Latin America Optics & Photonics 2012

Conference Program and Technical Digest

10 - 13 November 2012
Maresias Beach Hotel
São Sebastião, Brazil

Contents

Program Committee .......................2
Plenary Speakers ..........................3
Special Events ............................4
Exhibitors Guide ..........................5
Explanation of Session Codes ......7
Agenda of Sessions ......................7 - 9
Expanded Schedule with Abstracts ....9 - 30
Key to Authors and Presiders ........31 - 34
LAOP Program Committee

Hugo Fragnito, UNICAMP, Brazil, General Chair
Cid B. de Araújo, Univ. Federal Pernambuco, Brazil, Conference Co-Chair
Jean Pierre Van der Weid, PUC RJ, Brazil, Conference Co-Chair

Latin America Advisory Committee
Ana Cardenas, Universidad de Antioquia, Colombia
Ricardo Marotti, Instituto de Fisica, Facultad de Ingeniería, Univ. Republica Uruguay, Uruguay
Javier Sanchez-Mondragon, INAOE, Mexico
José Luis Paz, Simón Bolívar Univ., Venezuela
Carlos E Saavedra Rubilar, Univ. Concepción, Chile
Eunezio Thoro de Souza, Univ. Mackenzie, Brazil
Marcelo Trivi, CIOP, Argentina

Technical Program Subcommittees

Atomic Physics and Laser Spectroscopy
Vanderlei Bagnato, Univ. of São Paulo, São Carlos, Brazil, Chair
Flavio Cruz, UNICAMP, Brazil, Co-Chair
Marcelo Ducloy, Univ. Paris Nord, France
Rafael Sarmiento, Univ del Atlantico, Colombia

Biophotonics and Biomedical Applications
Laura Lechuga, CSIC CIN2, Spain, Chair
Carlos Lenz César, UNICAMP, Brazil, Co-Chair
Efrain Solarte, Univ del Valle, Colombia
Chris Xu, Cornell Univ., USA
Denise Zezell, IPEN, Brazil

Micro and Nanophotonics
Michal Lipson, Cornell Univ., USA, Chair
Hugo Figueroa, UNICAMP, Brazil, Co-Chair
Newton C Frateschi, UNICAMP, Brazil
Roberto Morandotti, Univ. of Quebec, Canada

Laser Science and Technology
Jorge Tredicce, INLN, France, Chair
Peter Delfyett, CREOL, Univ. of Central Florida, USA, Co-Chair
Hernando Garcia, Southern Illinois Univ., USA
Connie Chang-Hasnain, Univ. of California at Berkeley, USA
Oscar Martinez, Univ. of Buenos Aires, Argentina

Nonlinear Optics
Alex Gaeta, Cornell Univ., USA, Chair
Jorge Tocho, CIOP, Argentina, Co-Chair
Govind Agrawal, Univ. of Rochester, USA
George Boudiebs, Univ. d’Angers, France
Robert Boyd, Univ. of Rochester, USA
David Hagan, CREOL – Univ. of Central Florida, USA
Yehiam Prior, Weizmann Inst., Israel
Eric Van Stryland, CREOL, USA

Optical Communications
Andy Chraplyvy, Alcatel-Lucent Bell Labs, USA, Chair
Alberto Paradisi, CPqD Foundation, Brazil, Co-Chair
Nelson Fonseca, UNICAMP, Brazil
Angela Guzman, CREOL, Univ. of Central Florida, USA
Raman Kashyap, Ecole Polytechnique de Montreal, Canada
Atul Srivastava, NEL – America, USA

Optical Design and Instrumentation
Walter Margulis, ACREO, Sweden, Chair
Jaime Frejlich, UNICAMP, Brazil, Co-Chair
Hypolito José Kalinowski, Fed. Univ. of Technology Paraná, Brazil
Luiz Carlos Guedes Valente, PUC-Rio, Brazil

Optics in Information Science
Ari Friberg, Aalto Univ., Sweden, Chair
Pedro Torres, Univ. Nacional de Colombia, Colombia, Co-Chair
Daniel May Arrioja, Universidad Autónoma de Tamaulipas, México
Flavio Horowitz, Universidade Federal Rio Grande do Sul, Brazil
Jonathan Knight, Univ. of Bath, UK

Quantum Optics
Luiz Davidovich, Universidade Federal do Rio de Janeiro, Brazil
Gerd Leuchs, Univ. Erlangen-Nürnberg, Max Planck Inst., Germany
Jose Antonio Roversi, UNICAMP, Brazil
Guilherme Temporão, PUC-Rio, Brazil
Wolfgang Tittel, Univ. of Calgary, Canada

Conference Organizers
Simone Silva Telles, CEPOF/Fotonicom, UNICAMP, Brazil
Eliane Valente, CEPOF/Fotonicom, UNICAMP, Brazil
Plenary Speakers

Science and Technology in Brazil
Carlos Henrique de Brito Cruz, São Paulo Research Foundation, FAPESP, Brazil
Carlos Henrique de Brito Cruz graduated in Electrical Engineering (Inst. Tecn. de Aeronáutica, ITA, 1978) and has a MSc in Physics and a DSc in Physics (1980 and 1983, Physics Inst., Univ. of Campinas, Unicamp). He was a visitor at the Quantum Optics Laboratory, at the University of Rome (1981), at AT&T Bell Laboratories in Holmdel, NJ (1986-7) and Murray Hill, NJ (1990). Brito Cruz directed the Physics Institute at Unicamp for two terms. He has been the Dean of Research at Unicamp, the President of the São Paulo Research Foundation, FAPESP (1996-2002) and Rector of Unicamp (2002-05). Since 2005 he is the Scientific Director at the São Paulo Research Foundation, FAPESP. Brito Cruz is a member of the Brazilian Academy of Sciences.

Novel Light-Matter Interactions in Glass Fibre Microstructures
Philip Russell, Max Planck Institute for the Science of Light, Germany
Philip Russell is a Director at the Max-Planck Institute for the Science of Light in Erlangen, Germany and holds the Krupp Chair in Experimental Physics at the University of Erlangen-Nuremberg. His research interests currently focus on scientific applications of photonic crystal fibers and related structures. He is a Fellow of the Royal Society and the Optical Society of America and has won several international awards for his research including the 2005 Körber Prize for European Science, the 2005 Thomas Young Prize of the Institute for Physics (UK) and the 2000 OSA Joseph Fraunhofer Award/Robert M. Burley Prize.

Mid-infrared Generation with Two Color CPA Lasers
Donna Strickland, University of Waterloo, Canada
Donna Strickland received her B. Eng. Degree in Engineering Physics, from McMaster University in 1981. She graduated from the University of Rochester in 1989 with a Ph.D. in Optics. Along with her PhD supervisor, Dr. Gerard Mourou, Donna Strickland co-invented Chirped Pulse Amplification (CPA), which made it possible to amplify ultra-short pulses to unprecedented levels. From 1988 to 1991, Dr. Strickland was a research associate at the National Research Council of Canada. The following year, she was a physicist with the laser division of Lawrence Livermore National Laboratory. In 1992, she became a member of the technical staff of Princeton's Advanced Technology Center for Photonics and Optoelectronic Materials. Dr. Strickland joined the physics department of the University of Waterloo as an assistant professor in 1997. At Waterloo, Dr. Strickland's ultrafast laser group develops high-intensity laser systems for nonlinear optics investigations. She was promoted to Associate Professor in 2002 and since 2007 has been the Associate Chair of the Department. Dr. Strickland was selected as an Alfred P. Sloan Research Fellow in 1998. She received a Premier's Research Excellence Award in 1999 and a Cottrell Scholars Award from Research Corporation in 2000 and was named a Fellow of the Optical Society of America in 2008. Dr. Strickland has worked on several committees within the OSA, including the editorial board of OPN, topical editor for Optics Letters. She was elected to be a Director-at-large on the OSA board from 2005-2007 and sat on the Board executive committee during 2006-2007. Currently, she is the OSA appointed VP to the ICO board. Dr. Strickland is the 2011 OSA Vice-President and will serve as OSA President in 2013.
Special Events

Conference Reception
Saturday, 10 November
18:30-20:30
*Toulouse Garden (Maresias Hotel Restaurant’s Garden)*
Meet your fellow conference attendees during this informal reception. It will feature light fare and beverages. It is open to all full technical attendees.

Poster Sessions
Monday, 12 November, 10:30-11:30
Tuesday, 13 November, 10:00-11:00
*Exhibit Hall*
The poster sessions are an integral part of the technical program and offer a unique networking opportunity, where presenters can discuss their results one-on-one with interested parties.

Postdeadline Session
Monday, November 12
17:30 - 18:50
*Maresias Room*
The postdeadline sessions will give participants the opportunity to hear new and significant material in rapidly advancing areas. Only those papers judged to be truly excellent and compelling in their timeliness were accepted.

Conference Banquet
Monday, 12 November
17:45-23:00
*Buses departure Maresias Beach Hotel Reception Lobby at 19:45. Buses will leave Viela de Praia at 23:00 and 24:00 to return to the hotel.*
Conference attendees will be transferred to Viela da Praia for the conference banquet. The evening will feature multiple course including traditional Brazilian favorites: Seafood Tartlet, Potato cream with dried Beef and Cabbage Crisps, Shrimp Bobó, Penine with cubes of Filet Mignon with Capers and Olives Azapa, Shrimp Gabriela, Grilled Fish Sauce Seafood, Banana Cuca, Romeo and Juliet dessert and Caipirinhas. Guest will be entertained by a Brazilian Music Quartet and Samba Show. The banquet is open to all full technical attendees. Conference attendees may purchase extra tickets in advance for their guest.
Suggest dress: Cocktail attire, with jacket optional.

Exhibit Hall

*Foier Hall*
The exhibitors will be available during coffee breaks and Poster Sessions.

<table>
<thead>
<tr>
<th>Date</th>
<th>Coffee Breaks</th>
<th>Poster Sessions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sunday, 11 November</strong></td>
<td>10:00 – 10:30</td>
<td></td>
</tr>
<tr>
<td></td>
<td>16:00 – 16:30</td>
<td></td>
</tr>
<tr>
<td><strong>Monday, 12 November</strong></td>
<td>10:00 – 10:30</td>
<td>10:30 – 11:30</td>
</tr>
<tr>
<td></td>
<td>17:00 – 17:30</td>
<td></td>
</tr>
<tr>
<td><strong>Tuesday, 13 November</strong></td>
<td>10:00 – 10:30</td>
<td>10:30 – 11:30</td>
</tr>
<tr>
<td></td>
<td>17:00 – 17:30</td>
<td></td>
</tr>
</tbody>
</table>
Exhibitor Guide

BrLabs
Campinas, SP, Brazil
P: +55.19.4062.8090 R. 0500
E: helcia@br-labs.com
www.br-labs.com
BR Labs is a company based in Campinas, Sao Paulo, Brazil, dedicated to the development, manufacturing and sales of laser systems and optics. With selected partners such as Femtolasers, Laser Quantum, Northrop Grumman CEO, LIMO, Teem Photonics and Crystech, BR Labs can offer a broad selection of products and services.

CPqD
P: +55.19.3705.7066
E: paradisi@cpqd.com.br
www.cpqd.com.br
CPqD is an independent institution focused on innovation through Information and Communication Technologies (ICT) for telecommunication, finance, energy, and other industries, aiming at contributing to Brazil’s competitiveness and the digital inclusion of the Brazilian society.

Energetiq Technology, Inc.
Woburn, Massacusetts, USA
P: +1.781.939.0763
E: info@energetiq.com
www.energetiq.com
Energetiq’s Laser-Driven Light Source (LDLS®) offer the highest brightness, broadest band (170nm-2100nm UV-Vis-NIR), and the longest life, for advanced spectroscopic, imaging, monitoring and analytical applications. Energetiq adds to its LDLS range with the easy-to-use EQ-99FC, with a convenient SMA fiber-coupling output.

FEIRA Co., Ltd.
Tokyo, Japan
P: +81.3.6380.0390
E: sales@feira.co.jp
www.feira.co.jp
FEIRA, is a opto-photonics specialized trading company in Japan. Our mission is to present great products all over the world, bridging the product culture gap and adding value for each customer through our service. Our profound experience and credibility built up for more than total accumulation 55 years enable us to execute this mission and we hope we can start having new acquaintances with you.

Fotónica Tecnología Óptica Ltda.
Campinas, SP, Brazil
P: +55.19.3515.2200
E: walter@fotonica.com.br
www.fotonica.com.br
Fotónica manufactures passive optical components for optical communications, such as patch-cords, attenuators, splitters, connectorized cables, distribution frames, and related items. It also offers services in optical communications, such as system design, installation, commissioning, and audit.

Hamamatsu
Bridgewater, New Jersey, USA
P: +1.908.231.0960
E: usa@hamamatsu.com
www.sales.hamamatsu.com
Hamamatsu Corporation is the North American subsidiary of Hamamatsu Photonics K.K. (Japan), a leading manufacturer of devices for the generation and measurement of infrared, visible, and ultraviolet light. These devices include photodiodes, photomultiplier tubes, scientific light sources, infrared detectors, photoconductive detectors, and image sensors. The parent company is dedicated to the advancement of photonics through extensive research. This corporate philosophy results in state-of-the-art products which are used throughout the word in scientific, industrial and commercial applications.

Micron Optics, Inc
Atlanta, Georgia, USA
P: +1.404.325.0005
E: info@micronoptics.com
www.micronoptics.com
Micron Optics, a leading provider of tunable optical technologies, offers a comprehensive portfolio of components and instruments for Optical Sensing and Imaging markets. Built upon its solid technology foundation, Micron Optics’ products span from simple tunable components to fast swept laser modules to fast and accurate optical instrumentation.

PadTec
Campinas, SP, Brazil
E: comercial@padtec.com
www.padtec.com
Padtec is a company dedicated to the development, manufacturing and sales of high capacity optic communication systems. The company provides solutions for long distance networks, metropolitan, access and storage networks and has distinguished itself through its presence in the trunking networks of the largest telecommunication service providers of Latin America. With businesses and representatives in South America, Central America, Europe and Asia, Padtec has consolidated itself as a global provider of high technology customized solutions. Padtec is based in Campinas-São Paulo, Brasil, and has offices in Argentina, Peru, Mexico, France and Israel.

Thorlabs
Newton, New Jersey, USA
P: +1.973.300.3000
E: sales@thorlabs.com
www.thorlabs.com
Thorlabs designs, develops, and manufactures building blocks for the Photonics industry, including optomechanics, motion control electronics, nanpositioning stages, fiber and optical components, laser diodes, tunable lasers, and vibration isolation systems. In addition, we can provide system-level solutions including complete OCT, confocal, and multiphoton imaging systems.
Nossos Produtos:

- OBTENÇÃO DE IMAGENS
- OPTOMECÂNICOS
- CONTROLE DE MOVIMENTO
- ÓTICOS
- FIBRAS
- LUZ
- ANÁLISE DA LUZ

Contato:
Javier Jurado (suporte técnico)
Marilde Courteille (gerente, vendas)
Tel: (16) 3413-7062
brasil@thorlabs.com

Rua Riachuelo, 171,
São Carlos, SP, Centro
13560-110
CNPJ: 15.689.776/0001-38

www.thorlabs.com
Explanation of Session Codes

The first letter of the code designates the meeting. The second element denotes the day of the week (Sunday = S, Monday = M, Tuesday = T). The third element indicates the session series in that day (for instance, 1 would denote the first parallel sessions in that day). Each day begins with the letter A in the fourth element and continues alphabetically through a series of parallel sessions. The number on the end of the code (separated from the session code with a period) signals the position of the talk within the session (first, second, third, etc.). For example, a presentation coded LM2A.4 indicates that this paper is being presented on Monday (M) in the second series of sessions (2), and is the first parallel session (A) in that series and the fourth paper (4) presented in that session.

