OECC/ACOFT 2008 Conference, Monday 7 - Thursday 10 July 2008, Sydney Convention & Exhibition Centre
Preliminary Program

Monday 7 July 08 - Workshops			
7:00 - 19:30	**Registrations**		
	Room: Bayside 103		**Room: Bayside 104**
8:30 - 10:00	**Optical and electronic signal processing: matching the technology to the application** Convenors: Rod Tucker & Lars Thylen		**High Q cavities: how much is enough?** Convenors: Snjezana Tomljenovic-Hanic & Michael Steel
10:00 - 10:30	**Morning Tea**		
	Room: Bayside 103		**Room: Bayside 104**
10:30 - 12:00	**Optical and electronic signal processing: matching the technology to the application** Convenors: Rod Tucker & Lars Thylen		**High Q cavities: how much is enough?** Convenors: Snjezana Tomljenovic-Hanic & Michael Steel
12:00 - 13:30	**Lunch**		
	Room: Bayside 103		**Room: Bayside 104**
13:30 - 15:00	**DCF, Will It Ever Be Displaced** Convenors: Paul Westbrook & Mark Englund		**Will POF be used in FTTH?** Convenors: Maryanne Large & Yasuhiro Koike
3.30pm - 3.30pm	**Afternoon Tea**		
	Room: Bayside 103		**Room: Bayside 104**
15:30 - 17:30	**DCF, Will It Ever Be Displaced** Convenors: Paul Westbrook & Mark Englund		**Will POF be used in FTTH?** Convenors: Maryanne Large & Yasuhiro Koike
18:00 - 19:30	**Welcome Reception** *Bayside Gallery, Sydney Convention & Exhibition Centre*		

Tuesday 8 July 08					
7:00 - 17:00	**Registrations**				
	Room: Bayside Auditorium A				
8:30 - 10:15	**Plenary Session 1** **Presider: Ben Eggleton**				
08:30 - 9:00	**Conference Opening**				
09:00 - 09:45	**Silicon Nanophotonics** Michal Lipson				
09:45 - 10:30	**Evolution of Photonic Network Technologies: FTTH, NGN and beyond** Kazuo Hagimoto				
10:30 - 11:00	**Morning Tea**				
	Room: Bayside Auditorium A				
11:00 - 12:30	**Plenary Session 2** **Presider: Ben Eggleton**				
11:00 - 11:45	**Optical fiber revolution** David Payne				
11:45 - 12:30	**Impact of optical communications in developing countries** Samia Melhem				
12:30 - 13:30	**Lunch**				
	Room: Bayside 201	**Room: Bayside 202**	**Room: Bayside 204a**	**Room: Bayside 204b**	**Room: Bayside Auditorium A**
	TuA: 13:30-15:00 **Impairments Compensation** Presider: Prof. Hidenori Taga	**TuB: 13:30-15:00** **Internet Power and Optical Wireless** Presider: Christina Lim	**TuC: 13:30-15:00** **Laser Writing Techniques** Presider: Dmitrii Stepanov	**TuD: 13:30-15:00** **Active Fiber Materials** Presider: Gilberto Brambilla	**TuE: 13:30-15:00** **Slow Light** Presider: Martijn de Sterke
	13:30-14:00 TuA-1 (Invited) **Increasing the Performance of MLSE Equalization Using a Chirped Transmitter: 10GBit/s Field Trial With High PMD and CD** D. Fritzsche(1), D. Breuer(1), L. Schuerer(1), A. Ehrhardt(1), H. Oeruen(2) (1)T-Systems Enterprise Services GmbH, Germany (2)Core Optics GmbH , Germany A receiver using MLSE equalization is investigated in combination with a chirped transmitter in a 10Gbit/s field trial. Results show that the required OSNR at high CD and PMD can be decreased using appropriate chirp.	**13:30-14:00 TuB-1 (Invited)** **Energy and the Internet** R. S. Tucker(1), J. Baliga(1,2), R. Ayre(1), K. Hinton(1), W. V. Sorin(1) (1)ARC Special Research Centre for Ultra-Broadband Information Networks, Department of Electrical and Electronic Engineering, University of Melbourne, Australia (2)NICTA, Department of Electrical and Electronic Engineering, University of Melbourne, Australia The issue of energy consumption in ICT equipment is attracting increasing attention. This paper presents a model of energy consumption in the Internet and uses this model to estimate how Internet energy consumption will scale with increasing network traffic.	**13:30-14:00 TuC-1 (Invited)** **Femtosecond Direct Written Waveguides and Bragg Gratings** P. Herman University of Toronto, Canada	**13:30-14:00 TuD-1 (Invited)** **New Functionality Within Structured Optical Fibres by Selective Filling** J. Canning, T. Yip, S. Lim, C. Martelli Interdisciplinary Photonics Laboratories, University of Sydney, Australia We demonstrate multiple selective filling of holes in a photonic crystal fibre with three luminescent dyes: red, blue and green. White light is generated.	**13:30-14:30 TuE-1 (Invited - (Tutorial)** **Slow Light: What We Have Learned and Where Are We Going?** J. E. Sharping School of Natural Sciences, University of California at Merced, USA This tutorial will introduce slow light fundamentals and review numerous recent developments in the field. It will cover dispesion, Kramers-Kronig relations, and hallmark experiments in atomic, fiber,solid state, and semiconductor systems.

	14:00-14:15 TuA-2 **Sensitivity Improvement in 10-Gbit/s ODB Receiver Using Adaptive FFE With integrated Dispersion Monitor** K. Yonenaga(1), K. Suzuki(1), T. Yamamoto(1), A. Takada(1), A. Kanda(2) (1)NTT Network Innovation Laboratories, Japan (2)NTT Photonics Laboratories, Japan This paper presents the sensitivity improvement in a 10-Gbit/s ODB receiver using a newly-developed adaptive FFE with an integrated dispersion monitor. Experimental results show a 1.1-dB improvement in the sensitivity over a wide dispersion range.	**14:00-14:15 TuB-2** **Optical-Wireless Integration Incorporating Optical Tandem Single Sideband Modulation Format** Y. Zhu, P. Gamage, K.-L. Lee, C. Lim, E. Wong The University of Melbourne, Australia We demonstrate a technique based on optical tandem single sideband for simultaneous transmission of wired and wireless signals for optical-wireless integrated access networks.	**14:00-14:30 TuC-2 (Invited)** **Overview of Laser Microfabrication Techniques for Photonic Devices** M. Ams, D. Little, R. J. Williams, G. D. Marshall, P. Dekker, J. A. Piper, J. M. Dawes, M. J. Withford Centre for Ultrahigh-bandwidth Devices for Optical Systems (CUDOS), Department of Physics, MQ Photonics Research Centre, Macquarie University, Australia Recent results in femtosecond laser directwriting of guided wave devices will be presented. Particular emphasis will be placed on the fabrication of monolithic active photonic devices in doped phosphate glasses.	**14:00-14:15 TuD-2** **New Tellurite Glasses for Erbium Fibre Lasers** H. Ebendorff-Heidepriem, T.-C. Foo, Y. Li, M. Oermann, T. Monro(1) University of Adelaide. Australia We report on La- and Er-doped tellurite glasses that demonstrate improved properties for rare earth fibre lasers in the mid-infrared.	
	14:15-14:30 TuA-3 **Electrical Joint PMD Compensation in Direct-detection Polarization-Multiplexed Transmission Systems** J. Li, L. Zhang, D. Zhang, F. Zhang, Z. Chen Peking University, China We present simulation of electrical joint equalization including both DFE and Viterbi equalizer for PMD compensation in direct-detection PDM systems. The benifit of utilizing joint equalizer for dynamic polarization control is also investigated.	**14:15-14:30 TuB-3** **Experimental Demonstration of 1.56 Gbit/s OFDM-UWB Distribution over 100 km of Standard-fiber in FTTH Networks** T. Alves, A. Cartaxo Instituto Telecomunicações – IST, Portugal This work proposes the distribution of OFDM-UWB radio signals in FTTH networks. Transmission of five BPSK-OFDM channels with an accumulated bit-rate of 1.56 Gbit/s over 100 km of SSMF with a BER<10-9 is demonstrated experimentally.		**14:15-14:30 TuD-3** **Spectroscopy of Erbium in La3+-doped Tellurite Glass & Fibres** M. R. Oermann, H. Ebendorff-Heidepriem, Y. Li, T. Monro University of Adelaide, Australia We study the spectroscopic properties of erbium doped tellurite glass and the effect of co-doping with lanthanum. This is a route towards the development of versatile fibre lasers for the mid-infrared.	
	14:30-14:45 TuA-4 **Adaptive Decision-Aided Maximum Likelihood Phase Estimation in Coherent Optical DQPSK System** S. Zhang(1), P. Y. Kam(1), J. Chen(2), C. Yu(1, 2) (1)National Univ. of Singapore, Singapore (2)A*STAR Institute for Infocomm Research, Singapore Adaptive decision-aided maximum likelihood phase estimation is proposed to obtain optimum performance in coherent optical DQPSK system, which recovers the carrier phase and mitigates the impact of laser linewidth and nonlinear phase noise.	**14:30-15:00 TuB-4 (Invited)** **Delivery of 2.5/5-Gb/s Data and Uncompressed HDTV Signals on 60-GHz Optical Mm-wave in 3-ROADM Access Systems** Z. Jia, Y.-T. Hsueh, H.-C. Chien, A. Chowdhury, G.-K. Chang Georgia Institute of Technology, USA We experimentally demonstrated a 60-GHz radio-over-fiber system with high flexibility and agility by using 3 cascaded ROADMs. 2.5/5-Gb/s data and 1.485-Gb/s HDTV signals are successfully transmitted over 100-km SSMF with power penalty less than 1.5dB.	**14:30-14:45 TuC-3** **Large Diffractive Scattering Losses in the Visible Region Produced by Femtosecond Laser Written Bragg Gratings** M. Åslund(1), N. Jovanovic(2), N. Groothoff(3), J. Canning(3), G. Marshall(2) (1)Optical Fibre Technology Centre, Australia (2)2Centre for Ultrahigh bandwidth Devices for Optical Systems (CUDOS), Macquarie Uni., Australia (3)3Interdisciplinary Photonics Laboratories, School of Chemistry, Uni. of Sydney, Australia We present a study of the short wavelength attenuation induced by ultra-stable gratings written by a femtosecond Ti-sapphire laser. We demonstrate that these gratings are indistinguishable from UV-written Type-II gratings.	**14:30-14:45 TuD-4** **Dy3+ Doped Ge-As-S Fiber for 2.96um Fiber Laser** B. J. Park(1), H. S. Seo(1), J. T. Ahn(1), W. J. Chung(2) (1)ETRI (Electronics And Telecommunications Research Institute), South Korea (2)Kongju National University, South Korea Dy3+ doped Ge-As-S glasses was investigated for 2.96um fiber laser pumped at 1.7um. Ge10As25S65 and Ge9As23S68 were determined as core and clad compostion, respectively. Ge10As25S65 fiber showed ~2 dB/m loss at 1.7um.	**14:30-14:45 TuE-2** **Pulse Train Generation in a Highly Nonlinear Chalcogenide (As2S3) Waveguide Bragg Grating** N. Baker(1), M. Roelens(1), S. Madden(2), B. Luther-Davies(2), M. de Sterke(1) (1)CUDOS - University of Sydney (2)CUDOS - Australian National University We report the first nonlinear experiment performed in a chalcogenide (As2S3) waveguide Bragg grating through which a 4 ps input pulse undergoes soliton fission to emerge as a train of six 450 fs pulses.

	14:45-15:00 TuA-5 **Pre-equalization for Optical 16-QAM in a Vector Modulator** Y. Kamio, M. Nakamura, T. Miyazaki National Institute of Information and Communications Technology (NICT), Japan We investigated the performance of electric pre-equalization to compensate inter-symbol-interference (ISI) caused in electrical multilevel 16-QAM to a standard vector modulator. Drastically clear constellation was obtained experimentally by applying 16-taps finite impulse response filter technique.		**14:45-15:00 TuC-4** **Strong Photoinduced Bragg Gratings in Single-Mode Arsenic Selenide Optical Fibre by the Transverse Holographic Method** G. Brawley(1), V. Ta'eed(1), J. Bolger(1), J. Sanghera(2), I. Aggarwal(2) (1)CUDOS, School of Physics, University of Sydney, Australia (2)Naval Research Laboratory, Code 5606, Washington, USA We demonstrate large photoinduced core index change and inscription of strong Bragg gratings in As2Se3 optical fibre with transverse exposure to tunable CW laser light with photon energy near the absorption band edge.	**14:45-15:00 TuD-5** **Characteristics of Ultra-Broadband Cr-Doped Fibers** Y.-C. Huang(1), J.-S. Wang(2), C.-T. Wu(2), S.-L. Huang(1), W.-H. Cheng(2) (1)Graduate Institute o Electro-Optical Engineering, National Taiwan University, Taiwan (2)Institute of Electro-Optical Engineering, National Sun Yat-Sen University,Taiwan (3)Department of Electronic Engineering, Yung-Ta Institute of Technology and Commerce, Taiwan The characteristics of ultra-broadband Cr-doped fibers employing drawing-tower-method are reported. The Cr-doped fiber hows a longer fluorescence lifetime and 1.2-1.55 ìm broadband emission. This Cr-doped fiber may be used as a new broadband fiber amplifier.	**14:45-15:00 TuE-3** **Design Tolerances of Nonlinear Bragg-grating Couplers oOptimised for All-optical Slow-light Switching** S. Ha, A. Sukhorukov, Y. Kivshar Nonlinear Physics Centre and Centre for Ultrahigh Bandwidth Devices for Optical Systems, Research School of Physical Sciences and Engineering, Australian National University, Australia We study the tolerances in the phase shift between the Bragg gratings in coupled waveguides, for optimising power-controlled switching and slowing down of optical pulses, and cancellation of dispersion induced pulse broadening through nonlinearity.
15:00 - 15:30	**Afternoon Tea**				
	Room: Bayside 201	**Room: Bayside 202**	**Room: Bayside 204a**	**Room: Bayside 204b**	**Room: Bayside Auditorium A**
	TuF: 15:30-17:30 **Nonlinear optical Processing** Presider: Prof. P. K. Alexander Wai	**TuG: 15:30-17:30** **Optical CDMA** Presider: Naoya Wada	**TuH: 15:30-17:30** **Nanophotonic Devices** Presider: Kent Choquette	**TuI: 15:30-17:30** **Fiber Devices** Presider: Ju Han Lee	**TuJ: 15:30-17:30** **Propagation Effects** Presider: John Dudley
	15:30-15:45 TuF-1 **Arbitrary Pulse Bursts at 40 GHz Created With a Wavelength Selective Switch** M. Roelens, J. Bolger, D. Williams, B. Eggleton CUDOS, School of Physics, The University of Sydney, Australia We demonstrate the simultaneous three-fold functions of wavelength selection, pulse shaping and port switching at 40 GHz using a rapidly tunable wavelength selective switch.	**15:30-16:30 TuG-1 (Tutorial)** **Optical CDMA: Fundamentals, Developments, and Applications** K.-I. Kitayama(1), W. C. Kwong(2) (1)Dept. Electrical, Electronics and Information Engineering, Graduate School of Engineering, Osaka University, Japan (2)Department of Engineering, Hofstra University, USA Starting from the early 1980s, there have been steady developments in the coding schemes and enabling technologies in optical code division multiple access (O-CDMA). With the advance in technology and recent support of the U.S. Defense Advanced Research Projects Agency (DARPA), the progress in O-CDMA	**15:30-16:00 TuH-1 (Invited)** **III-V Nanowires and Quantum Dots for Optoelectronics** H. H. Tan Electronic Materials Engineering, Research School of Physical Sciences And Engineering, Australian National University, Australia	**15:30-15:45 TuI-1** **Nanoimprinted Optical Fibres: Biotemplated Nanostructures for SERS sensing** G. Kostovski(1), D. White(2), A. Mitchell(1), M. Austin(1), P. Stoddart(2) (1)RMIT University, Australia (2)Swinburne University, Australia Nanoimprint lithography is used to pattern the endface of an optical fiber. A biological nanotemplate is replicated into polymer and coated with metal. Observed enhancement of through-fibre Raman scattering validates the approach.	**15:30-16:00 TuJ-1 (Invited)** **Recent Progress in Photonic Crystal Fibre Technologies** S. Kawanishi Basic Research Laboratories, NTT Corporation, Japan Network Innovation Laboratories, NTT Corporation, Japan Recent progress on silica-based photonic crystal fiber technologies are reviewed. Possible optical active devices at unused visible and infrared regions wavelengths are discussed.

