

# AOE 2007 Advance Program

Wednesday, 17 October 2007

## Room 4

08.30 - 10.15

**Session PLE1: PLENARY SESSION I**

**Session Chair:** Thomas L. Koch, *Lehigh University, Bethlehem, PA, USA*

08.30 - 08.45      **Opening Remarks**

**PLE1.1 08.45 - 09.30**

**TBD,** D. N. Payne, *University of Southampton, Southampton, UK*

ABSTRACT NOT AVAILABLE

**PLE1.2 09.30 - 10.15**

**Organic Optoelectronics – Past, Present and Future,** C. W. Tang, *University of Rochester, Rochester, NY, USA*

In this talk, I will begin with a description of the bi-layer heterojunction device structure discovered in the Kodak Research Laboratories in the late 1970's, which laid the basis for the development of today's high-efficiency organic optoelectronic devices - the organic light emitting diode (OLED) and the organic photovoltaic cell (OPV). The heterojunction, formed between a hole-transport layer and an electron-transport layer with deliberate energy level offset at the HOMO or LUMO or both, provides an important means of manipulating the carrier transport, generation and recombination processes in a thin-film organic-based device. Consequently, it can be utilized to greatly improve the device performance, most importantly the efficiency and life. I will highlight the key advances in OLED and OPV based on various heterojunction structures and conclude with a discussion of the challenges and prospects in developing OLED for displays and illumination sources and OPV for energy conversion.

10.15 – 10.45

**TEA BREAK**

10.45 - 12.15

**Session PLE2: PLENARY SESSION II**

**Session Chair:** Sailing He, *Zhejiang University, Hangzhou, China*

**PLE2.1 10.45 - 11.30**

**Silicon Photonics and Lasers,** J. E. Bowers, *University of California - Santa Barbara, Santa Barbara, CA, USA*

Tremendous advances are being made in silicon photonics. Complicated photonic integrated circuits combining active and passive devices are becoming available for a large variety of applications from telecommunications to imaging.

**PLE2.2 11.30 - 12.15**

**Biophotonics - An Overview and Future Challenges,** D. L. Matthews, *University of California - Davis, Sacramento, CA, USA*

The field of biophotonics is rapidly growing both in its academic and industrial settings. I will review major sectors of the field relating to advanced microscopy, biosensors/assays and medical device development. I will also describe our recent market study of the biophotonics industry: ~\$50B/yr worldwide sales and 8-25% growth rates.

12.15 – 13.30

**LUNCH BREAK**

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Room 4	Room 5B	Room 2
<p><b>13.30 - 15.15</b>  <b>Session JSYMP1: JOINT SYMPOSIUM ON ENABLING TECHNOLOGIES FOR NEXT GENERATION NETWORKS I</b>  <b>Session Co-Chairs:</b> Katsunari Okamoto, <i>University of California - Davis, Davis, CA, USA</i> and John Zyskind, <i>JDSU, NJ, USA</i></p>	<p><b>13.30 - 15.15</b>  <b>Session SC4.S1: LIQUID CRYSTAL DISPLAYS I</b>  <b>Session Chair:</b> Deng-Ke Yang, <i>Kent State University, Kent, OH, USA</i></p>	<p><b>14.15 - 15.15</b>  <b>Session SC3.T1: TUTORIAL ON OPTICAL FIBER SENSORS AND INDUSTRIAL APPLICATIONS</b>  <b>Session Chair:</b> Yun-Jiang Rao, <i>University of Electronic Science and Technology of China, Chengdu, Sichuan, China</i></p>
<p><b>JSYMP1.1 13.30 - 14.00 (Invited)</b>  <b>Recent Research Activities on Photonic Network Technologies</b>, Y. Matsushima, <i>National Institute of Information and Communications Technology, Koganei, Tokyo, Japan</i>  Recent activities on optical network R&amp;D promoted by NICT will be reviewed. Topics include an optical packet network system, an ultra-fast optical communication system as well as advanced optical devices. Open laboratory, Japan giga-bit optical network (JGN-II), where industry, government and education are collaborating will also be presented.</p>	<p><b>SC4.S1.1 13.30 - 14.30 (Tutorial)</b>  <b>Advanced Liquid Crystal Displays</b>, S.-T. Wu, <i>University of Central Florida, Orlando, FL, USA</i>  This tutorial will describe the basic operating physics of transmissive and transreflective TFT-LCDs. Methods for improving the viewing angle, response time, color gamut, color shift, contrast ratio, and optical efficiency will be discussed.</p>	
<p><b>JSYMP1.2 14.00 - 14.45 (Invited)</b>  <b>Critical Technologies Enable Agile Optical Networks</b>, S. Lumish, <i>JDSU, Eatontown, NJ, USA</i>  Next generation optical networks are being built that deliver bandwidth-rich applications to the home or office. These Agile Optical Networks are auto-adjusting, dynamically reconfigurable, with bit rate and wavelength flexibility. Critical new technologies are implemented to create these networks. These new applications, networks and technologies will be reviewed.</p>		
		<p><b>SC3.T1.1 14.15 - 15.15 (Tutorial)</b>  <b>Optical Fiber Sensors and Industrial Applications</b>, H.-Y. Tam, <i>Hong Kong Polytechnic University, Kowloon, Hong Kong</i>  ABSTRACT NOT AVAILABLE</p>
	<p><b>SC4.S1.2 14.30 - 15.00 (Invited)</b>  <b>Advanced Technologies for High Quality LC Display</b>, Y.-P. Huang, F.-C. Lin, C.-Y. Liao, Y.-T. Hsu, <i>National Chiao Tung University, Hsinchu, Taiwan, R.O.C.</i>, W.-K. Huang, C.-H. Tsao, <i>AU Optronics Corp., Hsinchu, Taiwan, R.O.C.</i>, L.-Y. Liao, C.-H. Chen and H.-P. D. Shieh, <i>National Chiao Tung University, Hsinchu, Taiwan, R.O.C.</i>  For achieving high quality LC displays, Advanced-MVA mode was proposed to wide the viewing angle, 4-color filed sequential method was utilized to increase the optical efficiency, and the local controlled LED backlight was applied to much improve the contrast and lower the power consumption.</p>	

Room 4	Room 5B	Room 2
<p><b>JSYMP1.3 14.45 - 15.15 (Invited)</b>  <b>Prospects for Nanophotonics Circuits</b>, L. Thylen, <i>Royal Institute of Technology, Kista, Sweden</i></p> <p>We discuss from a theoretical viewpoint the required advances in material technology and device structures needed to continue the rapid development of photonic circuit spatial integration density. Metamaterials and various waveguide device structures are discussed.</p>		
	<p><b>SC4.S1.3 15.00 - 15.15</b>  <b>Response Times in Pi-cell Liquid Crystal Displays</b>, H. Ma, L. Jiang and Y. Sun, <i>Hebei University of Technology, Tianjin, China</i></p> <p>The rise times of Pi-cell with arbitrary pretilt angle are simulated under normal driven methods. The off times of the cell driven by under-shoot driven method is faster than that under normal driven method.</p>	
<b>15.15 – 15.45 TEA BREAK</b>		
<p><b>15.45 - 18.00</b>  <b>Session JSYMP2: JOINT SYMPOSIUM ON ENABLING TECHNOLOGIES FOR NEXT GENERATION NETWORKS II</b>  <b>Session Co-Chairs:</b> Katsunari Okamoto, <i>University of California - Davis, Davis, CA, USA</i> and John Zyskind, <i>JDSU, NJ, USA</i></p>	<p><b>15.45 - 17.15</b>  <b>Session SC4.S2: LIQUID CRYSTAL DISPLAYS II</b>  <b>Session Chair:</b> Sin-Doo Lee, <i>Seoul National University, Seoul, Korea</i></p>	<p><b>15.45 - 16.45</b>  <b>Session SC3.T2: TUTORIAL ON AN OVERVIEW OF BIOPHOTONICS</b>  <b>Session Chair:</b> Chinlon Lin., <i>Chinese University of Hong Kong, Shating, NT, Hong Kong</i></p>
<p><b>JSYMP2.1 15.45 - 16.30 (Invited)</b>  <b>Specialty Fibers as Key Components for Dispersion Management</b>, H. Damsgaard, <i>OFS Fitel Denmark, Brøndby, Denmark</i></p> <p>Enabling technologies based on specialty fiber for high-speed fiber communication systems are discussed with special attention to dispersion management and amplification. History, recent progress, and possible future directions will be discussed.</p>	<p><b>SC4.S2.1 15.45 - 16.15 (Invited)</b>  <b>Reflective Cholesteric Display: Principle and Progress</b>, D.-K. Yang, <i>Kent State University, Kent, OH, USA</i></p> <p>Cholesteric reflective displays exhibit two stable states at zero field: the reflecting planar texture and non-reflecting focal conic texture. They have the merits of energy-saving, low manufacturing cost low and compatibility with flexible plastic substrates. They are suitable for e-book application.</p>	<p><b>SC3.T2.1 15.45 - 16.45 (Tutorial)</b>  <b>Biophotonics - A Tutorial Overview</b>, A. E. Chiou, <i>National Yang-Ming University, Taipei, Taiwan, R.O.C.</i></p> <p>A tutorial overview of biophotonics is given followed by the highlights of some recent progresses in potential biomedical applications of optical microscopy, spectroscopy, and manipulation.</p>
	<p><b>SC4.S2.2 16.15 - 16.45 (Invited)</b>  <b>Polarizer-Free Liquid Crystal Displays</b>, Y.-H. Lin, J.-M. Yang, <i>National Chiao Tung University, Hsinchu, Taiwan, R.O.C.</i>, S.-T. Wu, <i>University of Central Florida, Orlando, FL, USA</i> and C.-C. Liao, <i>Industrial Technology Research Institute, Hsinchu, Taiwan, R.O.C.</i></p> <p>A reflective polarizer-free liquid crystal display (LCD) using dye-doped LC gels is demonstrated. The main mechanism is to combine dye absorption and polydomain scattering. The potential applications are electronic papers and flexible displays.</p>	

Room 4	Room 5B	Room 2
<p><b>JSYMP2.2 16.30 - 17.00 (Invited)</b>  <b>Micro/Nano-Scale Optical Circuits and Networks for Information and Telecommunication Applications</b>, E.-H. Lee, <i>Inha University, Nam-ku, Incheon, Korea</i></p> <p>We discuss on the theory, design, and fabrication of high-density micro/nano-photonic circuits and networks on a platform called optical printed circuit board for applications in telecom-munications and information technology.</p>		
	<p><b>SC4.S2.3 16.45 - 17.00</b>  <b>The Color Temperature Adjusting Method for Multi-Primary Display using Nonlinear Programming Problems</b>, Y. Cheng, X. Liu and H. Li, <i>State Key Lab of Modern Optical Instrumentation, Hangzhou, Zhejiang, China</i></p> <p>Multi-primary display are now wildly researched and used. There are few researches concerning with color temperature design. It is easy in three-primary display. But it is difficult when the number of primaries gets more than three. This paper presents a method to design the relative primary luminances of multi-primary color display.</p>	
<p><b>JSYMP2.3 17.00 - 17.30 (Invited)</b>  <b>The Role of Integration in Future Optical Networks</b>, A. P. Janssen, <i>Bookham Technologies, CA, USA</i></p> <p>Optical integration is providing evolutionary routes to achieving improved OE cost-performance ratios at many levels from devices to subsystems. We outline some of the technology choices relevant to today's and future networks using examples from receivers to next generation tunable lasers.</p>	<p><b>SC4.S2.4 17.00 - 17.15</b>  <b>Amplitude-Sensitive Interferometric Ellipsometer on TN-LCD Optical Parameters Measurement</b>, H.-C. Wei, C.-C. Tsai and C. Chou, <i>National Yang-Ming University, Taipei, Taiwan, R.O.C.</i></p> <p>This research proposes an amplitude-sensitive heterodyne interferometric ellipsometer to determine TN-LC cell parameters precisely based on single wavelength at normal incidence. The advantage is the capability of two dimensional distribution measurement using CCD camera.</p>	
<p><b>JSYMP2.4 17.30 - 18.00 (Invited)</b>  <b>Recent Progress on PLC Technologies for Large-Scale Integration</b>, S. Mino, <i>NTT Corporation, Atsugi, Kanagawa, Japan</i></p> <p>We review recent progress on PLC technologies for large-scale integration. We focus on three topics: the reduction of the switching power of thermo-optic switches, the hybrid-integration of chip-scale-package (CSP)-PDs for optical channel monitoring, and the hybrid integration of LiNbO<sub>3</sub>.</p>		

Room 4A	Room 4C	Room 5A	Room 5B	Room 2
<p><b>08.30 - 10.15</b></p> <p><b>Session SC1.S1: FIBERS AND PROPAGATION I</b></p> <p><b>Session Chair:</b> Philippe Grelu, <i>Université de Bourgogne, Dijon, France</i></p>	<p><b>08.30 - 10.15</b></p> <p><b>Session SC2.S1: MILLIMETER-WAVE, MID-INFRARED &amp; NONLINEAR DEVICES</b></p> <p><b>Session Chair:</b> El-Hang Lee, <i>Inha University, Incheon, Korea</i></p>	<p><b>08.30 - 10.15</b></p> <p><b>Session SC3.S1: BIOPHOTONICS AND BIOIMAGING I</b></p> <p><b>Session Chair:</b> Hui Ma, <i>Tsinghua University, Shenzhen, China</i></p>	<p><b>08.30 - 10.15</b></p> <p><b>Session SC4.S3: LIQUID CRYSTAL DISPLAYS III</b></p> <p><b>Session Chair:</b> Liang-Chy Chien, <i>Kent State University, Kent, OH, USA</i></p>	<p><b>09.00 - 10.00</b></p> <p><b>Session SC2.T1: TUTORIAL ON SILICON PHOTONICS</b></p> <p><b>Session Chair:</b> Haisheng Rong, <i>Intel Corporation, Santa Clara, CA, USA</i></p>
<p><b>SC1.S1.1 08.30 - 09.00 (Invited)</b></p> <p><b>Reduced Dispersion Fiber Extends Reach for Dispersion Tolerant Systems,</b> C. Towery, <i>Corning, Inc., Corning, NY, USA</i> and T. Zhang, <i>Corning, Inc., China</i></p> <p>This paper explores the synergy between electronic dispersion compensation (EDC) chip sets and NZDS fibers which have resulted in more dispersion tolerant and cost effective systems for long haul and regional networks.</p>	<p><b>SC2.S1.1 08.30 - 09.00 (Invited)</b></p> <p><b>Mid-Infrared Optoelectronic Devices and Applications,</b> Y.-G. Zhang and A.-Z. Li, <i>Chinese Academy of Sciences, Shanghai, China</i></p> <p>The semiconductor sources and detectors in mid-infrared band, including quantum cascade lasers, antimonide quantum well lasers and photovoltaic detectors grown using MBE in our laboratory are introduced, several applications using those devices are presented.</p>	<p><b>SC3.S1.1 08.30 - 09.00 (Invited)</b></p> <p><b>Overview of Research Activities at the NSF Center for Biophotonics Science and Technology (CBST),</b> Y. Yeh, <i>University of California - Davis, Davis, CA, USA</i></p> <p>We describe research highlights in three CBST theme areas: Advanced Microscopy, Molecular and Cellular Biophotonics, and Medical Biophotonics. Highlights include coherent x-ray diffraction and image reconstruction, engineering of switchable phytochromes, and time-gated CARS imaging modalities.</p>	<p><b>SC4.S3.1 08.30 - 09.00 (Invited)</b></p> <p><b>Wettability Patterning Technology for Organic Displays,</b> Y.-J. Na, S.-J. Kim and S.-D. Lee, <i>Seoul National University, Seoul, Korea</i></p> <p>We developed a simple and versatile patterning method for advanced organic displays with high resolution and uniformity in large area. Our patterning method involves the optical formation of selective wetting regions, where a regular array of functional polymer patterns is obtained by spin-coating or dip-coating.</p>	
<p><b>SC1.S1.2 09.00 - 09.30 (Invited)</b></p> <p><b>The Breakthrough of Specialty Fiber Fabricated by PCVD based Process,</b> Q. Han, F. Tu, J. Luo and R. Matai, <i>Yangtze Optical Fiber and Cable Co., Ltd., Wuhan, China</i></p> <p>In this paper, the principle of PCVD process was introduced briefly. The material composition and structure design combining with waveguide design of PCVD preform were analyzed. Besides, the application, key features and advantages of some specialty fibers fabricated by PCVD process were introduced.</p>	<p><b>SC2.S1.2 09.00 - 09.30 (Invited)</b></p> <p><b>Microwave and Millimeter-Wave Photonic Devices for Communications and Measurement Applications,</b> T. Nagatsuma, <i>Osaka University, Toyonaka, Osaka, Japan</i> and Y. Kado, <i>NTT Corporation, Atsugi, Kanagawa, Japan</i></p> <p>Microwave and millimeter-wave photonics, which merges radio-wave and photonics technologies, has recently attracted increasing interest. This paper provides an overview on the status of microwave and millimeter-wave photonic devices and some of their latest applications.</p>	<p><b>SC3.S1.2 09.00 - 09.30 (Invited)</b></p> <p><b>Least-Invasive Harmonic Generation Microscopy for Intravital Imaging,</b> C.-K. Sun, <i>National Taiwan University, Taipei, Taiwan, R.O.C.</i></p> <p>With a virtual-transition characteristic, harmonic generation microscopy provides high-penetration non-invasive intravital optical images with a submicron 3D resolution, ideal for in vivo disease diagnoses and longterm live animal studies.</p>	<p><b>SC4.S3.2 09.00 - 09.30 (Invited)</b></p> <p><b>Synthesis of High Birefringence Liquid Crystals for Display Application,</b> C.-S. Hsu and Y.-M. Liao, <i>National Chiao Tung University, Hsinchu, Taiwan, R.O.C.</i></p> <p>Four series of high birefringence bistolane liquid crystals were synthesized and characterized. Biphenyl and naphthyl moieties were introduced to enhance the birefringence. These bistolane compounds exhibit reasonably low melting points and high birefringence of 0.5-0.8.</p>	<p><b>SC2.T1.1 09.00 - 10.00 (Tutorial)</b></p> <p><b>Silicon Photonics,</b> T. L. Koch, <i>Lehigh University, Bethlehem, PA, USA</i></p> <p>The unprecedented maturity of silicon materials, processing, and device technologies, stemming from international R&amp;D investments now exceeding \$40B annually, offers an enticing opportunity for leveraging into photonics applications and markets. Additionally, Silicon-on-Insulator (SOI) provides many inherent physical benefits for optics that can be used to advantage in ultra-compact, high-performance communications, signal processing, and sensor circuits. This tutorial will survey design issues associated with maximizing performance of very high index contrast passive waveguide elements, recent exciting work in the field demonstrating high-speed active devices based upon plasma index mechanisms, and an examination of fundamental limits for various field effect device configure-</p>

