# Latin America Optics and Photonics Conference (LAOP)

### September 27-30 2010, Golden Tulip Recife Palace, Recife, Brazil

Thanks to the Ethanol program, Brazil has been recognized as one of the most prominent countries in using renewable energies.  While covering the wide field of Photonics from optical communications to biomedical applications, the LAOP conference will have a special focus on solar energy. Learn more.

### Conference Program

View the Agenda
Plan Your Conference

**View the conference program and plan your itinerary for the conference**

- Browse speakers and the agenda of sessions (pdf)
- Browse sessions by type or day
- Use Advanced Search to search by author, title, OCIS code and more
- Plan and print your personal itinerary before coming to the conference
- Download your personal itinerary to your mobile device
- Add your personal itinerary to your electronic calendar
- Email your itinerary to a colleague who might be interested in attending

**Download pages from the program book!**

- Agenda of sessions (pdf)
- Abstracts (pdf)
- Key to Authors and Presiders (pdf)
- Postdeadline Paper Abstracts (pdf)
- Postdeadline Paper Key to Authors (pdf)

### Keynote Speaker

**Monday, 27 September**

9.00–9.45

**The Global Impact of Photonics: Renewable Resources, Monitoring Climate Change, and Energy Conservation**, Thomas Baer, Stanford Univ., USA

Invited Speakers

### Meeting Topics

**1. Optical Design and Instrumentation**

- Novel Optical Architectures in Emerging Technologies
- Optics for Renewable Energy
- Polarization and Birefringence in Optical Design
- Lighting and Illumination Engineering: Design and Simulation of Lighting Systems and Lit Environments
- Diffractive and Holographic Optics
- General Optical Design and Instrumentation
- Computational Imaging and Photography

**2. Optics in Information Science**

- Optical Information Processing and Transport in the Age of Nanophotonics and Metamaterials
- Optical Signals and System in Four Dimensions

- Computational Imaging and Photography
- Wavefront Design for Information Transport and Sensing
- Optical Storage and Display
- General Optics in Information Science

**3. Nonlinear and Quantum Optics**

- Fundamental studies and new concepts
- Novel NLO characterization techniques
- Nonlinear Statistical Optics
- Single-photon nonlinear optics
- Slow Light
- Coherent Control
- Nonlinear Organic and Inorganic Materials
- Frequency Combs and Optical Clocks
- THz generation, spectroscopy and imaging
- Quantum Optics in Waveguides
- Quantum computing and teleportation
- Quantum entanglement
- Microcavity Devices
- Entanglement Generation and Measurement
- Anderson Localization of Classical and Quantum Waves
- Optical Probes of Molecular Chirality and Supramolecular Chiral Assemblies

**4. Atomic Physics and Laser Spectroscopy**

- Atomic tests of fundamental physics
- Laser spectroscopy, cooling and trapping
- Chip traps for atoms, ions and molecules
- Quantum optics and cavity QED with atoms
- Bose-Einstein condensates
- Fermi gases
- Cold molecules
- Atomic clocks
- Attosecond physics with atoms
- Atoms in optical lattices
- Quantum information processing with atoms and ions
- Artificial atoms

**5. Photonics**

- Novel Fiber, Guided-Wave Optics and Integrated-Optical Devices
- Photonic Devices for Sensing Applications
- All-Optical Signal Processing Devices and Applications
- Optical Communication
- Silicon Photonics
- Displays
- Optical Imaging
- LEDS based devices
- Photonics in Arts Conservation and Restoration

**6. Micro and Nanophotonics**

- Micro and Nanofluidics systems
- Nanoplasmonics Devices and Applications
- Photonic Crystals and Optical Circuits
- Nanomaterials and Devices
- Nanoscale Optics Imaging
- Nanophotonics for energy
- Nanophotonics for sensors
- Nanophotonics for information processing
- Metamaterials

**7. Biophotonics and Biomedical Applications**

- Optical Trapping and Micromanipulation
- Optical Biosensing
- Photonic Based Therapeutic and Diagnostic
- Tissue Imaging and Spectroscopy
- Microscopy Devices and Applications
- Optical Coherence Tomography Applications
- Molecular Imaging and Nanomedicine
- Molecular Imaging in the Eye
- Biomedical Applications of Ultrafast Optics
- Single-Molecule Biophysics
- General Optics in Biology and Medicine

**8. Laser Science and Technology**

- Semiconductor Laser and Devices
- Solid State Lasers
- Random Lasers
- High Power Laser Technology
- High-Power Continuous-Wave and Fiber Lasers
- Ultrafast Lasers
- Infrared Lasers
- Chaotic Lasers and Applications
- Extreme Light Sources
- Laser and Optical Materials
- Laser Metrology and Remote Sensing
- Laser Processing and Industrial Applications

All OSA Meetings are peer reviewed. Accepted papers presented at the conference will be archived in Optics InfoBase, OSA's online library for OSA flagship journals and partnered and copublished journals.

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### September 27-30 2010, Golden Tulip Recife Palace, Recife, Brazil

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### Program

The Latin America Optics and Photonics Conference covers photonics and solar energy, and Brazil has been recognized as one of the most prominent countries in using renewable energies thanks to the ethanol program. Several other subjects make the conference very attractive for young students and researchers.

- Optical Design and Instrumentation
- Nonlinear and Quantum Optics
- Atomic Physics and Laser Spectroscopy
- Photonics
- Micro and Nanophotonics
- Biophotonics and Biomedical Applications
- Laser Science and Technology

A number of distinguished invited speakers have been invited to present at the meeting. In addition, the organizers have planned a number of special events to make your meeting experience more enjoyable, including a welcome reception, lunches, and a conference banquet.

### Conference Program

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#### Special Events

- Welcome reception
- Poster session
- Post deadline sessions
- Conference Banquet
- Lunches

# Latin America Optics and Photonics Conference (LAOP)

### September 27-30 2010, Golden Tulip Recife Palace, Recife, Brazil

### Chairs & Committee Members

The Technical Program Chairs and Committee Members are integral to the success of the meeting. These volunteers dedicate countless hours to planning, including such critical activities as raising funds to support the event, securing invited speakers, reaching out to colleagues to encourage submissions, reviewing papers, and scheduling sessions. On behalf of OSA, its Board, and its entire staff, we extend enormous gratitude to the following members of the 1LAOP Technical Program Committee.

**Program Committee**

**Information for Conference Chairs and Committee Members**

**Information for Session Chairs/Presiders**

Anderson S. L. Gomes, *Univ. Federal de Pernambuco, Brazil,* **General Chair**
Luiz Davidovich, *Univ. Federal do Rio de Janeiro, Brazil,* **Conference Co-Chair**
Hugo Fragnito, *UNICAMP, Brazil,* **Conference Co-Chair**

### Latin America Committee

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Arturo Lezama, *Inst. de Fisica, Uruguay*
José Luis Paz, *Simón Bolívar Univ., Venezuela*
Luis Ponce, *CICATA-IPN, Mexico*

### Program Committee

### Optical Design and Instrumentation

Flavio Horowitz, *Inst. de Fisica, Univ Federal do Rio Grande do Sul, Brazil,* **Co-Chair**
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Lucila Cescato, *UNICAMP, Brazil*
Hans-Peter Grieneisen, *INMETRO, Brazil*
H. Angus Macleod, *Thin Film Center, USA*
Luiz G. Neto, *Univ. of São Paulo, Brazil*
Ric Shimshock, *MLD Technologies LLC, USA*
Brian Sullivan, *Iridian, Canada*
Eric Yeatman, *Imperial College, UK*

### Nonlinear and Quantum Optics

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Cleber Mendonça, *Univ. of São Paulo, São Carlos, Brazil*
Yehiam Prior, *Weizmann Inst. of Science, Israel*
Raul Rangel-Rojo, *CICESE, Mexico*

### Atomic Physics and Laser Spectroscopy

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J. W. R. Tabosa, *Univ. Federal de Pernambuco, Brazil,* **Co-Chair**
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Jean-Claude Garreau, *Lab de Physique des Lasers, Atomes et Molécules (PhLAM), CNRS, France*
Robin Kaiser, *Inst. Non Linéaire de Nice, CNRS, France*
Arturo Lezama, *Inst. de Fisica, Uruguay*

### Photonics

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Christiano de Matos, *Univ. Presbiteriana Mackenzie, Brazil*
Walter Margulis, *ACREO, Sweden*
Clifford Headley, *OFS Labs, USA*
Hypolito José Kalinowski, *Univ. Tecnológica Federal do Paraná, Brazil*

## Micro and Nanophotonics

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Hugo Figueroa, *UNICAMP, Brazil,* **Co-Chair**
Mario Dagenais, *Univ. of Maryland, USA*
Richard De La Rue, *Univ. of Glasgow, UK*
Newton C. Frateschi, *State Univ. of Campinas, Brazil*
Roberto Ricardo Panepucci, *Florida International Univ., USA*

## Biophotonics and Biomedical Applications

John Girkin, *Univ. of Durham, UK,* **Co-Chair**
Denise Zezell, *Inst. de Pesquisas Energéticas e Nucleares, Univ. of São Paulo, Brazil,* **Co-Chair**
Carlos Lenz César, *UNICAMP, Brazil*
Airton Martin, *UNIVAP, Brazil*

## Laser Science and Technology

Nasser Peyghambarian, Univ. of Arizona, USA, **Chair**
Lucio Acioli, Universidade Federal de Pernambuco, Brazil, **Co-Chair**
Farzin Amzagerdian, *NASA Langley, USA*
Arturo Chavez, *NP Photonics Inc., USA*
Mahmoud Fallahi, *Univ. of Arizona, USA*
Dan Hu, *Lockheed Martin, USA*
Giancarlo Righini, *Inst. of Applied Physics, Italy*
Axel Schulzgen, *CREOL, The College of Optics and Photonics, Univ. of Central Florida, USA*

If you are a member of the committee and have any questions or concerns at any point along the way, please refer to the information below or contact your program manager.

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## Information for Conference Chairs and Committee Members

- View the Calendar of Deadlines for the Meeting
- View the Call for Papers in English, Portuguese and Spanish
- View Author/Presenter Information
- View Peer Review Instructions
- View Scheduling Instructions

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## Information for Session Chairs/Presiders

Presiders are requested to identify themselves at least 20 minutes before the session begins to the audiovisual personnel for a quick review of equipment and procedures.

### Guidelines

Remember to introduce yourself as the presider and announce the session. The total amount of time allotted for each paper will be listed in the online program as well as in the conference program book. Generally, invited talks are allowed 25 minutes for presentation and 5 minutes for discussion. Generally, contributed talks are allowed 12 minutes for presentation and 3 minutes for discussion. Generally, tutorials are allotted 45 minutes to 1 hour, with 5 minutes for discussion. A 60-minute mechanical timer will be available for your use. We recommend that the timer is set two minutes prior to the end of the presentation time in order to provide a warning to wrap up the talk and start the discussion period. Notify the authors of this warning system. It is also important to remind the speaker to repeat the questions asked from the audience.

Maintaining the scheduled timing of papers is very important. In cases where the paper is withdrawn or the speaker does not show, use the time for an extended question period for authors of previously presented papers or call a break. PLEASE DO NOT START TALKS EARLIER THAN THEY ARE SCHEDULED. All requests to modify the program schedule should be directed to the program chair.

We encourage you to watch a short podcast featuring Dr. Ben Eggleton (*CUDOS, Univ. of Sydney, Australia*) giving tips on how to be a great presider. Or download notes from the podcast.

### Speaker Check-in Sheet

Once you arrive at your session room, you'll find a folder at the podium or on the table at the front of the room. This folder will contain a sheet for each session in that room. Please be sure to remove only your session sheet. The check-in sheet will list the talks within your session, the order in which they will be given, and the name of the author giving the presentation. Please be sure to check the box to indicate which speakers presented during the session. Make note of any no-show speakers or replacement speakers. Also, please try to estimate the number of attendees at the session at the start of the session, about halfway into the session, and at the end of the session; note these counts where indicated in the upper right corner. Leave the completed sheet in the folder in the pocket marked "Completed" and leave the folder on the podium or table for the next session presider. The check-in sheet serves two purposes: 1) to assist you in running an effective session and 2) to help us ensure that the appropriate speakers' files are archived on OSA Optics InfoBase after the meeting. Only those authors who attend and present are included in the InfoBase, so it's important that you make note of any presenters who are absent.

View a sample check-in sheet.

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## Invited Speakers

## Atomic Physics and Laser Spectroscopy

### Invited Speakers

**WB1, A Magnetic Lattice Atom Chip for Ultracold Quantum Gases,** *S. Jose, L. Krzemien, M. Singh, A. Sidorov, R. McLean,* ***Peter Hannaford****; Swinburne Univ. of Technology, Australia.*

**WB2, The Equation Of State Of An Ultracold Fermi Gas With Tunable Interactions**, ***Sylvain Nascimbène****; CNRS - Lab Kastler Brossel, Ecole Normale Supérieure, France.*

**WG1, Mesoscopic Non-classical Atomic States for Quantum Information and Metrology,** ***Jürgen Appel[1]****, Jelmer Renema[1], Daniel Oblak[2], Anne Louchet-Chauvet[3], Niels Kjærgaard[4], Eugene Polzik[1]; [1]Niels Bohr Inst., Univ. of Copenhagen, Denmark, [2]IQIS, Univ. of Calgary, Canada, [3]LNE-SYRTE, Observatoire de Paris, France, [4]Danish Fundamental Metrology, Denmark.*

**WG2, Direct Frequency Comb Spectroscopy**, ***Daniel Felinto[1]***, Jun Ye[2]; [1]Univ. Federal de Pernambuco, Brazil, [2]JILA, Natl. Inst. of Standards and Technology and Dept. of Physics, Univ. of Colorado, USA.

## Biophotonics and Biomedical Applications

### Tutorial Speaker

**TuE1, Fluorescence Methods for Genotyping**, ***John Girkin****; Univ. of Strathclyde, UK.*

### Invited Speakers

**TuA4, Two-Photon Temporal Focusing for Three-Dimensional Super Resolution Imaging,** ***Charles Shank****; Howard Hughes Medical Inst., USA.*

**WF1, New Optical Molecular and Bioimaging Methods**, ***Daniel Farkas[1],[2],[3]*** *[1]Cedars Sinai Medical Ctr., USA, [2]Univ. of Southern California, USA, [3]Carnegie Mellon Univ., USA.*

**WF2, New Biophotonic Tools to Understand Cellular Processes**, ***Carlos Lenz Cesar****; Inst. de Física "Gleb Wataghin" (IFGW), UNICAMP, Brazil.*

**WF3, Adaptive Optics in Deep Optical Sectioning Microscopy of Biological Samples**, ***John Girkin****; Univ. of Durham, UK.*

## Laser Science and Technology

### Invited Speakers

**ME1, High Power Diode and Solid State Lasers and their Industrial Applications,** ***Georg Treusch****; TRUMPF Photonics Inc., USA.*

**ME3, Absorption and Emission Based Lidar Remote Sensing of Chemical Species**, ***Dennis K. Killinger****; Univ. of South Florida, USA.*

**WC1, Stabilized Mode-locked Diode Lasers & Applications**, ***Peter J. Delfyett****, I. Ozdur, M. Akbulut, J. Davila-Rodriguez; School of Optics, CREOL, USA.*

**WC4, Multi-Physics of Laser-Induced Damage in Optical Systems**, ***Mireille Commandré****, Jean Yves Natoli, Frank Wagner, Laurent Gallais; Inst. Fresnel, Univ. Aix Marseille, Ecole Centrale Marseille, France.*

**WH1, Lasers for Optical Metrology and Spectroscopy**, ***Flavio C. Cruz****; Univ. Estadual de Campinas, Brazil.*

**WH3, Innovative Projects of Laser Applications in the Medical and Automotive Industry in Brazil**, ***Spero Morato****; Lasertools, Brazil.*

**ThA1, High Power Fiber Sources**, ***Clifford Headley***[1], J. P. Phillips[1], A. M. DeSantolo[1], J. M. Fini[1], E. Gonzales[1], J. W. Nicholson[1], E. Monberg[1], F. DiMarcello[1], T. F. Taunay[1], M. F. Fishteyn[1], D. J. DiGiovanni[1], S. Ghalmi[2], S. Ramachandran[3]; [1]OFS Labs, USA, [2]Vytran Corp., USA, [3]Boston Univ., USA.

