Asia Communications and Photonics Conference and Exhibition (ACP)

Conference: 2-6 November 2009
Exhibition: 4-6 November 2009
Submission Deadline: 23 June 2009, 12:00 p.m. Noon EDT (16.00 GMT)

Everbright Convention & Exhibition Center
Shanghai, China

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About ACP

The Asia Optical Fiber Communication & Optoelectronic Exposition & Conference (**AOE)** and Asia-Pacific Optical Communications (**APOC**) have merged their conferences and tradeshow under a new name: Asia Communications and Photonics Conference and Exhibition (ACP).

The combined event creates Asia's premier conference and exhibition in the Pacific Rim for photonics technologies, including optical communications, biophotonics, displays, illumination and applications in energy. The inaugural event taking place 2-6 Nov 2009 in Shanghai, China.

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ACP Workshops

Challenges and Opportunities in Fiber-Based Devices and Applications

Monday, 2 November · 13.30-18.00

Specialty Fibers have been widely investigated over the past few years. In that time they have moved from being an intriguing laboratory curiosity to become a new frontier in the development of optical fibers. They are now starting to become available in commercial products for several applications, and many more applications are currently under development. These new fibers have micron-scale – or even nanoscale – air-holes running down their length, which influence or define their waveguiding characteristics. The inclusion of such air holes in an optical fiber has resulted in a wide range of novel waveguiding designs and effects, greatly extending the possibilities of some fields while making others possible for the first time.

Conventional optical fibers now span the globe and have revolutionized how we communicate with each other. They have found a wide range of other applications as well. However, the technology used to form them (most commonly, using silica which is doped in different ways) also limits their applicability in areas like nonlinear fiber optics, high-power laser beam delivery, sensing applications, ultrashort pulse delivery and others. Microstructured fibers are formed using two or more natural materials, which are often very different from one another, and which are structured to form a synthetic optical material with otherwise unobtainable properties. Most results have been reported using an array of air holes embedded in a pure silica matrix. Light in such fibers can be guided either using total internal reflection (TIR, as in conventional fibers) or by using reflection from a photonic bandgap cladding. The wide range of possible structural designs coupled with the large refractive index contrast available between bulk materials means that the waveguiding properties can be tailored over a wide parameter space. Recent results have shown how MOFs can be designed with a very high or very low dispersion over a wide wavelength range; their nonlinear response can be varied over 5 orders of magnitude; they can be used to generate kilowatt-level fiber lasers; to generate broadband optical supercontinua; to convert between different wavelengths; to generate optical frequency combs, and much more. Bandgap guidance can trap light in a hollow core, enabling more exotic forms of single-mode fiber optics, like nonlinear optics in gases, atom optics and guiding, and sensing gases or liquids.

Besides silica, other materials are also being explored, including lead-silicate glasses, tellurite glasses, gallium lanthanum chalcogenide glasses, and polymers. These alternatives are being investigated to enhance certain fiber properties, such as increasing nonlinearity, or extending transmission. The purpose of this workshop is to provide a platform to discussion some of the current challenges and unsolved problems.

Organizers

Perry Shum	Ming Jun Li	Xiaomin Ren
Nanyang Technological Univ., Singapore	*Corning Inc., USA*	*BUPT, China*

Invited Talks
13:30 - 15:00

Prospects and Limitations of Microstructured Fibers for Transmission and Optical Signal Processing, *Christophe Peucheret, Technical Univ. of Denmark*
Subwavelength-Diameter Optical Fibers: Connecting Fiber Optics with Near-Field Optics, Nonlinear Optics and Quantum Optics on Nanoscale, *Limin Tong, Zhejiang Univ., China*

The Future of Specialty Optical Fibers: Old Designs, New Materials, *John Ballato, Clemson Univ., USA*

Emerging Possibilities in Pulse-Shaping and Pulse-Control with Fiber Gratings, *Morten Ibsen, Southampton Univ., UK*

Looking Sideways: New Opportunities for Micro and Nanostructured Optical Fibers, *Boris Kuhlmey, Univ. of Sydney, Australia*

Fibres with Subwavelength Features: New Opportunities and Trade-Off Between Enhanced Properties and Loss, *Heike Ebendorff, Adelaide Univ., Australia*

Tea/Coffee Break
15:00 – 15:30

Recent Developments in Fiber Optic Parametric Amplifiers, *John Harvey, Univ. of Auckland, New Zealand*

Nano-Engineered Structures for Specialty Fiber Applications, *Ming-Jun Li, Corning, USA*