15:45-16:00 TuF-2
Short Optical Pulse Generation by Self-Phase Modulation Based Compression of a Fiber-Looped 40 GHz LiNbO3 Mach-Zehnder Modulator
M. Pelusi, G. Gordon, B. Eggleton
CUDOS

A novel source of 2 ps optical pulses at 40 GHz repetition is demonstrated using a Mach-Zehnder modulator connected in a fiber-loop and compressing its output through self-phase modulation in highly nonlinear fibre and filtering.

has been tremendous since four years ago. O-CDMA systems are now closer to be deployable than ever before.

In this tutorial, we will first examine various coding schemes and enabling technologies in this area. Then, the recent developments of O-CDMA will be presented. Finally, we will investigate the potential applications and issues of O-CDMA.

15:45-16:00 TuI-2
A Fibre Bragg Grating Manometry Catheter for In-vivo Diagnostics of Swallowing Disorders
J. W. Arkwright(1), S. N. Doe(1,3), M. C. Smith(1), N. G. Blenman(1), I. D. Underhill(1), S. A. Maunder(1), J. A. Glasscock(1), B. Lim(1), M. M. Szczesniak(2), P. G. Dinning(2), I. J. Cook(2)
(1)CSIRO Materials Science and Engineering, Australia
(2)Dept Gastroenterology, St George Hospital, Kogarah, University of New South Wales, Australia
(3)Now with Micro nix Pty. Ltd., Adelaide, Australia

Fibre Bragg grating based pressure sensing catheters for the diagnosis of gastrointestinal motility disorders are presented. These catheters have been successfully trialled under controlled clinical conditions and results from in-vivo trials are given.

16:00-16:15 TuF-3
Simultaneous OTDM De-multiplexing and Power Amplification Using Optical Parametric Amplifier with a Clock-Modulated Pump
G.-W. Lu, K. S. Abedin, T. Miyazaki
National Institute of Information and Communications Technology (NICT), Japan

We demonstrate a n OTDM de -multiplexer with power amplification using optical parametric amplifier with a clock-modulated pump. 25-dB gain and less than 2 -dB power penalty were obtained for de-multiplexed four 10 -Gb/s tributaries from a 40 -Gb/s data. discussed in [4], if the input signal is CW light, chirped Gaussian pulses can be obtained at input signal and generated idler. When the input of OPA is an OTDM signal, with sufficient gating window, one tributary.

16:00-16:15 TuI-3
Positive and Negative Index Gratings in 10-ring Photonic Crystal Fibres With Germanosilicate Cores Using 193nm
K. Cook(1), A. Pohl(2), J. Canning(1)
(1)Interdisciplinary Photonics Laboratories, School of Chemistry, University of Sydney, Australia
(2)Federal University of Technology, Curitiba, Brazil
(3)Interdisciplinary Photonics Laboratories, School of Chemistry, University of Sydney, Australia

Efficient Bragg grating writing (>20dB) in 10-ring highly nonlinear photonic crystal fibre using 193nm radiation without hydrogen loading is demonstrated. Splicing to SMF-28 is done with care to avoid coupling to a higher-order triangular mode.

16:00-16:30 TuJ-2 (Invited)
Observation of Novel Surface Waves in Optical Waveguide Arrays.
I. L. Garanovich(1), A. Szameit(2), A. A. Sukhorukov(1), M. Heinrich(2), F. Dreisow(2), T.Pertsch(2), S. Nolte(2), A. Tünnermann(2), Y. S. Kivshar(1)
(1)Nonlinear Physics Centre and Centre for Ultra-high bandwidth Devices for Optical Systems (CUDOS), Research School of Physical Sciences and Engineering, Australian National University, Australia
(2)Institute of Applied Physics, Friedrich-Schiller-University Jena, Germany

We predict theoretically and observe experimentally novel defect-free surface waves in truncated arrays of coupled optical waveguides with periodically bent axes, demonstrating their di erent properties compared to the previously studied Tamm or Shockley type states.

16:15-16:30 TuF-4
Multi-Stage Wavelength by Cascaded SSB Modulators
T. Fujiwara, K. Kikushima
Access Network Service Systems Laboratories, NTT, Japan

We present the first demonstration of multi-stage wavelength conversion using cascaded SSB modulators. 72GHz frequency shift is achieved by four stages. Values of relative intensity noise (RIN) and noise figure are examined experimentally and theoretically.

16:15-16:30 TuI-4
193nm Bragg Grating Writing in H2-loaded Many-layered PCF
A. Pohl(1), K. Cook(2), J. Canning(3)
(1)Federal University Of Technology - Paraná (UTFPR)
(2)Interdisciplinary Photonics Lab, School of Chemistry,The University of Sydney, Australia
(3)Interdisciplinary Photonics Lab, School of Chemistry,The University of Sydney, Australia

193nm inscription of strong Bragg gratings in a hydrogen-loaded, ten ring PCF without liquid filling of the holes is studied. Grating strengths of at least 18 dB are routinely obtained.

	16:30-16:45 TuF-5 **Pulsewidth Tunable NRZ-to-RZ Data Format Conversion by Combination of SOA- and Fiber-Based Switches** H. Nguyen Tan, M. Matsuura, N. Kishi The University of Electro-Communications, Japan We demonstrate a pulsewidth tunable NRZ-to-RZ data format conversion by combination of SOA- and fiber-based switches. Negative-power penalties of converted signals for 0-km and 20-km SMF transmission are achieved for various pulsewidths at 10 Gb/s.	**16:30-16:45 TuG-2** **Multiuser Asynchronous OCDMA System with Different Types of FBG-based En/Decoders** H. Chen(1), Y. Zhang(1), X. Wang(2), N. Wada(3), T. Miyazaki(3) (1)Tsinghua University, Beijing, China (2)Heriot Watt University, UK (3)National Institute of Information and Communication Technology (NICT) (4)Institute of Semiconductors, Chinese Academy of Sciences, China Asynchronous OCDMA systems are demonstrated using 511 chip, 640 Gchip/s and 31 chip, 40Gchip/s with different types of fiber Bragg grating encoders/decoders. Error-free transmission has been achieved with up to five OCDMA users.	**16:30-16:45 TuH-3** **O-band InAs Quantum Dot (QD) Laser Diode With Sb-molecule Sprayed Dot-in-Well (DWELL) Structures Fabricated on GaAs Substrates** N. Yamamoto, K. Akahane, H. Sotobayashi, M. Tsuchiya National Institute of Information and Communications Technology, Japan O-band quantum-dot(QD) laser-diode(LD) has been successfully demonstrated with novel InAs dotin-well structures employed on GaAs-wafers. Improvement of crystal-qualities and enhancement of electroluminescence-intensities have been brought about to the LD-devices by Sb-molecule around InAs-QDs during molecular-beam-epitaxy.	**16:30-16:45 TuI-5** **All-fiber Wavelength Tunable and Mode Convertible Bandpass Filter** W. Shin(1), K. Oh(2), B. A. Yu(1), Y. L. Lee(1), D. K. Ko(1) (1)Advanced Photonics Research Institute, South Korea (2)Yonsei University, Department of Physics, South Korea We report an all-fiber wavelength tunable bandpass filter with multi-mode to single-mode converting property via serially concatenated structure of a helicoidal long-period fiber grating, a ring-core hollow optical fiber, and a multimode fiber.	**16:30-16:45 TuJ-5** **Impedance of Photonic Crystals** F. Lawrence(1), L. Botten(2), K. Dossou(2), M. de Sterke(1) (1)Centre for Ultrahigh-Bandwidth Devices for Optical Systems (CUDOS) and School of Physics, University of Sydney, Australia (2)CUDOS and Department of Mathematical Sciences, University of Technology, Sydney, Australia We show how the concept of impedance can be defined rigorously in terms of Bloch modes for photonic crystal applications and then exploit this to accurately and efficiently design multilayer anti-reflection coatings for photonic crystals.
	16:45-17:00 TuF-6 **Broad-band Tunable Four Wave Mixing Based Wavelength Converter With Filterless Pump Suppression** J. Liu(1,2) , Y. Yeo(2), Y. Wang(1,2), D. Wang(1), L. Xue(3), member of OSA, G. Xiao(1), L. Zhou(2), T. Hiang Cheng(1), senior member of IEEE (1)School of Electrical & Electronic Engineering, Nanyang Technological University, Singapore (2)Institute for Infocomm Research, Singapore (3)Institute of Semiconductor, China We propose and compare three schemes for realizing pumps suppression in a Broad- and flat-band tunable four wave mixing (FWM) wavelength converter (WC) without using a high-speed tunable filter.	**16:45-17:00 TuG-3** **OCDMA-WDM-PON with Two-Level Chaotic Logistic-Map as Spread Spectrum Sequence** L. Yang(0), G. Shou(1), Z. Qian(1), Y. Hu(1), T. Miki(2) (1)Beijing Univiersity Of Posts And Telecommunications, China (2)The University Of Electro-Communications,Japan A novel optical-code-division-multiplexing-access (OCDMA) wavelength-division-multiplexed (WDM) passive-optical-network (PON) scheme using two-level chaotic Logistic-map as spread spectrum sequence is investigated to extend the capacity of optical access network for the first time.	**16:45-17:00 TuH-4** **Efficient Two-Photon Detection in a GaAs / AlGaAs Multiple Quantum Well Modulator** D. Moss University of Sydney, Australia We report the first two-photon detector in a GaAs / AlGaAs multiple quantum well structure at 1550nm, obtaining an efficency 300x that reported in bulk heterostructure devices.	**16:45-17:00 TuI-6** **Hard Polymer Clad Fiber (HPCF) Fresnel Zone Plate Inscription Using Femtosecond Laser** J. Kim(1), J. Kim(1), I.-B. Sohn(2), W. Shin(2), K. Oh(1) (1)Institute of Physics and Applied Physics, Yonsei Univ., South Korea (2)Advanced Photonics research Institute, GIST, South Korea We demonstrated a compact zone plate lens on the end facet of Hard Polymer Clad Fiber (HPCF). Femto-second laser inscription technique was developed and the focusing properties of the lens were investigated.	**16:45-17:00 TuJ-6** **Analysis of Lateral Leakage Loss in Silicon-On-Insulator Thin-Rib Waveguides** T. Nguyen(1), R. Sekhar(2), M. Webster(2), T. Koch(2), A. Mitchell(1) (1)RMIT University, Australia (2)Lehigh University, Australia The lateral leakage behaviour of TM-based silicon-on-insulator thin-rib waveguides is analysed using mode matching technique. Both the TM-TE mode coupling properties and the leakage loss of propagating TM mode are investigated.
	17:00 - 17:15 ThF - 7 **Chip-Based Ultrafast Optical Oscilloscope** A. Gaeta, M. Foster, D. Geraghty, R. Salem, M. Lipson Cornell University, USA We demonstrate a single-shot, ultrafast optical oscilloscope using a four-wave-mixing-based parametric temporal lens integrated on a CMOS-compatible silicon photonic chip. Experimentally, we demonstrate waveform measurement with a 100-ps record length and sub-picosecond resolution.		**17:00-17:15 TuH-5** **Phase Modulator with InGaAs/InAlAs FACQW Grown by MOVPE** R. Hasegawa(1), T. Arakawa(1), T. Amemiya(2), T. Tanemura(2), H. Shimizu(3) (1)Graduate School of Engieneering, Yokohama National University, Japan (2)RCAST , The Univ. of Tokyo, Japan (3)Tokyo Univ. Agri. Tech, Japan The optical properties of InGaAs/InAlAs five-layer asymmetric coupled quantum well (FACQW) grown by MOVPE are investigated. The FACQW phase modulator is fabricated and its large phase shift is successfully observed.	**17:00-17:15 TuI-5** **All-fiber Micro Air Cavity Mach-Zehnder Interferometer Formed by Femtosecond Laser Micromachining** M. Park(1), S. Lee(1), W. Ha(1), J. Kim(1), Y. Jung(2), W. Shin(3), I. Sohn(3), K. Oh(1) (1)Institute of Physics and Applied Physics, Yonsei University, Republic of Korea (2)Optoelectronic Research Centre, University of Southampton, UK (3)Advanced Photonics Research Institute, GIST, Republic of Korea Micro air cavity fiber Mach-Zehnder interferometer (MZI) was experimentally demonstrated by femtosecond laser micromachining process followed by optimal fusion-splicing. Two optical paths were provided by the cavity to result in a characteristic, wide spacing MZI spectra.	**17:00-17:15 TuJ-5** **High-Order Dispersion Engineering for Optimal Four-Wave Mixing** M. Lamont, B. Kuhlmey, C. M. de Sterke Centre for Ultrahigh-Bandwidth Devices for Optical Systems (CUDOS), Australia Four-wave mixing in highly nonlinear materials requires dispersion engineering to obtain anomalous dispersion at telecom wavelengths. We show that tailoring the quartic dispersion can enhance the bandwidth, and propose how to achieve this in practice.

