OMN 2023

International Conference on Optical MEMS & Nanophotonics

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SBFOTON CONFERENCE 2023

SBFoton International Optics and Photonics Conference

Lighting Up a Smart Digital Future!

TECHNICAL PROGRAM

Unicamp Convention Center
July 30th – August 3rd

sbfoton · IEEE Photonics Society · OPTICA Formerly OSA · SPIE.

ESSS · Ansys · FAPESP · JOM Journal of Optical Microsystems

LUMENTUM · KEYSIGHT · padtec · THORLABS

Sisfóton · FEEC · IFGW · UNICAMP

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2023 International Conference on Optical MEMS and Nanophotonics (OMN) and SBFoton International Optics and Photonics Conference (SBFoton IOPC)

Sunday, July 30th

UNICAMP CPV

Casa do Professor Visitante - FUNCAMP

18:30 to 22:30	**Welcome Reception**		

Monday, July 31st

UNICAMP Convention Center

Entrance Hall

08:00 to 17:30	**Registration Desk**		Secretary: Simone Telles (Unicamp, Brazil)
08:30 to 09:00	**Opening Ceremony**		
09:00 to 12:30	PLS-G-MON	**Plenary Session**	Chairs: Dan Marom (Hebrew University, Israel) and, after the coffee break, : Newton Frateschi (Unicamp, Brazil)

Auditorium 1

14:00 to 15:15	TS-MON-01	**Integrated Photonics & Optoelectronics 1**	Chair: Thiago Alegre (Unicamp, Brazil)
16:00 to 17:30	TS-MON-02	**MEMS 1**	Chair: Niels Quack (University of Sydney, Australia)

Auditorium 2

14:00 to 15:30	TS-MON-03	**Biophotonics 1**	Chair: Denise Zezell (IPEN/USP, Brazil)
16:00 to 17:30	TS-MON-04	**Lasers 1**	Chair: Niklaus Wetter (IPEN, Brazil)

Auditorium 3

14:00 to 15:30	TS-MON-05	**Sensors, Image & Illumination 1**	Chair: Renato Evangelista de Araújo (UFPE, Brazil)
16:00 to 17:15	TS-MON-06	**Optics & Instrumentation 1**	Chair: Jonas Osório (Unicamp, Brazil)

Entrance Hall / Corridors

12:30 to 17:30	**Exhibits**	Ansys ESSS LUMENTUM KEYSIGHT padtec Sisfóton THORLABS

UNICAMP Lake House

18:30 to 20:30	**Music Concert**	**Choir “Zíper na Boca” (Unicamp, Brazil)**

Tuesday, August 1st

UNICAMP Convention Center

Entrance Hall

08:30 to 17:30	**Registration Desk**		Secretary: Simone Telles (Unicamp, Brazil)

Auditorium 3

09:00 to 12:30	PLS-G-TUE	**Plenary Session - Tuesday**	Chairs: Hugo Figueroa (Unicamp) and, after the coffe break, Andreas Seifert (NanoGune, Spain)

Auditorium 1

14:00 to 15:30	TS-TUE-01	**Photonics 1**	Chair: Gilliard Nardel Silveira (Unicamp, Brazil)
16:00 to 17:15	TS-TUE-02	**MEMS 2**	Chair: Yves-Alain Peter (Polytech. Montreal, Canada)

Auditorium 2			
14:00 to 15:30	TS-TUE-03	**Optical Communication 1**	Chair: Mônica Rocha (USP, Brazil)
16:00 to 17:30	TS-TUE-04	**Optical Communication 2**	Chair: Felipe Rudge Barbosa (Unicamp, Brazil)
Auditorium 3			
14:00 to 15:30	TS-TUE-05	**Lasers 2**	Chair: Ricardo Samad (IPEN, Brazil)
16:00 to 17:30	TS-TUE-06	**Biophotonics 2**	Chair: Denise Zezell (IPEN/USP, Brazil)
Entrance Hall / Corridors			
8:30 to 17:30	**Exhibits**		
UNICAMP IFGW Auditorium			
18:30 to 20:30	**SBFoton Assembly**		

Wednesday, August 2nd			
UNICAMP Convention Center			
Entrance Hall			
08:30 to 17:20	**Registration Desk**		Secretary: Simone Telles (Unicamp, Brazil)
Auditorium 3			
09:00 to 12:30	PLS-G-WED	**Plenary Session - Wednesday**	Chairs: Azizur Rahman (City University of London, UK) and, the after the coffee break, Gustavo Wiederhecker (Unicamp, Brazil)
Auditorium 1			
13:30 to 15:30	TS-WED-01	**Exhibitors Panel**	Chair: Rodrigo Vicentini (Keysight, Brazil)
16:00 to 17:30	TS-WED-02	**Workshop: Machine learning for optical communication**	Chair: Joaquim Martins Filho (UFPE, Brazil)
Auditorium 2			
14:00 to 15:30	TS-WED-03	**Nanophotonics 1**	Chair: Joseph Talghader University of Minnesota, USA)
16:00 to 17:15	TS-WED-04	**Integrated Photonics & Optoelectronics 2**	Chair: Frederic Zamkotsian (Laboratoire d'Astrophysique de Marseille, France)
Auditorium 3			
14:00 to 15:30	TS-WED-05	**Sensors, Image & Illumination 2**	Chair: Diego Rátiva (UPE, Brazil)
16:00 to 17:30	TS-WED-06	**Optics & Instrumentation 2**	Chair: Cícero Martelli (UTFPR,Brazil)
Entrance Hall / Corridors			
8:30 to 17:30	**Exhibits**		
Restaurante Estância Grill, Barão Geraldo			
19:30	**Conference Dinner**		

Thursday, August 3rd			
UNICAMP Convention Center			
Entrance Hall			
08:30 to 17:30	**Registration Desk**		Secretary: Simone Telles (Unicamp, Brazil)

Auditorium 3			
09:00 to 12:30	PLS-G-THU	**Plenary Session Thursday: 5th Webinar Brazilian Photonics Laboratories System SISFOTON/MCTI**	Chairs: João Batista Rosolém (CPQD, Brazil) and, after the coffe break, Rafa Figueiredo (CPQD, Brazil)
Auditorium 1			
14:00 to 15:15	TS-THU-01	**Photonics 2**	Chair: Ralf Bauer (University of Strathcycle, UK)
16:00 to 17:00	TS-THU-02	**Photonics 3**	Chair: Joseph Talghader (University of Minnesota, USA)
Auditorium 2			
14:00 to 15:30	TS-THU-03	**Optical Communication 3**	Chair: Alexandre Pohl (UTFPR, Brazil)
16:00 to 17:30	TUS-THU-04	**Optical Communication 4**	Chair: Rafael Figueiredo (CPQD, Brazil)
Auditorium 3			
14:00 to 15:30	TS-THU-05	**Sensors, Image & Illumination 3**	Chair: Joaquim Martins Filho (UFPE, Brazil)
16:00 to 17:15	TS-THU-06	**Optics & Instrumentation 3**	Chair: Claudio C. Motta (USP, Brazil
Entrance Hall / Corridors			
8:30 to 14:00	**Exhibits**	Ansys ESSS LUMENTUM KEYSIGHT padtec Sisfóton THORLABS	
Auditorium 3			
17:30 to 18:00	**Awards and Closing Ceremony**		Chairs: Luiz Bonani (UFABC, Brazil), Alexandre Pohl (UTFPR, Brazil) and Hugo Figueroa (Unicamp, Brazil)

Expanded Program

Sunday, July 30th

UNICAMP CPV

Casa do Professor Visitante - FUNCAMP

18:30 to 22:30	**Welcome Reception**		

Monday, July 31st

UNICAMP Convention Center

Entrance Hall

08:00 to 17:30	**Registration Desk**		Secretary: Simone Telles (Unicamp, Brazil)

Auditorium 3

08:30 to 12:30	PLS-G-MON	**Plenary Session - Monday**	Chairs: Dan Marom (Hebrew University, Israel) and, after the coffee break, Newton Frateschi (Unicamp, Brazil)
08:30 to 09:00	PLS-G-MON-01	Opening Ceremony and OMN 2024 First Announcement	Hugo Figueroa (General Chair); Dan Marom (OMN International Steering Committee Chair); Alexandre Pohl (SBFoton President and Organizing Committee Chair); Mônica Rocha (Technical Program Committee Chair); Andreas Seifert (OMN 2024 General Chair)
09:00 to 09:45	PLS-G-MON-02	“How does an idea of immersive display evolve into multiple innovations in personalized medicine?” By Sunghoon Kwon (Seoul National University, South Korea)	I was interested in future immersive display systems when I was a doctoral student, and that’s why I was into optical MEMS. Due to the massive amount of data that needs to be processed in the display system, I thought it should be a self-assembled form of identical active display components that should organize itself as a display panel later. I proposed ‘smart scalable systems' as a research theme that could enable such a massive system in display, energy, and biochips based on self-assembly of many heterogeneous 5.components. Though the immersive display by self-assembly is still just an idea, this concept of smart scalable systems evolved into multiple biotech innovations for the past 15 years in my research group. I will present the concept of smart scalable systems first. Then I will talk about our researches in structural colored microparticles, DNA laser printer, life-saving antibiotic test, laser-based single-cell genomics, a few of which already become commercial products. It is even more interesting Iam applying again the technique I learned from these researches back to displays that use self-assembly. Life is a journey full of expectations and surprises.
09:45 to 10:30	PLS-G-MON-03	“New synchrotron light sources and Sirius, the Brazilian player in this game” By Antonio Jose Roque da Silva (CNPEM, Brazil)	The use of synchrotron radiation by a great variety of fields has increased steadily worldwide for the past decades. This, to a large extent, is a result of the availability of the much brighter third-generation light sources, which allowed the development of new experimental techniques. Recently, new advances in accelerator technology are opening up the possibility of even brighter sources, which are being named fourth-generation light sources. Brazil gave an important contribution to science in Latin America through the development of the necessary technology and the construction of its first synchrotron between 1987 and 1997. Even though it was a second-generation machine, it was fundamental to develop the know how to build and operate a synchrotron facility as well as a significant user community. Moreover, its pioneering activities in synchrotron science gave rise, with time, to the Brazilian Center for Research in Energy and Materials (CNPEM). CNPEM is a research center that combines the development and operation of open, multi-user, globally competitive laboratory infrastructures with integrated research and development in strategic areas, with focus on nanotechnology, biosciences, biotechnology, and bio-renewables, cutting-edge engineering, and scientific instrumentation. Among these facilities, Sirius, the new Brazilian synchrotron, stands out. It is a state-of-the-art light source, one of the first fourth-generation machines in the world. It provides cutting edge research tools that will benefit a wide range of areas, significantly increasing the capabilities of the Brazilian science.
10:30 to 11:00	Coffee Break		
11:00 to 11:45	PLS-G-MON-04	“Next generation silicon photonics” By Michal Lipson (Columbia University, USA)	We are now experiencing a revolution in optical technologies: in the past the state of the art in the field of photonics transitioned from individual miniaturized optical devices to massive optical circuits on a microelectronic chip that can be modified on demand. This revolution is ongoing –new materials and technologies are emerging to control the flow of light in unprecedented ways and it is opening the door to applications that only a decade ago were unimaginable.
11:45 to 12:30	PLS-G-MON-05	“Synchronization in Nonlinear Nanophotonics” By Alexandre Gaeta (Columbia University, USA)	The phenomenon of synchronization occurs universally across the natural sciences and provides critical insight into the behaviour of coupled nonlinear dynamical systems. It also offers a powerful approach to robust frequency or temporal locking in diverse applications including communications, superconductors, and photonics. Here I describe several examples of synchronization between various types of nonlinear photonic oscillators including Kerr-comb generators and optical parametric oscillators.
12:30 to 14:00	Lunch Break		

Auditorium 1				
14:00 to 17:30	TS-MON	**Technical Session - Monday**		
14:00 to 15:15	TS-MON-01	**Integrated Photonics & Optoelectronics 1**	Chair: Thiago Alegre (Unicamp, Brazil)	
14:00 to 14:30	TS-MON-01-01	Invited: “Current Instabilities in Vacuum Electron Devices and Semiconductor Avalanche Diodes for Generation of THz Oscillations” (EDAS ID: 1570916806)	Konstantin Alexandrovich Lukin and Alexsei Kuleshov (Institute for Radiophysics and Electronics, Ukraine)	Two promising methods for generation of THz radiation are presented and discussed. The hybrid bulk-surface modes excited in a cavity with bi-periodic grating have been considered. Such modes appear due to Electrodynamic interaction of the bulk modes with surface-wave resonator modes (i.e., leaky spoof surface plasmon polariton of an open grating). The potential for the effective generation of the THz radiation in a Clinotron by the excitation of the hybrid modes has been demonstrated. Theory of a new instability in reversed biased pn-junctions with impact ionization was developed and applied for investigation of THz oscillators design.
14:30 to 14:45	TS-MON-01-02	“Dynamic control of coupled mode interactions in triple-state photonic molecules for four wave-mixing” (EDAS ID: 1570907705)	Eduardo S. Gonçalves and Luca O. Trinchao (Unicamp, Brazil); Nathalia B Tomazio (USP, Brazil); Laís Fujii, Paulo Jarschel, Thiago P. M. Alegre and Gustavo Wiederhecker (Unicamp, Brazil)	We present the dispersion engineering of the coupled modes of a triple-state photonic molecule via thermo-optic effects with integrated microheaters. Despite the overall normal group velocity dispersion, local regimes of normal and anomalous dispersion are tailored by fine-tuning the microcavities' supermodes frequencies, providing phase-matching conditions for four wave-mixing processes.
14:45 to 15:00	TS-MON-01-03	“Managing Erbium emissions through ZnO host crystallinity” (EDAS ID: 1570900759)	Camila Ianhez-Pereira, Ariano Rodrigues and Marcio Godoy (UFSCar, Brazil)	We report on the correlations between the optical emission of the Erbium and the structural conditions of ZnO host thin film. The influence of local chemical environment on the luminescence properties of the trivalent RE ions is often disregarded, and the management of host crystallinity in Spray-Pyrolysis synthesis is provided by the precursor dilution, i.e., solution molarity (M). Here we present an analysis of Erbium photoluminescence depending on the host crystallinity, which implies different Stark fields. The use of lower molarity results in transparent films well texturized in c-axis while the use of high molarity provides an opaque powder-like film.
15:00 to 15:15	TS-MON-01-04	“Analysis of integrated photonics with Saturable absorption in the C-Band employing 2D 1T'-MoTe2 monolayer” (EDAS ID: 1570911738)	Maria Carolina França Volpato, Pierre-Louis de Assis and Newton Cesário Frateschi (Unicamp, Brazil)	We investigate 1T'-MoTe2 as a saturable absorber for silicon photonics based integrated devices. Due to its semi-metallic and gap-less behavior, this material is ideal for saturable absorption. We present an optimization of the coupling coefficient between the waveguides to the 2D material, obtaining up to 17.5%. A simple carrier statistics calculation for this 2D structure is shown to be effective in providing good estimate of the saturation intensity for this material. Our simulation indicates that the saturation intensity for this material in an optimized waveguide is approximately 12 MW/cm^2 at 1550nm.
15:30 to 16:00	Coffee Break			
16:00 to 17:30	TS-MON-02	**MEMS 1**	Chair: Niels Quack (University of Sydney, Australia)	
16:00 to 16:30	TS-MON-02-01	Invited:”2D broadband beam steering with MEMS optical phased array” By Youmin Wang (Meta – Facebook, USA)	Optical-phased arrays (OPAs) enable complex beamforming, random-access beam pointing, and simultaneous scan and tracking of multiple targets by controlling the phases of two-dimensional (2D) coherent emitters. So far, no OPA can achieve all desirable features including large 2D arrays, high optical efficiency, wideband operation in wavelengths, fast response time, and large steering angles at the same time. Here, we report on a large-scale 2D OPA with novel microelectro-mechanical-system (MEMS)-actuated phase shifters. Wavelength-independent phase shifts are realized by physically moving a grating element in the lateral direction. The OPA has 160×160 independent phase shifters across an aperture of 3.1 mm×3.2 mm.	

16:30 to 16:45	TS-MON-02-02	"Exploiting Thermal Scanning Probe Lithography for the Fabrication of Micro and Nano Electronic Devices" (EDAS ID: 1570907700)	Paloma Pellegrini (Unicamp, Brazil); Silvia Vaz Guerra Nista, Daniel de Lara, Mara Canesqui, Emilio Bortolucci and Stanislav Moshkalev (Center for Semiconductor Components and Nanotechnologies, Brazil)	By exploiting alternative fabrication processes, electronic and photonic devices can be shrunken and their performance, enhanced. In this work, we study the fabrication of micro and nano structures through thermal scanning probe lithography. With no vacuum requirements, a structure with a minimum dimension of 100nm was successfully built, in 17 minutes. Aiming at high performance electronic applications, the structure was coated with a 30nm gold film, and then electric characterized according to its foil resistivity.
16:45 to 17:00	TS-MON-02-03	"Low-cost fabrication of an on-chip Fabry-Perot interferometer for dry environmental monitoring" (EDAS ID: 1570907443)	Régis Guertin, Marc-Antoine Bianki and Yves-Alain Peter (Polytechnique Montréal, Canada)	A silicon (110) on-chip in-plane Fabry-Perot interferometer (FPI) with fiber grooves and polymer reservoirs is fabricated through a single anisotropic wet etching process, resulting in high verticality and low roughness. The FPI exhibits high finesse and Q factors and is functionalized with polymers to enable temperature and gas sensing.
17:00 to 17:15	TS-MON-02-04	"Investigation of an inkjet printed optical resonator as an environmental sensor" (EDAS ID: 1570903103)	Marc-Antoine Bianki, Régis Guertin, Cédric Lemieux-Leduc and Yves-Alain Peter (Polytechnique Montréal, Canada)	We investigated an inkjet-printed polymer optical resonator as an environmental sensor. The fabrication method combines additive manufacturing and microfabrication techniques to obtain a suspended SU-8 microdroplet on a silicon pillar. Sensitivity for temperature (-41.4 pm/°C) and humidity sensitivity (0.22 pm/ppm) are measured.
17:15 to 17:30	TS-MON-02-05	"Theoretical and experimental study of comb-actuated mirror with cascaded structures" (EDAS ID: 1570907690)	Wenhao Chen, Huahuang Luo, Mingzheng Duan and Hadi Tavakkoli (The Hong Kong Univ. of Science and Techn., Hong Kong); Wibool Piyawattanametha (KMITL and Chulalongkorn University, Thailand); Yi-Kuen Lee (Hong Kong Univ. of Science and Techn., Hong Kong)	For the first time, we present a two-dimensional theoretical model for one-dimensional comb-actuated MEMS mirror with cascaded structures. The numerical model including different damping mechanisms and nonlinear capacitive force is validated with experiment results. Stability analysis is conducted to simulate the nonlinear hysteretic frequency response. The model proposed can be a guideline for designing multi-degree-of-freedom nonlinear parametric-excited MEMS mirror with high frequency and large scan angle.
Auditorium 2				
14:00 to 17:30	TS-MON	**Technical Session - Monday**		
14:00 to 15:30	TS-MON-03	**Biophotonics 1**	Chair: Denise Zezell (IPEN/USP, Brazil)	
14:00 to 14:30	TS-MON-03-01	Invited: "Metallic Nanoparticles Functionalized with Aminolevulinic Acid and Gamma-Aminobutyric Acid: Applications in Medicine and Agriculture" (EDAS ID: 1570907982) By Lilia Coronato Courrol (UNIFESP, Brazil)	Aminolevulinic acid (ALA) as a prodrug can be converted to protoporphyrin IX, which can be accumulated preferentially in tumor cells, presenting theranostic applications. ALA is also a precursor to chlorophyll, essential for photosynthesis. Gamma-aminobutyric acid (GABA) is a vertebrate central nervous system neurotransmitter. In plants, intracellular levels of GABA are typically low. GABA can be significantly accumulated in response to drought, salt, and low temperature and can increase the resistance of plants against these stresses. This paper describes the synthesis and characterization of metallic nanoparticles (silver, gold, and copper) and their applications in medicine and agriculture.	
14:30 to 14:45	TS-MON-03-02	"Evaluation of silver nanoparticles synthesized with ALA and plant extract in seed nanopriming" (EDAS ID: 1570906077)	Isabela Lopes (UNIFESP, Brazil); Lilia Coronato Courrol (Instituto de Ciências Ambientais, Químicas e Farmaceuticas, Brazil & UNIFESP, Brazil)	Nanopriming is a simple and cost-effective method for seed germination and consists in using nanoparticles (NPs) in a solution for a determined period. In this paper, sunflower seeds were primed with water and silver NPs produced with aminolevulinic acid (ALA) and Mimusops Coriacea leaves extract, both synthesized by the photoreduction method. The fluorescence spectra and decay time of the chlorophyll extract of seedlings ten days after nanopriming were measured. The results indicated that silver NPs increased seed germination, seedling growth, and chlorophyll production compared to water-primed seeds. No toxicity was observed with the presence of silver NPs