Panel Discussion
16:00 - 18:00

Panel Members:

John Harvey, Univ. of Auckland, New Zealand
Christophe Peucheret, Technical Univ. of Denmark, Denmark
Limin Tong, Zhejiang Univ., China
John Ballato, Clemson Univ., USA
Morten Ibsen, Southampton Univ., UK

Boris Kuhlmey, Univ. of Sydney, Australia
Heike Ebendorff, Adelaide Univ., Australia

Photonics and Optoelectronics Integration for Real-Life Applications: Promises, Opportunities, Challenges and Achievements

Monday, 2 November · 13.30-18.00

Organizers: Wei-Ping Huang, *McMaster Univ., Canada*, Jin Hong, *Opnext, USA*

Photonics and optoelectronic integration has long been a focus of intensive academic research and industrial development. The idea, conceptualized in early 70's by S.E. Miller of Bell Labs, has inspired generations of researchers, engineers and entrepreneurs with a promise that one day this technology will do for communications what microelectronic integrated circuits have done for computing and signal processing. The opportunities are obviously huge and real, yet challenges abound and significant, too. What are the holy grails for this fascinating technology of putting numerous photonic components monolithically or hybrid on the same substrate or even integrated with driving and processing electronics? What functionalities, performance, and cost impact this technology will have in near and long term? What are the immediate and far-reaching real-life commercial applications for the technologies? In particular, what we have learned and achieved through all these academic trial and error and industrial ups and downs with the photonic and optoelectronic integration?

This workshop intends to bring together some of the men and women who have devoted much of their life and effort in seeking answers to some of the above questions. All the speakers are invited to share their vision, ideas, recent achievements and past experiences in research, development and applications of photonic integrated circuits. More specifically, the workshop will have two distinct and related themes, namely, photonic and optoelectronic integration for high performance and low-cost applications, respectively. We plan to enlist about up to twelve (12) speakers for two half-day sessions, each focusing on one of the above themes. All speakers are invited only to ensure the scope, focus and quality of the presentations to maximize the values of the workshop to the attendees. Also, we will have a panel discussion at the end of each session to facilitate brain-storming discussions on some of the critical and pressing issues related to the technologies and applications.

Photonics and Optoelectronics Integration for Real-Life Applications: Promises, Opportunities, Challenges and Achievements I
13.00-15.00

Presider: Jin Hong; *Opnext Inc., USA*

Invited Talks
Photonic Integrated Devices for 40G/100G Long-Haul Systems, Shinji Mino; *NTT Photonics Labs, Japan*

Hybrid integration utilizing silica-based planar lightwave circuit (PLC) is a promising and practical way to achieve highly functional high-speed modulators/receivers. In this paper, we introduce our approach for developing a 40G/100G PLC-LiNbO3 modulator/receiver.

InP and Polymer Based OEICs for 100GBit/sec Transmission, Martin Schell; *Heinrich-Hertz-Inst. Einsteinufer, Germany*

Future 100 GBit/sec transmission in the core network requires stable and cost effective senders and receivers for phase dependent data, e.g. QPSK. After a short general overview, HHI's results on monolithic InP based and heterogeneous polymer based OEICs will be presented.

100G and 40G DWDM Modules and Subsystems for Metro and Long Haul Applications, Theodore J. Schmidt; *Opnext Subsystems, USA*

Manufacturing of Compact Parallel Optical Modules Based on Optical Engine Technologies, *Dennis Tong, SAE Magnetics Ltd., Hong Kong*

Tea/Coffee Break
15.00-15.30

Photonics and Optoelectronics Integration for Real-Life Applications: Promises, Opportunities, Challenges and Achievements II
15.30-18.00
Presider: Wei-Ping Huang; *McMaster Univ., Canada*

Invited Talks and Panel Discussion

Photonic Integration for Passive Optical Networks, Ning Cheng; *Huawei Technologies, USA*

This talk reviews the system requirements for optical transceivers in passive optical networks (PONs), and discusses different approaches of photonic integration for PON transceivers to meet these requirements, including hybrid and monolithic integrations.

Photonic Integration through Planar Lightwave Circuits, Matt Pearson; *Enablence, Canada*

Recent applications for Planar Lightwave Circuits have demanded increasingly higher performance and functionality. We review new PLC technology that allows a single highly flexible platform to address any application from very low-cost PON to very high-performance 40G/100G.