			17:15-17:30 TuH-6 **Absorption Saturation of AlN-based Waveguide Utilizing Intersubband Transition in GaN/AlN Quantum Wells** N. Iizuka(1), T. Shimizu(2,3), C. Kumtornkittikul(2,3), M. Sugiyama(3), Y. Nakano(2,3) (1)Corporate R&D Center, Toshiba Corporation, Japan (2)Reaserach Center for Advanced Sciense and Technology, The university of Tokyo, Japan (3)Department of Electrical Engineering, The University of Tokyo, Japan An AlN-based intersubband optical switch was investigated. Narrow absorption spectrum and low insertion loss were obtained. Absorption saturation by 10 dB was achieved at a wavelength of 1.42 mm with an energy of 50 pJ.	**17:15-17:30 TuI-6** **Tunable Dual-core Liquid-filled Photonic Crystal Fibers for Dispersion Compensation** J.-H. Liou(1), S.-S. Huang(1), H.-C. Chang(2), C.-P. Yu(1) (1)Institute Of Electro-Optical Engineering, National Sun Yat-Sen University, Taiwan (2)Graduate Institute of Photonics and Optoelectronics, National Taiwan University, Taiwan We have theoreticaly investigated the dispersion characteristics of the dual-core liquid-filled PCF. Dispersion values as large as -19000 ps/(nm-km) can be achieved at 1.55 μm wavelength. The proposed structure also demonstrates good tunable properties by temperature.	**17:15-17:30 TuJ-6** **Shaping the Colors of Polychromatic Light in Femtosecond Laser-written Two-dimensional Waveguide Arrays** A. Szameit(1), I. L. Garanovich(2), M. Heinrich(1), A. A. Sukhorukov(2), F. Dreisow(1), T. Pertsch(1), S. Nolte(1), A. T¨unnermann(1), Y. S. Kivshar(2) (1)Institute of Applied Physics, Friedrich-Schiller-University Jena, Germany (2)Nonlinear Physics Centre and Centre for Ultra-high bandwidth Devices for Optical Systems (CUDOS), Research School of Physical Sciences and Engineering, Australian National University, Australia We predict theoretically and observe experimentally new regimes of polychromatic beam shaping in laser-written periodically curved twodimensional waveguide arrays, demonstrating selective control over the strength and dimensionality of spatial di raction for di erent spectral components.
19:00 - 23:00	**Conference Dinner** *Dockside Function Centre, Cockle Bay Wharf*				

Wednesday 9 July 08

	Room: Bayside 201	Room: Bayside 202	Room: Bayside 204a	Room: Bayside 204b	Room: Bayside Auditorium A
	WeA: 8:30-10:00 **Optical Transmission Technologies** Presider: Prof. Gee-Kung Chang	**WeB: 8:30-10:00** **Group IV Materials** Presider: John Canning	**WeC: 8:30-10:00** **Photonic Integration 1** Presider: Shinji Tsuji	**WeD: 8:30-10:00** **Microstructured Fiber Technologies** Presider: Ping Shum	**WeE: 8:30-10:00** **Novel Devices** Presider: Jay Sharping
	8:30-9:00 WeA-1 (Invited) **Towards 1TbE using Coherent WDM** A.D.Ellis(1), F.C.G.Gunning(1), B.Cuenot(2), T.C.Healy(3), E.Pincemin(4) (1)Tyndall National Institute and University College Cork Department of Physics, Cork, Ireland (2)now @ JDSU, France (3)Now @ Intune Networks, Ireland (4)Orange Labs, France In this paper we report the transmission properties of a 0.3 Tbit/s Coherent WDM signal and confirm the scalability of this signal to 0.6 Tbit/s using polarisation division multiplexing.	**8:30-9:00 WeB-1 (Invited)** **Optical Signal Processing in Silicon Nano-waveguides** Y. Su(1), Q. Li(1), F. Liu(1), Z. Zhang(2), M. Qiu(2) (1)State Key Lab of Advanced Optical Communication Systems and Networks, Department of Electronic Engineering, Shanghai Jiao Tong University, China (2)Department of Microelectronics and Applied Physics, Royal Institute of Technology (KTH), Sweden All-optical tunable delay, dense wavelength conversion, and non return-to-zero (NRZ) to alternatemark-inversion (AMI) format conversion are experimentally demonstrated using silicon microrings with a 450 x 250 nm cross-section size.	**8:30-8:45 WeC-1** **Compact 40-Gbit/s Electroabsorption Monolithically Integrated DFB Laser (EML) Module Integrated With a Driver IC for Very Short Reach Application** T. Yagisawa(1), T. Watanabe(2), T. Ikeuchi(1) (1)Fujitsu Laboratories Limited, Japan (2)Fujitsu Limited, Japan We developed a compact 40-Gbit/s EML module integrated with a driver IC by using small boards with high-speed signal lines. Good eye openinig and a good transmission characteristics were obtained.	**8:30-9:00 WeD-1 (Invited)** **Photonic Crystal Fiber for Wide-band Transmission** K. Nakajima, K. Kurokawa, T. Matsui, K. Tajima NTT, Japan Recent research on wide-band transmission over photonic crystal fiber (PCF) is described. PCF with endlessly single-mode (ESM) and unique chromatic dispersion characteristics is expected to be a key transmission medium in future optical networks.	**8:30-8:45 WeE-1** **Highly Efficient Transmission Between 1-D Photonic Crystal Coupled Cavity Waveguides and Straight Waveguides** Y. Kawaguchi, K. Saitoh, M. Koshiba Hokkaido University, Japan We report a design method of tapering structure for highly-efficient coupling between one-dimensional photonic-crystal coupled-cavity-waveguides and straight waveguides. Numerical results show that high transmission over wide bandwidth can be achieved by using proposed waveguide-tapering technique.
			8:45-9:15 WeC-2 (Invited) **InP Integrated Photonic Circuits for Digital Optical Networking** M. Kato, R. Nagarajan, S. Murthy, S.Corzine, V. Dominic, H. Xu, B. Taylor, P. Evans, J. Pleumeekers, A. Dentai, S. Hurtt, M. Fisher, M. Raburn, M. Missey, A. Chen, D. Lambert, P. Chavarkar, J. Bäck, R.Muthiah, R. Salvatore, C. Joyner, J. Rossi, R. Schneider, M. Ziari, A. Nelson, S. Grubb, F. Kish, D. Welch Infinera, USA We review progress in the area of InP large scale photonic integrated circuits (LS-PICs). We will review transmitter and receiver PICs for digital optical networking.		**8:45-9:00 WeE-2** **Surface-Plasmon-Resonance Sensor Based on Suspended-Core Microstructured Optical Fiber** H. Ludvigsen, M. Hautakorpi, M. Mattinen Helsinki University of Technology, Finland We propose a novel surface-plasmon-resonance sensor design based on coating the hole surfaces of a suspended-core optical fiber with low-index dielectric layer on top of which gold layer is deposited.
	9:00-9:15 WeA-2 **Experimental Demonstration of Novel Poly-phase OCDM Code** M. Hanawa(1), K. Hosoya(1), M. Nguyen Van(1), K. Nakamura(1), K. Nonaka(2) (1)University of Yamanashi, Japan (2)Kochi University of Technology, Japan The low cross-correlation property and easy code adaptability of a novel complex-valued OCDM code, the Fourier code, have been demonstrated experimentally. It shows 4.8dB smaller cross-correlation than the frequently used binary Hadamard code.	**9:00-9:15 WeB-2** **Polarization Splitter Using Asymmetric Sidewall Long-Period Waveguide Gratings in a Two-Mode Silicon Waveguide** Y.-B. Cho, G.-J. Oh, D.-M. Yeo, S.-Y. Shin(1) Kaist, South Korea We demonstrate a silicon polarization splitter, which uses sidewall long-period waveguide gratings for coupling between the two core modes. The TM- and TE-like modes are divided in an asymmetric Ybranch. The measured maximum cross-talks of the TM- and TE-like modes are 15.8 and 15.1 dB, respectively. The extinction ratios of port I and II are 18.3 and 12.6 dB, respectively.		**9:00-9:15 WeD-2** **A Study on Holey Fibers for Wide Band Transmission** K. Imamura, K. Mukasa, R. Sugizaki, T. Yagi Furukawa Electric Co., Ltd., Japan Holey fibers suitable for wide band transmission system were numerically studied. By taking the relation between the macro bending loss and the confinement loss into account, the usable transmission band have been clarified.	**9:00-9:30 WeE-2 (Invited)** **Engineering Optical Fibres for Nonlinear Optical Endoscopy** M. Gu Centre for Micro-Photonics, Faculty of Engineering and Industrial Sciences, Swinburne University of Technology, Australia This paper is to review the recent development of fibre-optical nonlinear optical microscopy for 3D endoscope tissue imaging. The new compact probes are designed with a double-clad photonic crystal fibre or a double-clad fibre.

	9:15-9:30 WeA-3 **Comparison of 44.6-Gbit/s NRZ- and RZ-DQPSK Format in 50-GHz-Spacing ROADM System** T. Yoshimatsu(1), Y. Hashizume(1), S. Yamamoto(1), H. Takara(1), H. Kubota(1) (1)NTT Network Innovation Laboratories, NTT Corporation, Japan (2)NTT Photonics Laboratories, NTT Corporation, Japan We compare 44.6-Gbit/s NRZ-DQPSK format with EDC against RZ-DQPSK format for 50-GHz-spacing ROADM system. NRZ-DQPSK with EDC is superior to RZ-DQPSK when ROADM node number exceeds 10.	**9:15-9:30 WeB-3** **Reduced Lateral Leakage Losses of TM-Like Modes in Silicon-On-Insulator Ridge Waveguides** K. Kakihara, K. Saitoh, M. Koshiba Hokkaido University, Japan We numerically investigate the lateral leakage losses of TM-like modes in silicon-on-insulator ridge waveguides and propose a novel ridge waveguide structure with low leakage losses over a wide wavelength range.	**9:15-9:30 WeC-3** **43Gb/s Balanced Photoreceiver Using Monolithic Integrated Lensed Facet Waveguide dual-UTC Photodiodes** M. Achouche, C. Cuisin, E. Derouin, F. Pommereau, J.-Y. Dupuy Alcatel-Thales III-V Lab, France By integrating a monolithic lens using dry etching of the input mirror facet of an UTC photodiode, we have achieved > 4-fold improvement of alignment tolerance in the lateral axis without compromising diode efficiency.	**9:15-9:30 WeD-3** **Experimental Determination of bBands in Solid Core Photonic Bandgap Fibres Using Acoustic Gratings** B. T. Kuhlmey, F. Luan, L. Fu, D.-I. Yeom, B. J. Eggleton CUDOS/The University of Sydney, Australia Using acoustic gratings, we experimentally determine the band structure of an all-solid photonic bandgap fibre and compare it to simulations. We show that the band structure is very sensitive to minute details of the structure.	
	9:30-9:45 WeA-4 **Colorless Upstream Transmission Using Remote Self-Injection Locked Reflective SOA for WDM-PON** S.-Y. Jung(1), T.-Y. Kim(1), S. H. Han(1), G. Y. Lyu(2), C.-S. Park(1) (1)Gwangju Institute of Science and Technology, South Korea (2)Raybit Systems, Inc., South Korea Colorless upstream transmission is demonstrated using a self-injection locked RSOA for a range of 24nm, achieving error free performance after upstream transmission at 1.25-Gb/s over 20-km SMF. The receiver sensitivities were of < -28.5 dBm.	**9:30-9:45 WeB-4** **Progress towards achieving diamond waveguides** M. Hiscocks(1), F. Ladouceur(1), K. Ganesan(2), B. Gibson(2), S. Prawer(2) (1)UNSW, Australia (2)Quantum Communications Victoria, UoM, Australia We report on the progress made towards achieving light guidance in long diamond waveguides (i.e. > mm) fabricated using a combination of photolithography, reactive ion etching (RIE), ion implantation and FIB techniques.	**9:30-9:45 WeC-4** **Oscillating Characteristics of Self-written Active Waveguide Laser With In-line Cavity** K. Yamashita, M. Ito, A. Kitanobou, E. Fukuzawa, K. Oe Kyoto Institute of Technology, Japan A polymer-based gain waveguide structure, □gself-written active (SWA) waveguide□h, was invented. In the SWA waveguide, optical amplification and Fabry-Perot laser oscillation were demonstrated. The SWA waveguide devices will be considerable components for the integrated optoelectronics.	**9:30-9:45 WeD-4** **Bend Sensitive Wavelength Filtering in Concentric Core Solid Photonic Bandgap Fibre** S. Tanigawa, R. Goto, K. Takenaga, S. Matsuo, M. Fujimaki Optics And Electronics Laboratory, Fujikura Ltd., Japan Bend sensitive wavelength filtering property in a concentric core solid photonic bandgap fibre is presented. The property is realised by not only the bandgap effect but mode coupling between the core mode and ring modes.	**9:30-10:00 WeE-4 (Invited)** **Fiber-top Atomic Force Microscope: A Worthwhile Challenge** K. Smith(1), S. de Man(1), H. Zeijlemaker(2), A. A. Said(3), M. Dugan(3), D. Iannuzzi(1) (1)Vrije Universiteit Amsterdam, The Netherlands (2)FOM Institute AMOLF, The Netherlands (2)Translume Inc., USA Fiber-top technology offers an unprecedented opportunity to bring atomic force microscopy outside research laboratories. In this paper we analyze the challenges this technology-transfer process is facing and we discuss why it is worth addressing them.
	9:45-10:00 WeA-5 **A Theoretical Investigation of the Effect of the Block Type Dispersion Map upon a Long-Haul RZ-DPSK System** H. Taga, S.-S. Shu, J.-Y. Wu, W.-T. Shih National Sun Yat-Sen University Performance of a long-haul RZ-DPSK system is theoretically characterized. It is observed that number of dispersion blocks in the dispersion map combined with the SPM causes the performance degradation near the system zero dispersion wavelength.	**9:45-10:00 WeB-5** **Characterisation of Thermally Poled Multilayered Silicate Thin Films** H. An, S. Fleming Optical Fibre Technology Centre, The University of Sydney, Australia We report measurements of the spatial profile of the second-order optical nonlinearity induced in thermally poled silicate thin films. Contrary to the case of bulk silica, the nonlinearity was mainly located at surfaces and interfaces.	**9:45-10:00 WeC-5** **Reconfigurable Multi-Passband Optical Filter Using Opto-VLSI Processor** M. Aljada, K. Alameh Edith Cowan University, Australia A reconfigurable multi-passband optical filter of 0.5nm linewidth and a tuning range of 8 nm is demonstrated using an Opto-VLSI processor. The wavelength tunablility is performed using digital phase holograms uploaded on the Opto-VLSI processor.	**9:45-10:00 WeD-5** **Theoretical Design of Multi-Core Photonic Crystal Fiber Based 1x4 Power Splitters** S. Varshney(1), K. Saitoh(1), R. Sinha(2), M. Koshiba(1) (1)Hokkaido University, Japan (2)Delhi College of Engineering, University of Delhi, India A new design of multi-core photonic crystal fiber (PCF) based 1„e4 power splitter is demonstrated numerically. An equal power division in a ~ 6 mm long PCF device is confirmed through an accurate finite-element beam-propagation-method.	

