ., Israel, [2]Hebrew Univ., Israel.* Using a tilted double-lens setup we obtained highly-localized plasma filaments with 120fs pulses at a distance of 330m which, to the best of our knowledge, is the longest distance reported in the literature.

NWB3 • 12:00 p.m.
Cavity Solitons in Vertical-Cavity Surface-Emitting Lasers with Frequency-Selective Feedback, *Yann Tanguy[1], Thorsten Ackemann[1], Roland Jäger[2]; [1]Physics Dept., Strathclyde Univ., UK, [2]ULM Photonics GmbH, Germany.* We experimentally demonstrate cavity solitons in a vertical-cavity surface-emitting laser with frequency selective feedback. The switch-on and switch-off dynamics are presented, together with the dragging of a cavity soliton by attraction from an injected field.

NWB4 • 12:15 p.m.
Nonlinear Optical Shock Waves: Properties and Interactions, *Wenjie Wan, Shu Jia, Jason Fleischer; Princeton Univ., USA.* We experimentally demonstrate dispersive optical shock waves in 1-D and 2-D, characterize their nonlinear properties, and observe the complex interactions when two such shocks collide.

NWB5 • 12:30 p.m.
Lattice Shock Waves in Nonlinear Waveguide Arrays, *Shu Jia, Wenjie Wan, Jason W. Fleischer; Princeton Univ., USA.* We experimentally study dispersive shock waves in nonlinear waveguide arrays. We directly observe Bloch mode coupling, both within and between bands, by recording intensity in position space and power spectra in momentum space.

NWB6 • 12:45 p.m.
Optics in Curved Space, *Ulf Peschel, Henrike Trompeter; Inst. of Optics, Information and Photonics (Max Planck Res. Group), Univ. of Erlangen-Nuremberg, Germany.* We study effects of wave propagation in non-Euclidean spaces both experimentally and numerically. We derive evolution equations for fields propagating on surfaces of arbitrary curvature and investigate solitons on the surface of a sphere.

1:00 p.m.–2:30 p.m.
Lunch (on your own)

JWA • Joint Poster Session II

Suzor-Colé Foyer
2:30 p.m.–5:00 p.m.
JWA • Joint Poster Session II

JWA1
Nonlinear Optical Properties of Stimulated Brillouin Scattering Process in Submarine Objects Detecting, *YueLan Lü, LiHua Wu, XueQing Chong; Harbin Engineering Univ., China.* Nonlinear Optical Properties of Stimulated Brillouin Scattering are analyzed with different focusing geometry. The inflexion of varying rate of SBS energy reflection is used to determine the location of the submarine object.

JWA2
Nonlinear High Index-Contrast Waveguides with Optimum Geometry, *Christian Koos[1], Lenin Jacome[1], Christopher Poulton[2], Juerg Leuthold[1], Wolfgang Freude[1]; [1]Univ. of Karlsruhe, Inst. of High-Frequency and Quantum Electronics, Germany, [2]Max-Planck Res. Group for Optics, Information and Photonics, Germany.* Universal design curves for nonlinear high index-contrast strip/slot waveguides are computed. Predicted nonlinearity parameters are more than three orders of magnitude larger than for highly nonlinear fibers, thus enabling ultrafast on-chip all-optical signal processing.

JWA3
Stability of Transverse Field Structures in Two-Dimensional Optical Parametric Oscillators, *Joel Nishimura, J. Nathan Kutz; Dept. of Applied Mathematics, Univ. of Washington, USA.* Near resonance detuning the optical parametric oscillator is governed by a quintic, fourth-order PDE of the Swift-Hohenberg type. The stability of a soliton solutions are studied with an emphasis on inter-soliton interactions.

JWA4
Propagating Pulses in Optical Fibers Using Second Order Moments, *Bryan Burgoyne, Nicolas Godbout, Suzanne Lacroix; Ecole Polytechnique de Montreal, Canada.* Approximate yet efficient formulae describing the second order moments of a pulse propagating in a nonlinear dispersive optical fiber over many dispersion and nonlinear lengths are presented. Examples in the normal dispersion regime are given.

JWA5
A Self-Consistent CW Model of Unstable Cavity Semiconductor Lasers including Symmetrical and Antisymmetrical Solutions, *Ignacio Esquivias, Helena Odriozola, Jose Manuel G. Tijero, Alfredo M. Mínguez, Luis Borruel; Univ. Politecnica de Madrid, Spain.* We present a quasi-three dimensional (3-D) CW simulation model for unstable cavity semiconductor lasers which propagates simultaneously a symmetrical and an antisymmetrical optical field along the cavity until a stable solution is found.

JWA6
Multicanonical Monte Carlo Simulations of the Dynamic Power Transfer Characteristic of an All-Optical 2R Regenerator, *Taras I. Lakoba[1], Michael Vasilyev[2]; [1]Univ. of Vermont, USA, [2]Univ. of Texas at Arlington, USA.* We numerically study the effect of pulse temporal shape distortions due to added bandpass-filtered amplified spontaneous emission on the quality of the regenerated signal.

JWA7
Effect of the Gain Non-Locality on Bright Dissipative Optical Solitons in Multi-Domained Semiconductor Laser Waveguides with a Slowly Saturable Gain and a Fast-Relaxing Absorption, *Alexandre S. Shcherbakov[1], Ana Luz Munoz Zurita[1], Sergey Nemov[2], Joaquin Campos Acosta[3]; [1]Natl. Inst. for Astrophysics, Optics and Electronics, Mexico, [2]State Polytechnical Univ., Russian Federation, [3]CSIC - Inst. for Applied Physics, Spain.* The dissipative solitons shaped within resculpturing external optical pulses are revealed in multi-domained semiconductor laser waveguides. Bright asymmetrical optical solitons are supported by the waveguides with a slowly saturable non-local gain and a fast-relaxing absorption.

JWA8
TIRE of 2-D Binary Gratings with Combined Fe-SiO_2 Dots, *Jaromir Pistora[1], Jaroslav Vlcek[1], Michael Cada[2], Montasir Qasymeh[2]; [1]VSB-Technical Univ. of Ostrava, Czech Republic, [2]Dalhousie Univ., Canada.* Theoretical model for total internal reflection ellipsometry on 2-D grating structure.