Agenda of Sessions

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>17:30—20:30</td>
<td>Registration, Camburi Room</td>
</tr>
<tr>
<td>18:30—20:30</td>
<td>Welcome Reception, Toulouse Garden (Maresias Hotel Restaurant’s Garden)</td>
</tr>
</tbody>
</table>
## Agenda of Sessions

### Sunday, 11 November

<table>
<thead>
<tr>
<th>Time</th>
<th>Guaeca</th>
<th>Pauba</th>
<th>Una</th>
</tr>
</thead>
<tbody>
<tr>
<td>07:00 – 18:00</td>
<td>Registration, Foyer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>08:00 – 10:00</td>
<td>LS1A • Opening General Session, Maresias</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10:00 – 10:30</td>
<td>Exhibit Hall Opening and Coffee Break, Foyer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10:30 – 12:30</td>
<td>LS2A • Mode-Locked Lasers</td>
<td>LS2B • Quantum Optics</td>
<td>LS2C • Fiber Bragg Gratings</td>
</tr>
<tr>
<td>12:30 – 14:00</td>
<td>Lunch, On your Own</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14:00 – 16:00</td>
<td>LS3A • Novel Sources I</td>
<td>LS3B • Fiber Sensors</td>
<td>LS3C • Active Optics and Imaging</td>
</tr>
<tr>
<td>16:00 – 16:30</td>
<td>Exhibit Hall and Coffee Break, Foyer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16:00 – 18:10</td>
<td>LS4A • Novel Sources II</td>
<td>LS4B • Novel Sources and Precision Measurements</td>
<td>LS4C • Sensors</td>
</tr>
</tbody>
</table>

### Monday, 12 November

<table>
<thead>
<tr>
<th>Time</th>
<th>Guaeca</th>
<th>Pauba</th>
<th>Una</th>
</tr>
</thead>
<tbody>
<tr>
<td>07:00 – 18:00</td>
<td>Registration, Foyer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>08:00 – 10:00</td>
<td>LM1A • Nonlinear Optics I</td>
<td>LM1B • Ultracold Trapped Atoms</td>
<td>LM1C • WDM Transmission and Amplification</td>
</tr>
<tr>
<td>10:00 – 10:30</td>
<td>Exhibit Hall and Coffee Break, Foyer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10:30 – 11:30</td>
<td>LM2A • Poster Session I, Foyer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11:30 – 13:30</td>
<td>LM3A • Nonlinear Optics II</td>
<td>LM3B • Coherence and Physical Optics</td>
<td>LM3C • High Speed Optical Devices and Polarization Effects</td>
</tr>
<tr>
<td>13:30 – 15:00</td>
<td>Lunch, On your Own</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15:00 – 17:00</td>
<td>LM4A • Nonlinear Optics III</td>
<td>LM4B • Optical Forces and Imaging</td>
<td>LM4C • Optical Networking</td>
</tr>
<tr>
<td>17:00 – 17:30</td>
<td>Exhibit Hall and Coffee Break, Foyer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17:30 – 18:50</td>
<td>LM5A • Postdeadline Papers, Maresias Room</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19:45 – 23:00</td>
<td>Conference Banquet— Buses departure Maresias Beach Hotel Reception Lobby at 19:45.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
# Agenda of Sessions

## Tuesday, 13 November

<table>
<thead>
<tr>
<th>Time</th>
<th>Guaeca</th>
<th>Pauba</th>
<th>Una</th>
</tr>
</thead>
<tbody>
<tr>
<td>07:00 – 18:00</td>
<td></td>
<td>Registration, Foyer</td>
<td></td>
</tr>
<tr>
<td>8:00—10:00</td>
<td>LT1A</td>
<td>Biophotonics I</td>
<td>LT1B• Nanoparticles and Nanowires</td>
</tr>
<tr>
<td>10:00—10:30</td>
<td></td>
<td>Exhibit Hall and Coffee Break, Foyer</td>
<td></td>
</tr>
<tr>
<td>10:30—11:30</td>
<td></td>
<td>LT2A• Poster Session II, Foyer</td>
<td></td>
</tr>
<tr>
<td>11:30—13:30</td>
<td>LT3A</td>
<td>Biophotonics II</td>
<td>LT3B• Active Devices</td>
</tr>
<tr>
<td>13:30—15:00</td>
<td></td>
<td>Lunch, On your Own</td>
<td></td>
</tr>
<tr>
<td>15:00—17:00</td>
<td>LT4A</td>
<td>Biophotonics III</td>
<td>LT4B• Passive Devices</td>
</tr>
<tr>
<td>17:00—17:30</td>
<td></td>
<td>Exhibit Hall and Coffee Break, Foyer</td>
<td></td>
</tr>
<tr>
<td>17:30—18:00</td>
<td></td>
<td>Final Remarks, Maresias Room</td>
<td></td>
</tr>
</tbody>
</table>

## Sunday, 11 November

08:00—10:00
LS1A • Opening General Session
Maresias Room

LS1A.1 • 08:00
Science and Technology in Brazil, Carlos H. Brito Cruz1; 1Universidade Estadual de Campinas, Brazil.
We will show an overview of S&T in Brazil, considering funding, the role of universities and business, and illustrative results, including data for the areas of Optics and Photonics.

LS1A.2 • 08:40
Mid-infrared Generation with Two Color CPA Lasers, Donna T. Strickland1; 1University of Waterloo, Canada.
With the help of nonlinear optics, laser radiation can now span the electromagnetic spectrum from X-rays to THz radiation. However the mid-infrared radiation region known to spectroscopists as the “fingerprint region” from 5 to 20 µm still has very few coherent sources. Two-color chirped pulse amplification laser systems have been developed to generate mid-infrared wavelengths longer than 8µm by frequency mixing.

LS1A.3 • 09:20
Novel Light-Matter Interactions in Glass Fibre Microstructures, Philip S. Russell1; 1Max-Planck Institute, Germany.
The talk will include recent results on giant optomechanical nonlinearities in dual nanoweb fibre, optothermal particle trapping in a gas-filled hollow core, and excitation of orbital angular momentum states in twisted solid-core photonic crystal fibre.
**La (CNTs)** are developed to use passively mode-locked semiconductor lasers, and the modelling strategies developed on the basis of Travelling-Wave Models are reviewed.

### Guaecá Room

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Speaker(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:30–12:10</td>
<td>LS2A • Mode-Locked Lasers</td>
<td>Presider: Franklyn Quinlan; NIST, USA.</td>
</tr>
<tr>
<td>LS2A.1</td>
<td>10:30</td>
<td>Invited</td>
</tr>
</tbody>
</table>

### Pauba Room

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Speaker(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:30–12:30</td>
<td>LS2B • Quantum Optics</td>
<td>Presider: Antonio Vidella-Barranco; Universidade Estadual de Campinas, Brazil</td>
</tr>
<tr>
<td>LS2B.1</td>
<td>10:30</td>
<td>Invited</td>
</tr>
</tbody>
</table>

### Una Room

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Speaker(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:30–12:30</td>
<td>LS2C • Fiber Bragg Gratings</td>
<td>Presider: Luiz Valente; Pontificia Univ Catolica Rio de Janeiro, Brazil</td>
</tr>
<tr>
<td>LS2C.1</td>
<td>10:30</td>
<td>Invited</td>
</tr>
</tbody>
</table>

### LS2A.2 • 11:10

**Erbium-Doped Fiber Laser Hybrid Mode-Locked Operating With CNT at 10 GHz, Heidi Kaori Sato Pertille; Eunezio Antonio De Souza; 1Lab de Fotonica, Universidade Presbiteriana Mackenzie, Brazil. We present an Erbium-doped fiber laser operating at 10 GHz, hybrid mode-locked using an electro-optical phase modulator and carbon nanotubes (CNT) saturable absorbers generating pulses with duration of 1.77 ps and bandwidth of 4.04 nm.**

### LS2B.2 • 11:10

**Quantum Correlations Between Two Oscillators Connected by a Time-Dependent Coupling, Thales Figueiredo Roque; Jos A. Roveri; 1Universidade de Sao Paulo, Brazil. We analyse the dynamics of quantum correlations in a system composed by two harmonic oscillators in contact with a common heat bath and coupled with each other by a time dependent coupling.**

### LS2A.3 • 11:30

**New method for the fabrication of films incorporating carbon nanotubes for mode-locked Erbium-doped fiber lasers, Rodrigo M. Gerosa; David Steinberg; Henrique G. Rosa; Claudia B. dos Santos; Christiano de Matos; Eunezio Antonio De Souza; 1Grupo de Fotônica, Mackenzie University, Brazil. We present a new and simple method for the production of micron-thick polymeric films incorporating carbon nanotubes (CNTs) directly on the tip of an optical fiber ferrule using a microtip for EDFL.**

### LS2B.3 • 11:30

**The Interaction of a two-level Atom With the Electromagnetic Field in a Cross Cavity, Julio C. Garcia-Melgarejo; Craig Stroud; Jose Javier Sanchez-Mondragon; Omar S. Magaña-Loiza; 1Departamento de Óptica, Instituto Nacional de Astrofisica, Óptica y Electronica, Mexico; 2Department of Physics and Astronomy, University of Rochester, USA. We propose a model for studying a two-level atom (TLA) in a cross cavity configuration interacting with two electromagnetic fields. We calculate the wave function and present analytical results for the atomic inversion for a state in the weak intensity regime.**

### LS2C.2 • 11:10

**Forces of Orthodontic Closed Coil Springs Measured Using Fiber Bragg Gratings, Ceci-ro Martelli; Maura S. Milczewski; Felipe G. Dinisio; Paulo C. Borges; Hypolito J. Kali-nowski; Jose M. Cunha; 1UTFPR, Brazil; 2ABO, Brazil. The aim of this study is to compare forces generated by three different orthodontic closed coil springs supplied by three companies, optical fiber Bragg gratins are used to evaluate the force of closing of springs.**

### LS2C.3 • 11:30

**Fabrication of Low-Cost Long-Period Fiber Gratings Using Tapered Optical Fibers Embodied in Polymer, Anabel Martinez-Gaytan; Jorge Soto-Olmos; Laura Oropesa-Ramos; Juan Hernandez-Cordero; 1Departamento de Electronica, Facultad de Ingenieria, UNAM, Mexico; 2Instituto de Investigaciones en Materiales, UNAM, Mexico. We report on the fabrication of long-period fiber gratings using tapered fibers embedded in PDMS polymer using a low-cost technique. Temperature sensitivity of these biocompatible devices is also evaluated.**
LS2A • Mode-Locked Lasers  
- Continued

LS2A.4 • 11:50  
Thermo-optical Tuning of Erbium-Doped Fiber Ring Laser, Jose E. Antonio-Lopez1,2, Jose Javier Sanchez-Mondragon1, J. G. Murillo3, Patrick LiKamWa2, Daniel A. May-Arrioja4; 1Departamento de Optica, INAOE, Mexico; 2CREOL, The College of Optics and Photonics, University of Central Florida, USA; 3Centro de Investigación en Materiales Avanzados S C, Mexico; 4Departamento de Electronica, Universidad Autonomia de Tamaulipas, Mexico. A thermo-optically tunable multimode interference fiber laser is demonstrated. The laser emission can be easily tuned trough the C-band by simply changing the temperature around the multimode fiber liquid cladding of the filter.

LS2B • Quantum Optics  
- Continued

LS2B.4 • 11:50  
Entanglement Between a Moving Mirror and a Trapped Ion, Clovis Correia1, Antonio Vidieila-Barranco2; 1Universidade Estadual de Campinas, Brazil. We present an interferometry-based scheme to entangle the quantum state of a moving mirror of an optomechanical cavity with the vibrational state of a single ion trapped inside a second cavity.

LS2B.5 • 12:10  
Enhancement of the Quantum Coherence in a Two Qubits Systems by the Increases of the Temperature, Julio Cesar Gonzalez Henao1, Jose Antonio Roversi2; 1IFGW, UNICAMP, Brazil. In this work we study numerically and analytically, the interaction between two maximally entangled qubits in contact with a thermal reservoir is non-linear. It is analyzed the dynamics of the coherence of the system as a function of the temperature.

LS2C • Fiber Bragg Gratings  
- Continued

LS2C.4 • 11:50  
Biophotonics with Block Surface Waves on Photonics Crystals, Francesco Michelotti1, Alberto Sinibaldi2, Norbert Danz3, Francesca Frascella4, Paola Rivo1, Pietro Mandracci5, Natascia De Leo6, Fabrizio Giorgis7, Peter Munzert1, Ulrike Schultz8, Lorenzo Dominici9, Emiliano Descovil9; 1Department of Basic and Applied Sciences for Engineering, SAPIENZA Università di Roma, Italy; 2Department of Applied Science and Technology, Politecnico di Torino, Italy; 3Institute for Applied Optics and Precision Engineering, Fraunhofer Gesellschaft, Germany; 4National Institute of Metrological Research, Italy. We report on the experimental characterization of the peculiar properties of surface electromagnetic waves propagating at the truncation facet of finite one dimensional dielectric photonic crystals. Such waves are generally known as Bloch surface waves. In particular we show results on the direct experimental comparison of the performance of Bloch surface wave and surface plasmon polariton based optical biosensors and on the application of Bloch surface waves in fluorescence microscopy.

12:30 - 14:00  
LUNCH, On your Own

Notes
LS3A.1 • 14:00
Investigation of a Blue Luminescence Power in Raman Crystals, Jonas Jakutis Neto, Niklaus U. Wetter, Helen M. Pask; 1IPEN/Macquarie University, Brazil; 2MQPhotonics, Macquarie University, Australia. In order to improve the crystalline Raman laser performance, this work presents the characterization of the power extracted by a blue luminescence present in some of the Raman crystals, seen as probable source of loss.

LS3B.2 • 14:40
Fiber Optic Multimirror Fabry-Perot Sensor for Liquids Analysis, Violeta A. Marquez-Cruz, Juan Hernandez-Cordero; 1Instituto de Investigaciones en Materiales, Universidad Nacional Autónoma de Mexico, Mexico. We propose a new technique to determine physical properties of liquids through analysis of a remnant drop pending from an optical fiber. Processing of the back-reflected signal is done using a multimirror Fabry-Perot interferometer model.

LS3B.3 • 15:00
Salinity Sensor based on a Two-Core Fiber, Jose Guzman-Sepulveda, Miguel Torres-Cisneros, Daniel A. May-Arriola; 1Department of Electrical Engineering, Universidad Autónoma de Tamaulipas, Mexico; 2Engineering Division, Universidad de Guanajuato, Mexico. A highly sensitive salinity sensor based on Two-Core fiber is demonstrated. The achieved sensitivity, 9.60 nm/(mol/L), is more than 12 and 400 times larger than that reported for both polymide-coated PCF and FBG, respectively.