10:00 - 10:30	Morning Tea				
	Room: Bayside 201	**Room: Bayside 202**	**Room: Bayside 204a**	**Room: Bayside 204b**	**Room: Bayside Auditorium A**
	WeF: 10:30-12:15 **Advanced Modulation Schemes** Presider: Prof. Arthur Lowery	**WeG: 10:30-12:15** **Resonators & Couplers** Presider: Paul Westbrook	**WeH: 10:30-12:15** **Optical Amplifiers** Presider: Hark Hoe Tan	**WeI: 10:30-12:15** **Fiber Sensors** Presider: Kazunori Mukasa	**WeJ: 10:30-12:15** **Novel Materials & Geometries** Presider: Hanne Ludvigsen
	10:30-11:00 WeF-1 (Invited) **Coherent Optical Communications** K. Kikuchi Department of Electrical Engineering and Information Systems, University of Tokyo, Japan After reviewing the 30-year history of coherent optical communication systems, we describe state-of-the-art technologies of the digital coherent receiver, which has enormous potential for future optical networks.	**10:30-10:45 WeG-1** **Ultra-Low CW Power Wavelength Conversion in High-Index Glass Micro Ring Resonators** D. Moss University of Sydney, Australia We present the first demonstration of CW nonlinear optics in integrated glass waveguides. We achieve wavelength conversion via four-wave-mixing with a few mW of CW pump power in a high-index glass micro-ring resonator.	**10:30-11:00 WeH-1 (Invited)** **Fiber Amplifiers for Undersea Application** G. T. Harvey Tyco Telecommunications, USA Undersea fiber optic systems differ greatly from terrestrial systems in terms of their overall system length and their reliability requirements. This paper discusses how these requirements affect amplifier design.	**10:30-11:00 WeI-1 (Invited)** **Applications of Fibre Bragg Grating Sensors in Railroad** H.-Y. Tam	**10:30-11:00 WeJ-1 (Invited)** **Diamond Photonics** S. Prawer, A. Greentree
		10:45-11:00 WeG-2 **Triangular Ring Resonator Incorporating Total Internal Reflection Mirror and Compact Multimode Interference Coupler** D. G. Kim Chung-Ang University, South Korea We report fabrication and measurements on novel triangular ring resonators with extremely small multimode interference couplers and total internal reflection mirrors. Free spectral range and on-off ratio are 256 GHz and 14 dB respectively.			
	11:00-11:30 WeF-2 (Invited) **Advanced Modulation Format Devices for 40Gb/s and 100Gb/s Optical Telecommunication Systems** Y. Lize	**11:00-11:15 WeG-3** **Chalcogenide Microspheres** G. Elliott, D. Hewak ORC, UK Gallium lanthanum sulphide glass microspheres have been produced with diameters from 0.5µm up to 580µm and quality factor of up to 1.2x10^5 at 1.5µm. An ultimate quality factor of 4x10^10 is theoretically possible.	**11:00-11:15 WeH-2** **All-optical Differentiator Based on Cross-gain Modulation in Optical Parametric Amplifier** K. Wong, J. Chau, K. Cheung The University of Hong Kong, Hong Kong An all-optical differentiator making use of cross-gain modulation (XGM) in optical parametric amplifier (OPA) has been demonstrated. The experimental results of differentiating the periodic and pseudo-random signals are shown.	**11:00-11:15 WeI-2** **Simultaneous Measurement of Temparature and Strain Using Long-Period Fiber Grating Inscribed in Photonic Crystal Fiber Combined with Sagnac Loop Mirror** H.-M. Kim(1), T.-H. Kim(2), D. S. Moon(3), Y.-G. Han(4), Y. Chung(1) (1)GIST, South Korea (2)Youngnam University, South Korea (3)Samsung Electronics Hainan Fiberoptics-Korea Co., Ltd, South Korea (4)Hanyang University, South Korea We will propose and experimentally demonstrate optical fiber sensor for simultaneous measurement of temperautre and strain with long-period fiber grating inscribed in photonic crystal fiber combined with Sagnac loop mirror based on polarization-maintaining side-hole fiber.	**11:00-11:15 WeJ-2** **Doped Iron Garnet Materials for Magnetic Photonic Crystals** M. Vasiliev(1), K. Alameh(1), V. Kotov(2) (1)Electron Science Research Institute, Edith Cowan University, Australia (2)Institute of Microtechnology - Spin MT, Russia We have established a set of technologies for the deposition and annealing of magneto-optic garnets for use in photonic crystals. Devices for sensing magnetic fields and polarisation control using reconfigurable photonic crystals are being developed.

		11:15-11:30 WeG-4 **UV-Written Long-Period Waveguide Grating Coupler** C. K. Chow, K. S. Chiang, Q. Liu, K. P. Lor, H. P. Chan City University of Hong Kong, Hong Kong We present a UV -written polymer long - period waveguide grating coupler, which can be tuned over a wavelength range of 100 nm with a temperature control of 22 oC. Its coupling efficiency varies between 57% and 80%.	**11:15-11:30 WeH-3** **Amplitude-noise and Timing-jitter Reduction via Pulsed Injection Locking of SOA Fiber Ring Laser** M. Oiwa, J. Kim, K. Tsuji, N. Onodera, M. Saruwatari National Defense Academy, Japan We demonstrate the amplitude-noise and timing-jitter reduction of repetition pulses by the injection locking of an SOA fiber ring laser. Amplitudenoise and timing-jitter are successfully reduced from 3.50~6.46% to 0~2.68% and 0.41~4.07ps to 0.38~3.07ps, respectively.	**11:15-11:30 WeI-4** **Magnetic Field Sensor Based on Optical Fiber doped with CdSe Quantum Dots** H. Yang, P. Watekar, S. Ju, W.-T. Han Department of Information and Communications, School of Photon Science and Technology, Gwangju Institute of Science and Technology, South Korea We present a magnetic field sensor developed using the CdSe quantum dots doped optical fiber, with detection range from 0 to 0.12 T.	**11:15-11:30 WeJ-3** **Microfluidic Cavities in Silicon-Based Photonic Crystal Slab Waveguides** U. Bog(1), C. Karnutsch(1), C. Smith(1), B. Eggleton(1), T. Krauss(2) (1)Centre for Ultrahigh Bandwidth Devices for Optical Systems (CUDOS), School of Physics, University of Sydney, Australia (2)School of Physics and Astronomy, University of St Andrews, Scotland We demonstrate post-processed, reconfigurable microfluidic double-heterostructure cavities in silicon-based photonic crystal slab waveguides, formed by selective micropipette fluid infiltration. An examination of the induced cavities, performed by evanescent coupling, is presented.
	11:30-11:45 WeF-3 **Bit and Power Loading for Coherent Optical OFDM** Q. Yang(1), W. Shieh(2), Y. Ma(1) (1)Victoria Research Laboratory (NICTA), University of Melbourne, Australia (2)ARC Special Research Centre(CUBIN), University of Melbourne, Australia We show the first experiment of bit and power loading for CO-OFDM. The data rate can be dynamically adjusted according to the channel condition. The performance can be further improved through loading power optimally.	**11:30-11:45 WeG-5** **Dynamics in the Writing of Long-Period Gratings in Boron-Doped Fibers by CO2-Laser Pulses** Y. Liu, H. W. Lee, K. S. Chiang City University of Hong Kong, Hong Kong We investigate the dynamics of writing longperiod gratings in unannealed and annealed boron-doped fiber samples with repeated scanning of CO2-laser pulses. Our results demonstrate clearly the effects of glass structure changes in the writing process.	**11:30-11:45 WeH-4** **Chirp Properties Induced by SOA for Amplification and Wavelength Conversions Measured by an Optical Tunable Bandpass Filter** M. Matsuura, N. Iwatsu, K. Kitamura, N. Kishi Department of Information and Communication Engineering, University of Electro-Communications, Japan Chirp properties induced by a semiconductor optical amplifier (SOA) are investigated by simple chirp measurement method using an optical bandpass filter. We compare the properties among signal amplification and two types of wavelength conversions.	**11:30-11:45 WeI-5** **Ultrasonic Wave Detection using a Simple Design of Optical Fibre Interferometer** H.-C. Wang, S. Fleming Optical Fibre Technology Centre, Australia A simple, effective design of optical fibre interferometer (OFI) is presented. Novel results demonstrate its capability as a non-contacting sensor for accurate measurement of elastic ultrasonic waves on solid samples, and hence important material properties.	**11:30-11:45 WeJ-4** **Laser Induced Generation of Chalcogenide Microspheres and Their Characterisation** C. Grillet, S. Ning Bian, E. C. magi, B. E. Eggleton CUDOS University of Sydney, Australia We report the manufacturing and optical characterization of microsphere in chalcogenide. We show that high-Q modes (~20000) of a 9.2 um diameter chalcogenide glass can be efficiently excited using a tapered fiber.
	11:45-12:00 WeF-4 **Decision-feedback Carrier-phase Estimation for Digital Coherent Optical Receivers** Y. Mori, K. Igarashi, K. Katoh, K. Kikuchi The University of Tokyo, Japan We propose a novel method of carrier-phase estimation for digital coherent optical receivers, which is based on the decision-feedback loop and the adaptive-equalization algorithm. 10-Gsymbol/s QPSK and 16-QAM signals are demodulated by the proposed method.	**11:45-12:00 WeG-6** **Fabrication of Benzocyclobutene Multimode Interference Power Splitters** W.-S. Wang, Y.-S. Chang National Taiwan University, Taiwan Buried-type benzocyclobutene optical waveguides fabricated by the illumination of ultraviolet laser shots are presented. Experimental results show multimode interference power splitters can be fabricated with high accuracy, short time, and good controllability.	**11:45-12:00 WeH-5** **Study of Nonlinear Polarization Rotation in Semiconductor Optical Amplifiers** S. Zhao, C. Wu, M. Cheng, X. Sheng Optical Information, School of Science, Beijing Jiaotong University, China We proposed a geo metrical model to describe the NPR in SOA. There exists PSPv and PDGv. Their expressions with regard to parameters of SOA are obtained. Theoretical results accord well with the experimental data.	**11:45-12:00 WeI-6** **Thermal Characteristics of a Fiber Fabry-Perot Etalon Made of PANDA Fiber** M. Tateda, A. Takashi Chiba University, Japan Thermal characteristics of a fiber Fabry-Perot etalon made of polarization maintaining fiber is investigated. The transmission frequency separation due to birefringence showed a temperature dependence of -132 MHz/deg which is 17 times larger than conventional etalons.	**11:45-12:00 WeJ-5** **Photo-induced Cavities in Chalcogenide Photonic Crystals** M. Lee, C. Grillet, S. Tomljenovic-Hanic, C. Smith, C. Monat CUDOS, School of Physics, University of Sydney, Australia We demonstrate a photonic crystal (PC) cavity formed post-fabrication by locally modifying the refractive index of a chalcogenide PC by using the photosensitivity of the chalcogenide glass.

	12:00-12:15 WeF-5 **Linewidth-Tolerant Real-Time 10 Gbit/s 16QAM Homodyne Using a Polarization-Multiplexed Pilot-Carrier** M. Nakamura, Y. Kamio, T. Miyazaki National Institute Of Information And Communications Technology (NICT), Japan Linewidth tolerant 2.5-Gsymbol/s (10-Gbit/s) 16-QAM real-time modulation/demodulation of BER of less than 10-9 was experimentally demonstrated using a DFB-LD with a linewidth of 30-MHz.	**12:00-12:15 WeG-7** **All-fiber Variable Optical Attenuator based on 2x2 Fused Tapered Coupler for High-power Applications** Y. Jeong(1), W. Ha(1), J. K. Kim(1), W. Shin(2), D.-K. Ko(2), J. Lee(2), and K. Oh(1) (1)Institute of Physics and Applied Physics, Yonsei University, Republic of Korea (2)Advanced Photonics Research Institute, Republic of Korea All fiber variable attenuator was realized by applying torsional stress over a 2x2 fused tapered coupler. The spectral response and transmission was flexibly tuned to result in 40dB dymanic range for 2Watt laser at 1550nm.	**12:00-12:15 WeH-6** **Parabolic and Quasi-Parabolic Coupled Propagating Regimes in Optical Amplifiers** V. Kruglov, D. Méchin, J. Harvey University of Auckland, New Zealand New self-similar coupled propagating regimes have been found in optical amplifiers: the asymptotical parabolic, the asymptotical quasi-parabolic and the intermediate quasi-parabolic. Numerical simulations have confirmed the predicted power distributions and chirp functions for the solutions.		**12:00-12:15 WeJ-6** **High-Q Cavities in Multilayer Photonic Crystal Slabs** S. Tomljenovic-Hanic(1), M. de Sterke(1), M. Steel(2), B. Eggleton(1), Y. Tanaka(3) (1)University of Sydney, Australia (2)Macquarie University, Australia (3)Kyoto University, Japan We design multilayer photonic crystal cavities by depositing a polymer layer on top of a silicon photonic crystal slab. We demonstrate numerically that such cavities can have quality factors of Q_f106.
12:15 - 13:30	**Lunch**				
	Room: Bayside 201	**Room: Bayside 202**	**Room: Bayside 204a**	**Room: Bayside 204b**	**Room: Bayside Auditorium A**
	WeK: 13:30-15:00 **Performance Monitoring** Presider: Trevor Anderson	**WeL: 13:30-15:00** **Optical Interconnects & LANs** Presider: Changyuan Yu	**WeM: 13:30-15:00** **VCSEL & DBR** Presider: TBA	**WeN: 13:30-15:00** **Nanowires and Structures** Presider: Mark Pelusi	**WeO: 13:30-15:00** **Devices For Optical Interconnects** Presider: David Moss
	13:30-14:00 WeK-1 (Invited) **Multi-impairment Monitoring – Challenges and Directions** A. Nirmalathas, Y. Zhou, T. Anderson National ICT Australia (NICTA), Victoria Research Laboratory, Dept. of Electrical and Electronic Engineering, The University of Melbourne, Australia. Optical performance monitoring technologies are widely regarded as one of the key requirements for the realization of fully reconfigurable dynamic optical networks. Already a number of techniques have been developed to address the issue and in this paper, we review some of the potential candidates for simultaneous monitoring of multiple impairments in optical communication links.	**13:30-14:00 WeL-1 (Invited)** **Recent Research Progress in Hybrid Fibre-optic In-building Networks** A.M.J. Koonen(1), H. Yang(1), H.-D. Jung(1), Y. Zheng(1), J. Yang(1), H.P.A. van den Boom(1), E. Tangdiongga(1) (1)COBRA Institute, Eindhoven University of Technology, The Netherlands Advanced optically-emulated x-QAM techniques and the modal dispersion-robust radio-over-fiber OFM technique enable the delivery of high-capacity data via a single multimode (silica or polymer) optical fiber in-building network to wired as well as wireless terminals.	**13:30-13:45 WeM-1** **Double-path Resonance of a Mode-locked VCSEL Using a Concave Mirror** T. Kato, A. Matsutani, T. Sakaguchi, K. Kobayashi Tokyo Institute of Technology, Japan We have demonstrated mode-locking using a VCSEL and a concave mirror with new double-path resonance scheme. This scheme was found to provide significant improvement in the position tolerance between the VCSEL and the concave mirror. **13:45-14:00 WeM-2 (Invited)** **Fast and Widely Tunable Integrated DBR Lasers** S. Tsuji, H. Arimoto	**13:30-14:00 WeN-1 (Invited)** **Optical Fibre Nanowire Technology and Applications** G. Brambilla Optoelectronics Research Centre, UK A review of optical fibre nanowires and their applications is presented.	**13:30-14:00 WeO-1 (Invited)** **Convergence and Integration of Photonics Technology Platform– Enabling Drivers** S. Charbonneau