**ThA4, Large Fiber Core Designs For Nonlinear Effect Mitigation In High Power Fiber Lasers And Amplifiers**, ***William Torruellas****; Applied Physics Lab, John Hopkins Univ., USA.*

## Micro and Nanophotonics

### Invited Speakers

**WD1, On-chip Tunable Delay Lines In Silicon Photonics,** ***Andrea Melloni****; DEI - Politecnico di Milano, Italy.*

**WI1, Subwavelength Silicon Nanophotonics**, ***Pavel Cheben***[1]**,** *P. J. Bock[2], J. H. Schmid[1], J. Lapointe[1], S. Janz[1], D.-x. Xu[1], A. Densmore[1], A. Delâge[1], B. Lamontagne[1], T. j. Hall[1]; [1]Natl. Res. Council Canada, Canada, [2]Ctr. for Res. in Photonics, Univ. of Ottawa, Canada.*

## Nonlinear and Quantum Optics

### Tutorial Speaker

**WA1, Entanglement and Decoherence: From Einstein and Schrödinger to Quantum Optics Experiments**, ***Luiz Davidovich****; Univ. Federal do Rio de Janeiro, Brazil.*

### Invited Speakers

**TuC1, Multicolor Continuous-Variable Entanglement**, *A. S. Coelho[1], F. A. S. Barbosa[1], K. N. Cassemiro[2], A. S. Villar[2,3], M. Martinelli[1],* ***Paulo A. Nussenzveig***[1]*; [1]Inst. de Fisica, Univ. de São Paulo, Brazil, [2]Max Planck Inst. for the Science of Light, Germany, [3]Inst. for Optics, Information and Photonics, Univ. of Erlangen-Nuremberg, Germany.*

**TuG5, Revivals of Quadratic Nonlinear Optics at the Nanoscale: New Materials and Imaging Configurations**, *Dominique Chauvat[1], Bassam Hajj[1], Halina Mojzisova[1], Dan Oron[2], Helen Sung[1], Shoshana Winter[2], Joanna Olesiak[3], Kasya Matczyszyn[3], Marcin Zielinski[1],* ***Joseph Zyss***[1]*; École Normale Supérieure de Cachan, France, [2]Weizmann Inst. of Science, Israel, [3]Wroclaw Univ. of Technology, Poland.*

**ThD1, Laser Induced Molecular Alignment - Small and Large, Slow and Fast,** ***Yehiam Prior****, Sharly Fleischer, Atalia Birman, Yuri Khodrokovsky, Ilya Sh. Averbukh; Weizmann Inst. of Science, Israel.*

**ThG3, Nonlinear Characterization Techniques inside a 4f System**, ***Georges Boudebs****, K. Fedus; Univ. d`Angers, France.*

## Optical Design and Instrumentation

### Invited Speakers

**MF1, Trends in Optical Thin Film Monitoring,** ***H. Angus Macleod***[1]*, Flavio Horowitz[2]; [1]Thin Film Ctr., USA, [2]Inst. de Fisica, Univ Federal do Rio Grande do Sul, Brazil.*

**MF2, Micromachining and Microfabrication of Polymers Using Ultrashort Laser Pulses,** ***Cleber R. Mendonça;*** *Univ. de Sao Paulo, Brazil.*

**TuD1 Applications of Volume Bragg Gratings in Photo-Thermo-Refractive Glass**, ***C. Martin Stickley****, Leonid B. Glebov; CREOL, The College of Optics and Photonics, Univ. of Central Florida, USA.*

**TuD2, Optical Coatings for Photovoltaics,** ***Ric Shimshock****; MLD Technologies, LLC, USA.*

**TuH1, Developments in Optical Testing Technology During the Last Decade**, ***James C. Wyant****; Univ. of Arizona, USA.*

**TuH2, Zernike Polynomials and Beyond**, ***Virendra N. Mahajan****; The Aerospace Corp., USA.*

**TuH3, Photometric Testing of Light Sources and Luminaires for Energy Efficient Lighting**, ***Hans-Peter Grieneisen****; INMETRO, Brazil.*

**ThE1, Micromachining and Microfabrication of Polymers Using Ultrashort Laser Pulses**, ***Cleber R. Mendonça****; Univ. de Sao Paulo, Brazil.*

**ThE2, Diffractive Optics: An Overview for Industrial Applications**, ***Luiz G. Neto****; Univ. of Sao Paulo, Brazil.*

## Photonics

## Invited Speakers

**MD5, Nonlinear Wavelength Conversion in Novel Submicron Integrated Waveguides,** ***Roberto Morandotti****; INRS-EMT, Canada.*

**TuB1, Radio over GI-POF Transport Systems**, ***Hai-Han Lu****, Ching-Hung Chang, Peng-Chun Peng, Heng-Sheng Su, Hsuan-Wen Hu; Natl. Taipei Univ. of Technology, Taiwan.*

**TuF1, Bioplasmonic Platforms: Principles and Applications**, ***Alexandre G. Brolo****; Univ. of Victoria, Canada.*

**TuF2, Ultrafast Semiconductor Lasers in the Thin Disk Geometry**, *B. Rudin, M. Hoffmann, V. J. Wittwer, W. P. Pallmann, M. Golling, Y. Barbarin, T. Südmeyer,* ***Ursula Keller****; ETH Zurich, Switzerland.*

**TuF3, A Simple Bend Sensor Using a Twin Core Fiber Mach-Zehnder Interferometer**, *A. Harhira, J. Lapointe,* ***Raman Kashyap****; Ecole Polytechnique de Montreal, Canada.*

**ThB1, High Power Supercontinuum Sources**, *J. C. Travers, S. V. Popov,* ***J. R. Taylor****; Imperial College London, UK.*

**ThF1, Interferometric FBG Interrogation for Characterization and Sensing**, ***Hans G. Limberger****; EPFL, Switzerland.*

| Latin America Optics and Photonics Conference Agenda of Sessions | | | | |
|---|---|---|---|---|
| | **Boa Viagem** | **Candeias A** | **Candeias B** | **Piedade** |
| **Sunday, September 26, 2010** | | | | |
| **2:00 p.m.–6:00 p.m.** | **Registration Open**, *Imperial Room* | | | |
| **Monday, September 27, 2010** | | | | |
| **7:00 a.m.–6:30 p.m.** | **Registration Open**, *Imperial Room* | | | |
| **8:00 a.m.–9:45 a.m.** | **MA • Keynote Session**, *Boa Viagem* | | | |
| **10:00 a.m.–10:30 a.m.** | **Coffee Break**, *Panoramic A* | | | |
| **10:00 a.m.–12:30 p.m.** | **Exhibits Open**, *Panoramic A* | | | |
| **10:30 a.m.–12:30 p.m.** | **MB • Joint Poster Session I**, *Panoramic A* | | | |
| **12:30 p.m.–3:30 p.m.** | **Afternoon Break** | | | |
| **3:30 p.m.–5:30 p.m.** | **MC • Photonic Based Therapeutic and Diagnostic** | **MD • Nonlinear Waveguides** | **ME • Lasers and Applications I (ends at 5:10 p.m.)** | **MF • Design, Devices and Sensor Applications (ends at 5:50 p.m.)** |
| **6:00 p.m.–7:30 p.m.** | **Conference Reception**, *Poolside* | | | |
| **Tuesday, September 28, 2010** | | | | |
| **7:00 a.m.–5:30 p.m.** | **Registration Open**, *Imperial Room* | | | |
| **8:00 a.m.–10:00 a.m.** | **TuA • Biophotonics I** | **TuB • Optical Transmission** | **TuC • Quantum Optics and Atomic Physics** | **TuD • Laser and Photonic Technology** |
| **10:00 a.m.–10:30 a.m.** | **Coffee Break**, *Panoramic A* | | | |
| **10:00 a.m.–4:30 p.m.** | **Exhibits Open**, *Panoramic A* | | | |
| **10:30 a.m.–12:30 p.m.** | **TuE • Biophotonics II (ends at 12:50 p.m.)** | **TuF • Plasmonics and Optical Switching** | **TuG • Applications of Nonlinear Optics** | **TuH • Optical Testing and Characterization (ends at 12:50 p.m.)** |
| **12:30 p.m.–2:00 p.m.** | **Afternoon Break** | | | |
| **2:00 p.m.– 4:00 p.m.** | **TuI • LaserFest Session**, *Boa Viagem* | | | |
| **4:00 p.m.–4:30 p.m.** | **Coffee Break**, *Panoramic A* | | | |
| **4:30 p.m.–6:00 p.m.** | **Postdeadline Papers Session** | | | |
| **Wednesday, September 29, 2010** | | | | |
| **7:00 a.m.–5:00 p.m.** | **Registration Open**, *Imperial Room* | | | |
| **8:00 a.m.–10:00 a.m.** | **WA • Quantum and General Optics (ends at 9:00 a.m.)** | **WB • Atomic Physics and Laser Spectroscopy I** | **WC • Laser Applications II** | **WD • Resonant Structures (ends at 9:40 a.m.)** |
| **10:00 a.m.–10:30 a.m.** | **Coffee Break**, *Panoramic A* | | | |
| **10:00 a.m.–12:30 p.m.** | **Exhibits Open**, *Panoramic A* | | | |
| **10:30 a.m.–12:30 p.m.** | **WE • Joint Poster Session II**, *Panoramic A* | | | |
| **12:30 p.m.–3:30 p.m.** | **Lunch Break** | | | |
| **3:30 p.m.–5:30 p.m.** | **WF • Tissue Imaging and Spectroscopy** | **WG • Atomic Physics and Laser Spectroscopy II** | **WH • Laser Applications III (ends at 5:10 p.m.)** | **WI • Silicon Photonics (ends at 5:10 p.m)** |
| **7:30 p.m.** | **Conference Banquet**, *Off-Site (Buses will leave hotel at 7:30 p.m.)* | | | |
| **Thursday, September 30, 2010** | | | | |
| **7:00 a.m.–12:00 p.m.** | **Registration Open**, *Imperial Room* | | | |
| **8:00 a.m.–10:00 a.m.** | **ThA • Fiber Lasers** | **ThB • Photonic Devices (ends at 9:40 a.m.)** | **ThC • Nano Structures (starts at 8:20 a.m., ends at 9:40 a.m.)** | **ThD • Nonlinear Spectroscopy I** |
| **10:00 a.m.–10:30 a.m.** | **Coffee Break**, *Panoramic A* | | | |
| **10:30 a.m.–12:30 p.m.** | **ThE • Diffractive and Multifunctional Components** | **ThF • Fibre Devices (ends at 12:10 p.m.)** | | **ThG • Nonlinear Spectroscopy II** |

## Latin America Optics and Photonics Conference (LAOP) Program Committee

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Luiz Davidovich, *Univ. Federal do Rio de Janeiro, Brazil,* **Conference Co-Chair**
Hugo Fragnito, *UNICAMP, Brazil,* **Conference Co-Chair**

**Latin America Committee**
Sabino Chavez-Cerda, *Inst Nat Astrofisica Optica Electronica, México*
Arturo Lezama, *Inst. de Fisica, Uruguay*
José Luis Paz, *Simón Bolívar Univ., Venezuela*
Luis Ponce, *CICATA-IPN, Mexico*

**Program Committee**

**Optical Design and Instrumentation**
Flavio Horowitz, *Inst. de Fisica, Univ Federal do Rio Grande do Sul, Brazil,* **Co-Chair**
Glenn Boreman, *CREOL, The College of Optics and Photonics, Univ. of Central Florida, USA*
Lucila Cescato, *UNICAMP, Brazil*
Hans-Peter Grieneisen, *INMETRO, Brazil*
H. Angus Macleod, *Thin Film Center, USA*
Luiz G. Neto, *Univ. of São Paulo, Brazil*
Ric Shimshock, *MLD Technologies LLC, USA*
Brian Sullivan, *Iridian, Canada*
Eric Yeatman, *Imperial College, UK*

**Nonlinear and Quantum Optics**
David Hagan, *CREOL, The College of Optics and Photonics, Univ. of Central Florida, USA,* **Chair**
Cid B. de Araújo, *Univ. Federal de Pernambuco, Brazil,* **Co-Chair**
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Georges Boudebs, *Univ. d' Angers, France*
Robert W. Boyd, *Univ. of Rochester, USA*
Cleber Mendonça, *Univ. of São Paulo, São Carlos, Brazil*
Yehiam Prior, *Weizmann Inst. of Science, Israel*
Raul Rangel-Rojo, *CICESE, Mexico*

**Atomic Physics and Laser Spectroscopy**
Martial Ducloy, *Lab de Physique des Lasers, Univ. Paris Nord, France,* **Chair**
J. W. R. Tabosa, *Univ. Federal de Pernambuco, Brazil,* **Co-Chair**
Vanderlei Bagnato, *Univ. of São Paulo, São Carlos, Brazil*
Claudio Lenz Cesar, *Univ. Federal do Rio de Janeiro, Brazil*
Jean-Claude Garreau, *Lab de Physique des Lasers, Atomes et Molécules (PhLAM), CNRS, France*
Robin Kaiser, *Inst. Non Linéaire de Nice, CNRS, France*
Arturo Lezama, *Inst. de Fisica, Uruguay*

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Sérgio Zilio, *Univ. of São Paulo, São Carlos, Brazil,* **Co-Chair**
Christiano de Matos, *Univ. Presbiteriana Mackenzie, Brazil*
Walter Margulis, *ACREO, Sweden*
Clifford Headley, *OFS Labs, USA*
Hypolito José Kalinowski, *Univ. Tecnológica Federal do Paraná, Brazil*

**Micro and Nanophotonics**
Michal Lipson, *Cornell Univ., USA,* **Chair**
Hugo Figueroa, *UNICAMP, Brazil,* **Co-Chair**
Mario Dagenais, *Univ. of Maryland, USA*
Richard De La Rue, *Univ. of Glasgow, UK*
Newton C. Frateschi, *State Univ. of Campinas, Brazil*
Roberto Ricardo Panepucci, *Florida International Univ., USA*

**Biophotonics and Biomedical Applications**
John Girkin, *Univ. of Durham, UK,* **Co-Chair**
Denise Zezell, *Inst. de Pesquisas Energéticas e Nucleares, Univ. of São Paulo, Brazil,* **Co-Chair**
Carlos Lenz César, *UNICAMP, Brazil*
Airton Martin, *UNIVAP, Brazil*

**Laser Science and Technology**
Nasser Peyghambarian, Univ. of Arizona, USA, **Chair**
Lucio Acioli, Universidade Federal de Pernambuco, Brazil, **Co-Chair**
Farzin Amzagerdian, *NASA Langley, USA*
Arturo Chavez, *NP Photonics Inc., USA*
Mahmoud Fallahi, *Univ. of Arizona, USA*
Dan Hu, *Lockheed Martin, USA*
Giancarlo Righini, *Inst. of Applied Physics, Italy*
Axel Schulzgen, *CREOL, The College of Optics and Photonics, Univ. of Central Florida, USA*

• **Sunday, 26 September** •

**14.00–18.00, Registration Open,** *Imperial Room*

• **Monday, 27 September** •

**7.00–18.30, Registration Open**, *Imperial Room*

**8.00–9.45, MA • Keynote Session,** *Boa Viagem*

**10.00–10.30, Coffee Break,** *Panoramic A*

**10.00–12.30, Exhibits Open,** *Panoramic A*

**Panoramic A**

**MB • Joint Poster Session I**

**10.30–12.30**

**MB01**

**Resonances in a Three-level Lambda System Excited by an Ultrashort Pulse Train,** ***Marco P. Moreno,*** *Sandra S. Vianna; Dept. de Física, Univ. Federal de Pernambuco, Brazil.* We report on one- and two-photon resonances in a lambda system excited by a train of femtosecond pulses. Numerical results using Bloch equations reveal the conditions to distinguish between optical pumping, Raman and EIT processes.

**MB02**

**Evaluation of the Necrosis Profile Induced by ALA-PDT with the Association of Tissue Micromachining Using Femtosecond Laser Ablation,** ***Gustavo Nicolodelli***[1]*, José D. V. Filho*[1]*, Cristina Kurachi*[1]*, Anderson Z. Freitas*[2]*, Ricardo E. Samad*[2]*, Nilson D. V. Junior*[2]*, Vanderlei S. Bagnato*[1]*;* [1]*Physical Inst. of São Carlos, Univ. of São Paulo, Brazil,* [2]*Inst. de Pesquisas Energéticas, Brazil.* The aim of this study was the investigation of the 5-aminolevulinic acid (a tissue precursor for protoporphyrin-IX) penetration in rats' liver after tissue micromachining obtained by femtosecond laser ablation.

**MB03**

**Germination Capability of Wheat Seeds in Correlation with Delayed Luminescence Intensity,** *Rebeca T. Garofalo*[1]*, Thiago A. Moraes*[1]*,* ***Cristiano M. Gallep***[2]*;* [1]*FT-Unicamp, Brazil,* [2]*DTT-FT-Unicamp, Brazil.* The wheat seeds' delayed luminescence is related to the samples′ germination rate, with inverse relation observed and more clearly evidenced at the end of measurement term (4<t<5s) for all paired groups.

**MB04**

**A New Method for Diagnosis of Early Prostate Cancer Based on the Enhancement of Blood Porphyrin,** ***Flávia R. O. Silva***[1]*, Maria Helena Bellini*[2]*, Camila Nabeshima*[2]*, Nestor Schor*[1]*, Nilson D. Vieira Jr*[2]*, Lilia C. Courrol*[1]*;* [1]*UNIFESP, Brazil,* [2]*IPEN, Brazil.* Autofluorescence of blood porphyrin was analyzed using fluorescence spectroscopy on healthy and prostate cancer male NUDE mice induced by DU145 cells. An enhancement of PPIX was observed for animals that received aminolevulinic acid solution.

**MB05**

**Fluorescence-assessed Information for Prediction of Photodynamic Therapy Outcome,** *José D. Vollet-Filho, Lilian T. Moriyama, Cristina Kurachi,* ***Vanderlei S. Bagnato****; Univ. of Sao Paulo, Brazil.* This study aims to develop a model to predict Photodynamic Therapy outcome using fluorescence photosensitizer information assessed through spectroscopy.

**MB06**

**Effects of Infrared-LED Illumination Associated with Treadmill Training on Biomechanical Parameters in Post Menopausal Women,** ***Fernanda R. Paolillo***[1,2]*, Juliana C. Milan*[3]*, Selva G. Barreto*[4]*, José R. Rebelatto*[3]*, Audrey Borgui-Silva*[3]*, Nivaldo A. Parizotto*[3,2]*, Cristina Kurachi*[1,2]*, Vanderlei S. Bagnato*[1,2]*;* [1]*Univ. of São Paulo - Inst. de Física de São Carlos, Brazil,* [2]*Federal Univ. of São Carlos, Biotechnology Program, Brazil,* [3]*Federal Univ. of São Carlos, Dept. of Physical Therapy, Brazil,* [4]*Federal Univ. of São Carlos, Dept. of Physical Education and Human Motricity, Brazil.* The objective of this study was to investigate the effects of infrared-LED illumination (850nm) associated with treadmill training on biomechanical parameters (power, work and fatigue of quadriceps muscle) in post menopausal women.

**MB07**

**Micromachined Structures Used in DNA Damages Response Studies,** ***Arline M. Melo***[1,2]*, Angelo Gobbi*[3]*, Przemek M. Krawczyk*[4]*, Jan Stap*[4]*, Maria Helena O. Piazzetta*[3]*, Emilio C. Bortolucci*[2]*;* [1]*BR Labs Co., Brazil,* [2]*Ctr. for Semiconductor Components, Campinas State Univ., Brazil,* [3]*Brazilian Synchrotron Light Lab, Brazil,* [4]*Univ. of Amsterdam, Netherlands.* Micromachined sieves structures were manufactured to be used as thin microaperture system for localized induction of DNA damage in living cells using ultra-soft X-rays. The lithography fabrication of such structures is described in this paper.

**MB08**

**Periodic Time-Components in Spontaneous Ultra-Weak Photon Emission of Wheat Seedlings in Stressing Solutions,** *Eduardo Bertonha[1,2,3], Thiago A. Moraes[1], Evandro Conforti[4],* ***Cristiano M. Gallep**[1]; [1]FT-UNICAMP, Brazil, [2]FEEC -UNICAMP, Brazil, [3]UTFPR, Brazil, [4]FEEC-Unicamp, Brazil.* Total photon-counts of seedlings under stress show an inverse relation to the solution concentration, as well as the amplitude of periodic time components (multi-sine fitting), with evidence of biorhythm fundamental period T~6h.

**MB09**

**Interstitial Photodynamic Therapy in Normal Rat Liver,** ***Leandro M. V. Negreiros**, Lilian T. Moriyama, Luis Gustavo Sabino, Clóvis Grecco, Emery C. Lins, Cristina Kurachi, Vanderlei S. Bagnato; Physics Inst. of São Carlos,Univ. of São Paulo, Brazil.* We have investigated the necrosis profile induced by interstitial photodynamic therapy in normal rat liver and the results showed that irregularities inherent to the tissue lead to an irregular necrotic volume.