14:45 to 15:00	TS-MON-03-03	"Sub-nanosecond microchip oscillator for a MOPA system tailored for tattoo removal" (EDAS ID: 1570907716)	Marcus Vinicius Catarina, Allan Bereczki and Niklaus Wetter (IPEN, Brazil)	In this work we study a microchip laser designed to function as an oscillator in a Master-Oscillator Power-Amplifier (MOPA) system targeted for laser tattoo removal. Different configurations of the Nd: YAG resonator were used by changing the output coupler mirror reflectivities and the initial transmission of the Q-switch. The quasi-CW resonator provided 55.4 W of output with 51.31% and 78.2% optical and slope efficiencies, respectively. For Q-switched operation, the best configuration resulted in a peak output power of 3.6 MW with 588 ps pulse width.
15:00 to 15:15	TS-MON-03-04	"Identification of basal cell carcinoma skin cancer using FTIR and Machine learning" (EDAS ID: 1570907945)	Daniella L. Peres (IPEN & USP, Brazil); Sajid Farooq (IPEN, Brazil); Rocío Raffaeli (Universidad Nacional de La Plata, Argentina); Adele Croce (Universidad Nacional de La Plata, Brazil); Denise M. Zezell (IPEN/CNEN & USP, Brazil)	Here we applied ATR-FTIR spectroscopy combined with computational modeling based on 3D-discriminant analysis (3D-PCA-QDA). Our results present an exceptional performance of 3D-discriminant algorithms to diagnose BCC skin cancer, indicating the accuracy up to 97%.
15:15 to 15:30	TS-MON-03-05	"Monitoring changes in urine from diabetic rats using ATR-FTIR and Machine learning" (EDAS ID: 1570907965)	Sajid Farooq (IPEN, Brazil); Daniella L. Peres (IPEN & USP, Brazil); Douglas Caixeta (UFU, Brazil); Cássio Lima (University of Liverpool, UK); Robinson Sabino da Silva (UFU, Br); Denise M. Zezell (IPEN/CNEN & USP, Brazil)	Here, we aim to better characterize diabetes mellitus (DM) by analyzing 149 urine spectral samples, comprising of diabetes versus healthy control groups employing ATR-FTIR spectroscopy, combined with a 3D discriminant analysis machine learning approach. Our results depict that the model is highly precise with accuracy up to 100%.
15:30 to 16:00	Coffee Break			
16:00 to 17:30	TS-MON-04	**Lasers 1**	Chair: Niklaus Wetter (IPEN, Brazil)	
16:00 to 16:30	TS-MON-04-01	Invited: "Light-Sheets Composed of Bessel Beams for Three-Dimensional Holography and Imaging" (EDAS ID: 1570926021)	Leonardo Ambrosio , Jhonas O. de Sarro and Vinicius de Angelis (USP, Brazil); Ahmed H Dorrah and Priyanuj Bordoloi (Harvard University, USA); Michel Zamboni-Rached (Unicamp, Brazil); Federico Capasso (Harvard University, USA)	We discuss theoretical aspects of longitudinallystructured light-sheets constructed from superpositions of Bessel beams, envisioning applications in holography, volumetric displays, augmented and virtual reality, optical trapping and manipulation of microparticles and so on. Current experimental setups are presented.
16:30 to 16:45	TS-MON-04-02	"Photoelastic Dispersion Coefficient by Holographic Reconstruction with Neural Networks and the Fresnel Method" (EDAS ID: 1570907472)	Felipe Maia Prado (USP, Brazil); Pedro Henrique Miho de Souza and Sidney Leal da Silva (Faculdade de Tecnologia de Itaquera, Brazil); Niklaus Wetter (IPEN, Brazil)	Here we report the characterization of the photoelastic dispersion coefficient using digital holography with two distinct reconstruction methods: one based on the Fresnel method and the other utilizing convolutional neural networks (CNN). The CNN was trained with reconstruction from the Fresnel method and was able to provide reconstructions with an average Mean Squared Error of 0.006.
16:45 to 17:00	TS-MON-04-03	"Theoretical Analysis of Increasing Signal Beam Quality in a Pump-signal Beam Combiner by Adapting Mode Field Radius" (EDAS ID: 1570907981)	Lucas Mendes (USP, Brazil); Ricardo E. Samad (IPEN/CNEN, Brazil); Claudio C. Motta (USP, Brazil)	High efficiency, low insertion loss and high beam quality are pump-signal beam combiners interesting characterıstics. These devices have enable to coupling power in the fiber lasers active medium and their performance has a strong impact at fiber lasers efficiency. So, in this paper the optical beam quality increase was analyzed by adapting the modal radius of the combiner signal fiber. The formulation is supported by the Finite Difference Beam Propagation Method (FD-BPM) and Fast Fourier Transforms (FFT), and they were implemented in Matlab.
17:00 to 17:15	TS-MON-04-04	"Highly-efficient, dual-wavelength Nd: YLF laser emitting at 1314 nm and 1047nm" (EDAS ID: 1570907470)	Felipe Maia Prado (USP, Brazil); Tomás Junqueira Franco (RWTH Aachen University Aachen, Germany & IPEN, Brazil); Niklaus Wetter (IPEN, Brazil)	We report a record optical-to-optical efficiency of 43% and a slope efficiency of 48% for a Nd: YLF laser emitting at 1314 nm. The crystal was side-pumped by a VBG-equipped diode emitting at 797 mn, with a peak power of 1545 W. We also report simultaneous dual-wavelength emission, at 1313 nm and 1047 nm.

17:15 to 17:30	TS-MON-04-05	"Compact, high power CW ring laser resonator" (EDAS ID: 1570907967)	Felipe Cremasco de Menezes (USP, Brazil); Allan Bereczki and Niklaus Wetter (IPEN, Brazil)	We demonstrated the dynamically stable operation of a Nd: YAG ring laser with 51.8 W of linearly polarized, continuous output power. The laser was based on laser modules side-pumped by diode bars. The resonator is aimed to single-frequency operation and it is a design improvement from a previous work with the resonator length 4.3 times smaller than the previous design, thus resulting in a larger free spectral range favoring for operation at single-frequency.
Auditorium 3				
14:00 to 17:30	TS-MON	**Technical Session - Monday**		
14:00 to 15:30	TS-MON-05	**Sensors, Image & Illumination 1**	Chair: Renato Evangelista de Araújo (UFPE, Brazil)	
14:00 to 14:30	TS-MON-05-01	Invited: "Waveguide-Based Designs and Optimization of Solar Thermal Collectors for Building Integration" By Diego Rativa (UPE, Brazil)	Solar energy is becoming increasingly important as a clean and renewable energy source. One type of collector, the Direct Absorption Solar Collector (DASC), is a cost-effective and simple design without the need for solar tracker elements. The use of nanoparticles in the DASC has improved its performance, but challenges remain, such as high costs and handling issues. In this presentation, we propose new designs for the DASC and Concentrating Solar Thermal collectors based on waveguide mechanism, aiming to integrate them with building structures. These designs use advanced algorithms to optimize performance and reduce costs. We prototype the designs using Transparent/Clear 3D Printing and validate their efficiency under controlled illumination conditions.	
14:30 to 14:45	TS-MON-05-02	"Large-core hollow fibers for speckle-based displacement sensing" (EDAS ID:1570902665)	Jonas H Osório, Thiago D Cabral and Eric Fujiwara (Unicamp, Br); Marcos A. R. Franco (IEAv/CTA, Br); Foued Amrani (University of Limoges, France); Frédéric Delahaye (Glophotonics, Brazil); Frédéric Gérôme and Fetah Benabid (Univ. of Limoges, France); Cristiano MB Cordeiro (Unicamp, Brazil)	We study the application of a large-core hollow fiber as a platform for displacement sensing. The sensor is assembled by inserting and appropriately moving a single-mode fiber in the empty core of the hollow fiber. Such a construction allows attaining a speckled intensity profile at the hollow fiber output, which is evaluated while one controllably displaces the single-mode fiber in its interior. Our results allow identifying this scheme as a promising means for exploring the multimode characteristics of hollow fibers in sensing contexts.
14:45 to 15:00	TS-MON-05-03	"Temperature sensing with a liquid-filled hollow-core photonic crystal fiber" (EDAS ID: 1570902666)	Gabriel Labes Rodrigues and Cristiano MB Cordeiro (Unicamp, Brazil); Foued Amrani, Frédéric Gérôme and Fetah Benabid (University of Limoges, France); Jonas H Osório (Unicamp, Brazil)	We report the realization of temperature sensing measurements using a water-filled hollow-core photonic crystal fiber. The operation of the sensor relies on the thermo-optic effect-mediated spectral shifts of the fiber transmission bands due to temperature variations. The characterization of our device allowed us to estimate a sensitivity of (0.42 ± 0.04) nm/ºC and to identify the studied platform as a valid path for the development of fiber-based temperature sensors.
15:00 to 15:15	TS-MON-05-04	"Post-processing of hollow-core photonic crystal fibers: selective hole inflation and tapering" (EDAS ID: 1570902667)	Guilherme Machado and Cristiano MB Cordeiro (Unicamp, Brazil); Rodrigo Gerosa (Universidade Presbiteriana Mackenzie, Brazil); Foued Amrani, Frédéric Gérôme and Fetah Benabid (University of Limoges, France); Jonas Hosório (Unicamp, Brazil)	We report on post-processing experiments using hollow-core photonic crystal fibers. We show that, by simultaneously heating and internally pressurizing the fibers, we can taper or modify the sizes of the fiber microstructure features. Particularly, by employing a technique for selectively obstructing the microstructure elements, we could attain tailored modifications of the fiber architecture, namely the inflation of selected cladding tubes, which can be of interest for the development of new devices and sensors.
15:15 to 15:30	TS-MON-05-05	"Refractive Index Sensor based on Hetero-core fiber Interrogated by a Laser/photodetector at 1550 nm" (EDAS ID: 1570908013)	Hebio Oliveira, Thales H. Castro de Barros, Allamys Allan Dias da Silva, Jehan Nascimento and Joaquim F. Martins-Filho (UFPE, Brazil)	We present an investigation of a hetero-core fiber optic refractive index sensor that performs measurements under the 1550 nm wavelength for chemical and biological applications. The structure is formed by a no-core fiber (NCF) spliced to a multimode optical fiber at each of its ends, forming a Multimode / No-core fiber / Multimode (MNM) structure, where the NCF fiber is the sensing part of the structure. The simple and low cost interrogation scheme uses a laser and a photodetector. The sensor is able to measure refractive index variations with a resolution of 9.93×10-5 RIU.
15:30 to 16:00	Coffee Break			

16:00 to 17:15	TS-MON-06	**Optics & Instrumentation 1**	Chair: Jonas Osório (Unicamp, Brazil)	
16:00 to 16:30	TS-MON-06-01	Invited: “Upconversion nanoparticles and IR-activated processes”	Sidney José L. Ribeiro (Unesp, Brazil)	This presentation will focus on upconversion nanoparticles (UCNPs) which are suitable materials for bioapplications due to their ability to emit visible light under near infrared (NIR) excitation, in the biological transparency range.
16:30 to 16:45	TS-MON-06-02	“A study of the properties of Iron oxides (alpha-Fe2O3 and Fe3O4) through time domain spectroscopy in the Terahertz range” (EDAS ID: 1570907174)	Giovanni Budroni, Nt (Unicamp, Brazil)	Time domain spectroscopy was performed on samples of the iron oxides alpha-hematite and magnetite. From their spectra, we were able to obtain the complex refractive index, optical conductivity and dielectric constants. For alpha-hematite, an AFM resonance was detected in 0.13 THz. Although we did not find any resonance for magnetite, it was possible to observe spectral changes by decreasing the temperature. This show to us that TDS-THz is an attractive tool to detect corrosion on iron materials.
16:45 to 17:00	TS-MON-06-03	“Interactions between plasmonic nanoparticles with a Kretschmann-configuration SPR setup” (EDAS ID: 1570907502)	Ricardo Araguillin (Escuela Politécnica Nacional, Ecuador); Elizabeth Samaniego (Universidad de Buenos Aires, Argentina); Isamar Sarabia and Víctor Santos (Escuela Politécnica Nacional, Ecuador); Xavier Cattöen (Universitè Grenoble Alpes, France); Yanxia Hou (Université Grenoble Alpes, CNRS, CEA, IRIG SyMMES, France); César Costa-Vera (Escuela Politécnica Nacional, Ecuador)	We studied by Surface Plasmon Resonance (Kretschmann configuration) interactions in nanoparticles suspended in liquids and between the NPs and the sensor gold surface. After calibration with NaCl, suspensions were dried to measure the continuously reconcentrating NP suspensions.
17:00 to 17:15	TS-MON-06-04	“Characterizing an inhomogeneous water-carbohydrate solution using its optical activity” (EDAS ID: 1570907688)	Eduardo A. V. Souza, Jonas H Osório and Cristiano MB Cordeiro (Unicamp, Brazil)	We report on the characterization of the depth-dependent concentration gradient of an inhomogeneous water-sucrose solution and its evolution with time. The experimental method is simple and non-intrusive, being attractive for the characterization of liquid samples displaying optical activity.
Entrance Hall / Corridors				
12:30 to 17:30	**Exhibits**	Ansys ESSS LUMENTUM KEYSIGHT padtec Sisfóton THORLABS		
UNICAMP Lake House				
18:30 to 20:30	**Music Concert**	Unicamp’s Choir “Zíper na Boca”	Formed in September 1985, the group is made up of undergraduate and graduate students, employees and professors from different areas of Unicamp and people from the external community. Linked to the Center for Integration, Documentation and Cultural Diffusion (CIDDIC) since 1990, it actively participates in national and international choir festivals.	

Tuesday, August 1st				
UNICAMP Convention Center				
Entrance Hall				
08:30 to 17:30	**Registration Desk**		Secretary: Simone Telles (Unicamp, Brazil)	
Auditorium 3				
09:00 to 12:30	PLS-G-TUE	**Plenary Session - Tuesday**	Chairs: Hugo Figueroa (Unicamp) and, after the coffe break, Andreas Seifert (NanoGune, Spain)	
09:00 to 9:45	PLS-G-TUE-01	"Enhancement in LiDAR SNR using non-Classical Light" By Amr Helmy (University of Toronto, Canada)	Sensing modalities and instrumentation for target detection and raging applications have received tremendous attention over the past decade. This has been driven in no small part by the unsatiable demand for cheaper, more compact and significantly improved Light Detection and Ranging (LiDAR), which is essential for autonomous navigation. The detection of objects in the presence of significant background noise is a problem of fundamental interest in sensing. In this talk I aim to demonstrate theoretically and experimentally how one can exploit non-classical light generated in monolithic semiconductor light sources in conjunction with non-local effects to enhance the performance of optical target detection and model LiDAR system. Our protocols utilize quantum time-correlation which are obtained from a spontaneous parametric down-conversion sources. The protocols only require time-resolved photon-counting detection, which is phase-insensitive and therefore suitable for practical target detection. As a representative comparison to such a detection protocol, we also consider a classical phase-insensitive target detection protocol based on intensity detection. Unlike classical target detection and ranging protocols, the probe photons in our detection protocol are completely indistinguishable from the background noise and therefore useful for covert ranging applications. The experimental results agree very well with the theoretical prediction. In particular, we find that in a high-level environment noise and loss, our detection protocol can achieve performance comparable to that of the classical protocol that is practical in the optical regime.	
09:45 to 10:30	PLS-G-TUE-02	"Amorphous oxides by design for photonics applications" By Carmem Menoni (University of State Colorado, USA)	Amorphous oxides are prevalent in photonic technologies. They are transparent from the near ultraviolet to the midinfrared and offer a large refractive index contrast with substrates like Si which is exploited to confine light. In this talk I will describe how the optical and structural properties of amorphous oxide thin films deposited by sputtering are tailored to engineer multilayer dielectric stacks with selected optical response for their applications to laser science and photonics	
10:30 to 11:00	Coffee Break			
11:00 to 11:45	PLS-G-TUE-03	"Flat optics: arbitrary wavefront control with passive and active metasurfaces and metalenses for high volume applications" By Federico Capasso* (Harvard University, USA) (*remote from USA)	I will discuss metasurfaces that enable light's spin and orbital angular momentum to evolve along the propagation direction and nonlocal supercell designs that demonstrate multiple independent optical functions at arbitrary large deflection angles with high efficiency. 2D phase and polarization singularities ("structured dark") have been realized, as well as 0D singularities. I will give the state-of-the-art of metalenses including their high-volume manufacturing for consumer electronics.	
11:45 to 12:30	PLS-G-TUE-04	"Diffractive Optical Networks & Computational Imaging Without a Computer" By Aydogan Ozcan* (UCLA,USA) (*remote from USA)	I will discuss diffractive optical networks designed by deep learning to all-optically implement various complex functions as the input light diffracts through spatially-engineered surfaces. These diffractive processors designed by deep learning have various applications, e.g., all-optical image analysis, feature detection, object classification, computational imaging and seeing through diffusers, also enabling task-specific camera designs and new optical components for spatial, spectral and temporal beam shaping and spatially-controlled wavelength division multiplexing.	
12:30 to 14:00	Lunch Break			
Auditorium 1				
14:00 to 17:30	TS-TUE	**Technical Session - Tuesday**		
14:00 to 15:30	TS-TUE-01	**Photonics 1**	Chair: Gilliard Nardel Silveira (Unicamp, Brazil)	
14:00 to 14:30	TS-TUE-01-01	Invited: "Designs and Optimisation of Photonic Devices by Finite Element Method" (EDAS ID: 1570915340)	Azizur Rahman (City University of London, UK)	A review on the characterisations of photonics devices by using numerically efficient finite element method is presented.

14:30 to 14:45	TS-TUE-01-02	"Mixing Neural Networks and Genetic Algorithms for Optimized LSPR Biosensor Design" (EDAS ID: 1570911750)	Felipe Aragão Nogueira De Freitas, Omar Neto and Jhonattan Cordoba Ramirez (UFMG, Brazil)	Localized Surface Plasmon Resonance devices have garnered attention and demonstrated noteworthy promise in response to the growing demand for more precise and effective tools in the medical field. However, LSPR devices require optimized geometry to deliver high accuracy, which poses an inherent challenge for their use. In this paper, we present a novel methodology embedded in an in-use intelligent tool that uses a Genetic Algorithm and Neural Network for modeling and data processing in LSPR devices for biosensing applications.
14:45 to 15:00	TS-TUE-01-03	"Optical Fiber Specklegram Bending Sensor for Application in Soft Robotics" (EDAS ID: 1570906247)	Matheus Rodrigues (Unicamp & Embraer, Brazil); Eric Fujiwara (Unicamp, Brazil)	This work presents a straightforward, low-cost method for assessing the deflection of flexible elements to envisage applications in the field of soft robotics. The sensor comprises an optical fiber specklegram transducer coupled to a cantilever-type manipulator. The results yield absolute sensitivities of 0.37 N-1 and 0.05 cm-1 concerning force and deflection measurements, respectively, with a good agreement between simulation and experimental validation.
15:00 to 15:15	TS-TUE-01-04	"Optical Encoding Model based on OAM beam superposition and Machine Learning detection" (EDAS ID: 1570896314)	Erick Lamilla Rubio, Manuel Alvarez-Alvarado, Arturo Pazmino and Peter Iza (Escuela Superior Politecnica del Litoral, Ecuador)	An optical encoding model based on the coherent superposition of two Laguerre-Gaussian modes carrying orbital angular momentum is presented using Machine Learning detection method. In the encoding process, the intensity profile for the encoded data is generated based on selection of p and ℓ indices, while the decoding process is performed using support vector machine algorithm. Different encoding systems are designed and tested via simulations to verify the robustness of the proposed optical encoding model, finding a BER = 10−9 for 10.2 dB of signal-to-noise ratio in the best of the case.
15:15 to 15:30	TS-TUE-01-05	"Perpendicular optofluidic setup for real time droplet size measurements" (EDAS ID: 1570911214)	Juliana de Novais Schianti (UnB, Brazil)	The purpose of this work is to offer a low cost and noninvasive set up for measurement of droplet dimensions. An optical fiber is positioned perpendicularly on the top layer of the device guiding the light emitted from a laser diode at the wavelength of 632.8 nm. In these devices, by varying the continuous oil flow rate, was obtained droplets dimensions in a going from around 250 µm to 400 µm. To better understand the experimental results, droplets transmittance pattern was analyzed using Finite Element Method modeling in a frequency domain.
15:30 to 16:00	Coffee Break			
16:00 to 17:15	TS-TUE-02	**MEMS 2**	Chair: Yves-Alain Peter (Polytech. Montreal, Canada)	
16:00 to 16:30	TS-TUE-02-01	Invited: "Displays and Imaging Systems Enabled by MEMS Scanners and Computational Holography" By Hakan Urey (Koc University, Turkey)	I will present the story of MEMS laser scanners and computational holographic displays over the past 25 years that have been developed and commercialized by my group. In the first part of the talk, I will review the important figures of merit and the performance achieved for MEMS laser scanners using electromagnetic, electrostatic, and piezoelectric actuators. In the second part, I will discuss the basic principles and various applications of computational holographic displays, including head-worn displays, head-up displays, and a cataract vision simulator for ophthalmology clinics.	
16:30 to 16:45	TS-TUE-02-02	"Photoresponse of Diode-Biased Microelectrodes for Enhanced Microbial Metabolism" (EDAS ID: 1570908069)	Tianqi Luo, Joey Talghader and Daniel Bond (University of Minnesota, USA)	Silicon microelectrodes are biased by pn junctions to voltages favorable to the metabolism of metal-reducing bacteria. The photo-generated current of these silicon photovoltaic cells far exceeds the current draw of known microbial biofilms.
16:45 to 17:00	TS-TUE-02-03	"Micromachined Optical Scanner Using Acoustic Radiation Force" (EDAS ID: 1570910887)	Takashi Sasaki (Silicon Austria Labs, Austria)	This paper reports on a micromachined 1D optical scanner using acoustic radiation force. This novel method allows us to actuate the mirror statically without any electrical connection by means of noncontact repulsive force generated by an acoustic radiator placed more than 2 mm far from the mirror. The optical scanning angle of more than 60 degrees was shown by a fabricated 2 mm square mirror in the experiment.