	14:00-14:15 WeK-2 **Measuring Dispersion in WDM Links with Modulated Background ASE** G. Pendock(1), W. Shieh(1), X. Yi(2), C. Yu(3) (1)Centre for Ultra -Broadband Information Networks, Dept Electrical Engineering, Univeristy of Melbourne, Australia (2)Dept Electrical & Computer Engineering, Univeristy of California, USA (3)A*STAR Inst. for Infocomm Research, National University of Singapore, Singapore We demonstrate a technique for monitoring dispersion in WDM systems that is based on injecting RF modulated background ASE. We discuss the noise processes that limit its measurement accuracy.	**14:00-14:15 WeL-2** **Dynamic Skew Compensation for 40-Gb/s/ch Multi-Wavelength Parallel Transmission with OTN Frame** Y. Sun, T. Ono, A. Takada NTT Network Innovation Laboratories, Japan This paper proposes a dynamic skew compensation mechanism for multi-wavelength parallel transmission by using 40-Gb/s/ch OTN physical-layer multiframe architecture. The feasibility is verified by FPGA simulation.	Central Research Laboratory, Hitachi Ltd., Japan A short-cavity laser array with active distributed Bragg reflectors was developed for optical networks that require fast wavelength switching. Wavelength tuning and switching characteristics using this laser array were also investigated.	**14:00-14:15 WeN-2** **Trimming of Tapered Fiber Ring Resonator by Light Injection** K. Kashiwagi, S. Yamashita The University of Tokyo, Japan We propose and demonstrate optically controllable tapered fiber based ring resonators. Light injection through a resonator broadened its free spectral range by changing the shape of the resonator.	**14:00-15:00 WeO-2 (Tutorial)** **Devices for Optical Interconnects to Chips** D. Miller Ginzton Laboratory, Stanford University, USA This tutorial will discuss the requirements for devices for optical interconnects to chips, and recent progress in devices that are integrable with silicon technology, including germanium quantum wells.
	14:15-14:30 WeK-3 **Novel Signed Chromatic Dispersion Monitoring Technique Based on Asymmetric Waveform Distortion in DQPSK Receiver** H. Kawakami, E. Yoshida, H. Kubota, Y. Miyamoto NTT Network Innovation Laboratories, Japan We propose a novel monitoring technique targeting chromatic dispers ion (CD) in a DQPSK system. A signed non -intrusive monitor can be realized by using asymmetric wave for m distortion in a 43 Gbit/s DQPSK system without pilot tone.	**14:15-14:30 WeL-3** **EPON-based Intranet System** M. Hattori, K. Tanaka, Y. Horiuchi KDDI R&D Laboratories Inc., Japan We propose an EPON-based intranet system using newly developed ONU-embedded PCI cards. We confirm the practical feasibility of the system by clarifying the features and assessing the performance.	**14:15-14:30 WeM-3** **Direct Modulation of Photonic Crystal VCSELs** K. Choquette(1), C. Chen(1), D. Siriani(1), P. Leisherr(2) (1)University of Illinois, USA (2)nLight Corporation, Canada A Photonic crystal pattern fabricated into ionimplanted VCSELs can engineer the spatial overlap between the optical mode and gain cross section for improved high speed operation and reduced relative intensity noise. The ion-implanted aperture should be no more than 3um larger than the optical aperture in order to avoid excessive electrical parasitics. 12.5 Gb/s large signal modulation of a single mode implant-confined photonic crystal VCSEL is demonstrated.	**14:15-14:30 WeN-3** **Kerr Nonlinearity in Small Core Optical Fibres and Nanowires: A Generalised Model, and Application to Mmicrostructured Fibres** S. Afshar, T. Monro Centre of Expertise in Photonics, School of Chemistry & Physics, University of Adelaide, Australia We develop a generalized relation for effective nonlinear coefficients of waveguides with arbitrary refractive index profiles. Significant differences between the new definition and usual one are demonstrated in the regime of strong guidance.	
	14:30-14:45 WeK-4 **Dynamic Monitoring of Physical Link Performance for Path Computation In Transparent Optical Networks** J. H. Lee, N. Yoshikane, T. Tsuritani, T. Otani KDDI R&D Laboratories Inc., Japan We propose a link performance monitoring technique based on a dedicated optical monitoring channel to dynamically assess link performance like link OSNR and link MPI crosstalk for path computation in transparent optical networks.	**14:30-14:45 WeL-4** **Campus-scale Wavelength Routing Network Testbed for Large Contents Distribution Applications** K. Oguchi(1), S. Terada(1), D. Hanawa(1), K. Noguchi(2), A. Okada(2) (1)Seikei University, Japan (2)NTT Photonics Laboratories, Japan The design of and demonstration results for a campus-scale wavelength routing network testbed are described. 4K digital cinema contents are successfully transmitted over the testbed network via 8 ê and GbE interfaces to verify the feasibility of the network.	**14:30-14:45 WeM-4** **Optically Pumped Equilateral Triangular Microlasers With Three Mode-selective Trenches** H. Hattori, D. Liu, H. Tan, C. Jagadish The Australian National University, Australia Triangular laser devices can provide cheap, compact and high performance optical sources. We modify a large equilateral triangular laser by adding three mode-selective trenches and obtain a quasi single-mode operation for this device.	**14:30-14:45 WeN-4** **Nanostructures in tapered air-silica fibres** C. Rollinson(1), S. Huntington(1), B. Gibson(2), S. Rubanov(3), J. Canning(4) (1)School of Physics, The University of Melbourne, Australia (2)Quantum Communications Victoria, The University of Melbourne, Australia (3)Bio21 Institute, The University of Melbourne, Australia (4)Interdisciplinary Photonics Laboratories, School of Chemistry, University of Sydney, Australia Using a combined FIB and SEM technique, tapered air-silica structured fibres have been cleaved and characterised to outer diameters as small as ~200 nm. The results are compared with the predicted modes for such structures.	

	14:45-15:00 WeK-5 **Optical Signal Monitoring of DPSK Signals Using RF Power Detection** C. Lu, J. Zhao The Hong Kong Polytechnic University, Hong Kong We demonstrate DPSK signal dispersion monitoring by measuring low frequency RF power. This scheme can realize dispersion monitoring up to 4320ps/nm with sensitivity to 0.045dBm/ps/nm. OSNR effect on the monitoring system is studied and discussed.	**14:45-15:00 WeL-5** **The Implementation of the DS-SWFQ Mechanism for 10-Gigabit Ethernet Interface** R. Kawate, K. Koguchi, T. Yokotani, K. Shimokasa Mitsubishi Electric Corporation, Japan This paper reports our prototyping of the DS-SWFQ mechanism for 10-Gigabit Ethernet interface. This mechanism provides a low delay transmission and a guaranteed minimum bandwidth on multiplexing a large number of traffic flows.	**14:45-15:00 WeM-5** **Chaos Synchronisation in Unidirectionally Coupled VCSELs with Polarisation-Preserved and Polarisation-Selected Injection** A. Shore, Y. Hong, M. W. Lee, J. Paul, Pl. Spencer Bangor University, Wales, UK We study experimentally chaos synchronisation in unidirectionally coupled VCSELs. The results show that the quality of synchronisation with polarisation-preserved optical injection is significantly higher than that with polarisation-selected optical injection.	**14:45-15:00 WeN-5** **Development of Polarization-Maintaining Comb-like Profiled Fiber** M. Takahashi, J. Hiroishi, T. Inoue, M. Tadakuma, Y. Mimura, T. Yagi Furukawa Electric Co., Ltd., Japan We developed polarization-maintaining comb-like profiled fiber (CPF) for the first time. Extinction ratio of 20dB was achieved in a whole length of fabricated 4-step CPF. 10GHz repeating, 2.4ps pulse train was successfully compressed to 0.9ps.	
15:00 - 15:30	**Afternoon Tea**				

	Room: Bayside 201	Room: Bayside 202	Room: Bayside 204a	Room: Bayside 204b	Room: Bayside Auditorium A
	WeP: 15:30-17:00 **Emerging Technologies** Presider: Katsumi Takano	**WeQ: 15:30-17:00** **Long-haul & Core Networks** Presider: Rod Tucker	**WeR: 15:30-17:00** **Photonic Integration 2** Presider: Masaki Kato	**WeS: 15:30-17:00** **High Power Fiber Technologies** Presider: Tanya Monro	**WeT: 15:30-17:00** **Localisation Of Light** Presider: Lindsay Botten
	15:30-16:00 WeP-1 (Invited) **CMOS-Compatible Si Avalanche Photodetectors for Microwave Photonics Applications** W.-Y. Choi, H.-S. Kang Department of Electrical and Electronic Engineering, Yonsei University, Korea We demonstrate that CMOS-compatible Si avalanche photodetectors (CMOS-APD) are very useful for microwave photonics applications. CMOS-APDs are fabricated with 0.18 μm standard CMOS technology. Using the CMOS-APD, radio-over-fiber systems for IEEE 802.11a WLAN are realized. In addition, fibersupported 60 GHz self-heterodyne systems are implemented by utilizing the CMOS-APD as a harmonic optoelectronic mixer.	**15:30-16:00 WeQ-1 (Invited)** **Mixed 10/40/100-Gb/s Transmission Through Bandwidth-Managed ROADMs** S. Chandrasekhar, X. Liu Bell Labs, Alcatel-Lucent, USA We survey reconfigurable optical add/drop multiplexer (ROADM) architectures that enable efficient and flexible bandwidth utilization in dense wavelength division multiplexed (DWDM) systems. Recent system demonstrations showing the potential of in-service capacity upgrade by using mixed 10-Gb/s, 40-Gb/s, and 100-Gb/s channels in a same network are reviewed.	**15:30-15:45 WeR-1** **Fabrication of 8 ch DFB-LD-PLC Hybrid Integrated Module With Active Alignment Optical Connection** T. Akutsu(1), J. Hasegawa(1), K. Nara(1), M. Funabashi(2), H. Hasegawa(2) (1)The Furukawa Electric Co., Ltd., Fitel Photonics Lab., Japan (2)The Furukawa Electric Co., Ltd., Yokohama R&D Lab., Japan An 8 ch DFB-LD-PLC hybrid device was fabricated with high precision active alignment. The coupling loss between the DFB-LD and the PLC was 3.6 dB. All of 8 ch DFB-LDs oscillated appropriately.	**15:30-16:30 WeS-1 (Tutorial)** **Bend Distortion in Large Mode Area Fiber Amplifiers** J. M. Fini OFS Laboratories, USA	**15:30-15:45 WeT-1** **Modelling Time Reversal Experiments in the Optical Domain** B. Marks(1,2), M. Steel(1,2), A. Rahmani(2,3) (1)MQ Photonics Research Centre and Dept of Physics, Macquarie University, Australia (2)Centre for Ultrahigh-bandwidth Devices for Optical Systems (CUDOS), Australia (3)Dept of Mathematical Sciences, University of Technology, Australia We present a rigorous numerical study of the subwavelength focusing of electromagnetic waves using a time-reversal mirror, and show that the diffraction limit can be overcome in the optical domain.
			15:45-16:00 WeR-2 **High-Power Microwave Photodiode Array for Radio over Fiber Applications** T. Nagatsuka, S. Itakura, K. Sakai, Y. Hirano Mitsubishi Electric Corporation, Japan We designed a high-power microwave photodiode array consisting of an optical divider, a four-element InGaAs pin photodiode array and an RF power combiner. The developed array achieved RF output power of 1W at 5GHz.		**15:45-16:00 WeT-2** **Optical Coherent Signal Transmission Through Surface Plasmon and Optical Near Field** M. Fukuda, A. Utsumi Toyohashi University of Technology We present the first report of optical frequency-multiplexed signal transmission through surface plasmons and the optical near field generated in a random metal-dielectric film composed of submicrometer-sized silica balls and silver.
	16:00-16:15 WeP-2 **FCC-indoor-mask Compliant UWB-IR Signal Generation** M. Hanawa(1), K. Nakamura(1), K. Nonaka(2) (1)University of Yamanashi, Japan (2)Kochi University of Technology, Japan An experimental demonstration of a FCC-compliant UWB-IR signal generation has been reported. Modified doublet pulses were used to make a notch in the GPS band. EIRP spectra have been well-matched to the FCC mask.	**16:00-16:15 WeQ-2** **Comparisons Between Single and Double Sideband Direct-Detection and Coherent Baseband OFDM Optical Transmission** D. Hewitt, N. Nadarajah NICTA Victoria Laboratory, Electrical & Electronic Engineering, University of Melbourne, Australia We investigate the complex interactions between sidebands for baseband DSB coherent optical OFDM systems and propose the use of SSB coherent OFDM to avoid sideband interaction in dispersive fibre.	**16:00-16:15 WeR-3** **10-Gb/s Full C-band Operation of InP Mach-Zehnder Modulator Co-packaged with Tunable Laser Array under Constant Modulation Voltage** M. Ishikawa, K. Tsuzuki, N. Kikuchi, K. Kasaya, Y. Shibata NTT Photonics Laboratories, NTT Corporation, Japan Full C-band 10-Gb/s operation and 100-km single-mode fiber transmission with low power penalty are demonstrated by using an InP Mach-Zehnder modulator co-packaged with a tunable laser array under a constant modulation voltage condition.		**16:00-16:15 WeT-3** **Modes of Composite Defects in 2D Photonic Crystals** K. B. Dossou(1), L. C. Botten(1), S. Mahmoodian(2), R. C. McPhedran(2), C. G. Poulton(1) (1)University of Technology, Sydney, Australia (2)University of Sydney, Australia We demonstrate the existence of a class of defects in 2D photonic crystals, for which the eigenstates depend only on the defect geometry, and not on details like photonic crystal parameters or defect size.