LS3C.2 • 14:40
Progressive Power Lenses (PPL) Characterization with Multi-Wavelength Speckle Interferometry, Eduardo A. Barbosa, Danilo Silva, Fabio Lima, Carlos Nascimento, Juan Mittani, Niklaus U. Wetter; Laboratório de Óptica Aplicada, Fatec-SP, Brazil. This work presents a method for spherical and aspherical lens characterization based in dual-wavelength Digital Speckle Pattern Interferometry (DSSI). The spherical power and the astigmatism distribution are taken from reconstructed wavefront by using Zernike polynomials.

LS3C.3 • 15:00
Imaging with extended depth of field by means of the peacock eye optical element, Rodrigo Henao, Zbigniew Jaroszewicz, Karel Kakarenko, Andrzej Kolodziejczyk, Maria Sargario Millan, Krzysztof Petelczyk, Maciej Sypek, Izabela Duncz; Instituto de Fisica, Universidad de Antioquia, Colombia; 1Laboratory of Applied Optics, Poland; 1National Institute of Telecommunications, Poland; 3Faculty of Physics, Warsaw University of Technology, Poland; 4Dep. Optics & Optometry, Technical University of Catalonia, Spain. We present imaging properties of the peacock eye optical element. Its abilities for imaging with extended depth of field are illustrated experimentally. The element makes possible to maintain the acceptable resolution, contrast and brightness of the output images for a wide range of distances.
LS3A • Novel Sources I  
- Continued

LS3A.4 • 15:20  
Coherent and Dynamic Nonlinear Interactions in 2D Photonic Crystal nanocavities, J. Ariel Levenson1, Patricio Grinberg1, Maia Brunstein1, Kamel Bencheikh1, Alejandro Yacomotti1, Isabelle Sagnes1, Fabrice Raineri1, Yannick Dumeige2; 1LPN-CCNRS, France; 2Foton, France. By coupling light resonantly into a nanocavity new avenues are open to efficiently produce nonlinear coherent interactions. We discuss recent results on optical bistability, excitability and slow light in semiconductor L3 Photonic Crystal nanocavities.

LS3B • Fiber Sensors  
- Continued

LS3B.4 • 15:20  
MMI Fiber Optic Temperature Sensor, Victor Ivan Ruiz Perez1, Daniel Lopez-Cortés1, Jose Javier Sanchez-Mondragon1, Daniel A. May-Arrioja1; 1Departamento de Optica, INAOE, Mexico; 2Departamento de Electronica, Universidad Autónoma de Tamaulipas, Mexico. We report a temperature fiber sensor based on MMI effects using a No-Core fiber inserted in a glass tube filled with ethylene-glycol. A sensitivity of 0.4421 nm/°C has been achieved.

LS3B.5 • 15:40  
Polymer Microbubble Fabry-Perot Temperature Sensor, Beatriz Argumedo1, Violeta Marquez1, Juan Hernández1; 1Universidad Nacional Autónoma de México, Mexico. A Fabry-Perot cavity generated between a microbubble and a single-mode fiber embedded in PDMS is evaluated as a temperature sensor. The sensor provides a linear response over a temperature range of 35 °C.

16:00 - 16:30  
EXHIBIT HALL and COFFEE BREAK, Foyer

Notes
The Optical Frequency Divider for High Spectral Purity Microwave Generation, Franklin Quinlan; Tara M. Fortier; Haifeng Jiang; Jennifer Taylor; Scott Diddams; ‘National Inst of Standards & Technology, USA. An optical frequency comb locked to a stable optical reference can serve as a source for microwave signals having very high spectral purity. Here we describe the system architecture, and present our latest results.

Thermo-optically Tunable Polymer-based Waveguide Bragg-Grating Lasers for the C-Band Domain, Norbert Grote; Zhizhang Zhang; Holger Klein; David De Felipe; Wolfgang Rehbein; Walter Brinker; Crispin Zawadzki; Norbert Keil; Panos Groumas; Cristos Kouloumentas; Raulcu Dimitri; Eric Miller; ‘Photicomponents, Fraunhofer Heinrich Hertz Institute, Germany; ‘School of Electrical and Computer Engineering, National Technical University of Athens, Greece; ‘GigOptics Inc., USA. Thermo-optically tunable laser diodes comprised of hybridly integrated InP based gain chips and Bragg grating loaded polymer waveguides were developed for C-band applications. Passive and electro-optic polymer materials were used. Results will be reported.

Solvent effects in conjugated polymer random lasers, Ana Ramirez-Ledesma; Juan Hernandez-Cordero; ‘Univ National Autonoma de Mexico, Mexico. We evaluate the performance of MEH-PPV in a random laser configuration using different solvents. UV-Vis spectroscopy and SEM images show that the solvent is important for the morphology of the samples

Silver Nanoparticles Synthesized by Laser Ablation in Liquids and Application of Surface-Enhanced Raman Scattering, G. W. Yang; ‘Physics, Sun Yat-sen University, China. We report the synthesis and surface-enhanced Raman scattering (SERS) effect of silver nanoparticles (NPs) by using laser ablation in liquids. The as-synthesized silver NPs exhibit super SERS sensitivity.

Precision Measurements with Ultra-cold Alkaline Earth Atoms, Jan W. Thomesen; ‘Københavns Universitet, Denmark. Techniques of modern quantum optics allows for the preparation of ultra-cold atoms in well controlled quantum states ideal for precision measurements and tests of fundamental laws of physics. We report on our recent progress with precision measurements using alkaline earth atoms.

Optical Frequency Combs for Calibration of Spectra from Incoherent Sources: Improved Sensors for Pressure, Stark and Zeeman Shifts, Ricardo S. Moreira; Flavio C. Cruz; ‘Instituto de Fisica Gleb Wataghin, Universidade Estadual de Campinas, Brazil. We report on the use of an optical frequency comb for calibration of spectra from incoherent broadband light sources. Increased accuracy in frequency calibration can be used for improved sensing of pressure or electrical and magnetic fields.

Low-cost polymer Fresnel Microlens Array Fabricated by Maskless Lithography, Giuseppe A. Cirino; Sergio A. Loperena; Arlindo N. Montagnoli; Luiz G. Neto; Ronaldo D. Marnano; ‘Electrical Engineering, Universidade Federal de Sao Carlos, Brazil; ‘Electrical Engineering, Universidade de Sao Paulo, Brazil; ‘Electrical Engineering, Universidade de Sao Paulo, Brazil. This work presents the fabrication of 8X8 PDMS Fresnel microlens array (MLA) by maskless lithographic system. The FWHM intensity values of each spot present a deviation of 8%. Such a MLA can be applied as Shack-Hartmann wavefront sensor and to enhance the efficiency of detector arrays.
LM1A.1 08:00  Invited
Nonlinear Absorption in Quantum Confined Semiconductors, Lazaro A. Padilha1, David J. Hagan2, Eric W. Van Stryland1; Los Alamos National Laboratory, USA; CCREOL, University of Central Florida, USA. We show how the semiconductor band structure influences the size dependence trends of two-photon absorption in quantum dots. We demonstrate, via two-photon spectroscopy, that parity symmetry does not hold in small lead-chalcogenides quantum-dots.

LM1A.2 08:40
Withdrawn

LM1A.3 09:00
Charge-Transfer Dynamics in Rh6G-Functionalized TiO2 Nanoparticles Investigated by Pump-Probe Spectroscopy, Euclides Almeida1, Antonio M. Brito-Silva2, Andréa F. da Silva3, Giovanna Machado2, Leonardo de S. Menezes1, Cid Bartolomeu de Araujo1; Departamento de Física, Universidade Federal de Pernambuco, Brazil; Centro de Tecnologias Estratégicas do Nordeste (CETENE), Brazil; Programa de Pós-Graduação em Ciência de Matérias, Universidade Federal de Pernambuco, Brazil. We investigate charge transfer dynamics in Rh6G-functionalized amorphous TiO2 nanoparticles using transient absorption (TA) spectroscopy. The TA shows a bleaching signal that is shortened compared to the bleaching of the free dye in solution.

LM1A.4 09:20  Invited
Complex Nonlinear Optofluids - Optical Manipulation in Dense Suspensions, Mordechai Segev1, Elad Greenfield1, Demetri N. Christodoulides2; Technion Israel Institute of Technology, Israel; CCREOL - College of Optics & Photonics, University of Central Florida, USA. We demonstrate optical manipulation in strongly scattering colloidal Suspensions: shock-waves of particles induced by radiation pressure and the gradient force, inducing local phase transitions, manipulating condensed nanoparticle 'balls' deep inside light diffusing suspensions.

Guaecá Room
08:00—18:00
REGISTRATION, Sala de Apoio

LM1B.1 08:00  Invited
Using Atomic Physics to Understand Condensed Matter, Steven L. Rolston1; Physics, University of Virginia, USA. Using ultracold atomic systems as quantum simulators, many-body physics phenomena relevant to condensed matter systems can be explored. I will survey work in this area, and concentrate on the study of disorder in two-dimensional systems.

LM1B.2 08:40  Invited
Ultracold Atoms in Optical Lattices, Randall Hulet, Russell A. Hart1, Pedro M. Duarte1, Tsung-lin Yang1; Rice University, USA. We cool a two spin-component gas of 6Li atoms to quantum degeneracy and confine them in optical lattices. We obtain the phase diagram for a spin-imbalanced gas in 1D and search for antiferromagnetism in 3D.

LM1B.3 09:20
Engineered Optical Potentials for Dynamical Control of Quantum Gases, Ryan Ketterle1; Paula C. Ventura da Silva1, Luciano F. Santana1, Sergio R. Muniz1; IFSC-DFCM/UFP, University of São Paulo, Brazil. Quantum gases became an important cross-disciplinary tool in contemporary physics. Here we present the development of new methods to produce and control engineered arbitrary optical potentials to create dynamical quantum simulators of condensed matter systems.

Pauba Room
08:00—10:00
LM1B 08:00
Ultracold Trapped Atoms
Presider: Vanderlei Baghato, Univ. of São Paulo, São Carlos, Brazil

LM1B.1 08:00  Invited
Using Atomic Physics to Understand Condensed Matter, Steven L. Rolston1; Physics, University of Virginia, USA. Using ultracold atomic systems as quantum simulators, many-body physics phenomena relevant to condensed matter systems can be explored. I will survey work in this area, and concentrate on the study of disorder in two-dimensional systems.

LM1B.2 08:40  Invited
Ultracold Atoms in Optical Lattices, Randall Hulet, Russell A. Hart1, Pedro M. Duarte1, Tsung-lin Yang1; Rice University, USA. We cool a two spin-component gas of 6Li atoms to quantum degeneracy and confine them in optical lattices. We obtain the phase diagram for a spin-imbalanced gas in 1D and search for antiferromagnetism in 3D.

LM1B.3 09:20
Engineered Optical Potentials for Dynamical Control of Quantum Gases, Ryan Ketterle1; Paula C. Ventura da Silva1, Luciano F. Santana1, Sergio R. Muniz1; IFSC-DFCM/UFP, University of São Paulo, Brazil. Quantum gases became an important cross-disciplinary tool in contemporary physics. Here we present the development of new methods to produce and control engineered arbitrary optical potentials to create dynamical quantum simulators of condensed matter systems.

LM1B.4 09:40
Power Law on the Kinetic Energy Spectrum of a Turbulent Atomic Superfluid, Guilherme Baghato1, Gustavo Telles1, Vanderlei S. Baghato1; IFSC - UFP, Brazil. We report the observation of a scaling power law existing in the kinetic energy spectrum of an expanding turbulent BEC, analogous to the Kolmogorov "$5/3$" power-law for classical turbulent fluids.

Una Room
08:00—10:00
LMIC 08:00
Overview of the Nonlinear Shannon Limit for Optical Fibers, Rene-Jean Essambre1; Alcatel-Lucent, USA. We present a summary of a procedure for calculating a nonlinear fiber capacity limit estimate for optically-routed networks. We present nonlinear Kerr fiber capacity results for single-mode fibers and discuss spatial multiplexing in multicore and multimode fibers as a way to increase capacity.

LMIC.2 08:40
80 DWDM 112Gbps Channels over 2000km of SSFM Hybrid Amplified (DRA/EDFA) with 35dB of Span Loss, Getulio Paiva1, Juliano R. F. Oliveira1, Uliara C. Moura1, Rafael L. Amgarten1, Julio Oliveira1; Photonics, CPqD Foundation, Brazil. We experimentally demonstrate the transmission of 80 channels over 2000km of SSFM fiber. Hybrid optical amplifiers (DRA coupler-propagating and EDFA) were used to amplify the 112Gbps DP-QPSK channels leading to 1.1E-5 of BER after 2000km.

LMIC.3 09:00
448 Gb/s Dual-Carrier PDM-RZ-16QAM on 75-GHz Grid over 720 km with 10 Flexi-Grid ROADM passes, Edson P. Silva1, Luis Henrique H. Carvalho1, Júlio César M. Diniz1, Juliano R. Oliveira1, Vitor R. Ribeiro1, Reginaldo Silva1, José Paulo K. Perin1, Marcelo L. Silva1, Pedro Paulo G. Cardoso1, Julio Oliveira1; Optical Systems Division, CPqD, Brazil. We show 448 Gb/s transmission of dual-carrier pre-filtered PDM-RZ-16QAM modulation in 75-GHz flexi-grid channel spacing over 720 km and 10 ROADM passes with 5.97-b/Hz spectral efficiency.

LMIC.4 09:40
Optical Amplifier based on a Er3+-doped Tellurite Microstructured Optical Fiber, Mariana Ando1, Enver Chillice2, Jorge Marcon1, Robert Narro-Garcia1, Hugg L. Fragin1, Luis Barbossa1, Jackson Menezes1, Eugenio Rodriguez2; UFABC, Brazil; Unicamp, Brazil; Centro de Investigación en Ciencia Aplicada y Tecnología Avanzada, Mexico. Optical gain from 1530 up to 1570 nm by using an Er3+-doped tellurite microstructured fiber is presented. A maximum optical gain of ~27 dB at 1554 nm is obtained for a 980/1480 nm pump scheme.
Monday, 12 November

10:00 - 10:30
COFFEE BREAK, Foier

10:30-11:30
LM2A • Poster Session I
Exhibit Hall, Foier

LM2A.1
Investigation on Hydrogen-induced Attenuation in Optical Fibers for DTS Application, Sully M. Quintero1, Henrique Penna1, Adriana Triques2, Arthur M. Braga3, Luiz G. Valente1; 1Pontifícia Universidade Católica do Rio, Brazil; 2CENPES, Petróbras, Brazil. We analyze hydrogen-induced attenuation of the pure silica core and conventional fibers subjected to high temperature and hydrogen pressure. Hydrogen-induced attenuation in optical fibers is directly influenced by partial pressure of hydrogen surrounding the fiber.