Room 4A	Room 4C	Room 5A	Room 5B	Room 2
				<p>ations and resonant-enhancement concepts. The tutorial will also explore the challenges remaining in providing on-chip light sources, including work towards silicon-compatible lasers using intrinsic, extrinsic, and hybrid materials technologies.</p>
<p><b>SC1.S1.3 09.30 - 09.45</b>  <b>Online RIC process for G.652.D fiber production</b>, R. Sattmann and D. R. Vydra, <i>Heraeus Quarzglas GmbH &amp; Co. KG, Hanau, Hessen, Germany</i>                      The Online-RIC process for the production of G652.D single mode fiber is presented. This process utilizes large synthetic fused silica hollow cylinders for multi-thousand kilometres perform size, combining the highest technical and economic benefits.</p>	<p><b>SC2.S1.3 09.30 - 09.45</b>  <b>Optically Controllable Millimeter-Wave Oscillator Using InP-based HEMTs</b>, H. Murata, N. Kobayashi, <i>Osaka University, Toyonaka, Osaka, Japan</i>, T. Kosugi, T. Enoki, <i>NTT Corporation, Atsugi, Kanagawa, Japan</i> and Y. Okamura, <i>Osaka University, Toyonaka, Osaka, Japan</i>                      Optical response in InP-based HEMT by focusing a laser beam onto a surface was studied in detail. The changes in Drain current, gain, and capacitance were observed clearly. We propose an optically controllable millimeter-wave oscillator.</p>	<p><b>SC3.S1.3 09.30 - 09.45</b>  <b>The Purcell Effect of Silver Nanoshell on the Fluorescence of Nanoparticles</b>, W. C. H. Choy, <i>University of Hong Kong, Hong Kong</i>, X. Chen, S. He, <i>Zhejiang University, Hangzhou, China</i> and P. C. Chiu, <i>University of Hong Kong, Hong Kong</i>                      The Purcell effect on the spontaneously emission rate and fluorescence efficiency of nanoparticles with and without a silver nanoshell will be investigated which are important for nanoparticle applications in biomedical diagnostics, information storage and optoelectronics.</p>	<p><b>SC4.S3.3 09.30 - 10.00 (Invited)</b>  <b>Stereo Viewing Zone in Auto-stereoscopic Display based on Parallax Barrier</b>, Q.-H. Wang, <i>Sichuan University, Chengdu, Sichuan, China</i>                      The concept of stereo image quality factor was defined to indicate the stereo viewing zone of an auto-stereoscopic display based on parallax barrier. Simulated program was developed to calculate the stereo viewing zone. The stereo viewing zone was obtained by defining threshold value of stereo image quality factor.</p>	
<p><b>SC1.S1.4 09.45 - 10.00</b>  <b>Optical Ultra-Wideband Pulse Generation Using Air-Guiding Photonic Bandgap Fiber and a Semiconductor Optical Amplifier</b>, S. Li, X. Zheng and B. Zhou, <i>Tsinghua University, Beijing, China</i>                      A method to generate ultra-wideband monocycle and doublet pulses using air-guiding photonic bandgap fiber and cross-gain modulation in a semiconductor optical amplifier is proposed. The fractional bandwidth for monocycle and doublet are 157% and 163%.</p>	<p><b>SC2.S1.4 09.45 - 10.00</b>  <b>Wavelength-Tunable Slow Light of fs Laser Pulse by Quadratic Nonlinear Cascading Process</b>, W. Lu, <i>Shanghai Jiao Tong University, Shanghai, China</i>                      Wavelength-tunable all optical delay of femtosecond laser pulse demonstrated theoretically through SHG and DFG quadratic nonlinear cascading interactions, in which group velocity of signal pulse can be controlled by pump beam.</p>	<p><b>SC3.S1.4 09.45 - 10.00</b>  <b>Nanoparticle-Assisted DNA Nanosensor</b>, X. Li, J. Qian, L. Chen, Y. Zhu, Q. Fang and S. He, <i>Zhejiang University, Hangzhou, China</i>                      We report a sensitive nanosensor based on a micro-fluidic chip and nanoparticles to detect low concentrations of DNA. The emission of CdSe/ZnS-QDs linked with single strand DNAs was quenched by gold nanoparticles linked with the complementary sequences after hybridization. Sensitively detected signal of DNA was obtained from a 100µm capillary.</p>		
<p><b>SC1.S1.5 10.00 - 10.15</b>  <b>Polarization Changes of Partially Coherent Pulses Propagating in Optical Fibers</b>, W. Huang and S. Ponomarenko, <i>Dalhousie University, Halifax, NS, Canada</i>                      We consider polarization changes of statistical pulses in single-mode fibers.</p>	<p><b>SC2.S1.5 10.00 - 10.15</b>  <b>Characteristics of All-Optical Ultra-Fast Retiming Switches using Cascaded Second-Order Nonlinear Effect in Periodically Poled Lithium Niobate Waveguides</b>, Y. Fukuchi and J. Maeda, <i>Tokyo University of Science, Shinjuku-Ku, Tokyo, Japan</i></p>	<p><b>SC3.S1.5 10.00 - 10.15</b>  <b>DNA Hybridisation Biosensor based on Dual-Peak Long-Period Grating</b>, X. Chen, K. Zhou, M. Hughes, E. Davies, L. Zhang, A. Hine, K. Sugden and I. Bennion, <i>Aston University, Birmingham, UK</i></p>	<p><b>SC4.S3.4 10.00 - 10.15</b>  <b>Wide-View and Broadband Circular Polarizers for Transflective Liquid Crystal Displays</b>, Z. Ge, M. Jiao, R. Lu, T. X. Wu, S.-T. Wu, <i>University of Central Florida, Orlando, FL, USA</i>, W.-Y. Li, and C.-K. Li, <i>Chi Mei Opto-</i></p>	

Room 4A	Room 4C	Room 5A	Room 5B	Room 2
<p>We show that the evolution of the degree of polarization is determined by the interplay between the coherence properties of the pulse and fiber birefringence.</p>	<p>We numerically analyze characteristics of all-optical retiming switches employing the cascaded second-order nonlinear effect in periodically poled lithium niobate waveguides. A time offset between the signal and clock pulses can improve the timing-jitter transfer characteristics.</p>	<p>Using an optical biosensor based on dual-peak long-period fibre grating, we demonstrate the detection of interactions between DNA biomolecules in real-time, showing a high sensitivity and reusability function.</p>	<p><i>electronics, Corp., Tainan, Taiwan, R.O.C.</i> A simple wide-view and broadband circular polarizer comprising of a linear polarizer and two uniaxial films is proposed to enhance the viewing angle of transfective liquid crystal displays. The physical mechanisms for achieving broad bandwidth and wide viewing angle are discussed.</p>	
<b>10.15 – 10.30 TEA BREAK</b>				
<p><b>10.30 - 12.15</b> <b>Session SC1.S2: FIBER GRATINGS &amp; OCDMA</b> <b>Session Chair:</b> Chester Shu, <i>Chinese University of Hong Kong, Shatin, NT, Hong Kong</i></p>	<p><b>10.30 - 12.15</b> <b>Session SC2.S2: SILICON PHOTONICS AND HIGH-SPEED DEVICES</b> <b>Session Chair:</b> Fumio Koyama, <i>Tokyo Institute of Technology, Yokohama, Kanagawa, Japan</i></p>	<p><b>10.30 - 12.15</b> <b>Session SC3.S2: OPTICAL SENSORS I</b> <b>Session Chair:</b> Hwa-Yaw Tam, <i>Hong Kong Polytechnic University, Kowloon, Hong Kong</i></p>	<p><b>10.30 - 12.15</b> <b>Session SC4.S4: FLEXIBLE DISPLAYS</b> <b>Session Chair:</b> Chain-Shu Hsu, <i>National Chiao Tung University, Hsinchu, Taiwan, R.O.C.</i></p>	<p><b>10.30 - 11.30</b> <b>Session SC1.T1: TUTORIAL ON ERBIUM-DOPED AND RAMAN FIBER AMPLIFIERS</b> <b>Session Chair:</b> P.-K. Alexander Wai, <i>Hong Kong Polytechnic University, Kowloon, Hong Kong</i></p>
<p><b>SC1.S2.1 10.30 - 11.00 (Invited)</b> <b>Ultrafast Laser Direct-Writing of Bragg-Glass Photonic Devices,</b> G. D. Marshall, N. Jovanovic, <i>Macquarie University, Sydney, NSW, Australia</i>, D. Kan, <i>University of Technology, Sydney, Sydney, NSW, Australia</i>, A. Fuerbach, <i>Macquarie University, Sydney, NSW, Australia</i>, A. A. Asatryan, L. C. Botten, <i>University of Technology, Sydney, Sydney, NSW, Australia</i> and M. J. Withford, <i>Macquarie University, Sydney, NSW, Australia</i>  Ultrafast lasers can induce localised refractive index changes in a wide range of glass types and geometries. The challenges and developments in direct-writing of Bragg components in bulk and fibre glass forms will be presented.</p>	<p><b>SC2.S2.1 10.30 - 11.00 (Invited)</b> <b>Silicon Photonic Devices,</b> H. Rong, <i>Intel Corporation, Santa Clara, CA, USA</i>  ABSTRACT NOT AVAILABLE</p>	<p><b>SC3.S2.1 10.30 - 11.00 (Invited)</b> <b>In-Line Fiber-Optic Etalon Formed by Hollow-Core Photonic Crystal Fiber,</b> Y.-J. Rao, <i>University of Electronic Science and Technology of China, Chengdu, Sichuan, China</i>  A novel fiber-optic in-line etalon is proposed and demonstrated, formed by splicing a section of hollow-core photonic crystal fiber (HCPCF) in between two single-mode fibers, for the first time to our knowledge.</p>	<p><b>SC4.S4.1 10.30 - 11.00 (Invited)</b> <b>Bistable Reflective Displays for Paper-like Displays,</b> L.-C. Chien, <i>Kent State University, Kent, OH, USA</i>  Many types of bistable reflective displays have been demonstrated so far to target the mobile application market, electronic books and paper-like displays. To ensure as a vital display technology in this market, displays with the characteristics of full color, light weight, low power consumption, high reflectivity and motion picture capability are necessary. In addition, a display technology has to have a cost-effective production method such as using roll-to-roll continuous manufacturing process. This paper will give a comparison on the emergence and evolution of bistable reflective display technologies with bistable cholesteric liquid crystal displays.</p>	<p><b>SC1.T1.1 10.30 - 11.30 (Tutorial)</b> <b>Erbium-doped Fiber Amplifiers and Raman Fiber Amplifiers for Optical Communications,</b> J. Zyskind, <i>JDSU, NJ, USA</i>  This tutorial will address the properties and applications of Erbium-doped fiber amplifiers, which have revolutionized optical communications systems, and of Raman amplifiers which promise further advances in optically amplified networks.</p>

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<p><b>SC1.S2.2 11.00 - 11.30 (Invited)</b>  <b>Advanced Modulation Techniques in OCDMA System</b>, X. Wang, <i>Heriot-Watt University, Edinburgh, Scotland, UK</i>, N. Wada, T. Miyazaki, <i>National Institute of Information and Communications Technology, Koganei, Tokyo, Japan</i>, G. Cincotti, <i>University of Rome 3, Rome, Italy</i> and K.-I. Kitayama, <i>Osaka University, Suita, Osaka, Japan</i></p> <p>Advance modulation techniques such as differential phase-shift keying (DPSK), differential quaternary phase shift keying (DQPSK) and code-shift-keying (CSK) modulation with balanced detection has been proposed and demonstrated in high capacity asynchronous optical code division access (OCDMA) system to beat the MAI noise and enhance the security.</p>	<p><b>SC2.S2.2 11.00 - 11.30 (Invited)</b>  <b>High-Speed Versatile Modulator for Huge-Capacity Transmission</b>, T. Kawanishi, <i>National Institute of Information and Communications Technology, Koganei, Tokyo, Japan</i></p> <p>We describe high-speed versatile modulators, which can provide various types of lightwave modulation, such as differential quadrature phase shift keying, quadrature amplitude modulation, for huge-capacity transmission systems.</p>	<p><b>SC3.S2.2 11.00 - 11.30 (Invited)</b>  <b>Two-Core Fiber based In-Fiber Integrated Interferometers and Its Sensing Applications</b>, L. Yuan, J. Yang and Z. Liu, <i>Harbin Engineering University, Harbin, China</i></p> <p>Based on two-core optical fiber, compact in-fiber integrated Michelson and Mach-Zehnder interferometers are proposed and demonstrated, which have the potential to be exploited in a variety of wide sensing applications.</p>	<p><b>SC4.S4.2 11.00 - 11.30 (Invited)</b>  <b>Fabrications of Mechanically Stable Plastic Liquid Crystal Displays</b>, K.-S. Bae, Y. Choi, S.-J. Jang, J.-H. Bae, J.-H. Kim, <i>Hanyang University, Seoul, Korea</i> and J.-W. Jung, <i>LG Philips, Gumi, Gyung-sangbuk-do, Korea</i></p> <p>We present fabrications of mechanically stable plastic liquid crystal displays. The micro-structures support the stable molecular alignment of liquid crystals. Various tight bonding techniques are applied for enhancing the durability of the device.</p>	
<p><b>SC1.S2.3 11.30 - 11.45</b>  <b>2.5Gbps 60km OCDMA Transmission Experiment using EPS-SSFBG En/Decoder</b>, L. Lu, <i>PLA University of Science and Technology, Nanjing, China</i></p> <p>EPS-SSFBG OCDMA en/decoders were experimentally demonstrated. 2.5Gbps OCDMA experiment is shown to achieve 60km error free transmission using 63-chip ,300Gbps chiprate EPS-SSFBG en/decoder and threshold adjustable receiver.</p>	<p><b>SC2.S2.3 11.30 - 11.45</b>  <b>Recent Advances in Commercial Electro-Optic Polymer Modulator</b>, B. Li, R. Dinu, D. Jin, D. Huang, B. Chen, E. Miller, A. Barklund, M. Moolayil, G. Yu, Y. Fang, L. Zheng, H. Chen and J. Vemagiri, <i>Lumera Corporation, Bothell, WA, USA</i></p> <p>We present the state-of-art polymer-based electro-optic modulator, which, for the first time, can be used in real commercial systems. The devices work up to 100Gbps and possess the <math>V_{\pi}</math>; as low as 1.6V.</p>	<p><b>SC3.S2.3 11.30 - 11.45</b>  <b>A Nonimaging Optics Approach for Photoelectric Sensor Applications</b>, J. Jiang, <i>Motorola Labs, Schaumburg, IL, USA</i></p> <p>This paper discusses the application of a hybrid TIR lens in photoelectric sensors. The performances and design are evaluated using a commercial non-sequential raytracing software. The results of the TIR lens in a conceptual thru-beam photoelectric sensor system are compared with the results from a CPC and an imaging optics.</p>	<p><b>SC4.S4.3 11.30 - 11.45</b>  <b>The Electrolytic Polishing of Flexible Display Steel Substrate</b>, Y. Q. Li, Z. Yu, W. Xue and J. Leng, <i>Beijing Institute of Technology, Beijing, China</i></p> <p>The electrolytic polishing process of stainless steel sheet which is used as the substrate for flexible electroluminescence display is investigated. The surface roughness of steel sheet decreases from 2<math>\mu</math>m to 0.13<math>\mu</math>m successfully.</p>	
<p><b>SC1.S2.4 11.45 - 12.00</b>  <b>Experimental Study on the Spectral Behavior of an asymmetric Long Period Fiber Grating via Erosion</b>, M. Yang, J. Chen, Y. Wang and X. Li, <i>Shanghai Jiao Tong University, Shanghai, China</i></p> <p>An asymmetric long period grating with period grooves is chemically etched. Experimental results show that though the grooves are ablated, the period structure still remains. Analysis is given to explain the related mechanism.</p>	<p><b>SC2.S2.4 11.45 - 12.00</b>  <b>All-Optical Inverted Triode Based on Cross-Gain Modulation using InAs Quantum Dot Semiconductor Optical Amplifiers</b>, Y. Maeda, <i>Toyota Technological Institute, Nagoya, Aichi, Japan</i></p> <p>We designed active layer of 15 stacks of InAs quantum dots, AlGaAs/GaAs double heterostructure and fabricated QD-SOAs for optical inverted triode. Our results demonstrate input, control and output waveforms, and input-output characteristics of the optical triode. It</p>	<p><b>SC3.S2.4 11.45 - 12.00</b>  <b>Fiber-Optic Interferometric Temperature Sensor using a Hollow Fiber</b>, J. Park, J.-H. Bae, <i>Keimyung University, Daegu, Korea</i> and C. Lee, <i>3I Corporation, Seoul, Korea</i></p> <p>A fiber-optic interferometric sensor for measuring temperature in the range from 28°C to 100°C is developed using a hollow optical fiber with an air-hole around the center axis. This temperature sensor has a linear response and high resolution.</p>	<p><b>SC4.S4.4 11.45 - 12.00</b>  <b>The Bending Properties of Flexible ITO Films</b>, Z. Yu, L. Xiang, W. Xue and H. Wang, <i>Beijing Institute of Technology, Beijing, China</i></p> <p>The electrical and optical properties of flexible ITO films as a function of the radiuses of the films to be bent has been investigated. The threshold radius, keeping the resistivity almost constant, is 0.75cm and 1cm for the film without buffer layer and one with buffer layer, respectively.</p>	