JWA9
High Extinction Ratio Switching Using Two-Photon Absorption in a Silicon Waveguide Resonator, *Ayan Maitra, Jin Wang, Jürg Leuthold, Wolfgang Freude; Inst. of High-Frequency and Quantum Electronics, Univ. of Karlsruhe, Germany.* High extinction ratios may be achieved using two-photon absorption in an optically switched asymmetric Fabry-Perot waveguide resonator. This combines the high switching contrast of the resonator concept with a fast nonlinearity readily available in silicon.

JWA10
Cooperative Effects of Different Nonlinearities on the Composite Effective Susceptibility, *Ángel Vergara Betancourt[1], Erwin A. Marti-Panameño[1], Luz C. Gómez Pavón[1], David Iturbe Castillo[2]; [1]Benemerita Univ. Autonoma de Puebla, Mexico, [2]INAOE, Mexico.* The optical properties of the nonlinear effective susceptibility of a layered Kerr-Quadratic composite, and the conditions when it is possible to observe cooperative effects of both materials on the nonlinear beam propagation are determined.

JWA11
Investigation of Harmonic Generation in One-Dimensional Defective Nonlinear Photonic Crystal, *Yan Zhang, Qiaofen Zhu; Dept. of Physics, Capital Normal Univ., China.* The nonlinear photonic quantum well is designed for multiple frequencies conversion. When the fundamental and harmonic waves are assigned to the defect states, the giant enhancement of conversion efficiency can be derived.

JWA12
Amplitude and Phase Noise of Dispersion-Managed Solitons, *Elaine Spiller, Gino Biondini; State Univ. of New York at Buffalo, USA.* We quantify noise-induced perturbations of dispersion-managed solitons in optical fiber communications and femtosecond lasers by developing perturbation theory for the dispersion-managed nonlinear Schroedinger equation and applying it to guide importance-sampled Monte-Carlo simulations.

JWA13
Removing and Controlling Modulational Instabilities in Low Dispersion Fiber Ring Cavities, *Arnaud Mussot[1], Mustapha Tlidi[2], Eric Louvergneaux[1], Gregory Kozyreff[2], Andrei G. Vladimirov[3], Majid Taki[1]; [1]Lab de Physique des Lasers, Atomes et Molécules, UMR-CNRS, France, [2]Optique Nonlinéaire Théorique, Univ. des Sciences et Technologies de Lille, Belgium, [3]Weierstrass Inst. for Applied Analysis and Stochastics, Germany.* We show that it is necessary to take into account the fourth order dispersion term to capture the full dynamics of coherently driven fiber ring cavities when working in low dispersion regions.

JWA14
Polarization Changes of Partially Coherent Pulses Propagating in Optical Fibers, *Weihong Huang[1], Sergey A. Ponomarenko[1], Michael Cada[1], Govind P. Agrawal[2]; [1]Dalhousie Univ., Canada, [2]Univ. of Rochester, USA.* We consider polarization changes of statistical pulses in single-mode fibers. We show that the evolution of the degree of polarization is determined by the interplay between the coherence properties of the pulse and fiber birefringence.

JWA15
Soliton Dynamics in Optical Fibers with Two Zero-Dispersion Points, *Eduard N. Tsoy, C. M. de Sterke; CUDOS, School of Physics, Univ. of Sydney, Australia.* We study the soliton self-frequency shift in fibers where the two anomalous group velocity dispersion (GVD) regions are separated by the normal GVD region. Sharp switching of the soliton frequency is predicted.

JWA16
Spectral Filtering for Ultra-Fast Mode-Locking in the Normal Dispersive Regime, *Brandon Bale, J. Nathan Kutz; Dept. of Applied Mathematics, Univ. of Washington, USA.* A new mode-locking model is presented in which nonlinear mode-coupling along with a periodically applied frequency filter is used to achieve femtosecond, stable, passive mode-locking in a normal-dispersion laser cavity.

JWA17
Multi-Frequency Mode-Locking with Waveguide Arrays, *Brandon Bale[1], Edward Farnum[2], J. Nathan Kutz[1]; [1]Dept. of Applied Mathematics, Univ. of Washington, USA, [2]Ctr. for Science, Technology, and Mathematics Education, Kean Univ., USA.* A new mode-locking model is presented in which nonlinear mode-coupling along with a periodically applied frequency filter is used to achieve stable and robust multi-frequency passive mode-locking.

JWA18
Nonlinear-Spectronic Similariton of Single-Mode Fiber without Gain, *Garegin Yesayan[1], Kristine Palanjyan[1], Tigran Mansuryan[1], Aram Zeytunyan[1], Levon Mouradian[1], Pascal Kockaert[2], Philippe Emplit[2]; [1]Ultrafast Optics Lab, Faculty of Physics,Yerevan State Univ., Armenia, [2]Service Optique et Acoustique, ULB, Belgium.* We demonstrate the forming of a similariton of nonlinear-spectronic nature in single-mode fiber without gain caused by combined impact of Kerr-nonlinearity and normal dispersion. Spectro-temporal similarity and imaging accuracy of the nonlinear-spectronic similariton are discussed.

JWA19
Waveform Degradation and Spectral Broadening Due to Self-Phase Modulation in Optical BPSK-SSB Transmission, *Katsumi Takano, Takashi Murakami, Yuki Sawaguchi, Kiyoshi Nakagawa; Yamagata Univ., Japan.* SPM effect is evaluated in a dispersion-compensated transmission using optical BPSK single sideband modulation. It has been clarified by numerical simulations that pattern-dependent waveform degradation and less sideband-suppression are induced by SPM in BPSK-SSB transmission.

JWA20
Dark and Antidark Diffraction Free Beams, *Sergey A. Ponomarenko, Weihong Huang, Michael Cada; Dalhousie Univ., Canada.* We present dark and antidark diffraction free beams and discuss their properties. We show that all such beams must be partially spatially coherent. The new beams can be used for optical trapping of atoms.

JWA21
Modeling Supercontinuum Generation in Fibers with General Dispersion Characteristics, *Michelle Hummel, Ronald Chen, Thomas Hagstrom, Alejandro B. Aceves; Dept. of Mathematics and Statistics, Univ. of New Mexico, USA.* The generation of broadband supercontinua in air-silica microstructured fibers results from a delicate balance of dispersion and nonlinearity. In our model, we use the calculated GVD curves to account for the linear dispersion.