**MB10**

**Study of UV-blue Light Propagation in a Phantom to Characterize a LED Cancer Diagnosis Device,** ***Cintia Teles de Andrade**, José Dirceu Vollet-Filho, Mardoqueu Martins da Costa, Natalia Mayumi Inada, Vanderlei Salvador Bagnato, Cristina Kurachi; Univ. de São Paulo, Brazil.* This study investigates light propagation (UV-blue range) in a skin tissue phantom to characterize a LED cancer diagnosis device using a photosensitizer (protoporphyrin IX) as a biomarker.

**MB11**

**Spontaneous Light Emission of Wheat Seedlings with $K_2Cr_2O_7$,** *Thiago A. Moraes[1], Lucina C. C. Martins[1], Samili R. Ramos[1], Rebeca T. Garofalo[1],* ***Cristiano M. Gallep**[2]; [1]FT-UNICAMP, Brazil, [2]DTT-FT-UNICAMP, Brazil.* It is analyzed the spontaneous light emission of germinating seeds, in tests with optimum and stressed conditions; the growth performance is correlated to the total photon-count, with pronounced peak for low stress (<100ppm Dichromate) solutions.

**MB12**

**DNA Purifications Protocols for Fourier Transform Infrared Spectroscopy,** ***Jéssica Camila da Silva**, Maiara Lima Castilho, Leandro Raniero, Airton Martin, Renata de Azevedo Canevari; Univ. do Vale do Paraíba, Brazil.* In this study, the purifications protocols were optimized for FTIR. The acetate-ethanol protocol was more suitable for FT-IR analysis than QIAamp Clean, allowing the optimization of this methodology for the analysis of the tissues differentiation.

**MB13**

**Evaluation of the Viability of the Chemiluminescence as a PDT Light Source for Microbial Control,** *Ruy Carvalho Mattosinho de Castro Ferraz[1],* ***Cintia Teles de Andrade[1],*** *Carla Raquel Fontana[1], Emery Lins[2], Vanderlei Salvador Bagnato[1], Cristina Kurachi[1]; [1]Univ. de São Paulo, Brazil, [2]Federal Univ. of ABC, Brazil.* In this study, the viability of chemiluminescence use a PDT light source was evaluated in the *in vitro* microbial reduction of Staphylococcus aureus.

**MB14**

**Fiber Optic Probe Performance of Calcium Raman Signal Collection,** ***Kátia C. Rodrigues**, Jamil Saade; Univ. Federal de Pernambuco, Brazil.* The aim of this study was evaluate the performance of fiber optic probe in calcium identification by Raman spectroscopy applying Principal Component Analyses. The results shows that the fiber optic probe improves calcify recognition efficiency.

**MB15**

**Blue Light and Supercontinuum Generation Using Small-core Silica Photonic Crystal Fibers,** ***Enver F. Chillcce**, Cristiano M. B. Cordeiro, Roddy Ramos Gonzáles, Hugo L. Fragnito, Carlos H. de Brito Cruz, Hugo E. Hernández-Figueroa, Luiz C. Barbosa; Univerdade Estadual de Campinas, Brazil.* The fabrication of small-core photonic crystal fibers and preliminary supercontinuum generation characterization are reported. In such non-linear experiments fs pulses from a Ti:Sapphire laser were coupled in the fiber core and the generated spectra recorded.

**MB16**

**Influence of Ag Nanoparticles Density on the Enhancement of Random Laser Emission from PMMA Thin Films Doped with Rh6G Dye,** ***C. Tolentino Dominguez**[1], Rogerio L. Maltez[1,2], R. M. S. dos Reis[2], L. S. A. Melo[3], A. S. L. Gomes[1]; [1]Univ. Federal de Pernambuco, Brazil, [2]Inst. de Fisica, Univ. Federal do Rio Grande do Sul, Brazil, [3]Programa de Pós-Graduação em Ciência de Materiais, Univ. Federal de Pernambuco, Brazil.* We study the dependence of random laser emission from thin polymer films doped with Rh6G using Ag nanoparticles in several concentrations. We demonstrate that a higher optical gain for lasing is obtained via surface-plasmon resonance.

**MB17**

**Random Laser Action in Aqueous Solutions,** *Emerson de Lima[1,2], Christian Tolentino Dominguez[3],* ***Paulo C. de Oliveira**[1]; [1]Univ. Federal da Paraíba, Brazil, [2]Univ. Federal de Alagoas, Brazil, [3]Univ. Federal de Pernambuco, Brazil.*

We show experimental results on random laser action of rhodamine 6G in aqueous solutions containing alumina particles and SDS with high efficient energy conversion. The threshold is inversely proportional to the SDS concentration.

**MB18**

**Nonlinear Refractive Index Lineshape Determination of Nd:YAG Crystal around 590 nm Absorption Band,** ***Djalmir N. Messias***[1], *William J. Lima*[1], *Tomaz Catunda*[2]; [1]*Univ. Federal De Uberlandia, Brazil,* [2]*Univ. de São Paulo, Brazil.* Nonlinear refractive index measurements were performed in Nd:YAG crystal around 590 nm excitation. The spectral lineshape of $n_2$ around the absorption peak presented a lorentzian lineshape.

**MB19**

**Crustal Motion Measurements after Chilean Earthquake by using Satellite Laser Ranging,** ***Felipe Pedreros***[1,2], *Marcos Avendaño*[2], *Bernd Sierk*[3], *Hayo Hase*[3]; [1]*Dept. of Electrical Engineering, Univ. de Concepción, Chile,* [2]*Geodetic Observatory TIGO, Univ. de Concepción, Chile,* [3]*Federal Agency for Cartography and Geodesy, Germany.* We present high accuracy data for the displacement of the TIGO geodetic observatory, located in Concepción, Chile, after the major 2010 earthquake. The displacement has been obtained by using a Satellite Laser Ranging technique.

**MB20**

**Development of a Rotating Shutter Noise Reduction in Laser System,** ***Alejandro Fernandez Escobar***[1,2]; [1]*Observatorio Geodesico TIGO, Chile,* [2]*Univ. de Concepción, Chile.* The Rotating Shutter System was designed to synchronize the pulses that are being transmitted through a disc with apertures in order to eliminate noises that are produced between the transmission and the receiving system.

**MB21**

**Obtaining Superhydrophobic Surfaces by Laser Micromachining,** ***Marcos R. Cardoso***, *Vinicius Tribuzi, Debora Terezia Balogh, Lino Misoguti, Cleber Renato Mendonca; Univ. of São Paulo, Brazil.* This study presents three distinct laser methods, based on interference of a CW laser and pulsed laser ablation to create microstructures on polymeric surfaces.

**MB22**

**Dielectric-metal Core-shell Nanowires: Corrections to Shell Dielectric Constant,** ***Martín Abraham Ekeroth***[1,2], *Lucia B. Scaffardi*[3,4], *Daniel C. Schinca*[3,4], *Marcelo Lester*[1,2]; [1]*Inst. de Física Arroyo Seco, Facultad de Ciencias Exactas, Univ. Nacional del Ctr. de la Provincia de Buenos Aires, Argentina,* [2]*CONICET, Argentina,* [3]*Ctr. de Investigaciones Opticas (CIOp), (CONICET La Plata-CIC), Argentina,* [4]*Dept. de Ciencias Básicas, Facultad de Ingeniería, Univ. Nacional de La Plata, Argentina.* This work analyzes, in theoretical form, the electromagnetic response of a core-shell (dielectric-metallic) 2-D nano-system. We study the strong dependence of the dielectric constant with shell thickness and the red shift of surface plasmon.

**MB23**

**Optical Fiber Sensor for Pressure Based on Multimode Interference as Sensitive Element,** *Victor I. Ruiz-Pérez*[1], *Miguel A. Basurto-Pensado*[2], *Gustavo Urquiza-Beltrán*[2], *Daniel A. May-Arrioja*[3], *Eduardo Gasca-Herrera*[4], ***Jose Javier Sanchez Mondragón***[1], *Patrick L. LiKamWa*[5]; [1]*INAOE, Mexico,* [2]*Ctr. for Res. in Engineering and Applied sciences. UAEM, Mexico,* [3]*Univ. Autonoma de Tamaulipas, Mexico,* [4]*Univ. Veracruzana, Mexico,* [5]*CREOL, USA.* The experimental results of applications on a novel intrinsic fiber optic pressure sensor based on multimode interference are presented. The sensitive element consists in a SM-MM-SM (MMI) fiber structure embedded in a membrane.

**MB24**

**Surface-Plasmon-Polariton Propagation at the Interface of Magnetized Materials,** ***Anderson O. Silva***, *Victor Dmitriev; Federal Univ. of Para, Brazil.* We investigate the plasmonic modes of two-layer structures where metal and dielectric parts are significantly affected by an external magnetization. Numerical analysis of the dispersion equation shows enhanced phase shifting between forward and backward waves.

**MB25**

**Temperature Dependence of the Two-photon Absorption of Carotenoids,** ***Marcelo G. Vivas***, *Cleber R. Mendonca; Inst. de Física de São Carlos, Univ. de São Paulo, Brazil.* We investigated the influence of temperature on the two-photon absorption (2PA) cross-section of carotenoids employing the WLC Z-scan technique. Such effect was characterized by introducing a 2PA thermal coefficient.

**MB26**

**Optics Properties of X-ray Irradiated L-Threonine Crystals,** ***José J. Rodrigues Jr***[1], *Cleber R. Mendonça*[2], *Helinando P. de Oliveira*[3], *Sérgio C. Zilio*[2], *Lino Misoguti*[2]; [1]*Dept. de Física, Univ. Federal de Sergipe, Brazil,* [2]*Inst. de Física de São Carlos, USP, Brazil,* [3]*CPCM, UNIVASF, Brazil.* In this work we study optical properties of L-threonine crystals with stables radicals induced by X-ray irradiation. We have measured the absorption spectra, the index of refraction, the second-harmonic generation of irradiated and not-irradiated materials.

**MB27**

**Nonlinear Quantum Wires,** ***Omar S. Magaña-Loaiza*[1]**, *Nestor Lozano-Crisóstomo[1], Javier Sanchez Mondragon[1], Roman Sobolewski[2], Jesus Escobedo-Alatorre[3], David Romero Antequera[1]; [1]Natl. Inst. for Astrophysics Optics and Electronics, Mexico, [2]Univ. of Rochester, USA, [3]Univ. Autonoma del Estado de Morelos, Mexico.* We discuss, numerically and analytically, the nonlinear modes and supermodes of nonlinear Quantum wires. In particular a nonlinearity Kerr type $I^n$, where I is the intensity, and the Kerr elliptic solutions characterized by integral constants.

**MB28**

**Observation of Cascades of Spikes and Periodicity Hubs in a Semiconductor Laser with Optoelectronic Feedback,** *Joana Freire[1,2],* ***Jason Gallas*[1,2,3]**; *[1]Univ. Federal do Rio Grande do Sul, Brazil, [2]Ctr. de Estruturas Lineares e Combinatórias, Faculdade de Ciencias, Univ. de Lisboa, Portugal, [3]Dept. do Física, Univ. Federal da Paraíba, Brazil.* We report the discovery of cascades of spirals in semiconductor lasers with optoelectronic feedback where spikings were recently linked to incomplete homoclinic scenarios. This opens the possibility of measuring complicated distributions of non-Shilnikov laser oscillations.

**MB29**

**Nonlinear Optical Properties of Neodymium Doped Solids,** ***William J. Lima*[1]**, *Djalmir N. Messias[1], Tomaz Catunda[2]; [1]Univ. Federal de Uberlândia, Brazil, [2]Univ. de São Paulo, Brazil.* We performed time-resolved measurements using the Z-scan technique, which is based on the principles of spatial beam distortion and offers simplicity as well as very high sensitivity, to characterize the nonlinear optical properties of $Nd^{3+}$:YAG.

**MB30**

**The Compact Arrowhead Set-up for Holographic Interferometry,** ***Celso L. Ladera***; *Univ. Simón Bolívar, Venezuela.* An *arrowhead* shaped holographic set-up, with neither a collimator nor a beam-splitter, is applied to measure displacements and deformations using holographic interferometry with short coherence-length light sources, at low-cost and good immunity against mechanical perturbations.

**MB31**

**Optimal Reconstruction of Photonic Qudit States,** ***Esteban S. Gómez*[1,2]**, *Gustavo Lima[1,2], Leonardo Neves[1,2], Robert Guzmán[1,3], Wallon Nogueira[1,2], Aldo Delgado[1,2], Asticio Vargas[1,3], Carlos Saavedra[1,2]; [1]Ctr. for Optics and Photonics, Univ. de Concepcíon, Chile, [2]Dept. de Física, Univ. de Concepcíon, Chile, [3]Dept. de Ciencias Físicas, Univ. de La Frontera, Chile.* We show the experimental realization of an optimal quantum tomography via Mutually Unbiased Bases for photonic qudits states. We generate the states and make projections with optical programmable devices, obtaining fidelity for more than 90%.

**MB32**

**Micro-optical Gas Sensor Module Based on Atomic Emission Spectroscopy,** ***Matthias Gruber***, *Michael Bohling, Hans Knuppertz, Martin Mogl, Holger Winkelmann; Univ. of Hagen, Germany.* We report about design, fabrication, and experimental characterization of a compact gas sensor module based on atomic emission spectroscopy. The sensor head combines functionalities of plasma generation and optical collection on a common micro-systems platform.

**MB33**

**Optical Interference Testing of a Non-Newtonian Fluid Flow Model during Spin Coating,** ***Pedro L. G. Jardim***, *Flavio Horowitz, Alexandre F. Michels; IF-UFRGS, Brazil.* Optical monitoring is extended to power law fluids in spin coating, to which exact solution is presented. As it well fits to the measured data, rheological constants are obtained for several CMC concentrations and frequencies.

**MB34**

**Holographic Microscopy Techniques Applied to Micro-structures Analysis,** ***Isis V. Brito*[1]**, *Marcos R. R. Gesualdi[1], Mikiya Muramatsu[2], Jorge Ricardo[3]; [1]Univ. Federal do ABC, Brazil, [2]Univ. de São Paulo, Brazil, [3]Univ. de Oriente, Cuba.* In this work, we realized measurements of the 3-D profile of surfaces using a prototype of Photorefractive and Digital Holographic Microscope for real-time analysis of micro-structured systems, based on the phase-shifting real-time holographic interferometry techniques.

**MB35**

**Growth and Characterization of $Al_xGagA_{1-x}As$/GaAs Structures with Solid Arsenic MOCVD,** ***Francisco D. Marroquin*[1]**, *R. Castillo[1], R. Peña Sierra[2], L. Alberto Zamora[1]; [1]Univ. Politecnica de Pachuca, Mexico, [2]Cinvestav-IPN, Mexico.* In this work we present our results obtained in the growth of $Al_xGa_{1-x}As$/GaAs layers by an alternative MOCVD system in which the use of arsine has been substituted by the use of metallic arsenic.

**12.30–15.30**
**Afternoon Break**

| Boa Viagem | Candeias A | Candeias B | Piedade |
|---|---|---|---|
| 15.30–17.30 | 15.30–17.30 | 15.30–17.10 | 15.30–17.50 |

## Boa Viagem

**15.30–17.30**

**MC • Photonic Based Therapeutic and Diagnostic**

*Denise M. Zezell; IPEN - CNEN/SP, Brazil, Presider*

**MC1 • 15.30**
**Photodynamic Therapy with Ultrashort Pulsed Laser,** *Clóvis Grecco,* ***Vanderlei S. Bagnato****, Cristina Kurachi; Inst. de Física de São Carlos, Univ. de São Paulo, Brazil.* An alternative to improve the light penetration in biological tissues is the use of a pulsed light source. In this study we evaluated the Photodynamic response using a light source at femtosecond regime.

**MC2 • 15.50**
**Cancer Diagnosis by Optical Spectroscopy,** ***Airton A. Martin****, Leandro J. Raniero, Renata A. Canevari, Juliana Ferreira; UNIVAP, Brazil.* In this study we conducted Raman experiments of tumors. The *in vivo* and *ex vivo* measurements classified cancer tissue with specificity and sensitivity values are around 96% and 92%, respectively.

## Candeias A

**15.30–17.30**

**MD • Nonlinear Waveguides**

*Raman Kashyap; Ecole Polytechnique de Montreal, Canada, Presider*

**MD1 • 15.30**
**Continuous Wave Fiber Optical Parametric Oscillator with 254 nm Tuning Range,** ***Rohit Malik****, Michel E. Marhic; Swansea Univ., UK.* We report a continuous wave fiber optical parametric oscillator with a record bandwidth of 254 nm, centred at 1593 nm. Its wavelength can be tuned from 1476 to 1730 nm.

**MD2 • 15.50**
**Continuous Wave Second Harmonic Generation in Ultra-Compact AlGaAs Photonic Wire Waveguides** ***David Duchesne***[1]*, Katarzyna A. Rutkowska*[1,2]*, Maite Volatier*[3]*, Francois Legare*[1]*, Sebastien Delprat*[1]*, Mohamed Chaker*[1]*, Daniele Modotto*[4]*, Andrea Locatelli*[4]*, Constantino De Angelis*[4]*, Marc Sorel*[5]*, Demetrios Christodoulides*[6]*, Gregory J. Salamo*[7]*, Richard Ares*[3]*, Vincent Aimez*[3]*, Roberto Morandotti*[1]*;* [1]*INRS-EMT, Canada,* [2]*Warsaw Univ. of Technology, Poland,* [3]*Univ. of Sherbrooke, Canada,* [4]*Univ. di Brescia, Italy,* [5]*Univ. of Glasgow, UK,* [6]*CREOL, Univ. of Central Florida, USA,* [7]*Univ. of Arkansas, USA.* Modal phase-matched second harmonic generation is obtained in sub-micron AlGaAs waveguides using a

## Candeias B

**15.30–17.10**

**ME • Lasers and Applications I**

*Flavio C. Cruz; Univ. Estadual de Campinas, Brazil, Presider*

**ME1 • 15.30 Invited**
**High Power Diode and Solid State Lasers and their Industrial Applications,** ***Georg Treusch****; TRUMPF Photonics Inc., USA.* Design of high power high brightness diode laser systems based on passively cooled fiber coupled bars is described. Further advancements of high power disk lasers are presented fueled by improved architecture of the diode pumps.

## Piedade

**15.30–17.50**

**MF • Design, Devices and Sensor Applications**

*Luiz G. Neto; Univ. of Sao Paulo, Brazil, Presider*

**MF1 • 15.30 Invited**
**Trends in Optical Thin Film Monitoring,** ***H. Angus Macleod***[1]*, Flavio Horowitz*[2]*;* [1]*Thin Film Ctr., USA,* [2]*Inst. de Fisica, Univ Federal do Rio Grande do Sul, Brazil.* Review and perspectives are presented on *in-situ* film monitoring with regard to thickness control in physical vapor deposition, as well as to refractive index and understanding of flow in wet bench processes.

| Boa Viagem | Candeias A | Candeias B | Piedade |
|---|---|---|---|

continuous-wave laser at telecommunication wavelengths. The tunability and robust fabrication process make this device ideal for integrated wavelength conversion.