LM2A.2
Yb3+/Er3+ codoped Bi2O3-WO3-TeO2 pedestal type waveguide for photonic applications, Vanessa Cacho1, Davinson M. da Silva1, Luciana R. Kassab2, Marco Alayo3, Daniel Carvalho1; 1EPUSP, Brazil; 2FATEC, Brazil. This work presents, for the first time to our knowledge, experimental results on pedestal waveguides produced with Yb3+/Er3+ codoped Bi2O3-WO3-TeO2 thin films deposited by RF Sputtering.

LM2A.3
Transverse Force Sensitivity and Birefringence axes Rotation in Polarization-Maintaining Two-Hole Fiber Bragg Grating, Esteban González-Valencia1, Pedro Torres5; 1Universidad Nacional de Colombia, Colombia. We study the transverse force sensitivity and birefringence axes rotation in polarization-maintaining two-hole fiber Bragg grating. We found a relationship between the force sensitivity and the rotation of birefringence axes of such a grating.

LM2A.4
Diode Laser System for use in a Compact Cold Atoms Frequency Standard, Jair de Martin1, Rodrigo D. Pechonori1, Felipe A. Otoboni1, Stella T. Müller1, Vanderlei S. Bagh1, Daniel Magalhaes1; 1Engenharia Mecânica, Escola de Engenharia de São Carlos - USP, Brazil; 2Física e Ciência dos Materiais, Instituto de Física de São Carlos - USP, Brazil. Our group has been developing a compact and robust laser source to be used in a mobile frequency standard with cold atoms. The opto-mechanical setup is designed to use an intracavity ultra narrow interference filter.

LM2A.5
Silver Nanoparticles Dimensional Tailoring by Ultrashort Pulses Temporal Shaping, Thiago Da Silva Cordeiro1, Ricardo A. de Matos1, Lilian C. Courro1, Nilson D. Vieira1, Ricardo E. Samad2; 1Center for Lasers and Applications, IPEN, Brazil; 2UNIFESP, Brazil. A study of nanoparticles sizes and size dispersion was carried out, showing that nanoparticle characteristics can be controlled by shaping ultrashort pulses.

LM2A.6
Photorefractive holography for 2D mechanical vibrations measurement, Ivan de Oliveira1, Jaime Frejlich2; 1Facultad de Tecnología, Universidad de Colima-UNICAMP, Brazil; 2Departamento de Física da Materia Condensada, Instituto de Física, Universidad Estadual de Campinas-UNICAMP, Brazil. We report an efficient holographic setup for the real time measurement of 2D mechanical vibration modes in surfaces, based on the time-average holographic interferometry technique using a low power red laser for illumination and a photorefractive titanosilicate crystal as sensing element.

LM2A.7
Multiplexed FBG Optical Instrumentation System Using an FPGA-Based System, Yujuan Wang1, Lucas H. Negri1, Gustavo Cervi2, Valmir de Oliveira1, Hiplolto J. Kalinowski1, Aleksander S. Paterno1; 1Department of Electrical Engineering, Universidade do Estado de Santa Catarina, Brazil; 2Department of Chemistry, Universidade do Estado de Santa Catarina, Brazil. An FBG interrogation system was developed. Data processing algorithms were implemented by FPGA. It was tested by monitoring the fabrication of an evanescent-field sensor, which is then applied in an refractive index sensing experiment.

LM2A.8
Peak Detection Algorithm for Fiber Bragg grating sensors, Cicero Martelli1, Felipe Mezzadri1, Frederic C. Janzen1; 1UTFFPR, Brazil. Fiber Bragg gratings (FBGs) are widely studied because of their properties to measure variables like temperature, strain, pressure among others. This work proposes a simple and efficient FBG peak detection algorithm.

LM2A.9
Simulations of Time Multiplexed Fraunhofer Holograms Produced by Binary Phase SLMs for Video Projection, Yunuen Montelongo1, Ananta Palani1, Tim Wilkinson1; 1Engineering Department, University of Cambridge, United Kingdom. We demonstrate the use of simulations to generate realistic representations of holographic projection of binary phase SLMs. Using an appropriate representation of the hologram at the simulation allows an accurate visualization of the projected image.

LM2A.10
Dynamic Speckle technique to analysis of hydro-adsorption processes in clay surfaces, Maria J. González1, Guillermo Bertolini2, Irma Botto1, Carmen I. Cabello1, Ricardo Arizaga1, Marcelo Trivi1; 1Centro de Investigaciones Opticas (CONICET La Plata CIC) and UJD Optimo, Facultad de Ingeniería, UNLP, Argentina; 2Centro de Química Inorgánica, (CONICET La Plata -UNLP), Argentina. We use dynamic speckle technique to analyze the hydro-adsorption capacity of original and iron modified clay species. Experimental speckle results showed different behavior depending on physicochemical and textural properties of the samples.

LM2A.11
Measuring polarization entanglement with a pulsed source, Mónica Beatriz Agüero1, Marcelo G. Kovalsky1, Alejandro A. Hnilo1; 1CITEDEF, Argentina. Bell's inequality is measured recording the time of arrival of the pulses and detection of each single photon. The obtained results impose new restrictions to the class of hidden-variables theories that exploit the “time loopholes”.

Latin America Optics & Photonics • 10-13 November, 2012 Page 16
LM2A.12 Development of a Mobile Atomic Frequency Standard based on Cold Atoms, Daniel Magalhaes¹, Jair de Martin¹, Stella T. Müller¹, Rodrigo D. Pechonera¹, Felipe A. Otobonie¹, Vanderlei S. Bagnatotor¹; ²Engenharia Mecânica, Escola de Engenharia de São Carlos - USP, Brazil; ³Física e Ciência dos Materiais, Instituto de Física de São Carlos - USP, Brazil. We have been developing a compact frequency standard based on cold cesium atoms. The operation of this experiment is different from conventional cold atoms fountains, since all the steps are sequentially performed inside the microwave cavity.

LM2A.13 Production and Investigation in a Mixture of BECs, Edwin Eduardo Pedrozo Peñañiel¹; ¹Instituto de Física de São Carlos, Universidade de São Paulo, Brazil. In this work we are dealing with a mixture of Bose-Einstein Condensates. With the mixture of these two superfluids, we are going to investigate the effects of transferring quantum excitations, collective excitations and vortices.

LM2A.14 Analysis of Experimental Production of Photonic Molecules of Sodium in a Magneto Optical Trap, Franklin A. Julca Vivanco¹; ¹Instituto de Física de São Carlos, Universidade de São Paulo, Brazil. An experimental setup for the study of the sodium Na2⁺ molecule is presented. This molecular bond states are formed in the presence of light by photoassociation ionization (PAI). The pair of sodium atoms in the ground state absorbs two photons forming the photonic molecule.

LM2A.15 Analysis of Experimental Production of Photonic Molecules of Sodium in a Magneto Optical Trap, Franklin A. Julca Vivanco¹; ¹Instituto de Física de São Carlos, Universidade de São Paulo, Brazil. A experimental setup for the study of the sodium Na2⁺ molecule is presented. This molecular bond states are formed in the presence of light by photoassociation ionization (PAI). The pair of sodium atoms in the ground state absorbs two photons forming the photonic molecule.

LM2A.16 Thermodynamic analysis of a trapped BEC: Phase transitions, Freddy Jackson Poveda Cuevas¹; ¹Instituto de Física de São Carlos, Universidade de São Paulo, Brazil. The difficulty to define pressure in a medium which is not homogeneous, involves a difficulty in studying systems harmonically trapped cold gases. Thus, we need to define new thermodynamic variables that allow us to study phase transition.

LM2A.17 Thermodynamic analysis of a trapped BEC: Characterization of the experimental setup, Patrícia Castilho¹, Freddy Jackson Poveda Cuevas¹, Sergio Muniz¹, Vanderlei S. Bagntot¹; ¹Instituto de Física de São Carlos - Universidade de São Pauilo, Brazil. To extend the study of thermodynamic properties of a trapped Bose-Einstein Condensate of 87Rb by the concept of global variables we make use of a hybrid trap which experimental setup is described on this paper.

LM2A.18 Mechanism of Vortices Generation for a Trapped Superfluid under Oscillatory Excitation, Pedro Ernesto Schiavinnati Tavares¹, GUSTAVO TELLES¹, Rodrigo F. Shiozaki¹, Cora C. Castelo Branco¹, Kilvia M. Farias¹, Vanderlei S. Bagntot¹; ¹Instituto de Física de São Carlos, Universidade de São Paulo, Brazil. We observed a relative motion in between a 87Rb Bose-Einstein condensate and the thermal fraction, excited by a time-varying magnetic field. This motion produces ripples on the BEC/thermal interface and gives evidences of vortex nucleation mechanism.

LM2A.19 The role of surface roughness on the electron confinement in semiconductor quantum dots, Rair Macêdo¹, Michael S. Sena¹, Jusciane Costa e Silva¹, Andrey Chaves¹, José A. P. da Costa¹; ¹Departamento de Física, Unic. do Estado do Rio Grande do Norte, Brazil; ²Departamento de Ciências Exatas e Naturais, Universidade Federal Rural do Semi-Árido, Brazil; ³Departamento de Física, Universidade Federal de Campina Grande, Brazil. Using the effective mass approximation, we present a theoretical study of surface roughness effects on electron energies in semiconductor quantum dot, which are demonstrated to increase up to approximately 6%.

LM2A.20 Innovative OSNR Monitoring Technique Employing HiBi Fibre Bragg Gratings for 10Gb/s-1 Passive Optical Networks, Ana Souza¹, Carlos A. Marques¹, Paulo André¹; ¹Instituto de Telecomunicações, Portugal; ²Departamento de Física, Universidade de Aveiro, Portugal. An innovative method to monitor OSNR based on high birefringent fibre Bragg gratings is presented. It was analyzed for a 10 Gb/s-1 channel, showing a maximum error of 0.9 dB for an OSNR range up to 25 dB.

LM2A.21 Practical Impairments in FBG-Based True Time Delays, Pablo A. Costanzo Caso¹,², Sebastian Rabal¹,², Emanuel Paucci¹,², Alejandro Giordana¹,², Laureano A. Bulus Rossini¹,²; ¹Centro de Investigaciones Opticas (Conicet La Plata - CIC), Argentina; ²Facultad de Ingeniería, UNLP, Argentina. The response of an OBF which employs TDs based on FBG is analyzed. Deviation in the Bragg wavelengths, instabilities in the laser wavelength, and misalignment in the fiber path lengths were considered.

LM2A.22 Numerical Analysis of Periodic Segmented Waveguides Directional Couplers, Ana Julia Oliveira¹, Matheus Silva Costa¹, Cosme E. Rubio Mercedes², Vitaly Felix Rodriguez Esquerre¹, ¹Electrical Engineering Department, Universidade Federal do Bahia, Brazil; ²Mathematic and Engineering Physics Courses, State University of Mato Grosso do Sul, Brazil. The coupling characteristics of directional couplers based on periodic subwavelength segmented waveguides of silicon on insulator have been analyzed by an efficient 2D finite element method in the frequency domain.

LM2A.24 Athermal Directional Couplers: Theoretical Analysis, Joaquim J. Isidio de Lima¹, Vitaly Felix Rodriguez Esquerre¹, Bernardo Danias Yoshiba¹, ¹Electrical Engineering Department, Universidade Federal do Bahia, Brazil. The optimal parameters to design athermal directional couplers have been theoretically analyzed by considering the influence of the thermooptic coefficient of their constituent materials on the coupling distance.
Monday, 12 November

10:30–11:30

LM2A • Poster Session I—Continued

Exhibit Hall, Foier

LM2A.24 Oscillatory growth-erosion process of FBG recording, Valmir de Oliveira1, Larissa N. da Costa1, Ismael Chiamenti2, Ilda Abe1, Hy-polito J. Kalinowski3; 1Universidade Tecnológica de Parana, Brazil. We investigate and compare the oscillatory growth-erosion process of fiber Bragg gratings engraved in nonhydrogenated standard telecommunications-grade and photosensitive single-mode fibers.

LM2A.25 Luminescence of Er3+ doped TeO2-ZnO glass containing silicon nanocrystals, Giordano B. Crepaldi1, Luciana R. Kassab1, Diego Silvério da Silva1, Tiago A. Alves de Assumpção2, Davinson M. da Silva1, Cid Bartolomeu de Araujo1; 1Faculdade de Tecnologia de São Paulo, Brazil; 2Departamento de engenharia de sistemas eletrônicos, Escola Politécnica da USP, Brazil; 3Departamento de Física, Universidade Federal de Pernambuco, Brazil. We investigate the influence of silicon nanocrystals on Er3+ doped TeO2-ZnO. Large enhancement of the photoluminescence is observed. This is the first observation of photoluminescence enhancement in Er3+ doped TeO2-ZnO composites due to silicon nanocrystals.

LM2A.26 Green Synthesis of Spherical Gold Nanoparticles Using Amino Acids, Lília C. Courrol1, Ricardo A. de Matos1, Mariana T. Iwasaki1, Rafael J. Tomita1; 1Universidade Federal de São Paulo, Brazil. This study compares five amino acids (tryptophan, histidine, methionine, valine, threonine) for the spherical gold nanoparticles synthesis. Dieonized water, HAuCl4, amino acid and Xe light were used to represent a ‘green’ alternative to traditional techniques.

LM2A.27 Slow Surface Plasmon-Polaritons in a Metal-Dielectric Structure Incorporating a Lorentzian Gain Medium, Abraham Vázquez-Guardado1, Gisela López-Galmeche2, Abraham Vázquez-Guardado1, Rafael Paez-López1, Miguel Torres-Cisneros3, Jose Javier Sanchez-Mondragon1; 1Optics, INAOE, Mexico; 2Physics, U of Ottawa, Canada; 3FIMME, U of Guanajuato, Mexico. We investigate slow surface plasmons supported at the surface of a semi-infinite metal bound by a gain medium with Lorentzian lineshape and the induced slow light regime due to the active medium.

LM2A.28 Nanowires geometry dependence of coupling properties of a hybrid directional coupler, Nestor Lozano-Crisostomo1, Daniel A. May-Arrioja1, Miguel Torres-Cisneros1, Jose A. Andrade-Lucio1, Govind P. Agrawal2, Jose J. Sanchez-Mondragon1; 1Departamento de Óptica, INAOE, Mexico; 2Departamento de Ingeniería Electrónica, Universidad Autónoma de Tamaulipas, Mexico; 3Dirección de Apoyo a la Investigación, Universidad de Guanajuato, Mexico; 4División de Ingenierías, Universidad de Guanajuato, Mexico; 5The Institute of Optics, University of Rochester, USA. In this work we have modeled and characterized the near infrared coupling between a plasmonic wire and a silicon nanowire. We have studied the coupling parameters dependence on the dimensions of the directional coupler nanowires.

LM2A.29 Analysis of Extrinsic Losses in a Corrugated Photonic Crystal Waveguide, Gisela López-Galmeche2, Abraham Vázquez-Guardado1, Rafael Paez-López1, Miguel Torres-Cisneros3, Jose Javier Sanchez-Mondragon1; 1Optics, INAOE, Mexico; 2Physics, U of Ottawa, Canada. We analyzed the scattering produced by technological imperfections in a corrugated photonic crystal waveguide. Modeling and losses analysis of the slow-light structures were carried out by plane wave expansion method using the MPB software.