17:00 to 17:15	TS-TUE-02-04	"Increasing MEMS micromirror line-scan rates through 3D-printed micro-optics" (EDAS ID: 1570908344)	Ralf Bauer, Jay Christopher, Mark Donnachie and Deepak Uttamchandani (University of Strathclyde, United Kingdom (Great Britain))	Line-scan rates of mechanical scanners are in general limited to <100 kHz for scan mirror apertures of up to 1 mm. We present work to increase the line-scan rate of a MEMS micromirror beyond this through a scan multiplication unit consisting of a mirror, a cylindrical lens, and a 3D-printed cylindrical microlens array with 1 mm pitch and 2.5 mm effective focal length. Scan rates of up to 635 kHz at the scan line centre are demonstrated with seven array lenslets, with the compact multiplier having the potential to achieve over 1 MHz line-scan rate using higher element numbers
Auditorium 2				
14:00 to 17:30	TS-TUE	**Technical Session - Tuesday**		
14:00 to 15:30	TS-TUE-03	**Optical Communication 1**	Chair: Mônica Rocha (USP, Brazil)	
14:00 to 14:30	TS-TUE-03-01	Invited: "Impact of Mode-Dependent Gain on the Capacity of Ultra-Long-Haul SDM systems"	Darli Mello (Unicamp, Brazil)	We review the fundamentals of MDG and its impact on the average, outage, and minimum capacities of ultra-long-haul SDM systems. We also study the challenges of estimating the MDG based on the receiver DSP. Our results dictate stringent MDG requirements for SDM amplifiers to ensure capacities equivalent to uncoupled transmission.
14:30 to 14:45	TS-TUE-03-02	"Channel Allocation Analysis for EDFA-based C+L Optical Systems" (EDAS ID: 1570907941)	Luis Gustavo Riveros and Carine Mineto (CPQD & Unicamp); Fábio D. Simões, Tiago Sutili (CPQD & Unicamp, Brazil); Rafael C. Figueiredo (CPQD, Brazil); Evandro Conforti (Unicamp, Brazil)	The channel allocation in a long-haul C+L optical link supported by a parallel EDFA-based amplification subsystem is comparatively analyzed for 80 channels allocated on C, L, or C+L optical band. The achieved results indicate gains on employing a less dense channel grid fully occupying the C+L band, resulting in a reduction of linear and nonlinear impairments.
14:45 to 15:00	TS-TUE-03-03	"Performance Assessment of L-band High-Concentration EDFA using Power Masks" (EDAS ID: 1570907944)	Marcionilo José da Silva (CPqD, Brazil); Luis Gustavo Riveros (CPQD & Unicamps, Brazil); Bethânia A Gomes and Carine Mineto (CPQD and Unicamp, Brazil); Júlia Aline Sousa Maciel and Fábio D. Simões (CPqD, Brazil); Tiago Sutili (CPQD & Unicamp, Brazil); Rafael C. Figueiredo (CPQD, Brazil)	Erbium-doped fiber amplifiers performance, especially designed with high doping concentration to operate at the optical L-band, were experimentally characterized in terms of gain, ripple, and noise figure power masks as a function of both pump power and signal input power. The results indicate the possibility of achieving an optical gain of around 15 dB with a nearly equalized output, using doped fibers with only 25 m of length.
15:00 to 15:15	TS-TUE-03-04	"Extreme Gradient Boost Regression to model a SI-POF Link using OFDM Transmission" (EDAS ID: 1570907713)	Jonathan Gois (CEFET/RJ, Brazil & UFF, Brazil); Flávio André Nogueira Sampaio (Orange, Brazil); Andrés Pablo López Barbero, Vinicius Nunes Henrique Silva and Tadeu Ferreira (UFF, Brazil); Luiz Anet Neto (Imt-atlantique, France)	The use of plastic optical fibers has become widespread due to its mechanical advantages and low cost, despite presenting considerable dispersion. This paper models an OFDM transmission link using the signal power, the bias current and the fiber length over an Extreme Gradient Boost regressor by fitting the multicarrier signal-to-noise ratio. The results show an improvement in the coefficient of determination, and in the error metrics, when compared to traditional modeling.
15:15 to 15:30	TS-TUE-03-05	"Nonlinear Signal Degradation in Unrepeatered Optical Systems with Distributed Raman Amplification" (EDAS ID: 1570907936)	Júlia A. Sousa Maciel and Marcelo P. Nogueira (CPQD, Brazil); Bethânia A Gomes (UNICAMP & CPQD, Brazil); Marcionilo José da Silva (CPqD, Brazil); Stefan Tenenbaum , Felipe Mejia and Gabriel Suzigan (Padtec, Brazil); Lailson Santos (Unicamp, Brazil); Alexander P. Ramirez (Padtec, Brazil); Eduardo Rosa, Fábio D. Simões and Rafael C. Figueiredo (CPQD, Brazil); Tiago Sutili (CPQD & Unicamp, Brazil)	The Kerr-related nonlinear signal distortion for unrepeatered optical links is evaluated for a 100-Gb/s single-channel scenario supported by first-order distributed Raman amplification. The results, comparing systems performance in terms of bit error rate for several optical fibers with dissimilar characteristics, indicate the importance to balance nonlinear and noise degradation to fully optimize the reach and capacity of this kind of system.
15:30 to 16:00	Coffee Break			

16:00 to 17:30	TS-TUE-04	**Optical Communication 2**	Chair: Felipe Rudge Barbosa (Unicamp, Brazil)	
16:00 to 16:30	TS--TUE-04-01	Invited: “Generation of Optical Frequency Combs by Fiber Recirculation Loops and/or Electro-optic Modulators” By Aldário Chrestani Bordonalli (Unicamp, Brazil)	An optical frequency comb generator (OFCG) releases a special type of regular-repetition-rate light pulses that produce a sequence of coherent spectral lines of equal spacing around a stable optical carrier. Because of promising applications in different areas, OFCG design and implementation have recently received strong consideration. Among the various techniques employed for optical frequency comb generation, this lecture deals with two of them in particular, recirculation optical fiber loops and electro-optic modulators. Aspects of their different structures and corresponding experimental results towards applications in optical fiber communications are presented and commented.	
16:30 to 16:45	TS--TUE-04-02	“Optical OFDM transmission based on phase modulation and fiber bragg grating” (EDAS ID: 1570907953)	Paulo de Tarso Neves, Jr., Luis C. Vieira and Alexandre Pohl (UTFPR), Brazil)	In this work, we propose an optical OFDM system using phase modulation followed by optical filtering and direct detection. A fiber Bragg grating is used as an optical filter for phase to amplitude conversion. The performance of the proposed system is investigated for both 16 QAM- and 64 QAMOFDM signals considering different numbers of training signals for frequency-domain channel estimation. With adequate choice of the training sequence length, BER results below 10−4 are reported for the 16 QAM based signal.
16:45 to 17:00	TS--TUE-04-03	“Optimization of Unrepeatered Optical Links with Probabilistic Shaping for Heterogenous Propagation Regimes” (EDAS ID: 1570907942)	Júlia Aline Sousa Maciel (CPQD, Brazil); Tiago Sutili (CPQD & Unicamp, Brazil); Rafael C. Figueiredo (CPQD, Brazil); Darli Mello (Unicamp, Brazil)	The impact of probabilistic shaping in unrepeatered optical communication links operating in the linear, quasi-linear, and nonlinear regimes is investigated. System performance is evaluated considering both uniform and Maxwell-Boltzmann constellations at three different representative launch power levels. Results show shaping-induced gains for all investigated scenarios.
17:00 to 17:15	TS--TUE-04-04	“60-GHz 5G-NR Optical Fronthauls Based on CS-DSB Technique” (EDAS ID:1570911590)	Celso Henrique, Leticia Carneiro Souza, and Tomas P V Andrade (INATEL, Brazil); Evandro Conforti (Unicamp, Brazil); Arismar Cerqueira S. Jr. (INATEL, Brazil)	This paper reports the implementation of 5G New Radio (5G-NR) optical fronthauls based on radio-over-fiber (RoF) technology and optical carrier-suppressed double sideband (CSDSB) technique, operating at 60 GHz. Experimental results over 20-km fiber-optics links demonstrate the successful transmission of QPSK, 16-QAM and 64-QAM modulated signals with up to 400-MHz bandwidth. The proposed 5G-NR RoF system performance meets the 3rd Generation Partnership Project (3GPP) requirements, achieving a total throughput of 800 Mbps.
17:15 to 17:30	TS--TUE-04-05	“Spectral Modulation of Antiresonant Hollow Core Optical Fiber with Flexural Acoustic Waves” (EDAS ID: 1570910856)	Ricardo E. da Silva and Marcos A. R. Franco (IEAv/CTA, Brazil)	Acousto-optic modulation of an antiresonant hollow core optical fiber employing flexural acoustic waves is numerically investigated for the first time. Acoustically induced attenuation of propagating core optical modes is simulated with the finite element method. The fiber's transmission spectrum is tuned by the acoustic amplitude and frequency, indicating an efficient possibility to Q-switch high power fiber lasers in the range of 1030 - 1090 nm.
Auditorium 3				
14:00 to 17:30	TS-TUE	**Technical Session - Tuesday**		
14:00 to 15:30	TS-TUE-05	**Lasers 2**	Chair: Ricardo Samad (IPEN, Brazil)	
14:00 to 14:30	TS-TUE-05-01	Invited: “Random Lasers: review of research activities at IPEN” (EDAS ID: 1570925600)	Niklaus Wetter; Renato J. R. Vieira, Danilo M. da Silva and Kelly C. Jorge (IPEN, Brazil); Ernesto Jimenez-Villar (UFPB, Brazil); Julia M. Giehl and Adriana R. de Miranda (IPEN, Brazil); Jessica Dipold (USP, Brazil)	Random lasers offer advantages such as low-cost fabrication and robustness in harsh environments and have applications in sensing, imaging, communications, and security. Our current research focuses on advanced materials, active control techniques, integration with other photonic structures, and exploration of Anderson localization and polydisperse effects. Coherent feedback in cavity-enhanced random lasers is discussed as means to achieve specific emission characteristics, and emission at 1300 nm is shown for the first time.

14:30 to 14:45	TS-TUE-05-02	"Ionization Model to Estimate the Density and Temperature of fs-Laser-Induced Plasmas in Air" (EDAS ID: 1570907990)	Armando V. F. Zuffi, Jhonatha dos Santos and Ricardo E. Samad (IPEN/CNEN, Brazil)	We present a simple ionization model to assess the density of femtosecond-laser-induced plasmas in air. It calculates the average ionization induced by the laser taking into account the threshold intensities for each ionic state, the beam spatial profile and the atmospheric composition, estimating the plasma density. The model density predictions are compared to experimental results obtained by a time-resolved Mach-Zehnder-like interferometer, and are also used as entry parameters to evaluate the plasma temperature by the Saha equation.
14:45 to 15:00	TS-TUE-05-03	"Nonlinear refractive index analysis in a high-power Yb-doped double-clad fiber laser (YDCFL)" (EDAS ID: 1570907984)	Elbis Cardoso and Pedro Bernardo S. Melo (USP, Brazil); Ricardo E. Samad (IPEN/CNEN, Brazil); Claudio C. Motta (USP, Brazil)	An analytical investigation of the nonlinear refractive index behavior of a high-power Yb-doped double-clad fiber laser (YDCFL) as a function of the pump power, transition frequency between a ground state (level 1) and an excited state (level 2), and pump saturation intensity of the transition is presented in this paper. In order to build the theoretical analysis, three fundamental expressions were used, which describe the changes in the nonlinear refractive index due to these quantum phenomena in the laser. The model was evaluated considering a 500W steady state fiber laser, operating in a two-end pumped configuration.
15:00 to 15:15	TS-TUE-05-04	"Random laser emission in Nd3+ doped tellurite glass" (EDAS ID: 1570907037)	Jessica Dipold (USP, Brazil); Camila Dias da Silva Bordon and Evellyn Magalhães (USP, Brazil); Luciana Kassab (Faculdade de Tecnologia do Estado de São Paulo (FATEC-SP), Brazil); Ernesto Jimenez-Villar (UFPB, Brazil); Niklaus Wetter (IPEN, Brazil)	Random lasers are easier and cheaper to manufacture than regular ones, being made of several materials such as polymers, powders or dyes. Glass random lasers have been rarely studied due to their inhomogeneous broadened emission and low damage threshold. Here, we study Nd3+doped TeO2-ZnO-Al2O3 glasses with different concentrations of rare-earth doping (4 wt.%, 8 wt.% and 16 wt.%). Emission intensity per fluency and fluorescence decay time measurements showed the potential of these glasses for random laser applications in the near-infrared region.
15:15 to 15:30	TS-TUE-05-05	"Transverse electromagnetic modes simulation and experimental measurement technique for a single stripe laser diode" (EDAS ID: 1570907611)	Fernando Carlos Romano and Niklaus Wetter (IPEN, Brazil)	A software model for a single stripe multimode laser diode has been developed. In addition, a method for measuring the transverse electromagnetic modes (TEM) in the RF spectrum through a frequency beating process was also developed. For supporting the TEM readings, a spectrum analyzer was applied and converting the temporal signals to the frequency domain using the fast Fourier transform (FFT) method.
15:30 to 16:00	Coffee Break			
16:00 to 17:30	TS-TUE-06	**Biophotonics 2**	Chair: Denise Zezell (IPEN/USP, Brazil)	
16:00 to 16:30	TS-TUE-06-01	Invited:"Exploring plasmonic nanoparticles in biomedical applications" By Renato Evangelista de Araújo (UFPE, Brazil)	In this presentation the interaction of light with metallic nanoparticles will be described, and the use of plasmonic nanostructures on optical therapy and medical diagnosis will be reveled. Plasmonic properties rely on shape, size and material of the nanostructure. Metallic nanoparticles are explored as starting point for biosensing platforms. The engineering of plasmonic nanoplatforms for medical diagnostic will be discussed. Moreover, the use of plasmonic nanostructures in photothermal therapy will be examined. In this presentation, crucial optical parameters ruling plasmonic heating will be appraised.	
16:30 to 16:45	TS-TUE-06-02	"Quantitative biospeckle spectral and angular analysis of tomatoes at different ripening stages" (EDAS ID: 1570911200)	Juan F. Serighelli, Eric Fujiwara and Cristiano MB Cordeiro (Unicamp, Brazil)	Quantitative biospeckle measurements in tomatoes at different ripening stages are reported. The biological activity was calculated with a correlation method using few seconds videos recorded with a low-cost, lensless webcam. 543 and 633 nm lasers were used as light sources similar or complementary to the tomato color. The webcam captures videos at different angles, close or away from the quasi-specular reflection. A new metric (ratio of the biospeckle activity at two wavelengths) was proposed, allowing for differentiating biological samples at different stages.

16:45 to 17:00	TS-TUE-06-03	“Polarization-Diverse Bimodal Waveguide Interferometric Refractive Index Sensor” (EDAS ID: 1570906867)	Marco A Silva (Universidade Presbiteriana Mackenzie, Brazil); Mauricio Moderno Carvalho (MackGraphe - Centro de Pesquisas em Grafeno, Nanomateriais e Nanotecnologia, Brazil); Christiano Matos (Universidade Presbiteriana Mackenzie, Brazil)	During the Covid-19 pandemic, the rapid and accurate pathogen detection has become increasingly important in preventing/mitigating future pandemics. Photonic biosensors have the potential to detect a variety of pathogens, with high sensitivity. Bimodal waveguides are among the most sensitive photonic sensors demonstrated. However, they generally require complex waveguide structures putting strain on fabrication. This study investigates an interferometric sensor that exploits the fundamental modes at orthogonal polarizations, thus allowing for the use of a standard silicon nitride rib waveguides. Simulation results using COMSOL Multiphysics indicate over 60% improvement in bulk sensitivity, relative to previously demonstrated bimodal waveguides.
17:00 to 17:15	TS-TUE-06-04	“A 3D discriminant analysis for Hyperspectral FTIR images” (EDAS ID: 1570907934)	Gleice Conceição Mendonça Germano (IPEN & CNEN, Brazil); Sajid Farooq (UPE, Brazil); Kleber Stancari (IPEN/CNEN, Brazil); Rocío Raffaeli (Universidad Nacional de La Plata, Argentina); Adele Croce (Universidad Nacional de La Plata, Brazil); Denise M. Zezell (IPEN/CNEN & USP, Brazil)	Here, we apply a 3D discriminant analysis approach to analyze FTIR hyperspectral images of normal vs malignant samples for skin cancer diagnosis. Our results evidence the outstanding performance with accuracy up to 81% for big data (> 100k).
17:15 to 17:30	TS-TUE-06-05	“FBG thoracic strap for apnea tests” (EDAS ID:1570911836)	Gabriel H de Andrade, Sr., Ilda Abe and Acy Cidade Filho, Sr. (UTFPR, Brazil)	Respiratory movement is used to detect homeostatic changes in an individual organism. This manuscript reports a strap instrumented with fiber Bragg grating (FBG) for the analyses of respiratory movements during apnea cycles. Tests are performed by the voluntary using the FBG straps covered the entire thoracic circumference. The expansion of the ribcage cause the change in resonance wavelength of the FBGs. The apnea tests shows a decay due to oxygen loss of approximately 0.012 nm/s. Results shows that the FBG straps could be used for analyses of respiratory movements with high sensibility, allowing its use for health area.
Entrance Hall / Corridors				
8:30 to 17:30	**Exhibits**	Ansys ESSS LUMENTUM KEYSIGHT padtec Sisfóton THORLABS		
UNICAMP IFGW Auditorium				
18:30 to 20:30	**SBFoton Assembly**			

Wednesday, August 2nd

UNICAMP Convention Center

Entrance Hall

08:30 to 17:20	**Registration Desk**		Secretary: Simone Telles (Unicamp, Brazil)

Auditorium 3

09:00 to 12:30	PLS-G-WED	**Plenary Session - Wednesday**	Chairs: Chairs: Azizur Rahman (City University of London, UK) and, the after the coffee break, Gustavo Wiederhecker (Unicamp, Brazil)
09:00 to 9:45	PLS-G-WED-01	"Two-Dimensional Materials for Nanophotonics" By Javier García de Abajo (ICFO-Institut of Photonic Sciences, Spain)	We explore new approaches relying on two-dimensional materials for nanophotonics, including plasmonics in ultrathin crystalline metals, quantum-phase materials, and recent advances in coupling between free-space light and confined optical excitations. Atomically thin materials provide a platform for manipulating and exploiting light at the nanoscale, with a wide range of polaritonic modes. Recent developments in thin noble-metal films have created a new realm in plasmonics and nanophotonics. We examine progress in controlling ultrafast and nonlinear optical processes, and their potential applications in light modulation and quantum optics.
09:45 to 10:30	PLS-G-WED-02	"Gbps Laser-based Visible Light Communications" By Boon Ooi (KAUST, Saudi Arabia)	Visible light communication (VLC or LiFi) has attracted much attention in recent years. Data rate of multiple 100s Mbps has been accomplished using LEDs as transmitter. Recently, micro-LED and laser-based device and system technologies have been topics for intense research for Gbps VLC. in this talk, in addition to providing a general overview of recent advances in VLC, from the perspective of optics devices, I will discuss various challenges facing VLC and offers insights into the possible solutions.
10:30 to 11:00	Coffee Break		
11:00 to 11:45	PLS-G-WED-03	"Quantum Technologies for São Paulo, Brazil and Latin America" By Paulo Nusssenzveig (USP, Brazil)	The world is experiencing a second quantum revolution, with the introduction of emerging technologies based on generalizations of information science using principles of quantum physics. Concepts such as interference, indistinguishability, uncertainty, and quantum entanglement provide additional resources for processing, storing, and transmitting information, as well as allowing more sensitive measurements of physical quantities. In São Paulo, Brazil, and Latin America, we have important groups conducting academic research in this area but relatively few efforts to transform this knowledge into technologies. We will present proposals to change this situation, pointing out some sectors in which we can be especially competitive in the development of emerging quantum technologies.
11:45 to 12:30	PLS-G-WED-04	"Spectral imaging: from push-broom scanning to integrated subwavelength filters" By Sailing He (Zhejiang University, China; Royal Institute of Technology, Sweden)	I will present some of our recent results on scanning based hyperspectral imagers, as well as miniaturized spectrometers and spectral imaging system based on emerging subwavelength structures. Combining with some advanced reconstructive algorithms, miniaturized spectral imaging based on subwavelength filter arrays, tunable filters and co-modulated filter arrays is promising for e.g. portable consumer electronics and wearable devices.
12:30 to 14:00	Lunch Break		

Auditorium 1

14:00 to 17:30	TS-WED	**Technical Session - Wednesday**	
13:30 to 15:30	TS-WED-01	**Exhibitors Panel**	Chair: Rodrigo Vicentini (Keysight, Brazil)
13:30 to 14:00	TS-WED-01-01	"Let's talk about Lumerical" By Igor Feliciano da Costa (ESSS/Ansys)	Ansys Lumerical's Photonic Multiphysics Simulation tools enable seamless workflows to model optical, electrical, thermal and quantum effects at the physical level. Ansys Lumerical's Photnoic Integrated Circuit Simulation tools offer a rich set of analysis capabilities to design and optimize the performance of photonic integrated circuits. Lumerical's tools have been designed to tackle the most challenging photonic design problems across fields including integrated optics, metamaterials, CMOS imaging, and more
14:00 to 14:45	TS-WED-01-02	"Single Photon Test and Measurement" By John Dorighi (Keysight Technologies, USA)	Photonic integrated circuits (PICs) are a key enabler for scaling bulk optic quantum devices to production for real world applications, I will highlight classic measurements for PICs characterization. An additional challenge for quantum photonic integrated circuits (qPICs) is the requirement to generate, control, and measure single photons. I will discuss recent work performed at Keysight to generate faint laser photons, control polarization to generate qubits, and measure using single photon detectors. I will review applications which integrate these capabilities for quantum communication research, including a laboratory test bed for quantum key distribution (QKD). The QKD test bed performs link calibration, automates the process of generating and analyzing keys, and reports important link metrics such as raw key generate rate and quantum bit error ratio (QBER).