InP-Based Photonic Integrated Circuits for Optical Access, Valery Tolstikhin; *OneChip Photonics Inc., Canada*

Photonic integration is an attractive approach to volume manufacturing of optical transceivers for access, provided it delivers high performance components at very low cost. From this

prospective, we review monolithic photonic integrated circuit solutions in InP, including an original multi-guide vertical integration platform developed at OneChip Photonics.

Next Generation FTTH Technologies

Monday, 2 November · 13.30-18.00

Organizer: Shoichi Hanatani, *Hitachi Ltd., Japan*

FTTH has been well accepted as a future-proof broadband access solution. In the past a few years, great progress has been made in FTTH technologies and deployment. This Workshop/Symposium focuses on discussion on next generation technologies for FTTH as well as sharing global FTTH market trend and a carrier perspective over FTTH. The workshop will invite FTTH experts from service providers, government, equipment vendors, fiber and cable providers and universities to the discussion on following topics:

- FTTH global market trend, analysis and forecast;
- Carrier perspective on next generation services and application scenarios;
- High speed PON/FTTH technology over 10 Gb/s;
- Long Reach PON technology
- WDM PON/FTTH technology;
- OFDM and OCDMA technologies
- Radio over fiber / Optical wireless convergence
- Advanced PON management technology
- Low-cost FTTH devices and components, indoor fiber and cable

Invited Talks
Experiences of Advanced Broadband Technologies in Korea, Suncheol Gweon, *Korean Telecom, South Korea*
In this talk, advance in the broadband service environment of Korea will be reviewed along with its market status and based on some deployment of the latest broadband technologies, prospects regarding the future trend of broadband technology will be presented.

Technologies for FTTP Fiber Management, TJ Xia, *Verizon, USA*
Bend insensitive fiber improves FTTP installation in buildings and fiber switches provide flexibility and efficiency in management of access fiber networks. The challenges applying fiber switches to FTTP networks, however, should not be overlooked.

Optical-Wireless Integrated Networks, Christina Lim, *ARC Special Research Centre for Ultra-Broadband Information Networks (CUBIN), The University of Melbourne, Australia*
One of the effective and potentially inexpensive solutions for the provision of broadband access is via integration of optical and wireless broadband infrastructure. Here, I will present an overview and research progress on optical-wireless integration.

Future Access Network Technologies, Byoung-whi Kim, *MEL Inc. (An ETRI Venture), South Korea*
The talk centers on the colorless dense WDM-PON technology that has been considered as an

ultimate solution for future access networks owing to its large transmission capacity, p2p and symmetrical bandwidth connectivity, physical layer security, and protocol transparency.

Title to Be Announced, Naoto Yoshimoto, *NTT Access Network Service Systems Labs, Japan*

Title to Be Announced, Jess Li, *ZTE, USA*

Title to Be Announced, Tang Xiongyan, *China Unicom Res. Inst., China*

Meeting the Need for Speed - 40G & the Road to 100G

Monday, 2 November · 13.30-18.00

Organizers

Frank Chang
Vitesse Semiconductor, USA

T.J. Xia, *Verizon Communications, USA*

The workshop will bring leading industry experts from IC/component, modules and system vendors, with primary focusing on the deployment of 40g/100g technologies. The workshop will run two sessions: 13:30 to 15:30pm and 16:00-18:00 on 2 November.

Interested participants are encouraged to contact the organizer: ychang@vitesse.com, or bring slides and/or questions to the workshop.

Bandwidth is growing rapidly, 40G starts to get off the ground first in operator DWDM networks and there is clearly need for 100G technology. This workshop is targeted to report on the latest status of relevant IEEE, ITU and OIF standards, and recent technological advancements. Potential topics for discussion will cover, but are not limited to:

- Identifies the key drivers behind the migration to 40G/100G interfaces,
- Explore emerging 40G/100G standards for data center and core network
- Emerging next-gen transceivers such as WDM active cables/QSFP/CXP/CFP;
- Advanced high-speed IC and component technologies;
- Next-gen Carrier Ethernet
- 40G/100G testing challenges

This workshop will put its primary focus on technology aspect, and bring together experts in the industry and academia to provide a broad set of backgrounds that should enable lively discussion.