LM2A.31 Energy transfer between CdSe/ZnS quantum dots in colloidal solution studied by thermal lens technique, Djalmir N. Messias1, Vanessa M. Martins1, Adamo F. Monte1, Acacio A. Andrade1; 1Universidade Federal De Uberlandia, Brazil. Energy transfer between CdSe/ZnS quantum dots of different sizes were studied through the Thermal Lens technique. It was possible to obtain the energy transfer efficiency and the individual luminescence quantum efficiency.

LM2A.32 Optical Fiber Ring Resonator (OFRR) as temperature sensor for single mode laser system, Emiliano Callegari1, Santiago Suarez2, Demian Biasetti1, Matias Tejerina1, Gustavo Torchia1; 1Centro de Investigaciones Opticas, Argentina. We present an optical fiber ring resonator (OFRR) as temperature sensor for a DBF single mode laser system. The room temperature change produces a wavelength detuning of 0.25 pm which was perfectly measured by the OFRR system.
<table>
<thead>
<tr>
<th>Guaecá Room</th>
<th>Pauba Room</th>
<th>Una Room</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>11:30–13:30</strong></td>
<td><strong>11:30–13:30</strong></td>
<td><strong>11:30–13:30</strong></td>
</tr>
<tr>
<td><strong>LM3A • Nonlinear Optics II</strong>&lt;br&gt;Presid: Lazar A. Padilha, Los Alamos National Laboratory, USA</td>
<td><strong>LM3B • Coherence and Physical Optics</strong>&lt;br&gt;Presid: Pedro Torres, Universidad Nacional de Colombia, Colombia</td>
<td><strong>LM3C • High Speed Optical Devices and Polarization Effects</strong>&lt;br&gt;Presid: Alberto Paradisi, CPqD, Brazil</td>
</tr>
<tr>
<td><strong>LM3A.1 • 11:30</strong></td>
<td><strong>LM3B.1 • 11:30</strong></td>
<td><strong>LM3C.1 • 11:30</strong></td>
</tr>
<tr>
<td>High-field THz Pulses from Laser-Induced Ionization and their Nonlinear Interaction with Optical Fields, Roberto Morandotti; INRS-Energie Mat &amp; Tele Site Varennes, Canada. We developed a novel scheme for intense terahertz pulse generation by two-color driven ionization of gases that allows for MV/cm level peak-fields. The nonlinear mixing between such high-field terahertz pulse and an optical pulse results in an electric-field-induced second harmonic generation, both in gases and in condensed media. We report on our recent investigations on this phenomenon that allows e.g. for the terahertz pulses three-dimensional mapping.</td>
<td>Mesoscale Optics: Sensing and Action, Aristide Dogariu; University of Central Florida, CREOL, USA. Harnessing light at wavelength scales offers unique possibilities for sensing material properties and controlling the mechanical action of light. We will review both passive and active applications of controlling the coherence and polarization properties at these scales.</td>
<td>Advanced Optical Modulators Using Silica-LiNbO3 Hybrid Configuration, Shinni Mino, Ken Tszuki, Hiroshi Yamazaki, Takashi Goh, Atsushi Aratake, Takashi Saida; NTT Photonics Laboratories, NTT Corporation, Japan. We review optical modulators with a hybrid configuration of silica PLCs and LiNbO3 phase modulators. The hybrid configuration is highly scalable for advanced modulation formats, and is reliable both thermally and mechanically.</td>
</tr>
<tr>
<td><strong>LM3A.2 • 12:10</strong></td>
<td><strong>LM3B.2 • 12:10</strong></td>
<td><strong>LM3C.2 • 12:10</strong></td>
</tr>
<tr>
<td>A simple Picosecond Tuneable Pulse Generator at GHz Frequencies Using a SBS Frequency Comb, Sébastien Loranger, Victor Lambin-Lejzri, Raman Kasyap, École Polytechnique de Montréal, Canada. We propose a new method to generate high frequency phase-locked tunable pulses in the ps regime by using a Stimulated Brillouin Scattering frequency comb in single mode fiber at any wavelength.</td>
<td>Maximal Polarization Order of Random Electromagnetic Light Beams, Ari Tapio Friberg, Tero Setala, Ilpo Lassila, Philippe Refregier; Department of Applied Physics, Aalto University, Finland; Department of Physics and Mathematics, University of Eastern Finland, Finland; Fresnel Institut, Domaine Universite de Saint Jerome, France. We consider the mean spectral degree of polarization and show that it represents the maximal polarization order of fluctuating optical beams, leading to a classification of time-domain polarization changes into reversible and irreversible processes.</td>
<td>A Simple Method to Localize and Estimate PMD in Optical Fibers using the Polarization Optical Time Domain Reflectometry Technique, Carolina Franciscangelis, Claudio Floridia, Livia A. Ribeiro, Fabiano Fruetti; DSIF, Unicamp, Brazil; DRC, CPqD, Brazil. We propose and demonstrate experimentally a method for PMD localization and estimation based in the analysis of the ripple of polarization optical time reflectometry trace as a function of temporal pulse width launched signal.</td>
</tr>
<tr>
<td><strong>LM3A.3 • 12:30</strong></td>
<td><strong>LM3B.3 • 12:30</strong></td>
<td><strong>LM3C.3 • 12:30</strong></td>
</tr>
<tr>
<td>Fresnel-Limited Extraction Algorithm for X-SPIDER, Alessia PasquaZZi, Marco Pecchianti, Jose Azana, David J. Moss, Roberto Morandotti; INRS-Energie Mat &amp; Tele Site Varennes, Canada; Institute for Complex Systems - CNR, Italy; CUDOS, School of Physics, University of Sydney, Australia. We introduce a novel algorithm for phase reconstruction X-SPIDER that significantly extends the measurement time windows and test it in an integrated CMOS SPIDER device.</td>
<td>Edge Detection of Fingerprint with the Radial Hilbert Transform, Leonardo Díaz, Yailith Morales, Cesar Torres, Lorenzo Mattos; Cesar, UIPC, Colombia. In this paper we present the radial Hilbert transform as a tool for the detection of edges, having the advantage of being immune to noise, thereby achieving the edge of the image of the fingerprint.</td>
<td>The Role of a Fabless Silicon Photonics Industry in the Era of Quantum Engineering, Michael Hochberg, Christophe Galland, Ran Ding, Yang Liu, Yi Zhang, Nicholas Harris, Tom - Baehr Jones; University of Delaware, USA; National University of Singapore, Singapore. OpgSIS is a foundry service for silicon photonics offering open processes and low access costs. We present the success of our project in conventional applications and how it can enable breakthroughs in applied quantum optics.</td>
</tr>
<tr>
<td><strong>LM3A.4 • 12:50</strong></td>
<td><strong>LM3B.4 • 12:50</strong></td>
<td><strong>LM3C.4 • 13:10</strong></td>
</tr>
<tr>
<td>Nonlinear Optics With Backward Waves, Alexander K. Popov, Mikhail I. Shalaev, Sergey A. Myslivets, Vitaly V. Slabko, Igor S. Nefedov; Physics and Astronomy, University of Wisconsin-Stevens Point, USA; Siberian Federal University, Russian Federation; Institute of Physics of Siberian Branch of the Russian Academy of Sciences, Russian Federation; Aalto University, Finland. Extraordinary properties of nonlinear-optical propagation processes in double-domain positive/negative phase velocity metamaterials such as second harmonic generation, three- and four-wave frequency conversion and optical parametric amplification are reviewed. Novel types of materials are proposed.</td>
<td>Modified Fourier transform Fractional FRFTM in the study of wave propagation through optical systems, duber avila padilla, Cesar Torres; Laboratorio de Optica e Informatica, Universidad Popular del Cesar, Colombia; Departamento de Matemáticas y Física, Universidad de Sucre, Colombia. In this paper we study wave propagation in a second order approximation of canonical systems of Lohmann type I and II using the modified fractional Fourier transform (FRFTM).</td>
<td>Performance Analysis of Lossless Polarization Attactors, matteo barozzi, Armando Vannucci; Dipartimento di Ingegneria Dell’Informazione, Università degli Studi di Parma, Italy. Following recent studies on Kerr-based polarization attractors, we characterize their performance by introducing the Degree Of Attraction. Results provide the guidelines for selecting pump power and fiber length, in the attractor’s design.</td>
</tr>
</tbody>
</table>
15:00–17:00
LM4A • Nonlinear Optics III
Presider: Jorge Tocho; CIOp - UNLP, Argentina

15:00–17:00
LM4B • Optical Forces and Imaging
Presider: Ari Tapio Friberg; Aalto Yliopisto, Sweden

15:00–17:00
LM4C • Optical Networking
Presider: Hypolito Kalinowski; Universidade Tec Federal do Paraná, Brazil

15:00–17:00
LM4D • Optics for Imaging
Presider: Jochen Vetter, Jena, Germany; "Center for Physical Science and Technology, Lithuania; Tel-Aviv University, Israel. The detection of THz radiation is linked with mainstream silicon technology using plasmonic mixing in MOSFETs. We report imaging in heterodyne and sub-harmonic-mixing mode for enhanced dynamic range, and present a 220-GHz all-silicon imager.

15:00–17:00
LM4A.1 • 15:00
THz Sensing and Imaging with Silicon Field-effect Transistors up to 9 THz, Hartmut G. Roskos; Alyvadas Lissackas; Sebastian Boppel; Da lius Salita; Linas Minkevičius; Irmantas Kašal ynas; Gintaras Valutis; B. Khamaisi; Viktor Krozer; E. Socher; University of Arizona, USA. We describe an approach to a complete and consistent theory of classical electrodynamics based on Maxwell’s macroscopic equations, Poynting’s postulate, Abraham’s linear and angular momentum densities, and the Einstein-Laub equations of force and torque densities.

15:00–17:00
LM4A.2 • 15:40
Influence of Gas Pressure on High Harmonic Generation on Argon, Rabia Qin deel; Paulo S. Matos; Ricardo E. Samad; Edilson L. Falcão; Anderson Z. de Freitas; Nilson D. Vieira; Center for Lasers and Applications, IFGW/CNEN-SP, Brazil. A Ti:Sapphire laser was employed to generate harmonics in argon gas flowing through a nozzle. We present here the current results of high-harmonic generation at different gas pressure and discuss phase matching.

15:00–17:00
LM4A.3 • 16:00
Highly Accurate Wavelength-Dependent Characterization of Second-Order Nonlinear Optical Molecules, Jochno Campo; Filip Desmet; Wim Wenseleers; Etienne Goovaerts; Physics, University of Antwerp, Belgium. A very sensitive experimental setup is presented for extensive and accurate tunable wavelength hyper-Rayleigh scattering measurements of the molecular first hyperpolarizability, allowing its wavelength-dependence to be studied in detail throughout and beyond resonance.

15:00–17:00
LM4A.4 • 16:20
Synchronization of Micromechanical Oscillators using Light, Gustavo S. Wiederhever; Instituto de Fisica "Gleb Wataghin" - IFGW, Universidade Estadual de Campinas - UNICAMP, Brazil. In this talk I will review our recent results on the synchronization of optomechanical oscillators that are coupled only through the optical field.

15:00–17:00
LM4B.1 • 15:00
On the Foundational Equations of the Classical Theory of Electrodynamics, Masaud Mansuripur, University of Arizona, USA. We describe an approach to a complete and consistent theory of classical electrodynamics based on Maxwell’s macroscopic equations, Poynting’s postulate, Abraham’s linear and angular momentum densities, and the Einstein-Laub equations of force and torque densities.

15:00–17:00
LM4B.2 • 15:40
Quantitative Phase Imaging: Seeing Transparent Objects, Gabriel Popescu; University of Illinois at Urbana-Champaign, USA. Quantitative phase imaging is an emerging approach to biomedical imaging that provides label free information about completely transparent structures such as live cells. I will review some recent QPI methods developed in our laboratory and their applications to cell and tissue imaging.

15:00–17:00
LM4B.3 • 16:20
Optimization of Pseudorandom Code Aperatures for Compressive Spectral Imaging, Henry Arguello; Gonzalo Arce; University of Delaware, USA; Universidad Industrial de Santander, Colombia. A new pseudorandom code aperture design framework for multi-frame Code Aperature Snapshot Spectral Imaging (CASSI) system is presented. A set of selective code apertures is optimized to reduce the required number of FPA shots.

15:00–17:00
LM4B.4 • 16:20
Limitation of the Power Auto-Correlation-Based Chromatic Dispersion Estimation Method in Dispersion-Managed Links, Fernando Pereira; Valery Rozental; Darli A. Mello; Electrical Engineering, University of Brasilia, Brazil. We propose to extend an existing chromatic dispersion (CD) estimation algorithm, based on the auto-correlation of the signal power waveform, by electronically adding CD, to overcome the limitations of the original proposal in dispersion-managed links.

15:00–17:00
LM4C.1 • 15:00
Photonic Technologies for Short Range Hybrid Optical Fibre-Wireless Data Links, J.J. Vegas-Olmos, A. Caballero, D. Zibar, J. Jensen, Idefonso Tafur Monroy; Technical Univ. of Denmark, Denmark. This paper presents an overview of activities within our laboratory in the area of photonic technologies, including high-capacity radio-over-fiber systems, optical MIMO and optical switching.

15:00–17:00
LM4C.2 • 15:40
1GbE Media-converter Topology for 1.25 Gbps RSOA-based WDM-PON Transceiver, Bernardo R. Pereira; Fernando F. Padela; Joao A. Cremasco; Rival S. Penze; Joao B. Rosolem; Ulysses Duarte; CPqD Foundation, Brazil. We present a cost-effective C-band 1.25 Gbps RSOA-based colorless WDM-PON transceiver evaluating a 1GbE full duplex plug-and-play media-converter topology. Bidirectional transmission of 1GbE packets is demonstrated over 40 km.

15:00–17:00
LM4C.3 • 16:00
Security issues in m-sequence spectral phase-encoded time spreading (SPECTS) OCDMA systems, Pedro L. Bertarini; Ben-Hur V. Borges; Department of Electrical Engineering - Engineering School of Sao Carlos, Universidade de Sao Paulo, Brazil. In this paper, we investigate security issues due to crosstalk in a m-sequence codes family and prove that an inadequate choice of these codes, in fact, compromises the overall performance of the SPECTS-OCDMA system.

15:00–17:00
LM4C.4 • 16:20
Optimization of Pseudorandom Code Aperatures for Compressive Spectral Imaging, Henry Arguello; Gonzalo Arce; University of Delaware, USA; Universidad Industrial de Santander, Colombia. A new pseudorandom code aperture design framework for multi-frame Code Aperature Snapshot Spectral Imaging (CASSI) system is presented. A set of selective code apertures is optimized to reduce the required number of FPA shots.