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	was obtained high speed response time at higher bit rate of 40 Gbps.			
<p><b>SC1.S2.5 12.00 - 12.15</b></p> <p><b>A Review of the Effects of High Refractive Index Overlays on Tunable Long Period Fiber Gratings,</b> J. Lee, Q. Chen, Q. Zhang and S. Yin, <i>Pennsylvania State University, University Park, PA, USA</i></p> <p>An optimized high refractive index overlay can be coated on the surface of a thin cladding long period fiber grating to achieve an enhanced tuning range and a stable resonant peak depth.</p>	<p><b>SC2.S2.5 12.00 - 12.15</b></p> <p><b>Modulation Properties of Erbium Doped Silicon Laser Diode,</b> M. D. Z. Hossain, S. Subrina and M. D. Q. Huda, <i>Bangladesh University of Engineering &amp; Technology, Dhaka, Bangladesh</i></p> <p>Frequency response is of interest in determining the bandwidth of laser for application in communication networks. In this paper we investigate both amplitude and frequency modulations of erbium doped silicon laser using rate equations formalism.</p>	<p><b>SC3.S2.5 12.00 - 12.15</b></p> <p><b>Transverse-Load Sensor based on a Distributed Bragg Reflector Fiber Laser,</b> L.-Y. Shao, X. Y. Dong and H.-Y. Tam, <i>Hong Kong Polytechnic University, Kowloon, Hong Kong</i></p> <p>We demonstrate a dual-polarization distributed Bragg reflector (DBR) fiber laser sensor for the measurement of transverse-load. Experimental results show that the beat frequency of the laser output has an orientation-dependent load sensitivity of up to 4.07 MHz/(N/m).</p>	<p><b>SC4.S4.5 12.00 - 12.15</b></p> <p><b>Fabrication and Characterization of Polymer Microtip Array Coated GaN Thin Film using Femtosecond Pulsed Laser Deposition,</b> X. Tong, and H. Wen, <i>Wuhan University of Technology, Wuhan, China</i></p> <p>The characterizations of polymer microtip array coated GaN thin film using femtosecond pulsed laser deposition have been studied. The results indicate that the GaN thin film deposited on polymer array is hexagonal polycrystalline, and the GaN microtip FEA has uniform size and well-defined profile, which shows a field emission characteristics.</p>	
<p><b>12.15 – 13.00 LUNCH BREAK</b></p> <p><b>&amp;</b></p> <p><b>13.00 – 14.30 EXHIBITION</b></p>				
<p><b>14.30 - 16.00</b></p> <p><b>Session SC1.S3: FIBERS AND PROPAGATION II</b></p> <p><b>Session Chair:</b> P.-K. Alexander Wai, <i>Hong Kong Polytechnic University, Kowloon, Hong Kong</i></p>	<p><b>14.30 - 16.00</b></p> <p><b>Session SC2.S3: PHOTONIC CRYSTALS AND PLASMONICS</b></p> <p><b>Session Chair:</b> Lars Thylen, <i>Royal Institute of Technology, Kista, Sweden</i></p>	<p><b>14.30 - 16.00</b></p> <p><b>Session SC3.S3: OPTICAL SENSORS II</b></p> <p><b>Session Chair:</b> Yun-Jiang Rao, <i>University of Electronic Science and Technology of China, Chengdu, Sichuan, China</i></p>	<p><b>14.30 - 16.00</b></p> <p><b>Session SC4.S5: DISPLAY LIGHTING</b></p> <p><b>Session Chair:</b> Yung S. Liu, <i>National Tsing Hua University, Hsinchu, Taiwan, R.O.C.</i></p>	<p><b>13.30 - 16.00</b></p> <p><b>Session FTTH1:</b></p> <p><b>Session Chair:</b> Wei-Ping Huang, <i>McMaster University, Hamilton, ON, Canada</i></p>
				<p><b>FTTH1.1 13.30 - 14.00 (Invited)</b></p> <p><b>Introduction &amp; Perspective of FTTH Council,</b> S. Hanatani, <i>Hitachi, Communication Technologies, Ltd., Tokyo, Japan</i></p> <p>ABSTRACT NOT AVAILABLE</p>
				<p><b>FTTH1.2 14.00 - 14.30 (Invited)</b></p> <p><b>FTTH: The Final Frontier of Optical Market,</b> J. Kuo, <i>Delta Electronics, Inc., Taiwan, R.O.C.</i></p> <p>ABSTRACT NOT AVAILABLE</p>

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<p><b>SC1.S3.1 14.30 - 15.00 (Invited)</b>  <b>Dissipative Solitons for Real World Optical Solitons</b>, P. Grelu, L. Rapp, <i>Université de Bourgogne, Dijon, France</i>, J. M. Soto-Crespo, <i>Instituto de Óptica, Madrid, Spain</i> and N. Akhmediev, <i>Australian National University, Canberra, Australia</i></p> <p>Efficient use of nonlinear dissipation enables the formation of robust optical pulses, with unique soliton properties. This way, exceptional stability of mode-locked lasers, formation of "soliton molecules", and optical regeneration schemes can be better understood.</p>	<p><b>SC2.S3.1 14.30 - 15.00 (Invited)</b>  <b>Photonic Crystal and Plasmonic Devices for Photonic Integration</b>, M. Qiu, <i>Royal Institute of Technology, Stockholm, Sweden</i></p> <p>Our recent research results on photonic crystal and plasmonic devices for photonic integration are reviewed here. Silicon-based photonic crystal waveguides, microcavities, and filters, as well as plasmonic waveguides will be presented.</p>	<p><b>SC3.S3.1 14.30 - 15.00 (Invited)</b>  <b>Single-Beam Self-Referenced Phase-Sensitive Surface Plasmon Resonance Sensor with High Detection Resolution</b>, H.-P. A. Ho and S.-Y. Wu, <i>Chinese University of Hong Kong, Shatin, NT, Hong Kong</i></p> <p>We present a new surface plasmon resonance (SPR) sensing system exhibiting a root-mean-square resolution of <math>5.2 \times 10^{-9}</math> refractive index units. This brings non-labeling SPR bio-sensing closer to that achievable by fluorescence-based techniques.</p>	<p><b>SC4.S5.1 14.30 - 15.00 (Invited)</b>  <b>Application of Microplasma Modes to a Highly Efficient Light Source for Displays</b>, K. C. Choi, S. H. Kim and K. H. Cho, <i>Korea Advanced Institute of Science and Technology, Daejeon, Korea</i></p> <p>Microplasma modes generated in a three electrode structure, including an auxiliary electrode, were analyzed and application of this structure to PDPs and BLUs was investigated. Highly efficient microplasma was generated in modes 1 and 2. Luminous efficacy was improved by 350% for AC PDPs and 50% for BLUs, respectively.</p>	<p><b>FTTH1.3 14.30 - 15.00 (Invited)</b>  <b>Integrated Photonics: Enabling Optical Component Technologies for Next Generation Access Networks</b>, V. I. Tolstikhin, <i>OneChip Photonics Inc., Ottawa, ON, Canada</i></p> <p>Integrated photonics technologies are reviewed in application to access network transceivers. Low manufacturing cost and high volume scalability, achievable through monolithic integration by means of semiconductor wafer fabrication techniques, identified as enablers for mass deployment.</p>
<p><b>SC1.S3.2 15.00 - 15.30 (Invited)</b>  <b>Generation of Energetic Wavelength Tunable Femtosecond Pulses in Higher-Order-Mode Fiber</b>, C. Xu, <i>Cornell University, Ithaca, NY, USA</i></p> <p>We demonstrate soliton-self frequency shift and Cerenkov radiation in higher-order-mode solid, silica-based fibers below 1300 nm. A wavelength shift of 240 nm and pulse energy of 1 nJ were achieved for sub 100-fs pulses.</p>	<p><b>SC2.S3.2 15.00 - 15.30 (Invited)</b>  <b>Light Confinement at Interfaces and Talbot Effect using Optical Surface Modes</b>, J. Garcia de Abajo, R. Sainidou, <i>Instituto de Óptica, Madrid, Spain</i>, T. V. Teperik, <i>DIPC, San Sebastian, Spain</i>, M. Dennis and N. I. Zheludev, <i>University of Southampton, Southampton, UK</i></p> <p>Various schemes of light confinement at interfaces will be presented, including dielectric thin films, metallic surfaces, and new proposed alternatives. The analogy of the Talbot effect in these systems will be discussed as well.</p>	<p><b>SC3.S3.2 15.00 - 15.30 (Invited)</b>  <b>All Fiber Optic Coal Mine Safety Monitoring System</b>, T. Liu, <i>Shandong Laser Institute, Jinan, Shandong, China</i></p> <p>This paper reports on the concept and field test results of the first all fiber optic sensor-based comprehensive coal mine safety monitoring system for remote monitoring of methane concentration, mining pressure, water pressure and temperature.</p>	<p><b>SC4.S5.2 15.00 - 15.30 (Invited)</b>  <b>Dielectric Superlattice and Its Potential Applications in Display Technology</b>, Y. Lu, S. Zhu, Y.-Y. Zhu, Y. Chen, H. Wang and N.-B. Ming, <i>Nanjing University, Nanjing, Jiangsu, China</i></p> <p>Dielectric superlattice has artificial microstructures in micrometer span. Cascade quasi-phase-matched frequency conversion could be realized in specially-designed superlattices. Efficient red-green-blue lights were obtained simultaneously, which may be used in laser display. On the other hand, light filtering and modulation also could be achieved through acousto-optic effect by using dielectric superlattices.</p>	<p><b>FTTH1.4 15.00 - 15.30 (Invited)</b>  <b>PLC based Bi-Directional Optical Module for Access Fiber Networks</b>, N. Kitamura, <i>NEC Corporation, Abiko, Chiba, Japan</i></p> <p>Optical modules based on PLC (Planar Lightwave Circuit) and passive optical alignment technologies has been developed for access network. These technologies can realize the cost and size reduction of the optical modules, with high productivity.</p>
<p><b>SC1.S3.3 15.30 - 16.00 (Invited)</b>  <b>Phase Noise Tolerant &amp; Real Time Multilevel Homodyne</b>, T. Miyazaki, M. Nakamura and Y. Kamio, <i>National Institute of Information and Communications Technology, Koganei, Tokyo, Japan</i></p> <p>Ultimately phase-noise tolerant multilevel homodyne technique without using offline signal processing has been demonstrated. The technique will allow us to use 30-MHz linewidth LD</p>	<p><b>SC2.S3.3 15.30 - 15.45</b>  <b>Optical Polarization Beam Splitting through Anisotropic Metamaterial Slab Realized by Layered Metal-Dielectric System</b>, J. Zhao, Y. Chen and Y. Feng, <i>Nanjing University, Nanjing, Jiangsu, China</i></p> <p>We report a novel polarization beam splitter (PBS) utilizing the anomalous reflection and transmission of an anisotropic metamaterial slab. By properly design of the constitutive tensors, PBS is achieved with little dependence</p>	<p><b>SC3.S3.3 15.30 - 15.45</b>  <b>Research on Optical Sensor for Pulsed Magnetic Field Measurement</b>, Y. Su, <i>PLA University of Science and Technology, Nanjing, China</i></p> <p>In this paper the key technologies in optical sensor for pulsed magnetic field measurement including the effect of linear birefringence on the precision, directionality of the sensor and the reconstruction of ultra wideband analog signal are studied.</p>	<p><b>SC4.S5.3 15.30 - 16.00 (Invited)</b>  <b>Organic Light Emitting Devices from OLED to Organic Laser Diode</b>, C. Adachi, T. Matsushima, H. Nakanotani, D. Yokoyama and M. Yaburo, <i>Kyushu University, Nishi, Fukuoka, Japan</i></p> <p>We mention some significant progresses on organic light emitting diode (OLED), organic laser diode (OLD) and organic field effect transistor (OFET). We discuss prospect of OLD based on</p>	<p><b>FTTH1.5 15.30 - 16.00 (Invited)</b>  <b>The Low Cost Single Mode Laser Technology for Mass Deployment</b>, B. Cai, <i>Eblana Photonics Ltd., Herts, UK</i></p> <p>DM laser is a breakthrough for low cost single mode laser. Designed around standard semiconductor process, the DM laser shares the simplicity and high yield of an FP laser, yet provide single spectrum emission with noise much lower than current DFB laser.</p>

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even for 80-Gb/s 256-QAM format so long as DGD is compensated.	on the incident angle and slab thickness, and realized in the optical range by layered metal-dielectric nano-structured system.		recent developments of organic light emitting devices.	
	<p><b>SC2.S3.4 15.45 - 16.00</b>  <b>Asymmetric Hybrid Three-Arm Coupler with Long Range Surface Plasmon Polariton and Dielectric Waveguides</b>, F. Liu, <i>Tsinghua University, Beijing, China</i>                      The characteristics of the asymmetric hybrid three-arm coupler, which consists of one middle long range surface plasmon polariton waveguide and two outside conventional dielectric waveguides, are analyzed numerically with finite element method.</p>	<p><b>SC3.S3.4 15.45 - 16.00</b>  <b>Distributed Bragg-Reflector Fiber Laser Sensor for Lateral Force Measurement</b>, Y. Zhang, B.-O. Guan, <i>China</i> and H.-Y. Tam, <i>Hong Kong Polytechnic University, Kowloon, Hong Kong</i>                      ABSTRACT NOT AVAILABLE</p>		
<b>16.00 – 16.15 TEA BREAK</b>				
<p><b>16.15 - 18.00</b>  <b>Session SC1.S4: FIBER LASERS, AMPLIFIERS AND NONLINEARITIES</b>  <b>Session Chair:</b> John Zyskind, <i>JDSU, NJ, USA</i></p>	<p><b>16.15 - 17.45</b>  <b>Session SC2.S4: PHOTONIC INTEGRATION</b>  <b>Session Chair:</b> Jian-Jun He, <i>Zhejiang University, Hangzhou, Zhejiang, China</i></p>	<p><b>16.15 - 18.00</b>  <b>Session SC3.S4: BIOPHOTONICS AND BIOIMAGING II</b>  <b>Session Chair:</b> Ho-pui Aaron Ho, <i>Chinese University of Hong Kong, Shatin, NT, Hong Kong</i></p>	<p><b>16.15 - 17.45</b>  <b>Session SC4.S6: OLED</b>  <b>Session Chair:</b> Ching W. Tang, <i>University of Rochester, Rochester, NY, USA</i></p>	<p><b>16.15 - 18.00</b>  <b>Session FTTH2: FTTH INDUSTRIAL FORUM II</b>  <b>Session Chair:</b> Shoichi Hanatani, <i>Hitachi Communication Technologies, Ltd., Tokyo, Japan</i></p>
<p><b>SC1.S4.1 16.15 - 16.45 (Invited)</b>  <b>Tunable Optical Delay Schemes using All-Optical Processing in a Highly Nonlinear Bismuth Oxide Fiber</b>, C. Shu and M. P. Fok, <i>Chinese University of Hong Kong, Shatin, Hong Kong</i>                      Widely tunable delay schemes are demonstrated using nonlinear phase modulation or four-wave mixing in a 32-cm bismuth oxide fiber followed by group velocity dispersion in a chirped fiber Bragg grating or a dispersion-compensated fiber.</p>	<p><b>SC2.S4.1 16.15 - 16.45 (Invited)</b>  <b>High Density Photonic Circuits and Their Applications in Advanced Digital Optical Networks</b>, S. T. Chu, <i>Infinera, Annapolis Junction, MD, USA</i>                      Reliable commercial development of high density, photonics integrated circuits (PIC) and high index contrast photonics lightwave circuits (PLC) where 100's of discrete components are incorporated onto a single chip have been developed for us in the advanced Digital Optical Networks. The benefits of these empowering devices.</p>	<p><b>SC3.S4.1 16.15 - 16.45 (Invited)</b>  <b>Photoacoustic and Thermoacoustic Imaging for Biomedical Applications</b>, D. Xing and L. Xiang, <i>South China Normal University, Guangzhou, China</i>                      Laser-based photoacoustic imaging and microwave-based thermoacoustic imaging could be the next successful generation imaging techniques in biomedical application. It can provide an effective approach of tissue structure and functional images to study the architectures, physiological and pathological properties and metabolisms of biological tissues.</p>	<p><b>SC4.S6.1 16.15 - 16.45 (Invited)</b>  <b>Extraction Efficiency Enhancement of an OLED using Surface Plasmon Resonance</b>, S.-Y. Nien, N.-F. Chiu, <i>National Taiwan University, Taipei, Taiwan, R.O.C.</i>, Y.-C. Tsai, <i>University of Chang Gung, Tao-Yuan, Taiwan, R.O.C.</i>, C.-W. Lin, <i>National Taiwan University, Taipei, Taiwan, R.O.C.</i>, K.-C. Liu, <i>University of Chang Gung, Tao-Yuan, Taiwan, R.O.C.</i> and J.-H. Lee, <i>National Taiwan University, Taipei, Taiwan, R.O.C.</i>                      In this paper, organic light-emitting devices with non-planar and periodic structures, fabricated by e-beam lithography, were demonstrated which exhibits improved extraction efficiency by coupling out the plasmonic mode. Their optical characteristics were presented and analyzed.</p>	<p><b>FTTH2.1 16.15 - 16.45 (Invited)</b>  <b>Overview of Japanese FTTH Market and NTT's Strategies for Entering Full-Scale FTTH Era</b>, H. Shinohara, <i>NTT Corporation, Tokyo, Japan</i>                      This presentation gives configuration of commercial FTTH systems. It also gives lessons learned from actual FTTH deployment and latest technologies used in massive FTTH deployment, highlighting easy construction technologies. NTT set the target of moving 30 million customers to FTTH by 2010. Technologies required for entering full-scale FTTH era is also discussed.</p>