**MC3 • 16.10**
**Characterization of Topical Delivery System of $ZnPcSO_4$ to Use in Photodynamic Therapy of Skin Cancer,** ***Wanessa Medina***[1], *Clayton Azevedo*[2], *Patricia Farias*[2], *Beate Santos*[2], *Adriana Fontes*[2], *Maria Vitoria Bentley*[1]; [1]*Univ. de São Paulo, Brazil,* [2]*Federal Univ. of Pernambuco, Brazil.* We developed a nanodispersion system using Zinc Phtalocyanine Tetrasulphonet for photodynamic therapy. The characterization was performed based on liquid crystalline phases and photostability. We conclude that the method for preparation of nanodispersion was accomplished successfully.

**MC4 • 16.30**
**Optical Characterization of the Molecule Lapps34m for use as a New Fluorophore,** *Luciana M. P. Araújo*[1], *Vinicius S. Oliveira*[1], *Arandi G. Bezerra, Jr*[1], ***Fabio K. Schneider***[1], *Pedro M. Gewehr*[1,2], *Denis A. Turchetti*[2], *Leni C. Akcelrud*[2]; [1]*Federal Univ. of Technology-Paraná, Brazil,* [2]*Federal Univ. of Paraná, Brazil.*
Many fluorescence-based diagnostic methods rely on antigen-antibody complexes detection. Specificity, stability, emission efficiency, and Stokes shift are features

**MD3 • 16.10**
**Membranized Semiconductor Rib Waveguides for Acousto-optic Modulation Enhancement,** ***Elaine C. S. Barretto***, *Jørn M. Hvam; DTU Fotonik,Technical Univ. of Denmark, Denmark.* Membranized rib waveguides are proposed as an efficient way to increase acousto-optic modulation by up to four orders of magnitude compared to the traditional structures, opening up possibilities of constructing more compact and power-saving devices.

**MD4 • 16.30**
**Optical Waveguide Amplifier Written Using a Femtosecond Laser in Germanate Glasses**
***Thiago B. N. Lemos***[1], *Davinson M. da Silva*[2], *Luciana R. P. Kassab*[3], *Anderson S. L. Gomes*[1]; [1]*UFPE, Brazil,* [2]*Polytechnic of São Paulo, Brazil,* [3]*Faculty of Technology of São Paulo (FATEC-SP), Brazil.*
Active waveguides fabricated in $GeO_2$-PbO-$Ga_2O_3$ (GPG) glasses using direct femtosecond laser (at 800 nm, 1 kHz, 130 fs) writing is demonstrated.

**ME2 • 16.10**
**Power and Efficiency Scaled Resonantly Cladding-Pumped Er-doped LMA Fiber Lasers,** ***Jun Zhang***, *Viktor Fromzel, Mark Dubinskii; US ARL, USA.* Next step in power scaling of low quantum defect resonantly cladding-pumped Er-doped LMA fiber laser is reported. Over 88 W of single transverse mode power at 1590 nm was obtained with optical-to-optical efficiency of 69%.

**ME3 • 16.30 Invited**
**Absorption and Emission Based Lidar Remote Sensing of Chemical Species,** ***Dennis K. Killinger,*** *Denis V. Plutov; Univ. of South Florida, USA.*
Absorption and emission based Lidar remote sensing of chemical species will be discussed including Differential Absorption Lidar (DIAL), Laser Induced Breakdown Spectroscopy (LIBS), and Laser Induced Thermal Emission (LITE).

**MF2 • 16.10**
**Micromachining and Microfabrication of Polymers Using Ultrashort Laser Pulses,** ***Cleber R. Mendonça;*** *Univ. de Sao Paulo, Brazil.* In this work we present results we have obtained on the use of ultrashort pulses for the microfabrication in polymers, aiming at applications ranging from photonics to biology.

| Boa Viagem | Candeias A | Candeias B | Piedade |
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of interest. This work presents results on a molecule, Lapps34m, emerging as a new fluorophore for biosensing.

**MC5 • 16.50**
**Discrimination of Calcification in Aortic Valve Tissue by Reflectance Spectroscopy, *Kátia C. Rodrigues***, *Jamil Saade, Cid B. de Araújo, Renato E. de Araújo, Anderson S. L. Gomes; Univ. Federal de Pernambuco, Brazil.* The samples were classified into three different groups: normal, moderate and severe calcific tissue based on a Raman Spectroscopy study. The results show the specificity and sensitivity ability of Reflectance Spectroscopy to discriminate the tissues.

Peak internal gain of 2.7dB/cm is obtained at 1535 nm.

**MD5 • 16.50 Invited**
**Nonlinear Wavelength Conversion in Novel Integrated Waveguides and Ring Resonators, *Roberto Morandotti*[1],** *L. Razzari[1,2], M. Ferrera[1], D. Duchesne[1], S. Chu[3], B. E. Little[3], D. J. Moss[4]; [1]INRS-EMT, Canada, [2]Univ. di Pavia, Italy, [3]Infinera Corp., USA, [4]Univ. of Sydney, Australia.* We demonstrate wavelength conversion in CMOS-compatible, integrated high index glass based waveguides and ring resonators. Such process leads to a host of applications, including optical parametric oscillation and the realization of ultrafast laser schemes.

**MF3 • 16.50**
**Optical Design and Ground Tests, for PILOT, a Balloon Borne Experiment for Astronomy, *Céline Engel*[1]**, *Yuying Longval[2], Jean-Philippe Bernard[1], Isabelle Ristorcelli[1], Bernadette Leriche[2], Christophe Marty[1], Baptiste Mot[1], Georges Otrio[3], Giorgio Savini[4], Carole Tucker[5], Gilles Roudil[1], Peter Ade[5], Mehdi Bouzit[2], Robert Daddato[6], Martin Giard[1], Matt Griffin[5], Peter Hargrave[5], René Laureijs[6], Bruno Maffei[7], François Pajot[2], Nicolas Ponthieu[2], Louis Rodriguez[8], Maria Salatino[9]; [1]Ctr. d'étude Spatial des Rayonnements, France, [2]Inst. d'Astrophysique Spatiale, France, [3]Ctr. Natl. des Etudes Spatiales, France, [4]Univ. College London, UK, [5]Cardiff Univ., UK, [6]European Space Agency, Netherlands, [7]Univ. of Manchester, UK, [8]CEA, France, [9]Universita degli studi di Roma « La Sapienza », Italy.* PILOT is a balloon borne experiment, which will measure the polarized emission of interstellar dust grains, in the submillimeter range. We present the instrumental concept and the associated ground tests in progress and planned.

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**MC6 • 17.10**
**Optical Detection of Antioxidants in Living Human Tissue,** ***Werner Gellermann****; Dept. of Physics and Astronomy, Univ. of Utah, USA.* We developed optical methods for the non-invasive detection of antioxidant molecules in living human tissue. Large subject populations are measured to investigate correlations with the development and potential prevention of oxidative stress related diseases.

**MF4 • 17.10**
**Compact Holographic Refractometer for Liquid Analysis,** ***Eduardo A. Barbosa****, Danilo M. Silva; Faculdade de Tecnologia de São Paulo, Brazil.* The construction and performance of a portable holographic refractometer prototype for liquid measurement is described, using multimode red diode lasers as the light source and a photorefractive $Bi_{12}TiO_{20}$ (BTO) crystal as the holographic storage medium**.**

**MF5 • 17.30**
**Fluorescence Spectroscopy Applied to the Monitoring of the Production and Oxidative Degradation of Biodiesel,** *Tiago A. Chimenez[1], Anderson R. L. Caires[1],* ***Samuel L. Oliveira****[2]; [1]Univ. Federal da Grande Dourados, Brazil, [2]Univ. Federal de Mato Grosso do Sul, Brazil.* In this work we show that fluorescence spectroscopy is a powerful tool to monitor the production and the degradation process of biodiesel obtained from different oil sources.

**18.00–19.30**
**Conference Reception**
*Poolside*

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• **Tuesday, 28 September** •

**7.00–17.30, Registration Open,** *Imperial Room*

**8.00–10.00**

**TuA • Biophotonics I**

*Cid B. de Araújo; Univ. Federal de Pernambuco, Brazil, Presider*

**TuA1 • 8.00**
**Photonic Applications of Bacteriorhodopsin, *Devulapalli V. Rao***; *Univ. of Massachusetts Boston, USA.* Thin films of bacteriorhodopsin are used to manipulate amplitude, phase, polarization of the incident light for a variety of applications like all-optical switching, logic gates, power limiting, optical Fourier processing for breast cancer diagnostics, slow/fast light.

**TuA2 • 8.20**
**Biological Cell as IR-optical Resonator, *Michal Cifra*[1,2]*;*** *[1]Inst. of Photonics and Electronics, Acad. of Sciences of the Czech Republic, Czech Republic, [2]Czech Technical Univ. in Prague, Czech Republic.* Electromagnetic field is generated in biological systems. Eigenmodes in living cells as cavity resonators are calculated. It is shown that the certain modes may

**8.00–10.00**

**TuB • Optical Transmission**

*Hans G. Limberger; EPFL, Switzerland, Presider*

**TuB1 • 8.00 Invited**
**Radio over GI-POF Transport Systems, *Hai-Han Lu***, *Ching-Hung Chang, Peng-Chun Peng, Heng-Sheng Su, Hsuan-Wen Hu; Natl. Taipei Univ. of Technology, Taiwan.* A novel radio over graded index-plastic optical fiber (GI-POF) transport system is proposed based on vertical cavity surface emitting lasers (VCSELs) and light injection locking technique. Impressive transmission performance was experimentally demonstrated in the paper.

**8.00–10.00**

**TuC • Quantum Optics and Atomic Physics**

*Daniel P. Barbosa Felinto; Univ. Federal de Pernambuco, Brazil, Presider*

**TuC1 • 8.00 Invited**
**Multicolor Continuous-Variable Entanglement**
*A. S. Coelho[1], F. A. S. Barbosa[1], K. N. Cassemiro[2], A. S. Villar[2,3], M. Martinelli[1],* ***Paulo A. Nussenzveig***[1]; *[1]Inst. de Fisica, Univ. de São Paulo, Brazil, [2]Max Planck Inst. for the Science of Light, Germany, [3]Inst. for Optics, Information and Photonics, Univ. of Erlangen-Nuremberg, Germany.* Direct generation of tripartite entanglement between pump, signal, and idler beams of an above-threshold optical parametric oscillator was implemented. All three bright beams of light have different wavelengths. Partial-loss disentanglement was also observed.

**8.00–10.00**

**TuD • Laser and Photonic Technology**

*Hans-Peter Grieneisen; INMETRO, Brazil, Presider*

**TuD1 • 8.00 Invited**
**Prospects for More Efficient, Smaller High Power Lasers, *Martin Stickley***; *College of Optics and Photonics, Univ. of Central Florida, USA.* High power lasers suffer from being large and inefficient. This paper will review the present status of electric laser technology and their prospects for lower SWaP and for being scaled to 100 kW cw.

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contribute to the organization of the structures in the living cell.

**TuA3 • 8.40**
**A New Quantum Optical Structure to Separate Attracting Electrical Charges, *Marco Sacilotti*[1,2],** *Euclides Almeida*[1], *Claudia C. B.O. Mota*[1], *Thiago Vasconcelos*[1], *Frederico Dias Nunes*[1], *Anderson S. L. Gomes*[1]; [1]*Univ. Federal de Pernambuco, Brazil*, [2]*Univ. de Bourgogne, France.* A new quantum optical band gap energy engineering between two materials is proposed to explain the photovoltaic attracting charges separation mechanism.

**TuA4 • 9.00 Invited**
**Two-Photon Temporal Focusing for Three-Dimensional Super Resolution Imaging, *Charles Shank*;** *Howard Hughes Medical Inst., USA.* This talk will present a method that combines optical sectioning of two-photon temporal focusing with lateral super resolution provided by PALM and a virtual volume imaging technique with resolution better than 20nm in three dimensions.

**TuB2 • 8.40**
**Zero-Dispersion-Wavelength Displacement of a Photonic Crystal Fiber, *Roddy E. R. Gonzales*[1],** *Enver F. Chillcce*[1], *Luiz C. Barbosa*[1], *Hugo E. H. Figueroa*[2]; [1]*DEQ/IFGW/UNICAMP, Brazil*, [2]*DMO/FEEC/UNICAMP, Brazil.* The Zero-Dispersion-Wavelength (ZDW) of a Photonic Crystal Fiber (PCF) may be controlled by changing the linear refractive index and the thickness of the thin film that covers the inner surfaces of the holes.

**TuB3 • 9.00**
**Empirical Characterization of Wavelength Conversion for Phase Modulated Channels Based on SOA-FWM Properties,** *EduardoC. Magalhães, Evandro Conforti,* ***Aldário C. Bordonalli****; University of Campinas - UNICAMP, Brazil.* An empirical characterization of wavelength conversion for phase modulated channels based on SOA-FWM is presented. For a 4-nm range around the modulated carrier, the first FWM product in negative detuning showed the best conversion performance.

**TuC2 • 8.40**
**Generation of Correlated Light Pulses from a Coherently Prepared Atomic Ensemble,** *Danieverton Moretti, Daniel Felinto,* ***José W. R. Tabosa****; Univ. Federal de Pernambuco, Brazil.* We investigate the generation of correlated light beams in a coherently prepared atomic system consisting of cold cesium atoms. Double Bragg diffraction into a Zeeman coherence grating is employed to conditionally extract the stored information.

**TuC3 • 9.00**
**Quantum Teleportation of Displaced Fock States,** *William Quintero,* ***Celso L. Ladera****; Univ. Simón Bolívar, Venezuela.* The quantum teleportation of displaced Fock states is studied. The teleportation of the oscillations of their photon distributions is derived in terms of the compression parameter of the correlated EPR states of the quantum channel.

**TuD2 • 8.40 Invited**
**Optical Coatings for Photovoltaics, *Ric Shimshock*;** *MLD Technologies, LLC, USA.* Optical Coatings play a key role in the capture, transmission and conversion of Solar Energy. Performance, cost and environmental durability are the main drivers for these applications. We review some of the major applications and explore some of the future directions required of these optical coatings.

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| | **TuB4 • 9.20**<br>**Reduction of Inter-channel FWM Crosstalk on Coherent QPSK Ultra-dense WDM Transmission,** ***Jacklyn D. Reis***[1]**,** *António L. Teixeira*[1,2]*;* [1]*Univ. de Aveiro, Portugal,* [2]*Nokia Siemens Networks Portugal S.A., Portugal.* In this paper, the impact of fiber nonlinearities is investigated on ultra-dense WDM systems. Performing small frequency tuning of optical carriers inter-channel FWM crosstalk is reduced on 64x1Gb/s-QPSK spaced at 3GHz transmission with coherent detection. | **TuC4 • 9.20**<br>**Electromagnetically-Induced Phase Grating,** ***Lúis de Araujo****; Univ. Estadual de Campinas, Brazil.* Exploiting the giant Kerr nonlinearity associated with electromagnetically induced transparency, an atomic phase grating created with arbitrarily weak fields is proposed. Almost 30% of a probe beam can be diffracted into the first diffraction order. | **TuD3 • 9.20**<br>**DWDM 40 Gb/s Long Haul Transmission Using PCF for Dispersion Compensation,** ***Suzanne Susskind***[1]*, Marcos Antonio R. Franco*[2,3]*, Valdir A. Serrão*[2]*, Eunézio A. de Souza (Thoroh)*[1]*;* [1]*Univ.Presbiteriana Mackenzie, Brazil,* [2]*Inst. de Estudos Avançados (IEAv), Brazil,* [3]*Inst. Tecnológico de Aeronáutica (ITA), Brazil.* We demonstrate a 10 channels DWDM transmission at 40 Gb/s RZ-DQPSK with 50 GHz of channel spacing over 1800 km employing a multicore PCF to compensate the link residual dispersion instead of dispersion compensating fibers. |
| **TuA5 • 9.40**<br>**Optical Torque Analysis of Double-Negative Optical Trapping with Focused Gaussian Beams**, ***Leonardo A. Ambrosio****, Hugo E. Hernández-Figueroa; Unicamp - Univ. of Campinas, Brazil.* Preliminary results of the optical torques exerted on negative refractive index spherical particles trapped by focused Gaussian beams are shown, based on the generalized Lorenz-Mie theory and the integral localized approximation, revealing new trapping behaviors. | **TuB5 • 9.40**<br>**Digital Filtering Algorithms for 112Gb/s Dual Polarization QPSK Optical Systems with Coherent Detection,** *Vitor B. Ribeiro*[1]*, Julio C. M. Diniz*[1]*,* ***Julio C. R. F Oliveira***[1]*, Adolfo F. Herbster*[1]*, Aldario C. Bordonalli*[2]*;* [1]*CPqD Foundation, Brazil,* [2]*UNICAMP, Brazil.* We present a set of digital algorithms for Dual-Polarization Quadriphase Shift Keying (DP-QPSK) transmission impairments compensation. Chromatic dispersion, polarization mode dispersion and phase estimation algorithms are presented and tested at 112Gb/s enabling total signal recovery. | **TuC5 • 9.40**<br>**Fast Entanglement Detection for Unknown States of Two Spatial Qutrits,** ***Gustavo M. Lima***[1,2]**,** *E. S. Gómez*[1,2]*, A. Vargas*[1,3]*, R. O. Vianna*[4]*, C. Saavedra*[1,2]*;* [1]*Ctr. for Optics and Photonics, Univ. de Concepcíon, Chile,* [2]*Dept. de Física, Univ. de Concepcíon, Chile,* [3]*Dept. de Ciencias Físicas, Univ. de La Frontera, Chile,* [4]*Dept. de Física, ICEx, Univ. Federal de Minas Gerais, Brazil.* We investigate the practicality of the method proposed in Phys. Rev. A. 80, 032325 (2009) for detecting the entanglement of two spatial qutrits. | **TuD4 • 9.40**<br>**Dissipative Four Wave Mixing Sub-ps Laser Based on a CMOS Compatible Integrated Microring Resonator,** *Marco Peccianti*[1,2]*, Alessia Pasquazi*[1]*, Yongwoo Park*[1]*, Brent Little*[3]*, Sai T. Chu*[3]*, David J. Moss*[,1,4]*,* ***Roberto Morandotti***[1]*; 1INRS Énergie, Matériaux et Télécommunications, Canada,* [2]*Inst. for Chemical and Physical Processes, CNR, "Sapienza" Univ., Italy,* [3]*Infinera Corp., USA,* [4]*CUDOS, School of Physics, Univ. of Sydney, Australia.* We present a dissipative four wave mixing tunable laser based on a integrated CMOS-compatible high-Q nonlinear ring resonator, emitting subpicosecond pulses at 200GHz-repetition rate. Quasi-sinusoidal 800GHz emission regime is also demonstrated. |

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**Coffee Break, 10.00–10.30,** *Panoramic A*
**Exhibits Open, 10.00–16.30,** *Panoramic A*

## Boa Viagem

**10.30–12.50**

### TuE • Biophotonics II

*Denise M. Zezell; IPEN - CNEN/SP, Brazil, Presider*

**TuE1 • 10.30 Tutorial**
**Fluorescence Methods for Genotyping, *John Girkin;*** *Univ. of Strathclyde, UK.* This tutorial will examine fluorescent based methods for DNA sequencing covering the principles of fluorescence and fluorescence lifetime measurements, FRET as well as the micro-optics and low cost sources that can be integrated into bedside diagnostic instruments. The overall presentation will demonstrate an approach on how photonics technology can be used to solve a specific clinical challenge.