	16:15-16:30 WeP-3 **40Gb/s Operation Performance of an Optical Serial-to-Parallel Converter With Phase-Shifted Preamble and Mach-Zehnder Delay Interferometers** G. Yazawa, H. Uenohara Tokyo Institute of Technology, Japan We Propose the new method of an optical serial-to-parallel converter using a phase-shifted preamble and delay interferometers with high-speed and low power consumption. Operation performance at 40Gb/s was obtained analytically and experimentally.	**16:15-16:30 WeQ-3** **A Central Control Optical Burst Switching Scheme** C. Y. Li, P. K. A. Wai The Hong Kong Polytechnic University, Hong Kong We propose a central control optical burst switching scheme that can provide higher system throughput even when the data burst transmission time is much smaller than the propagation time between nodes.	**16:15-16:45 WeR-4 (Invited)** **Fast Pulsed Mode-locked Lasers** E. Bente(1), M. Heck(1,2), P. Muñoz(3), A. Renault(2), R. Nötzel(1), M.Smit(1) (1)COBRA Research Institute, Technische Universiteit Eindhoven, The Netherlands (2)Laser Centre Vrije Universiteit, The Netherlands (3)Grupo de Comunicaciones Opticas, Universidad Politecnica de Valencia, Spain InP integration technology and InAs/InP(100) quantum dot gain material are shown to be promising for realising fully integrated modelocked laser systems operating at 1.5µm. Fast switching of output pulse parameters is possible with such systems.		**16:15-16:30 WeT-4** **The Role of Dimensionality and Dispersion for Defects in Photonic Crystals** S. Mahmoodian(1), K. Dossou(2), R. McPhedran(1), L. Botten(2), M. deSterke(1) (1)CUDOS, University of Sydney, Australia (2)CUDOS, University of Technology, Sydney, Australia We show that band-edge curvature and dimensionality control photonic crystal defect modes. We find frequencies of localised defect modes as a function of defect strength for weak defects, linking our results to effective mass.
	16:30-16:45 WeP-4 **A Composite Microwave Photonic Link System For Increased Dynamic Range** K. Gupta, A. Lindsay, R. Lindop, D. Palumbo, T. Priest, A. Vanderklugt Defence Science and Technology Organisation, Australia A composite microwave photonic link system exhibiting significantly increased dynamic-range is demonstrated. The compressive dynamic range achieved was >104dB while the spurious-free dynamic range was >96dB, both in a 20MHz receiver noise bandwidth in the frequency range 2-10GHz.	**16:30-16:45 WeQ-4** **An Optical Crosspoint Buffered Switching Architecture** L. Cai(1), C.Y. Li(1), P.K.A. Wai(1), A. Xu(2) (1)The Hong Kong Polytechnic University, Hong Kong (2)Pecking Universtiy, China We propose an optical crosspoint buffered switching fabric to simplify the implementation of optical packet switches. With the proposed switching fabric architecture, the control complexity of the optical buffers can be significantly reduced.		**16:30-16:45 WeS-2** **High Power Laser Fibers - Comparison of Aluminium and Phosphorus Codoping** J. Kirchhof, S. Unger, A. Schwuchow, S. Jetschke, V. Reichel Institute of Photonic Technology, Germany Fibers with a composition of Yb2O3-P2O5-SiO2 and Yb2O3-Al2O3-SiO2 were prepared via MCVD and solution doping and characterized regarding absorption, emission, photodarkening and lasing. Significantly different behaviour of Yb3+ in both glasses was found and discussed.	**16:30-16:45 WeT-5** **Spatiotemporal Light Localization in Infiltrated Waveguide Arrays** P. D. Rasmussen(1), D. Neshev(2), A. Sukhorukov(2), Krolikowski(2), O. Bang(1) (1)DTU Photonics, Technical University of Denmark, Denmark (2)Nonlinear Physics Centre and Laser Physics Centre, Centre for Ultrahigh bandwidth Devices for Optical Systems, Research School of Physical Sciences and Engineering, Australian National University, Australia We study light propagation in hexagonal waveguide arrays and show that simultaneous spatiotemporal localisation is possible by combination of engineered anomalous dispersion through selective excitation of Bloch-modes and spatial confinement in a nonlinear defect mode.
	16:45-17:00 WeP-5 **UWB Monocycle Pulse Generation Based on Transfer Curve of Two Mach-Zehnder Modulators** C. K. Oh, T.-Y. Kim, C.-S. Park Department of Information and Communications, Gwangju Institute of Science and Technology, Republic of Korea A novel ultra-wideband monocycle pulse generation method based on transfer curve of two Mach-Zehnder modulators (MZMs) is proposed. By changing the bias voltage of MZMs, positive and negative polarity monocycle pulses are generated.	**16:45-17:00 WeQ-5** **Multi Root Node Structure for Dynamic Multi-source Multicasting in IP/MPLS over WDM Networks** S. Hassani, W.-D. Zhong, S. K. Bose Nanyang Technological University, Singapore A multi-root node structure for dynamic multicasting is proposed to support multi-source bidirectional multicasting in IP/MPLS over WDM networks. The blocking probability of this method is studied.	**16:45-17:00 WeR-5** **Optical Bistability in a Semiconductor Fiber Laser Incorporating an Electro-Absorption Modulator** M. Depa, L. Chen Department of Electrical and Computer Engineering, McGill University, Canada We demonstrate optical bistability in a semiconductor fiber laser incorporating an electro-absorption modulator. The width of the bistable region can be controlled by simple adjustment of the laser operating parameters.	**16:45-17:00 WeS-3** **Highly Efficient 70W All-fibre Tm-doped Laser System Operating at 1908nm** G. Frith, A. Carter, B. Samson, J. Farroni, K. Farley, K. Tankala. Nufern, USA Achieving efficient operation from 790nm-pumped Tm-doped fibres at wavelengths <1.95µm requires careful attention to fibre and device design. We present a high-efficiency MOPA producing 70W at 1908nm with 53% slope efficiency from the PA stage.	**16:45-17:00 WeT-6** **Nonlinear Surface Modes in Annular Waveguides** X. Zhiyong The Australian National University, Australia We introduce a novel type of surface waves that can be excited at the edge of annular waveguides. We demonstrate that such surface waves can rotate upon propagation and feature power thresholdless for existence.
Room: Bayside Auditorium A					
17:15 - 18:30	**Post Deadline Sessions**				

Thursday 10 July 08

	Room: Bayside 201	Room: Bayside 202	Room: Bayside 204a	Room: Bayside 204b	Room: Bayside Auditorium A
	ThA: 8:30-10:30 **Polymer Devices** Presider: Arnan Mitchell	**ThB: 8:30-10:30** **Novel Network Architecture & Functionalities** Presider: William Shieh	**ThC: 8:30-10:30** **Fiber Lasers** Presider: Erwin Bente	**ThD: 8:30-10:30** **Microwave Photonics** Presider: Shu Namiki	**ThE: 8:30-10:30** **Fiber Materials and Physics** Presider: John Fini
	8:30-9:00 ThA-1 (Invited) **Polymer Optical Waveguide Devices for FTTH** N. Yoshitake, Y. Terakawa, H. Hosokawa Advanced Device Laboratory, Corporate R&D Headquarters, OMRON Corporation, Japan Unique replication technology and V-groove integration technology for fabricating low cost polymer optical waveguide device have been developed. With these technologies, low cost coupler modules with practical performance are successfully demonstrated.	**8:30-9:00 ThB-1 (Invited)** **An Evolution Method for Next-Generation Access Networks With a Reconfigurable Remote Node** J. H. Lee, K.-M. Choi, J.-H. Moon, C.-H. Lee Department of Electrical Engineering and Computer Science, Korea Advanced Institute of Science and Technology (KAIST), South Korea Efficient evolution methods maintaining existing legacy PON services and fiber infrastructure are discussed for next-generation access networks. A user-by-user evolution from legacy PONs to NG-PONs and reuse of video-overlay wavelength band for NGPON are demonstrated with remotely reconfigurable remote nodes.	**8:30-8:45 ThC-1** **Multiple-watt Tm3+, Ho3+-co-doped Silica Fibre Laser Tunable Across Both Dopant Transitions** A. Sabella(1), A. Hemming(1), S. Bennetts(1), S. D. Jackson(2), D. G. Lancaster(1) (1)Electro Optics Technology Group, Defence Science and Technology Organisation, Australia (2)OFTC, Sydney University, Australia We have obtained tunable laser emission across both Tm3+ and Ho3+ transitions in a 0.79-µm pumped Tm3+, Ho3+-co-doped silica fibre laser. For a 2.3m fibre a 1920-2125nm tuning range was measured with 3.6W maximum power.	**8:30-9:00 ThD-1 (Invited)** **Single Passband, Tunable, Photonic Microwave Filter Based on Supercontinuum and Hi-Bi Fiber Interferometric Filter** J. H. Lee(1), W. J. Jeong(1), S. B. Lee(2), Y. M. Chang(3) (1)School of Electrical and Computer Engineering, University of Seoul, Republic of Korea (2)Photonics Research Team, Korea Institute of Science and Technology, Republic of Korea (3)Technology Research Center, FST Co., Republic of Korea We experimentally demonstrate a novel photonic microwave bandpass filter with capability of frequency tuning and single passband. The filter is constructed by using a CW, depolarized supercontinuum and a multiple segment, Hi-Bi fiber-based interferometric filter.	**8:30-9:00 ThE-1 (Invited)** **Breakthroughs in Nonlinear Optical Materials for Signal Processing Applications** B. Luther-Davies Australian National University, Australia I review the material requirements for all-optical processing and describe our progress based on the use of waveguide devices fabricated in nonlinear chalcogenide glass.
			8:45-9:00 ThC-2 **110W 790nm Pumped 1908nm Thulium Fibre Laser** S. Bennetts, A. Hemming, A. Davidson, D. Lancaster Electronic Warfare And Radar Division, Defence Science And Technology Organisation, Australia We describe the highest power 790nm pumped 1908nm thulium fibre laser reported with an output of 110W and a resolution limited linewidth of 0.5nm.		
	9:00-9:15 ThA-2 **Multimode Parallel Polymer Optical Waveguide with Graded-Index Rectangular Cores for Optical Interconnects** T. Kosugi, T. Ishigure Keio University, Faculty of Science and Technology, Japan A novel polymer parallel waveguide with 4-channel rectangular graded-index cores is fabricated successfully by the preform method. We demonstrate that theis novel waveguide has superier optical propeties to conventional waveguides with step-index core.	**9:00-9:15 ThB-2** **10 Gb/s Upgrade for High-Split and Long-Reach PON Using Remote Repeater** N. Nadarajah(1), A. Tran(2), C.-J. Chae(1) (1)National ICT Australia (NICTA), Australia (2)2ARC Special Research Centre for Ultra-Broadband Information Networks (CUBIN), Australia We report a 10 Gb/s upgrade mechanism of an existing optical access network while enabling high split and long reach transmissions using a remote repeater. The proposed system employs standard transceivers and demonstrates good performance.	**9:00-9:15 ThC-3** **A 226W High Power Thulium Doped Fibre Laser** A. Hemming, S. Bennetts, A. Davidson, N. Carmody, D. Lancaster Electro-Optical Technologies Group, Defence Science and Technology Organisation, Australia We report a thulium doped fibre laser operating at 2 microns with an input power of 226W and a slope efficiency of 50%. The laser displayed moderate beam quality of 2.0-2.4 times the diffraction limit.	**9:00-9:15 ThD-2** **New Photonic Signal Processor with Wavelength Re-use and Bipolar Taps** T. Huang, X. Yi, R. Minasian The University of Sydney, Australia A new photonic signal processor with wavelength reusability that can generate multiple taps including bipolar taps, is presented. It features coherence-free operation, and offers the ability of providing scalability and reconfigurability.	**9:00-9:15 ThE-2** **All-Optical Signal Gating in Cascaded LPGs of Ag Nanoparticles Incorporated Germano-Silicate Optical Fiber** A. Lin(1), P. R. Watekar(1), X. Liu(2), Y. Chung(1), W.-T. Han(1) (1)Gwangju Institute of Science and Technology (GIST), South Korea (2)State Key Laboratory of Transient Optics and Photonics, Xi¡¯an Institute of Optics and Precision Mechanics, Chinese Academy of Sciences, Xi¡¯an 710068, China All-optical signal gating based on cross-phase modulation was demonstrated in the cascaded LPGs of the optical fiber incorporated with Ag-nanoparticles. 10% modulation depth of a signal at 499nm was obtained with pump intensity of 1GW/cm2.

	9:15-9:30 ThA-3 **Compact and Low Power Operation Thermo-optic MMI-based Polymer Photonic Switch** N. Xie, K. Utaka Waseda University, Japan We demonstrate a compact polymer-based photonic switch with low power operation of 9mW. This compact polymer switch exhibits a low switching crosstalk of -23dB with an MMI device length of 510μm.	**9:15-9:30 ThB-3** **Channel Identification with Low-Resolution Optical Spectrum Monitors** M. Li, G. Pendock, R. Evans National ICT Australia, Dept. Electrical and Electronic Engineering, The Univerisity of Melbourne, Australia We demonstrate how a severely blurred spectral measurement taken with a low-resolution spectrum monitor can be sufficiently enhanced to enable channel bit-rates and modulation formats to be determined.	**9:15-9:30 ThC-4** **Holmium Doped Silica Fibre Lasers** S. Jackson Optical Fibre Technology Centre, Australia I review our recent work concerning the direct diode pumping of Ho3+-doped silica fibre lasers with diodes operating at 1150 nm.	**9:15-9:30 ThD-3** **RF Photonic Instantaneous Frequency Measurement Using DC Photo-Detection** H. Emami, N. Sarkhosh, L. Bui, A. Mitchell RMIT University, Australia A microwave photonic Instantaneous Frequency Measurement (IFM) system based on a photonic transversal approach and DC-detection is proposed and practically demonstrated. This system is able to measure the RF frequency and power level independently.	**9:15-9:30 ThE-3** **Porous Fibre: A Novel THz Waveguide** S. Atakaramians(1&2), S. Afshar V.(1), B. M. Fischer(2), D. Abbott(2), T. M. Monro(1) (1)Centre of Expertise in Photonics, School of Chemesrty and Physics (2)Centre for Boimedical Engineering, School of Electrical and Electronics Engineering, The University of Adelaide, Australia We propose a novel class of fibre with a porous core transverse cross-section that can offer a combination of low transmission loss and high mode confinement in the THz regime.
	9:30-9:45 ThA-4 **Fabrication of a Polymer Based Variable Optical Attenuator Using Liquid Crystal Cladding on Inverted Channel Waveguide Structure** Y. Xu, M. A. Uddin, P. S. Chung, H. P. Chan City Univeristy of Hong Kong, Hong Kong Using nematic liquid crystal as the upper cladding of inverted polymer waveguide structure, we fabricated a variable optical attenuator which exhibited a 24dB of attenuation range with a tuning range of 10 Vpeak at 1550nm.	**9:30-9:45 ThB-4** **A Multiple Star WDM-PON Using a Band Splitting WDM Filter** S.-G. Mun(1), S.-M. Lee(1), K. Okamoto(2), C.-H. Lee(1) (1)KAIST, South Korea (2)University of California, USA We demonstatre a multiple star WDM-PON using BSWDM filter to serve several subscriber groups located at a widely distributed area. It enables to use a single type AWG for second RN and simplifies management issues.	**9:30-9:45 ThC-5** **Efficiency Performance of Optical Wavelength Conversion using FBGs Based-on Degenerate FWM in Raman Ring Laser** U. S. Ismail, K. Khairi, M. Z. Abdul Kadir, M. N. Ismail, A. S. Abdul Aziz TMR&D Sdn. Bhd., Malaysia This paper presents wavelength conversion based-on degenerate Four-Wave Mixing (DFWM) assisted by Raman Ring Laser (RRL) in the distance of 3 km of highly nonlinear fiber (HNLF)which using a single external lightsource.	**9:30-9:45 ThD-4** **Novel Coherence-free Microwave Photonic Signal Processor** X. Yi, R. Minasian School of Electrical and Infromation Engineering, Australia A new microwave photonic filter based on a sinusoidal group delay grating is presented, which realizes a multi-tap, flat-top RF filter and bipolar taps, while also exhibiting reconfigurablity and coherence-free operation.	**9:30-9:45 ThE-4** **Magneto-optical Effect in Cobalt Nanoparticle Doped Polymer Optical Material** H. Yu(1), A. Argyros(1), G. Barton(2), S. Leon-Saval(1), M. van Eijkelenborg(1) (1)Optical Fibre Technology Centre, University of Sydney, Australia (2)School of Chemcial and Biomolecular Engineering, Australia Magnetic Faraday effect was demonstrated in cobalt-nanoparticle doped polymer fibre material fabricated using the powder-mixing method. Magneto-optical rotation of the plane of polarisation was demonstrated using a rare-earth magnet. Applications include an all-fibre optical isolator.