JWA22
All-Optical Triode Using InAs Quantum Dot Semiconductor Optical Amplifiers, *Yasuhiko Kuroki, Jae-Hoon Huh, Sayaka Maki, Yoshinobu Maeda; Toyota Technological Inst., Japan.* We designed InAs QDs, AlGaAs/GaAs double heterostructure and fabricated QD-SOAs for optical triode. Our results demonstrate input, control and output waveforms, and response time of two optical triodes.

JWA23
Snaking of Cavity Solitons in Theory and Experiment, *William J. Firth[1], Andrew J. Scroggie[1], Alison M. Yao[1], Sylvain Barbay[2], Tiffany Elsass[2], Damia Gomila[3], Lorenzo Columbo[4]; [1]Strathclyde Univ., UK, [2]Lab de Photonique et de Nanostructures, CNRS, France, [3]Unidad de Física Interdisciplinar(CSIC-UIB), Campus Univ. de les Illes Balears, Spain, [4]Univ. e Politecnico di Bari, Italy.* Experiments on spontaneous self-localized spatial structures in an optically-pumped vertical-cavity semiconductor laser are compared with theory and simulations of homoclinic snaking of dissipative solitons in two transverse dimensions.

JWA24
Simulation of Guiding-Centre Soliton Transmission System Stability in the Presence of Polarisation Mode Dispersion, *Marc A. Eberhard, Keith J. Blow; Aston Univ., UK.* Results of full numerical simulations of a guiding-centre soliton system with randomly birefringent SMF fibre are shown and analysed. It emerges that the soliton system becomes unstable even for small amounts of PMD.

JWA25
Multi-Watt Supercontinuum Generation in a Nonlinear Fiber Amplifier, *Paul-Henri Pioger[1], Vincent Couderc[1], Philippe Leproux[1], Pierre-Alain Champert[2]; [1]XLIM, France, [2]Keopsys, France.* A nonlinear fiber amplifier is used to simultaneously achieve large spectral broadening and amplification of nanosecond pulses. The output supercontinuum extends from 1.05 to 1.75 μm, with a spectral power density higher than 3 mW/nm.

JWA26
Raman Self-Frequency Shift in a Passively Mode-Locked Fibre Laser Containing a Long-Period Fibre Grating, *Abdullah Karar, Tom Smy, Alan Steele; Carleton Univ., Canada.* The effect of Raman self-frequency shift on the dynamics of a passively mode-locked fibre laser containing a long period grating is studied numerically. Focus is paid to the affect on the pulse generation and evolution.

JWA27
Frequency Chirp in a Pattern-Independent SOA Used in a Pump-Probe Configuration for All-Optical De-Multiplexing, *Claudio Crognale[1], Vittorio Ricchiuti[1], Stefano Caputo[2], Sante Saracino[3]; [1]Technolabs S.p.A., Italy, [2]SMD Elettronica, Italy, [3]Siemens S.p.A., Italy.* We show how a proper SOA nonlinearities management can suppress the impact of the optical gain pattern-dependence on the probe pulses frequency chirp in an ultra-fast all-optical de-multiplexer, preserving the extracted channel integrity.

JWA28
Two-Dimensional Surface Lattice Solitons, *Alexander Szameit[1], Felix Dreisow[1], Matthias Heinrich[1], Thomas Pertsch[1], Stefan Nolte[1], Andreas Tünnermann[1], Yaroslav Kartashov[2], Llouis Torner[2]; [1]Inst. of Applied Physics, Friedrich-Schiller-Univ. Jena, Germany, [2]ICFO-Inst. de Ciencies Fotoniques, Spain.* We report on the observation of two-dimensional surface lattice solitons in a fs laser written waveguide array and investigate the transition from linear two-dimensional discrete diffraction to surface lattice soliton formation.

JWA29
A Visual Interpretation of Fiber Optic Circular Vortex Modes Generated by an Acoustic Long-Period Grating, *Fares Alhassen, Rong Huang, Henry P. Lee; Univ. of California at Irvine, USA.* A study of fiber optic vortex modes generated by an acoustic long-period grating is done based on graphical simulations of modal field time evolutions and intensity distributions.

JWA30
Annealing Properties of Femtosecond Laser Inscribed Point-by-Point Fiber Bragg Gratings, *Graham D. Marshall, Michael J. Withford; Macquarie Univ., Australia.* The annealing properties of point-by-point inscribed fiber Bragg gratings written at different pulse energies is examined. Three annealing modes are observed due to the complex interaction of regions modified by different writing laser beam intensities.

JWA31
Numerical Optimization of Passband Fiber Bragg Gratings, *Guillaume Tremblay, Yunlong Sheng, Martin Bernier, Jean-Philippe Bérubé; Univ. Laval, Canada.* Real-valued encoding genetic algorithm is used to optimize fiber Bragg gratings. One may pre-choose number of phase-shifts in grating according to fabrication conditions. The fabricated grating achieves designed performance with minimum dispersion in flat-top passband.

JWA32
Bending Characteristics of Holey Fiber-Based Long-Period Fiber Grating Depending on Rotational Orientation, *Young-Geun Han[1], Suho Song[2], Kwanil Lee[2], Sang Bae Lee[2], Je-Myung Jeong[3], Chang Hyun Jeong[4], Chi Hwan Oh[4], Hee Jeon Kang[4]; [1]Hanyang Univ., Republic of Korea, [2]Korea Inst. of Science and Technology, Republic of Korea, [3]Div. of Electrical and Computer Engineering, Hanyang Univ., Republic of Korea, [4]Optomagic Ltd., Republic of Korea.* We discuss bending properties of long-period fiber grating (LPFG) inscribed into a holey Fiber depending on an axial rotation angle and achieve a bending-insensitive LPFG under a certain range of bending curvature (<3.9 m^{-1}).

JWA33
Evolution from Type IA to IIA FBG in Hydrogenated Boron/Germanosilicate Optical Fiber, *Kyriacos Kalli[1], George Simpson[2], Kaiming Zhou[3], Lin Zhang[3], Ian Bennion[3]; [1]Higher Technical Inst., Cyprus, [2]BAE Systems, UK, [3]Aston Univ., UK.* The evolution from Type IA to Type IIA Bragg gratings in B/Ge co-doped optical fibers is reported and shown to be intrinsically linked to the level of hydrogen in the optical fiber.