## Candeias A

**10.30–12.30**

### TuF • Plasmonics and Optical Switching

*Raman Kashyap; Ecole Polytechnique de Montreal, Canada, Presider*

**TuF1 • 10.30 Invited**
**Bioplasmonic Platforms: Principles and Applications, *Alexandre G. Brolo***; *Univ. of Victoria, Canada.* In this work, we will provide an overview on the fabrication of gold nanostructures and discuss their applications to biomedical relevant problems. These plasmonic platforms are ideal for integration in microfluidics and fiber optics-based devices.In this work, we will provide an overview on the fabrication of gold nanostructures and discuss their applications to biomedical relevant problems. These plasmonic platforms are ideal for integration in microfluidics and fiber optics-based devices.

## Candeias B

**10.30–12.30**

### TuG • Applications of Nonlinear Optics

*Jason Gallas; Univ. Federal do Rio Grande do Sul, Brazil, Presider*

**TuG1 • 10.30**
**Quantum Hall Charge Sensor for Single-Donor Nuclear Spin Detection in Silicon, *Darin Sleiter*[1]**, *Na Young Kim[1,2], Katsuya Nozawa[3], Thaddeus D. Ladd[1,4], Michael L. W. Thewalt[5], Yoshihisa Yamamoto[1,4]; [1]Stanford Univ., USA, [2]Univ. of Tokyo, Japan, [3]Panasonic Corp., Japan, [4]Natl. Inst. of Informatics, Japan, [5]Simon Fraser Univ., Canada.* We propose a novel scheme for detecting the nuclear spin state of a phosphorus impurity in silicon. Selective ionization by optical pumping of the donor-bound exciton transition is detected electrically using the quantum Hall effect.

**TuG2 • 10.50**
**Femtosecond Pulse Shaping For Coherent Control Of Gold Nanoparticles Formation, *Cleber Mendonca***, *Paulo H. D. Ferreira, Jonathas Siqueira, Lino Misoguti, Marcelo G. Vivas, David S. dos Santos, Leonardo De Boni; Inst. de Fisica de Sao Carlos - IFSC/USP, Brazil.* We use pulse-shaping of

## Piedade

**10.30–12.50**

### TuH • Optical Testing and Characterization

*Flavio Horowitz; Inst. de Fisica, Univ Federal do Rio Grande do Sul, Brazil, Presider*

**TuH1 • 10.30 Invited**
**Developments in Optical Testing Technology During the Last Decade, *James C. Wyant***; *Univ. of Arizona, USA.* This talk discusses advances for reducing the effects of vibration and atmospheric turbulence on interferometric measurements. Many applications of these techniques for measuring optical components and optical systems will be described.

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femtosecond pulses to coherent control the synthesis of gold nanoparticles induced by two-photon absorption. Applying distinct phase masks to the pulse, we were able to shift the plasmon absorption band.

**TuF2 • 11.10** **Invited**

**Ultrafast Semiconductor Lasers in the Thin Disk Geometry,** *B. Rudin, M. Hoffmann, V. J. Wittwer, W. P. Pallmann, M. Golling, Y. Barbarin, T. Südmeyer,* ***Ursula Keller;*** *ETH Zurich, Switzerland.*
We have demonstrated the highest average power of any modelocked semiconductor laser: the optically pumped MIXSEL generates 6.4 W in 28-ps pulses at 2.5-GHz repetition rate. Furthermore, we discuss electrically pumped VECSELs optimized for passive modelocking.

**TuG3 • 11.10**

**Quaternary Amplitude-Shift Keying Modulation Generated by Parametric Amplification,** ***Jorge D. Marconi***[1]*, Marcelo L. F. Abbade*[2]*, Andre L. A. Costa*[3]*, Felipe R. Barbosa*[3]*, Edson Moschim*[3]*, Hugo L. Fragnito*[4]*;* [1]*UFABC, Brazil,* [2]*School of Electrical Engineering, PUC-Campinas., Brazil,* [3]*FEEC, Univ. of Campinas., Brazil,* [4]*IFGW, Univ. of Campinas., Brazil.* This work presents experimental results concerning a new all-optical technique that multiplexes two binary signals into a quaternary one. The technique is based on parametric amplification. Simulation and experimental results present a rather good agreement.

**TuH2 • 11.10** **Invited**

**Zernike Polynomials and Beyond,** ***Virendra N. Mahajan****; The. Aerospace Corp., USA.* We discuss why we use Zernike circle polynomials in optics, when to use them, and what to use in their place when not to use them.

**TuE2 • 11.30**

**Imaging of Third-Degree Burned Skin by Two-Photon Emission Fluorescence Microscope and Second Harmonic Generation Microscopy**
*Moisés Oliveira dos Santos*[1]*, Vitor Bianchini Pelegati*[2]*, Carlos Lenz Cesar*[2]*, Telma Maria Tenório Zorn*[3]*,* ***Denise Zezell***[1]*;* [1]*Univ. of São Paulo, Brazil,* [2]*Inst. de Física Gleb Wataghin- UNICAMP, Brazil,* [3]*Inst. de Ciências Biomédicas-Univ. de São Paulo, Brazil.*
Third-degree burn is an

**TuG4 • 11.30**

**Third-Harmonic Generation with Femtosecond Pulses at Different Rayleigh Ranges,** *Emerson C. Barbano, Jonathas P. Siqueira, Cleber R. Mendonça,* ***Lino Misoguti****, Sergio C. Zilio; Inst. de Fisica de São Carlos, Brazil.* We report on the third-harmonic intensity and spectrum of silica using the Z-scan method at different Rayleigh ranges with femtosecond laser. To explain the third-harmonic signal, we have to

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injury that extend down to subdermal layer. In this study, we characterized the dermis of third-degree burns by using two-photon emission fluorescence microscopy (TPEFM) and second harmonic generation (SHG).

**TuE3 • 11.50**
**Bovine Versus Human Dental Hard Tissues Under Ultrashort Laser Ablation: Morphological and Physical Aspects,** ***Francisco de Assis Rego Filho***[1], *Maristela Dutra-Corrêa*[2], *Gustavo Nicolodelli*[3], *Vanderlei Salvador Bagnato*[3], *Maria Tereza de Araujo*[1]; [1]*Univ. Federal de Alagoas, Brazil,* [2]*Univ. Paulista – UNIP, Brazil,* [3]*Univ. de São Paulo, Brazil.* This study aims to present, morphological and physical aspects of the femtosecond laser ablation of dental hard tissues, from different animal origins, at varying structural water composition, showing general and specific ablation qualities.

**TuE4 • 12.10**
**The Determination of Biochemical Changes of Women Skin Layers as Function of Aging by Confocal Raman Spectroscopy,** ***Maira G. Tosato***, *Rani S. Alves, Leandro Raniero, Airton A. Martin; Univ. do Vale do Paraíba, Brazil.* The biochemical changes that occurred during the aging process were studied by Confocal Raman

**TuF3 • 11.50 Invited**
**A Simple Bend Sensor Using a Twin Core Fiber Mach-Zehnder Interferometer,** *A. Harhira, J. Lapointe,* ***Raman Kashyap****; Ecole Polytechnique de Montreal, Canada.* A simple bend sensor based on a multimode fiber combined with a twin-core fiber is proposed. The section of twin-core fiber is spliced between a section of multimode fiber and a single mode fiber. The bend shifts the interference fringe peak wavelengths which are monitored. A shift toward shorter wavelengths is observed. This device is simple to fabricate, and is used as a bend sensor with good sensitivity.

take into account the interfaces contributions.

**TuG5 • 11.50 Invited**
**Revivals of Quadratic Nonlinear Optics at the Nanoscale: New Materials and Imaging Configurations,** *Dominique Chauvat*[1], *Bassam Hajj*[1], *Halina Mojzisova*[1], *Dan Oron*[2], *Helen Sung*[1], *Shoshana Winter*[2], *Joanna Olesiak*[3], *Kasya Matczyszyn*[3], *Marcin Zielinski*[1], ***Joseph Zyss***[1]; [1]*École Normale Supérieure de Cachan, France,* [2]*Weizmann Inst. of Science, Israel,* [3]*Wroclaw Univ. of Technology, Poland.* Nanoscale engineering of functional-materials is reviving quadratic-nonlinear optics in conjunction with new quantitative multiphoton imaging-techniques allowing phase and polarization-resolution. It permits full tensor characterization of individual nanoparticles as well as mapping of artificial and bio-environments.

**TuH3 • 11.50 Invited**
**Photometric Testing of Light Sources and Luminaires for Energy Efficient Lighting,** ***Hans-Peter Grieneisen****; INMETRO, Brazil.* A report is presented on the optical testing activities at Inmetro for assessment on performance and color quality of illuminants for general lighting applications according to international standards and practices. Current methods require improvements for SS-lighting.

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spectroscopy. The spectra were obtained for the forearm of 50 health women. The spectral variations were quantified using the vibration modes.

**TuE5 • 12.30**
**Marginal Analysis of Silorane-Based Restorations Using Optical Coherence Tomography,** *Gabriela Queiroz de Melo Monteiro*[1], ***Cláudia C. B. Mota***[2], *Anderson S. L. Gomes*[3], *Sérgio Lemos Campello*[4], *Anderson Z. Freitas*[5], *Marcos Antonio J. R. Montes*[6]; [1]*Dental School of Ctr. Universitário de João Pessoa, Brazil,* [2]*Univ. Federal de Pernambuco, Graduate Program in Dentistry, Brazil,* [3]*Univ. Federal de Pernambuco, Dept. of Physics, Brazil,* [4]*Univ. Federal de Pernambuco, Ciência de Materiais, Brazil,* [5]*Inst. de Pesquisas Energéticas e Nucleares, Ctr. de Lasers e Aplicações, Brazil,* [6]*Univ. de Pernambuco, Dept. de Odontologia Restauradora/ Materiais Dentários, Brazil.* Commercially available OCT system was used to analyze marginal integrity of *in vitro* resin composites dental restorations. Qualitative marginal analysis did not observe gaps even after A-scan examination, although bonding agents/dentin interactions were visualized.

**NOTES**

**12.30–14.00, Afternoon Break**
**14.00–16.00, TuI • LaserFest Session,** *Boa Viagem*
**16.00–16.30, Coffee Break,** *Panoramic A*
**16.30–18.00, Postdeadline Paper Sessions,** *Technical Session Rooms*

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• **Wednesday, 29 September** •

**7.00–17.00, Registration Open,** *Imperial Room*

**8.00–9.00**

**WA • Quantum and General Optics**

*Anderson S. L. Gomes; Univ. Federal de Pernambuco, Brazil, Presider*

**WA1 • 8.00** **Tutorial**
**Entanglement and Decoherence: From Einstein and Schrödinger to Quantum Optics Experiments,** ***Luiz Davidovich****; Univ. Federal do Rio de Janeiro, Brazil.* I review recent theoretical and experimental findings on the open-system dynamics of entanglement, which can differ in remarkable ways from the dynamics of the individual components of the system.

**8.00–10.00**

**WB • Atomic Physics and Laser Spectroscopy I**

*Martial Ducloy; Univ. Paris Nord, France, Presider*

**WB1 • 8.00** **Invited**
**A Magnetic Lattice Atom Chip for Ultracold Quantum Gases,** *S. Jose, L. Krzemien, M. Singh, A. Sidorov, R. McLean,* ***Peter Hannaford****; Swinburne Univ. of Technology, Australia.* We describe a 1-D magnetic lattice atom chip, with a period of 10 μm, to trap multiple clouds of $^{87}$Rb F=1 atoms at temperatures down to 10 μK with trap lifetimes of 8 s.

**WB2 • 8.40** **Invited**
**Thermodynamics of Ultracold Fermi Gases,** ***Sylvain Nascimbène,*** *Nir Navon, Frédéric Chevy, Christophe Salomon; CNRS - Lab Kastler Brossel, Ecole Normale Supérieure, France.* We measure the equation of state of a low-temperature two-component ultracold Fermi gas for a wide range of interaction strengths. A detailed comparison with theories including Monte-Carlo calculations and the Lee-Huang-Yang corrections is presented.

**8.00–10.00**

**WC • Laser Applications II**

*Martin Stickley; Univ. of Central Florida, USA, Presider*

**WC1 • 8.00** **Invited**
**Stabilized Mode-locked Diode Lasers & Applications,** ***Peter J. Delfyett,*** *I. Ozdur, M. Akbulut, J. Davila-Rodriguez; School of Optics, CREOL, USA.* Stabilized ultrafast mode-locked lasers are developed to generate ultralow noise optical frequency combs and pulse trains. The resulting pulses and associated frequency combs are then used for a variety of optical signal processing functions, such as optical sampling and waveform generation.

**WC2 • 8.40**
**Comparison of Characteristic Behavior in a Synchronously and Asynchronously Mode-locked EDFL,** ***Camila C. Dias,*** *E. A. De Souza; Univ. Presbiteriana Mackenzie, Brazil.* We investigated the characteristic behavior of an Erbium-doped-fiber-laser synchronously and asynchronously mode-locked operating at 10GHz. We observed that the central wavelength shifts to a lower one. This knowledge is necessary to achieve the mode-locking stabilization.

**8.00–9.40**

**WD • Resonant Structures**

*Hugo H. Figueroa; Univ. Estadual de Campinas, Brazil, Presider*

**WD1 • 8.00** **Invited**
**On-chip Tunable Delay Lines In Silicon Photonics** ***Andrea Melloni****; DEI - Politecnico di Milano, Italy.* The state-of-the-art of on-chip tunable delay lines in silicon-on-insulator technology is discussed. Architectures, theoretical results, limits and experimental results up to 10 bits delay at 100 Gbit/s are presented.

**WD2 • 8.40**
**Demonstration of Quasi-2-D Optomechanical Cavities Within a Full Bandgap Phononic Crystal,** ***Thiago P. M. Alegre****, Amir H. Safavi-Naeini, Oskar Painter; Caltech, USA.* We demonstrate simultaneous strong confinement and interaction of photons and phonons in a quasi two-dimensional (2-D) slab.

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**WB3 • 9.20**
**Raman-Ramsey Multi-zone Spectroscopy in Rb Vapor,** ***Horacio Failache****, Lorenzo Lenci, Arturo Lezama; Inst. de Física, Univ. de la República, Uruguay.* We analyze the multi-zone coherent population trapping spectroscopy of alkali-vapor atoms interacting with a laser beam split into several parallel narrow light sheets. We show that the spectroscopic signal is largely insensitive to intensity broadening.

**WB4 • 9.40**
**Atom Photoionization Using Evanescent Fields: Preparation to Probe Quantum Adsorption States,** *Weliton S. Martins, Martine Chevrollier,* ***Marcos Oriá****; Univ. Federal da Paraiba, Brazil.* We present an experimental set up to prepare excited atoms near a surface and probe them with an ion detector. Improving this system performance will allow us to look for atom-surface interaction signatures.

**WC3 • 9.00**
**TIGO Satellite Laser Ranging System Upgrade,** ***César O. Guaitiao****, Sergio K. Sobarzo, Luis E. Arias; Univ. de Concepción, Chile.* This work summarizes the changes made to the existing SLR system at TIGO observatory. A description of the old and new system and an analysis of the performance achieved by the optical modifications are shown.

**WC4 • 9.20 Invited**
**Multi-Physics of Laser-Induced Damage in Optical Systems,** ***Mireille Commandré****, Jean Yves Natoli, Frank Wagner, Laurent Gallais; Inst. Fresnel, Univ. Aix Marseille, Ecole Centrale Marseille, France.* The comprehension of the multiple physical phenomena involved in laser damage, the measurement and the improvement of the damage thresholds are of a major importance for the design and use of high power laser systems.

**10.00–10.30**
**Coffee Break**
*Panoramic A*

**10.30–12.30**
**Exhibits Open**
*Panoramic A*

**12.30–15.00**
**Afternoon Break**

**WD3 • 9.00**
**Highly Linear Electro-optic Modulator Based on Ring Resonator,** ***William D. Fegadolli***[1,2]*, Vilson R. Almeida*[1,2]*, Olympio L. Coutinho*[1]*, José Edimar B. Oliveira*[1]*;* [1]*Inst. Tecnológico de Aeronáutica-ITA, Brazil,* [2]*Inst. de Estudos Avançados - IEAv, Brazil.* The ring resonator modulator linearity is analyzed and modeled in terms of the design parameters; results show that appropriately design of the device enables a high spurious free dynamic range on an optical link (~126dB.Hz$^{4/5}$).

**WD4 • 9.20**
**Color Filtering by Trilayer Subwavelength Gratings**
***Hans Lochbihler****; Papierfabrik Louisenthal GmbH, Germany.* Subwavelength gratings with trilayer coatings may act as color filters for profiles supporting resonant light interaction in the visible range. Colored images are generated by this type of gratings having a lateral variable modulation depth.

## WE • Joint Poster Session II

**10.30–12.30**

**WE01**
**Length Measurement using Frequency Comb and Optical Clock Technology at Inmetro,** ***Luiz V. G. Tarelho****, Elizabeth V. Raymundo, Hakima Belaidi, Ana D. Alvarenga, Ricardo S. França, Hans P. Grieneisen, Iakyra B. Couceiro; Inmetro, Brazil.* Inmetro is assembling a frequency comb for measurements of optical frequencies traceable to a Cesium clock and/or to an optical clock. This setup will replace meter traceability based on length standards to time standards based.