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<p><b>SC1.S4.2 16.45 - 17.15 (Invited)</b>  <b>Recent Advances in the Practical Fiber Optical Parametric Amplifiers</b>, K. K.-Y. Wong, B. P. Kuo, <i>University of Hong Kong, Hong Kong</i>, M. E. Marhic, <i>University of Wales, Bangor, Wales, UK</i>, G. Kalogerakis and L. G. Kazovsky, <i>Stanford University, Stanford, CA, USA</i></p> <p>In recent years, impressive performance of fiber optical parametric amplifiers (OPAs) have been demonstrated in different respects. We describe these recent advances and discuss some of the challenges should be addressed before OPAs can be practical.</p>	<p><b>SC2.S4.2 16.45 - 17.15 (Invited)</b>  <b>InP-based Photonic Integrated Devices</b>, S. Matsuo, H. Ishii, T. Segawa, T. Kakitsuka, and H. Oohashi, <i>NTT Corporation, Atsugi, Kanagawa, Japan</i></p> <p>Monolithically integrated tunable lasers have been developed for use in R-OADM, burst switching, and packet switching systems. By using monolithic integration technologies, the optimal device configuration can be constructed for each application.</p>	<p><b>SC3.S4.2 16.45 - 17.15 (Invited)</b>  <b>Optical Coherence Tomography for Oral Cancer Diagnosis</b>, M.-T. Tsai, H.-C. Lee, C.-W. Lu, Y.-M. Wang, C.-K. Lee, C.-P. Chiang and C. C. Yang, <i>National Taiwan University, Taipei, Taiwan, R.O.C.</i></p> <p>Incorporating with a flexible-holder probe, a time-domain optical coherence tomography system is built to achieve 7 microns in axial resolution, 80-90 dB in sensitivity, and sub-sec imaging rate for clinical oral cancer diagnosis.</p>	<p><b>SC4.S6.2 16.45 - 17.00</b>  <b>Real-time Voltage Controlled Color Tunable OLEDs</b>, W. C. H. Choy, C. J. Liang and H. M. Zheng, <i>University of Hong Kong, Hong Kong</i></p> <p>Using the rare-earth and phosphorescent materials, voltage-controlled color tunable OLEDs has been achieved. The mechanisms of color-tuning have been investigated. The color purity and efficiency of the tunable OLEDs will be discussed.</p>	<p><b>FTTH2.2 16.45 - 17.15 (Invited)</b>  <b>Cost Effective, Flexible Optical Transceiver Solutions for FTTx Deployments</b>, R.-C. Yu, <i>Fiberxon, Inc., Santa Clara, CA, USA</i></p> <p>ABSTRACT NOT AVAILABLE</p>
			<p><b>SC4.S6.3 17.00 - 17.15</b>  <b>High-Performance Passive-Matrix OLED Display by Colour Conversion Method</b>, Y. Terao, M. Kobayashi, N. Kanai, R. Makino, C. Li, Y. Kawamura, K. Kawaguchi, T. Saito, <i>Fuji Electric Advanced Technology Co., Ltd., Matsumoto, Japan</i>, H. Hashida, <i>Fuji Electric Device Technology Co., Ltd., Matsumoto, Japan</i> and H. Kimura, <i>Fuji Electric Advanced Technology Co., Ltd., Matsumoto, Japan</i></p> <p>Highly power efficient white OLEDs for PM-OLED displays were developed. The operating voltage and the power-efficiency of the device are 6.4V and 5.9lm/W at 1A/cm<sup>2</sup>. The prototype PM-OLED display with Advanced-CCM was made.</p>	
<p><b>SC1.S4.3 17.15 - 17.30</b>  <b>Single Polarisation Fibre Ring Laser by Utilising Intracavity 45° Tilted Fibre Bragg Grating</b>, K. Zhou, C. Mou, X. Chen, L. Zhang, I. Bennion, <i>Aston University, Birmingham, UK</i>, S. Fu, and X. Dong, <i>Nankai University, Tianjin, China</i></p> <p>Single polarisation operation of fibre ring laser has been realised by employing an intracavity 45°-tilted fibre</p>	<p><b>SC2.S4.3 17.15 - 17.30</b>  <b>Analysis of Deep Etched Trench in Planar Optical Waveguide by FDTD Method</b>, J. Wang, <i>Zhejiang University, Hangzhou, Zhejiang, China</i></p> <p>A finite-difference time-domain (FDTD) method is presented for simulating deep etched trench structures in planar optical waveguides. Numerical results obtained from FDTD simulations and from the Transfer Matrix Method (TMM)</p>	<p><b>SC3.S4.3 17.15 - 17.30</b>  <b>Raman Signal Enhancement in a Liquid-Core Optical Fiber based on Hollow-Core Photonic Crystal Fiber</b>, L. Huo, <i>Chinese University of Hong Kong, Shatin, NT, Hong Kong</i></p> <p>Raman scattering of glycerol in a liquid-core optical fiber based on hollow-core photonic crystal fiber was demonstrated. Compared with conventional method, the Raman signal was en-</p>	<p><b>SC4.S6.4 17.15 - 17.30</b>  <b>Improvement of Electrical Characteristics of Fluorinated Perylene Diimide Thin-Film Transistors by Gate Dielectric Surface Treatment</b>, L.-G. Yang, J.-C. Huang, <i>Zhejiang University, Hangzhou, China</i>, R.-J. Li, <i>Chinese Academy of Sciences, Beijing, China</i>, M.-M. Shi, Y. Gao, M. Wang, <i>Zhejiang University, Hangzhou, China</i>, W.-P. Hu, <i>Chinese Academy of Sciences, Beijing, China</i> and</p>	<p><b>17.15 - 18.00 Panel Discussion</b></p>



Room 4A	Room 4C	Room 5A	Room 5B	Room 2
<p>Bragg grating (45°-TFBG). The degree of polarisation upto 99.94% of the laser was demonstrated with good stability.</p>	<p>are compared. The effect of sidewall verticality is analyzed.</p>	<p>hanced over 20 times in a 2.5-cm liquid-core fiber.</p>	<p>H.-Z. Chen, <i>Zhejiang University, Hangzhou, China</i></p> <p>The structural and electrical properties of n-channel OTFTs based on N,N'-(4-monofluorophenyl)-3, 4, 9, 10-perylene tetracarboxylic diimide (D4MFPP) were investigated. The influence of surface treatment on the mobility and the interface traps were quantitatively evaluated.</p>	
<p><b>SC1.S4.4 17.30 - 17.45</b></p> <p><b>Brillouin/Erbium Fiber Laser with Pre-Amplified Brillouin Pump Using Ring-Cavity Configuration</b>, N. Md Samsuri and A. Ahmad, <i>Telekom Research &amp; Development Malaysia SDN BHD, Serdang, Selangor, Malaysia</i></p> <p>In this paper, we present the experimental results of a Brillouin/Erbium fiber laser (BEFL) design using a ring cavity with a pre-amplified Brillouin pump. The effects of 980 nm pump power and Brillouin pump power parameters towards wavelength tuning range characteristics of this BEFL is investigated.</p>	<p><b>SC2.S4.4 17.30 - 17.45</b></p> <p><b>Fabrication of Polymer Integrated Optical Microring Resonator with Photobleaching Method</b>, J. Zhou, <i>Ningbo University, Ningbo, Zhejiang, China</i></p> <p>An optical-quality polymer film based on the AJL8/APC material is used for the fabrication of a single-mode microring resonator with photo-bleaching method. The measured transmission responses of the micro-ring resonator present a high Q-factor of device.</p>	<p><b>SC3.S4.4 17.30 - 18.00 (Invited)</b></p> <p><b>Time-of-Flight Laser Spectroscopy in Biomedical Diagnostics</b>, S. Andersson-Engels, J. Axelsson, A. Johansson, <i>Lund Institute of Technology, Lund, Sweden</i>, J. Johansson, <i>AstraZeneca Research and Development, Mölndal, Sweden</i>, S. Svanberg and T. Svensson, <i>Lund Institute of Technology, Lund, Sweden</i></p> <p>Optical spectroscopy is becoming a very valuable diagnostic tool in biomedical research. Time-of-flight spectroscopy is a tool providing information regarding scattering and absorption properties of the tissue, valuable for several applications as seen below. In Lund we have in the past developed the technique of supercontinuum generation for spectroscopic investigations of highly scattering media such as tissue, plant material, and pharmaceutical samples.</p>	<p><b>SC4.S6.5 17.30 - 17.45</b></p> <p><b>Electrochemical Polyaniline/Poly-pyrrole Composite Film with Novel Nanostructure and High Biosensitivity</b>, Y. Cheng, <i>Zhejiang University, Hangzhou, China</i></p> <p>Bilayer polypyrrole (PPY) and polyaniline (PANI) composite (PANI/PPY) films with surface morphology of micro/nano domain were prepared by two-step electrochemical polymerization. The enzyme Horse Radish Peroxide was successfully immobilized in the bilayer composite film and the resulting composite was responsive to hydrogen peroxide with high sensitivity.</p>	
<p><b>SC1.S4.5 17.45 - 18.00</b></p> <p><b>Impairment in Amplification of Optical Packets Regarding the Gain Transient and Nonlinear Effect Depending on Peak Power of NRZ Payload</b>, Y. Awaji, <i>National Institute of Information and Communications Technology, Tokyo, Japan</i>, H. Furukawa and N. Wada, <i>National Institute of Information and Communications Technology, Koganei, Tokyo, Japan</i></p> <p>We observed impairments of gain transient and significant nonlinearity in</p>	<p><b>SC2.S4.5 17.45 - 18.00</b></p> <p><b>Image Resolution Analysis of Different Super Lenses</b>, P. Andalib and N. Granpayeh, <i>K.N.Toosi University of Technology, Tehran, Iran</i></p> <p>In this paper, we have analyzed the dependence of Quality of the image in triangular lattice PC slab with circular air holes, elliptical rods and cylindrical PC lens with circular air holes. The results have been compared.</p>			

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amplification of optical packet. We clarified each phenomenon and pointed out the importance of monitoring of traffic density in optical layer to reduce the impairment.				
<b>18.30 CONFERENCE BANQUET</b>				

Room 4A	Room 4C	Room 5A	Room 5B	Room 2
<p><b>08.30 - 10.15</b></p> <p><b>Session SC1.S5: FIELD DEPLOYMENT, CHARACTERIZATION AND PERFORMANCE MONITORING</b></p> <p><b>Session Chair:</b> Yikai Su, <i>Shanghai Jiao Tong University, Shanghai, China</i></p>	<p><b>08.30 - 10.15</b></p> <p><b>Session SC2.S5: LASERS AND VCSELS</b></p> <p><b>Session Chair:</b> Wei-Ping Huang, <i>McMaster University, Hamilton, ON, Canada</i></p>	<p><b>08.30 - 10.15</b></p> <p><b>Session SC3.S5: BIOPHOTONICS AND BIOIMAGING III</b></p> <p><b>Session Chair:</b> Da Xing, <i>South China Normal University, Guangzhou, China</i></p>	<p><b>08.30 - 10.15</b></p> <p><b>Session SC4.S.: LIGHTING TECHNOLOGY I</b></p> <p><b>Session Chair:</b> Wallace C. Choy, <i>University of Hong Kong, Hong Kong</i></p>	<p><b>09.00 - 10.00</b></p> <p><b>Session SC2.T2: TUTORIAL ON PLANAR LIGHTWAVE CIRCUITS</b></p> <p><b>Session Chair:</b></p>
<p><b>SC1.S5.1 08.30 - 09.00 (Invited)</b></p> <p><b>On-Line Optical System Performance Monitoring using Coherent Detection,</b> R. Hui, <i>University of Kansas, Lawrence, KS, USA</i></p> <p>Techniques of optical system performance monitoring using coherent detection will be discussed. Especially, recent field test of fiber PMD performances in traffic-carrying optical systems will be presented.</p>	<p><b>SC2.S5.1 08.30 - 09.00 (Invited)</b></p> <p><b>VCSEL Photonics - Athermalization and Slowing-Down,</b> F. Koyama, <i>Tokyo Institute of Technology, Yokohama, Kanagawa, Japan</i></p> <p>Our recent research activities on VCSEL photonics will be reviewed. This talk explores the potential and challenges for new functions of VCSELS, including the athermalization with MEMS technology and slowing light for ultra-compact photonic devices.</p>	<p><b>SC3.S5.1 08.30 - 09.00 (Invited)</b></p> <p><b>Investigating the Cortical Hemodynamics with High Spatiotemporal Resolution by Optical Imaging Techniques,</b> P. Li and Q. Luo, <i>Huazhong University of Science and Technology, Wuhan, China</i></p> <p>Optical techniques have been shown to be powerful tools for investigating cortical functional architecture and dynamics with high spatio-temporal resolution in normal and disease brain. In this paper, the technical background and present applications of two optical imaging techniques, intrinsic optical signal imaging and laser speckle imaging are summarized.</p>	<p><b>SC4.S7.1 08.30 - 09.30 (Tutorial)</b></p> <p><b>Advances of Lighting Technologies - From Light Bulbs to Solid State Light Sources,</b> Y. S. Liu, <i>National Tsing Hua University, Hsinchu, Taiwan, R.O.C.</i></p> <p>Major breakthroughs that took place chronically in the light source development are: the invention of incandescence light bulbs, the invention of lasers, particularly semiconductor lasers, and the high-brightness blue/white LED. Two of these represent the major advances in the lighting technologies. It is further shown that what we called "nanoscience and technology," today had played a critical role in commercialization of these great inventions.</p>	
<p><b>SC1.S5.2 09.00 - 09.15</b></p> <p><b>Waveguide Structure Evaluation based on a Photon-Counting OTDR,</b> T. Aiba, <i>Yazaki Research and Technology Center, Yokosuka, Kanagawa, Japan</i></p> <p>Utility of a photon-counting OTDR for evaluating waveguide parameters along a sequentially-spliced single-mode fiber is confirmed quantitatively. Mode-field diameter and relative-index difference evaluated by the OTDR at 835 nm are in good agreement with those obtained by the reference test methods.</p>	<p><b>SC2.S5.2 09.00 - 09.30 (Invited)</b></p> <p><b>Threshold Analysis of a Novel Dispersive Grating Distributed Feedback Laser Diode,</b> X. Li, Y. Xi and W.-P. Huang, <i>McMaster University, Hamilton, ON, Canada</i></p> <p>This work proposed a novel distributed feedback (DFB) laser design with a dispersive grating having its coupling strength dependence on the operating wavelength detuning from the Bragg wavelength. This structure guarantees single mode operation as there is an inherent threshold gain discrimination on the two otherwise degenerated modes.</p>	<p><b>SC3.S5.2 09.00 - 09.30 (Invited)</b></p> <p><b>Photonics and Immobilisation of Biomolecules,</b> M. Duroux, E. Skovsen, T. Neves-Petersen, L. Duroux and S. B. Petersen, <i>Aalborg University, Aalborg, Denmark</i></p> <p>A new photonic technology is demonstrated that allows for precise immobilisation of proteins in any wanted pattern onto activated surfaces. Molecular immobilisation is limited to the <math>\mu\text{m}</math> sized focal point of the focused UV beam.</p>		<p><b>SC2.T2.1 09.00 - 10.00 (Tutorial)</b></p> <p><b>Planar Lightwave Circuits for FTTH and Photonic Networks,</b> K. Okamoto, <i>University of California - Davis, Davis, CA, USA</i></p> <p>Integrated-optic waveguide devices become more and more complicated to realize high functionality. Optical functional devices are important to solve electrical bottleneck issues. Ultra-compact and CMOS compatible silicon waveguides are important for the integration of an optical component and an electronic circuit aiming at higher level of functionalities. This paper reviews the recent progress and future prospects of PLC devices and their applications to FTTH and photonic networks.</p>