40G/100G Transport Module Market Growth and Future Developments, *Niall Robinson, Mintera, USA*

The Road to Next Generation 40G/100G Modules, *Ed Cornejo, Jon Anderson, Opnext, USA*

Enabling Highest Utilization with Mellanox 40Gb/s Server and Storage Connectivity Solutions, *Joe Cherng, Gilad Shainer, Mellanox, USA*

High Speed Serdes for 40G/100G Optical Communications, *Song Shang, SMI, China*

Keynote: Development and Application of 40G/100G WDM Technology, *Ruiquan Jing, China Telecom, China*

Considerations on Technical Conditions Towards Commercialized 100Gbps Optical Transport, *Jiaying Wang, ZTE, China*

Keynote: Optical Transport Network Evolving with 40G/100G Ethernet, *Osamu Ishida, NTT, Japan*

Specifying Optical Fiber for Today's Premises Applications and Tomorrow's, *Yi Sun, John Kamino, OFS, USA*

Reliable VCSELs for 40GE and 100GE, *Wenbin Jiang and Karlheinz Gulden, Oclaro, USA*

40/100G Components/Subsystems Based on PLC Technology, *Wupen Yuen, NeoPhotonics, USA*

The Road Towards 100GbE, *Sander Jansen, NSN, USA*

40G/100G Optimized Photonic Transport Platform, *Yoshiaki Aono and Satomi Shioiri, NEC, Japan*

Research Activities of 40G and 100G Optical Transmission in China, *Fan Zhang, Peking Univ., China*

Adaptive Equalization of Linear Distortion in Dual-Polarization Optical Coherent Receivers, *Huijian Zhang, Fujitsu R&D Center Co., China*

40G DWDM Technology and Application, *Junbo Xu,* ***FiberHome, China***

The Road to 100G: Step by Step, Not Skip, *Anle Shen, Huawei Technologies, China*

Invited Speakers

SC1: Passive Components and Fiber-Based Devices

Progress in Semiconductor Optical Fibers, *John Ballato; Clemson Univ., USA.*

Structured Fibres and Gratings for Sensing, *John Canning; Univ. of Sydney, Australia.*

New Challenges for the Fibers and Cables in the FTTH and MDU Deployment, *David Chen; Verizon, USA.*

Soft Glass Microstructured Optical Fibers with New Structures: Recent Progress in Design, Fabrication and Application, *Heike Ebendorff-Heidepriem; Univ. of Adelaide, Australia.*

Ultrafast Nonlinear Optics on a Chip: Breaking the Terabit Per-Second Barrier, *Benjamin J. Eggleton; Univ. of Sydney, Australia.*

Ultrahigh-Speed Optical Signal Processing on a Silicon Chip, *Alexander Gaeta; Cornell Univ., USA.*

Advanced Fibre Grating Technologies for Application in Next Generation Lasers and Networks, *Morten Ibsen; Univ. of Southampton, UK.*

Advances in Solid-Core Photonic Bandgap Fibre Devices and Sensors, *Boris T. Kuhlmey; Univ. of Sydney, Australia.*

Third Harmonic Generation in Optical Fibers, *Shenping Li; Corning Inc., USA.*

Hybrid WDM/TDM Sensor Passive Optical Network and its Applications, *Deming Liu; Huazhong Univ. of Science and Technology, China.*

Silica Microtoroid and its Applications, *Tao Lu; Univ. of Victoria, USA.*

Wideband Parametric Delay Dispersion Tuner: A New Class of Devices for All Optical Networks, *Shu Namiki; AIST, Japan.*

Optical Signal Processing with Delay-Asymmetric Nonlinear Loop Mirror, *Chester Shu[1], Yongheng Dai[1], Mable P. Fok[2]; [1]Chinese Univ. of Hong Kong, Hong Kong, [2]Princeton Univ., USA.*

Wavelength Conversion and Optical Signal Processing in PPLN Waveguides, *Wolfgang Sohler; Univ. of Paderborn, Germany.*

Brillouin Dynamic Grating in Optical Fibers and its Application, *Kwang Yong Song; Chung-Ang Univ., Republic of Korea.*

Recent Progress in Carbon Nanotube-Enhanced Fiber Optics, *Yong-Won Song; Korea Inst. of Science and Technology, Republic of Korea.*

Signal Processing in Silicon Waveguides, *Yikai Su; Shanghai Jiao Tong Univ., China.*

Semiconductor Specialty Fiber Optics for Wideband Optical Amplifiers, *Tingyun Wang; Shanghai Univ., China.*

Second-Order Effects in Fiber Optical Parametric Amplifiers, *Kenneth Kin-Yip Wong; Univ. of Hong Kong, Hong Kong.*