JWA34
Effect of the Grating Parameters on the Polarization Properties of Uniform FBGs, *Christophe Caucheteur[1], Sébastien Bette[1], Raimundo Garcia-Olcina[2], Marc Wuilpart[1], Salvador Sales[2], José Capmany[2], Patrice Mégret[1]; [1]Faculté Polytechnique de Mons, Belgium, [2]Univ. Politecnica Valencia, Spain.* We analyze the grating parameters effects on the polarization dependent loss and differential group delay generated by uniform FBGs. Experimental evolutions are confirmed by simulation realized using the coupled mode theory and the Jones formalism.

JWA35
Power Penalty of Bragg Grating Based Optical Add-Drop Multiplexers in the Presence of Polarization Mode Dispersion and Polarization Dependent Loss, *Ping Lu, Stephen J. Mihailov; Communications Res. Ctr. Canada, Canada.* Considering the presence of birefringence in Bragg grating based optical add-drop multiplexers (OADMs), pulse distortions of non-return to zero signals are simulated in an all optical network consisting of concatenated Bragg grating based OADMs.

JWA36
Dependence of Type IA FBG Growth on Inscription Intensity, *Kyriacos Kalli[1], George Simpson[2], Kaiming Zhou[3], Lin Zhang[3], Ian Bennion[3]; [1]Higher Technical Inst., Cyprus, [2]BAE Systems, Advanced Technology Ctr., UK, [3]Aston Univ., UK.* We present a study on the dependence of the rate of Type IA fiber Bragg grating formation on the inscription laser intensity with a view to ascertaining the optimum CW inscription conditions at 244nm.

JWA37
Numerical Investigation on Propagation Characteristics of a Surface Plasmon Mode Guided through a Metallic Rod with Periodic Surface Grating Structures, *Junghyun Park, Hwi Kim, Byoungho Lee; Seoul Natl. Univ., Republic of Korea.* Propagation characteristics of a surface plasmon mode guided by a metallic rod with periodic surface gratings are investigated. The dependencies of reflection and transmission efficiency of structures with several grating structure parameters are also analyzed.

JWA38
Energetically-Efficient Sub-Picosecond Flat-Top Waveform Generation Using Long-Period Fiber Grating, *Radan Slavik[1], Yongwoo Park[2], Jose Azana[2]; [1]Inst. of Photonics and Electronics, Czech Republic, [2]EMT-Inst. Natl. de la Recherche Scientifique, Canada.* Recently-reported filtering technique for ultrafast flat-top optical pulse re-shaping based on long-period fiber grating is demonstrated to generate pulses of sub-picosecond duration (800fs shown here) with unprecedented energetic efficiencies of almost 60%.

JWA39
Inscription of Fiber Bragg Gratings in Multicore Fiber, *Charles G. Askins, Thierry F. Taunay, Gary A. Miller, Barbara M. Wright, John R. Peele, Lucienne R. Wasserman, E. Joseph Friebele; NRL, USA.* We present solutions to unique problems associated with simultaneously writing FBGs in 4 cores of a multicore fiber used for bend and twist sensing, including exposure conditions, photosensitivity balance, and draw-induced refractive index changes.

JWA40
Integrated-Optical Add/Drop Multiplexer for DWDM in Lithium Niobate, *Daniel Runde, Detlef Kip; Clausthal Univ. of Technology, Germany.* An add/drop multiplexer using a holographically recorded Bragg grating in $LiNbO_3$ is demonstrated experimentally. Polarisation-independent operation, electrical tuning of Bragg wavelengths and on/off switching is achieved using the electro-optic effect.

JWA41
An Ultrahigh Resolution FBG Dynamic Strain Sensing System, *ZengLing Ran[1], Yunjiang Rao[1,2], Jianzhong Li[1], Weijun Liu[1]; [1]Univ. of Electronics Science and Technology of China, China, [2]Chongqing Univ., China.* An FBG dynamic strain sensing system based on a fiber ring laser configuration and the eigenvector spectrum analysis method, is proposed and demonstrated. An ultrahigh dynamic strain resolution of $3.4x10^{-6}$ nε /$Hz^{1/2}$ is achieved.

JWA42
All-Fiber Ultrafast Second-Order Differentiator Based on a Single Uniform Long-Period Fiber Grating, *Jose Azaña[1], Yongwoo Park[1], Tae-Jung Ahn[1], Radan Slavik[2]; [1]EMT-INRS, Canada, [2]Inst. of Photonics and Electroncis AS CR, Czech Republic.* We report the first experimental demonstration of an all-fiber higher-order optical differentiator. It is based on a single long-period fiber grating and allows processing of arbitrary waveforms with sub-picosecond time features.

JWA43
Novel Amplitude FBG Sensor Made with fs-IR Radiation in SMF-28 Fiber for Multi-Parameter Bend Sensing, *Dan Grobnic, Stephen J. Mihailov, Robert B. Walker, Christopher W. Smelser; Communications Res. Ctr. Canada, Canada.* A new bend sensor based on Bragg gratings written in the cladding of SMF-28 fiber, with a Bragg resonance amplitude dependent on the fiber bending radius, is presented.

JWA44
High-Speed Control of Fiber Bragg Gratings, *Zhangwei Yu[1,2,3], Walter Margulis[4], Oleksandr Tarasenko[4], Harald Knape[4], Pierre-Yves Fonjallaz[1,4]; [1]Royal Inst. of Technology (KTH), Sweden, [2]Joint Res. Ctr. of Photonics of KTH and Zhejiang Univ., China, [3]Zhejiang Univ., China, [4]ACREO, Sweden, Sweden.* FBGs were written in fiber with internal alloy electrodes. Nanosecond high current pulses cause metal expansion, increase birefringence and tune the gratings. High-speed wavelength switching was accomplished with potential use in Q-switching fiber lasers.

JWA45
Silica Fibre Bragg Grating Sensor Embedded into a Textile Fabric for Large Strain Applications, *Damien Kinet[1], J. Witt[2], A. Grillet[1], M. Schukar[2], K. Krebber[2], D. Giannone[1], F. Pirotte[3]; [1]MULTITEL, Belgium, [2]Federal Inst. for Materials Res. and Testing, Germany, [3]Centexbel, Belgium.* A FBG written on standard silica fibre, with coating transparent at 248nm, was integrated on an elastic textile fabric. The so-formed optical gauge showed a linear relationship when strained up to 40%.