**WE02**
**Resonant Nonlinear Optical Properties of Gold Nanoparticles,** ***Luis A. Gómez Malagón****, João Batista Monteiro-Filho; Univ. de Pernambuco, Brazil.* Nonlinear optical properties of gold nanoparticles (NPs) were studied using the degenerate electron gas model. Influence of the size and laser intensity on the third order susceptibility was analyzed around the plasmon resonance.

**WE03**
**Pair of Coupled Bloch Equations,** ***Jose Javier Sanchez Mondragón*** *[1], Julio C. Garcia-Melgarejo[1], Segio Sanchez-Sanchez[2], Margarita Tecpoyotl-Torres[3], Miguel A. Basurto-Pensado[3]; [1]INAOE, Mexico, [2]Univ. del Istmo, (UNISTMO) Campus Tehuantepec, Mexico, [3]Ctr. for Res. in Engineering and Applied Sciences. UAEM, Mexico.* The coherent coupling of a pair of Bloch Equations is used to model the coupling of a pair of Two Level Atoms in terms of their symmetric and antisymmetric states.

**WE04**
**Production and Characterization of Nanostructured Tips to Near-field Optical Microscopy,** ***Alex S. Duarte****, Marcos A. Z. Vasconcellos, Ricardo R. B. Correia; Univ. Federal do Rio Grande do Sul, Brazil.* The localized and highly intense field generated at nanotips apex can be nonlocally excited. Nanostructures are introduced at tip surface and used to propagate the incident light field energy through Plasmon oscillations till the extremity.

**WE05**
**GAWBS and its Effect on SBS Based Slow Light in Optical Fibers,** ***Christopher K. Horne****, Chung Yu, Khanh Tran; North Carolina A&T State Univ., USA.* The sBs based fiber ring with enhanced gain and linewidth is a special slow light device. We report the effect of GAWBS modes on pulse delay and distortion of the fiber ring slow light device.

**WE06**
**Fluorescence Enhancement in $Er^{3+}$ -doped Tellurite Glass from Gold Nanoparticles,** *S. P. A. Osorio[1], V. A. G. Rivera[1], Y. Messaddeq[2],* ***E. Marega****[1], L. A. O. Nunes[1]; [1]IFSC-USP, Brazil, [2]IQ-Araraquara, Brazil.* It is well known that metallic structures have complex effects on fluorescence. In addition to an enhancement in fluorescence from the enhancement of the local electromagnetic field.

**WE07**
**Nonlinear Antiresonant Ring Interferometer,** ***Magnus K. Pereira****, Rafael Rui, Ricardo R. B. Correia; Univ. Federal do Rio Grande do Sul, Brazil.* The setup presented here addresses the nonlinear optical characterization technique with ultrashort light pulses. A pump-probe time resolved scheme developed within the interferometer ring allowed the evaluation of the response function excluding slow thermal effects.

**WE08**
**All-optical Switching Based On Cascaded Long-period Fiber Grating,** *Zhigang Zang,* ***Wenxuan Yang****; Dept. of Physics, Harbin Inst. of Technology, China.* The properties of a new all-optical switching based on cascaded long-period fiber gratings between which an erbium-doped fiber is inserted. The threshold power for this new switching, can be decreased to 15 mW range.

**WE09**
**Energy Analysis of Nonlinear Optical Pulses,** ***Antônio F. de Faria Jr.****, Antônio Osny Toledo, Luciana Castellano Vasconcellos; Inst. de Estudos Avançados, Brazil.* This work analysis the energy density of solutions of nonlinear Schroendinger equation (NLS), spatial and temporal solutions and show that in some cases the correspondent energy for that solutions is proportional to the its square.

**WE10**
**Dynamics of Four-tangle and Pairwise Entanglement of Two Atoms Coupled to Cavity Field,** *S. Shelly Sharma[1], Naresh K. Sharma[2],* ***Bruno L. S. Vicentin****[1]; [1]Dept. de Fisica, Univ. Estadual de Londrina, Brazil, [2]Dept. de Matematica, Univ. Estadual de Londrina, Brazil.* We examine analytically and numerically the dynamics of negativity, four-tangle, and pairwise entanglement invariants of two atoms coupled to cavity field. The amount of entanglement lost due to state reduction is obtained.

**WE11**
**Nonlinear Optical Properties of Phenyl Diphenylamine Derivatives and Platinum Acetylide Complexes,** ***Erick Piovesan****, Leonardo De Boni, Cleber Renato Mendonça; Inst. de Física de São Carlos, Brazil.* This work presents a study on the nonlinear optical properties of organic and

organometallic compounds, using femtosecond Z-Scan. Results show reasonable two-photon absorption cross-section, which make these compounds good candidates for technological applications.

**WE12**

**Excited State Studies in Ruthenium Porphyrins Using Z-Scan Technique,** ***Renato N. Sampaio***[1], *Newton M. Barbosa Neto*[1], *Pablo J. Gonçalves*[2], *Sérgio C. Zílio*[3], *Alzir A. Batista*[4], *Iouri Borissevitch*[3], *Amando S. Ito*[3]; [1]*Federal Univ. of Uberlândia, Brazil,* [2]*Federal Univ. of Goias, Brazil,* [3]*Univ. of São Paulo, Brazil,* [4]*Federal Univ. of São Carlos, Brazil.* This work reports the excited state dynamics performed for free base tetrapyridyl porphyrins ($H_2$TPyP) with peripheral ruthenium groups attached to pyridine rings aiming to obtain its photophysical parameters using single pulse and pulse train Z-Scan.

**WE13**

**Experimental Analysis of Stokes and Anti-Stokes Brillouin Signal in the Disturbed Single Mode Optical Fiber,** ***Sandro F. Quirino***; *Inst. Nacional de Pesquisas Espaciais, Brazil.* We present the relationship between the number of modes, linewidth, Brillouin shift of Stokes lines and anti-Stokes and pumping power. Tension in the fiber is fixed. All measurement were in the backward direction.

**WE14**

**Spectroscopic Ellipsometry Study of a Swiss Cross Metamaterial,** ***M. L. Miranda-Medina***[1], *B. Dastmalchi*[2], *H. Schmidt*[3], *E.-B. Kley*[3], *I. Bergmair*[4], *K. Hingerl*[2], *J.J. Sanchez Mondragon*[1]; [1]*INAOE, Mexico,* [2]*Johannes Kepler Univ., Austria,* [3]*Inst. of Applied Physics, Friedrich-Schiller-Univ., Germany,* [4]*PROFACTOR GmbH, Mexico.* We present spectroscopic ellipsometry measurements of a metamaterial, taken under different incidence angles and compared with calculations based on the RCWA method. We find that resonances for (Psi,Delta) do not disappear changing the incidence angle.

**WE15**

**Two-photon Polymerization Microfabrication of Double Doped Structures,** ***Adriano J. G. Otuka***, *Daniel S. Côrrea, Cleber R. Mendonça; Inst. de Física de São Carlos, Univ. de São Paulo, Brazil.* The doping of the microstructures allows the fabrication of devices with specific features. In this work, we developed a method for fabricating microstructures, by two-photon absorption polymerization, that can be doped with different dopants.

**WE16**

**Preliminary Results of the Generalized Extremal Optimization Algorithm Applied in the Design of Optical Systems,** ***Braulio F. C. Albuquerque***, *Fabiano L. de Sousa; Natl. Inst. for Space Res.-INPE, Brazil.* We present preliminary results of the Generalized Extremal Optimization algorithm applied to the problem of optical design. Two versions of GEO were tested in the design of an air spaced triplet lens system.

**WE17**

**Resonance Frequency Analysis in Open Tubular Channels Ferroelectrets by Interferometry,** ***Daniel B. Mazulquim***, *Ruy A. P. Altafim, Heitor C. Basso, Ruy A. C. Altafim, Luiz G. Neto; Dept. of Electrical Engineering - EESC, Univ. of Sao Paulo, Brazil.* We describe the use of an interferometric system to analyze the resonance frequency of ferroelectrets. This technique is attractive (no force applied in the sample) and sensitive to small displacements, improving the analyze of elements.

**WE18**

**Binary Amplitude Holograms: Coding and Fabrication Using Photographic Film,** ***Daniel B. Mazulquim***[1], *Giuseppe A. Cirino*[2], *Luiz G. Neto*[1]; [1]*Dept. of Electrical Engineering - EESC, Univ. of São Paulo, Brazil,* [2]*CCET - Federal Univ. of São Carlos, Brazil.* We code and fabricate binary amplitude holograms using the Iterative Fourier Transform Algorithm (IFTA) and a photographic camera, in a simple and low cost way.

**WE19**

**High Sensitivity Differential Refractometer by Evanescent Wave in a Thin Dielectric Waveguide,** *Rafael A. S. Ribeiro,* ***Sérgio C. Zilio***; *Inst. de Física de São Carlos, Univ. de São Paulo, Brazil.* We report on a differential refractometer based on a guided wave that interacts with gaseous or liquid samples, presenting sensitivity better than $10^{-5}$ for changes in the index of refraction.

**WE20**

**A Novel Design of All Optical Logic Gates at 10Gb/s,** ***Abhishek K. Katiyar***; *PEC Univ. of Technology, India.* We propose a scheme to realize the optical logic gates through SOA non-linear properties, XGM and XPM that will broadened the probe signal. This broadening is used to realize the logics by detuning of a filter.

**WE21**

**Experimental Ultrafast Spectroscopy Used to Study Carrier Dynamics of High Quality Silicon on Glass Sample,** ***Omar S. Magaña-Loaiza***[1], *Roman Sobolewski*[2], *Javier J. Sanchez-Mondragon*[1], *Carlo Kosik-Williams*[3], *Jie Zhang*[2]; [1]*Natl. Inst. for Astrophysics Optics and Electronics,* *Mexico, [2]Univ. of Rochester, USA, [3]Corning Inc., USA.* We study, experimentally and theoretically, the carrier dynamics in high quality silicon on glass sample by a model that relates the reflectance time dependence with the carrier dynamics.

**WE22**

**Photon Migration and Energy Transfer in CdSe/ZnS Quantum Dots,** ***Guilherme A. Alves****, Adamo F. Monte, Erasto J. dos Santos, Túlio P. Quaresma; Federal Univ. of Uberlandia, Brazil.* Energy transfer experiments were realized using a confocal microscope adapted for scanning the spatial distribution of emitted luminescence. The photon propagation was measured, and the energy transfer among the dots was discussed.

**WE23**

**All-Angle Negative Refraction from the Phonon Response in Anisotropic Crystals,** *Rízia R. da Silva[1,2],* ***Rair M. da Silva****[1], Thomas Dumelow[1], José A. P. da Costa[1], Sara B. Honorato[3], Alejandro P. Ayala[3]; [1]Univ. do Estado do Rio Grande do Norte, Brazil, [2]Univ. Federal do Rio Grande do Norte, Brazil, [3]Univ. Federal do Ceará, Brazil.* We consider how all-angle negative refraction may be induced in anisotropic crystals by making use of the phonon response. We investigate, both theoretically and experimentally, the example of crystal quartz at far infrared wavelengths.

**WE24**

**Optical Logic Gates Using Nonlinear Directional Coupler under Pulse Position Modulation,** *Alisson C. Ferreira[1], Cícero S. Sobrinho[1], José Wally M. Menezes[1], Hélio H. B. Rocha[1], Herbert de O. Rodrigues[1], Guilherme F. de M. P. Júnior[1], Antônio S. B. Sombra[1],* ***José Luiz S. Lima****[2]; [1]Univ. Federal do Ceará, Brazil, [2]Univ. Federal Rural do Semi-Árido, Brazil.* The implementation of optical logic gates in nonlinear fiber directional coupler is investigated numerically in soliton regime. The study shows that with a proper phase control it is possible to accomplish logical operations.

**WE25**

**Study of a Spherical Photonic Crystal with Conducting Nano Shell and a Nano Particle Core,** *Alvaro Zamudio-Lara[1],* ***Jose Javier Sanchez Mondragon****[2], Celso Velasquez-Ordoñez[3], Adalberto Alejo-Molina[2], Miguel Torres-Cisneros[4], Jesus Escobedo-Alatorre[1]; [1]Ctr. for Res. in Engineering and Applied Sciences. UAEM, Mexico, [2]INAOE, Mexico, [3]Ctr. Univ. de los Valles, Univ. de Guadalajara, Mexico, [4]Univ. Autonoma de Guanajuato, Mexico.* We discuss the effects of a 3-D Metallo-Dielectric Photonic Crystal with both a metallic core and a metallic shell as basic elements. We discuss the formed cavity and the dielectric stack in a structured sphere.

**WE26**

**Omnidirectional Reflector in a Ternary Metallo-Dielectric Stack,** *Adalberto Alejo-Molina[1],* ***Jose J. Sanchez-Mondragon****[1], Alvaro Zamudio-Lara[2], Daniel A. May-Arrioja[3], Miguel Torres-Cisneros[4]; [1]Inst. Nacional de Astrofisica Optica y Electronica, Mexico, [2]Ctr. for Res. in Engineering and Applied Sciences. UAEM, Mexico, [3]Univ. Autonoma de Tamaulipas, Mexico, [4]Univ. Autonoma de Guanajuato, Mexico.* Omnidirectional band gaps are found in a ternary structure, quarter-wave-like, dielectric-dielectric-metal. We plot the band gaps through the analytical dispersion relations, derived using the transfer matrix method, for oblique incidence (transversal electric and magnetic modes).

**WE27**

**Pressure Induced Single-Polarization Single-Mode Microstructured Polymer Optical Fiber,** ***Yovanny A. V. Espinel****[1], Marcos A. R. Franco[2], Cristiano M. B. Cordeiro[1]; [1]State Univ. of Campinas, Brazil, [2]Inst. de Estudos Avançados, Brazil.* We report a new procedure to obtain single-polarization single-mode polymeric optical fibers. The state is induced by applying hydrostatic pressure and is shown to be related with coupling between core and cladding modes.

**WE28**

**Multimode Interference Fiber Optic Temperature Sensor,** *Jose G. Aguilar-Soto[1], Jose E. Antonio-Lopez[1],* ***Jose J. Sanchez-Mondragon****[1], Patrick LiKamWa[2], Jaime A. Arrendondo-Lucio[3], Daniel A. May-Arrioja[3]; [1]INAOE, Mexico, [2] CREOL, The College of Optics and Photonics, Univ. of Central Florida, USA, [3]Univ. Autonoma De Tamaulipas, Mexico.* A novel fiber optic temperature sensor based on multimode interference (MMI) was designed, fabricated and tested. A sensing range of 25ºC to 375ºC is demonstrated with potential multiplexing operation.

**WE29**

**One Dimensional Photonic Crystal with Conducting Nanoparticles Composite,** ***Jose Javier Sanchez Mondragon****[1], Jesus Escobedo-Alatorre[2], Omar Magana-Loaiza[1], Margarita Tecpoyotl-Torres[2], Alvaro Zamudio-Lara[2]; [1]INAOE, Mexico, [2]Univ. Autonoma del Estado de Morelos, Mexico.* We discuss the changes introduced in switching, bistability and chirping of a one dimensional photonics crystal made up of conducting nanoparticles composites modelled classically and quantum mechanically.

**WE30**

**Tellurite Based PCF with Flattened Dispersion,** ***G. N. Malheiros-Silveira****, J. A. Mores-Jr, E. F. Chillcce, H. E. Hernández-Figueroa, H. L. Fragnito; Univ. of Campinas - UNICAMP, Brazil.* Tellurite PCF with flattened and near zero dispersion was obtained by genetic algorithms simulations associated with a finite element modal solver. The fiber obtained may be promising for applications in nonlinear optics.

**WE31**

**Ultrafast Spectroscopy Used to Generate and Detect Longitudinal Acoustic Phonons in High Quality Silicon on Glass Sample,** ***Omar S. Magaña-Loaiza***[1,2]*, Roman Sobolewski*[2]*, Adalberto Alejo-Molina*[1]*, Jie Zhang*[2]*, Carlo Kosik-Williams*[3]*, Javier J. Sanchez-Mondragon*[1]*;* [1]*Natl. Inst. for Astrophysics Optics and Electronics, Mexico,* [2]*Univ. of Rochester, USA,* [3]*Corning Inc., USA.* We show the experimental generation and detection, as well as theoretical studies, of unusual coherent acoustic phonons on a high quality silicon-on-glass sample. We suggest a photonic crystal based on the studied sample.

**WE32**

**Optical Signal Degradation in a ROADMs-based DWDM Ring Network,** ***José Ewerton P. Farias***[1]*, Luis H. H. de Carvalho*[1,2]*, Júlio César R. F. Oliveira*[2]*, Luciana C. L. de Medeiros*[1]*, Gabriel C. L. Cunha*[1]*, Maiara J. T. Brito*[1]*;* [1]*Federal Univ. of Campina Grande, Brazil,* [2]*CPqD Foundation, Brazil.* An investigation of the optical signal degradation in a ROADMs-based DWDM metropolitan optical network is reported. Software implementation of a PLC-ROADM is presented. Crosstalk, spectrum narrowing and OSNR degradation are included in the simulations.

**WE33**

**Dynamics of Entanglement Transfer from Squeezed Field to Remote Atomic Qubits,** ***P. J. Reis***[1]*, S. Shelly Sharma*[1]*, Naresh K. Sharma*[2]*;* [1]*Dept. de Física, Univ. Estadual de Londrina, Brazil,* [2]*Dept. de Matemática, Univ. Estadual de Londrina, Brazil.* Dynamics of entanglement transfer from two-mode squeezed field and initially entangled atomic qubit pair to atomic qubits located in remote cavities is examined. Remote qubits become entangled through interaction with two mode squeezed light.

**WE34**

**Kinetic of Photoacid Generation in SU8 Negative Photoresists,** ***Luis F. de Avila****, Lucila Cescato; Univ. of Campinas, Brazil.* We measure the kinetic constant of the photoacid generation in SU8 photoresists using two different methods. The measurements, performed under homogeneous exposures and holographic exposures, show a good accordance for the kinetic constant values.

**NOTES**

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## Boa Viagem

**15.30–17.30**

### WF • Tissue Imaging and Spectroscopy

*Claudio Lenz Cesar; Univ. Federal do Rio de Janeiro, Brazil, Presider*

**WF1 • 15.30 Invited**

**New Optical Molecular and Bioimaging Methods, *Daniel Farkas*[1,2,3]**; *[1]Cedars Sinai Medical Ctr., USA, [2]Univ. of Southern California, USA, [3]Carnegie Mellon Univ., USA.* This talk will present new optical bioimaging methods with high resolution and specificity, such as superresolution, heterodyned coherence tomography, parametrically amplified NIR, confocal, multiphoton, lifetime, spectral, multimodality imaging and endoscopy for minimally invasive image-guided surgery.