14:45 to 15:15	TS-WED-01-03	"Atomic Force Microscopy: An Introduction" By Rosane Palissari (Unicamp, Brazil)	In this presentation we will discuss the basic concepts associated with atomic force microscopy and aspects of associated instrumentation. We will also discuss the applications of the technique, from its various modes of use. (Note: A Thorlabs' representative will demonstrate, on site, its Atomic Force Microscope Educational Kit)
15:15 to 15:30	TS-WED-01-04	"Advanced photonics product development for high-end applications" By Luis Henrique Hecker Carvalho (Lumentum, Brazil)	Lumentum is a market-leading designer and manufacturer of innovative optical and photonic products enabling optical networking and laser applications worldwide. Lumentum is headquartered in San Jose, California with R&D, manufacturing, and sales offices worldwide. In this presentation, Luis Hecker will share more details about technology capabilities at the Lumentum location in Campinas, Brazil from highly complementary and differentiated transceiver product lines to digital communications ASICs, including coherent DSPs, to X-ray detectors. Luis will also discuss important role that this site plays in helping speed up go-to-market time from R&D to NPI lines for the company's state-of-the-art products.
15:30 to 16:00	Coffee Break		
16:00 to 17:30	TS-WED-02	**Workshop: Machine learning for optical communication**	Chair: Joaquim Martins Filho (UFPE, Brazil)
16:00 to 16:15	TS-WED-02-01	"How Artificial Intelligence can impact photonic networks?" By Carmelo Bastos-Filho (UPE, Brazil)	Artificial intelligence is transforming photonic networks, making them more efficient, reliable, and intelligent. It plays a crucial role in automation, design, resource optimization, and data analysis, enabling better service delivery at lower cost. Several lines of AI are used in the areas of photonic networks, such as Machine Learning, which allows systems to learn from data, restoring signal shapes, finding better routes, or anticipating failures without being explicitly programmed; and intelligent metaheuristics, which are used to solve complex optimization and search problems, allowing efficient solutions to be found in multidimensional search spaces, such as network optimization, resource allocation and device design.
16:15 to 16:30	TS-WED-02-02	"MDG and SNR estimation in SDM optical systems using machine learning" By Darli Mello (Unicamp, Brazil)	The increase in capacity provided by coupled space division multiplexing (SDM) systems is fundamentally limited by mode-dependent gain (MDG) and amplified spontaneous emission (ASE) noise. Therefore, monitoring MDG and optical signal-to-noise ratio (SNR) is essential for accurate performance evaluation and troubleshooting. Recent works show that the conventional MDG estimation method based on the transfer matrix of multiple-input multiple-output (MIMO) equalizers optimizing the minimum mean square error (MMSE) underestimates the actual value at low SNRs. Besides, estimating the optical SNR itself is not a trivial task in SDM systems, as MDG strongly influences the electrical SNR after the equalizer. In a recent work we propose an MDG and SNR estimation method using artificial neural networks (ANNs). The proposed ANN-based method processes features extracted at the receiver after digital signal processing (DSP). In this paper, we discuss the ANN-based method in detail, and validate it in an experimental 73-km 3-mode transmission link with controlled MDG and SNR. After validation, we apply the method in a case study consisting of an experimental long-haul 6-mode link. The results show that the ANN estimates both MDG and SNR with high accuracy, outperforming conventional methods.
16:30 to 16:45	TS-WED-02-03	"Linear and nonlinear transceiver impairments compensation via deep learning equalization for 1 Tb/s coherent optical systems" By Leonardo Didier Coelho (UFPE, Brazil)	In order to satisfy the demand of Internet connectivity, the optical communications systems industry urge for high-capacity and cost-effective solutions over a wide range of applications such as submarine, terrestrial long-haul, metro and access networks, for traditional telecom services providers (TSP), and data center interconnect (DCI), for cloud services providers (CSP). In this way, the coherent line interfaces continue to evolve the transmission rate per wavelength from 100 Gb/s to 800 Gb/s in commercial systems. To support the growing traffic demands, the next frontier in coherent technology pushes the single wavelength capacity towards 1 Tb/s. To achieve a high transmission rate per wavelength as 1 Tb/s, the main physical degrees of freedom to explore in a coherent optical transceiver are the number of optical subcarriers, modulation format, and symbol rate. Regarding the first, single-carrier approaches come up as an attractive solution compared with multi-carrier implementations due to the reduced transceiver complexity and cost. Specifically for a single-carrier solution, the combination of high-order quadrature amplitude modulation (QAM) format, as the dual-polarization (DP) 16QAM in contrast with DP-64QAM, and high baud rate, currently, is the best option to scale the bit rate of a coherent line interface, yielding to a reasonable trade-off between implementation cost and system performance. Nevertheless, optical systems based on high-order QAM modulation and high symbol rate are highly impacted by optical fiber nonlinear distortions, noise sources and transceiver impairments such as linear and nonlinear distortions of electrical and optical components. Now, efforts are made to mitigate nonlinear effects imposed by the optical fiber and also distortions imposed by the transmitter and receiver and, among them, the deep learning equalization has been a promising solution. In this seminar, we present and evaluate an alternative receiver (Rx)-based deep cascade-forward neural network (CDNN) for transceiver impairments compensation applied to 1 Tb/s coherent optical systems. Also, we describe the future works in order to implement a deep learning equalizer for coupled transceiver-fiber nonlinearity mitigation and to define the optimum neural architecture.

16:45 to 17:00	TS-WED-02-04	"Enabling the proactive minimization of fragmentation losses in elastic optical networks using machine learning" By Helio Waldman (Unicamp, Brazil)	Elastic optical networks (EONs) have emerged in the past decade to promote efficiency in the use of the fiber optical spectrum by a heterogeneous dynamic traffic. For this purpose, it allocates to each user only the number of spectrum slots it needs to meet its bitrate and distance requirements, so the allocated slots reach an efficiency close to the Shannon limit. However, the heterogeneity and dynamicity of the demand produce long-living spectral voids that degrade the spectral efficiency, so the non-allocated slots may stay deadlocked for a long time. In order to address this problem, machine learning may be used in order to estimate, in real-time, the profile of the demand for connections given by the sizes of the requests and their rates of arrival. With this knowledge, we have already shown, in a paper published in 2022, that both first-fit and exact-fit algorithms may be outperformed in a single link by a new algorithm that is aware of the sizes that may be requested by the traffic. We are currently extending this capability by expanding the traffic-awareness to include the knowledge of the rates of request of each connection size. Preliminary results of this approach will be shown in the presentation, assuming adjacent assignments. The results confirm the expectation of strongly enhanced reduction of fragmentation losses in many instances, but not all. We expect to obtain more consistent results by combining the new algorithm with the previous one.	
17:00 to 17:15	TS-WED-02-05	"Deep Learning for routing and spectrum assignment assessment" By Raul C. Almeida Jr (UFPE, Brazil)	Lightpath establishments and releases in Elastic Optical Networks generate fragments of available slots that whenever the size of these fragments are inferior to the number of requested slots path-request blockings occur. To mitigate such undesired effect, an efficient spectrum assignment heuristic known as Min Slot-Continuity Capacity Loss (MSCL) was proposed. MSCL receives the slot-availability vector of routes potentially affected by the establishment of a request and calculates the reduction in assignment capacity that would occur if a specific group of contiguous slots were chosen to attend the request. This is performed for each route and the group of slots that provides the lowest loss of capacity is chosen. MSCL is shown in the literature to be very efficient, but is computationally intensive. We present two classifier models based on deep neural networks to speed up the MSCL spectrum assignment operation. The first decides between the use of First-Fit or MSCL heuristic, with the aim of avoiding unnecessary MSCL calls whenever the application of First-Fit would provide the same minimum loss of capacity as MSCL. The second adds the capability of pointing out the correct portion of the spectrum MSCL should look for whenever First-Fit is not selected. Compared to the MSCL, simulation results demonstrate great reductions on the execution time of the two proposed models without compromising blocking performance.	
17:15 to 17:30	TS-WED-02-06	"Federated Learning over Ethernet Passive Optical Networks" By Nelson Fonseca (Unicamp, Brazil)	Federated Learning (FL) enables distributed machine learning while preserving user privacy by training local models using private datasets and sharing only model parameters with a central server. However, FL imposes specific latency and bandwidth requirements, requiring efficient resource allocation in the communication network. This work introduces two novel Dynamic Wavelength and Bandwidth Allocation (DWBA) algorithms for Time and wavelength Division Multiplexing Passive Optical Networks (TWDM-PONs). The first algorithm employs bandwidth reservation, while the second utilizes statistical multiplexing to ensure Quality of Service (QoS) provisioning for FL traffic over 50 Gb/s Ethernet PON networks (50-EPON). These algorithms improve the TWDM-PON operations by effectively allocating resources for FL processing while preserving QoS for other network traffic. This contribution facilitates the practical deployment of FL in PON environments by addressing the network requirements of FL operations without compromising the QoS demands of delay-critical applications.	
Auditorium 2				
14:00 to 17:30	TS-WED	**Technical Session - Wednesday**		
14:00 to 15:30	TS-WED-03	**Nanophotonics 1**	Chair: Joseph Talghader (University of Minnesota, USA)	
14:00 to 14:30	TS-WED-03-01	Invited: "Colloidal versus substrate-based plasmonic materials"	Andreas Seifert (NanoGune, Spain)	The talk will be about periodic superlattices of noble metal nanoparticles which have demonstrated superior plasmonic properties compared to randomly distributed plasmonic arrangements due to near-field coupling and constructive far-field interference. To illustrate that, the investigation and optimization of a chemically driven, templated self-assembly process of colloidal gold nanoparticles will be presented.
14:30 to 14:45	TS-WED-03-02	"Nanophotonic cavity modes from subwavelength polaritons of polar two-dimensional crystals" (EDAS ID: 1570911509)	Francisco Maia (Centro Nacional de Pesquisa em Energia e Materiais, Brazil); Flávio Feres (Unicamp, Brazil); Raul Freitas (LNLS, Brazil); Ingrid David Barcelos (Centro Nacional de Pesquisa Em Energia e Materiais, Brazil)	Cavity modes have fundamental importance in nanophotonics as in the two-dimensional (2D) crystals' optical response supporting subwavelength polaritons. Typically, high momenta polaritons in 2D crystals create cavity modes dependent on boundary conditions dictated by the material geometrical forms, substrate electrical permittivity and the optical probes used to interrogate the phenomenon. Here, we use a synchrotron infrared nanospectroscopy to probe polaritonic cavities in hexagonal boron nitride 2D crystals lying on metallic and dielectric substrates. From theoretical approach in quantitative agreement with experimental real-space imaging of polariton waves, we derive the dispersion relation and the reflection/transition coefficients governing the polaritonic cavities.

14:45 to 15:00	TS-WED-03-03	"Nonlinear Frequency Conversion by Silicon Nitride Waveguide Integrated with MoS2" (EDAS ID: 1570907947)	Mohd Rehan (Mackenzie Presb. Univ., Brazil); Nathalia B Tomazio (USP, Brazil); Rodrigo Gerosa (Mackenzie Presb. Univ., Brazil); Alisson R Cadore (IPEN, Brazil); Gustavo Wiederhecker (Unicamp, Brazil); Christiano de Matos (Mackenzie Presb. University, Brazil)	This paper presents the characterization of a silicon nitride waveguide engineered with monolayer MoS2 flakes for nonlinear frequency conversion applications. The 2D material was mechanically exfoliated and deterministically dry transferred to selected areas of the waveguide. Comparing similar waveguides with and without MoS2, we observe that the 2D material provides enhancement in the intensity of second- and third-harmonic generation for the horizontal (TE) polarization, with a 150 fs, 89 MHz pump at 1560 nm.
15:00 to 15:15	TS-WED-03-04	"Bicontrollable optical and plasmonic waveguide" (EDAS ID: 1570903573)	Freddy Orlando Jara Poma (Unicamp, Brazil); Ruth Rubio-Noriega (INICTEL-UNI, Peru); Hugo Enrique Hernandez-Figueroa (Unicamp, Brazil)	In this work, we propose electrical and thermal control over a horizontal slot waveguide. The proposed device takes advantage of the thermally dependent transition phases of Vanadium Dioxide (VO2), and a high r33 electro-optic polymer called BAY1, which is responsible for the electrical control. We demonstrated a transitioning waveguide which can be used in different applications ranging from phase shifting to plasmonic waveguide feeding by engineering the effective index and mode distribution. Additionally, we report a band gap in our modal analysis that can be engineered without using periodical segmentation, rendering our discovery a useful bicontrollable metawaveguide.
15:15 to 15:30	TS-WED-03-05	"Organic resist based fabrication of integrated waveguides and ring resonators in thin-film lithium niobate" (EDAS ID: 1570911672)	Felipe Boechat Mazzi and Felippe Alexandre Silva Barbosa (Unicamp, Brazil)	Thin-film lithium niobate (TFLN) is a promising candidate for photonic-based quantum information technology. This platform combines large nonlinear and electro-optical coefficients with the tight confinement and reduced footprint characteristic of integrated devices. Nonetheless, current high-performance devices in TFLN generally rely on the use of hydrogen-silsesquioxane (HSQ) resist, or on silicon dioxide hardmasks, adding complexity to the fabrication process. Here, we fabricate and characterize optical resonators in TFLN using readily available organic deep UV resist. This process constitutes an alternative for more accessible microfabrication of TFLN photonic devices.
15:30 to 16:00	Coffee Break			
16:00 to 17:15	TS-WED-04	**Integrated Photonics & Optoelectronics 2**	Chair: Frederic Zamkotsian (Laboratoire d'Astrophysique de Marseille, France)	
16:00 to 16:30	TS-WED-04-01	Invited :"CMOS-compatible Si-TiN Schottky SWIR photodetectors enhanced by pyramidal nanostructures" (EDAS ID: 1570918112)	Lion Augel (Fraunhofer IPMS & Brandenburg University of Technology Cottbus-Senftenberg, Germany), Hanying Wen (Fraunhofer IPMS, Germany); Jens Knobbe (Fraunhofer IPMS, Germany)	Short-wavelength infrared detection has shown an enormous potential for future application in autonomous systems and security. Up to today the use has been limited by the cost for high quality detectors. Using TiN Schottky barrier photodetectors with pyramidal photonic nanostructures opens a path to circumvent the typically low quantum efficiencies with compatibility to CMOS technology
16:30 to 17:00	TS-WED-04-02	Invited: "Silicon Photonics with Integrated MEMS"	Niels Quack and Alain Yuji Takabayashi (University of Sidney, Australia); Hamed Sattari (EPFL, Switzerland), Pierre Edinger, Kristinn B. Gyfason and Gaehun Jo (KTH,Sweden), Peter Verheyen (IMEC, Belgium), Moises Jezzini and Peter O'Brian (Tyndall National Institure, Ireland), Umar Khan (Ghent University, Belgium), Wim Bogaerts (IMEC, and Ghent University, Belgium)	In this talk we will discuss recent advances in wafer-scale integration of Micro-Electro-Mechanical Systems in a standardized Silicon Photonics platform. Our high-performance Silicon Photonic MEMS tuneable couplers, filters, switches, and phase shifters, provide an advanced technology basis for emerging applications requiring very large-scale photonic integration. We will outline the assembly approach for interfacing with optical fibres and integration with control electronics to enable programmable photonic integrated circuits.
17:00 to 17:15	TS-WED-04-03	"Robust Edge States in C6 Topological Photonic Crystals" (EDAS ID: 1570907678)	Daniel Borges-Silva (UFRN, Brazil); Carlos Humberto Costa (UFCE, Brazil); Claudionor Gomes Bezerra (UFRN, Brazil)	We study the edge states that emerge in a system composed of a topological photonic crystal and a trivial one. We verify the emergence of the edge modes and we investigate their main features. Our numerical results show that they are pseudospin modes and they are well localized at the interface between both photonic crystals. Furthermore, the robustness is studied by adding defects at the interface. We verify that the defects have mild effects on the transmission of the light along the system. We conclude that the edge modes are protected by topology and robust against disorders and defects.

Auditorium 3				
14:00 to 17:30	TS-WED	**Technical Session - Wednesday**		
14:00 to 15:30	TS-WED-05	**Sensors, Image & Illumination 2**	Chair: Diego Rativa (UPE, Brazil)	
14:00 to 14:30	TS-WED-05-01	Invited: "Synchrotron characterization of metal halide perovskites" By Rodrigo Szostak* (LNLS/CNPEM, Brazil) (*remote from France)	Metal halide perovskite (MHP) emerged in the last two decades and received attention due to its optoelectronic properties appropriated to use in several applications, such as X-ray detectors, LEDs, and solar cells. Besides the high efficiency obtained in the last years, several aspects need to be better understood to lead this technology to maturity and commercialization. In this context, synchrotron-based techniques play an important role in allowing the characterization of the MHP in films, during preparation, or complete devices in ex-situ, in situ, or operando conditions. This lecture will summarize last year's contribution of the Brazilian Synchrotron Light Laboratory (LNLS) to the characterization of MHP. Also, recent results obtained at the CARNAÚBA (Coherent X-Ay NAnoprobe BeAmline) will be shown.	
14:30 to 14:45	TS-WED-05-02	"Improving Solar Cells Efficiency with PMMA-Carbon Dots Nanocomposites" (EDAS ID: 1570897127)	Marco C P Soares (Unicamp, Br); Francesco Amato (Univ. of Trieste, Italy); Thiago D Cabral (Unicamp, Br); Michele Cacioppo (Univ. of Trieste, Italy); Marcelo Carreño, Inês Pereyra, Carlos Ramos, Manuel Cid, Gilson S Goveia and José Chubaci (USP, Br); Maurizio Prato (Univ. of Trieste, Italy); Julio R Bartoli and Eric Fujiwara (Unicamp, Brazil)	Nitrogen-doped carbon nanodots synthesized from L-arginine and ethylenediamine (NCNDs) were combined to PMMA for obtaining fluorescent nanocomposites. Since this photoluminescence could increase the efficiency of solar energy concentrators and generators, photovoltaic cells were coated with such materials. Even using a setup with low contact of the optical polymer film on silicon surface, a promising 11.3% increase of cell efficiency was observed, showing the feasibility and potential for application of these environmentally friendly materials.
14:45 to 15:00	TS-WED-05-03	"Pigtailed Polymeric Optical Biosensor based on Interferometric Multimode Waveguide and Image Processing" (EDAS ID: 1570911548)	Ursula Salazar Roggero and Jorge R Fernández (Unicamp, Brazil); Andreas Seifert (CIC NanoGUNE, Spain); Hugo Enrique Hernandez-Figueroa (Unicamp, Brazil)	Operating optical biosensors outside laboratories presents a major challenge. This work presents a novel approach by introducing a practical coupling mechanism and using SU- 8 polymer to reduce the complexity of the fabrication process. Additionally, software techniques used for detection allow for potential improvements without requiring costly hardware. The limit of detection of the proposed device is 3 × 10−5 RIU.
15:00 to 15:15	TS-WED-05-04	"Optical Fiber Speckle-Based Musical Interface" (EDAS ID: 1570907976)	Yu Tzu Wu and Eric Fujiwara (Unicamp, Brazil)	This paper demonstrates a simple piano-inspired interface to play a full C major scale based on an optical fiber specklegram quasi-distributed sensor. The user inputs musical notes via foam pads over one multimode optical fiber connected to a laser source and webcam. Correlating the reference and immediate specklegrams retrieves the note input, subsequently played via audio output connected to the webcam. The interface is demonstrated with a precision of ~0.94% for eight musical notes plus a neutral state and does not depend on the input order.
15:15 to 15:30	TS-WED-05-05	"Biodegradable ball lenses made of agar" (EDAS ID: 1570911373)	Lidia O Rosa and Eduarda F Morais, Cristiano MB Cordeiro and Eric Fujiwara (Unicamp, Brazil)	This work reports the fabrication of agar ball lenses, a biodegradable, edible, and renewable material. Pouring melted agar-glycerol-water solutions into vegetable oil produces transparent spheres whose refractive index and diameter change with glycerol concentration and agitation speed. The results confirm the agar lens feasibility for imaging and suggest possible applications in illumination and biomedical sensing.
15:30 to 16:00	Coffee Break			
16:00 to 17:30	TS-WED-06	**Optics & Instrumentation 2**	Chair: Cícero Martelli (UTFPR, Brazil)	
16:00 to 16:30	TS-WED-06-01	Invited: "Interferometry in harsh environments" By Armando Albertazzi (UFSC, Brazil)	Interferometry is widely used to measure various physical quantities. Due to its high sensitivity, its use is normally restricted to laboratory environments. However, there are demands for interferometry outside the lab. This lecture presents the agents that make the application of interferometry difficult in hostile environments, like vibrations, temperature, humidity, air currents and radiation, and their deleterius effects on interferometry measurements. It also presents three strategies for interferometry measurements in hostile environments: isolation, robustness and the combination of both. Finally, five interferometric systems that operate successfully in hostile environments are presented.	