JWA46
Realisation of Single Polarisation State of Fibre Ring Laser by Utilising Intracavity 45° Tilted Fibre Bragg Grating, *Chengbo Mou[1], Xianfeng Chen[1], Kaiming Zhou[1], Lin Zhang[1], Ian Bennion[1], Shenggui Fu[2], Xiaoyi Dong[2]; [1]Photonics Res. Group, School of Engineering and Applied Science, Aston Univ., UK, [2]Inst. of Modern Optics, Nankai Univ., China.* Single polarisation operation of fibre ring laser has been realised by employing an intracavity 45°-tilted fibre Bragg gratings (45°-TFBGs). The degree of polarisation of 99.94% of the laser was demonstrated with good stability.

JWA47
Optical Logic Gates Based on Soliton Interaction in Fiber Bragg Gratings, *Yuval P. Shapira, Moshe Horowitz; Technion, Israel.* We demonstrate theoretically optical cascadable NOT and AND gates based on a frequency change caused by soliton interaction in a fiber Bragg grating. The devices length can be on the order of tens of centimeters.

JWA48
Purely Axial Compression of Fiber Bragg Gratings Written with UV and Femtosecond Pulses, *Erik Bélanger, Martin Bernier, Stéphan Gagnon, Jean-Philippe Bérubé, Réal Vallée; Ctr. d'Optique, Photonique et Laser (COPL), Univ. Laval, Canada.* Fiber Bragg gratings written by standard UV and femtosecond methods were tuned by means of a purely axial tuning technique. UV and femtosecond FBGs were tuned over 66.3 and 58.6 nm respectively.

JWA49
Tilted Fiber Bragg Gratings Stubs for Vibration and Bend Sensing, *Alexei Ivanov, Jacques Albert; Carleton Univ., Canada.* A tilted fiber Bragg grating in a short piece of fiber is configured to reflect two resonances separated by 2 nm. The differential sensitivity of the resonances to bending is large (7μW/mm) and temperature-independent.

JWA50
Reconfigurable Multi-Wavelength Semiconductor Fiber Laser Using Thermally Induced Phase-Shifts in a Chirped Grating, *Alexandre D. Simard, YoungJae Kim, Sophie Larochelle; Ctr. d'Optique, Photonique et Laser (COPL), Univ. Laval, Canada.* We demonstrate a reconfigurable multi-wavelength semiconductor fiber laser with line spacing down to 25 GHz by the application of thermally induced distributed phase shifts along a chirped fiber Bragg grating using heating wires.

JWA51
Development of an Optical Fiber Bragg Grating Fabrication Technique by a Near-Ultraviolet Laser, *Yoshinari Maezono[1], Yousuke Iwasa[1], Ikuo Yamamoto[2], Atsushi Yokotani[3]; [1]Japan Science and Technology Agency, Japan, [2]Toyoko ELMES Co., Ltd., Japan, [3]Univ. of Miyazaki, Japan.* We have developed a new laser for the fabrication of FBGs without removal of polymer jackets covering fibers, and basic investigated the role of Ge concentration in the core using our developed laser.

JWA52
Locally Pressed Hi-Bi Fiber Bragg Grating, *Juan F. Botero-Cadavid, Jesús D. Causado-Buelvas, Pedro Torres; Univ. Nacional de Colombia, Colombia.* An experimental and numerical study of transversely loaded Hi-Bi fiber Bragg gratings is presented. A local pressure applied to the centre of the grating produce a transmission window within the Bragg stop-band with polarization properties.

JWA53
A Highly Sensitive Fiber-Optic Refractive Index Sensor Based on an Edge-Written Long-Period Fiber Grating, *Yun-Jiang Rao[1,2], Tao Zhu[1,2]; [1]Key Lab of Optoelectronic Technology and Systems, Chongqing Univ., China, [2]Key Lab of Broadband Optical Fiber Transmission and Communication Networks Technologies, Univ. of Electronic Science and Technology of China, China.* A long-period-grating whose refractive-index disturbance mainly occurs in the edge region of the cladding is edge-written without destructive damage on the fiber by CO_2 laser, which has much higher refractive-index sensitivity over conventional gratings.

JWA54
Study of Refractive Index Change in Ge-Doped Fibers with Vacuum Ultraviolet Light Irradiation, *Yoshinari Maezono[1], Yousuke Iwasa[1], Ikuo Yamamoto[2], Atsushi Yokotani[3]; [1]Japan Science and Technology Agency, Japan, [2]Toyoko ELMES Co., Ltd., Japan, [3]Univ. of Miyazaki, Japan.* We determined that refractive index change in the fiber's core was induced by vacuum ultraviolet light irradiation using Xe_2^* and Kr_2^* excimer lamps and revealed the change of wavelength dependence.

JWA55
Absence of UV-Induced Stress in Bragg Gratings Recorded by High-Intensity 264 nm Laser Pulses in a Hydrogenated SMF-28, *Hans G. Limberger[1], Christian Ban[1], René P. Salathé[1], Stephen A. Slattery[2], David N. Nikogosyan[2]; [1]Ecole Polytechnique Fédérale de Lausanne (EPFL), Advanced Photonics Lab, Switzerland, [2]Univ. College Cork, Natl. Univ. of Ireland, Ireland.* We report on photochemical two-photon Bragg grating preparation in hydrogenated fiber without any UV-induced stress in the core or cladding, leaving only the color-center model responsible for refractive index changes for UV femtosecond irradiation.

JWA56
Modeling of the Nonlinear Photosensitivity Response of Hydrogen-Loaded Germanium-Doped Optical Fiber in the Presence of Hydrogen Diffusion and Depletion, *Guillaume Brochu, Sophie LaRochelle; Ctr. d'Optique, Photonique et Laser, Univ. Laval, Canada.* We present a novel model demonstrating the critical role of hydrogen diffusion and depletion in the nonlinear photosensitivity response of hydrogen loaded optical fibers during grating inscription. It provides answers to several experimental observations.

JWA57
UV Excited Luminescence Behavior in H_2-Loaded Ge-Doped Silica Preform Plates Exposed to 193nm Laser Light, *Matthieu Lancry[1], Bertrand Poumellec[1], Pierre Niay[2], Marc Douay[2]; [1]Univ. of Paris Sud, France, [2]Univ. of Lille [1], France.* We studied the influence of H_2-loading and subsequent 193nm UV-exposure on both the photo-luminescence VUV excitation and absorption spectra in Ge-doped silica glass. Next, we have also investigated the polarization properties of the luminescence.