Room 4A	Room 4C	Room 5A	Room 5B	Room 2
<p><b>SC1.S5.3 09.15 - 09.30</b>  <b>Measurements of Multimode Fiber PON Bandwidth</b>, L. Maksymiuk, G. Stepniak and J. Siuzdak, <i>Warsaw University of Technology, Warsaw, Poland</i></p> <p>Employment of MM PON appears to be natural for short-range application such as intra-office or home networks. We have presented the results of the measurements of MM fiber PONs frequency responses in various configurations. We have shown that bandwidth at different nodes of the MM PON may be different.</p>				
<p><b>SC1.S5.4 09.30 - 09.45</b>  <b>Novel Technique for Measuring Raman Gain Efficiency Distribution by Conventional OTDR</b>, M. Ohashi, <i>Osaka Prefecture University, Sakai, Osaka, Japan</i></p> <p>A novel technique is proposed for measuring Raman gain efficiency distribution in optical fibers by using a conventional OTDR. Raman gain efficiency distributions for a single-mode fiber and a fiber link have been successfully estimated.</p>	<p><b>SC2.S5.3 09.30 - 09.45</b>  <b>40 GHz Self-Pulsation in Two-Section DFB Lasers with Varied Ridge Width</b>, D. Chen, <i>Chinese Academy of Sciences, Beijing, China</i></p> <p>1.55-<math>\mu\text{m}</math> InGaAsP-InP two-section DFB lasers with varied ridge width have been fabricated. Self-pulsations with frequencies around 40GHz are observed. The related mechanism and the tunability of generated self-pulsations is studied.</p>	<p><b>SC3.S5.3 09.30 - 09.45</b>  <b>Methane Concentration Monitoring System based on a Pair of FBGs</b>, B. Zhou and Z. Guan, <i>Zhejiang University, Hangzhou, China</i></p> <p>In this paper, we propose a simple fiber-optic sensing system to measure the concentration of the methane based on a special catalyst and fiber Bragg gratings (FBGs). The temperature around the catalyst rises rapidly as the concentration of methane increases, and hence can be detected by an FBG-type sensor through monitoring the wavelength shift of the reflection spectrum. By employing a well-matched FBG as a reference, the wavelength shift of the sensing FBG can be transformed effectively into the variation in the measured optical intensity. An experiment is demonstrated to show the good performances of our system, such as the high resolution and good stability to the environmental temperature.</p>	<p><b>SC4.S7.2 09.30 - 10.00 (Invited)</b>  <b>Organic Light-Emitting Devices for Solid State Lighting</b>, J. Liu and A. R. Duggal, <i>General Electric Company, Niskayuna, NY, USA</i></p> <p>We present recent progress in developing efficient organic light-emitting devices and novel low-cost device fabrication for solid-state lighting applications.</p>	
<p><b>SC1.S5.5 09.45 - 10.00</b>  <b>EPON Deployment Challenges - Now and in the Future</b>, B. McDonald, <i>Centillum Communications, Fremont, CA, USA</i></p> <p>As several Asian telcos role out EPON en masse, they are grappling with a</p>	<p><b>SC2.S5.4 09.45 - 10.00</b>  <b>Emission Characteristics of a Surface-Emitting Organic Photonic Crystal Laser</b>, S. S. Yang, L.-W. Chang and C.-J. Huang, <i>National Tsing Hua University, Hsinchu, Taiwan, R.O.C.</i></p>	<p><b>SC3.S5.4 09.45 - 10.15 (Invited)</b>  <b>Emerging Fiber-Optic Micro-Endoscopy Technologies for High-Resolution Biomedical Imaging</b>, X. Li, <i>University of Washington, Seattle, WA, USA</i></p> <p>We present recent advances of micro-</p>		

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number of challenges that affect present and future deployments. This paper identifies and examines these challenges.	Lasing action of a composite organic thin-film laser with a 2nd-order two-dimensional photonic crystal structure of triangular lattice is investigated. The analysis of band theory is also adopted to confirm the lasing mode.	endoscopy technologies that are critical for clinical translation of high-resolution optical imaging modalities (such as OCT, SHG and two-photon fluorescence microscopy). Remaining challenges will also be discussed.		
<p><b>SC1.S5.6 10.00 - 10.15</b></p> <p><b>Fault Location for Fiber Links in PON by Means of FSF Fiber Laser and FBGs</b>, N. Zou and Y. Namihira, <i>University of the Ryukyus, Okinawa, Japan</i></p> <p>A novel fault location method for fiber links in PON is proposed based on heterodyne detection. Experiments were demonstrated by using a self-developed wavelength tunable FSF fiber laser and FBGs with different reflective wavelengths.</p>	<p><b>SC2.S5.5 10.00 - 10.15</b></p> <p><b>Uncooled Submarine Pump Laser Module at 980 nm</b>, J. Shen, <i>Bookham Technologies, Shenzhen, China</i></p> <p>We present a new generation 980 nm submarine pump module that consists of a hermitically sealed 8-pin ceramic MiniDIL package without thermo-electric cooler.</p>		<p><b>SC4.S7.3 10.00 - 10.15</b></p> <p><b>In-situ Fabrication of Highly-Fluorescent Nanohybrids Based on Carbon Nanotubes and Gold Nanoparticles</b>, R. Zhou, M. Wang and H.-Z. Chen, <i>Zhejiang University, Hangzhou, China</i></p> <p>Highly-fluorescent and water-soluble nanohybrids based on carbon nanotubes with high-density and well-distributed Au nanoparticles were obtained assisted by organic optoelectronic-active molecules as an interlinker via a facile in-situ fabrication method, and were confirmed by TEM, SEM, EDX, UV-Vis measurements. The nanohybrids exhibited strong visible luminescence under UV lamp irradiation.</p>	
<b>10.15 – 10.30 TEA BREAK</b>				
<p><b>10.30 - 12.30</b></p> <p><b>Session SC1.S6: SUBSYSTEMS AND SYSTEM TECHNOLOGIES</b></p> <p><b>Session Chair:</b> Xu Wang, <i>Heriot-Watt University, Edinburgh, Scotland, UK</i></p>	<p><b>10.30 - 12.15</b></p> <p><b>Session SC2.S6: PLANAR WAVEGUIDE DEVICES</b></p> <p><b>Session Chair:</b> Katsunari Okamoto, <i>University of California - Davis, Davis, CA, USA</i></p>	<p><b>10.30 - 12.15</b></p> <p><b>Session SC3.S6: OPTICAL SENSORS III</b></p> <p><b>Session Chair:</b> Libo Yuan, <i>Harbin Engineering University, Harbin, China</i></p>	<p><b>10.30 - 12.15</b></p> <p><b>Session SC4.S8: LIGHTING TECHNOLOGY II</b></p> <p><b>Session Chair:</b> Jie Liu, <i>General Electric Company, Niskayuna, NY, USA</i></p>	<p><b>10.30 - 11.30</b></p> <p><b>Session SC1.T2: TUTORIAL ON HIGH POWER FIBER LASERS</b></p> <p><b>Session Chair:</b> P.-K. Alexander Wai, <i>Hong Kong Polytechnic University, Kowloon, Hong Kong</i></p>
<p><b>SC1.S6.1 10.30 - 11.00 (Invited)</b></p> <p><b>Convergence of RoF and Access Systems Employing Dual-Parallel Modulator in the Central Station</b>, Y. Su and Q. Chang, <i>Shanghai Jiao Tong University, Shanghai, China</i></p> <p>We propose and demonstrate simultaneous delivery of wireless and baseband signals in a passive optical network architecture. The downstream baseband data and RF signals are generated based on a single-integrated dual-parallel modulator.</p>	<p><b>SC2.S6.1 10.30 - 11.00 (Invited)</b></p> <p><b>Microring Resonator Devices</b>, Y. Kokubun, <i>Yokohama National University, Yokohama, Kanagawa, Japan</i></p> <p>In this review, the fundamental characteristics of microring resonator filters using high index contrast (HIC) optical waveguides are introduced, and the recent progress in the hitless wavelength selective switch achieved by the author's group is mainly described.</p>	<p><b>SC3.S6.1 10.30 - 11.00 (Invited)</b></p> <p><b>Paired Surface Plasma Waves Biosensor</b>, C. Chou, H.-T. Wu, <i>National Yang-Ming University, Taipei, Taiwan, R.O.C.</i> and Y.-C. Li, <i>National Central University, Zhongli City, Taoyuan, Taiwan, R.O.C.</i></p> <p>To integrated paired surface plasma waves biosensor with heterodyne technique to construct a paired SPW biosensor in order to enhance the detection sensitivity is developed. It demonstrates <math>\Delta n_{eff}=10^{-10}</math> RIU of</p>	<p><b>SC4.S8.1 10.30 - 11.00 (Invited)</b></p> <p><b>Phosphor-Free White-Light Light-Emitting Diodes based on InGaN/GaN Quantum Wells</b>, C.-F. Huang, C.-F. Lu, D.-M. Yeh, Y.-S. Chen, W.-Y. Shiao and C. C. Yang, <i>National Taiwan University, Taipei, Taiwan, R.O.C.</i></p> <p>Two approaches for fabricating white-light light-emitting diodes are discussed, including the stacking of various InGaN/GaN quantum wells for mixing into white light and the use of II-</p>	<p><b>SC1.T2.1 10.30 - 11.30 (Tutorial)</b></p> <p><b>High Power Fiber Sources: More than Kilowatts</b>, J. Nilsson, <i>University of Southampton, Southampton, UK</i></p> <p>Fiber lasers and amplifiers have reached several kilowatts of output power, and offer many attractions beyond raw power. This tutorial discusses basic scientific and practical issues of fiber sources, and advantages and limitations that derive from them.</p>

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		detection sensitivity between mouse IgG/rabbit anti-mouse IgG interaction in real time.	VI nano-crystals for converting short-wavelength photons into long-wavelength light.	
<p><b>SC1.S6.2 11.00 - 11.30 (Invited)</b>  <b>160 Gbit/s/port Colored Optical Packet Switching System</b>, N. Wada, <i>National Institute of Information and Communications Technology, Koganei, Tokyo, Japan</i></p> <p>A prototype 160Gbit/s/port colored optical packet switch with all-optical multiple label-processor and high-speed optical-switch is experimentally demonstrated. As related technologies, arrayed burst-mode Tx./Rx., 10GbE/optical-packet converter, and a novel transient response suppressed EDFA are also developed.</p>	<p><b>SC2.S6.2 11.00 - 11.30 (Invited)</b>  <b>Athermal AWG Multiplexer/Demultiplexer for E/C-Band WDM-PON Application</b>, T. H. Kim, B. G. You, H. J. Lee and T. H. Rhee, <i>POINTek Inc., Pyeongtaek, Gyeonggi-Do, Korea</i></p> <p>Athermal AWG multiplexer/demultiplexer prepared for E/C-band WDM-PON application, by a novel and practical pseudo-passive alignment packaging method, demonstrates <math>\pm 30</math>pm center wavelength shifts at ITU grids over the widest operating temperature range of <math>-40^{\circ}\text{C}\sim +80^{\circ}\text{C}</math>.</p>	<p><b>SC3.S6.2 11.00 - 11.30 (Invited)</b>  <b>Novel Devices based on Micro-Fiber Components for Sensors and Communications</b>, H. Liu, <i>Peking University, Beijing, China</i></p> <p>ABSTRACT NOT AVAILABLE</p>	<p><b>SC4.S8.2 11.00 - 11.30 (Invited)</b>  <b>Comprehensive Investigation of Light Emission of OLEDs: From Absolute Optical Properties to the Purcell Effect</b>, W. C. H. Choy, <i>University of Hong Kong, Hong Kong</i>, X. Chen, <i>Zhejiang University, Hangzhou, China</i>, H. H. Fong, <i>Cornell University, Ithaca, NY, USA</i> and S. He, <i>Zhejiang University, Hangzhou, China</i></p> <p>The dispersively absolute absorption coefficient and refractive index as well as the Purcell effect have been theoretically and experimentally studied for optimizing the light emission properties of organic light emitting devices.</p>	
<p><b>SC1.S6.3 11.30 - 11.45</b>  <b>Modified Duobinary Signals with Tunable Duty Cycle and Its Application in a Label Switching Optical Network</b>, Y. Shao, S. Wen, L. Chen, H. Xu and J. He, <i>Hunan University, Changsha, Hunan, China</i></p> <p>A novel configuration to use modified duobinary signals with tunable duty cycle as optical labels in optical packet switching system is proposed. The performance of 10Gbit/s DPSK payload with 2.5Gbit/s MD-RZ label is analysed.</p>	<p><b>SC2.S6.3 11.30 - 11.45</b>  <b>Experimental Demonstration of Cross-Order Arrayed Waveguide Grating Triplexer</b>, T. Lang, L. Yang, J. Hu, Z. Wang, Z. Sheng, J.-J. He, and S. He, <i>Zhejiang University, Hangzhou, China</i></p> <p>Experimental results on a cross-order arrayed waveguide grating triplexer for fiber-to-the-home applications are presented. The cross-order design allowed us to fabricate compact devices of a size of only 19mmx1.6mm. The measured spectra confirmed the operation principle of the device.</p>	<p><b>SC3.S6.3 11.30 - 12.00 (Invited)</b>  <b>Temperature-Insensitive Pressure Sensor Using a Polarization-Maintaining Photonic Crystal Fiber based Sagnac Interferometer</b>, H.-Y. Tam, <i>Hong Kong Polytechnic University, Kowloon, Hong Kong</i>, S. K. Khijwania, <i>Indian Institute of Technology, Guwahati, India</i> and X. Y. Dong, <i>Hong Kong Polytechnic University, Kowloon, Hong Kong</i></p> <p>A novel, highly sensitivity, fiber-optic pressure sensor with polarization-maintaining photonic crystal fiber (PM-PCF) based Sagnac interferometer is proposed and experimentally demonstrated. A wavelength-pressure sensitivity <math>\sim 3.75</math> nm/MPa is achieved with a 79.6-cm PM-PCF as the sensing element. Owing to the birefringence insensitivity for the PM-PCF, the sensor is inherently temperature insensitivity.</p>	<p><b>SC4.S8.3 11.30 - 11.45</b>  <b>Mutual Thermal Effects of Light-Emitting Diode with Wafer-Level Packages</b>, J.-W. Choi, J. M. Kang, J.-W. Kim, J.-H. Choi, D.-H. Kim, G.-H. Kim and J.-S. Lee, <i>LG Electronics Institute of Technology, Seoul, Korea</i></p> <p>Wafer-level packaged LEDs are useful for the high power applications due to the compactness and integrated fabrication process with Si-MEMS technology. In this paper, thermal characteristics of wafer-level packaged LEDs with multi-chips are investigated including mutual thermal effects due to the adjacent chips using both serial and parallel measurements methods.</p>	

Room 4A	Room 4C	Room 5A	Room 5B	Room 2
<p><b>SC1.S6.4 11.45 - 12.00</b>  <b>Dual Band Optical Receiver for Video Broadcasting Services over Fiber – to – the - Home Network,</b>                      Y. C. Kim, <i>Kyungpook National University, Daegu, Korea</i></p> <p>We demonstrate a novel optical video receiver to provide dual band broadcasting services, CATV and SATV, by using a single photo-diode. The spectral flatness of the receiver was within <math>\pm 1.5</math> dB over both VHF/UHF and L-bands with more than 36 dB band isolation.</p>	<p><b>SC2.S6.4 11.45 - 12.00</b>  <b>Lateral Leakage in Symmetric SOI Rib-Type Slot Waveguides,</b>                      R. Hainberger, P. Müllner and N. Finger, <i>Austrian Research Centers GmbH - ARC, Vienna, Austria</i></p> <p>We theoretically investigate the lateral leakage of rib-type SOI slot waveguides caused by coupling between the TM-like slot mode and a TE slab mode using a finite element method eigenmode analysis and the variational mode-matching method.</p>		<p><b>SC4.S8.4 11.45 - 12.00</b>  <b>Enhance the Extraction Efficiency of ZnS:Mn TFEL by Photonic Crystals Structure,</b>                      Y. Jiang, J. Li, X. Li and W. Xue, <i>Beijing Institute of Technology, Beijing, China</i></p> <p>A photonic crystals(PC) structure is introduced in the Thin-film electroluminescence (TFEL) device to enhance the light extraction efficiency. FDTD method was used to simulate and get the optimized photonic crystals structure parameters.</p>	
<p><b>SC1.S6.5 12.00 - 12.15</b>  <b>Novel Distributed All-optical Multicast WDM Fiber Network: Design and Implementation,</b>                      D. Lu, X. Qin, F. Zhang, B. Lv, M. Chen and S. Jian, <i>Beijing Jiaotong University, Beijing, China</i></p> <p>A novel distributed all-optical multicast WDM fiber network based on a modified all-fiber multicast-capable OXC has been proposed and established. Configurable all-optical multicast including video and 10Gb/s data are experimentally demonstrated.</p>	<p><b>SC2.S6.5 12.00 - 12.15</b>  <b>Analysis on Curved Waveguide Grating (CWG) with Rowland Circle Construction,</b>                      Y. Hao, J. Yang, X. Jiang, W. Zheng, J. Zhou, H. Zhou, and M. Wang, <i>Zhejiang University, Hangzhou, China</i></p> <p>Configuration of Curved Waveguide Grating (CWG) with Rowland circle construction is presented, working mechanism of CWG is demonstrated, result show that CWG is a promising candidate wavelength demultiplexer in optical DWDM network.</p>	<p><b>SC3.S6.4 12.00 - 12.15</b>  <b>Fiber Bragg gGating Interrogating System Employing an Arrayed Waveguide Grating,</b>                      Q. Zhou and T. Xu, <i>Ningbo University, Ningbo, China</i></p> <p>Two types of interrogating schemes based on an waveguide grating for fiber Bragg grating sensors are reviewed. A method of extending the wavelength measuring range is proposed. And Experiment results match well with the theory.</p>	<p><b>SC4.S8.5 12.00 - 12.15</b>  <b>A Facile Route to Synthesize Three-Dimensional CdS Nanocrystals,</b>                      F. Chen, R. Zhou, M. Wang and H.-Z. Chen, <i>Zhejiang University, Hangzhou, China</i></p> <p>We report for the first time to large-scale synthesize an interesting 3D structured CdS nanocrystals by a facile hydrothermal method. The photoluminescence results of the 3D CdS nanocrystal indicated they have the potential applications for the building blocks on optoelectronic devices.</p>	
<p><b>SC1.S6.6 12.15 - 12.30</b>  <b>Burst Mode Receiver Based on SOA,</b>                      X. Hong, <i>Beijing University of Posts &amp; Telecommunications, Beijing, China</i>,                      W.-P. Huang, <i>McMaster University, Hamilton, ON, Canada</i> and J. Wu, <i>Beijing University of Posts &amp; Telecommunications, Beijing, China</i></p> <p>In this paper, we propose a burst mode receiver model based on Semiconductor Optical Amplifier (SOA) and PIN photodiode, which operates as both a nonlinear amplifier when receiving a high power packet and a linear amplifier in small signal case. Experimental results show that a 21dB input dynamic range is reduced to 11dB power variation with proper SOA parameters and the signal quality is</p>				