16:30 to 16:45	TS-WED-06-02	“An H2S gas sensor based on Long Period Gratings-Mach Zehnder nterferometer” (EDAS ID: 1570911086)	Andre Dias Sousa, Juan D Lopez, Paulo Henrique S Pinto, Regina Allil and Marcelo Werneck (UFRJ, Brazil)	This work presents a hydrogen sulfide (H2S) gas sensor manufactured using a Long Period Gratings-Mach Zehnder (LPG-MZ) interferometer that was coated with CuO2 nanoparticles. The LPG-MZ was fabricated using the electric arc discharge method, and the resulting sensor was coated with CuO nanoparticles. Prior to testing with H2S, the sensor was characterized with aqueous solutions of varying refractive indices (RI), with a sensitivity of 186 nm/RIU between 1.35 and 1.39. The sensor was then tested with H2S concentrations ranging from 0 to 40 ppm, and exhibited a sensitivity of approximately 7.8 pm/ppm between 5 and 20 ppm.
16:45 to 17:00	TS-WED-06-03	“Chlorophyll Fluorescence Analysis to Evaluate the Photo-oxidation Process in Organic Soybean Oil” (EDAS ID: 1570907970)	Carla Lopes (UNIFESP, Brazil); Lilia Coronato Courrol (Instituto de Ciências Ambientais, Químicas e Farmaceuticas, Brazil & UNIFESP, Brazil)	The chlorophyll fluorescence (Ex/Em: 411/667 nm) of organic, non-transgenic, and cold-extracted soybean oils was analyzed to evaluate the photosensitized oxidation. A strong negative correlation (r≥-0.94) was recorded between emission intensity and lipid oxidation indicators.
17:00 to 17:15	TS-WED-06-04	“Development of an Imaging System for an Electron Spectrometer for laser accelerated electrons” (EDAS ID: 1570907998)	Vitória Macêdo Costa Brandão (USP, Brazil); Ricardo E. Samad (IPEN/CNEN, Brazil)	We present the development of a Thomson spectrometer with an imaging system to determine the energy spectrum of laser accelerated electrons. The spectrometer is composed by a region with a constant magnetic field that deflects relativistic electrons according to their kinetic energy, and a luminescent screen into which the electrons impinge. The imaging system optimizes the collection of the screen luminescence, which is inside a vacuum chamber, and magnifies it, through a window, into a CCD in atmosphere that records the light pattern, from which the energy spectrum is recovered.
17:15 to 17:30	TS-WED-06-05	“Applications of Spectral Interferometry in sub-THz, Infrared and Optical Frequency Ranges” (EDAS ID: 1570898171)	Konstantin Alexandrovich Lukin and Dmytro Tatyanko (UIRE, NAS of Ukraine, Ukraine); Sergii Lukin (University of Alcalá, Spain)	The paper presents some results of the noise spectral interferometry (SI) for precise distance measurement in sub-THz Infra-Red and optical radiations using low-coherence optical sources beyond their coherence zone. It is shown that when the path difference of arms in Michelson interferometer exceeds the coherence length of the light-emitting diode radiation, the interference pattern in spectral domain enables to perform absolute measurements of micro- and nano- distances due to its dependence on both time delay and relative phase of the signals. Application of SI for coherent imaging in X-ray is briefly discussed
Entrance Hall / Corridors				
8:30 to 17:30	**Exhibits**	Ansys ESSS LUMENTUM KEYSIGHT padtec Sisfóton THORLABS		
Restaurante Estância Grill, Barão Geraldo				
19:30	**Conference Dinner**			

Thursday, August 3rd				
UNICAMP Convention Center				
Entrance Hall				
08:30 to 17:30	**Registration Desk**		Secretary: Simone Telles (Unicamp, Brazil)	
Auditorium 3				
09:00 to 12:30	PLS-G-THU	**Plenary Session Thursday: 5th Webinar Brazilian Photonics Laboratories System SISFOTON - MCTI**	Chairs: João Batista Rosolém (CPQD, Brazil) and, after the coffe break, Rafael Figueiredo (CPQD, Brazil)	
09:00 to 9:15	PLS-G-THU-01	MCTI	Felipe Silva Bellucci (General Coordinator of Enabling Technologies of the Ministry of Science, Technology and Innovation, Brazil (MCTI)	Sisfóton is an initiative of the General Coordination of Enabling Technologies – CGTH of the MCTI – Ministry of Science, Technology and Innovation. The objective is to promote unity among the actors of the ecosystem for Brazilian innovation in photonics (academy, ICT, industry and startups) and actions aimed at the country's scientific, technological, economic and social development. Sisfóton defines two complementary roles throughout its development – namely the Integrator Laboratory (CPQD) and the General Laboratories. https://antigo.mctic.gov.br/mctic/opencms/tecnologia/tecnologias_convergentes/fotonica.html
09:15 to 9:30	PLS-G-THU-02	USP	Vanderlei Bagnato (Coordinator of Sisfoton Laboratory at University of São Paulo (USP))	https://sites.usp.br/sisfoton/
09:30 to 9:45	PLS-G-THU-03	UFG	Lauro June Queiroz Maia (Coordinator of Sisfoton Laboratory at Federal University of Goiás (UFG))	https://pitt.prpi.ufg.br/pitt/laboratorios/details/3/195
09:45 to 10:00	PLS-G-THU-04	UFMS	Anderson Rodrigues Lima Caires.(Coordinator of Sisfoton Laboratory at Federal University of Mato Grosso do Sul (UFMS))	https://infi.ufms.br/gof/
10:00 to 10:15	PLS-G-THU-05	SENAI	Moisés Felipe Teixeira (Vice-Coordinator of Sisfoton Laboratory at National Service of Industrial Apprenticeship (SENAI)	https://sc.senai.br/institutos-senai-de-inovacao/sistemas-de-manufatura
10:15 to 10:30	PLS-G-THU-06	UNESP	Marcelo Nalin (Vice-Coordinator of Sisfoton Laboratory at São Paulo State University - Júlio de Mesquita Filho (UNESP))	https://www.iq.unesp.br/#!/fotonicos/
10:30 to 11:00	Coffee Break			
11:00 to 11:15	PLS-G-THU-07	EMBRAPA	Débora M. B. Pereira Milori (Coordinator of Sisfoton Laboratory at Brazilian Agricultural Research Company (EMBRAPA))	https://www.embrapa.br/laboratorio-nacional-de-agro-fotonica-lanaf
11:15 to 11:30	PLS-G-THU-08	UNICAMP	Newton C. Frateschi (Coordinator of Sisfoton Laboratory at University of Campinas (UNICAMP))	https://lif.iphd.tec.br/
11:30 to 11:45	PLS-G-THU-09	UFPE	Anderson Stevens L. Gomes (Coordinator of Sisfoton Laboratory at Federal University of Pernambuco (UFPE))	https://www.fotonnetufpe.com/

11:45 to 12:00	PLS-G-THU-10	UFES	Maria José Pontes (Vice-Coordinator of Sisfoton Laboratory at Federal University of Espírito Santo (UFES))	https://labtelufes.net/
12:00 to 12:15	PLS-G-THU-11	CNEN	Wagner de Rossi and Denise Maria Zezell (Coordinator and Vice-Coordinator of Sisfoton Laboratory at National Nuclear Energy Commission (CNEN))	https://www.ipen.br/portal_por/portal/interna.php?secao_id=3103
12:15 to 12:30	PLS-G-THU-12	CPQD	João Batista Rosolem (Coordinator of Sisfoton Integrator Laboratory at Research and Development Center in Telecommunications (CPQD))	https://www.cpqd.com.br/inovacao/sisfoton/
12:30 to 14:00	Lunch Break			
Auditorium 1				
14:00 to 17:30	TS-THU	**Techncial Session - Thursday**		
14:00 to 15:15	TS-THU-01	**Photonics 2**	Chair: Ralf Bauer (University of Strathcycle, UK)	
14:00 to 14:30	TS-THU-01-01	Invited: “Harnessing optical nonlinearities with integrated photonics structures” By Gustavo Wiederhecker (Unicamp, Brazil)	Harnessing optical nonlinearities with integrated photonic structures allows for remarkable regimes of nonlinear optics at low power levels. By recirculating light in optical microcavities, the intensity of the stored field amplifies interaction between light and matter by thousands of times. In this presentation, I will discuss fundamental concepts and our recent progress in this field, focusing on how these microstructures can reshape the nonlinear interaction and lay a fertile soil for sensing, communications, and second-generation quantum technologies.	
14:30 to 14:45	TS-THU-01-02	“Plasmonic signals modified by dielectric layers and exploited by multivariate analysis” (EDAS ID: 1570907693)	Jaione Etxebarria-Elezgarai (CIC NANOGUNE, Spain); Luca Bergamini (University of the Basque Country UPV/EHU, Spain); Eneko Lopez Corrillero (CIC NanoGUNE, Spain); Maria Carmen Morant-Miñana (CIC EnergiGUNE, Spain); Jost Adam (University of Southern Denmark, Denmark); Andreas Seifert (CIC nanoGUNE)	We present a sensing device that combines plasmonic Au nanodiscs with dielectric layers. The sensor is operated in Kretschmann configuration and delivers highly complex and sensitive reflectance curves as a result of hybridized plasmons and Fresnel reflections from the microfluidic device in which the plasmonic chip is embedded. Using multivariate analysis for analyzing multiple features of the reflectance curves in angular interrogation, strongly helps improve the sensing performance in comparison with a standard sensing chip of a continuous Au thin film. We improve analytical sensitivity, sensor resolution, and prediction errors by 200%, 23%, and 38% respectively.
14:45 to 15:00	TS-THU-01-03	“High Absorption per Unit Mass Subwavelength Structure as Uncooled Infrared Detector” (EDAS ID: 1570907819)	Avijit Das, Merlin Mah and Joseph Talghader (University of Minnesota Twin Cities, USA)	A subwavelength perforated structure designed for a maximum absorption-to-mass ratio has been utilized to construct an uncooled infrared (λ~8-12 μm) thermal detector operating in the air with a noise equivalent temperature difference (NETD) of 23 mK and detectivity of 1.1×10^(9) cmHz^(0.5)/W while time constant is 1.5 ms. With a fill factor of ~27%, the detector shows an average absorption per unit mass of ~6.8×10^(12) kg^(-1) over the long-wave infrared regime. Mach-Zehnder interferometry has been used for the optical readout of the detector.
15:00 to 15:15	TS-THU-01-04	“Efficient Beamforming Using Magneto-Optical Metagratings for Terahertz Communications” (EDAS ID: 1570898128)	William O. F. Carvalho (UNIFEI, Brazil); Jorge Ricardo Mejía-Salazar (Inatel, Brazil); Danilo Spadoti (UNIFEI, Brazil)	This work presents a magneto-optical (MO) metagrating for beamforming at f = 300 GHz. Our device comprises a periodic arrangement of aluminum and indium antimonide semiconductor. Numerical results show diffraction angles of ± 45°, with transmittance and extinction ratios of 0.54 and 0.74, respectively. Results are promising for future dynamic THz communications.
15:30 to 16:00	Coffee Break			

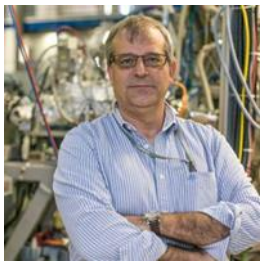
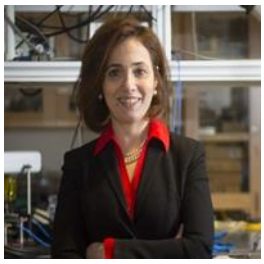
16:00 to 17:00	TS-THU-02	**Photonics 3**	Chair: Joseph Talghader (University of Minnesota, USA)	
16:00 to 16:30	TS-THU-02-01	Invited: “Optomechanical quantum teleportation” By Thiago Alegre (Unicamp, Brazil)	Quantum communication networks rely on the efficient transfer of unknown input states over long distances, and quantum teleportation plays a crucial role in achieving this objective. In this presentation, we showcase a groundbreaking advancement in the field by demonstrating the quantum teleportation of a polarization-encoded optical input state onto the joint state of a pair of nanomechanical resonators. Our approach utilizes the power of dispersive optomechanical coupling to enable this faithful transfer. Furthermore, we explore the potential of dissipative optomechanical systems, which address the challenge posed by thermal phonons hindering optomechanical operations in the quantum regime. We present a remarkable dissipative optomechanical system operating in the sideband-resolved regime, boasting a two-order-of-magnitude increase in mechanical frequency and a tenfold rise in the dissipative optomechanical coupling rate compared to prior works. These achievements underscore the yet to be explore potential of dissipative coupling.	
16:30 to 16:45	TS-THU-02-02	“Towards SiNx High Frequency Optomechanics” (EDAS ID: 1570911176)	Nick J. Schilder, Roberto O. Zurita, Cauê Moreno Kersul, Caique C. Rodrigues, and Thiago P. M. Alegre (Unicamp, Brazil)	Silicon nitride has emerged as a promising material for photonic integrated circuits. To design and optimize future silicon-nitride-based optomechanical devices, it is essential to fully understand the photoelastic tensor. We use microgear cavities designed by us and fabricated by Ligentec. By optical spectroscopy we characterize the optical response of the devices made in the silicon nitride foundry. As a future step, we will characterize the optomechanical coupling of the device. By comparing the experimental results with simulations, we aim to fully characterize the photoelastic tensor. We expect this work to be an important step towards SiNx based high frequency optomechanics.
16:450 to 17:00	TS-THU-02-03	“Degenerate optical parametric oscillation enhancement via coupled mode dispersion in triple-state photonic molecules” (EDAS ID: 1570907876)	Nathalia B Tomazio (USP, Brazil); Laís Fujii, Luca O. Trinchao, Eduardo S Gonçalves, Paulo Jarschel, Felipe G. S. Santos, Thiago P. M. Alegre and Felippe Alexandre Silva Barbosa (Unicamp, Brazil)	We demonstrate degenerate optical parametric oscillation (DOPO) in the coupled modes of a triple-state silicon nitride photonic molecule. Our results show that DOPO with a contrast of 17 dB with respect to the pump fields can be achieved by fine-tuning the dispersion of the coupled modes to the normal regime with the aid of integrated microheaters.
Auditorium 2				
14:00 to 17:30	TS-THU	**Technical Session - Thursday**		
14:00 to 15:30	TS-THU-03	**Optical Communication 3**	Chair: Alexandre Pohl (UTFPR, Brazil)	
14:00 to 14:30	TS-THU-03-01	Invited:”Optical Networks Perspectives to Support Future Connectivity” (EDAS ID: 1570920826)	Rafael Figueiredo (CPqD, Brazil); Tiago Sutili (CPqD & Unicamp, Brazil); Júlia Aline Sousa Maciel and Fuad M Abinader, Jr and Joao B Rosolem (CPqD, Brazil); Luis Gustavo Riveros (CPqD & Unicamp, Brazil); Luciano Martins and Gustavo Correa (CPqD, Brazil)	The evolution of optical networks, with a focus on supporting next-generation connectivity solutions, is driving the development of technological solutions aimed at reducing capital and operational expenditures and energy consumption while increasing capacity, reach, and information security in optical transmissions. Within this context, this paper addresses recent developments and trends in coherent systems, optical amplification, integrated photonics, software-defined networking, and the use of quantum-based cryptography, which are highlighted across various scenarios, including transport, data center interconnects, access, and mobile xHaul.
14:30 to 14:45	TS-THU-03-02	“Enhancing the Performance of Optical Networks with Route Segmentation and Fiber Augmentation” (EDAS ID: 1570907961)	Felipe Augusto Tavares and Luiz H Bonani (UFABC, Brazil); Eric Fagotto (PUCCampinas, Brazil); Sandro M. Rossi (CPqD, Brazil); Marcelo Abbade (Unesp, Brazil)	In this paper, we propose and evaluate a scheme to enhance the performance of optical networks using route segmentation (RS) limited to modulation format maximum range. We have performed this study with an incremental traffic model considering the densely-connected CORONET topology taking the C-band and C+L-bands, with and without the adoption of fiber augmentation (FA). The results show that this strategy can be an interesting way to improve network performance regarding blocking and bit rates.

14:45 to 15:00	TS-THU-03-03	"Sensitivity Analysis of Neural Network Hyperparameters for Chromatic Dispersion Compensation in Optical Transmissions" (EDAS ID: 1570907911)	Fernanda Chaves (CPQD & Unicamp); Eduardo Rosa (CPqD, Brazil); Tiago Sutili (CPQD & Unicamp, Brazil); Rafael C. Figueiredo (CPQD, Brazil)	To verify and validate the use of machine learning techniques for chromatic dispersion compensation, we developed an end-to-end recurrent neural network (RNN) to replace the digital signal processing (DSP) blocks used in optical transmission and reception. We also evaluated the sensitivity of the developed networks to certain hyperparameters. Our analysis indicated that the number of neurons and the number of epochs were the most impactful parameters, and we also observed that using lower values for these parameters resulted in performance that was closer to that of a conventional DSP implementation.
15:00 to 15:15	TS-THU-03-04	"Experimental Study of a MISO-VLC using two LED Luminaires" (EDAS ID: 1570907460)	David Esteban Farfán-Guillén, Luis C. Vieira and Alexandre Pohl, UTFPR, Brazil)	In this work, the multiple-input, single-output (MISO) technique is implemented with OFDM modulation and the variation of the cyclic prefix (CP) is used to optimize the performance of an indoor VLC link, while maintaining the lighting conditions within the recommended levels (300-500 lux). Results show that by increasing the number of luminaires and by selecting the appropriate value of the OFDM cyclic prefix, the system's bit error rate (BER $\leq 10^{-3}$) is improved.
15:15 to 15:30	TS-THU-03-05	"Impact of Noise in Continuous Pump Profiles on Distributed Raman Amplifiers for C+L Systems" (EDAS ID: 1570907937)	Carine Mineto and Luis Gustavo Riveros (CPQD & Unicamp, Brazil); Fábio D. Simões (CPqD, Brazil); Tiago Sutili (CPQD & Unicamp, Brazil); Rafael C. Figueiredo (CPQD, Brazil); Evandro Conforti (Unicamp, Brazil)	The impact of noise in the pump profile of distributed Raman amplifier (DRA) for extended bandwidth transmissions is investigated. Specifically, a continuous pump generated by a shaped amplified spontaneous emission signal is employed to fit the DRA gain profile to a predefined target. The analysis is performed by comparing the power profiles obtained by the artificial neural networks (ANN) and by conventional numerical models for the Raman amplification process, resulting in errors below 0.5 dB.
15:30 to 16:00	Coffee Break			
16:00 to 17:30	TS-THU-04	**Optical Communication 4**	Chair: Rafael Figueiredo (CPQD, Brazil)	
16:00 to 17:30	TS-THU-04-01	Tutorial: "Optical Communications - from Mb/s to Tb/s" By Felipe Rudge Barbosa (Unicamp, Brazil)	The amazing evolution of Optical Communication Systems – from components and sub-systems to whole WDM networks -- will be presented. In its 50 years of existence capacity of transmission has evolved from Mb/s to aggregates of over Tb/s, spanning thousands of kilometers worldwide. All this has been possible through the creative evolution of Photonic Technologies, combining optoelectronic components with optical systems and electronic interfaces. Details of wavelength division multiplexing (WDM), optoelectronic technologies (lasers; detectors), sophisticated photonic equipment (such as reconfigurable ROADM) and submarine high-capacity links, will be discussed.	
Auditorium 3				
14:00 to 17:15	TS-THU	**Technical Session - Thursday**		
14:00 to 15:30	TS-THU-05	**Sensors, Image & Illumination 3**	Chair: Joaquim Martins Filho (UFPE, Brazil)	
14:00 to 14:30	TS-THU-05-01	Invited:"Distributed Optical Fiber Sensing"	Cícero Martelli (UTFPR, Brazil)	This talk discusses the capabilities of a Sagnac Interferometer-based Distributed Optical Fiber Sensor (DOFS) system which, in comparison with conventional amplitude-based Distributed Acoustic Sensing (DAS) system, arises as a promising and rather accessible topology for a practical implementation.
14:30 to 14:45	TS-THU-05-02	"Improving the sensitivity of lateral-mode bimodal waveguide interferometric biosensors" (EDAS ID: 1570907480)	Daniel F. Londono-Giraldo and Christiano de Matos (Universidade Presbiteriana Mackenzie, Brazil)	Vertical-mode bimodal waveguides are challenging to fabricate in certain materials, such as silicon nitride. However, they provide an inherently better sensitivity compared to lateral-mode rectangular bimodal waveguides. We propose an `inverted T' core structure, which improves the sensitivity of lateral-mode waveguides. This design uses a thicker core at the center, to better confine the fundamental mode, and a thinner core at the edges to increase exposure of the second-order mode to the analyze.
14:45 to 15:00	TS-THU-05-03	"Effect of Metal Oxide Layers on the Performance of Polymer Optical Fiber-based Hydrogen Sulfide Sensors"	Juan D Lopez (UFRJ, Brazil); Alex Dante (UFRJ, Brazil & International Iberian Nanotechnology Laboratory (INL), Portugal); Regina Allil (UFRJ, Brazil); Ignacio Del Villar (Public University of Navarre, Spain); Ignacio R.	This work presents the development of polymer optical fiber (POF) sensors for hydrogen sulfide (H2S) detection, coated with varying numbers of metal oxide layers. Four sensors with identical structures were fabricated, and their performance was evaluated when exposed to 200 ppm of H2S. Increasing the number of metal oxide layers led to a sensitivity enhancement, up to 8 times greater with 21 layers compared to 3 layers. However, sensitivity decreased with more than 21 layers.