JWA58
UV Excited Luminescence Behavior in OH-Flooded Ge-Doped Silica Preform Plates Exposed to 193nm Laser Light, *Matthieu Lancry[1], Bertrand Poumellec[1], Marc Douay[2]; [1]Univ. of Paris Sud, France, [2]Univ. of Lille [1], France.* We studied the influence of OH-flooding treatment and subsequent UV exposure on the photo-luminescence excitation spectra. We compare the 193nm laser induced absorption and photo-luminescence excitation changes in Ge-doped silica glass.

JWA59
A Comparative Study on the Type IIA Photosensitivity of a B-Ge Optical Fiber Using Ultraviolet, Femtosecond Radiation, *Georgios Violakis, Savas Georgiou, Maria Konstantaki, Stavros Pissadakis; Inst. of Electronic Structure and Laser, Foundation for Res. and Technology Hellas, Greece.* A comparative study on the Type IIA photosensitivity of a B/Ge-codoped optical fibre is performed using 5ps, 500fs and 120fs, 248nm laser radiation. Index modulation curves and annealing behaviour of fabricated Bragg gratings is presented.

JWA60
Large Photosensitivity in Hydroxyl-Rich Tin-Phosphosilicate Fibers under KrF-Excimer Laser Illumination, *Gilberto Brambilla; Optoelectronics Res. Ctr., Univ. of Southampton, UK.* Large modulations in the induced refractive index have been recorded in wet tin-phosphosilicate fibers under KrF excimer laser illumination.

Suzor-Colé
4:30 p.m.-5:00 p.m.
Coffee Break/Exhibits Open

JWB • Joint Postdeadline Session

Borduas/Krieghoff
5:00 p.m.–7:00 p.m.
JWB • Joint Postdeadline Session
Presider to be Announced

NOTES

•Thursday, September 6, 2007•

Third Floor
8:00 a.m.–3:00 p.m.
Registration Open

NThA • Computational Analysis

Borduas
9:00 a.m.–11:00 a.m.
NThA • Computational Analysis
Nail Akhmediev; Optical Sciences Group, Australia, Presider

NThA1 • 9:00 a.m. Invited
Pulse Dynamics in Mode-Locked Lasers, *Steven T. Cundiff[1], Jared K. Wahlstrand[1], John Willits[1], Ryan P. Smith[1], Thomas R. Schibli[1], Curtis R. Menyuk[2]; [1]JILA, NIST and Univ. of Colorado, USA, [2]Univ. of Maryland, Baltimore County, USA.* Measurements of the pulse dynamics in a mode-locked laser show that the dynamics of the gain medium must be included. The dynamical response of the timing and phase are measured using femtosecond comb techniques.

NThA2 • 9:30 a.m.
Spatial Dynamics of Shock Waves in Nonlocal Media, *Neda Ghofraniha[1], Giancarlo Ruocco[1], Claudio Conti[2], Stefano Trillo[3]; [1]Res. Ctr. SOFT INFM-CNR and Dept. di Fisica, Univ. di Roma, Italy, [2]Ctr. Studi e Ricerche Enrico Fermi, Italy, [3]Univ. of Ferrara, Italy.* We investigate spatial shock waves in nonlocal media in both defocusing and focusing media. Spatial patterns observed in a thermal defocusing medium are interpreted in the framework of our theory.

NThA3 • 9:45 a.m.
Nonlinear All-Photonic Crystal Fabry-Pérot Resonator, *Rumen Iliew[1], Christoph Etrich[1], Kestutis Staliunas[2], Thomas Pertsch[1], Falk Lederer[1]; [1]Friedrich-Schiller-Univ. Jena, Germany, [2]Univ. Politecnica de Catalunya, Spain.* We study the bistability behavior of the transmitted field in dependence on the pump for an all-photonic crystal Fabry-Pérot resonator with Kerr nonlinearity. Finite-difference time-domain calculations are used to obtain the hysteresis for different detunings.

NThA4 • 10:00 a.m.
Self-Propelled Solitons in Dissipative Systems, *Wonkeun Chang[1], Adrian Ankiewicz[1], Nail Akhmediev[1], Jose-Maria Soto Crespo[2]; [1]Australian Natl. Univ., Australia, [2]Inst. de Optica, Spain.* We have constructed a bifurcation diagram for the region of transition between solitons and fronts. It shows a rich variety of transitions between various types of localized solutions including creeping solitons with zig-zag motion.

NThA5 • 10:15 a.m.
Generation of Multiply Charged Optical Vortices and Spatiotemporal Helical Beams Using Cascaded Four-Wave Mixing, *Dmitry Skryabin, Andrey Gorbach; Univ. of Bath, UK.* We demonstrate how four-wave mixing can lead to cascaded excitation of multiply charged optical vortices and generation of ultra-short spatio-temporal helical beams and solitons. Phenomenon of self-focusing in defocusing materials is presented and explained.

NThA6 • 10:30 a.m.
High-Order Numerical Method for the Nonlinear Helmholtz Equation with Material Discontinuities, *Guy Baruch[1], Gadi Fibich[1], Semyon V. Tsynkov[2]; [1]Tel-Aviv Univ., Israel, [2]North Carolina State Univ., USA.* We develop a numerical algorithm for solving the nonlinear Helmholtz equation at high powers and with large material discontinuities.

NThA7 • 10:45 a.m.
From Turing Instability to Fractals, *Jungang G. Huang[1], James M. Christian[1], Graham S. McDonald[1], Pedro Chamorro-Posada[2], Jafar Jahanpanah[3]; [1]Joule Physics Lab, School of Computing, Science and Engineering, Inst. for Materials Res., Univ. of Salford, UK, [2]Dept. de Teoría de la Señal y Comunicaciones e Ingeniería Telemática, Univ. de Valladolid, Spain, [3]Dept. of Physics, Teacher Training Univ., Iran (Islamic Republic of).* We confirm the proposal of a generic fractal pattern formation criterion, reporting the first predictions (analyses and simulations) of spatial optical fractal formation in the two new contexts of ring cavities and purely-absorptive nonlinear systems.