Room 4A	Room 4C	Room 5A	Room 5B	Room 2
<p>excellent in higher power operation. This is also a promise design in optical packet switching (OPS) and optical burst switching, where higher bit rate burst mode receiver is required. With this model, the high sensitivity demand to use Avalanche Photodiode (APD) is also substituted by PIN.</p>				
<p><b>12.15 – 13.00 LUNCH BREAK</b></p>				

**Central Area of Exhibition Hall**

13.00 - 14.30

**Session P: POSTER SESSION**

- P1 Dispersion Controlled in a Birefringent Modified Octagon Photonic Crystal Fiber for Optical Communication Applications**, S. F. Kaijage, Y. Namihira, N. H. Hai, F. Begum, S. M. Abdur Razzak, T. Kinjo, and N. Zou, *University of the Ryukyus, Okinawa, Japan*  
We report a dispersion controlling technique with a modified octagon photonic crystal fiber. The low flattened dispersion feature, as well as low leakage loss and high birefringence are the main advantages of the proposed PCF.
- P2 Full-vector Effective Index Method for Modeling Endlessly Single-mode and Large Mode Area of Photonic Crystal Fiber**, L. Wang, S. Lou, W. Chen and H. Fang, *Beijing Jiaotong University, Beijing, China*  
Full-vector effective index method for modeling photonic crystal fiber is developed and the influence of structure parameters such as hole size, pitch and number removed in the center on endlessly single-mode and large mode area are discussed in the detail.
- P3 High Negative Dispersion and Low Confinement Loss Photonic Crystal Fiber**, L. Yao, S. Lou, H. Fang, T. Guo, H. Li and S. Jian, *Beijing Jiaotong University, Beijing, China*  
A novel design of high negative dispersion and low confinement loss photonic crystal fiber (PCF) was proposed. The PCF designed has a high dispersion of -1120 ps/nm/km and a very low confinement loss of  $1.01 \times 10^{-6}$  dB/km at 1.55 $\mu$ m.
- P4 Adiabatic Compression of Quadratic Solitons and Frequency Shift by Using Cascading Nonlinearities**, X. Zeng, *Shanghai University, Shanghai, China*  
We investigate that the equivalent Kerr self-phase-modulation (SPM) and cross-phase-modulation (XPM) effects introduced in cascaded second-order processes is dependent on the phase mismatch and group velocity mismatch. Adiabatic compression of quadratic solitons and frequency shift is reported.
- P5 New Microwave Up-Conversion Solution Using an Optical Phase Modulator in Radio-over-Fiber Networks**, H. Ou, H. Fu, and B. Chen, *Zhejiang University, Hangzhou, China*  
An approach for frequency up-conversion in Radio-over-Fiber system is demonstrated by simulation. The technique employs a phase modulator and an FBG. Error-free data transmission was demonstrated for downlink with frequency conversion from 3GHz to 53GHz.
- P6 Photonic Frequency Down-Conversion for Millimeter-Wave-Band Radio-over-Fiber Systems by Directly Modulating a Dual-Wavelength Fiber Laser**, S. Gao, Y. Gao, H. Fu, D. Chen, and S. He, *Zhejiang University, Hangzhou, China*  
A novel photonic frequency down-conversion scheme is proposed and demonstrated through directly modulating a dual-wavelength single-longitudinal-mode fiber laser. A 10.6 GHz microwave is down-converted to 1 GHz and a >7 dB signal-to-noise ratio is obtained.
- P7 Analysis of Dispersion Properties in Highly Nonlinear Photonic Crystal Fibers**, H. Li, S. Lou, H. Fang, L. Yao and S. Jian, *Beijing Jiaotong University, Beijing, China*  
A fully vectorial effective index method and multiple-cladding method (FVEIM&MCM) is developed for modeling photonic crystal fibers. The large negative and nearly zero flattened dispersion in highly nonlinear photonic crystal fibers are analyzed numerically.
- P8 Micro-Structured Photonic Crystal Fibers with Large Mode Area and High Negative Dispersion**, N. H. Hai, Y. Namihira and S. F. Kaijage, *University of the Ryukyus, Okinawa, Japan*  
We propose a novel PCF with Ge-rods at the center core. The authors designed a single mode PCF with large  $A_{eff} > 200 \mu\text{m}^2$  over the wavelength above 1.2  $\mu\text{m}$  and exhibits high negative dispersions (-186 to -158 [ps/nm-km]).
- P9 A C+L-band Erbium-doped Fiber ASE Source using Dual-Forward Pumping Configuration**, W. Huang, C. Huang, X. Wang, B. Zheng, H. Xu, and Z. Cai, *University of Xiamen, Xiamen, China*  
We present a C+L-band ASE fiber source using double-pass dual-forward pumping configuration. The proposed ASE source offers a high pumping efficiency of 24.6%, output power of 52mW and a wide bandwidth of about 80nm.
- P10 Enhancement of Multi-wavelength Brillouin-Erbium Fibre Laser Utilizing Fibre Bragg Grating Filter**, M. N. Mohd Nasir, M. H. Al-Mansoori, H. A. Abdul Rashid, P. K. Choudhury and Z. Yusoff, *Multimedia University, Cyberjaya, Selangor, Malaysia*  
We demonstrate an efficient multi-wavelength Brillouin-erbium fibre laser incorporating an FBG filter. The self-lasing effect is reduced and subsequently the number of output channels increased. Furthermore, the stability of output channels is also improved.
- P11 A Novel Millimeter-Wave Generation Technique for mm-ROF System Based on Harmonic Generation Principle**, M. Zhu and J. Ye, *Shanghai University, Shanghai, China*  
A novel millimeter-wave generation technique for mm-ROF system is proposed in this paper. The phase modulated lightwave by 5-GHz microwave signal and the unmodulated one are combined together and photodetected to generate electrical signal containing the desired 40 GHz millimeter-wave signal. Also, data transmission on downlink system is demonstrated.
- P12 Fiber Ring Based Microwave Photonic Filters Implemented in a Radio-over-Fiber Link**, K. Zhu, H. Fu and Y. Xiao, *Zhejiang University, Hangzhou, China*  
A microwave photonic filter based on fiber ring implemented in a Radio-over-Fiber link with two carrier frequencies is demonstrated. System performance under the situation of different filter parameters and different frequency spacing is analyzed.
- P13 Study on Optical Digital Phase Modulation Applied to Millimeter-Wave Radio-over-Fibre System**, M. Zhu, *Shanghai University, Shanghai, China*  
This paper presents a novel millimeter-wave radio-over-fiber system based on harmonic generation technique employing optical PSK modulation. 60GHz BPSK millimeter-wave signal is generated at basestation by 6GHz sinusoidal signal scan at central station. And triangular periodic signal is used to implement multiphase PSK.

**P14 A Simplified Model of Multi-Wavelength Fibre Lasers based on Hybrid Fibre Raman and Erbium Fibre Amplifications**, S. Qin and D. Chen, *Zhejiang University, Hangzhou, Zhejiang, China*

A simplified model is established to explain the principle of stable multi-wavelength fibre laser based on hybrid fibre Raman and Erbium-doped fibre amplifications, the simulation results agree with the experimental results very well and show that FRA is effective to make an MW-EDFL stable at room temperature.

**P15 Lagrange Multiplier Optimization Synthesis of Long-Period Fiber Gratings**, C.-L. Lee, *National United University, Miaoli, Taiwan, R.O.C.*

A Lagrange multiplier optimization method to the inverse design problems for complex LPGs was developed in the present study. For the first time, an EDFA gain flattening LPG is successfully synthesized by the proposed algorithm.

**P16 Feasibility Study of a Simple 100Gb/s Transmitter with Low-Speed Electronics and 0.8bit/s/Hz Spectral Efficiency**, J. Gao, X. Xu and Y. Su, *Shanghai Jiao Tong University, Shanghai, China*

We propose a simple 100Gb/s transmitter using multi-wavelength generation scheme and DQPSK modulation format. Only devices of lower speed are needed to reduce the system cost.

**P17 Controlling Chaos in an Erbium-doped Fiber Dual-Ring Laser via Modulating Its Loss and Phase**, S. L. Yan, *Nanjing Xiaozhuang College, Nanjing, Jiangsu, China*

Chaos-control of an erbium-doped fiber dual-ring laser is studied. When optical attenuators and a phase modulator are used to modulate the loss and the phase shift of the laser, the chaotic laser can be suppressed in a stable state, a single-period, a dual-period and multi-periods, respectively.

**P18 A Shared Sub-Path Protection Strategy in Multi-Domain Optical Networks**, X. Xie, *Shanghai Jiao Tong University, Shanghai, China*

We propose a shared sub-path protection mechanism for multi-domain optical networks. It divides the working path into sub-paths which spans two domains. For each sub-path, intra-domain and inter-domain backup sub-paths are found to protect failures. Simulation results show it has a short switching time and acceptable network resources utilization ratio.

**P19 Novel Multi-Channel Temporal Phase En/Decoder used in OCDMA**, Y.-X. Zhu, *PLA University of Science and Technology, Nanjing, China*

A novel SSFBG based multi-channel OCDMA en-decoder is proposed. By sinc sampling the FBG, uniformity and good performance of each channel are obtained. Simulation shows that it is very suitable to an OCDMA over WDM PON.

**P20 Untraditional All-Optical Chromatic Dispersion Compensating Elements - Experimental Verification**, J. Vojtech, M. Karasek and J. Radil, *CESNET a.l.e., Prague, Czech Republic*

This contribution deals with experimental investigation of usability of untraditional all-optical chromatic dispersion elements. Results are compared with traditional dispersion compensating fibres; emphasis was also given to tuneability and broadband characteristics of elements.

**P21 Simultaneously Realizing Optical Millimeter-Wave Generation and Photonic Frequency Down-Conversion Employing Optical Phase Modulator and Sidebands Separation Technique**, H. Wen, L. Chen, J. He and S. Wen, *Hunan University, Changsha, Hunan, China*

We proposed a novel scheme to generate millimeter-wave and realize photonic frequency down-conversion for uplink connection. One sideband of double-sideband signals created by phase modulator beats with carrier to generate millimeter-wave, while another sideband along with carrier is injected into the second phase modulator to implement photonic frequency down-conversion.

**P22 Analysis of Photonic Band-Gaps of a Novel PBGF Structure**, Y. Xiao, *Shanghai University, Shanghai, China*

A novel PBGF structure of hexagonal symmetry is presented. Numerical investigation shows that the optimized air-guiding PBG is almost as large as that of triangular structure, while the range of normalized frequency allowing air-guiding is much wider.

**P23 Application of Lambert W function to Raman fiber laser**, C. Huang, W. Huang, *Xiamen University, Xiamen, China*, X. Wang, *Jimei University, Xiamen, China*, H. Xu, and Z. Cai, *University of Xiamen, Xiamen, China*

With the assistance of Lambert W function, we derive an explicit expression for output power of Raman fiber laser without using the depleted-pump approximation. Moreover, the optimal fiber length and FBG reflectivity are obtained analytically.

**P24 A New Technique for Side Pumping of Double-Clad Fiber Lasers**, D. Wang, *Chinese Academy of Sciences, Beijing, China*

We report a new technique, called SAP, for side pumping of double-clad, rare-earth-doped fiber lasers using fiber-coupled pump sources. The highest coupling efficiency can even exceed 92% in theory with this structure.

**P25 Design of a Doubly Grooved Binary Metallic Diffraction Grating for Efficient Side-Pumping of High-Power Fiber Lasers**, F. Zhang, C. Wang, Z. Tong, G. Rui and N. Tigang, *Beijing Jiaotong University, Beijing, China*

A metallic binary grating with two grooves per period is applied to side-pump high-power fiber lasers for the first time. By combining a gradient algorithm and micro-genetic algorithm, the grating is optimized and the maximum coupling efficiencies of 94.77% and 77.27% for TM and TE polarization waves respectively are demonstrated.

**P26 Combined FEC/SOP Scrambling with Delay Line PMD Mitigation Scheme**, J. Ferreira, *Inmetro, Xerém, RJ, Brazil* and J. P. von der Weid, *Pontifical Catholic University of Rio De Janeiro, Rio de Janeiro, RJ, Brazil*

Based on simulations of the time evolution of PMD-related variables a PMD mitigation technique combining FEC and polarization scrambling with DGD control is presented. An improvement of 40% for the robustness to PMD was obtained.

**P27 Tailoring Confinement Losses of Photonic Crystal Fibers**, L. Yao, S. Lou, H. Fang, T. Guo, H. Li and S. Jian, *Beijing Jiaotong University, Beijing, China*

Confinement losses in photonic crystal fibers (PCFs) with different structure are discussed by a full vectorial finite element method. Based on numerical results, confinement losses in high birefringence PCFs and high negative dispersion PCFs are tailored.

**P28 Two-Stage Hermite-Gaussian Function Method with Perfectly Matched Layers for Analyzing Microstructured Optical Fibers**, X. Chen, S. He, *Zhejiang University, Hangzhou, China*, Z. Wang, *Beijing Jiaotong University, Beijing, China* and P.-K. A. Wai, *Hong Kong Polytechnic University, Kowloon, Hong Kong*

A Two-stage Hermite-Gaussian function expansion method incorporated with anisotropic perfectly matched layers (PMLs) is developed to efficiently calculate the complex propagation constant of a microstructured optical fiber (MOF).

**P29 Liquid Crystal Optical Modulator Based on In-Plane Switching**, Y. Sun and L. Jiang, *Hebei University of Technology, Tianjin, China*

The in-plane switching liquid crystal optical modulator is simulated. The critical frequency of the liquid crystal rotation depends on the strength of electric field, the rotational viscosity and the dielectric anisotropy of liquid crystal.

**P30 Analysis of the Scalability of the Video-Overlay System**, I. C. Choi, *Kyungpook National University, Daegu, Korea*

We have derived an analytic expression for the scalability of the video-overlay system in the FTTH network and shows that the scalability strongly depends on both the optical amplifier noise and the configuration of the distribution network.

**P31 An All-Optical Frequency Down-Converter Based on Four-Wave-Mixing in a Highly Nonlinear Fiber for Radio-over-Fiber Systems**, Y. Gao, S. Gao, H. Fu, D. Chen, and X. Miao, *Zhejiang University, Hangzhou, China*

An optical frequency down-converter based on four-wave mixing in highly nonlinear fibers is proposed and experimentally realized for radio-over-fiber systems. A down-converted 1.5 GHz intermediate-frequency signal is obtained from a received 11.1 GHz millimeter-wave signal.

**P32 Shape Influence on the Two-Dimensional Photonic Crystal Devices**, Y. Lu, *Chinese Academy of Sciences, Beijing, China*

The influence of the irregular shape of atom on the optical characteristics of photonic crystal devices was demonstrated. A multi-channel filter based on this theory was designed to demonstrate the shape tuning capability.

**P33 Tunable Artificial Birefringence in Woodpile Photonic Crystals**, M. Che, *Chinese Academy of Sciences, Beijing, China*

A large relative anisotropy can be realized in three-dimensional woodpile photonic crystals in the long-wavelength limit. We find that the anisotropy can be tuned. Transition from positive anisotropy to negative anisotropy can be widely achieved.

**P34 Wavelength Assignment Algorithm for Hybrid WDM/TDM Passive Optical Network**, S. Qiu, *Chongqing University of Posts & Telecommunications, Chongqing, China*

The guideline of wavelength assignment for hybrid WDM/TDM passive optical network is studied and a novel wavelength assignment algorithm is proposed. The numerical and simulations results demonstrate that this algorithm can improve the system's performance.

**P35 Effect of Source Parameters on Beam Self-collimation in 2D Photonic Crystal**, X. Li, W. Xue and Y. Jiang, *Beijing Institute of Technology, Beijing, China*

The influence of source parameters on self-collimated Gauss beam in two-dimensional photonic crystal is analyzed by Finite-difference time-domain method. The transmission fluctuation with source shift, the stable beam-expansion suppression with increased source width are observed and explained.

**P36 Improvement of Automatic Alignment Algorithm for Butterfly Laser Module Packaging**, H. Shen, *Harbin Institute of Technology, Shenzhen, China*

This paper introduces two kinds of strategy to improve the efficiency and stability of butterfly laser module packaging. One is the 3-D simplex optical fiber alignment algorithm; the other is named the crash preventing method.