		(EDAS ID: 1570907723)	Matias (Universidad Pública de Navarra, Spain); Marcelo Werneck (UFRJ, Brazil)	These findings highlight the importance of optimizing the number of layers to achieve the best performance of an H2S sensor.
15:00 to 15:15	TS-THU-05-04	"Curvature sensing with a hybrid-lattice hollow-core photonic crystal fiber" (EDAS ID: 1570907725)	André D. P. Souza and Cristiano MB Cordeiro (Unicamp, Brazil); Foued Amrani (University of Limoges, France); Frédéric Delahaye (Glophotonics, Brazil); Frédéric Gérôme and Fetah Benabid (University of Limoges, France); Jonas H Osório (Unicamp, Brazil)	We report on curvature sensing measurements using a hybrid Kagome-tubular hollow-core photonic crystal fiber. The sensing principle is based on bending-mediated resonant couplings between core and airy cladding modes achieved at specific curvature radii and wavelengths. We consider that our investigation identifies a promising use of hollow-core fibers in sensing, thus broadening the application framework of this family of fibers.
15:15 to 15:30	TS-THU-05-05	"D-shaped Plastic Optical Fiber Sensor for Detection of Ethanol Fuel Adulteration" (EDAS ID: 1570907980)	Thales H. Castro de Barros (UFPE, Brazil); Henrique Patriota Alves (UFRPE, Brazil); Hebio Oliveira and Joaquim F. Martins-Filho (UFPE, Brazil)	Modern society, increasingly concerned about all the environmental impacts related to the production and use of petroleum-derived fuels, has sought alternative solutions to mitigate these impacts. From this context, ethanol produced from plants such as sugarcane is an important alternative to petroleum-derived fuels and research on production improvement, quality control and other related topics are common in the literature. This work proposes a device based on D-shaped plastic optical fiber to measure the water content mixed into ethanol. This measure is an important quality parameter to guide production and a common way to evaluate any possible adulteration.
15:30 to 16:00	Coffee Break			
16:00 to 17:15	TS-THU-06	**Optics & Instrumentation 3**	Chair: Claudio C. Motta (USP, Brazil)	
16:00 to 16:30	TS-THU-06-01	Invited: "Camera calibration for satellites and other embedded cameras" By Álvaro José Damião (IEAv/CTA, Brazil)	The presentation covers visible and infrared camera calibration in situ, mainly the spatial calibration for satellites and other airplane-embedded cameras. The Modulation Transfer Function (MTF) is one of the figures of merit to characterize an electro-optical sensor and is related to the Spatial Frequency Response (SFR). In this work, the MTF was obtained by the Slanted Edge Method (SEM). The MTF and other camera parameters allow for obtaining the spatial resolution and quality of equipment distance performance. Those are essential for Search and Rescue operations.	
16:30 to 16:45	TS-THU-06-02	"Comparison of Scalar and Vector Vortex Beams for Turbulence-Immune Applications" (EDAS ID: 1570907889)	Ramzil Galiev, Ravi K. Saripalli, Juan Coronel, Chaouki Kasmi and Steevy Joyce Cordette (Technology Innovation Institute, United Arab Emirates)	We study the propagation properties of scalar and vector vortex beams through a turbulent atmosphere. The irradiance beam profile, scintillation index and crosstalk are computed for different propagation distances in atmosphere with weak and strong turbulences. We also implement a neural network for a classification task to determine the number of topological charges of the scalar and vector vortex beams.
16:45 to 17:00	TS-THU-06-03	"Progress towards a dual-comb spectrometer based on diode-pumped ErYb: glass lasers" (EDAS ID: 1570907939)	Flavio Cruz (Unicamp, Brazil); Jonathas Siqueira (Unicamp - IFGW, Brazil); Antonio Saldanio Matos Macedo (Unicamp, Brazil)	We report our ongoing work on implementing dual-comb spectrometers in the near- and far-infrared (Tehahertz). They are based on two diode-pumped 500 MHz ErYb: glass femtosecond lasers at 1555 nm, whose pulses are amplified and compressed using all PM-fibers.
17:00 to 17:15	TS-THU-06-04	"Thermophoretic efficiency in the MCVD process: A CFD modeling" (EDAS ID: 1570907898)	Rubens Cavalcante da Silva, Paulo Jorge de Morais, and A. Carvalho (USP, Brazil); Wagner de Rossi (IPEN, Brazil); Claudio C. Motta (USP, Brazil)	The thermophoretic efficiency in the modified chemical vapour deposition (MCVD) process has been numerically determined under specified conditions of temperature and velocity field in the silica deposition tube. A CFD code was used to solve a steady-state numerical model of the MCVD process. The cumulative efficiency of SiO2 and GeO2 deposition was calculated along the tube length, yielding to a maximum value of 42% and 37% respectivelly.

Entrance Hall / Corridors		
8:30 to 14:00	**Exhibits**	Ansys ESSS LUMENTUM KEYSIGHT padtec Sisfóton THORLABS
Auditorium 3		
17:30 to 18:00	**Awards and Closing Ceremony**	Chairs: Luiz Bonani (UFABC, Brazil), Alexandre Pohl (UTFPR, Brazil) and Hugo Figueroa (Unicamp.Brazil)

Invited Speakers

Monday, July 31st		
UNICAMP Convention Center		
Auditorium 3		
08:30 to 12:30	**Plenary Session - Monday**	
09:00 to 9:45	Sunghoon Kwon	Sunghoon Kwon is a full professor of School of Electrical and Computer Engineering at Seoul National University. He received his B. S. in Electrical and Computer Engineering (1998), M. S. in Biomedical Engineering (2000) from Seoul National University, and his Ph.D. in Bioengineering from University o¬f California, Berkeley (2004). His research interest is to develop diagnostic and therapeutic technologies for personalized medicine. He has published over 80 papers in international journals holds more than 70 international patents. Many of his research were commercialized as IVD (in-vitro-diagnostics) kits and now being used in hospitals. He is a founder and CEO of Quanta Matrix Inc, a company that productized life-saving microfluidic-based antibiotic test for sepsis. He has generated more than $100M research and development funding for innovation in personalized medicine. He received many prestigious awards including the KAST Young Scientist Award, the Presidential Young Scientist Award, the IEEK/IEEE IT Young Engineer Award, and the NAEK Young Engineer Award.
09:45 to 10:30	 Antonio Jose Roque da Silva	Antonio José Roque da Silva earned his bachelor's (1986) and master's (1989) degrees in Physics from UNICAMP and his Ph.D. in Physics from the University of California at Berkeley in 1994. He did a post-doc at the University of California at Berkeley (1994-1995) and at the University of California at Los Angeles (1995-1997). He is currently a Full Member of the Brazilian Academy of Sciences (Physical Sciences), a member of the Academy of Sciences of the State of São Paulo (ACIESP), a Professor at the University of São Paulo, and a Director General of CNPEM and the Sirius Project. Awarded with the National Order of Scientific Merit, Commander Class. He has published more than 130 articles in specialized journals and is a co-author of more than 200 papers presented at national and international events. He has more than 4500 citations and an h=34 parameter. He has 4 book chapters and 1 published book. He has supervised 6 post-doctoral fellowships, supervised 7 MSc dissertations and co-supervised 2, supervised 9 Ph.D. theses, and co-supervised. He works in Physics, with an emphasis on Condensed Matter Physics and Atomic and Molecular Physics. In particular, he has a main interest in the area of computational simulation and calculations of electronic structure and electronic transport properties, focusing on the area of nanostructures.
11:00 to 11:45	 Michal Lipson	Prof. Michal Lipson is the Eugene Higgins Professor at Columbia University. Her research focus is on Nanophotonics and includes the investigation of novel phenomena, as well as the development of novel devices and applications. Prof. Lipson pioneered critical building blocks in the field of Silicon Photonics, which today is recognized as one of the most promising directions for solving the major bottlenecks in microelectronics. She is the inventor of over 45 issued patents and has co-authored more than 250 scientific publications. In recognition of her work in silicon photonics, she was elected as a member of the National Academy of Sciences and the American Academy of Arts and Sciences. Her numerous awards include the NAS Comstock Prize in Physics, the MacArthur Fellowship, the Blavatnik Award, OPTICA's R. W. Wood Prize, the John Tyndall Award, the IEEE Photonics Award, and an honorary degree from Trinity College, University of Dublin. In 2020 she was elected the 2021 Vice President of OPTICA, formerly known as The Optical Society (OSA), and is currently (2023) the President of OPTICA. Since 2014, every year she has been named by Thomson Reuters as a top 1% highly cited researcher in the field of Physics.
11:45 to 12:30	Alexandre Gaeta	Gaeta received his BS, MS, and PhD degrees in Optics from the University of Rochester in Rochester, NY in 1983, 1985, and 1991, respectively. He remained there as a postdoctoral associate from 1991 – 1992. Gaeta joined Columbia Engineering as the David M. Rickey Professor of Applied Physics and Materials Science in 2015. Prior to that, Gaeta was the Samuel B. Eckert Professor of Engineering at Cornell University and was Chair of the School of Applied and Engineering Physics from 2011 – 2014. He has published more than 300 journal articles in quantum and nonlinear photonics. He served as the founding Editor-in-Chief of the journal Optica from 2014-2020 and Chair of the Optica Publications Council in 2022. He co-founded Xscape Photonics, Inc. in 2022 and is currently serving as the CEO. He is a Fellow of the Optica, APS, and IEEE, and a Thomson Reuters Highly Cited Researcher, and was awarded the 2019 Charles H. Townes Medal from Optica.
Auditorium 1		
14:00 to 17:30	**Technical Session - Monday**	
14:00 to 14:30	Konstantin Alexandrovich Lukin	Prof. Kostantin Lukin received his diploma in radiophysics and electronics from Kharkov State University, Ukraine, in 1973. He is head of the Laboratory for Nonlinear Dynamics of Electronic Systems (LNDES), at the O. Ya. Usikov Institute for Radiophysics and Electronics of the National Academy of Science of Ukraine (IRE NASU). He completed his candidate of sciences thesis at IRE NASU and defended it at Moscow State University (MSU) in 1980. He completed his doctor of science dissertation in physical electronics in IRE NASU and defended it at Kharkov State University in 1989. Dr. Lukin was leader of many international research and development projects on noise radar systems and sensors, and on SAR imaging and microwave monitoring of the environment.

16:00 to 16:30	 Youmin Wang	Education: BS Electronic Engineering, 2008, at Shangai Jiao Tong University; PhD Electrical and Computer Engineering, at University of Texas at Austin. Experience: Himax (Staff Engineer), 2013-14; Postdoctoral Scholar at UC Berkeley, 2014-18; Co-founder of Raydian Inc (2017-18); Rech Lead Manager at Didi, 2018-22; Applied Research Scientist at Meta, since 2022, where he does hardware research of AR/VR Metaverse. Skills: Optics, MEMS, semiconductor fabrication.
Auditorium 2		
14:00 to 17:30	**Technical Session - Monday**	
14:00 to 14:30	 Lilia Coronato Courrol	Bachelor's Degree in Physics from PUC São Paulo (1987), Master's (1990) and Ph.D. (1994) from USP. She is a Lecturer at the Federal University of São Paulo (UNIFESP), where she joined in 2006 and is currently in the position of Prof. Holder. She was head of the Department of Physics between 2017-2020. She works in the graduate program in Technology and Sustainability Sciences at Unifesp Diadema and collaborates with: Instituto Butantã, IPEN-SP, and King Saudi University. She has experience in Physics with an emphasis on Optics and Spectroscopy of Condensed Matter; She works mainly on the following topics: theranostics, laser, biosensors, crystals, amorphous, spectroscopy, lipoproteins, atherosclerosis, fluorescence microscopy, nanotechnology, optical diagnosis, liquid biopsy, among others. Journal of Luminescence, Journal of Fluorescence, Ultrasound in Biology and Medicine, among others. Invention patents: BR102014016592-A2, BR200602279-A2; BR200602279-B1 and BR9600093-A5. Researcher at INCT-Fx, National Institute of Science and Technology of Complex Fluids of CNPq (2009-present). Member of the Brazilian Society of Physics, and of the Brazilian Society of Optics and Photonics.
16:00 to 16:30	 Leonardo Ambrosio	Associate Professor at USP at the Department of Electrical and Computer Engineering (SEL) at the School of Engineering of São Carlos (EESC). Graduated in Electrical Engineering (Unicamp, 2002), Master's (Unicamp, 2005) and Doctorate (Unicamp, 2009) in Electrical Engineering, with post-doctorate at Unicamp/UPenn (Philadelphia, USA). He has a theoretical-numerical research lines in photonics, light-matter interaction problems for applications in optical trapping and manipulation, metamaterials and plasmonics for nano-circuits, and microstructured light beams and non-diffractive beam modeling for applications in biomedical optics , telecommunications, holography, volumetric displays and atomic guidance. His current research projects merge the above lines, with an emphasis on microstructured beams and non-diffractive waves for trapping and micromanipulation of micro and nanometric. Recently, he started a line of research in brain-computer interfaces for entertainment, games and the metaverse, aiming at mind control of three-dimensional volumetric displays.
Auditorium 3		
14:00 to 17:30	**Technical Session - Monday**	
14:00 to 14:30	 Diego José Rátiva Milán	Diego Rátiva is Associate Professor (Free Lecturer) of the Computer Engineering course at the University of Pernambuco (UPE), permanent member and coordinator of the Graduate Program in Systems Engineering at UPE, permanent member of the Graduate Program in Engineering of Computing at UPE. He also holds the position of Manager of the Research Division at the Polytechnic School of Pernambuco and is a technical-scientific adviser to the Institute of Technological Innovation (IIT) at UPE. He is Managing Director of the Brazilian Society of Optics and Photonics (SBFOTON) and IEEE senior member. He is editor in chief of the Journal of Applied Engineering and Research (REPA) and a member of the editorial board of the IEEE Latin American Transactions. He coordinates Research and Development Projects with different industries in the areas of: Computational Fluid Dynamics (CFD) of Industrial Machines, Digital Twins and Data Analytics of Industrial Lines. Other research topics are in the areas of optical instrumentation, design of optical devices for solar collection, and intelligent algorithms for optical control systems.
16:00 to 16:30	 Sidney José Lima Ribeiro	Director of the Institute of Chemistry UNESP (2020-2024). Full Professor at the Institute of Chemistry-UNESP in Araraquara, Bachelor in Chemistry (UNESP-1982), Master in Inorganic Chemistry (UNESP- 1987) and Doctor in Inorganic Chemistry (UNESP-UFPE -1992). Full member of the Brazilian Academy of Sciences (ABC) and of the Academy of Sciences of the State of São Paulo (ACIESP). Fellow of the European Academy of Sciences. Coordinator of the international network "Materias for the Future (CAPES-PRINT-UNESP). Vice-coordinator of the National Institute of Photonics (InFO). Researcher 1A CNPq. Postdoctoral at École Centrale Paris- 1994 and CNET-France Telecom- 1995, working with transparent glass-ceramics and lasers. Works in the area of Inorganic Chemistry and its implications in Materials Science, Spectroscopy and Chemistry Teaching. Ongoing projects involve natural polymers (bacterial cellulose and silk fibroin), organic-inorganic hybrids, light (optical fibers and thin films), porous materials and luminescent markers for Medicine. He is Associate Editor of the journal "Frontiers in Chemistry- Inorganic Chemistry" and member of the editorial board of the Journal of Sol-Gel Science and Technology and Journal of Non-Crystalline Solids, he is also scientific advisor to the main agencies in the country, NSF (United States), CNR (Italy) and several scientific journals. He was a visiting researcher at NIRIM, Japan. He was Visiting Professor at the University of Trento in Italy, at the Universities of Angers, Bordeaux and Toulouse, France, University of Aveiro ,Portugal, and UFJF

Tuesday, August 1st

UNICAMP Convention Center

Auditorium 3

09:00 to 12:30	**Plenary Session - Tuesday**	
09:00 to 9:45	 Amr Helmy	Amr S. Helmy joined the department of Electrical and Computer engineering of the University of Toronto with a mixed experience in academic as well as industrial settings. He received both his MSc (1995) and PhD (1999) degrees from the University of Glasgow, Scotland, in the field of photonics. Between 2000 and 2004 he joined Agilent Technologies, where he was involved in developing different photonic devices ranging from high reliability submarine-class lasers, to un-cooled single mode lasers, to integrated photonic circuits. Dr. Helmy's research interests include quantum/non-linear integrated photonic devices/circuits and nano-photonic devices/circuits using hybrid metallic architectures. The application domains, where his group contributes, include optical signal processing, communications and sensing. He is currently the Vice President for the IEEE Photonics Society and has been Editor for several IEEE and OSA journals and has also chaired flagship conferences for IEEE and OSA; namely CLEO and IEEE IPC.
09:45 to 10:30	 Carmem Menoni	Carmen S. Menon, University Distinguished Professor, Electrical & Computer Engineering, Colorado State University, also holds appointments in the department of Chemistry, and the School of Advanced Materials Discovery. Prof. Menoni's group investigates the synthesis of amorphous thin film oxides by sputtering and uses spectroscopic and other material diagnostics to identify their structural organization at the nanoscale. Through a combination of fundamental understanding of the optical and structural properties of the thin films materials and device engineering, Prof. Menoni research is advancing the state-of-art in interference coatings for ultra-high intensity lasers and for gravitational wave detectors. Menoni is also involved in using high-brightness coherent beams of light of wavelengths between 10-50 nm for optics applications such as nanoscale imaging, ablation and chemical imaging. Prof. Menoni is Fellow of the Institute of Electrical & Electronic Engineers (IEEE), the American Physical Society (APS), the Optical Society of America (OSA), the American Association for the Advancement of Science (AAAS) and the International Society for Optics and Photonics (SPIE). Prof. Menoni was President of the IEEE Photonics Society in 2020-2021.
11:00 to 11:45	 Federico Capasso	Federico Capasso joined Harvard University in 2003 after 27 years at Bell Labs where his career advanced from postdoctoral fellow to VP for Physical Research. His contributions include band structure engineering, the quantum cascade laser, MEMS based on the Casimir effect and the first measurement of the repulsive Casimir force, metasurfaces including the generalized laws of refraction and reflection and high performance metalenses. He is cofounder and a board member of Metalenz, which commercializes metaoptics for high volume markets.
11:45 to 12:30	 Aydogan Ozcan	Aydogan Ozcan is the Chancellor's Professor and the Volgenau Chair for Engineering Innovation at UCLA and an HHMI Professor with the Howard Hughes Medical Institute. He is also the Associate Director of the California NanoSystems Institute. Dr. Ozcan holds more than 60 issued/granted patents, and is the co-author of more than 1000 peer-reviewed publications in leading scientific journals/conferences. He is elected Fellow of National Academy of Inventors (NAI), Optica/OSA, AAAS, SPIE, IEEE, AIMBE, RSC, APS and the Guggenheim Foundation, and is a Lifetime Fellow Member of Optica, NAI, AAAS, and SPIE. Dr. Ozcan is also listed as a Highly Cited Researcher by Web of Science.