Suzor-Colé
11:00 a.m.–11:30 a.m.
Coffee Break

NThB • Temporal Effects and Analysis

Borduas
11:30 a.m.–1:00 p.m.
NThB • Temporal Effects and Analysis
Jonathan C. Knight, Univ. of Bath, UK, Presider

NThB1 • 11:30 a.m.
All-Fiber Ultra-Fast Optical Switch Based on Bragg Scattering, *David Méchin[1], Richard Provo[1], John D. Harvey[1], Colin J. McKinstrie[2]; [1]Dept. of Physics, Univ. of Auckland, New Zealand, [2]Bell Labs, Alcatel-Lucent, USA.* We present an experimental demonstration of an all-optical switch based on frequency conversion by Bragg scattering in a nonlinear optical loop mirror.

NThB2 • 11:45 a.m.
Pulse Compression at 1.06μm in Dispersion Decreasing Photonic Crystal Fibers, *James M. Stone[1], Alan K. George[1], Jonathan C. Knight[1], John C. Travers[2], Burly A. Cumberland[2], Andre B. Rulkov[2], Sergei V. Popov[2], James R. Taylor[2]; [1]Univ. of Bath, UK, [2]Imperial College, UK.* We report use of 15-60m long, dispersion-decreasing tapered solid-core photonic crystal fibers for adiabatic soliton compression at 1.06μm wavelength. 655fs input pulses were compressed to 43fs solitons.

NThB3 • 12:00 p.m.
Spectro-Temporal Imaging through Aberration-Free Temporal Lensing: An Ultrafast Optical Oscilloscope, *Levon Kh Mouradian[1], Tigran Mansuryan[1], Aram Zeytunyan[1], Meri Kalashyan[1], Garegin Yesayan[1], Frédéric Louradour[2], Alain Barthélémy[2]; [1]Yerevan State Univ., Armenia, [2]Dept. Photonique, XLIM Inst. de Recherche, Faculté des Sciences, France.* We present a new, self-reference method of direct, real-time femtosecond scale temporal measurements, based on the aberration-free temporal lensing / spectral compression through sum frequency generation, which leads to a design of ultrafast optical oscilloscope.

NThB4 • 12:15 p.m.
Solitons and Antisolitons in Dissipative Systems, *Natasha Devine[1], Adrian Ankiewicz[1], Nail Akhmediev[1], Jose-Maria Soto Crespo[2]; [1]Optical Sciences Group, Res. School of Physical Sciences and Engineering, Australian Natl. Univ., Australia, [2]Inst. de Optica, Spain.* Using the method of moments for solitons, we show that there are two disjoint sets of fixed points. These correspond to stationary solitons of the Ginzburg - Landau equation with concave or convex phase chirps.

NThB5 • 12:30 p.m.
Gravity-Like Potential Traps Light and Stretches Optical Supercontinuum, *Andrey Gorbach, Dmitry Skryabin; Univ. of Bath, UK.* We present theory explaining the long-standing problem of formation, temporal localization and frequency shift of the radiation associated with the blue edge of supercontinua generated in silica core photonic crystal fibers.

NThB6 • 12:45 p.m.
Dynamics of Passive Harmonic Mode-Locking, *J. Nathan Kutz[1], Bjorn Sandstede[2]; [1]Dept. of Applied Mathematics, Univ. of Washington, USA, [2]Dept. of Mathematics, Univ. of Surrey, UK.* A comprehensive theoretical model of harmonic mode-locking is presented in which the nonlinear mode-coupling behavior in a waveguide array is used to achieve stable and robust passive mode-locking.

1:00 p.m.–2:30 p.m.
Lunch (on your own)

NThC • Nonlinear Effects in Fibres

Borduas
2:30 p.m.–4:30 p.m.
NThC • Nonlinear Effects in Fibres
Keith Blow; Aston Univ., UK, Presider

NThC1 • 2:30 p.m.
Soliton Pulse Delivery and Compression Using Hollow-Core Photonic Bandgap Fibers, *F. Gérôme[1], J. C. Knight[1], J. Clowes[2], W. J. Wadsworth[1]; [1]Ctr. for Photonics and Photonic Materials, Univ. of Bath, UK, [2]Fianium Ltd., UK.* We report applications of hollow-core photonic bandgap fibers for ultrashort pulse delivery and compression. Two effects have been investigated: evolution of strongly chirped input pulses into ultrashort solitons, and adiabatic pulse compression using tapered fibers.

NThC2 • 2:45 p.m.
Highly Coherent Supercontinuum Generation in Dispersion Increasing Fibers, *Goery Genty[1], Stephane Coen[2], Pierre-Ambroise Lacourt[3], Bertrand Kibler[3], John M. Dudley[3]; [1]Helsinki Univ. of Technology, Finland, [2]Univ. of Auckland, New Zealand, [3] Inst. FEMO-ST , Univ. de Franche-Comté, France.* We demonstrate the use of dispersion-increasing fiber for coherent supercontinuum generation. We show that dispersion-increasing fibers allow for generating broadband supercontinuum with high coherence across octave-spanning bandwidths even for input pulses of 0.5 ps duration.

NThC3 • 3:00 p.m.
Parabolic Pulse Generation with Dispersion Decreasing Optical Fiber, *Christophe Finot[1], Stefan Wabnitz[1], Alexey Guryanov[2], Alexej A. Sysoliatin[2]; [1]Inst. Carnot de Bourgogne, France, [2]Fiber Optics Res. Ctr., Russian Federation.* We experimentally demonstrate the possibility to generate parabolic pulses via a single dispersion decreasing optical fiber with normal dispersion. We numerically and experimentally outline the influence of the dispersion profile.

NThC4 • 3:15 p.m.
Multi-Wavelength Generation in Yb-Doped Fiber Laser through Four-Wave Mixing, *Xijia Gu[1], Lawrence R. Chen[2]; [1]Ryerson Univ., Canada, [2]McGill Univ., Canada.* Four-wave mixing is used to generate multi-wavelength lasing in a high power Yb-doped fiber laser. We achieved narrow linewidth (< 40 pm), high signal-to-noise-ratio (> 55 dB) and high output power (1.70 W).

NThC5 • 3:30 p.m.
What is the Exact Soliton Content of Pulses in Lossy Fibers? An Uncertainty Relation for Solitons, *Michael Böhm, Fedor Mitschke; Univ. of Rostock, Germany.* We show that soliton content of pulses in optical fibers can be determined even in nonintegrable cases. "Soliton-radiation beat analysis" shows that soliton decay in lossy fibers is governed by an uncertainty relation.