**P37 Low Loss Performances of Long Range Surface Plasmon Polariton Waveguides with Buffer Layer Structures**, Y. Rao, *Tsinghua University, Beijing, China*

Long range surface plasmon strip waveguide with low refractive index dielectric buffer layers is proposed in this paper. Simulation results show that ultra low propagation loss can be obtained.

**P38 Measurement of Small Aspheric Surface Using Interferometric System for Spherical Surface Test**, N.-Y. Jang, *Changwon National University, Changwon, Kyungnam, Korea*

Using the aspheric analysis algorithm, a Fizeau-type phase shifting interferometer (FPSI)-based spherical surface testing system is developed for analyzing small aspheric surface. Measurement result of an aspheric surface is compared to the conventional aspheric testing system.

**P39 Design and Realization of Strip-loaded Waveguide Electro-Optic Modulators in Barium Titanate**, J. Tang, *Hunan No. 1 Normal College, Changsha, Hunan, China*, S. Yang, *Applied Materials, Inc., Sunnyvale, CA, USA* and A. Bhatranand, *King Mongkut's University of Technology Thonburi, Bangkok, Thailand*

The design and realization of Si<sub>3</sub>N<sub>4</sub> strip-loaded waveguide electro-optic modulators in barium titanate (BaTiO<sub>3</sub>) are demonstrated. Low half-wave voltage length product of 2.3 V-cm and low loss of 0.5 dB/cm are achieved at 1550 nanometer.

**P40 Evolution of Partially Coherent Solitons in Optical Lattices**, H. Zhuo, S. Wen and Y. Hu, *Hunan University, Changsha, Hunan, China*

We investigate the propagation of a partially coherent beam in optical lattice. The condition for formation of partially coherent solitons is obtained using mutually coherent function, and the influence of partial coherence on the evolution of light beam is identified.

**P41 A Proposal for Passive Optical Network Architecture (WDM-PON) Based on Array of Ring Resonators**, G. Rostami, R. Faraji-Dana and M. Shahabadi, *University of Tehran, Tehran, Iran*

In this paper, we propose a novel and manageable passive optical network (PON) based on array of ring resonators. The proposed structure includes a compact chip to operate as multiplexer, demultiplexer, add-drop multiplexer and remote node.

**P42 An Improved Selective Area Growth Method in Fabrication of Electroabsorption Modulated Laser**, H. Wang, H. Zhu, Y. Cheng, D. Chen, W. Zhang, L. Wang, Y. Zhang, Y. Sun and W. Wang, *Chinese Academy of Sciences, Beijing, China*

An improved selective area growth (SAG) method is proposed to better the fabrication and performance of the Electroabsorption modulated laser. The typical threshold current of the EML is 18mA, and the output power is 5.6mW at EAM facet.

**P43 Experiments and Simulations of Infrared Transmission by Transverse Electric Mode through Au Gratings on Silicon with Various Au Widths**, Y.-R. Chen, *National Taiwan University, Taipei, Taiwan, R.O.C.*

We have measured infrared (2.5~25 $\mu$ m) transmission by the transverse electric (TE) mode through Au gratings on silicon substrate with various Au widths. Simulation is used by surface impedance boundary condition (SIBC) method. Simulation results agree well with experiments and offer an evanescent-wave model.

**P44 All-Optical Switch in Alkoxysilane Dye Doped Waveguides based on m-line Spectroscopy Technique**, W. Dang, *Shanghai Jiao Tong University, Shanghai, China*

We use the m-line spectroscopy technique to characterize the guiding modes in alkoxysilane dye (ASD) doped polymethyl methacrylate film waveguide. All-optical switching phenomenon with response time of ps was observed with improved prism-waveguide coupling.

**P45 Experimental Demonstration of All Optical Wavelength Full Conversion based on Quadratic Cascading Effect in Periodically Poled MgO-doped Lithium Niobate**, J. Zhang, *Shanghai Jiao Tong University, Shanghai, China*

A broad pump wavelength band up to 27 nm has been obtained in a 20-mm long periodically poled MgO:LiNbO<sub>3</sub>. Arbitrary wavelength conversion of signal waves at communication band has been successfully demonstrated through nonlinear quadratic cascading process.

**P46 The Application of the Wavelet Transform to the Continuous Wave Terahertz imaging**, F. Yu, *Beijing Institute of Technology, Beijing, China*

The wavelet transform is used for restoration of the continuous wave THz images which have the appearance of sinusoidal waves covering the images with standing wave patterns for the THz imaging system.

**P47 A Novel and Simple Power Splitter Utilizing Two-Branched Equal-Frequency Contours of a Dielectric Periodic Structure**, Y. Zhang, Y. Jiang, W. Xue and S. He, *Beijing Institute of Technology, Beijing, China*

With a special design, the equal-frequency contours of a special one-dimensional dielectric periodic structure can have two branches indicating two different propagating directions. Based on this property a novel power splitter is designed.

**P48 Modelling and Numerical Analysis of Carrier Transport Effects on the Wavelength Chirp of SCH-QW Lasers**, F. Gity, M. N. Moghaddasi, *Islamic Azad University, Tehran, Iran*, and L. Ansari, *Amir-Kabir University of Technology, Tehran, Iran*

We drive a numerical model, based on physical principles, for a separate confinement heterostructure-quantum well (SCH-QW) laser. Effects of carrier transport on the transient responses and chirp characteristic is analyzed by means of finite-difference method.

**P49 The Iterative Ranked Phased-Array Method**, P. Pojanasomboon, *Assumption University, Bangkok, Thailand*

Based on the Ranked Phased-Array Method (RPAM), the proposed iterative technique can improve the performances of the designed device by normalizing the output intensities with equivalent signal-to-noise ratio characteristics.

**P50 A Rigorous Vectorial Gaussian Beam Modeling of Virtually-Imaged-Phased-Array**, A. A. Shishegar and A. Mokhtari, *Sharif University of Technology, Tehran, Iran*

The Virtually-Imaged-Phased-Array (VIPA) is a modified version of etalon used as a hyperfine spectral disperser. We have developed an analytical Gaussian beam tracing formulation which can model the VIPA output pattern and the effects of polarization changes.

**P51 Fabrication and Characterization of Deeply-Etched SiO<sub>2</sub> Waveguides**, Z. Sheng, L. Yang, D. Dai, T. Lang and Z. Wang, *Zhejiang University, Hangzhou, China*

Deeply-etched SiO<sub>2</sub> waveguide is fabricated and characterized. The fabrication process is easier than the conventional buried SiO<sub>2</sub> waveguide. The fabricated waveguide exhibits good performances, such as low propagation loss, broad band.

**P52 Transmissive Properties and Faraday Rotation of Tunable Photonic-Band-Gap System Containing Liquid Crystal**, P. Xu, *Suzhou University, Suzhou, Jiangsu, China*

The optical and magneto-optical properties of the defect mode in a periodic structure have been demonstrated using a liquid crystal as a defect layer. The results show that the defect mode in the photonic band gap is sensitive to the thickness scale and a significant enhancement of the Faraday rotation is observed.

**P53 Resonance-Induced Transmissions through Waveguides below Cut-Off Frequencies: An Effective-Medium Model for Waveguide**, H. Xu and L. Zhou, *Fudan University, Shanghai, China*

We demonstrated that while a hollow metallic waveguide can be viewed as an permittivity effective medium with for the transverse-electric (TE) polarized waves, it should be viewed as a different permeability effective medium with for the transverse-magnetic (TM) polarized waves.

**P54 Modeling and Optimization for Segmented Transmission-Line Electroabsorption Modulators with Asymmetrical Electrodes**, Y. Tang, Y. Yu and Y. Ye, *Zhejiang University, Hangzhou, China*

Normalized RF link gain is derived for a segmented transmission-line electroabsorption modulator. Genetic algorithm is used to optimize the electrode structures which are asymmetrical and non-periodic. Performance of the optimized EAM design is analyzed.

**P55 Study of Optical Phased-Array Technology based on PLZT Electro-Optic Ceramic**, Q. Ye, *Chinese Academy of Sciences, Shanghai, China*

Based on the optical characteristics of PLZT electro-optic ceramic, a novel optical phased-array beam deflector with the transverse electro-optic effect is proposed. The deflection characteristic and mechanism of the deflector is analyzed theoretically and experimentally.

**P56 Controlling Chaos in an Injection Multi-Quantum Well Laser via Modulating the Injection Light**, S. L. Yan, *Nanjing Xiaozhuang College, Nanjing, Jiangsu, China*

Chaos-control of an injection multi-quantum-well (MQW) laser is studied. A frequency modulator is used to modulate the frequency of an injection light, the chaotic laser can be suppressed in a stable state, a single-periodic state, a dual-periodic and multi-periodic states, respectively.

**P57 Analysis and Simulation of a Channel Add-Drop Filter Composed of Two Dimensional Photonic Crystal**, N. Nozhat and N. Granpayeh, *K.N.Toosi University of Technology, Tehran, Iran*

The properties of the resonant modes in the two dimensional photonic crystal cavities and channel add-drop filters are presented. Both square and triangular PC lattices have been analyzed. We have used an effective numerical method based on the finite-difference time-domain scheme for computing resonant modes. We have clarified coupling between the single point

**P58 Numerical Research on Quality Factor Q of 2D Photonic Crystal Microcavity with Modulation of Localized States**, Z. Wang, *University of Science and Technology Beijing, Beijing, Haidian, China*, L. Li, *Tsinghua University, Beijing, China*, D. Wang and W. Cao, *University of Science and Technology Beijing, Beijing, Haidian, China*

A theoretical model of a microcavity composed of a photonic crystal with five-point defects is proposed. The effect of the number of scatters on the quality factor Q and transmission T have been investigated. Modulation of localized states was introduced to increase the Q and T.

**P59 Ultra-Fast All-Optical Switch and its Nonlinear Dynamical Process**, Y. Liu, *Chinese Academy of Sciences, Beijing, China*

Nonlinear optical interaction in a nonlinear Kerr photonic crystal is considered theoretically. We find field enhancement at some wavelengths where the transmission ratio exceeds one. Then we explain some interesting phenomena on optical switching observed in our previous experiments.

**P60 New PON Add/Drop Multiplexer to Support Next-Generation PON**, S. H. Ibrahim, *Telekom Research & Development Malaysia SDN BHD, Serdang, Selangor, Malaysia* and A. B. Mohammad, *Universiti Teknologi Malaysia, Johor Bahru, Johor, Malaysia*

We propose a novel WDM-PON architecture which employs multiple new optical add/drop multiplexer which is made possible configuration for a next-generation PON. The architecture provides WDM traffic in both directions and its fully operating at 2.5 Gb/s for triple play services.

**P61 A Novel Method to Measure Brillouin Frequency Shift for Brillouin-based Sensing Application Incorporating a Dual-Wavelength Single-Longitudinal-Mode Fibre Laser**, Y. Wei, Y. Tang and D. Chen, *Zhejiang University, Hangzhou, China*

A method to measure Brillouin frequency shift incorporating a dual-wavelength single-longitudinal-mode fibre laser for sensing application is proposed. Brillouin frequency shift at 10.64 GHz has been shifted and measured at low frequency of 1.03 GHz.

**P62 Application of Half-Cycle Phase-Stepping Algorithm in Eliminating or Diminishing Errors of Phase Measurement**, F. Yu, *Beijing Institute of Technology, Beijing, China*

A half-cycle phase-stepping algorithm based on the character of trigonometric function is proposed for diminished the phase delay error and azimuth error of 1/4 plate and analyzer corner error in phase measurement.

**P63 The Annealing Process of R.F. Magnetron Sputtered ZnO:Al Films**, Z. Yu, J. Xu, W. Xue and J. Li, *Beijing Institute of Technology, Beijing, China*

The ZnO:Al films were annealed at different atmosphere. The films annealed in vacuum showed perfect properties, compared with in air and Ar atmosphere, and the low resistivity of the order of  $10^{-3}$   $\cdot$ cm was obtained in the condition of vacuum annealing at 220 $^{\circ}$ .

**P64 Uniform Color Space for Color Storage**, Y. Cheng, X. Liu and H. Li, *State Key Lab of Modern Optical Instrumentation, Hangzhou, Zhejiang, China*

The RGB color space has been widely used, but has limitations. A new presentation method is put forward. It uses floating-point to characterizing colors in L\*a\*b\* color space. Due to high precision of floating-point and uniform perception of L\*a\*b\* color space, it can present better color perception.

Room 4A	Room 4C	Room 5A	Room 5B	Room 2
<p><b>14.30 - 16.00</b></p> <p><b>Session SC1.S7: INTEGRATED DEVICES &amp; OPTICAL SWITCHING</b></p> <p><b>Session Chair:</b> P.-K. Alexander Wai, <i>Hong Kong Polytechnic University, Kowloon, Hong Kong</i></p>	<p><b>14.30 - 16.00</b></p> <p><b>Session SC2.S7: INTEGRATED TUNABLE DEVICES</b></p> <p><b>Session Chair:</b> Emil Koteles, <i>Lightip Technologies, Inc., Ottawa, ON, Canada</i></p>	<p><b>14.30 - 16.00</b></p> <p><b>Session SC3.S7: BIOIMAGING AND SENSORS</b></p> <p><b>Session Chair:</b> Qingming Luo, <i>Huazhong University of Science and Technology, Wuhan, China</i></p>	<p><b>14.30 - 16.00</b></p> <p><b>Session SC4.S9: ENERGY I</b></p> <p><b>Session Chair:</b> Mamoru Nango, <i>Nagoya Institute of Technology, Nagoya, Aichi, Japan</i></p>	<p><b>14.30 - 16.00</b></p> <p><b>Session SLW1: SLOW-LIGHT WORKSHOP I</b></p> <p><b>Session Chair:</b> Yikai Su, <i>Shanghai Jiao Tong University, Shanghai, China</i></p>
<p><b>SC1.S7.1 14.30 - 15.00 (Invited)</b></p> <p><b>Chalcogenide Glass Photonic Chips for All-Optical Signal Processing,</b> V. G. Ta'eed, M. R. E. Lamont, M. D. Pelusi, M. A. F. Roelens, <i>CUDOS, University of Sydney, Sydney, NSW, Australia</i>, D. J. Moss, <i>Institut National de la Recherche Scientifique, Varennes, QC, Canada</i>, S. Madden, D.-Y. Choi, B. Luther-Davies, <i>Australian National University, Canberra, ACT, Australia</i> and B. J. Eggleton, <i>CUDOS, University of Sydney, Sydney, NSW, Australia</i></p> <p>The large, ultra-fast Kerr nonlinearity and low nonlinear loss of chalcogenide glasses are attractive for chip based all-optical signal processing. We highlight successes including optical time demultiplexing at 160 Gb/s in As<sub>2</sub>S<sub>3</sub> planar waveguides.</p>	<p><b>SC2.S7.1 14.30 - 15.00 (Invited)</b></p> <p><b>Recent Progress in the Integration of MGY-based Tunable Lasers and Mach-Zehnder Modulators,</b> P.-J. Rigole, <i>Syntune AB, Kista, Sweden</i></p> <p>We review recent progress in the tuning and transmission performance of a hermetically-packaged Modulated-Grating Y-branch-based tunable laser that is monolithically integrated with an SOA and a Mach-Zehnder modulator.</p>	<p><b>SC3.S7.1 14.30 - 15.00 (Invited)</b></p> <p><b>Rotating Linear Differential Polarization Imaging for Quantitative Characterization of Superficial Tissues,</b> X. Jiang, W. Li, T. Yun, N. Zeng, H. Ma, and Y. He, <i>Tsinghua University, Shenzhen, China</i></p> <p>Differential polarization images corresponding to different incident and exit polarizations are recorded and fitted to an analytical expression. The fitted parameters correlated quantitatively to the structural and optical properties of the superficial tissues.</p>	<p><b>SC4.S9.1 14.30 - 15.30 (Tutorial)</b></p> <p><b>Organic Photovoltaics,</b> J. Xue, <i>University of Florida, Gainesville, FL, USA</i></p> <p>Organic photovoltaic cells have the potential to offer low cost solar energy conversion, and are considered as a promising candidate to replace fossil fuels in the future. This tutorial will describe the fundamental operation principles of these devices and review the major advances in this field.</p>	<p><b>SLW1.1 14.30 - 15.00 (Invited)</b></p> <p><b>Control of Slow Light in Coupled Resonator Optical Waveguide Structures with Highly Dispersive Media,</b> M. Qiu, <i>Royal Institute of Technology, Stockholm, Sweden</i></p> <p>Dispersive material background may enable dynamic tunability of slow light of the coupled resonator optical waveguides. It may also result in an enhanced transmission spectrum with a time-dependent tuning of the dispersive medium.</p>
<p><b>SC1.S7.2 15.00 - 15.15</b></p> <p><b>Low Cost Integrated Optical Mux/Demux for LX4 Transceiver,</b> H. Han, J. Morris and K. Main, <i>Tessera North America, Charlotte, NC, USA</i></p> <p>This presentation reviews the development of an integrated, optical Mux/Demux based on wafer scale micro-optics and optical wavelength filters. This small form factor design enabled the LX4 transceiver to satisfy X2-MSA for 10G Ethernet applications.</p>	<p><b>SC2.S7.2 15.00 - 15.30 (Invited)</b></p> <p><b>Wavelength and Space Switchable Semiconductor Laser,</b> J.-J. He, <i>Zhejiang University, Hangzhou, China</i></p> <p>A novel monolithic integrated wavelength and space switchable laser is presented. It consists of two V-coupled cavities with optimized coupling coefficient and phase for high single-mode selectivity. The waveguide branch structures inside and outside the cavities allow the wavelength and space switching functionalities to be realized simultaneously.</p>	<p><b>SC3.S7.2 15.00 - 15.30 (Invited)</b></p> <p><b>Applications of Total Internal Reflection Fluorescence (TIRF) Microscopy in Cellular Bio-imaging,</b> L. Jin, R. K. Lee, S. K. Kong, W. Yuan, H.-P. A. Ho, and C. Lin, <i>Chinese University of Hong Kong, Shatin, NT, Hong Kong</i></p> <p>Evanescent field based imaging and sensor technologies have been widely used for a long time, but only recently has TIRF been introduced for bio-imaging. This paper will discuss the reasons and give a brief summary of the recent development of TIRF which is also based on evanescent wave excitation, and which is well suited for ultra thin optical sectioning (hundreds</p>		<p><b>SLW1.2 15.00 - 15.30 (Invited)</b></p> <p><b>Slow Light and Its Potential Applications,</b> Z. Li, C. Peng and A. Xu, <i>Peking University, Beijing, China</i></p> <p>This talk will review devising methods for tailoring the dispersion of optical materials, such as electromagnetically induced transparency, photonic crystals, and nano-optic resonators over the last decade.</p>