15:00–17:00
LM4D • Optical Networking
Presider: Hypolito Kalinowski; Universidade Tec Federal do Paraná, Brazil
LM4C • Optical Networking - Continued

LM4C.5 • 16:40
Demonstration of orbital-angular-momentum-based multiple-channel free-space communication, Jaime A. Anguita¹, Camilo Quezada¹; ¹College of Engineering and Applied Sciences, Universidad de los Andes, Chile. We demonstrate the feasibility of multi-channel orbital-angular-momentum (OAM)-based laser communication by transmitting and detecting three coaxial channels, individually modulated at 100 Mb/s using OOK. Selection of OAM states and channel cross-talk are discussed.

17:00 - 17:30
COFFEE BREAK, Foier

17:30—19:30
Postdeadline Papers, Maresias

LM5A.1 • 17:30
PCF interferometer to temperature sensor, F.C. Fávero¹, R. Spittel¹, J. Kobelke¹, M. Rothhardt¹, H. Bartelt¹; ¹Institut of Photonics and Technology, Germany. We demonstrate the use of a very short Photonic Crystal Fiber (PCF) stub as temperature sensor. The length of the PCF stub is 2.2 mm and exhibits high thermal sensitivity of 84 pm/°C.

LM5A.3 • 18:10
High conversion efficiency from qcw to Q-switched operation in a side-pumped Nd:YLiF laser, A. Deana¹, N.U. Wetter¹; ¹University of Nove de Julho, Brazil; ²Centro de Lasers e Aplicações, CNEN-IPEN/SP, Brazil. A record 66% conversion efficiency from qcw to Q-switched operation is demonstrated whilst maintaining diffraction limited diode-side-pumped laser resonator.

LM5A.2 • 17:50
Production of coherent extreme ultraviolet radiation by phase matched high order harmonic generation in hollow fiber with argon, J.D. Siqueira¹, L. Misogut¹, C. Mendonça¹, S.C. Zilio¹; ¹Universidade de Sao Paulo, Brazil. We present the generation of coherent extreme ultraviolet light in the range of 30 to 45 nm by the process of high order harmonic generation using the recently implemented guided wave phase-matched frequency conversion technique.

LM5A.4 • 18:30
Random Lasing of Rhodamine 6G Solution Containing TiO2:Silica Core:Shell Nanoparticles, P.C. de Oliveira¹, V. Mestre¹, E. Jimenez¹; ¹Departamento de Física, Universidade Federal da Paraíba, Brazil; ²Instituto de Ciencia Molecular, Universitat de València, Spain. High efficiency and low rate of photodegradation was obtained in a random laser suspending TiO2@Silica nanoparticles in ethanol solution of Rhodamine 6G. The TiO2 nanoparticles were coated with a silica shell prepared via Stöber method.

19:45—23:00
Conference Banquet

Buses departure Maresias Beach Hotel Reception Lobby at 19:45.
Buses will leave Viela de Praia at 23:00 and 24:00 to return to the hotel.
Guacá Room

08:00–10:00

LT1A • Biophotonics I
Presider: Laura Lechuga; CIN2 (CSIC), Spain

LT1A.1 • 08:00
Invited
Totally Integrated Linear and Non-Linear Optics Multimodal Microscopy Platform to Understand Single Cell Processes, Carlos L. Cesar1; 1Universidade Estadual de Campinas, Brazil.
We describe a multimodal non linear optics platform which integrates all modalities in one instrument to allow us to observe single cell/single molecule events in time and space without information losses.

LT1A.2 • 08:40
Curcumin in living biofilm: A study with confocal microscopy, Mariana T. Carvalho1, Livia N. Dovigo2, Alessandra Rastelli3, Vanderlei S. Bagnato1; 1Optics Group, IFSC, Universidade de Sao Paulo, Brazil; 2Dept. of Social Dentistry, Araraquara Dental School, UNESP-Uni Estadual Paulista, Brazil; 3Dept. of Restorative Dentistry, Araraquara Dental School, UNESP-Uni Estadual Paulista, Brazil. This study aimed to use confocal microscopy to evaluate different microorganisms and how photosensitizers bind to it, for this purpose we evaluate the Curcumin. We show the relation between incubation time and concentration of PS.

LT1A.3 • 09:00
Orientation, rotation and position control of multiple birefringent microparticles with optical tweezers, Augusto Arias1,2, Sebastián S. Etchverry1,2, Pablo P. Solano1,2, Juan Pablo Safforelli1,2, Halina Rubinsztein-Dunlop4, Carlos Saavedra1,2; 1Center for Research, Instituto Tecnológico Metropolitano, Colombia; 2Center for Optics and Photonics, Universidad de Concepción, Chile; 3Department de Fisica, Universidad de Concepción, Chile; 4School of Mathematics and Physics, The University of Queensland, Australia. We report both the design and the experimental results of a novel method for generating multiple mobile optical tweezers, with linear polarization states where each one has a programmable orientation.

Pauba Room

08:00–10:00

LT1B • Nanoparticles and Nanowires
Presider: Newton Frateschi; UNICAMP, USA

LT1B.1 • 08:00
Integration of multiple SiO2 nanoparticles on a tapered fiber through evanescent wave, Amado M. Velazquez-Benitez1, Juan Hernandez-Cordero1, Reiner Pimentel-Dominguez1; 1Instituto de Investigaciones en Materiales, UNAM, Mexico. We present a simple method to incorporate SiO2 nanoparticles on the surface of tapered optical fibers exploiting optically driven transport of SiO2 nanoparticles. Changes in the transmission spectrum are registered during particle deposition.

LT1B.2 • 08:20
RLC ladder networks for relatively and very small negative refractive index scatterers, Leonardo A. Ambrosio1, Hugo E. Hernández-Figueroa2; 1Department of Microwaves and Optics, University of Campinas, UNICAMP, Brazil. We present RLC ladder networks for the Mie scattering coefficients of small negative refractive index particles, extending previous analysis for dielectric materials and revealing the fundamental differences associated with the NRI circuits obtained.

LT1B.3 • 08:40
Optical Properties of Zinc Oxide Based Nanostructures, Ricardo Marotti1; 1Instituto de Fisica, Facultad de Ingenieria, Universidad de la Republica, Uruguay. ZnO nanowires and nanostructures (nanowires sensitized with other semiconductors) for photovoltaic devices, prepared mainly by electrochemical deposition, are studied. Optical properties can be understood from single materials absorption edges and light scattering.

Una Room

08:00–10:00

LT1C • Fiber Optics and Materials
Presider: Daniel May, Universidad Autonoma de Tamaulipas Mexico

LT1C.1 • 08:00
Invited
Advances in Fibre Optic Lasers and Amplifiers, John D. Harvey1; 1University of Auckland, New Zealand. This talk discusses theoretical and experimental investigations of self similar solutions of the equation governing pulse propagation in optical fibre amplifiers. Several such similariton solutions have been discovered and experimentally realised in the last decade.

LT1C.2 • 08:40
Photographic technologies based on liquid crystals, M. G. Tomlin1; 1Physics Department, St.-Petersburg University of Information Technologies, Mechanics and Optics, Russian Federation. The LCs recording mediums are described in conception of one step and two steps photography. Such formalism opens the possibilities to describe LCs in recording radiation and physical field’s images using photographic methods.

LT1C.3 • 09:00
Second-order Nonlinearity in Fibers and Application, Walter Margulis1,2, Mikaal Malinmårom1,2, Patrik Rugeland1,2, Oleksandr Tarasenko1; 1Department of Fiber Photonics, Acreo AB, Sweden; 2Department of Applied Physics, Royal Institute of Technology, Sweden. Fiber modulators with strong field recorded exhibit the linear electrooptic effect. Interferometry transforms phase- intensity modulation. Vπ ~100-V is obtained, with an electrical bandwidth of tens of MHz. Applications and limitations are discussed.
LT1A • Biophotonics I - Continued

LT1A.4 • 09:20
Atheroma optical imaging using europium Chlortetracycline complex fluorescent probe, Letícia B. Sicchieri¹, Daliana C. Silva¹, Lilia C. Courro²;¹Departamento de Ciências Exatas e da Terra, Universidade Federal de São Paulo, Brazil;¹Centro de Lases e Aplicações, Instituto de Pesquisas Energéticas e Nucleares, Brazil. The analyses of the arteries of rabbits subjected to high-cholesterol diets were performed by fluorescence microscopy. The images were obtained by using the complex Europium Chlortetracycline as fluorescent probe, following the development of the hypercholesterolemia framework.

LT1B • Nanoparticles and Nanowires - Continued

LT1B.4 • 09:00
Spectroscopic Approach to Structure, Configuration and Size Determination of Cu Nanoparticles Generated by fs Laser Ablation in Liquids, Lucia Scaffardi¹, Jesica M. Santillán¹, Fabian A. Videla², Daniel C. Schinca¹;¹Plasmonics, Centro de Investigaciones Ópticas CIOp, Argentina. We report on the analysis of structure and sizing of resulting species of nanoparticles produced by femtosecond laser ablation of solid copper target in liquids through optical extinction spectroscopy, using Mie theory to fit the full experimental spectra.

LT1C • Fiber Optics and Materials - Continued

LT1C.4 • 09:20
Multimode Interference All-Fiber Sensors, Cristiano M. Cordeiro¹,²;¹UNICAMP, Brazil. Fiber optic structures based on multimode interference were investigated to strain, curvature, refractive index and temperature sensing. Devices sensitivity and spectral profile were analyzed both experimentally and numerically. Tapered structures were also explored.

10:00 - 10:30
EXHIBIT HALL and COFFEE BREAK, Foier

Notes
LT2A.1
D-Scan Measurement of the Ablation Threshold and Incubation Parameter of Optical Materials in the Ultrafast Regime, Ricardo E. Samad1, Leandro M. Machado1, Wagner de Rossi1, Nilson D. Vieira1; 1IPEN/CNEN-SP, Brazil. The D-Scan technique for the measurement of the ablation threshold in the ultrafast regime is extended to consider the pulses superposition, and the ablation parameters dependences on it for optical materials are measured.

LT2A.2
First Hyperpolarizability Dispersion of the Octupolar Molecule Crystal Violet, Jochen Campo1, Anna Painelli2, Francesca Terzeniani2, Tanguy Van Regemorter3, David Beljonne1, Etienne Goovaerts1, Wim Wenseleers1; 1Physics, University of Antwerp, Belgium; 2Chemistry, Universita di Parma, Italy; 3Chemistry of Novel Materials, University of Mons-Hainaut, Belgium. The first hyperpolarizability dispersion curve is measured for the first time for an octupolar nonlinear optical molecule (crystal violet), using highly sensitive tunable wavelength hyper-Rayleigh scattering, and the results are successfully modeled theoretically.

LT2A.3
Ultraviolet third-harmonic femtosecond Maker fringe technique, Lino Misoguti1, Emerson C. Barbano1, Sergio C. Zilio1; 1Instituto de Fisica de Sao Carlos, Brazil. We present new results on femtosecond third-harmonic generation Maker fringes technique at 267 nm-UV range. We have measured two UV transparent materials: fused silica and sapphire to demonstrate our method.

LT2A.4
Optical determination of H2O2 vapor concentration: a sterilizer agent and biomarker, Tadashi Oshisawa1, Flavio C. Cruz1; 1Universidade Estadual de Campinas, Brazil. We report on a simple apparatus for real time optical measurement of H2O2 vapor concentration. It is based on absorption in the UV and is insensitive to water contamination.

LT2A.5
Mode-locked laser based on an integrated nonlinear microring resonator generating a dual comb, Alessia Pasquaiz1, Marco Pecchi1anti, Brent Little1, Sai T. Chu1, David J. Mose2, Roberto Morandr1otti; 1INRS-Enzyme Mat & Tele Site Varennes, Canada; 1Institute for Complex Systems - CNR, Italy; 2Infermna Ltd, USA; 3University of Hong Kong, Hong Kong; 4CUDOS, School of Physics, University of Sydney, Australia. We report a mode locked laser based on an integrated high-Q microring resonator with a highly monochromatic radiofrequency modulation thanks to the stable operation of two slightly shifted spectral optical comb replicas.

LT2A.6
Parametric oscillation in CMOS-compatible microring resonators induced with a self-locking scheme, Marco Pecchianti1, Alessia Pasquaiz2, Luca Caspani1, Luca Razzari1, Marcello Ferrera1, David Duchesne1, Matteo Clerici1, Brent Little1, Sai T. Chu1, David J. Mose2, Roberto Morandr1otti; 1INRS-Enzyme Mat & Tele Site Varennes, Canada; 1Institute for Complex Systems - CNR, Italy; 2Italian Institute of Technology (IIT), Italy; 3University of St Andrews, United Kingdom; 4Massachusetts Institute of Technology, USA; 5Infermna Ltd, USA; 6University of Hong Kong, Hong Kong; 7CUDOS, School of Physics, University of Sydney, Australia. We introduce an innovative geometry for OPOs in a CMOS-compatible microring resonator that is robust against the effect of thermal fluctuations. It exploits lasing of the pump inherently positioned within the resonances of the microcavity.

LT2A.7
Validation of a Sterilization Methods for FBG Sensors for in vivo Experiments, Leandro Zen Karam1, Ana Paula Franco1, Paulo Tomazinho1, Hylpolito J. Kalinowski1; 1CPGEI, Federal University of Technology - Paraná, Brazil; 2Dentistry Department, Positivo University, Brazil. A sterilization method is proposed to use fiber Bragg grating in vivo experiments. The operation of the sensors were not influenced by any of the sterilization methods. The results suggest that the autoclave and ethylene oxide are of the choice to sterilization.

LT2A.8
Accurate and Practically Implementable Model for First Hyperpolarizability Dispersion, Jochen Campo1, Wim Wenseleers1, Joel M. Hales1, Nikolay Makarov2, Joe W. Perry3; 1Physics, University of Antwerp, Belgium; 2School of Chemistry and Biochemistry, Georgia Institute of Technology, USA. We present a practical yet accurate dispersion model for the molecular first hyperpolarizability β, incorporating both homogeneous and inhomogeneous line-broadening. With a single shape-determining parameter, a reliable description of the wavelength-dependence of β is obtained.

LT2A.9
Effective high-order susceptibilities in composites containing elipsoidal nanoparticles and nanoshells, Anderson M. Amaral1, Cid Bartolomeu de Araújo1, Edilson L. Falcao-Filho1; 1Universidade Federal de Pernambuco, Brazil; 2Nanoform Group, UFR Sc. Techn., Université de Bourgogne, France. We report coherent random laser emission in polymer films doped with rhodamine 6G having as scatterers TiO2 nanomembranes randomly distributed on the surface of a glass substrate.
LT2A.13
Monitoring of thermally driven drying varnish kinetics, Pedro Zambianchi1; Marlos O. Ribas1, Fernanda M. Dala Rosa de Oliveira1, Fernando A. Moura Sacco1, José L. Fabris1, Marcia Muller1; ‘DAFIS - Physics, Federal University of Technology of Paraná, Brazil. Time dependence of solvent mass loss taking place in drying varnish kinetics is investigated. A simplified theoretical model based on Fick’s law is presented and its relation to actual polymer drying diffusion process is discussed.