Auditorium 1

14:00 to 17:30	**Technical Session - Tuesday**	
14:00 to 14:30	 Azizur Rhaman	Professor B. M. Azizur Rahman received BSc Eng and MSc Eng degrees in Electrical Engineering with distinctions from Bangladesh University of Engineering and Technology (BUET), Dhaka, Bangladesh, in 1976 and 1979, respectively. He received his PhD degree in Electronic Engineering from University College, London, in 1982. From 1976-79 he was a Lecturer at the Electrical Engineering Department, BUET. After completing his PhD he joined University College London as a Post-doctoral Research Fellow and continued his research work on the finite element modelling of optical waveguide until 1988. In1988 he joined the Electrical, Electronic and Information Engineering Department of City University, London, as a Lecturer, where he is now a Professor.
16:00 to 16:30	 Hakan Urey	Hakan Urey is a Professor of Electrical Eng. at Koç University, Istanbul, Turkey. He was a visiting Professor at Cambridge Univ., UK, Boğaziçi University, Turkey, and Stanford Univ, USA. He received the BS degree from Middle East Technical Univ., Ankara, in 1992, and MS and Ph.D. degrees from Georgia Institute of Technology in 1996 and in 1997, all in Electrical Eng.. After his PhD, he joined Microvision Inc.-Seattle as Research Engineer and played a key role in the development of the Retinal Scanning Display technology. He was the Principal System Engineer when he left Microvision to join the faculty of Eng. at Koç Univ. in 2001. His current research interests are Augmented Reality, 3D displays, MEMS/MOEMS, micro-optics, optical and biological sensors. He has more than 60 patents, all of which have been licensed to companies and led to a number of commercial products. He founded 5 technology startup companies which are spinoffs from his research lab at Koç University. He is a member of Science Academy in Turkey and fellow of OPTICA

Auditorium 2		
14:00 to 17:30	**Technical Session - Tuesday**	
14:00 to 14:30	 Darli Mello	Darli Mello studied Electrical Engineering at the RWTH-Aachen, Germany, and at the State University of Campinas (UNICAMP), Brazil, where he graduated in 2000. In 2002 he received the M. Sc. degree from the Institute for Communications Engineering (LNT) at the Munich University of Technology (TUM), Germany. During his masters studies, he carried out experimental and theoretical work at the Siemens research labs in Munich. In 2006 he received the Ph.D. degree from UNICAMP after research stays at the TUM and the California Institute of Technology (Caltech). After his Ph.D. studies, he spent one year with Padtec Optical Components and Systems as a senior technology engineer. From August 2008 to March 2014, he was with the Electrical Engineering Department (ENE) of the University of Brasilia (UnB) as an Assistant Professor. Since March 2014, he serves as Assistant Professor at the Communications Department (DECOM) of the School of Electrical and Computer Engineering (FEEC), University of Campinas (Unicamp). From January 2019 to January 2020, he was a Visiting Scholar at Stanford University. His main research interests are optical transmission and networking.
16:00 to 16:30	 Aldário Chrestani Bordonalli	He holds a degree in Applied Physics from the State University of Campinas (1989), a master's degree in Electrical Engineering from the State University of Campinas (1992), a doctorate (1996) and post-doctorate (2012) in Electrical Engineering from the University College London and associate professor at area of Telecommunications and Telematics (2010), with emphasis on Optical Communications. He is currently Associate Professor III at the State University of Campinas. He has experience in the field of Optical Communications, working mainly on the following subjects: optical amplifiers, WDM and OFDM systems, optoelectronic generation/conversion of signals and coherent systems.
Auditorium 3		
14:00 to 17:30	**Technical Session - Tuesday**	
14:00 to 14:30	 Niklaus Ursus Wetter	Niklaus Ursus Wetter holds a BA in Physics from the Eidgenössische Technische Hochschule Zürich - ETH (1988 - Switzerland) and a Ph.D. in Nuclear Technology from the Institute for Energy and Nuclear Research (1993). He is currently a senior researcher at the National Nuclear Energy Commission at IPEN / SP and a postgraduate professor at the University of São Paulo USP. As manager of Internationalization, he has so far implemented 14 bilateral agreements with universities and institutes around the world, including the Battelle Energy Alliance, which encompasses eight of the largest federal research institutions in the US. He specializes in laser development and operates in the main segments: Diode lasers, waveguides, solid state lasers and materials for laser media, laser applications in life sciences, lasers in nuclear applications and Raman spectroscopy. Since 2008 he has been developing light sources in disordered materials, or "Random Lasers", for the purpose of applications in optical devices.
16:00 to 16:30	 Renato Evangelista de Araújo	Graduated (1994), master's (1997) and doctorate (2001) in Physics from the Federal University of Pernambuco. He was a postdoctoral fellow at the Robotics Institute at Carnegie Mellon University (2001-2002) and was a research fellow at the Minimally Invasive Surgical Technologies Institute at Cedars Sinai Medical Center (2002-2003). He is currently an Associate Professor at the Department of Electronics and Systems at UFPE. He works in the undergraduate courses in Electronic and Electrical Engineering, in the graduate program in Electrical Engineering and in the graduate program in Biomedical Engineering at UFPE. His research topics are: biomedical optics, nanobiophotonics, biomaterials spectroscopy, optical coherence tomography and optical microscopy.

Wednesday, August 2nd

UNICAMP Convention Center

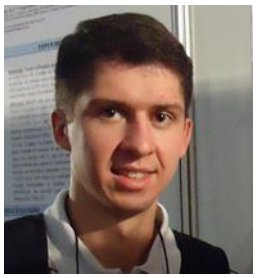
Auditorium 3

09:00 to 12:30	**Plenary Session - Wednesday**	
09:00 to 9:45	 Javier García de Abajo	After completing his PhD from the University of the Basque Country in 1993, Javier García de Abajo spent three years as a visiting researcher at Berkeley National Lab. He then became a Research Professor at the Spanish CSIC and eventually moved to ICFO-Institut de Ciencies Fotoniques in Barcelona in 2013 as an ICREA Research Professor. García de Abajo is a Fellow of the American Physical Society and the Optical Society of America. His research interests include theoretical studies on electron microscope spectroscopies, atomic collisions, quantum phenomena at the nanoscale, and various aspects of nanophotonics such as graphene and two-dimensional polaritonics, optical sensing, and quantum friction. He has co-authored 400+ articles that have been cited 55,000+ times, with an h index of 114 according to March 2023 Google Scholar data.
09:45 to 10:30	 Boon Ooi	Boon Ooi received his pre-college education in Penang, Malaysia. He earned the B.Eng. and Ph.D. degrees in electronics and electrical engineering from the University of Glasgow (U.K.) in 1992 and 1994, respectively. He was an Assistant Professor at Nanyang Technological University (Singapore) from 1996 to 2000. He co-founded a photonics startup in Pleasanton, California (U.S.A.), and led the company as VP for Technology Development from early 2000 to late 2003. He joined Lehigh University (Pennsylvania, USA) where he held an Associate Professor position and headed the Photonics and Semiconductor Nanostructure Laboratory from 2003 to 2009. He has been with KAUST since Fall 2009. Boon Ooi's recent research is concerned with the study of III-Nitride based materials and devices, and lasers for applications such as solid-state lighting, visible light and underwater wireless optical communications, energy harvesting devices, and optical sensors. He is a regular grant panelist and reviewer of NSF (USA), NSERC (Canada), A*STAR and NRF (Singapore), Dutch Technology Foundation STW (Netherlands), FPS (Poland), ELIDEK (Greece), RGC (Hong Kong), QNRF (Qatar) and KACST (KSA). He was the Guest Editor for the Journal Crystal Growth (Elsevier) in 2006/7, and Applied Physics A (Springer) in 2013/14, and Lead Editor of a Feature Issue of Optics Express in 2018/2019. He is Editor-in-Chief of the IEEE Photonics Technology Letters. He is a Fellow of IEEE, NAI, OPTICA and SPIE.
11:00 to 11:45	 Paulo Nussenzveig	Bachelor in Physics from Pontifícia Universidade Católica do Rio de Janeiro (1988), Master in Physics from Pontifícia Universidade Católica do Rio de Janeiro (1990), and Ph.D. in Physique Quantique - Université Pierre et Marie Curie (Paris VI), École Normale Supérieure (1994). Lecturer at the University of São Paulo (2002). Visiting Professor at Cornell University in 2012. He is a member of the Scientific Council of the Foundation Institute of Theoretical Physics (Principia Foundation) and was a member of the International Council of the OSA (Optical Society) from 2014 to 2018. He was the Topical Editor of the journal Optics Letters and the Associate Editor of the Brazilian Journal of Physics. He is a full professor (MS-6) at the Institute of Physics of the University of São Paulo. He was chairman of the Postgraduate Committee and Coordinator of the Postgraduate Program of the Physics Institute of the University of São Paulo. He is a member of the Physics Area Coordination of FAPESP. Presents the column Science and Scientists on Radio USP. His areas of interest are Quantum Optics, Atomic Physics, and Quantum Information.
11:45 to 12:30	 Sailing He	Prof. Sailing He is currently the Director for the Sino-Swedish Joint Research Center of Photonics (JORCEP). After receiving his Ph.D. degree from the Royal Institute of Technology, he has worked at the Royal Institute of Technology (Stockholm, Sweden) as an assistant professor, an associate professor, and a full professor. Prof. He's main research interest includes sub-wavelength photonics, optical sensing and communication, electromagnetic waves and applications. He has first-authored one monograph (Oxford University Press) and authored/co-authored over 700 papers in refereed international journals. Prof. He has served as General Chair (or Co-chair) for a number of international conferences, as well as in Steering Committee, Scientific Advisory Board or Technical Program Committee for numerous international congress/conferences and journals. Prof. He is a Fellow of IEEE, OSA (Optical Society of America) and SPIE (International Society for Optical Engineering. Prof. He serves as co-editor-in-chief of Progress In Electromagnetics Research (PIER), in editorial board of Laser & Photonics Reviews, Scientific Reports, and Electronics Letters.

Auditorium 1

13:30 to 17:30	**Technical Session - Wednesday**	
13:30 to 14:00	 Igor Feliciano da Costa	Igor graduated as a Technologist in Telecommunications Engineering, Electrical and Electronics Engineering, at Unicamp (2011), obtained a Master's degree in Telecommunications, Electrical and Electronics Engineering, from Inatel (2013), and a PhD in Microelectronics, Electrical and Electronics Engineering from UNIFEI (2016). His experience includes: a Visiting Research Fellow at DTU, Technical University of Denmark (2016), an RF and Antenna Research Collaborator at Embraer Defense & Security (2010-106), a Postdoctoral Scientist on RF and Antennas at Inatel (2017); and an RF Antenna Engineer at Antenna Company (2017-19). He went to ESSS in 2019 to be a Business Development (Latin America and Iberia region) and, since 2022 works as Business Development and CAE Technical Coordinator (Latin America and Iberia region) of ESSS.
14:00 to 14:45	 John Dorighi	John Dorighi is a photonics application engineer at Keysight Technologies. He received his B.S. degree in engineering at University of Colorado, Boulder, and his M.S. and Ph.D. engineering degrees at Northwestern University in Evanston Il. His doctoral research focused on developing, modelling, and characterizing fiber optic sensors for materials testing. He is currently engaging with university research labs to explore new photonic application spaces. Current areas of focus include: photonic integrated circuits (PICs), quantum communication, and optical 6G wireless. John works with customers to investigate high speed electrical and optical measurements and is passionate about experimental lab work. He is a member of IEEE and has been with Hewlett Packard, Agilent, and Keysight Technologies since 1999.

14:45 to 15:15	 Rosane Palissari	Bachelor's degree in Physics from the State University of Campinas (UNICAMP) (1984), Master's (1990) and Ph.D. (2007) in Physics from UNICAMP. She worked as a Research Professional at the Institute of Geosciences at UNICAMP, acquiring experience mainly in the area of SEM (Scanning Electron Microscopy). She participates as a contributor to the Chronology Group of the Dept. of Cosmic Rays and Chronology of the Gleb Wataghin Institute of Physics (IFGW) - UNICAMP, whose work emphasizes the area of Traces of Nuclear Particles. Currently, she works as a Professional for University Affairs, being Supervisor of the Operations area of the Specialized Technical Support Group (GATE), which includes the Multi-user Laboratory (LAMULT) of the IFGW, acquiring experience in the areas: AFM (Atomic Force Microscopy), FTIR (Fourier Transform Infrared Spectroscopy), XRD (X Ray Diffraction) and Raman Spectroscopy.
15:15 to 15:30	 Luis H. Hecker de Carvalho	Luis Hecker is an Electrical Engineer, M.Sc., with more than 15 years of experience in Optics and Photonics. He is currently working as Photonics Director and Site Leader of Lumentum in Brazil, leading high-performance R&D engineering teams on the complete product development cycle of PICs, Devices, and Modules for high-capacity optical communications systems. Has 6 patents, 5 technology products currently in the market, and more than 90 papers published in leading journals and conferences in the field of photonics and optical communications.
16:00 to 16:15	 Carmelo J. A. Bastos-Filho	Carmelo J. A. Bastos Filho is Pro-Dean of Graduate Studies, Research and Innovation, and Associate Professor at the Polytechnic School of Pernambuco, University of Pernambuco (UPE). He is a professor at UPE. He was Chief Scientist of the Technological Park of Electro-electronics of the State of Pernambuco between 2016-2020. From 2020 to 2022, he was the director of innovation environments and higher education at the secretary of science, technology and innovation in Pernambuco. He is the coordinator of the Rota TIC Mangue Digital, a joint action with SUDENE and MDR. He is on the advisory board of ISI TICs SENAI. He is the coordinator of the specialization in Artificial Intelligence at UPE and deputy coordinator of the residency in data science for the automotive sector with Stelantis. He was coordinator of the Specialization Program / Technological Residency in IP Network Engineering at UPE / Alcatel-Lucent / FITec, vice-coordinator of the Specialization in Digital TV and Communications Networks at UPE. He was general coordinator of Graduate Studies at the University of Pernambuco in 2015. After finishing his doctorate, his thesis was chosen by CAPES as the best thesis in Brazil in the area of Engineering IV in 2005. He has published more than 300 complete articles. He has coordinated several research projects funded by CNPq/Universal, FACEPE, FINEP, CHESF (R&D ANEEL), FITec, Alcatel-Lucent and Fiat-Chrysler.
16:15 to 16:30	Darli Mello	Bio on Auditorium 2 - Tuesday’s Technical Session slot
16:30 to 16:45	 Leonardo Didier Coelho	Leonardo Didier Coelho graduated in Electrical Engineering in 2003 from the Federal University of Pernambuco. In 2005 and 2010 he received the title of master and doctor, respectively, from Technische Universität München, Munich, Germany. During his master's and doctoral thesis, he carried out several researches on modeling, simulation and optimization of optical communication systems. In 2006 and 2007 he worked on nonlinear phase noise in optical communication systems at the Fraunhofer Heinrich-Hertz-Institut in Berlin, Germany. He spent three months in 2009 at the Department of Photonic Engineering, Technical University of Denmark, Denmark, as a visiting researcher working with fiber optic parametric amplifiers. From 2011 to 2014, he worked at Infinera (formerly part of Nokia Siemens Networks and Coriant R&D GmbH) in Munich, Germany. He is currently Professor at the Department of Electronics and Systems at the Federal University of Pernambuco. His main interests include optimization of optical communication systems, optical amplification, integrated photonics, fiber optic power supply and battery management systems. doctor Coelho received the Bund der Freunde der TU München prize for the best Doctoral Thesis in Electrical Eng. in 2011.
16:45 to 17:00	 Helio Waldman	Graduated in Electronic Engineering from Instituto Tecnológico de Aeronáutica (1966), Master's in Electrical Engineering - Stanford University (1968) and Ph.D. in Electrical Engineering - Stanford University (1971). He is currently a retired full professor at the Fundação Universidade Federal do ABC and at the State University of Campinas. He has experience in Electrical Engineering, with emphasis on Telecommunications, working mainly on the following topics: optical networks; optical communications; route allocation, spectrum and modulation format in elastic optical networks; optical spectrum management in fiber networks. He was the first Dean of Research at Unicamp in the 1980s, and at UFABC from its foundation until 2009. He was Dean of UFABC from 2010 to 2014, when he was compulsorily retired at the age of 70. He is currently coordinating a Fapesp thematic project on new strategies to face the threat of capacity exhaustion, within the scope of a program aimed at research associated with the Internet of the future, and collaborates with graduate programs at Unicamp and UFABC.
17:00 to 17:15	 Raul C. Almeida Jr.	Raul C. Almeida Jr. holds a degree in Electrical/Electronic Eng. from the UFPE (1999), a Master's degree in Electrical Eng. from Unicamp (2001) and a Ph.D. in Electrical Eng. from Unicamp (2004). In 2005 he was a postdoctoral fellow in the optical networks group at UFPE as a regional scientific development (DCR) fellow. From 2006- 2011 he was a Senior Research Officer at the University of Essex, UK. In 2012 he returned to the optical networks group at UFPE as a postdoctoral fellow and DCR fellow. Since 2012 he has been a professor at the Depart. of Electronics and Systems (UFPE), being an Associate Professor since 2020. He participated and collaborated with several research projects in England, financed by the Technology Strategy Board (TSB) and EPSRC (Eng. & Physical Science Research Council), in partnership Brazil-Portugal (Capes-FCT), as a consultant in the Portuguese project Morfeus, and, in Brazil, funded by Facepe, Ericsson, PadTec, CNPq/Universal and FAPESP. He has experience in the area of Electrical Eng. and Computer Science with emphasis on telecom networks and systems, having worked mainly on: optical networks with wavelength, optical networks with switching bursts and packets, WDM, delay-line buffers, route and wavelength allocation under physical layer constraints and quality of service guarantees , analytical modeling, optimization, heuristics, evolutionary algorithms, application of machine learning techniques in networks, mathematical programming, numerical simulations, GMPLs, flat label routing, Internet of the future and elastic optical networks.

17:15 to 17:30	 Nelson Fonseca	He holds a degree in Electrical Engineering from PUC-Rio (1984), a Master's in Master's in Computer Science from PUC-Rio (1987), a Master's in Master In Computer Engineering - University of Southern California (1993) and PhD in Computer Engineering - University of Southern California (1994). He is a Full Professor at Unicamp. He is a member of Unicamp's Institutional Development Evaluation Commission. He serves as Vice President of Conferences for the IEEE Communications Society. He created the IEEE Latin America on Communications conference, the IEEE Latin America Conference on Cloud Computing and Communications and was co-founder of series of symposiums at IEEE Globecom/ICC conferences Technical coordinator of over 15 conferences. He also created the IEEE ComSoc Student Competition Program. He is Senior Technical Editor for IEEE Communications Magazine and IEEE Systems Journal. He is a member of the advisory committee for the IEEE Communications Surveys and Tutorials and a member of the Steering Committee for the IEEE Transactions on Cloud Computing. He is a member of the editorial board of the journals Computer Networks, P2P Networking and Appl.cations, J. of Internet Services and Appl. and J. of the Brazilian Computer Society
Auditorium 2		
14:00 to 17:30	**Technical Session - Wednesday**	
14:00 to 14:30	 Andreas Seifert	After his PhD in Physics, Andreas Seifert dedicated his career to optics and photonics. In brief: From space telescopes over optical microsystems to nanophotonics. First, he worked for many years in leadership positions in Optical Industry at Carl Zeiss, Germany, and from 2007 at the University of Freiburg, Germany, as Group Leader in the field of Microsystems Engineering, in particular Medical Optical Microsystems. In 2015 he joined CIC nanoGUNE as Ikerbasque Research Professor and Group Leader in Nanoengineering. Current research combines nanotechnology with photonics, primarily with applications in the fields of medical diagnostics, food control and environmental monitoring.
16:00 to 16:30	 Lion Augel	Lion Augel is a Scientific Researcher at Fraunhofer IPMS, Germany. Education: BSc (2011) and MSc (2013) in Electric Engineering and Information Technology, and PhD (2019) in Microelectronics (“Plasmonic structures on Ge photodiodes for the integration of collinear biosensors”), at the University of Sttutgart. Skills: microelectronics, semiconductor manufacturing and optoelectronics. His interest in scientific work lies in the interaction of radiation and matter. In particular, he has developed semiconductor optics with its wide range of possible applications and developments as an exciting field of work. Research objectives: Group-IV Photonic Devices (design of nanophotonic structures; CMOS-compatible plasmonics, Fab-standard manufacturing technology; electrical and photonic simulation); and Applications (multi- and hyperspectral imaging; spectroscopy, photonic biosensing, photonic device metrology).
16:30 to 17:00	 Niels Quack	Niels Quack is a Swiss and German engineer specialized in optical micro engineering. He studied engineering at EPFL and received his MSc degree in 2005. He then joined Jürg Dual's Institute for Mechanical Systems at ETH Zurich as a PhD student and graduated in 2010."In 2011, he worked as a postdoctoral researcher at Ming C. Wu's Integrated Photonics Laboratory at University of California, Berkeley. From 2014 to 2015, he was senior microelectromechanical systems engineer with Sercalo Microtechnology Inc. From 2015 to 2022 he was an SNSF Assistant Professor with the EPFL, and head of the Photonic Micro- and Nanosystems Laboratory at its school of engineering. Since January 2022 he is an Associate Professor in Micro- and Nanosystems at the University of Sydney, Faculty of Engineering/School of Aerospace, Mechanical and Mechatronic Engineering.
Auditorium 3		
14:00 to 17:30	**Technical Session - Wednesday**	
14:00 to 14:30	 Rodrigo Szostak	Rodrigo Szostak got his bachelor’s degree in Chemistry at UEPG (2014). Then, at Unicamp,; he got a master’s degree in chemistry on perovskite solar cells (PSCs) (2016). After thathe kept studying PSCs but started to employ synchrotron radiation techniques to characterize the PSCs together with Dr. Hélio Tolentino, from Brazilian Synchrotron Light Laboratory (LNLS), which is part of the Brazilian Center for Research in Energy and Materials (CNPEM). Also, during his Ph.D., he spent one year at EPFL under professor Anders Hagfeldt working on perovskite solar cells devices. Rodrigo got his Ph.D in 2021 and joined to Dr. Tolentino at Carnauba beamline (Sirius/LNLS). His post-doctoral activities are focused on the development of in situ and operando experimental setups to characterize PSCs at Carnauba beamline. Rodrigo has experience in perovskite solar cells device preparation and characterization using synchrotron radiation through X-ray scattering (in situ GIWAXS) and nano-FTIR techniques.
16:00 to 16:30	 Armando Albertazzi Gonçalves Jr	Graduated in Mechanical Engineering, at UFBA (1982), Master's (1984) and Ph.D. (1989) in Mechanical Engineering, at UFSC, and post-doctorate at the Illinois Institute of Technology (1991). He is a full professor at the Federal University of Santa Catarina, where he joined in June 1987. He is the author of the book Fundamentals of Scientific and Industrial Metrology (Ed. Manole 2008/2018). He was a member of the International Scientific Committee of about 40 congresses and president or vice-president of six of them. Since 2008 he has been a SPIE Fellow. He was coordinator of the Graduate Program in Scientific and Industrial Metrology in the periods 1996-2001, 2006-2011 and of the Graduate Program in Mechanical Engineering in the period 2013-2016. He assumed the Research Superintendence at UFSC from 2016 to 2022. He works in the area of optical metrology, with emphasis on the development and application of techniques and equipment for measuring the geometry and residual stresses of pipes and in the area of non-destructive testing with laser. Since the 1990s, he has been strongly involved in the oil and gas sector.