UWB over Fiber Technologies, *Jianping Yao; Univ. of Ottawa, Canada.*

32Tb/s DWDM Transmission System, *Jianjun Yu; NEC Labs America, USA.*

SC2: Optoelectronic Materials and Devices

Advances in Single Dot Light Sources with 2-D/3-D Photonic Crystal, *Yasuhiko Arakawa; Univ. of Tokyo, Japan.*

High Speed Parallel Modules for Optical Interconnection between the Chips On-Board, *Hongda Chen; Chinese Acad. of Sciences, China.*

Silicon-Based Long Wavelength Photodetectors, *Buwen Cheng; Inst. of Semiconductors, Chinese Acad. of Sciences, China.*

InAs/InP Based Quantum Dash Mode-Locked Lasers for WDM Transmission and Millimeter Wave Generation, *Guang-Hua Duan; Alcatel Thales III-V Lab, France.*

Quantum Dot Based Lasers and SOAs for Optical Communications, *Gadi Eisenstein; Technion-Israel Inst. of Technology, Israel.*

Single Wavelength Silicon Evanescent Lasers, *Alexander W. Fang; Aurrion, Univ. of California Santa Barbara, USA.*

Quantum Dot Microlasers, *Alfred Forchel; Julius-Maximilians-Univ. Würzburg, Germany.*

Low-Power Consumption VCSEL for Optical Interconnects, *Norihiro Iwai; Furukawa Electric Co., Ltd., Japan.*

Monolithic Integration of InP MZ Modulators, *Nobuhiro Kikuchi; NTT Photonics Labs, Japan.*

Investigation of Coherently Controlled Photonic Band Gap and Its Applications in Optoelectronic Devices, *Wei Li; Univ. of Wisconsin-Platteville, USA.*

Specialty Multi-Mode Fiber for Wide Bandwidth, *Robert Lingle; OFS-Fitel Norcross, USA.*

High-Q Photonic Crystal Cavities and their Applications, *Marko Loncar; Harvard Univ., USA.*

Low-Power, High-Bandwidth Optical Interconnects for Computing Systems, *Shigeru Nakagawa; IBM Tokyo Res. Lab, Japan.*

40Gbit/s Directly Modulated DFB Lasers, *Koji Otsubo; Fujitsu Labs Ltd., Japan.*

Low Power Consumption Driving Circuit, *Thomas Reunert; IPtronics A/S, Denmark.*

C-MOS Photonics, *Kal Shastri; Lightwire, Inc., USA.*

Photonic Interconnect for Computer Applications: Removing the Electronic Bottleneck, *Michael Tan; HP Labs, USA.*

High Performance Computing Using Optical Interconnection in USA, *Marc Taubenblatt; IBM T.J. Watson Res. Ctr., USA.*

GaN-Based Blue Vertical Cavity and Photonic Crystal Surface Emitting Lasers, *Shing Chung Wang; Natl. Chiao Tung Univ., Taiwan.*

MEMS, *Ming Wu; Univ. of California at Berkeley, USA.*

Functional Nanomaterials for Nanophotonics and Plasmonics, *Younan Xia; Washington Univ. in St. Louis, USA.*

InP Based Monolithic Integrated Photonic Devices, *Liming Zhang; Bell Labs, Lucent Technologies, USA.*

SC3: Optical Transmission Systems, Switching and Subsystems

Transparent Optical Networks, *Jean-Christophe Antona; Alcatel-Lucent, Bell Labs, France.*

All Optical Processing of Optical Packets, *Nicola Calabretta; Technical Univ. of Eindhoven, Netherlands.*

Migration towards High Speed Optical Access Enabled by WDM Techniques, *Fabio Cavaliere; Ericsson, Italy.*

Perspectives of Optical Coding/Decoding Techniques in OCDMA Networks, *Gabriella Cincotti; Univ. Roma Tre, Italy.*

Ultra High Bit Rate Optical Processing, *H. J. S. Dorren; Eindhoven Univ. of Technology, Netherlands.*

Secure Optical Communications, *Mable P. Fok; Princeton Univ., USA.*

Approaches to Ultrafast All-Optical Signal Processing, *Ivan Glesk; Univ. of Strathclyde, UK.*

Bidirectional WDM-RoF Transmission for Wired and Wireless Signals, *Sang-Kook Han; Yonsei Univ., Republic of Korea.*

High-Speed Photonic Integrated Devices for Advanced Modulation Formats, *Inuk Kang; Alcatel-Lucent, Bell Labs, USA.*