LT2A.14
Appraisal "In Vitro" of Anti-microbial Activity Photodynamic Therapy on Streptococcus Mutans over Dental Biofilm "In Situ", Vitor Panhoca1, Fernando Florez2, Alessandra Rastelli2, Cristina Kurachi2, Juliane Tanomaru1, Vanderlei S. Bagnato1; ‘Instituto de Fisica de Sao Carlos, Universidade de Sao Paulo, Brazil; ‘Clinica Integrada - Odontologia, UNESP, Brazil. This in situ work is to investigate the antimicrobial effect of photodynamic therapy over biofilms by the use of Curcumin and Photogem® and to clarify the mechanisms of action involved in this photobiocemical process.

LT2A.15
Elevation Maps with and without Defocus Correction by Using Null Screen Testing: A Potential Application for Corneal Topography, Amilcar Estrada-Molina1, Manuel Campos-Garcia1, Rufino Diaz-Uribe1; ‘Univ Nacional Autonoma de Mexico, Mexico. Elevation maps for a calibration sphere with and without defocus correction were obtained. Experimental results of two different evaluations show that when the defocus correction was performed these maps decrease around two orders of magnitude.

LT2A.16
Biological System Modeling based on Fourier Series, Rafael Guzman1, José Guzman-Sepulveda1, Miguel Torres Cisneros1, Oscar Gerardo Ibarra-Manzano1; ‘Ingenieria Electrica, Universidad de Guanajuato, Mexico. In this paper we propose an approach based on Fourier series for effective mathematical model of a biological system.

LT2A.17
Z-scan modeling by Split Step Fourier Method, Juan D. Barranco1, Erwin Marti; ‘BUAP, Mexico. We analyze Gaussian beam Z-scan, using a hyperbolic equation getting from Helmholtz, solving by split step Fourier method in paraxial approximation.

LT2A.18
Breast Cancer Classification of Mammograms using a Combined Classifier, Rafael Guzman1, Jose Guzman-Sepulveda1, Miguel Torres Cisneros1, Gabriel Avina Cervantes1; ‘Ingenieria Electrica, Universidad de Guanajuato, Mexico. In this paper, we propose an approach to computationally perform mammograms images classification based on a combined classifier.

LT2A.19
Fluorescence Monitoring of Haematoporphyrin Derivatives for Photodynamic Diagnosis, Cintia T. Andrade1, José Dirceu Vollet_Filho1, Ana Gabriela Salvio1, Vanderlei S. Bagnato1, Cristina Kurachi1; ‘University of Sao Paulo, Brazil; ‘Hospital Amaral Carvalho Foundation, Brazil. In vitro and in vivo tests were performed to investigate marked fluorescence diagnosis of basal cell carcinoma. Results showed improved differentiation between normal and lesion tissues. Excitation light showed to be limiting factor for diagnosis.

LT2A.20
Beam shifts of Far-Infrared Radiation on Reflection off the Anisotropic Crystal LiYF4, Rair Macedo1, Thomas Dumelow1, José A. P. da Costa1; ‘UERN, Brazil. We investigate the Goos-Hänchen shifts associated with phonons in the anisotropic crystal LiYF4. In polarization the shifts can be either positive or negative, and various mechanism are discussed.

LT2A.21
Effect of Electron Withdrawing Substituents on the Two-Photon absorption Properties of a Novel Class of Push-Pull Triarylamine Compounds, Marcelo G. Vivas1, Leonardo De Boni1, Cleber Mendonca1, Elena Ishow2; ‘IFSC - USP, Brazil; ‘Ecole Normale Superieure de Cachan, France. In this report, we study the effect of Electron Withdrawing substituents (EWG) on the two-photon absorption properties of a novel class of push-pull triarylamine compounds containing trifluoromethyl (CF3).

LT2A.22
Influence of Conformational Change Induced by Solvent on the Two-photon Absorption spectrum of Poly(3,6-phenanthrene), Marcelo G. Vivas1, Guy Koeckelberghs2,3, Cleber Mendonca1; ‘IFSC - USP, Brazil; ‘Laboratory of Molecular Electronics and Photonics, Universiteit Leuven, Belgium. The aim of this report was investigate the conformational change effect of Poly(3,6 phenanthrene) induced by the action of solvent on their two-photon absorption (2PA) properties. Such properties were investigated employing the wavelength-tunable femtosecond Z-scan technique.

LT2A.23
Construction of a Low-Cost Stere Retinal Camera and Quantitative 3D Diagnosis for Early Glaucoma, Luis Carvalho1,2, Andre Romano1, Elizeu Ramos2; ‘Grupo de Optica, Instituto de Fisica de Sao Carlos, Universidade de Sao Paulo, Brazil; ‘Departamento de Pesquisa e Desenvolvimento, Waavet Technologies, Brazil; ‘Escola Paulista de Medicina, Universidade Federal de Sao Paulo - UNIFESP, Brazil. Glaucoma has no symptoms in the early stages and most retinal cameras in the market are expensive and have features targeted to other diseases. The instrument developed here is cost-effective and targeted towards glaucoma diagnosis.

LT2A.24
LED-Therapy and Physical Exercise to Improve Aerobic Capacity and Treatment of Cellulite, Fernanda Paolillo1,2, Adalberto Corazza1, Alessandra R. Paolillo1, Marcela S. Fiorese1, Antonio Eduarndo de Aquino Jr3, Cristina Kurachi1, Vanderlei S. Bagnato1; ‘University of Sao Paulo (USP), Brazil. LED arrays were developed to irradiate a large area, such as hip and quadriceps muscles. This study evaluates the effects of an infrared-LED (850nm) therapy associated with treadmill training regarding aerobic capacity and cellulite.

LT2A.25
Low Level Laser Therapy and Physical Exercise Accelerates Muscle Recovery After Injury, Mayna Adabbo1, Fernanda Paolillo1, Vitória M. Coelho1, Vanderlei S. Bagnato1, Nivaldo A. Parizotto1; ‘University of Sao Paulo (USP), Brazil; ‘Federal University of Sao Carlos (UFSCar), Brazil. Due to photobiostimulation, Low-level laser therapy (LLLT) has been presented as an alternative to soft tissue treatment. This study evaluates the effects of LLLT associated with treadmill training on the muscle regeneration process.
LT2A.26
Fluorescence Diagnosis in the characterization of basal cell carcinoma, Vitória Maciel1,2, Wagner Correr2, Cristina Kurachi2, Vanderlei S. Bagnato2, Cácilda Silva Souza1; 1Medical School, University of São Paulo, Brazil; 2Physical Institute, University of São Paulo, Brazil. Fluorescence spectroscopy has been proposed as potential method for the evaluation of various skin disorders. The purpose in this study was to evaluate, by fluorescence spectroscopy the basal cell carcinoma and compared to normal skin.

LT2A.27
Effect of LLLT Combined with Aerobic Exercise and High Fat Diet on The Glycogen Stores and The Workload of Wistar Rats, Antonio Eduardo de Aquino Jr1,2, Marcela S. Fiorese1, Fernanda Paolillo1, Vanderlei S. Bagnato2, Nivaldo A. Parizotto2; 1University of São Paulo (USP), Brazil; 2Federal University of São Carlos, Brazil. The combination of exercise and high-fat diet promotes related effects on lipid metabolism, but opposite effects on the carbohydrate metabolism. The mechanisms of action of LLLT could alter these correlations for the carbohydrate metabolism.

LT2A.28
Digital Holographic Microscopy applied in the obtainment of hematological parameters in healthy and unhealthy individuals, Miriela Escobedo1, Francisco Palacios1, Ammis Sanchez2, Inaudis Alvarez2, Oneida Font1, Guillermo Palacios1, Mikiya Muramatsu2, Isis Vasconcelos2, Diogo Soga2; 1Computación, Universidad de Oriente, Cuba; 2Physics Institute, University of São Paulo, Brazil. The Digital Holographic Microscopy was applied to obtain hematological parameters in healthy and unhealthy individuals. The parameters analyzed were: mean corpuscular volume, mean corpuscular hemoglobin and the concentration of the mean corpuscular hemoglobin.

LT2A.29
Effects of Ultrasound and Laser on The Pain Relief, Alessandra R. Paolillo1, Marcela S. Fiorese1, Fernanda Paolillo1, Vanderlei S. Bagnato1; 1University of São Paulo (USP), Brazil. The use of laser and ultrasound shows promising results as non-pharmacological pain treatment. This study evaluated the effects of laser and ultrasound on abdominal pain in mice.

LT2A.30
Gain-Clamped SOA for Optical 16-QAM Amplification, C. M. Gallego2, R. Rocha2, E. Conforti2; 1Universidade Estadual de Campinas, Brazil; 2Universidade Estadual de Campinas, Brazil. The performance of 16-QAM optical carrier link employing gain-clamped SOA is simulated at 56 Gbps and compared for different pump/bias level, enabling even the use of short, non-dispersion) compensated fiber links.

LT2A.31
Kinematic of Singular Regions, P. Martínez-Vara1, J. Silva Barranco2, G. Díaz Gonzales3, G. Martínez-Niconoff1; 1Benemérita Universidad Autónoma de Puebla (BUAP), Mexico; 2Instituto Nacional de Astrofísica, Óptica y Electrónica (INAOE), Mexico. The scattering field generated by the coherent illumination on a three-dimensional slit-curve is described through the trihedral reference system. The projected curves on the orthogonal planes carries the information of the curvature and torsion generated bifurcation effects.

Notes
LT3A.1 • 11:30
Silicon Photonics: A New Paradigm in Multiplexed Biosensing, Ryan Bailey;
Univ. of Illinois at Urbana-Champaign, USA. Silicon photonics technologies are poised to revolutionize clinical diagnostics. This talk describes the development of silicon photonics biosensors as a rapid, multiplexed, and cost-effective platform to detect disease-related biomarkers for applications in personalized medical diagnostics.

LT3A.2 • 12:10
Monitoring Deformation of Resin Cements During Polymerization, Ana Paula Franco1, Leandro Zen Karam1, Maura S. Milczewski2, Hypolito J. Kalinowski3, 4; Federal University of Technology - Paraná, Brazil. The aim of this study is to compare the strains that occur in two dental cements with different formulations after the same photoactivation conditions. The study suggests that the different contraction levels were found and may result clinically significant interference.

LT3A.3 • 12:30
FTIR spectroscopic analysis of chemical changes promoted by ErCr:YSGG laser and fluoride during dentin erosion, Patricia Ana1,2, Larissa S. Silva1, Denise M. Zezelli1,2; Centro de Engenharia, Modelagem e Ciências Sociais Aplicadas, Universidade Federal do ABC, Brazil; 3Centro de Tecnologia e Aplicações, Instituto de Pesquisas Energéticas e Nucleares, Brazil. It was evaluated the chemical changes promoted by ErCr:YSGG laser on dentin during erosive process by FTIR, and it was observed that the association of laser and fluoride is able to reduce erosive process.

LT3A.4 • 12:50
Elimination of Onychomycosis by Photodynamic Therapy: a Comparison of Two Photosensitizers, Ana Paula da Silva1, Cristina Kurachi1, Vanderlei S. Bagnato1, Natalia Inada1; 2Physics Institute of Sao Carlos, Brazil. Photodynamic Therapy (PDT) represents a non invasive technique for the treatment of onychomycosis, a resistant nail fungal infection. Here we are presenting clinical results comparing two different photosensitizers.

LT3B.1 • 11:30
Silicon Photonics-based Nanobiosensors for Lab-on-a-chip Integration, Laura Lechuga1,2, Daphne Duval3, Stefania Dante1, Ana B. Gonzalez1, Luis J. Fernandez1,2; CIN2 (CSIC), Spain; 3University of Zaragoza, Spain. We present our work towards the assembly of label-free lab-on-a-chip platforms based on silicon nanointerferometers. The sensors show sensitivity of 10-7 RIU, which means an ability to discern concentrations of biomolecules at pM level.

LT3B.2 • 12:10
Geometry Optimization of Nanopatch Semiconductor Lasers: the Trade-off Between Quality Factor and Gain, Felipe Vallini1, Qing Gu2, Brett Wingad2, Boris Slutsky2, Michael Katz2, Yeshaiahu Fainman3, Newton Frateschi1; 1Department of Applied Physics, Universidade Estadual de Campinas, Brazil; 2University of California at San Diego, USA. In this work we present a design optimization of the nanopatch semiconductor laser. Geometry parameters are optimized for the best combination of quality factor (photonic lifetime) and stimulated emission (gain).

LT3B.3 • 12:30
Synthesis and Optical Characterizations of Energy Upconverting Ytrrium Vanadium Oxide Nanocrystals, Yashji Dwivedi1, Sergio C. Zilio3, 4; 1Instituto de Fisica de Sao Carlos, Universidade de Sao Paulo, Brazil. Synthesis and optical characterizations of Y8V2O17:Eu:Yb nanocrystals were presented. Samples showed multicolor fluorescence and upconversion emissions on 325 and 976 nm excitations. Efficient energy transfer from Yb to Eu ions was established with the lifetime.

LT3B.4 • 12:50
Monolithic Erbium-Doped Al2O3 Waveguide Amplifier, Paulo F. Jarchel de Siqueira1, Luis Barea1, Antonio A. von Zuben1, Rafael B. Merlo1, Newton Frateschi2; 1Instituto de Física “Gleb Wataghin”, Universidade Estadual de Campinas, Brazil. We propose the development of an integrated optical amplifier, consisting of a 980 nm emission laser and an erbium-doped waveguide. Coupling simulations and current fabrication results are presented, which shows that the finished device should be able to achieve a gain of 1.55 dB/cm.

LT3C.1 • 11:30
Interferometry in Harsh Environments - Design Considerations and Case Studies, Armando G. Albertazzi1; 1Mechanical Engineering, Universidade Federal de Santa Catarina, Brazil. Sometimes interferometers need to be used outside laboratories. This paper analyzes the main disturbing factors and how they degrade interferometer performance. It also presents and discuss possible solutions.

LT3C.2 • 12:10
Photorefractive reflection holography compound microscope for MEMs characterization, Merilyn Santos Ferreira1, Eduardo A. Barbosa1; 1Departamento de ensino geral, Faculdade de Tecnologia de Sao Paulo, Brazil. This work describes a reflection holography microscope setup based on sillenite photorefractive crystals and illuminated by a diode laser. The resulting compound microscope has shown to be suitable for MEMs characterization through holographic interferometry.

LT3C.3 • 12:30
Characterization of a Laser Induced Fluorescence Detection System for Microdroplets Fluorescence Quantification, Benjamin Vazquez1, Luis Fernando Olguin1, Laura Oropeza1; 1Electronica, UNAM, Mexico; 2Fisiotermica, UNAM, Mexico. On this work a laser induced fluorescence system for microdroplets fluorescence quantification is described on detail, and it is characterized considering flow rate, laser power and fluorophore concentration. At the end, results of a microdroplet essay are presented.

LT3C.4 • 12:50
CO2 detection and characterization in the NIR region, Cicero Martelli1, Rodolfo Luiz Palty1, Marco Silva2, Rigobero Morales2; 1UTFPR, Brazil. In this paper we show the CO2 spectral signature obtained using a gas chamber operating at the C band. It is observed a relation between the absorption intensity and the gas pressure into the chamber.
Tuesday, 13 November

Guacé Room

LT3A • Biophotonics II • Continued

LT3A.5 • 13:10
Characterization of irradiated bone tissue using ATR-FTIR technique, Carolina Benetti; Denise M. Zezelli; "CLA, IPEN/CNEN - SP, Brazil. This work aims to establish the ATR-FTIR technique for the characterization of natural and irradiated osseous tissue, and to verify the possible chemical and structural changes caused by laser irradiation.