	9:45-10:00 ThA-5 **A Flat-top Pass-band Interleaver Through Two-stage Y-Junction MZI on Polymer PLC Platform** W. Y. Chan(1), K. Chen(1), H. P. Chan(1), S. R. Kumar(2), R. K. Varshney(2), B.P. Pal(2,3) (1)Optoelectronic Laboratory, Electronic Engineering Dept, City University of Hong Kong, Hong Kong (2)Department of Physics, Indian Institute of Technology, India (3)On sabbatical leave at the Institute of Optics, USA A two-stage-cascaded Y-Junction MZI interleaver of 100 GHz channel spacing over a 40 nm wavelength window is experimentally demonstrated. The 0.5 dB pass-band at the two output ports were 38 GHz and 50 GHz, respectively.	**9:45-10:00 ThB-5** **Novel Fault Monitoring Scheme for PON Systems Using Wavelength Sweeper and Interferometric Devices** S.-L. Lee, S.-T. Ji, C.-H. Cheng, Y.-J. Hung National Taiwan University of Science and Technology, Taiwan New fault monitoring scheme is proposed to locate troubled fiber paths for PON systems by using simple light sources and low-cost and mass-producible interferometric devices. The reflected signals can be simply analyzed by spectral analysis.	**9:45-10:00 ThC-6** **Polarised High Power Fibre Lasers by Combining Low Birefringence Fibres and Point-by-point Bragg Gratings** N. Jovanovic, R. Williams, G. Marshall, A. Fuerbach, M. Withford Macquarie University, Australia We present a novel scheme for obtaining highly linearly polarised, high power fibre lasers. The technique exploits the natural birefringence of point-by-point written Bragg gratings, which constitute the frequency selective feedback elements of the lasers.	**9:45-10:00 ThD-5** **Tunable Photonic Microwave Notch Filter Incorporating a S-Bending-based, Linearly Tunable, Chirped Fiber Bragg Grating** W. J. Jeong(1), J. K. Bae(2), K. Lee(2), S. B. Lee(2), J. H. Lee(1) (1)University of Seoul,South Korea (2)Korea Institute of Science and Technology,South Korea We experimentally demonstrate a novel photonic microwave notch filter with capability of frequency tuning using an S-bending-based, linearly tunable, chirped FBG with no center wavelength shift.	**9:45-10:00 ThE-5** **Molecular Electronics inside Optical Fibres** C. Martelli(1,3), J. Canning(1), J. R. Reimers(2), M. Sintic(2), M. J. Crossley(2) (1)Interdisciplinary Photonics Laboratories, School of Chemistry, University of Sydney, Australia (2)School of Chemistry, University of Sydney, Australia (3)School of Electrical and Information Engineering, University of Sydney, Australia The fabrication of organised porphyrin thin-films inside structured fibres is demonstrated. Coupling between the molecules and the surface is reported.
		10:00-10:15 ThB-6 **A Heuristic Algorithm of p-Cycle based Tree Protection of Optical Multicast Traffic in WDM Mesh Networks** F. Zhang, W.-D. Zhong Nanyang Technological University, Singapore We propose an efficiency-score based heuristic algorithm (ESHT) for p-cycle based multicast tree protection. Results show that the capacity-efficiency of ESHT is close to that of ILP-based algorithms, but with much reduced computational time.	**10:00-10:15 ThC-6** **Multiwavelength and Tunable Regenerative Laser Resonator with Passive Self-Pulsating Action** M. Rochette(1), K. Sun(1), J. Hernández-Cordero(2), L. R. Chen(1) (1)Department of Electrical and Computer Engineering, McGill University, Canada (2)Instituto de Investigaciones en Materiales, UNAM, Mexico We experimentally demonstrate the operation of a self-pulsating laser that is dual-wavelength and continuously wavelength-tunable. This passive laser is extremely simple to implement and has properties that theoretically enables signal buffering.	**10:00-10:15 ThD-6** **Ultrawideband Doublet Pulse Generation Using Optical Parametric Amplifier** J. Li, B. Kuo, K. Wong Photonics System Research Laboratory, Department of Electrical and Electronic Engineering, The University of Hong Kong, Hong Kong We demonstrated a novel technique to generate ultrawideband doublet pulse using pump depletion and idler generation in optical parametric amplifier (OPA). High quality doublet pulse with repetition rate up to 4.2 GHz was successfully generated.	**10:00-10:15 ThE-6** **Temperature Sensitive Polarization in Holey Optical Fiber Filled With Metal** B. H. Kim(1), J. Lee(1), S. H. Lee(2), W.-T. Han(2) (1)Advanced Photonics Research Institute (APRI), GIST, South Korea (2)Dep. Information and Communications, School of Photon Science and Technology, GIST, South Korea Temperature sensitivity on polarization change of a holey optical fiber filled with 63%Sn-37%Pb metal alloy was investigated. The temperature sensitivity of the fiber was found to strongly increase by introduction of the internal metal.
			10:15-10:30 ThC-7 **Laser Dynamics of New Fiber Soliton Lasers** Y. Lai(1), W.-W. Hsiang(2) (1)National Chiao Tung University, Taiwan (2)Fu Jen Catholic University, Taiwan Modelocked fiber lasers have become an platform for investigating new soliton phenomena. Laser dynamics of two interesting high-repetition-rate new fiber soliton lasers (asynchronous modelocked and phase-modulation-induced bound-state) are investigated both theoretically and experimentally.		

	Room: Bayside Terrace				
10:30 - 12:00	Poster Session & Morning Tea				
12:00 - 13:30	Lunch				
	Room: Bayside 201	**Room: Bayside 202**	**Room: Bayside 204a**	**Room: Bayside 204b**	**Room: Bayside Auditorium A**
	ThF: 13:30-15:00 **Plasmonics & Sensors** Presider: TBA	**ThG: 13:30-15:00** **High Speed PON** Presider: Yikai Su	**ThH: 13:30-15:00** **Novel Devices** Presider: Malin Premaratne	**ThI: 13:30-15:00** **Measurement Techniques** Presider: Hwa-Yaw Tam	**ThJ: 13:30-15:00** **Nonlinear Optics** Presider: Andrey Sukhorukov
	13:30-14:00 ThF-1 (Invited) **Feasibility Overview of Plasmonic Devices for Optoelectronics** B. Lee, H. Kim, J. Park, I.-M. Lee Seoul National University, South Korea We present an overview of recently proposed various plasmonic devices for optoelectronics, such as channel plasmon subwavelength components, nonlinear plasmon-based photonic transistor, optical memory by slowing and trapping surface plasmons, and active plasmonics.	**13:30-14:00 ThG-1 (Invited)** **High-Speed Burst-Mode Transmission Technologies for 10-Gbit/s-class PON Systems** S. Kimura NTT Access Network Service Systems Labs., Japan We have developed an ac-coupled burstmode transceiver using baseline-wander common-moderejection techniques for 10-Gbit/s-class PON systems. The fabricated transceiver achieved 10.3125-Gbit/s operation with an ultra-fast response.	**13:30-13:45 ThH-1** **40 Gb/s All Optical Clock Recovery Based on an Optical Parametric Oscillator with Photonic Crystal Fiber** L. F. K. Lui(1), A. Zhang(2,3), P. K. A. Wai(1), H. Y. Tam(2), M. S. Demokan(2) (1)Photonics Research Centre and Department of Electronic and Information Engineering, The Hong Kong Polytechnic University, Hong Kong (2)Department of Electrical Engineering, The Hong Kong Polytechnic University, Hong Kong (3)School of Electronics Information and Communications Engineering, Tianjin University of Technology, China We demonstrate 40 Gb/s optical clock recovery based on optical parametric oscillator using a highly nonlinear photonic crystal fiber as the dynamic gain medium. The timing jitter of the recovered clock signal is 270 fs.	**13:30-14:00 ThI-1 (Invited)** **Optical Fiber Laser-based Optical Coherence Tomography** C. S. Kim Department of Nanosystem Engineering, Pusan National University, South Korea Optical fiber laser has a great potential in biomedical applications. In this talk, the application of multi-wavelength tunable fiber laser will be discussed for optical coherence tomography. Novel electro-optic and acousto-optic wavelength selecting filters are also investigated for various wavelength-swept lasers.	**13:30-14:30 ThJ-1 (Tutorial)** **Supercontinuum Generation and High Field Effects in Optical Fibers** J. Dudley Université De Franche-Comté, France
			13:45-14:00 ThH-2 **Photonically Assisted RF Generator With Incoherent Sources** V. Torres(1), J. Lancis(1), P. Andrés(2), L. Chen(3) (1)Departament de Fisica. University Jaume, Spain (2)Optics Department. University of Valencia, Spain (3)Department of Electrical & Computer Engineering. McGill University, Spain An RF waveform generator operating with incoherent broadband light is successfully implemented. Complex RF ~10 GHz bandwidth waveforms are generated by means of incoherent wavelength-to-time mapping. Our technique can be scaled to the mm-wave range.		

	14:00-14:15 ThF-2 **Plasmonic Nano Cavity Using the Cut off Property in the Metal-insulator-metal Waveguide** J. Park, H. Kim, I.-M. Lee, B. Lee National Creative Research Center for Active Plasmonics Application Systems, Inter-University Semiconductor Research Center and School of Electrical Engineering, Seoul National University, South Korea We present a novel plasmonic nano cavity formed by two metal-insulator-metal waveguides with different core indices, which utilizes the cut off property of the symmetric mode.	**14:00-14:15 ThG-2** **A 40Gb/s Bidirectional CWDM-PON System with 4-channel for Metro/Access Applications** T.-T. Shih(1), P.-H. Tseng(2), T.-W. Wu(1), Min-Ching Lin(2), Hidenori Taga(2), W.-H. Cheng(2) (1)Department of Electronics Engineering, National Kaohsiung University of Applied Sciences, Taiwan (2)Institute of Electro-Optical Engineering, National Sun Yat-sen University, Taiwan A high capacity CWDM-PON system has been proposed and demonstrated experimentally. 8 wavelengths have been transmitted at a 10km singlemode fiber successfully. This system enables the maximum subscribing bit-rate to 10Gb/s for a client.	**14:00-14:15 ThH-3** **RCE Measurements in RoF of WiMAX with DFB-LDs** K. Chinen Okinawa National College of Technology, Japan A system design of an RoF link with MQW -DFB-LDs and a WiMAX link using a controllable directive antenna is experimentally carried out. The system performance is evaluated by measuring the RCE.	**14:00-14:15 ThI-2** **Prototype Double-pulse BOTDR for Measuring Distributed Strain With 20-cm Spatial Resolution** Y. Sakairi(1), S. Adachi(1), S. Matsuura(1), Y. Koyamada(2) (1)Yokogawa Electric Corporation, Japan (2)Ibaraki University, Japan We developed a prototype double-pulse BOTDR (DP-BOTDR) system. The system can measure a distributed Brillouin frequency shift, i.e., the distributed strain and temperature, with a spatial resolution of 20 cm and accuracy of 20μstain.	
	14:15-14:30 ThF-3 **Stoichiometric Low Loss Tellurium Oxide Thin Films for Photonic Applications** K. Vu, S. Madden, B. Luther-Davies, D. Bulla Laser Physics Centre, Research School of Physical Sciences and Engineering, The Australian National University, Australia Stoichiometric low loss Tellurium Oxide, TeO2, films have been produced by reactive rf sputtering. TeO2 films with propagation loss below 0.1dB/cm at 1550nm are achieved in as deposited films for the first time.	**14:15-14:30 ThG-3** **10-Gb/s Carrier-Reuse WDM-PON Based on Injection Locked FP- LDs** Z. Xu(1), Y. J. Wen(2), W.-D. Zhong(1), T. H. Cheng(1), Y.-K. Yeo(2) (1)Nanyang Technological University, Singapore (2)Insititute for Infocomm Research, Singapore We propose and demonstrate a high speed carrier-reuse WDM-PON based on injection locked FPLDs. Experiments for both downlink and uplink transmission at 10 Gb/s show very good BER performance with a large operating range.	**14:15-14:30 ThH-5** **Integrated True-time Delay Unit for Broadband Inteference Nulling in Phased-array Antenna** B. Juswardy, K. Alameh Centre Of Excellence In MicroPhotonic Systems, Edith Cowan University, Australia This paper discusses an integrated true-time delay generation unit based on microminiaturisation of photonic and electronic components. Design, simulation, and performance of important building blocks for implementing a true-time delay based phased-array antenna are presented.	**14:15-14:30 ThI-3** **Accurate Measurement of the Brillouin Frequency Shift in Optical Fibers Using a Doubly Phase-Modulated Probe Light** K. Tsuji(1), J. Kim(1), M. Oiwa(1), N. Onodera(1), M. Saruwatari(1) National Defense Academy, Japan We propose an accurate measurement method of the Brillouin frequency shift in optical fibers applicable for distributed strain/temperature measurement, using a doubly phase-modulated probe light. Its accuracy and the usefulness are experimentally demonstrated.	
	14:30-14:45 ThF-4 **Fiber Bragg Grating Sensor for High Temperature Application** J. Canning(1), S. Bandyopadhyay(1,2), M. Stevenson(1), K. Cook(1) (1)Interdisciplinary Photonics Laboratories, School of Chemistry, University of Sydney, Australia (2)Central Glass & Ceramic Research Institute, India Regenerated gratings seeded by type I gratings withstand temperatures beyond 10000C. A new approach to increasing temperature resistance of ultra high T stable gratings is presented.	**14:30-14:45 ThG-4** **Experimental Study of Multi-Point MAC Control for 10G-EPON System** Y. Hotta, K. Sugimura, S. Kozaki, K. Shimokasa Mitsubishi Electric Corporation, Japan We have developed the 10G-EPON system to evaluate Multi-Point MAC Control mechanism. The system supports IEEE802.3 MPCP and the optical interface is complied to PR-30 specification. Successfully, we have got 9.7Gbps for the upstream throughput.	**14:30-14:45 ThH-6** **Wavelength Tunable Optical Time Domain Reflectometry for WDM-PONs** W. Shin(1), B.-A. Yu(1), Y.L. Lee(1), D.-K. Ko(1), Kyunghwan. Oh(2) (1)Advanced Photonics Research Institute, South Korea (2)Yonsei Unversity, Department of Physics. South Korea A new fiber fault location detecting method is demonstrated for WDM-PON. Unique wavelength tunable optical time domain reflectometry was developed by a digital micro mirror array based tunable fiber laser and correlation OTDR technique.	**14:30-14:45 ThI-4** **Raman Gain Efficiency Distribution Measurement of Optical Fiber Cable Installed in the Field Using Indirect OTDR Technique** I. Yamashita(1), K. Oro(1), T. Yabu(2), M. Ohashi(2) (1)Kansai Electric Power, Japan (2)Osaka Prefecture University, Japan A novel indirect OTDR technique for measuring Raman gain efficiency distribution is applied to optical fiber cables installed in the field. Field measurements are successfully made on a 17-km long test fiber.	**14:30-14:45 ThJ-2** **Modulation Control and Spectral Shaping of Supercontinuum Generation in the Picosecond Regime** G. Genty(1), J. Dudley(2), B. Eggleton(3) (1)Department of Physics, Tampere University of Technology, Tampere, Finland (2)Departement d'Optique P. Duffieux, Université de Franche-Comté, Besançon, France (3)CUDOS, School of Physics, University of Sydney, Australia We numerically study the shaping of broadband supercontinuum spectra through the use of strong input pulse modulation. The underlying physical mechanism is shown to be rogue wave control through induced modulation instability.