Thursday, August 3rd		
UNICAMP Convention Center		
Auditorium 3		
09:00 to 12:30	**Plenary Session Thursday: 5th Webinar Brazilian Photonics Laboratories System SISFOTON - MCTI**	
09:00 to 9:15	 Felipe Silva Bellucci	PhD in Science and Technology of Materials from Unesp and PhD in Physical Sciences from Universidad de Valladolid - UVa/Spain. Performed Research internship at Post-Doctoral level at the Faculty of Engineering of Ilha Solteira - FEIS/UNESP (2014-2016), Research internship at Post-Doctoral level Nov/13 to Mar/14) and PhD internship PDEE/CAPES (Sep/10 to Aug/11) at the Facultad de Ciencias of the Universidad de Valladolid - UVa/Spain. He is a specialist in Science, Technology and Innovation Policy Management from the National School of Public Administration-ENAP (2017-18) and has an MBA in Innovation Management from the School of International Business and Entrepreneurship (Germany). He has experience in the areas of applied research, technological development, innovation and entrepreneurship and new technology-based businesses in Nanotechnology, Advanced Materials, Photonics and Technologies for Advanced Manufacturing, as well as a Specialist and MBA in Management and Public Policy in S,T&I. He currently occupies the permanent position of Full Technologist 3-III in Science, Technologies and Innovation (Law No. 8.691/93), General Coordinator of Enabling Technologies, of the Secretariat of Entrepreneurship and Innovation of the Ministry of Science, Technology and Innovations - MCTI in Brasilia/DF.
09:15 to 9:30	 Vanderlei Bagnato	Vanderlei Salvador Bagnato simultaneously completed a Bachelor's Degree in Physics - USP, and Materials Engineering - UFSCar in 1981 and completed his PhD in Physics - Massachusetts Institute of Technology - MIT in 1987. He is currently a professor at the University of São Paulo. He was director of the Institute of Physics of São Carlos from 2018 to 2022. He has published around 700 articles in specialized journals. He has 29 book chapters and 7 published books. He has supervised more than 100 theses between masters and doctorates, in the areas of Physics, Dentistry and Medicine. He received several awards and honors. He works in the area of Atomic Physics and Applications of Optics in Health Sciences. He works with cold atoms, Bose-Einstein Condensates and photodynamic actions in cancer and microbiological control. He is a member of the Brazilian Academy of Sciences, The Academy of Sciences for the Developing World, the Vatican's Pontifical Academy of Sciences, and the National Academy of Sciences (USA). He coordinates a Research Center, in which basic and applied sciences coexist in harmony. It carries out various activities of Technological Innovation and science dissemination.
09:30 to 9:45	 Lauro June Queiroz Maia	Bachelor in Physics from UFMS (2000), Master in Applied Physics from IFSC-USP (2003) and PhD in Cotutela regime in Applied Physics by IFSC-USP and in Physics of Materials and Nanostructures by the Université Joseph Fourier/France (Current Université Grenoble Alpes-UGA) (2006). He held a Post-Doctoral Internship at IQ-UNESP. From June/2017 to May/2018 he carried out a Senior Internship (Post-Doctoral Internship) at the Ecole Polytechnique Montréal/Université de Montréal, in the Departments of Physical Engineering and Electrical Engineering, under the supervision of Prof. doctor Raman Kashyap for the study of oxide materials for laser cooling. He is currently Associate Professor IV at the Institute of Physics at the Federal University of Goiás. Since April/2021 he is the Director of the Institute of Physics at UFG. From January to March/2020 and from November to December/2021 he carried out scientific and technological research activities at the Institut Néel of the CNRS de Grenoble in France, as an Invited Professor at the Université Grenoble Alpes. He has experience in Physics and Materials Science and Engineering, with emphasis on Optical and Spectroscopic Properties of Condensed Matter, acting on the following topics: thin films, waveguides, optical nanothermometry, nanostructured particles, clay, advanced ceramics, structural ceramics , glasses and glass-ceramics, photoluminescent emission, optical spectroscopy, 2nd harmonic generation (GSH), thermal analysis, X-ray diffraction, scanning and transmission electron microscopy and AFM, vibrational infrared and Raman spectroscopies, method of polymeric precursors and sol-gel process.
09:45 to 10:00	 Anderson Rodrigues Lima Caires	Graduated in Bachelor of Physics from the Federal University of Mato Grosso do Sul (1999), did a Direct Doctorate in Physics from the University of São Paulo (2004) and Post-Doctorate in Plant Physiology at University of Essex, UK (2011). He is an associate professor IV at the Federal University of Mato Grosso do Sul, working for a period as a senior visiting professor at the University of Essex, UK (2019 - 2020). Leader of the Optics and Photonics Group (GOF) and coordinator of the Optics and Photonics Laboratory (LOFt), recently accredited to the National System of Photonics Laboratories (SISFÓTON-MCTI). Member of the National Institute of Science and Technology (INCT) of Basic Optics and Applied to Life Sciences, in which LOFt is also associated. He has experience in the area of Optical Spectroscopy and Materials, working mainly on the following topics: Photoinactivation of Microorganisms, Development of Materials and Methods for Environmental Assessment and Optical Characterization of Biological Systems, Biofuels and Materials.
10:00 to 10:15	 Moisés Felipe Teixeira	He currently works as a research engineer at the SENAI Laser Innovation Institute in Joinville, Santa Catarina. He specializes in laser surface treatment, such as: localized heat treatment, coating (Laser Cladding) and surface modification with the addition of an alloying element (Laser Alloying). He is a Materials Engineer graduated from UFSC, with a Masters in Science and Materials Engineering also from UFSC, with a dissertation in the area of reducing wear through the Laser Alloying process, in partnership with the Fraunhofer IPT Institute in Aachen, Germany. He holds a PhD from UFSC in Materials Science and Engineering with a work topic in the area of reducing wear on grinding hammers through laser coating. He is also CEO and co-founder of the company Nanogreen Desenvolvimento Ltda.

10:15 to 10:30	 Marcelo Nalin	He holds a degree in Chemistry from the Unesp (1995), a Master's degree in Chemistry from Unesp (1998), a PhD in Chemistry - Universite de Rennes I (2002) and a PhD in Chemistry from the Instituto de Quimica Unesp (2002). He held a postdoctoral degree at the Université de Paris Sud (2002-2003) and a postdoctoral degree at the Gleb Wataglin Institute of Physics at the State University of Campinas (2004-2007). He developed a Young Researcher project with the Department of Physics at the Faculty of Sciences at UNESP in Bauru (2007-2009). He was an adjunct professor at the Department of Chemistry at UFSCar in São Carlos, SP from August 2009 to May 2013. He carried out an internship as a visiting researcher at ICMCB at the University of Bordeaux, France from 08/2019 to 07/2020 . He has been a member of the Coordination of the Chemistry area at FAPESP since August 2022. He is currently a Professor MS5.3 at the Institute of Chemistry at UNESP in Araraquara, SP. He has experience in the areas of Chemistry and Physics, with emphasis on Inorganic Chemistry, working mainly on the following subjects: glasses and glass-ceramics with applications in photonics and magneto-optical materials, photonic crystals and photosensitive materials.
11:00 to 11:15	 Débora M. B. Pereira Milori	Graduated, master's and doctorate in Physics from the Institute of Physics of São Carlos - University of São Paulo (USP), with specialization in optical techniques and photonics. Since 2001 she has been a researcher at Embrapa Instrumentação, São Carlos/SP, where she is also, currently, the Deputy Head of Technology Transfer, which includes an agenda of innovation and business with private companies. Her research area at Embrapa is optics and photonics applied to agriculture and the environment, and, in 2021, she had approved, under her coordination, the first National Laboratory of Agro-photonics, supported by the Ministry of Science, Technology and Innovation, within of the SISFOTON initiative. She works with the development of methods, sensors and equipment for soil, plant, fertilizer and food analysis. Along these lines, she highlights her unprecedented work, worldwide, in the development of an automated method and equipment using optical emission spectroscopy with laser-induced plasma - LIBS - for the quantification of carbon, nutrients and contaminants in the soil, as well as the development of portable systems for the early diagnosis of diseases in plants in the field. During her research activities she established several international cooperations with institutions in Europe and USA. She has around 500 published works, 130 of which in indexed international journals with more than 4500 citations. Within the scope of acting as Head of Technology Transfer, she was decisive in increasing the portfolio of projects in open innovation and/or in partnership with private companies; in four years the number of this type of project increased from 25% to more than 65% of Embrapa Instrumentação's projects. Also noteworthy is her work supporting the development of startups, in articulation with investors and Venture Capitals.
11:15 to 11:30	 Newton C. Frateschi	Professor Newton C. Frateschi is a professor at the Institute of Physics Gleb Wataghin from the State University of Campinas (IFGW UNICAMP). He was the executive director of the Inova Unicamp Innovation Agency from 2017 to 2021. He was director of the IFGW-UNICAMP from 2014 to 2017 and deputy director of the same institute from 2010 to 2014. Nanotechnologies at Unicamp from 2005 to 2010. From 2001 to 2003, Frateschi served as a senior designer in optoelectronics in the advanced technology group for photonic devices at T-Networks Inc., in Pennsylvania, United States. He holds a Master's and PhD in Electronic Engineering from the University of Southern California and a Bachelor's and Master's in Physics from IFGW Unicamp. Frateschi is also a level 1 researcher at CNPq - National Council for Scientific and Technological Development, leading the IFGW's Device Research Laboratory (LPD). He is the author and co-author of several scientific papers and several patents, mainly in the fields of optoelectronics and photonics.
11:30 to 11:45	 Anderson Stevens L. Gomes	Anderson S. L. Gomes completed his Graduation (Licenciatura, 1978) and Masters in Physics (1982) at the Physics Department of the Federal University of Pernambuco. He held a Ph.D. in Physics at the Imperial College of Science, Technology and Medicine, University of London (1986), and a postdoctoral degree at Brown University (1992). He is a Full Professor at the Department of Physics at UFPE, where he has been a permanent professor since 1990. He is a permanent member of the Physics and Dentistry PG programs (UFPE) and collaborator of the Materials Science PG program, UNIVASF. His scientific activities are in the area of nanophotonics, biophotonics, non-linear optics and optical communications. He is co-author of more than 300 scientific papers (H Factor: 36 Web of Science; Google Scholar H Index 47) and has supervised 39 master's theses and 20 doctoral theses. He is a Fellow of OPTICA (formerly OSA), where he was President of the International Council (2011-2012). He acts as a referee for several international journals in his field of knowledge (Optics Letters, Optics Express, Physical Review, J. of Biomedical Optics, Electronics Letters, etc). He is associate editor of the journal Light: Science and Applications (Nature Group) from 2019-2025. He is Full Member (since 2015) and Vice-President for NE and ES (2022-2025) of the Brazilian Academy of Sciences and elected Fellow of The World Academy of Science (TWAS). For more details on the lines of research, see www.andersongomes.com
11:45 to 12:00	 Maria José Pontes	She holds a degree in Physics from the State University of Campinas (1985), a Master's degree in Physics from the Gleb Wataghin Institute of Physics (1989) and a PhD in Electrical Engineering from the Faculty of Electrical and Computing Engineering (1996) - UNICAMP. She has worked in several Science and Technology Institutions, in Undergraduate and Postgraduate Teaching, Research, supervision and guidance of students. This is the case of CEFET/PR, today the Federal Technological University of Paraná (UTFPR) and the Military Institute of Engineering (IME). She also worked at Optiwave Corporation Inc., Ottawa-Canada in the development of software products for the design of amplifiers and optical systems. She is currently Associate Professor IV at the Department of Electrical Engineering at the Federal University of Espírito Santo. She was Director of Technological Innovation, the Nucleus of Technological Innovation at UFES. She chaired the Brazilian Society of Microwaves and Optoelectronics-SBMO for two consecutive terms. She currently works in the Division of Cooperation Agreements of the Secretariat for International Relations-SRI at UFES. She has been working in recent years on the modeling and practical implementation of fiber devices, working mainly on the following topics: optical amplifiers, plasmonic effect and fiber sensors, fiber nonlinearities, application of devices in WDM networks, high-rate systems.

12:00 to 12:15	 Wagner de Rossi Denise Maria Zezell	Completed his doctorate in Nuclear Technology USP in 1995. He is currently a supervisor at USP, senior technologist III of the National Nuclear Energy Commission and head of the Center for Lasers and Applications at IPEN. He has published 63 articles in specialized journals and 210 papers in annals of events. He has 9 book chapters and 1 book published. He has 15 technological products, 31 processes or techniques, 4 of which are registered, in addition to 7 other technical production items. He participated in dozens of events abroad and in Brazil. Among completed or ongoing supervision are 25 master's dissertations, 8 doctoral theses and 4 post-doctoral supervisions, in addition to having supervised 5 scientific initiation works in the areas of Physics, Mechanical Engineering and Materials and Metallurgical Engineering. He has received 5 awards and/or honors. Between 1982 and 2020, he participated in 34 research and technological development projects, of which he coordinated 12. He currently participates in 8 technological development projects, coordinating 6 of these. He is the coordinator of a FAPESP thematic project that has the participation of 18 doctors and 15 postgraduate students from IPEN and 05 other partner institutions. He works in the field of lasers, specializing in manufacturing processes. He provides technical consultancy and teaches courses on industrial laser processes to companies. Currently, he develops micromachining processes with ultrashort laser pulses, with which he is producing opto-microfluidic systems for applications in the areas of chemistry, biochemistry and health. OPTICA FELLOW since 2022. Bachelor in Physics (1984), MSc in Physics (1987) and PhD in Sciences from Unicamp (1991). Postdoc at the International Center for Theoretical Physics - Trieste, Italy (1992) and at IPEN /CNEN-SP (1992-1995). She has been a full reserarcher at CNEN since 1995, where she was Manager of the Lasers and Applications Center in 2008. From 2009 to 2013 she was the Coordinator of the Professional Master Program in Lasers in Dentistry at IPEN, together with School of Dentistry- (USP). She was the creator and since 2019 is the Dean of the Professional Master Course in Radiation Technology in Health Sciences, IPEN. Since 2017, she has been appointed OPTICA Traveling Lecturer, a member of Education Commission from CNEN. Member of the Deliberative Council of the Brazilian Photonics Society (2021-current) and its Newsletter editor for Biophotonics (2018-2019). Since 2020 is member of the Committee of Photonics (MCTI). Since 2023 she coordinates a CNPq INCT INTERAS (Radiation Technology in Health Science). Works in the following fields: Physics, Biophotonics (Optical and Spectroscopic Properties of biological tissues mainly by micro-FTIR and fluorescence, infrared thermography, aiming at the development of new diagnostic and therapeutic processes for clinical applications of lasers in dentistry and medicine). She has been dedicated to the search for biomarkers to determine the effects of ionizing radiation on biological tissues as well as to study the early diagnosis of skin and breast tumors by vibrational spectroscopy (FTIR optical biopsy).
12:15 to 12:30	 João Batista Rosolem	Graduation, master’s degree and doctorate in Electrical Engineering in 1986, 1990 and 2005, respectively, obtained at SEL-EESC-USP. In 1988 he carried out the experimental part of his MSc’s work at CPQD and developed a pioneering system of bidirectional transmission and multiplexing by optical fibers, which was employed by many Brazilian telecom companies. From 1993-96, alreadyb as a CPQD’s researcher, he led the development and transfer of EDFA’s technology. From 1997 to 2005 he participated in the development of DWDM systems, concomitantly with the use of EDFAs for metropolitan and long distance systems. All these technologies were transferred to Brazilian companies. Since his PhD he has coordinated and led a team of researchers of the Laboratory of Optical Sensing and Monitoring (LSMO), at CPQD, aiming developing innovating devices and sensing systems applied to electricity, oil and gas, railway systems, mining, and security. He has published 50 articles in specialized journals, 5 chapters in books and 177 works in annals of events, authored and co-authored of 53 patent applications, of which 5 patents have already been granted abroad and 30 in Brazil. He has co-supervised 5 PhD students and 3 Master's students at Unicamp, USP and INPE. He received 23 awards and/or honors. He is a TPC member of OFS, OWPT and IMOC. He is a CNPq DT-1D scholarship holder and a member of the CNPq Advisory Committee for Technological Training and Innovation in DT scholarships. Since 2021 he has been coordinator of the Sisfóton-MCTI Integrator Laboratory.
Auditorium 1		
14:00 to 17:30	**Technical Session - Thursday**	
14:00 to 14:30	 Gustavo Wiederhecker	Gustavo Wiederhecker holds an Associate Professor position at the University of Campinas, his research laboratory targets at harnessing nonlinear optical phenomena within microphotonic devices, with emphasis in the interaction between light and mechanical waves. He has been elected an affiliate member of the Brazilian Academy of Sciences for the 2019-2024 term. Before joining University of Campinas in 2011, he earned his B.Sc and Ph.D degrees in Physics from the same University and has been a postdoctoral fellow at Cornell University from 2008-2011. His Ph.D thesis has been awarded with the "Grande Prêmio CAPES José Leite Lopes" on 2009.
16:00 to 16:30	 Thiago Alegre	Thiago Alegre is a professor at the Department of Applied Physics at the Gleb Wataghin Institute of Physics at the State University of Campinas (Unicamp) since 2011, where he leads a research group on classical and quantum interactions between light and acoustic waves in micro- and nanostructured. He is currently the IFGW Undergraduate Coordinator (2021) and previously was Associate Undergraduate Coordinator at the same institution between 2019-2021. He was elected an affiliate member of the Brazilian Academy of Sciences for the 2019-2024 term and Member of the Editorial Advisory Board of the APL Photonics magazine (AIP) since 2019. Doctor of Science (2008) and Bachelor of Physics from the State University of Campinas (2003), Postdoctoral fellow at the California Institute of Technology (Caltech) (2011) and in 2020 he received the title of Livre Docência from Unicamp. Between 2014 and 2018 he coordinated the LIEF extension laboratory aimed at dissemination and education in basic science. He is also a member of the Brazilian Society of Physics, the Brazilian Society of Photonics and the Optical Society of America.

Auditorium 2		
14:00 to 17:30	**Technical Session - Thursday**	
14:00 to 14:30	 Rafael Figueiredo	Tecnologist in telecommunications, master and doctor in electrical engineering, all titles obtained at the State University of Campinas (UNICAMP), where he also did postdoctoral work, under the supervision of Prof. doctor Evandro Conforti. He is currently an Executive MBA student in Strategic and Economic Business Management at FGV. He is a member of Optica (formerly OSA), a senior member of the IEEE, a founding member of the FEEC-UNICAMP Postgraduate Association (APOGEEU) and a founding member of the Brazilian Society of Optics and Photonics (SBFoton). Since 2016 he has been a researcher at CPQD, where he acts as technical project coordinator and leader of the Optical Communications technology platform. He is also a part-time Wine Sommelier and a full-time father.
16:00 to 17:30	 Felipe Rudge Barbosa	He holds a bachelor's degree (B.Sc.) in Physics from the Pontifical Catholic University of Rio de Janeiro (1976), a Master's degree in Physics (M.Sc.) from the State University of Campinas (1979) and a PhD (Ph.D.) in Electrical Engineering from the State University of Campinas (1992). He is a collaborating professor at the Faculty of Electrical and Computer Engineering, State University of Campinas (FEEC-Unicamp); and senior researcher at INCT-Namitec, at the Information Technology Center - MCT/CTI, in Campinas SP. He has extensive experience in academic and business environments, in the areas of Electrical Engineering and Condensed Matter Physics, with emphasis on Lasers, Optical Fibers and their applications, and Telecommunications Systems. He works in R&D and technological innovation, with teaching and consulting activities as a specialist in Optical Communications systems, Optical Metropolitan Networks and access, photonic switching, semiconductor devices, optical and optoelectronic components, and opto-mechanics of precision. He has dozens of papers published in conferences and national and international journals. He is a member of SBF, SBrT, member and advisor of SBMO, consultant to ITU-T, and member of OSA and IEEE ComSoc. He received two professional awards. Currently CNPq DTI-1 scholarship holder.
Auditorium 3		
14:00 to 17:30	**Technical Session - Thursday**	
14:00 to 14:30	 Cícero Martelli	He holds a degree in Electrical Industrial Engineering (2002) and a Master's degree in Industrial Informatics with an emphasis on opto-electronics (2003) from the Federal Technological University of Paraná. In 2008 she completed a PhD in Engineering at the Interdisciplinary Photonics Laboratories / Optical Fiber Technology Center and School of Electrical and Information Engineering at the University of Sydney. She is interested in the following areas: optical fibers, optical devices for communication, optical sensors, high power lasers, fiber optic lasers, laser light material processing, non-linear optics, electro-optical coupling and molecular self-assembly ".
16:00 to 16:30	 Álvaro José Damião	Completed his doctorate in Physics at Unicamp. He was Senior Researcher III at IEAv, where he was Head of the Optical Components Manufacturing Workshop, having also been head of the Photonics Division. Permanent professor of the graduate program in Space Sciences and Technologies (ITA). He works in the area of Physics, with emphasis on Optics. He works in the field of instrumentation, with an emphasis on applications in optics and metrology. In the area of materials, he maintains joint work with other institutions, in the field of lasers and dentistry. The development and production of precision optical components, including the deposition and characterization of coatings, is his main activity. He was Quality Manager at IEAv-CTA and responsible for the Optical Surface Measurement Laboratory, which was Accredited by CGCRE. He was coordinator of the Area of Applied Physics and Mathematics of the graduate at ITA, from October 2013 to April 2016.

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