Pauba Room

LT3B • Active Devices - Continued

LT3B.5 • 13:10
Optomechanical devices with gain media: approach and challenges, Debora Princepe1, Luis Barea1, Gustavo Luiz1, Gustavo S. Wiederhecker1, Newton Frateschi1; "Applied Physics Department, University of Campinas, Brazil. We propose the development of active devices with light emission modulated by optomechanics, exploring the interaction between photons emitted due to recombination in the semiconductor and mechanical oscillations excited by optical forces in the cavities.

Una Room

LT3C • Interferometry and Optical Characterization - Continued

LT3C.5 • 13:10
Design of a high voltage measurement transformer base in the electro-optic effect Pockels, Nicolas A. Gomez Montoya1, Hernan Salazar1, Alberto Ciro1; "Facultad de Ciencias, Instituto Tecnologico Metropolitano, Colombia. This paper describes the construction of an optical voltage transformer for measuring A.C and D.C high potential based on the electro-optical Pockels effect. Sensor element, we tested two types of photorefractive crystal, crystal Bi12SiO20 (BSO) and crystal Bi4Ge3O20 (BGO).

13:30 - 15:00
LUNCH, On your Own

Notes
15:40–17:00
LT4A • Biophotonics III
Presider: Denise Zecell; USP, Brazil

LT4A.1 • 15:00
Invited
Withdrawn

LT4A.2 • 15:40
Presbyopia Compensation with Elements of Extended Depth of Focus, Lope A. Ciro1,2; "Universidad de Antioquia, Colombia. The paper investigates the properties for imaging of two axicones quartic and two generalized zone plates, trying to find the item to correct presbyopia. The results show that the light sword optical element is a possible solution to the problem of presbyopia.

LT4A.3 • 16:00
Diagnosis of inflammatory lesions by high-wavenumber FT-IR spectroscopy, Luís Felipe Carvalho1,2, Thiago Dreyer1, Janete Almeida1, Herculano Martinho1; "Universidade Federal do ABC, Brazil; "Faculdade de Odontologia de São José dos Campos - UNESP, Brazil. We evaluated FT-IR high wavenumber (2800-3600 cm⁻¹) for diagnosis of oral inflammatory lesions. Logistic binary regression was used for the spectral areas and gave 92.4% of concordant pairs and Sommers' D of 0.85.

15:00–17:00
LT4B • Passive Devices
Presider: Laura Lechuga; CIN2 (CSIC), Spain

LT4B.1 • 15:00
Terahertz Resonant Dipole Nanoantennas, Luca Razzari1, Andrea Toma1, Matteo Clerici2, Mostafa Shalaby2, Salvatore Tuccio1, Simone Panaro1, Manohar Chirumamilla1, Braheem Al-Naib2, Sergio Marras1, Carlo Liberale1, Remo Proietti Zaccaria1, Gobind Das1, Francesco De Angelis1, Andrea Falqui1, Marco Peccianni2, Tsvikeyu Ozaki2, Roberto Morandotti2, Enzo Di Fabrizio1; "Italian Institute of Technology, Italy; "INRS-EMT, Canada. We investigate the resonance characteristics of terahertz nanoantenna arrays, both numerically and experimentally. We demonstrate their tunability and their significant field enhancement properties, which can find several applications in terahertz spectroscopy and nonlinear optics.

LT4B.2 • 15:40
Lineshape Engineering in an All-Pass Ring Resonator with Backreflection Coupled to a Symmetrical Fabry-Perot Resonator, Vasily A. Melnikov1, Iman S. Roqan1,2; "Physical Sciences and Engineering Division, King Abdullah University of Science and Technology, Saudi Arabia. We derive transfer functions for an all-pass ring resonator with internal backreflection coupled to a symmetrical Fabry-Perot resonator and demonstrate electromagnetically induced transparency-like and Fano-like lineshapes tunable by backreflection in the ring resonator.

LT4B.3 • 16:00
Estimate of Refractive Index Changes of Optical Waveguides Recorded by Femtosecond Laser in LiF Crystal, Ismael Chiamenti1, Hypolito J. Kalinowski1, "Universidade Tecnológica Federal do Paraná, Brazil. A technique to estimate the refractive index increase in optical waveguide core, recorded in lithium fluoride crystal by femtosecond laser pulses, by an inverted scalar wave equation is used. The estimated refractive index changes are consistent with published data.

15:00–16:20
LT4C • Terahertz and Heat
Presider: Flavio Cruz, UNICAMP, Brazil,

LT4C.1 • 15:00
Optical properties of silicon, sapphire, silica and glass in the Terahertz range, Jorge O. Tocho1, Federico Sanjuan2,3; "CIOp-UNLP, Argentina. Optical properties, refractive index and absorption coefficient, of silicon, sapphire, silica and pyrex glass near 1 THz frequency were determined by simple transmission measurements of THz pulses.

LT4C.2 • 15:20
Imaging with monochromatic sources at 0.2 and 2.5 Terahertz, Arline M. Melo1, Mauricio Toledo1, André Rocha1, Matheus B. Plotegher2, Daniel Pereira1, Flavio C. Cruz3; "Universidad Estadual de Campinas, Brazil; "BR Labs Ltda, Brazil. We describe the design and construction of two Terahertz imaging systems based on sources at 0.2 and 2.52 THz. One is based on a single emitter and detector, in which the sample position is scanned across the beam. The other is based on a molecular gas laser at 2.52 THz and a microbolometer camera.

LT4C.3 • 15:40
Infrared thermography of integrated circuits heated by focused IR light soldering system, Marco Felix1, Citalli Angiuano1, Andres Medel1, Miguel Bravo2, David Salazar4, Heriberto Marquez2; "Universidad Autonoma de Baja California, Mexico; Center of Investigation Científica y de Educación Superior de Ensenada, Mexico. In this work, we present a thermal distribution measurement and analysis on the surface area of a Ball Grid Array (BGA), soldered by means of a Focused Infrared Light Soldering System (FILSS), which meets the BGA surface mount device (SMD) reflow solder heating profile.
LT4A • Biophotonics III - Continued

LT4A.4 • 16:20
New Device for PpIX Fluorescence Imaging and Non-melanoma Skin Cancer Treatment, Natalia Inada1, Dora P. Ramirez1, Lilian T. Moriyama1, Cintia T. Andrade1, Clovis Grecco1, Ana Gabriela Salvio2, Cristina Kurachi1, Vanderlei S. Bagna-toto1; 1Physics Institute of Sao Carlos, Brazil; 2Amaral Cardilha Hospital, Brazil. Non melanoma skin cancer (NMSC) is the most frequent worldwide, and is necessary the development of new technologies with successful results. We are presenting our National Program for the Photodynamic Therapy of NMSC.

LT4A.5 • 16:40
Random Laser Emission from Bovine Pericardium undergoing uniaxial tension, Celso Briones1, Natanael Cuando-Espitia1, Francisco Sánchez-Arévalo1, Juan Hernandez-Cordero2; 1IIM-LINAM, Mexico. Micromechanical behavior of bovine pericardium under uniaxial tension was associated with random laser emission for the first time. Spectral width variations of the laser emission due to collagen fiber alignment were observed during the tests.

LT4B • Passive Devices - Continued

LT4B.4 • 16:20
A confocal microscopy study on the transmis-sion of light through a single sub-wavelength slit, Mariana T. Carvalho1, Marcel T. Bezerra23, Euclydes Marega-Junior2, Ben-Hur V. Borges3, Frederico D. Nunes23; 1Instituto de Fisica de Sao Carlos, Universidade de Sao Paulo, Brazil; 2Department of Elettronica e Sistemas, Universidade Federal de Pernambuco, Brazil; 3Escola de Engenharia de Sao Carlos, Universidade de Sao Pau-lo, Brazil. We measured a single sub-wavelength slit using confocal microscopy. The transmitted light was measured and the dependence with the input laser polarization was characterized. Results may be related to the coupled SPP throughout the slit.

LT4B.5 • 16:40
High Frequency Double-disk Optomechanical Oscillators, Gustavo Luiz1, Luís Barea1, Newton Frateschi1, Thiago Alegre1, Gustavo S. Wieder-hecker1; 1"Gleb Wataghin" Physics Institute, Uni-camp, Brazil. We propose a double-disk optomechanical resonator with mechanical frequency close to 1 GHz. The design is based on the optimization of the optomechanical interaction of a second-order mechanical mode.

LT4C • Terahertz and Heat - Continued

LT4C.4 • 16:00
A Smart Window for Solar Energy Co-utilization, Flavio Horowitz2, Giovane de Azambuja2, Marcelo B. Pereira1; 1Univ Federal do Rio Grande do Sul, Brazil; 2HABILIS Arquite-tura Ltda., Brazil. Aiming at thermal comfort and integrated to the building envelope, a low-emissivity, double-glazed window is presented, with adjustable blinds and spectrally selective heat reflection, which allows illumination control and climate-adaptive co-utilization of the reflected infrared.

17:00 - 17:30
EXHIBIT HALL and COFFEE BREAK, Foyer

17:30—18:00
Final Remarks, Maresias
Key to Authors and Presiders

S
Saavedra, Carlos - LT1A.3
Sacilotto, Marco A. - LT2A.12
Sagnes, Isabelle - LS3A.4
Saia, Takashi - LM3C.1
Salazar, David - LT4C.4
Salazar, Hernan - LT3C.5
Salvio, Ana Gabriela - LT2A.19
Samad, Ricardo E. - LM2A.5, LM4A.2, LT2A.1
Sanchez, Ammis - LT2A.28
Sanchez-Arévalo, Francisco - LT4A.5
Sanjuan, Federico - LT4C.2
Santana, Luciano F. - LM1B.3
Santillán, Jessica M. - LT1B.4
Santos Ferreira, Merilyn - LT3C.2
Sato Pertile, Heidi Kaori - LS2A.2
Scafardi, Lucia - LT1B.4
Schiavinatti Tavares, Pedro Ernesto - LM2A.18
Schinca, Daniel C. - LT1B.4
Schreiner, Wido H. - LM1A.2
Schultz, Ulrike - LS2C.4
Segev, Mordechai - LM1A.4
Seliuta, Daluis - LM4A.1
Sen, Michael S. - LM2A.19
Setala, Tero - LM3B.2
Shalaby, Mostafa - LT4B.1
Shalaev, Mikhail I. - LM3A.4
Shiozaki, Rodrigo F. - LM2A.18
Sicchieri, Leticia B. - LT1A.4
Silva Barranco, Javier - LT2A.11
Silva Costa, Matheus - LM2A.22
Silva Souza, Caicida - LT2A.26
Silva, Daliana C. - LT1A.4
Silva, Danilo - LS3C.2
Silva, Edson P. - LM1C.3
Silva, José - LT1A.5
Silva, Larissa S. - LT3A.3
Silva, Marcelo L. - LM1C.3
Silva, Marco - LT3C.4
Silva, Reginaldo - LM1C.3
Silvério da Silva, Diego - LM2A.25
Sinibaldi, Alberto - LS2C.4
Siqueira, JD - LM5A.2
Slabko, Vitaly V. - LM3A.4
Slutsky, Boris - LT3B.2
Soares, Francisco - LS3A.3
Socher, E. - LM4A.1
Soga, Diogo - LT2A.28
Solano, Pablo P. - LT1A.3
Soto-Olmos, Jorge - LS2C.3
Sousa, Ana - LM2A.20
Spatel, R. - LM5A.1
Staforelli, Juan Pablo - LT1A.3
Steinberg, David - LS2A.3
Strickland, Donna T. - LS1A
Stroud, Craig - LS2B.3
Suarez, Santiago - LM2A.32
Sypek, Maciej - LS3C.3

T
Tafur Monroy, Idelfonso - LM4C.1
Tanomaru, Julianne - LT2A.14
Tarasenko, Oleksandr - LT1C.3
Taylor, Jennifer - LS4A.1
Tejerina, Matias - LM2A.32
Telles, Gustavo - LM1B.4
Terenziani, Francesca - LT2A.2
Thomsen, Jan W. - LS4B.2
Tocho, Jorge O. - LT4C.2, LT4A
Toledo, Mauricio - LT4C.3
Toma, Andrea - LT4B.1
Tomazinho, Paulo - LT2A.7
Tomita, Rafael J. - LM2A.26
Tomlin, M. G. - LT1C.2
Torchia, Gustavo - LM2A.32
Torres Cisneros, Miguel - LT2A.16, LT2A.18, LM2A.27, LM2A.28, LS3B.3
Torres, Carlos - LM3B.3
Torres, Pedro - LM2A.3, LM3B
Trijes, Adriana - LM2A.1
Trivi, Marcelo - LM2A.10
Tszuzuki, Ken - LM3C.1
Tuccio, Salvatore - LT4B.1

U
Uzeda Souza, Lucas - LT1B.5

V
Valente, Luiz G. - LM2A.1, LS2C
Vallini, Felipe - LT3B.2
Valušis, Gintaras - LM4A.1
Van Regemorter, Tanguy - LT2A.2
Van Stryland, Eric W. - LM1A.1
Vannucci, Armando - LM3C.4
Vasconcelos, Isis - LT2A.28
Vazquez, Benjamin - LT3C.3
Vázquez-Guardado, Abraham - LM2A.27
Vegas Olmos, Jj. - LM4C.1
Velazquez-Benitez, Amado M. - LT1B.1
Ventura da Silva, Paulo C. - LM1B.3
Videla, Fabian A. - LT1B.4
Vidieri-Barranco, Antonio - LS2B.4, LS2B
Vieira, Nilson D. - LM2A.5, LM4A.2, LT2A.1
Villar, As - LS2B.1
Vivas, Marcelo G. - LT2A.21
Vollet Filho, José Dirceu - LT2A.19
von Zuben, Antonio A. - LT3B.4

W
Wang, Shoujun - LS3A.2
Wang, Yong - LS3A.2
Wang, Yujuan - LM2A.7
Wenseleers, Wim - LM4A.3, LT2A.2, LT2A.8
Wetter, N.U. - LM5A.3
Wernsing, Keith - LS3A.2
Wetter, Niklaus U. - LS3A.1
Wiederhecker, Gustavo S. - LM4A.4, LT3B.5, LT4B.5
Wilkinson, Tim - LM2A.9
Wingad, Brett - LT3B.2
Woolston, Mark - LS3A.2

Y
Yacomotti, Alejandro - LS3A.4
Yamazaki, Hiroshi - LM3C.1
Yang, G. W. - LS4A.4
Yang, Tsung-lin - LM1B.2
Yin, Liang - LS3A.2

Z
Zambianchi, Pedro - LT2A.13
Zawadzki, Crispin - LS4A.2
Zen Karam, Leandro - LT2A.7
Zezell, Denise M. - LT3A.3, LT4A
Zhang, Yi - LM3C.3
Zhang, Zihang - LS4A.2
Zibar, D. - LM4C.1
Zilio, Sergio C. - LT2A.3, LM5A.2