	14:45-15:00 ThF-5 **Glucose Senosr Based on Two Distinct Microring Resonators** M.-S. Kwon(1), W. Steier(2) (1)Dept. Optical Engineering, Sejong University, Korea (2)Dept. Electrical Engineering, University of Southern California, USA A micro -ring-resonator-based glucose sensor is experimentally investigated, whic h measures both the temperature and concentration of glucose solution. It consists of t wo different micro -ring resonators consecutively coupled to a bus waveguide by the over lap between them.	**14:45-15:00 ThG-5** **Single Fiber Based 10.66 Gb/s Bidirectional Long Reach WDM-PON Supported by Distributed Raman Amplifier** H.-M. Wang, W.-T. Shih, H. Taga National Sun Yat-Sen University, Taiwan We implement a single fiber based bidirectional 84km long reach WDM-PON system with symmetric 10.66 Gb/s up-and downstream data rate by using a combined forward and backward distributed Raman Amplifier pumping scheme.		**14:45-15:00 ThI-5** **Temperature Dependence of Chromatic Dispersion Distribution Along a Single-mode Fiber Using OTDR** Y. Tsutsumi(1), T. Yabu(1), M. Ohashi(1) Osaka Prefecture University, Japan Temperature dependence of the chromatic dispersion distribution of the fiber is examined using OTDR for the first time. The relationship between MFD and relative-index difference due to temperature change is also clarified experimentally.	**14:45-15:00 ThJ-3** **Picosecond Supercontinuum Generation With Back sSeeding of Different Spectral Parts** P. Moselund(1,2), M. Frosz(1,2), C. Thomsen(2), O. Bang(1) (1)DTU Fotonik, Dept. of Photonics Engineering, Technical University of Denmark, Denmark (2)Koheras A/S, Denmark We study supercontinuum generation with picosecond pumping, and the resulting spectrum obtained when coupling back the part of the output around 1200-1700 nanometers or the part around 600-700 nanometers with a variable time delay.
15:00 - 15:30	**Afternoon Tea**				

	Room: Bayside 201	Room: Bayside 202	Room: Bayside 204a	Room: Bayside 204b	Room: Bayside Auditorium A
	ThK: 15:30-17:00 **Novel Signal Processing** Presider: TBA	**ThL: 15:30-17:00** **WDM PON** Presider: Chang-Hee Lee	**ThM: 15:30-17:00** **Fiber Lasers and Amplifiers** Presider: Yin-Chieh Lai	**ThN: 15:30-17:00** **Cables & Fiber Technologies** Presider: Kazuhide Nakajima	**ThO: 15:30-17:00** **Nonlinear Optics II** Presider: Mike Steel
	15:30-15:45 ThK-2 **Proposal of Waveguide-Type Optical Circuit for Recognition of Optical QPSK Coded Labels in Photonic Router** Y. Makimoto(1), H. Hiura(0), N. Goto(1), S.-i. Yanagiya(1) (1)The University of Tokushima, Japan (2)Japan Broadcasting Corp., Japan In photonic label routing networks, optical recognition of optical labels is one of the key functions. We propose a passive waveguide-device for recognition of QPSK labels. The function is confirmed with BPM simulation.	**15:30-16:00 ThL-1 (Invited)** **Roles of Long-Wavelength VCSELs in Access and Hybrid-Wireless Networks** E. Wong Centre of Ultra Broadband Information Networks and Victoria Research Laboratory, NICTA, Dept of Electrical and Electronic Engineering, The University of Melbourne, Australia. The application of long wavelength (~1.55 μm) VCSELs in WDM access and hybrid fibre-wireless networks is reviewed and discussed. Their deployment enables additional features such as monitoring and add-drop functionality to be achieved in the network.	**15:30-15:45 ThM-1** **O-Band Brillouin Semiconductor Fiber Laser with Improved Multiwavelength Output Characteristics** A. Hayder, L. Chen McGill University, Canada We investigate the characteristics of multiwavelength O-band Brillouin semiconductor fiber lasers in a linear cavity configuration. We generate 8 wavelengths within 3 dB and a spacing of ~ 12.7 GHz.	**15:30-15:45 ThN-1** **Ultra-High-Density Optical Fiber Cable with Rollable Optical Fiber Ribbons** K. Toge, Y. Yamada, K. Hogari NTT Access Network Service Systems Labs., NTT Corporation, Japan We propose a novel ultra-high-density optical fiber cable employing rollable optical fiber ribbons that can be mass spliced. These ribbons are specially designed for high-density assembly in the small core of the cable.	**15:30-16:00 ThO-1 (Invited)** **All-Optical Switching in Nonlinear Long-Period Gratings in As2Se3 Chalcogenide Fiber** H. C. Nguyen, E. Magi, B. Kuhlmey, M. de Sterke, B. Eggleton CUDOS, University of Sydney, Australia We experimentally demonstrate all-optical switching using an acoustically generated long-period grating in highly nonlinear As2Se3 chalcogenide fiber. The results, with numerical simulations, demonstrate switching at optical powers two orders of magnitude lower than in silica.
	16:00-16:15 ThK-3 **All-FBG-based Switchable Dual Wavelength EDF Laser With High Tunability of Lasing Wavelength** Y.-G. Han(1), H.-J. Kim(1), S. B. Lee(2) (1)Department of Physics, Hanyang University, South Korea (2)Korea Institute of Science and Technology, South Korea A simple technique for fabrication of a tunable dual wavelength-switchable erbium-doped fiber laser based on a fiber Bragg grating is demonstrated by using both linear cavity loss controlling and homogeneous gain broadening of the EDF.		**15:45-16:00 ThM-2** **Passively modelocked self-starting figure-eight fiber laser with semiconductor optical amplifier** S.-S. Min(1), Y. Zhao(2), S. Fleming(1) (1)Optical Fibre Technology Centre, Australia (2)Redfern Optical Components, Australia The operation of a novel passively modelocked self-starting figure-eight fiber laser is experimentally demonstrated. A stable pulse train is produced without any starting/triggering mechanism and stays modelocked as long as it is pumped.	**15:45-16:00 ThN-2** **Solid Ring-assisted Fibers With Low Bend Loss** J. M. Fini(1), P. I. Borel(2), M. F. Yan(1), S. Ramachandran(1), A. D. Yablon(1), P. W. Wisk(1), D. Trevor(1), D. J. DiGiovanni(1), J. Bjerregaard(2), P. Kristensen(2), K. Carlson(2), P. A. Weimann(3), C. J. Martin(4), A. McCurdy(4) (1)OFS Laboratories, USA (2)OFS Fitel Denmark ApS, Denmark; (3)OFS Optical Cable, USA (4)OFS-Fitel, USA Solid fibers with greatly reduced bend loss are presented. Ring-assisted fibers provide enhanced cutoff, allowing .01dB/turn cable losses around a 9.5mm mandrel while meeting cutoff and MFD standards and avoiding potential problems with holes.	
	15:45-16:00 ThK-4 **All-Optical Label Recognition and Classification Using Complex-Valued Neural Network** T. Fujimoto(1), M. Terai(2), N. Goto(1), S.-i. Yanagiya(1) (1)The University of Tokushima,Japan (2)Toyohashi University of Technology, Japan Optical neural-network circuit to recognize or classify optical BPSK labels for photonic label routing is proposed. The circuit consists of optical amplifiers, phase shifters and nonlinear thresholding devices. The circuit is proved by numerical simulation.	**16:00-16:15 ThL-2** **Wavelength switchable ONU transmitter using a self-seeded RSOA for reconfigurable optical VPN over WDM PON** T. C. Jayasinghe(1), C. J. Chae(1), R. Tucker(2), T. Nirmalathas(1), B.-W. Kim(3) (1)NICTA -Victoria Research Lab, Australia (2)ARC special research Centre for Ultra-Broadband Communication Networks, Australia (3)BcN Research Laboratory, ETRI, Australia A tunable transmitter using a self-seeded RSOA, which allows flexible operation of optical virtual private networking (OVPN) in WDM PON is proposed. We successfully demonstrate the use of this transmitter for initial implementation of OVPN.	**16:00-16:15 ThM-3** **All-Fiber High-Energy Passively Mode-Locked Laser Based on a Carbon Nanotube Filled Microchannel** A. Martinez(1), K. Zhou(2), I. Bennion(2), S. Yamashita(1) (1)Department of Electronic Engineering, The University of Tokyo, Japan (2)Photonics Research Group, School of Engineering and Applied Science, Aston University, UK We present a novel saturable absorber configuration based on a femtosecond laser processed micro -fluidic channel filled with a Carbon na notube solution. All -fiber high-energy passive mode -locked lasing is de monstrated with an output power of 13.5dBm.	**16:00-16:15 ThN-3** **Fiber identification technique based on mechanically induced long-period grating for bending-loss insensitive fibers** T. Matsui, K. Nakajima, K. Shiraki, T. Kurashima, M. Shimizu NTT Corporation, Japan New fiber identification technique is proposed that is based on mechanically induced long-period grating (M-LPG). The technique enables us to identify hole-assisted fiber with extremely low bending-loss by detecting leaky higher-order mode induced by M-LPG.	**16:00-16:15 ThO-2** **Nonlinear, discrete-continuous propagation of ultrashort pulses in 2-dimensional, periodic fibre arrays** F. Eilenberger(1), T. Pertsch(1), F. Lederer(1), U. Röpke(2), A. Tünnermann(3) (1)Instiute of Applied Physics, Friedrich-Schiller-University of Jena, Germany (2)Institut of Photonic Technology, Jena, Germany (3)Fraunhofer Institute for Applied Optics and Precision Engineering, Jena, Germany We investigate the propagation of ultrashort pulses in 2D fibre arrays both numerically and experimentally. The Nonlinearity suppresses discrete diffraction and dispersion, leading to spatiotemporal contraction, as well as pulse breaking and supercontinuum (SC) generation.

	16:00-16:15 ThK-5 **Holographic Design and Realization of Hexagonal 2D Photonic Crystal with Elliptical Air Holes** Y.-J. Hung(1), S.-L. Lee(1), Y.-T. Pan(1), C. Chao(2) (1)Department of Electronic Engineering, National Taiwan University of Science and Technology, Taiwan (2)Electronics and Optoelectronics Research Laboratories, Industrial Technology Research Institute, Taiwan Highly-ordered two-dimensional hexagonal photonic crystals (PhCs) with elliptical air holes are realized by low-cost laser holographic technique. PhCs of 375-nm lattice constant can be realized with good uniformity and repeatability.	**16:15-16:30 ThL-3** **Low-Noise Broadband Light Source with an RF Modulation for a Large Capacity and High bit-rate WDM-PON** K.-M. Choi, C.-H. Lee Kaist, South Korea We demonstrate the performance enhanced low-noise BLS for a large capacity and high bit-rate WDM-PON. The 3 dB linewidth and RIN of one mode from the low-noise BLS is improved by a RF modulation.	**16:15-16:30 ThM-4** **200GHz DWDM Channel Pulsed Optical Carrier Generated by 10GHz Mode-Locking of weak-Resonant-Cavity Fabry-Perot Laser Diode Fiber Ring** J.-J. Kang(1), G.-H. Peng(2), G.-R. Lin(2) (1)National Sun Yat-sen University,Taiwan (2)National Taiwan University,Taiwan A novel optical TDM carrier with 200-GHz DWDM channel spacing from optically injection-mode-locked weak-resonant-cavity Fabry-Perot laser diode with 10%-end-facet reflectivity is demonstrated with chirp and pulsewidth dispersion compensated to 5.4 GHz and 8.5 ps, respectively.	**16:15-16:30 ThN-4** **Investigation of Bend Insensitive Multimode Fiber for optical interconnection systems** I. Shimotakahara, H. Inaba, R. Sugizaki, T. Yagi Furukawa Electric Co., Ltd., Japan Multimode fiber which can be used with bending radius of less than 5mm was investigated. Improvement of bandwidth maintaining low bending loss was achieved by adopting Multimode fiber with core/cladding of 30/80 m.	**16:15-16:30 ThO-3** **Harmonic Extension Dynamics of Supercontinuum Generation in Highly Nonlinear Silica Nanowires** G. Genty(1), B. Kibler(2), P. Kinsler(3), J. Dudley(2) (1)Tampere Univ of Technology, Finland (2)Institut FEMTO-ST Besancon, France (3)Imperial College London,UK We numerically investigate non phasematched third harmonic generation by ultrashort pulses in silica nanowires. We study in particular the interplay between the pump and harmonic which leads to carrier envelope phase dependence of the spectrum.
		16:30-16:45 ThL-4 **An Automatic Decision Threshold Control Circuit for WDM-PON Based on the Wavelength-locked F-P LDs** H.-K. Lee, J.-H. Moon, S.-G. Mun, K.-M. Choi, C.-H. Lee Korea Advanced Institute of Science and Technology, South Korea We propose and demonstrate a simple decision threshold control circuit. By employing this method, we demonstrate a feasibility of WDM-PON at 1.25 Gb/s per channel with 100 GHz spacing based on the wavelength-locked F-P LDs.	**16:30-16:45 ThM-5** **Using Fabry-Perot Lasers With Interinjection Technique for Color-Free WDM-PON Applications** C. H. Wang(1), C. H. Yeh(2), F. Y. Shih(3), C. W. Chow(1), S. Chi(1,3) (1)Department of Photonics and Institute of Electro-Optical Engineering, National Chiao Tung University, Taiwan (2)Information and Communications Research Laboratories, Industrial Technology Research Institute, Taiwan (3)Department of Electrical Engineering, Yuan Ze University, Taiwan ROC A simple laser configuration to generate wavelength-tunable single-mode source based on two FP-LDs with interinjection technique is proposed and demonstrated. By adjusting the tunable filter inside the laser cavity, the wavelength tuning can be achieved.	**16:30-16:45 ThN-5** **Development of Low-loss SMF with Low-nonlinearity for Next Generation Terrestrial Transmission** N. Kumano, M. KawasakiR. Sugizaki, T. Yagi Furukawa Electric Co., Ltd., Japan Single mode fiber with low attenuation loss as 0.180dB/km at 1550nm with low splice loss has been developed for next generation terrestrial transmission. Its low nonlinearity could also make wideband, high-density transmission easier.	**16:30-16:45 ThO-4** **Optical Rogue Wave Dynamics in Supercontinuum Generation** J. Dudley(1), G. Genty(2), B. Eggleton(3) (1)Departement d'Optique P. Duffieux, Université de Franche-Comté, Besançon, France (2)Department of Physics, Tampere University of Technology, Tampere, Finland (3)CUDOS, School of Physics, University of Sydney, Australia We study the physical origin and propagation dynamics of optical rogue waves, statistically-rare extreme red-shifted soliton pulses arising from broadband supercontinuum generation in optical fibre.
		16:45-17:00 ThL-5 **Remote Frequency Stabilization in DWDM-PON Using Supervisory Frame Transfer with Fixed Time Interval** M. Fujiwara(1), T. Suzuki(1), H. Suzuki(1), T. Tanaka(2), N. Ooba(2) (1)NTT Access Network Systems Laboratories, Japan (2)NTT Photonics Laboratories, Japan We propose an error signal transfer method for remote frequency stabilization in DWDM-PON. The error signal is embedded in a downlink signal using a supervisory frame; the effectiveness of this method is experimentally confirmed.	**16:45-17:00 ThM-6** **Optimal Noise Figure for Raman-assisted Fiber Optical Parametric Amplifiers** S. Wang(1), L. Xu(2), P. K. A. Wai(1) (1)The Hong Kong Polytechnic University. Hong Kong (2)University of Science and Technology of China The noise figure of a Raman-assisted fiber optical parametric amplifier is reduced to 3.6 dB by using a fiber Bragg grating to suppress input parametric pump noise.		**16:45-17:00 ThO-5** **Compression limits in cascaded quadratic soliton compressors** M. Bache(1), O. Bang(1), W. Krolikowski(2), J. Moses(3), F. W. Wise(4) (1)DTU Fotonik (2)Research School of Physical Sciences and Engineering, ANU (3)Optics and Quantum Electronics Group, MIT (4)Dept. of Applied and Engineering Physics, Cornell University Cascaded quadratic soliton compressors generate under optimal conditions few-cycle pulses. Using theory and numerical simulations in a nonlinear crystal suitable for high-energy pulse compression, we address the limits to the compression quality and efficiency.
Room: Bayside Auditorium A					
17:00 - 17:30	**Wrap Up & Awards Session**				