**WF2 • 16.10 Invited**

**New Biophotonic Tools to Understand Cellular Processes, *Carlos Lenz Cesar***; *Inst. de Física "Gleb Wataghin" (IFGW), UNICAMP, Brazil.* This talk will show the importance of integration of nonlinear optical techniques such as Optical Tweezers, multiphoton, SHG/THG, FLIM and CARS in one confocal microscope to observe cell processes in real

## Candeias A

**15.30–17.30**

### WG • Atomic Physics and Laser Spectroscopy II

*Arturo Lezama; Facultad de Ingenieria, Universida de la Republica, Uruguay, Presider*

**WG1 • 15.30 Invited**

**Mesoscopic Non-classical Atomic States for Quantum Information and Metrology, *Jürgen Appel*[1],** *Jelmer Renema[1], Daniel Oblak[2], Anne Louchet-Chauvet[3], Niels Kjærgaard[4], Eugene Polzik[1]; [1]Niels Bohr Inst., Univ. of Copenhagen, Denmark, [2]IQIS, Univ. of Calgary, Canada, [3]LNE-SYRTE, Observatoire de Paris, France, [4]Danish Fundamental Metrology, Denmark.* Using shot noise limited Quantum-Non-Demolition measurements, we prepare an entangled, spin squeezed ensemble of 105 cold Cs atoms, which we use to improve the precision of an atomic clock by >1 dB beyond the projection noise limit. We report on progress towards applying our method for realizing and characterizing non-Gaussian atomic states.

**WG2 • 16.10 Invited**

**Direct Frequency Comb Spectroscopy, *Daniel Felinto*[1]**, *Jun Ye[2]; [1]Univ. Federal de Pernambuco, Brazil, [2]JILA, NIST and Dept. of Physics, Univ. of Colorado, USA.* We summarize recent developments in direct frequency-comb spectroscopy that allowed high-resolution, broad-bandwidth measurements of multiple atomic and molecular resonances using

## Candeias B

**15.30–17.10**

### WH • Laser Applications III

*Lucio H. Acioli, Sr.; Univ. Federal de Pernambuco, Brazil, Presider*

**WH1 • 15.30 Invited**

**Lasers for Optical Metrology and Spectroscopy**
***Flavio C. Cruz***; *Univ. Estadual de Campinas, Brazil.* Laser technology for metrology and spectroscopy is briefly discussed. It is described a new scheme for implementing optical frequency combs for spectroscopy, based on continuous-wave telecom lasers, and another to achieve single-frequency operation in a compact ring laser.

**WH2 • 16.10**

**In-Field and in-Laboratory 50 km Ultralong Erbium Fiber Laser with Soliton Pulse Compression, *Lucia Akemi Miyazato Saito***, *Eunezio Antonio De Souza; Univ. Presbiteriana Mackenzie, Brazil.* We demonstrated an in-field and in-laboratory 50 km ultralong Erbium fiber laser actively mode locked with repetition rate varying from 1 to 10 GHz where the output pulse widths were

## Piedade

**15.30–17.10**

### WI • Silicon Photonics

*Michal Lipson; Cornell Univ., USA, Presider*

**WI1 • 15.30 Invited**

**Subwavelength Silicon Nanophotonics, *Pavel Cheben*[1]**, *P. J. Bock[2], J. H. Schmid[1], J. Lapointe[1], S. Janz[1], D.-x. Xu[1], A. Densmore[1], A. Delâge[1], B. Lamontagne[1], T. J. Hall[1]; [1]Natl. Res. Council Canada, Canada, [2]Ctr. for Res. in Photonics, Univ. of Ottawa, Canada.* A new optical waveguide principle is proposed, exploiting subwavelength grating effect. We demonstrate first subwavelength grating waveguides, including practical components such as highly efficient fibre-chip couplers, waveguide crossings and microspectrometer chips.

**WI2 • 16.10**

**Ultra-fast All-optical Integration on a Silicon Chip, *Marcello Ferrera*[1],** *Yong-Woo Park[1], Luca Razzari[1,2], Brent Little[3], Sai Chu[3], Roberto Morandotti[1], David J. Moss[4], Jose Azana[1]; [1]INRS, Canada, [2]Univ. di Pavia, Italy, [3]Infinera Ltd., USA, [4]CUDOS School of Physics, Univ. of Sydney, Australia.* We report on ultra-high speed temporal-integration of arbitrary

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| time. | only a phase-stabilized femtosecond laser, opening the way for merging precision spectroscopy with coherent control. | determined by the soliton regime. | optical complex waveforms by using an integrated and fully CMOS compatible micro-ring resonator. The device offers an unprecedented time bandwidth product approaching the remarkable value of 100. |
| | | **WH3 • 16.30 Invited**<br>**Innovative Projects of Laser Applications in the Medical and Automotive Industry in Brazil,** ***Spero Morato****; LaserTools, Brazil.* In this presentation I will show some applications of Nd:YAG solid state lasers that aggregate value to products from well apart sectors such as medicine and industry. Most relevant results will be presented. | **WI3 • 16.30**<br>**Highly Insensitive to Temperature and Ultra-Broadband Silicon Electro-optic Modulator,** ***William S. Fegadolli***[1,2]*, Vilson R. Almeida*[1,2]*, José Edimar B. Oliveira*[1]*;* [1]*Inst. Tecnológico de Aeronáutica - ITA, Brazil,* [2]*Inst. de Estudos Avançados - IEAv, Brazil.* A novel compact silicon electro-optic modulator, entirely compatible with CMOS process, is theoretically proposed. Results reveal that such device enables operation over an ultra-broad bandwidth (~865GHz), besides remaining highly insensitive to temperature variations (~75K). |
| **WF3 • 16.50 Invited**<br>**Adaptive Optics in Deep Optical Sectioning Microscopy of Biological Samples,** ***John Girkin****; Univ. of Durham, UK.* Adaptive optics have demonstrated their ability to maximize resolution and signal from in-depth microscopy. Practical implementation of AO in microscopy, emphasizing the determination of the aberration correction required will be presented. | **WG3 • 16.50**<br>**Light-induced Atomic Desorption of Rb Atoms from Nano-structured Alumina,** ***Horacio Failache****, Santiago Villalba, Arturo Lezama; Inst. de Física, Univ. de la República, Uruguay.* We present an experimental study of light-induced atomic desorption (LIAD) of Rb atoms from porous alumina. The well defined geometry of the nano-structured alumina allows a description of the LIAD process at the microscopic level. | | **WI4 • 16.50**<br>**Excitation of Microstructures Fabricated by Two-photon Polymerization Through Silica Nanowires,** *Daniel S. Correa, Marcos R. Cardoso, Vinicius Tribuzi, Rafael H. Pacheco,* ***Cleber R. Mendonca****; Inst. de Fisica de Sao Carlos - IFSC/USP, Brazil.* We use two-photon polymerization to fabricate microstructures containing rodhamine 6G. Such microstructures were excited through silica nanowires, by coupling light to the standard end of the fiber. Such results open new |

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**WG4 • 17.10 p.m.**
**Optogalvanic Signal Optimization Through the Coherent Control of Multiphoton Ionization,** *Guilherme Cañete Vebber[1],* ***Ricardo R. B. Correia****[1], Ricardo Elgul Samad[2], Nilson Dias Vieira Jr.[2]; [1]Univ. Federal do Rio Grande do Sul, Brazil, [2]Ctr. de Lasers e Aplicações - Inst. de Pesquisas Energéticas e Nucleares/CNEN, Brazil.* The optogalvanic signal, induced in a hollow cathode discharge in argon, is optimized by phase-shaping the pulses of an ultrashort Ti:Sa laser. Multiphoton transitions leading to ionization determine the efficiency of the electric signal generation.

opportunities for micro-optical devices.

| Boa Viagem | Candeias A | Candeias B | Piedade |
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• **Thursday, 30 September** •

**7.00–12.00, Registration Open,** *Imperial Room*

## Boa Viagem

**8.00–10.00**

**ThA • Fiber Lasers**

***Carlos Lenz Cesar**; Inst. de Física "Gleb Wataghin" (IFGW), UNICAMP, Brazil, Presider*

**ThA1 • 8.00** **Invited**

**High Power Fiber Sources,** *Clifford E. Headley[1], J. P. Phillips[1], A. M. DeSantolo[1], J. M. Fini[1], E. Gonzales[1], J. W. Nicholson[1], E. Monberg[1], F. DiMarcello[1], T. F. Taunay[1], M. F. Fishteyn[1], D. J. DiGiovanni[1], S. Ghalmi[2], S. Ramachandran[3]; [1]OFS Labs, USA, [2]Vytran Corp., USA, [3]Boston Univ., USA.* High power fiber sources, their advantages and nonlinear limitations are described. Current efforts to increase output powers lead to a reduction in beam quality. We show how to overcome these limitations by amplifying a higher order mode.

## Candeias A

**8.00–9.40**

**ThB • Photonic Devices**

***Roberto Morandotti**; INRS-EMT, Canada, Presider*

**ThB1 • 8.00** **Invited**

**High Power Supercontinuum Sources,** *J. C. Travers, S. V. Popov, **J. R. Taylor**; Imperial College London, UK.* The development of high-power supercontinuum sources and the techniques to extend the operational wavelength ranges are described for both pulsed and cw pumping schemes. Spectral power densities of up to 100 mW/nm have been achieved.

## Candeias B

**8.00–9.40**

**ThC • Nano Structures**

*Pavel Cheben; Natl. Res. Council Canada, Canada, Presider*

**ThC1 • 8.00**

**Paper Withdrawn**

**ThC2 • 8.20**

**LSPR-based Fiber Optic Sensing with Chemically Deposited Au Nanoparticles,** *Alexandre R. Camara[1], Paula M. P. Gouvêa[1], Alexandre G. Brolo[2], Meikun Fan[2], Ryan Abel[2], Michael Fokine[3], Arthur M. B. Braga[1], **Isabel C. S. Carvalho**[1]; [1]PUC - Rio, Brazil, [2]Univ. of Victoria, Canada, [3]Royal Inst. of Technology, Sweden.* A refractive index fiber optic sensor based on Localized Surface Plasmon Resonance (LSPR) and specular

## Piedade

**8.00–10.00**

**ThD • Nonlinear Spectroscopy I**

*Sérgio C. Zilio; Univ. de São Paulo, Brazil, Presider*

**ThD1 • 8.00** **Invited**

**Laser Induced Molecular Alignment - Small and Large, Slow and Fast** ***Yehiam Prior**, Sharly Fleischer, Atalia Birman, Yuri Khodrokovsky, Ilya Sh. Averbukh; Weizmann Inst. of Science, Israel.* The ultrafast alignment of molecules by laser pulses, and the control of their rotational behavior, as well as the very slow laser alignment of much larger molecules at liquid air interfaces will discussed.

| Boa Viagem | Candeias A | Candeias B | Piedade |
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reflection from chemically deposited gold nanoparticles has been characterized, presenting a sensitivity of 25nm/RIU.

**ThA2 • 8.40**
**Multifunctional Erbium Doped-Fiber Laser,** ***Cláudia B. Santos****, Eunézio A. Souza; Univ. Presbiteriana Mackenzie, Brazil.* This work present a multifunctional Erbium doped fiber laser by the use of two arrayed waveguide gratings intracavity. The experimental setup allows simultaneous operation of three regimes: passive mode-locking, continuous wave and active mode-locking**.**

**ThB2 • 8.40**
**Multi-Segmented Semiconductor Optical Amplifier for Optical Saturation Control,** ***Felipe Valine***[1]*, Antônio A. von Zuben*[1]*, Newton C. Frateschi*[1,2]*;* [1]*Univ. of Campinas, Brazil,* [2]*Ctr. for Semiconductor Components, UNICAMP, Brazil.* We fabricated multi-contacts tilted semiconductor amplifiers based on InGaAsP/InP quantum wells for external control of the optical power saturation. A linearity control of the amplification for DC signals was achieved for relatively low injection current**.**

**ThC3 • 8.40**
**Infrared Nonlinearity of Gold Nanoshells,** ***Renato B. Silva****, Edilson Falcão-Filho, Regivaldo Sobral-Filho, Antonio Brito-Silva, André Galembeck, Cid B. de Araújo; Univ. Federal de Pernambuco, Brazil.* In this paper we report on the fabrication of gold nanoshells (GNS) and present a study of their nonlinear optical properties. GNS were studied and the results exhibit large third and fifth order susceptibilities.

**ThD2 • 8.40**
**Two-beam Coupling with Femtosecond Pulses in an Atomic Vapor: Accumulation and Propagation Effects,** *Carlos A. C. Bosco, Daniel Felinto, Sandra S. Vianna,* ***Lucio H. Acioli;*** *Dept. de Física, Univ. Federal de Pernambuco, Brazil.* We present experimental results on the Two-Beam Coupling of femtosecond beams in atomic rubidium vapor. Propagation and accumulation effects due to the modelocked pulse train are investigated.

**ThA3 • 9.00**
**A Bimodal Fiber Laser for Generation of a Narrow Microwave Tone,** ***Thiago Ferreira da Silva***[1,2]*, Djeisson H. Thomas*[1]*, Jean Pierre von der Weid*[1]*;* [1]*Pontifical Catholic Univ. of Rio de Janeiro, Brazil,* [2]*Natl. Inst. of Metrology, Standardization and Industrial Quality, Brazil.* We present a bimodal laser using a multiple-Bragg-gratings Fabry-Perot filter inside a fiber loop. A single microwave signal with 1 kHz FWHM linewidth is obtained by heterodyne beating the two laser modes at a photodiode.

**ThB3 • 9.00**
**Effect of the Tapered Regions on the Evolution of a Spectrally Phase Modulated Pulse in a Tapered Fiber for Supercontinuum Generation,** ***Pedro L. L. Bertarini***[1]*, Emiliano R. Martins*[2]*, Sérgio C. Zílio*[1]*, Ben-Hur V. Borges*[1]*;* [1]*Univ. de São Paulo, Brazil,* [2]*Univ. of St Andrews, UK.* In this paper we demonstrate how the supercontinuum (SC) generated by a spectrally phase modulated femtosecond pulse in a tapered fiber is influenced by the tapered regions of this fiber.

**ThC4 • 9.00**
**Comparative Near Field Analysis of Gold Nanodisks of Different Shapes,** ***Thaís L. T. dos Santos****, Karlo Q. da Costa, Victor Dmitriev; Federal Univ. of Pará, Brazil.* We present a comparison near field for gold nanodisks with different shapes. The method of moments is used to solve the electromagnetic scattering problem. We investigate the spectral response of electric field near these particles.

**ThD3 • 9.00**
**Determination of Molybdenum Ablation Threshold for Ultrashort Laser Pulses in Atmosphere and Vacuum Using the Diagonal Scan Technique,** ***Ricardo E. Samad****, José T. Vidal, Wagner de Rossi, Nilson D. Vieira; IPEN-CNEN/SP, Brazil.* We present results of molybdenum ablation threshold in the 30fs regime. The measurements were performed in atmosphere and vacuum, resulting in 1.6TW/cm$^2$ and 3.8TW/cm$^2$, respectively. The difference is credited to a plasma etching in atmosphere.

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**ThA4 • 9.20 Invited**
**Large Fiber Core Designs For Nonlinear Effect Mitigation In High Power Fiber Lasers And Amplifiers,** ***William Torruellas****; Applied Physics Lab, John Hopkins Univ., USA.* Fiber lasers achieving kW to MW powers require nonlinear optical effects to be mitigated to achieve the required performances. We will present fiber core designs capable of achieving such remarkable average and peak powers.

**ThB4 • 9.20**
**Genetic Algorithm Search of Absolute Photonic Band Gap in 2-D Anisotropic Tellurium Photonic Crystals,** *Gilliard N. Malheiros Silveira[1],* ***V. F. Rodríguez-Esquerre****[2], Hugo E. Hernandez Figueroa[1]; [1]State Univ. of Campinas, UNICAMP, Brazil, [2]Federal Univ. of Bahia, UFBA, Brazil.* The finite-element-method and the Genetic-Algorithm have been used to solve the inverse problem involving absolute-photonic-band-gap searching and maximization. Triangular lattices composed by tellurium and air have been analyzed. We obtained absolute midratio band-gaps of 23.49%.

**ThC5 • 9.20**
**Size and Dispersion Control of Gold Nanoparticles Obtained by Nanosecond Laser Ablation,** *Wellington C. dos Santos[1],* ***Vinicius S. Oliveira****[2], Wido H. Schreiner[1], Arandi G. Bezerra-Jr[2]; [1]Federal Univ. of Parana, Brazil, [2]Federal Univ. of Technology, Parana, Brazil.* We report on the production of narrow-size gold-nanoparticles through laser-ablation, using a Nd:YAG laser delivering 200ns pulses. Our approach emerges as a low-cost alternative to chemical-methods and to femtosecond-laser ablation in the green-synthesis of metallic-nanoparticles.

**ThD4 • 9.20**
**Nonlinear Phase Noise in One-pump Fiber-optic Parametric Amplifiers,** ***Slaven Moro****[1], Ana Peric[1], Nikola Alic[1], Bryan Stossel[2], Stojan Radic[1]; [1]Univ. of California at San Diego, USA, [2]Lockheed Martin Corp., USA.* We analytically predict, and subsequently experimentally verify, the spectral dependence of nonlinear phase noise in one-pump fiber-optic parametric amplifiers. The measurements agree well with theoretical predictions.

**ThD5 • 9.40**
**Magnetization Precession Induced by Ultrashort Laser Pulses in Thin Films of Fe/MgO and Py/Si,** ***Lucio H. Acioli****[1], Antonio Azevedo[1], Douglas L. P. Lacerda[1], Carlos A. C. Bosco[2]; [1]Univ. Federal de Pernambuco, Brazil, [2]Univ. Federal Rural de Pernambuco, Brazil.* We study the magnetic transient dynamics induced by a femtosecond laser using Time-Resolved Magneto-Optical Kerr Effect to characterize the local anisotropy and the Gilbert damping constant of magnetic films of Fe permalloy.

**10.00–10.30, Coffee Break,** *Panoramic A*

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## Boa Viagem

**10.30–12.30**

### ThE • Diffractive and Multifunctional Components

*Ric Shimshock; MLD Technologies, LLC, USA, Presider*

**ThE1 • 10.30 Invited**

**Applications of Volume Bragg Gratings in Photo-Thermo-Refractive Glass, *C. Martin Stickley,*** *Leonid B. Glebov; CREOL, The College of Optics and Photonics, Univ. of Central Florida, USA.* This paper will review the science underlying volume Bragg gratings in PTR glass and their applications to ultrashort pulse lasers, beam combining, and ultra-narrow optical filters as only three examples of their many applications.