NThC6 • 3:45 p.m.
Measurement of the Phase and Amplitude Profile of Temporal Soliton Molecules, *Haldor Hartwig, Alexander Hause, Michael Böhm, Fedor Mitschke; Univ. Rostock, Germany.* Phase and power profiles of temporal soliton molecules in dispersion-managed fibers were measured with a new technique since existing methods (FROG, etc.) proved inadequate. Observed phase profiles confirm expectations about the binding mechanism.

NThC7 • 4:00 p.m.
All-Fibered High-Quality Low Duty-Cycle 20-GHz and 40-GHz Picosecond Pulse Sources, *Christophe Finot, Julien Fatome, Stéphane Pitois, Guy Millot; Inst. Carnot de Bourgogne, France.* We demonstrate all-fibered 20-GHz and 40-GHz picosecond pulse sources with duty cycles as low as 1/14. The pulse train is achieved via the high-quality compression of an initial sinusoidal beating through four segments of fibers.

NThC8 • 4:15 p.m.
Localization Phenomena in Disordered Optical Fiber Arrays, *Gowri Srinivasan, Shadi Naderi, Alejandro B. Aceves; Dept. of Mathematics and Statistics, Univ. of New Mexico, USA.* Arrays of nonlinear optical fibers have an intrinsic disorder that accounts for random variations in coupling coefficients and propagation constants. In this paper we study the effects of disorder in enhancing or inhibiting light localization.

Key to Authors and Presiders

(**Bold** Denotes Presenting Author or Presider)

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•Wednesday, September 5, 2007•

JWB • Joint Postdeadline Session

Borduas/Krieghoff
5:00 p.m.—7:00 p.m.
JWB • Joint Postdeadline Session
Morten Ibsen; Optoelectronics Res. Ctr., Univ. of Southampton, UK, Presider
Jonathan Knight; Univ. of Bath, UK, Presider
Michael Cada; Dalhousie Univ., Canada, Presider

JWBPDP1 • 5:00 p.m.
EIT and STIRAP in Waveguides: Linear and Nonlinear Effects in a Three-Core Coupled System, *Yoav Lahini[1], Francesca Pozzi[2], Mark Sorel[2], Roberto Morandotti[3], Yaron Silberberg[1]; [1]Weizmann Inst. of Science, Israel, [2]Univ. of Glasgow, UK, [3]Inst. Natl. de la Recherche Scientifique, Canada.* We demonstrate the elimination of tunneling between two coupled waveguides and adiabatic passage between uncoupled waveguides, in analogy with the quantum effects of EIT and STIRAP. We investigate the influence of nonlinearity on these effects.

JWBPDP2 • 5:15 p.m.
Monolithic Waveguide-Laser Created Using the Direct Write Technique, *Graham D. Marshall, Peter Dekker, Martin Ams, James A. Piper, Michael J. Withford; Macquarie Univ., Australia.* We report the optical characteristics of a monolithic waveguide-laser structure based on the direct write technique. The laser, which incorporated waveguide-Bragg gratings within the doped guide structure, produced narrow linewidth laser output in the C-band.

JWBPDP3 • 5:30 p.m.
Dissipative Solitons in Normal-Dispersion Fiber Lasers: Exact Pulse Solutions of the Complex Ginzburg-Landau Equation, *William H. Renninger, Andy Chong, Frank W. Wise; Cornell Univ., USA.* A recently-developed modelocked fiber laser is analyzed with the Ginzburg-Landau equation. A range of experimental pulse shapes are predicted remarkably well by an exact analytical solution, and thus constitute dissipative temporal solitons.

JWBPDP4 • 5:45 p.m.
Refractometer Based on a Liquid Core FBG Device, *Kaiming Zhou, Yicheng Lai, Xianfeng Chen, Kate Sugden, Lin Zhang, Ian Bennion; Photonics Res. Group, Aston Univ., UK.* A 1.2X500μm slot was engraved across a fiber Bragg grating (FBG) using femtosecond laser patterning and chemical etching. Liquid core FBGs were constructed and their sensitivity to refractive index of up to 10^{-6}/pm was measured.

JWBPDP5 • 6:00 p.m.
Novel Solid-Core Photonic Bandgap Fiber Structures for Second and Third Harmonic Generation, *Aurelie Bétourné, Yves Quiquempois, Geraud Bouwmans, Mathias Perrin, Marc Douay; PhLAM/IRCICA, France.* We report on a microstructured fiber in which phase matching is achieved for second or third harmonic generation between two fundamental modes and for wavelengths over a large spectral range, simply by tuning the pitch.

JWBPDP6 • 6:15 p.m.
Thermal Poling of Glass: A Nonlinear Ionic RC Circuit, *Michael Fokine[1], Monica Ferraris[1], Isabel C. S. Carvalho[2]; [1]Politecnico di Torino, Italy, [2]Dept. de Física, Pontificia Univ. Católica do Rio de Janeiro, Brazil.* In this work we propose that thermal poling of glasses can be viewed as an ionic RC circuit, which opens up new opportunities to study and control the induced optical second order nonlinearity in glasses.

JWBPDP7 • 6:30 p.m.
Self-Organized Supercontinuum Generation from a Nonlinear Fiber Resonator, *Toralf Ziems[1], Kumaran N. V. Adarsh[1], Michael Böhm[1], Ayhan Demircan[2], Fedor M. Mitschke[1]; [1]Univ. Rostock, Germany, [2]Weierstrass-Inst. fuer Angewandte Analysis und Stochastik, Germany.* We demonstrate a concept to generate supercontinuum based on self-organization in a holey-fiber ring resonator, which is simpler than existing schemes.

JWBPDP8 • 6:45 p.m.
A Multi-Fiber-Channel Wavelength Converter Based on a Passive Ultrafast Switch, *Darren Wu, Li Qian, Waleed S. Mohammed, Peter W. E. Smith; Univ. of Toronto, Canada.* We demonstrate 40Gb/s multiple-fiber-channel wavelength conversion using a passive ultrafast reflective switch, and a 2-D lens array aligned to a fiber array. Wavelength conversion is tunable over 20nm. Simultaneous 1-to-N conversion is also demonstrated.

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