Room 4A	Room 4C	Room 5A	Room 5B	Room 2
		of nanometres) at cell-substrate regions with an unusually high signal-to-noise ratio and image quality.		
<p><b>SC1.S7.3 15.15 - 15.30</b>  <b>Tuneable Photonic Millimetre Wave Generation using an Optical Phase Modulator and DWDM Thin Film Filters</b>, P. Shen, J. James, N. J. Gomes, <i>University of Kent at Canterbury, Canterbury, UK</i> and P. G. Huggard, <i>Rutherford Appleton Laboratory, Didcot, UK</i></p> <p>We report on the generation of continuously tuneable W-band millimetre-wave signals with low phase noise based on sideband filtering of a phase modulated optical signal by using a novel cost optical notch filter.</p>				
<p><b>SC1.S7.4 15.30 - 15.45</b>  <b>An Ultrasmall Polarization Rotator Based on Si Nanowire</b>, Z. Wang and D. Dai, <i>Zhejiang University, Hangzhou, China</i></p> <p>An ultrasmall polarization rotator based on asymmetrical Si nanowires is presented. Almost 100% polarization rotation is achieved with a very small beat length (~10µm). And a broad 3-dB bandwidth (~120nm) is obtained.</p>	<p><b>SC2.S7.3 15.30 - 15.45</b>  <b>Widely Tunable Slow-Light Delay Line Using Parametric-Amplification Assisted Silicon Microring Resonator</b>, F. Liu, C. Jiang and Y. Su, <i>Shanghai Jiao Tong University, Shanghai, China</i></p> <p>We propose a widely tunable slow-light delay element based on silicon microring resonator assisted by parametric amplification. This scheme provides flexible adjustment of the delay time and bandwidth to adapt to different data rates.</p>	<p><b>SC3.S7.3 15.30 - 15.45</b>  <b>Fluid Sensor Based on Transmission Dip Caused by Mini Stop-Bands in 2D Photonic Crystal Waveguides</b>, L. Cao, <i>Tsinghua University, Beijing, China</i></p> <p>In this paper, we propose a fluid sensor based on transmission dip caused by mini stop-band in 2D photonic crystal waveguides. Simulation results shows that it has large detective range and relative high sensitivity.</p>	<p><b>SC4.S9.2 15.30 - 16.00 (Invited)</b>  <b>Development of Solar Photovoltaic in China</b>, R. Cui, J. Wang, Q. Ye, S. Yan, Y. Shi, J. Du, L. Yang, F. Meng, L. Xu and W. Shen, <i>Shanghai Jiao Tong University, Shanghai, China</i></p> <p>With rapid development of global solar photovoltaic (PV) industries, China's PV sector is growing at a surprising high-speed. China's Renewable Energy Law was promulgated on Jan 1, 2006. The present status of solar photovoltaic in China will be introduced in this paper briefly.</p>	<p><b>SLW1.3 15.30 - 16.00 (Invited)</b>  <b>Delay-Bandwidth Product of a Novel Slow Light Waveguide</b>, C. Jiang, <i>Shanghai Jiao Tong University, Shanghai, China</i></p> <p>A optimally-designed novel slow light waveguide is present, the calculated dispersion curve, delay and bandwidth of it reveal that the waveguide has a ultra-slow group velocity and negative dispersion mode and giant delay-bandwidth product.</p>
<p><b>SC1.S7.5 15.45 - 16.00</b>  <b>Bistable Device based on the Kerr Effect in a Microfiber Resonator</b>, G. Vienne, <i>Zhejiang University, Hangzhou, China</i>, P. Grelu, <i>Université de Bourgogne, Dijon, France</i>, Y. Li, <i>Zhejiang University, Hangzhou, China</i>, X. Chen-Perdereau, <i>Université de Bourgogne, Dijon, France</i> and L. Tong, <i>Zhejiang University, Hangzhou, China</i></p> <p>We propose a bistable device based on the Kerr effect in a microfiber resonator. Our simulations show that low switching powers (in the order of a few tens of</p>	<p><b>SC2.S7.4 15.45 - 16.00</b>  <b>Proposal of a Thermally-Tunable Silicon-on-Insulator Microring Resonator Filter</b>, D. Dai and L. Yang, <i>Zhejiang University, Hangzhou, China</i></p> <p>An ultrasmall microring resonator (MRR) based on silicon-on-insulator nanowires is presented. The metal circuit along the microring is used as a submicron heater. For the fabrication of the present thermally-tunable MRR, only a single lithography process is needed.</p>	<p><b>SC3.S7.4 15.45 - 16.00</b>  <b>Fabrication and Photochromic Properties of Ag/Ag<sup>+</sup>-Codoped Germano-Silicate Glass Fiber</b>, A. Lin, S.-H. Kim, Y. Chung and W.-T. Han, <i>Gwangju Institute of Science and Technology, Gwangju, Korea</i></p> <p>Ag/Ag<sup>+</sup>-codoped germano-silicate fiber was developed and the photocatalytic reduction from Ag<sup>+</sup> ions to Ag nanoparticles inside the fiber core by UV light was found.</p>		

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mW) are expected with tellurite micro-fibers.				
<b>16.00 – 16.15 TEA BREAK</b>				
<b>16.15 - 18.15</b> <b>Session SC1.S8: NOVEL DEVICES AND SUBSYSTEMS</b> <b>Session Chair:</b> Kenneth K.-Y. Wong, <i>Chinese University of Hong Kong, Shatin, NT, Hong Kong</i>	<b>16.15 - 17.45</b> <b>Session SC2.S8: NOVEL DEVICES &amp; MATERIALS</b> <b>Session Chair:</b> Min Qiu, <i>Royal Institute of Technology, Stockholm, Sweden</i>	<b>16.15 - 17.45</b> <b>Session SC3.S8: OPTICAL SENSORS IV</b> <b>Session Chair:</b> Chien Chou, <i>National Yang-Ming University, Taipei, Taiwan, R.O.C.</i>	<b>16.15 - 17.45</b> <b>Session SC4.S10: ENERGY II</b> <b>Session Chair:</b> Jianguo Xue, <i>University of Florida, Gainesville, FL, USA</i>	<b>16.15 - 17.45</b> <b>Session SLW2: SLOW-LIGHT WORKSHOP II</b> <b>Session Chair:</b> Yikai Su, <i>Shanghai Jiao Tong University, Shanghai, China</i>
<b>SC1.S8.1 16.15 - 16.45 (Invited)</b> <b>All-Fiber Acousto-Optic Tunable Filters</b> , B. Y. Kim, <i>Novera Optics, Inc., Daejeon, Korea</i> Several types of all-fiber tunable filters are described where acoustic wave and optical wave are guided along the same optical fiber.	<b>SC2.S8.1 16.15 - 16.45 (Invited)</b> <b>Patterned Photonic Crystals for Novel Applications</b> , Y. Ohtera, <i>Tohoku University, Aoba-ku, Sendai, Japan</i> , T. Sato, and S. Kawakami, <i>Photonic Lattice Inc., Sendai, Miyagi, Japan</i> Using patterned photonic crystals fabricated by Autoclone, novel functional elements, devices, and systems are realized. Applications of axisymmetric polarization, photo-elasticity imaging, and spectroscopic imaging are introduced.	<b>SC3.S8.1 16.15 - 16.45 (Invited)</b> <b>Surface Plasmonic Microscopy for Live Cell Membrane Imaging</b> , R.-Y. He, Y.-D. Su, K.-C. Chiu, H.-L. Wu, <i>National Cheng Kung University, Tainan, Taiwan, R.O.C.</i> , C.-H. Lin, <i>National Yang-Ming University, Taipei, Taiwan, R.O.C.</i> , S.-J. Chen and G.-L. Chang, <i>National Cheng Kung University, Tainan, Taiwan, R.O.C.</i> This study presents a surface plasmon-enhanced total internal reflection fluorescence microscopy (TIRFM) and a surface plasmon polariton (SPP) phase microscopy techniques to image live cell membranes. In the surface plasmon-enhanced TIRFM, the developed microscopy technique is successfully applied to the real-time observation of the thrombomodulin proteins of live cell membranes.	<b>SC4.S10.1 16.15 - 16.45 (Invited)</b> <b>Bio-Inspired Nanodevices for Artificial Solar Energy Conversion</b> , M. Nango, <i>Nagoya Institute of Technology, Nagoya, Aichi, Japan</i> Photocurrent response of photo-synthetic light harvesting core complex (LH1-RC) and its model complex on electrodes were performed to attempt the construction of an artificial photo-synthetic antenna complex toward developing useful nanodevices of solar-energy conversion.	<b>SLW2.1 16.15 - 16.30</b> <b>Spectrally Broadened Optical Pump Source via Phase Modulation for Wideband SBS Slow Light</b> , C. Shu, A. Cheng, and M. P. Fok, <i>Chinese University of Hong Kong, Shatin, NT, Hong Kong</i> We demonstrated slow light of 1 GHz and 10 GHz pulses using stimulated Brillouin scattering in a single mode fiber. The cw pump sources are spectrally broadened by phase modulation at different bit rates.
				<b>SLW2.2 16.30 - 16.45</b> <b>Slow Light in Silicon Nano-Waveguide</b> , F. Liu, <i>Shanghai Jiao Tong University, Shanghai, China</i> We propose a widely tunable slow-light delay element based on nano-scale silicon microring resonator assisted by parametric amplification. This scheme provides flexible adjustment of the delay time and bandwidth to adapt to different data rates.

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<p><b>SC1.S8.2 16.45 - 17.15 (Invited)</b>  <b>TBD</b>, P.-K. A. Wai, <i>Hong Kong Polytechnic University, Kowloon, Hong Kong</i>                      ABSTRACT NOT AVAILABLE</p>	<p><b>SC2.S8.2 16.45 - 17.15 (Invited)</b>  <b>Novel Glasses and Glass-Ceramics for Broadband Optical Amplification</b>, J. Qiu, S. Zhou, <i>Zhejiang University, Hangzhou, China</i>, J. Ren and B. Wu, <i>Chinese Academy of Sciences, Shanghai, China</i>                      Optical fiber amplifier plays an important role in the optical communication system. Recently, considerable effort has been devoted to develop optical fiber amplifiers which can be used to produce optical gains at different communication bands. In this paper, we review recent research progress on the development of novel materials for optical amplification.</p>	<p><b>SC3.S8.2 16.45 - 17.00</b>  <b>Laser Ultrasound Detecting Experiment with Fiber Michelson Interferometer</b>, J.-L. Zhang, X.-Z. Sheng, C.-Q. Wu and L.-J. Zhang, <i>Beijing Jiaotong University, Beijing, China</i>                      A laser ultrasound stably detecting has been demonstrated by a new type fiber optic Michelson interferometer with 3×3 direction coupler. The experimental result suggests that it's able to sense an ultrasound vibration frequency from 10 KHz to 1.5MHz.</p>	<p><b>SC4.S10.2 16.45 - 17.15 (Invited)</b>  <b>Challenges in Luminescent Materials for Lighting and Medical Applications</b>, C. Ronda, <i>Philips Research Laboratories, Aachen, Germany</i>                      In this paper, we will outline how new requirements have revitalised research on luminescent materials. Using selected examples from applications in lighting and the medical field, we will show how materials science on luminescent materials results in new and improved phosphors.</p>	<p><b>SLW2.3 16.45 - 17.15 (Invited)</b>  <b>Storage Capacity of Slow-Light based on Fiber Brillouin Amplifiers</b>, L. Zhan, <i>Shanghai Jiao Tong University, Shanghai, China</i>                      We study the the storage capacity of slow-light tunable optical buffers based on fiber Brillouin amplifiers (FBA through theoretical analysis The storage capacity is discussed for two modulation formats: return-to-zero (RZ) and non-return-to-zero (NRZ). Gain saturation and pulse broadening are two key factors which limit the buffer capacity. It is shown that the maximum buffer capacity varies with data bit rate. We also investigate the optimum data bit rate to achieve the highest storage capacity.</p>
		<p><b>SC3.S8.3 17.00 - 17.30 (Invited)</b>  <b>Spectroscopic Applications to Environmental Monitoring and Nanobiophotonics</b>, G. Somesfalean, <i>Lund Institute of Technology, Lund, Sweden</i>                      Atmospheric gas sensing can help us understand the complex processes governing global warming and the impact of pollutant emissions related to human activity. Spectroscopic techniques, especially based on robust and affordable diode lasers, have a great potential to become an industrially well-established technology for environmental monitoring.</p>		
<p><b>SC1.S8.3 17.15 - 17.45 (Invited)</b>  <b>Evolution of ROADM Technologies in a Dynamic Reconfigurable WDM Network</b>, P. Hu, M. Zou, J. Zhang, J. He, Y. Qin and H. Dai, <i>Alcatel-Lucent, Shanghai, China</i>                      Up to now ROADM technology has experienced three generations and each of them is with different architecture and key elements. This presentation will review evolution of ROADM technology in terms of architecture, performance, economy</p>	<p><b>SC2.S8.3 17.15 - 17.30</b>  <b>Raman Enhancement of TO-520cm<sup>-1</sup> Mode of Si by Off-Plane One-Dimensional Grating Etched on Si Substrate</b>, L.-C. Chou, <i>National Taiwan University, Taipei, Taiwan, R.O.C.</i>                      We have observed the relationship between the intensity of Raman scattering of TO-520cm<sup>-1</sup> mode of Si and variations of the geometrical structure of Si gratings as well as the polarizations of incident waves.</p>		<p><b>SC4.S10.3 17.15 - 17.45 (Invited)</b>  <b>Si based Thin Film Technology for Solar Cells</b>, L. Guo, <i>Shanghai Topsolar Green Energy Co., Ltd., Shanghai, China</i>                      ABSTRACT NOT AVAILABLE.</p>	<p><b>17.15 - 17.45 Panel Discussion</b></p>

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<p>within the context of modern reconfigurable WDM network. Design and application of future ROADM technology will also be envisioned.</p>				
	<p><b>SC2.S8.4 17.30 - 17.45</b>  <b>Modeling of Spontaneous Emission from Erbium Incorporated Silicon Nanocrystal</b>, S. Subrina, M. D. Z. Hossain and M. D. Q. Huda, <i>Bangladesh University of Engineering &amp; Technology, Dhaka, Bangladesh</i>                      Mathematical model has been developed for erbium (Er) luminescence in silicon nanocrystal (nc-Si) embedded in SiO<sub>2</sub>. Performances of Er luminescence under different conditions have been analyzed for both steady state and time varying case.</p>	<p><b>SC3.S8.4 17.30 - 17.45</b>  <b>Multiplexing of Fiber Bragg Grating Pairs for Sensing based on Optical Low Coherence Technology</b>, W. Liu, <i>Zhejiang University, Hangzhou, China</i>                      A distributed sensing system based on fiber Bragg grating pairs is presented. Multiplexing is achieved by using optical low coherence technology. A measurement of strain is demonstrated to verify good performance of the system.</p>		
<p><b>SC1.S8.4 17.45 - 18.00</b>  <b>A Simple Implementation of Tunable All-Optical Microwave Notch Filter with a Negative Tap Based on a Semiconductor Optical Amplifier</b>, H. Fu, H. Ou, K. Zhu, and S. He, <i>Zhejiang University, Hangzhou, China</i>                      A simple implementation of tunable all-optical microwave notch filter with a negative tap based on a semiconductor optical amplifier is demonstrated. The present filter shows good tunability, and is easy to implement and cost-effective.</p>				
<p><b>SC1.S8.5 18.00 - 18.15</b>  <b>Demonstration of Optical Line Terminal for Full Colorless Bidirectional WDM-Passive Optical Networks using Injection-Locked Fabry Perot Laser and Optical Carrier Suppression</b>, Y.-Y. Won, <i>Yonsei University, Seoul, Kyunggi-do, Korea</i>                      A new architecture of optical line terminal for fully colorless bidirectional wavelength division multiplexed passive optical networks is proposed and experimentally demonstrated. It is implemented by injection-locked Fabry-</p>				

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<p>Perot laser and optical carrier suppression. Error free transmissions of both 1.25-Gb/s downstream signal and upstream one are accomplished at three representative wavelengths.</p>				

END OF PROGRAM