## Candeias A

**10.30–12.10**

### ThF • Fibre Devices

*Sérgio C. Zilio; Univ. de São Paulo, Brazil, Presider*

**ThF1 • 10.30 Invited**

**Interferometric FBG Interrogation for Characterization and Sensing, *Hans G. Limberger*;** *EPFL, Switzerland.* Results on grating characterization and sensing of temperature, strain, and load induced birefringence with high spatial resolution in silica and plastic optical fibers using optical low coherence reflectometry are reported.

## Candeias B

## Piedade

**10.30–12.30**

### ThG • Nonlinear Spectroscopy II

*Leonardo de Souza Menezes; Univ. Federal de Pernambuco, Brazil, Presider*

**ThG1 • 10.30**

**Nonlinear Optics and Quantum Control in Doped Negative-index Metamaterials, *Alexander K. Popov*;** *Univ. of Wisconsin-Stevens Point, USA.* The possibility of creation of all-optically tailored, frequency selective, ultracompact nonlinear optical backward-wave negative index metamirror is shown, which is based on resonant four-wave frequency mixing and quantum control in doped nanostructured composite metamaterials.

**ThG2 • 10.50**

**Excited State Absorption Study in Sulfonated-Halogenated Porphyrins, *Leonardo De Boni*[1],** *Pablo J. Gonçalves[2], Carlos J. P. Monteiro[3], Mariette M. Pereira[3], Sergio C. Zilio[1], Cleber R. Mendonca[1]; [1]Inst. de Física de São Carlos, Brazil, [2]Inst. de Física, Univ. Federal do Goias, Brazil, [3]Dept. de Química - Univ. de Coimbra, Portugal.* Excited state absorption of sulfonated-halogenated porphyrins was characterized using the Z-scan technique. We obtained similar values of the excited state absorption cross-section if compared with ground state ones, which have demonstrated an efficient absorption.

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**ThE2 • 11.10 Invited**
**Diffractive Optics: An Overview for Industrial Applications,** *Giuseppe A. Cirino[1], Daniel B. Mazulquim[2], Robson Barcellos[2], **Luiz G. Neto[2]**; [1]Federal Univ. of Sao Carlos, Brazil, [2]Univ. of São Paulo, Brazil.* This article is a review of the activities at University of Sao Paulo on diffractive and microoptics. It describes several types of microdevices, with selected applications. Their common characteristic is the low-cost fabrication processes.

**ThF2 • 11.10**
**Induced Birefringence Analysis in an All-fiber Device Based an Photonic Crystal Fiber with Integrated Electrodes,** *Erick Reyes-Vera[1], Esteban Gonzalez-Valencia[1], J. F. Botero-Cadavid[1], **Pedro Torres[1]**, G. Chesini[2], C. M. B. Cordeiro[2]; [1]Natl. Univ. of Colombia, Colombia, [2]Univ. Estadual de Campinas, Brazil.* We present an analysis of induced birefringence in a photonic crystal fiber with integrated electrodes. We found that the fiber birefringence axes rotated with temperature, which causes the effective refractive index varies nonlinearly.

**ThF3 • 11.30**
**FBG Interrogation System on a Silicon Chip,** *Xuan Wang[1], German R. Vargas[1], **Roberto R. Panepucci[2]**; [1]Florida Intl. Univ., USA, [2]Ctr. de Tecnologia da Informação Renato Archer, Brazil.*
We demonstrated a silicon-photonic approach to FBG sensor readout based on a thermooptic tunable filter(s). The resulting system has the potential to be compact, low cost and with high resolution when multiplexed.

**ThG3 • 11.10 Invited**
**Nonlinear Characterization Techniques inside a 4f System,** ***Georges Boudebs**, K. Fedus; Univ. d`Angers, France.* Using I-scan or Z-scan techniques inside a 4-f system we perform third-order nonlinear optical characterizations. Simulations based on Helmholtz equation provide simple expressions relating the signal to the phase shift in different wave-mixing configurations.

**ThE3 • 11.50**
**Diffractive Optical Element Applied to Proximity Exposure Lithography Exploring Partial Light Coherence,** ***Giuseppe A. Cirino[1]**, Ronaldo D. Mansano[2], Patrick Verdonck[3], Luiz G. Neto[4]; [1]CCET - Univ. Federal de São Carlos, Brazil, [2]PSI/EPUSP - Univ. de São Paulo, Brazil, [3]IMEC, Belgium,*

**ThF4 • 11.50**
**In-fiber Modal Mach-zehnder Interferometer Based on Locally Post-processing the Core of a Photonic Crystal Fiber,** ***Rodrigo M. Gerosa[1]**, Danilo H. Spadoti[1], Leonardo de S, Menezes[2], Christiano J. S, de Matos[1]; [1]Univ. Presbiteriana Mackenzie, Brazil, [2]Univ. Federal de Pernambuco, Brazil.*

**ThG4 • 11.50**
**Nonlinear Spectroscopy of Lead-Germanium Oxide Amorphous Films With Gold Nanoparticles,** ***Tâmara R. Oliveira[1]**, Davinson M. Silva[2], Edilson L. Falcão-Filho[1], Luciana R. P. Kassab[3], Cid B. de Araújo[1]; [1]Univ. Federal de Pernambuco, Brazil, [2]Univ. de São Paulo, Brazil, [3]Faculdade de*

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*[4]EESC - Univ. de São Paulo, Brazil.* A diffractive optical element was designed to operate as lithographic photomask in proximity mode (50 μm gap). Exposition was performed by exploring the partial coherence of UV source. An Improvement in resolution was achieved.

**ThE4 • 12.10**
**A Super-hydrophobic and Wide-angle, Anti-reflective Optical Coating in the Infrared,** ***Kelly C. Camargo****, Alexandre F. Michels, Daniel E. Weibel, Adriano F. Feil, Flávio Horowitz; Univ. Federal do Rio Grande do Sul, Brazil.* Simultaneous anti-reflective and superhydrophobic properties on glass are pursued by combination of multi-scale surface topology and interference coating.

By collapsing one cladding hole next to the solid-core of a photonic crystal fiber, a modal interferometer is demonstrated. More than one mode is naturally excited and spectral modulation depths of 9dB could be observed.

*Tecnologia de São Paulo, Brazil.* The nonlinear susceptibility and temporal response of lead-germanium oxide films containing gold nanoparticles were measured in the pico and femtosecond regimes. An improvement of the figure-of-merit, by more than one-order of magnitude was obtained.

**ThG5 • 12.10**
**Resonant Nonlinear Absorption in J-aggregates of Meso-tetrakis(sulfonatophenyl) Porphyrin,** ***Leonardo De Boni***[1]*, Pablo J. Gonçalves*[2]*, Newton M. B. Neto*[3]*, Iuri E. Borissevitch*[4]*, Sérgio C. Zilio*[1]*; [1]Inst. de Física de São Carlos, Brazil, [2]Inst. de Física - UFG, Brazil, [3]Inst. de Física, Univ. Federal de Uberlândia, Brazil, [4]Dept. de Física e Matemática, Univ. de São Paulo, Brazil.* We reports the excited-state dynamics in J-aggregates of meso-tetrakis(sulfonatophenyl) porphyrin. We found a RSA process at 532 nm and that aggregation creates several internal decay paths which reduce the triplet state formation.

## Key to Authors and Presiders

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

# Latin America Optics and Photonics Conference (LAOP)

## Update Sheet

**Withdrawals:**

**MB22**
**MC6**
**TuB1**
**WC4**
**ThG1**

**Presenter Update**

**MB12** will be presented by Airton Martin; *Univ. do Vale do Paraíba, Brazil.*
**WE14** will be presented by J.J. Sanchez Mondragon, *INAOE, Mexico.*
**WE34** will be presented by Lucila Cescato, *Univ. of Campinas, Brazil*

## Special Thanks

Anderson S. L. Gomes, *Univ. Federal de Pernambuco, Brazil,*
**General Chair**
Luiz Davidovich, *Univ. Federal do Rio de Janeiro, Brazil,*
**Conference Co-Chair**
Hugo Fragnito, *UNICAMP, Brazil,*
**Conference Co-Chair**

# MA • Keynote Session

## Monday 27 September
## Boa Viagem
## 8.00–9.45

**9.00–9.45**

**The Global Impact of Photonics: Renewable Resources, Monitoring Climate Change, and Energy Conservation,** Thomas Baer, *Stanford Univ., USA.* The possibility of radical climate changes due to global warming poses a significant world-wide threat of unknown magnitude. These potential changes are attributed to rapidly increasing atmospheric $CO_2$ levels thought to be caused by several centuries of extensive use of fossil fuels as primary energy sources. Mitigating this threat will require a multifaceted deployment strategy consisting of developing alternative non-carbon energy sources, replacing existing infrastructure with more energy efficient technologies, and the effective monitoring of climate and atmospheric variables to measure the impact of climate change as well as monitoring compliance. I will review the critical roles that photonics technologies are playing in helping to implement these strategies.

Tom Baer is the Executive Director of the Stanford Photonics Research Center at Stanford University and co-founder of Arcturus Bioscience, Inc. which he established in 1996. He served as the company's Chairman and CEO until January 2005. Prior to Arcturus, Dr. Baer was Vice President of Research at Biometric Imaging, where he led an interdisciplinary group developing instrumentation and reagents with applications in the areas of AIDS monitoring, bone marrow transplant therapy, and blood supply quality control. From 1981 to 1992 Dr. Baer was at Spectra-Physics, Inc., in Mountain View, California, where he held positions as a Research Scientist, Spectra-Physics Fellow, and Vice-President of Research. In 1989, he co-founded a new company, Spectra-Physics Laser Diode Systems, which was established to commercialize diode and solid-state laser instruments based on his research.Dr. Baer has been a pioneer in many areas of biotechnology, laser development, and laser applications, and is listed as an inventor on over 50 patents in these areas. He graduated with a BA degree in Physics from Lawrence University and received his MS and Ph.D. degrees in Atomic Physics from the University of Chicago. He has been elected to the status of Fellow of two major international scientific societies, The American Association for the Advancement of Science and The Optical Society of America. Dr. Baer also was awarded the Silicon Valley Entrepreneurial Award for Emerging Companies by the San Jose Business Journal.

**8.00–8.45**

**Science, Technology and Innovation In Brazil: A Brief Account,** Sergio Machado Rezende[1, 2] ;[1] *Minister of Science and Technology, Brazil,* [2] *Universidade Federal of Pernambuco (UFPE), Brazil.* We present historical remarks on Science and Technology (S&T) in Brazil and information on current S&T policy. In recent years, Brazilian science has achieved important advances and has become an increasingly important component for the country's development. The National Science and Technology System has gained a stronger institutional basis thanks to new laws passed by Congress and a manyfold increase in federal funds. Current S&T and industrial policies are supporting technological innovation in established companies and strongly stimulating start-ups.


Sergio Machado Rezende holds a degree in Electronic Engineering (PUC-RJ, Brazil) and received a master's degree (1965) and Ph.D. (1967) from the Massachusetts Institute of Technology (MIT), United States, for his work on magnetic materials. Rezende was a professor at the Pontifical Catholic University (PUC-RJ) and the Institute of Physics, State University of Campinas (Unicamp).

He is currently a professor at the Universidade Federal of Pernambuco (UFPE), where he went in 1972 to coordinate the deployment of the first groups of research in physics. This work was the basis for the creation of the Master program of that institution in 1973, the Physics Department in 1974 and Doctorate program in 1975. His current research as an Emeritus professor in the Department of Physics, UFPE is in materials physics, with emphasis on Magnetic Materials and Magnetic Properties, working in experimental physics and theoretical physics, mainly on the following topics: magnetism, magneto-optical, magnetic materials, magnetic multilayers, nanostructured materials and spintronics.

His public activities outside of academia began in 1986 when he advised the government of Miguel Arraes, Pernambuco, in the area of S & T. After a period as secretary of the Heritage, Science and Culture of the Municipality of Olinda (PE) in 2001-2002 Rezende took office in January 2003, as the president of the Financier of Studies and Projects (FINEP / MCT). In July 2005, He left FINEP to assume the post of Minister of Science and Technology, which he holds until now.

# Latin America Optics and Photonics Conference Postdeadline Paper Abstracts

**• Tuesday, 28 September 2010 •**

**PDPTuJ • Postdeadline Session I**

*Boa Viagem*
**16.30–18.00**
*Denise M. Zezell; IPEN - CNEN/SP, Brazil, Presider*

**PDPTuJ1 • 16.30**
**Optical Characterization of Europium Chlortetracycline Complexes in the Presence of Oxidized Low Density Lipoproteins,** *Luciane dos Santos Teixeira[1], Andrea Moreira Monteiro[2], Antônio Martins Figueiredo Neto[2], Magnus Gidlund[2], Nilson Dias Vieira Júnior[1],* ***Lilia C. Courrol***[3]*; [1]IPEN/CNEN-SP, Brazil, [2]Univ. de São Paulo, Brazil, [3]Univ. Federal de São Paulo, Brazil.* Low Density Lipoprotein (LDL) or bad cholesterol, becomes even more dangerous when it is oxidized. In this paper we report an increase of the Europium Chlortetracycline complex emission in the presence of oxidized LDL.

**PDPTuJ2 • 16.45**
**Semiconducting Nanocomposites: Potential Tools for Optoelectronic Applications,** ***Patricia M. A. Farias***[1]*, Brunno H. Santiago[1], Claudilene R. Chaves[1], Denise P. L. A. Tenório[1], Beate S. Santos[1], Adriana Fontes[1], Marco A. Sacilotti[1], Marina F. Pillis[2], Luydson R. V. Silva[3], Rosa F. Dutra[3]; [1]Federal Univ. of Pernambuco - UFPE, Brazil, [2]Inst. for Nuclear and Energetics Res. IPEN, Brazil, [3]North-Northeast Graduate Program on Biotechnology RENORBIO, Brazil.* $TiO_2$ thin films covered by luminescent cadmium telluride quantum dots, produced a new semiconducting nanocomposite with very unique properties, which strongly point to the potential of this novel nanomaterial for the application in opto-electronic devices.

**PDPTuJ3 • 17.00**
**Fluorescence Spectroscopy: A Noninvasive Method for Monitoring the Treatment of Metastatic Renal Cell Carcinoma,** ***Rodolfo F. Marques****, Marina Souza Braga, Karen Cristina Chaves, Camila Barricheli Campanharo, Cinthia Zanini Gomes, Lilia Coronato Courrol, Maria Helena Bellini; IPEN - Inst. de Pesquisas Energéticas e Nucleares, Brazil.* The erythrocyte protoporphyrin IX was used to monitor the antiangiogenic treatment with endostatin in animal models of renal cancer. In the treated group there was a significant reduction in erythrocyte PpIX fluorescence levels.

**PDPTuJ4 • 17.15**
**Plasmon Waveguide Modes in Light Transmission through Subwavelength Sits and Holes in Real Metals,** ***John Weiner***[1]*, Frederico Nunes[2]; [1]NIST/CNST, USA, [2]Grupo de Engenharia da Informaco, DES, UFPE, Brazil.* We show that the lowest mode waveguide cutoff in cylindrical holes in real metals controls the transmission profile in line arrays of subwavelength round holes as a function of the array pitch. This behavior is in sharp contrast to the transmission profile in arrays of subwavelength slits where the lowest waveguide mode exhibits no cutoff. The transmission profile in both slits and holes is determined by interference between surface waves and the incident standing wave. We show through full 3-D, FDTD simulations that the phase of the interference pattern is a sensitive function of the position of the lowest-order waveguide mode, above or below cutoff.

**PDPTuJ5 • 17.30**
**An Artificial Immune System for Optical Fiber Based Directional Couplers Multiplexer/Demultiplexers Design,** ***Carlos H. Silva-Santos***[1,2]*, Vitaly F. Rodríguez-Esquerre[3], Hugo E. Hernández-Figueroa[2]; [1]IFSP-Itapetininga, Brazil, [2]Univ. of Campinas, Brazil, [3]Federal Univ. of Bahia, Brazil.* The design of optical-fiber directional couplers based multiplexers/demultiplexers by using the artificial immune system for wavelength division multiplexing applications is presented and validated by the beam propagation method.

**PDPTuJ6 • 17.45**
**Determining the Upconversion Luminescence in a Diode-pumped Nanocrystaline $Nd^{3+}$:$YVO_4$ Random Laser,** ***Niklaus Ursus Wetter****, Renato Juliani Ribamar Vieira, Laércio Gomes; Ctr. de Lasers e Aplicações - IPEN/SP, Brazil.* The first Nd:$YVO_4$ random laser is demonstrated as well as a new method to demonstrate random laser action and calculate the contribution of stimulated emission and upconversion to the backscattering cone.

PDPTuK • Postdeadline Session II

*Candeias A*
**16.30–17.45**
*Christiano J. de Matos; Univ. Presbiteriana Mackenzie, Brazil, Presider*

**PDPTuK1 • 16.30**
**Efficient Neural Network Modeling of Photonic Crystal Fiber Chromatic Dispersion, *V. F. Rodríguez-Esquerre*,** *J. J. Isidio de Lima, A. Dourado-Sisnando; Federal Univ. of Bahia, UFBA, Brazil.* The chromatic dispersion of photonic crystal fibers has been successfully and efficiently computed by using an artificial neural network. By using ANN we can easily evaluate the properties of PCFs without needing numerical computations

**PDPTuK2 • 16.45**
**Analytical Description of Spatial Depolarization, *Jacques Sorrentini*,** *Myriam Zerrad, Gabriel Soriano, Claude Amra; Inst. Fresnel, France.* A general analytical approximated model is proposed to describe the loss of polarization that can take place by spatial average within the solid angle of a detector.

**PDPTuK3 • 17.00**
**Reduction of Cross-Gain Modulation in a Fiber Optical Parametric Amplifier by Using All-Optical Gain Clamping, *Rohit Malik*,** *Michel Marhic; Swansea Univ., UK.* We report reduction of cross gain modulation to less than 1 dB by using gain clamping in a fiber optical parametric amplifier. Power penalties were improved from 2.5 dB to 0.5 dB.

**PDPTuK4 • 17.15**
**True Bandlimited Diffusers, *Tasso Sales*;** *RPC Photonics, Inc., USA.* We have recently developed design and fabrication techniques that provide refractive diffusers with true bandlimited performance. We discuss design principles, comparison with alternate diffuser technologies, fabrication, testing, and some applications of bandlimited diffusers.

**PDPTuK5 • 17.30**
**Hermann Grid's Dark Diagonals Disprove QM's "Beliefs",** *David Matthew McLeod, DECEASED[1],* ***Roger D. McLeod*[2]**; *[1]Bastyr Univ., USA, [2]Univ. Massachusetts Lowell, USA.* Vision, QM, electrons, nucleons in stringy equivalences, encode and spatially Fourier transform as field amplitudes, not "probabilities."

## NOTES

## Latin America Optics and Photonics Conference Key to Authors

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