Recent Results on Optical RAMs, *Ken Ichi Kitayama; Osaka Univ., Japan.*

Radio-over-Fiber Systems, *Christina Lim; Univ. of Melbourne, Australia.*

Fiber Nonlinear Effects and their Mitigation in Coherent Optical OFDM, *Xiang Liu; Bell Labs, Alcatel-Lucent, USA.*

All-Optical Regeneration, *Juerg Leuthold; Univ. of Karlsruhe, Germany.*

Multiple Wavelength Optical Packet Switching by InP Integrated Photonic Devices, *Yoshiaki Nakano; Univ. of Tokyo, Japan.*

Very High Data Rate Fiber-Radio Communication, *Anthony Ng'oma; Corning Inc., USA.*

Radio over Fibre Technologies for Wideband In-Building Wireless Coverage, *Richard Penty; Cambridge Univ., UK.*

Challenges High-Capacity Undersea Long-Haul Systems, *Alexei Pilipetskii; Tyco Telecommunications, USA.*

Ultra-High-Capacity Optical Transmissions, *Dayou Qian; NEC America Labs, USA.*

High Spectral Efficiency Coherent Optical OFDM Transmissions, *William Shieh; Univ. of Melbourne, Australia.*

Operation and Management of Transparent Mesh Network Considering Physical Impairments, *Masatoshi Suzuki; KDDI R&D Labs, Japan.*

Hybrid Optoelectronic Router for Asynchronous High-Speed Optical Packets, *Hirokazu Takenouchi; NTT Photonics Labs, Japan.*

Demonstration of Real-Time Multi-Gigabit Optical OFDM Modems for Optical Access Networks, *Jianming Tang; Bangor Univ., UK.*

SC4: Network Architectures, Management and Applications

Next Generation Fiber Access: Architecture Challenges, *Dirk Breuer; Deutsche Telekom T-Systems, Germany.*

Title to Be Announced, *Angela L. Chiu; AT&T Lab, USA.*

Title to Be Announced, *Andrea Fumagalli; Univ. of Texas at Dallas, USA.*

Title to Be Announced, *Andreas Gladisch; Deutsche Telekom, Germany.*

Title to Be Announced, *Gert Grammel; Alcatel-Lucent, France.*

Title to Be Announced, *Hiroaki Harai; NICT, Japan.*

Title to Be Announced, *Feng Huang; Alcatel-Lucent, China.*

Title to Be Announced, *Yuefeng Ji; Beijing Univ. of Post and Telecommunications, China.*

Title to Be Announced, *Masahiko Jinno; NTT Network Innovation Labs, Japan.*

Title to Be Announced, *Susumu Kinoshita; Fujitsu Labs Ltd., Japan.*

Title to Be Announced, *Hans Mickelsson; Ericsson, Sweden.*

Dynamic Lightpath Networking via Overlay Control of Static Optical Connections, *George Rouskas; North Carolina State Univ., USA.*

GMPLS Provisioning Performance: Bridging the Gap between Network and Applications, *Weiqiang Sun; Shanghai Jiao Tong Univ., China.*

Recent Progress on Planar Lightwave Circuit Technology for Optical Communication, *Hiroshi Takahashi; NTT Photonics Labs, Japan.*

Title to Be Announced, *Lena Wosinska; KTH, Royal Inst. of Technology, Sweden.*

Title to Be Announced, *Jing Wu; Communications Res. Ctr. Canada, Canada.*

Title to Be Announced, *Tiejun J. Xia; Verizon Communications, USA.*

Title to Be Announced, *Hui Zang; Sprint Applied Res. Group, USA.*

Title to Be Announced, *Min Zhang; Beijing Univ. of Posts and Telecommunications, China.*

Principle, Technology and Challenge of Radio over Fiber (RoF) Based Broadband Access for Metro and Inter-City Trains, *Michael Minli Zhou; Shanghai Univ. of Engineering Science, China.*

SC5: Optical Sensors and Biophotonics

Biomedical Optics Spectroscopy for Tissue Characterization and Treatment Control, *Stefan Andersson-Engels; Lund Inst. of Technology, Sweden.*

Multi-Modality Systems for Molecular Tomographic Imaging, *Jing Bai; Tsinghua Univ., China.*

Alterations of the ECM During Ovarian Carcinogenesis Studied by Second Harmonic Generation Imaging Microscopy, *Paul Campagnola; Univ. of Connecticut Health Ctr., USA.*

Combining Optical Coherence Tomography with Fluorescence Molecular Imaging: Towards Simultaneous Morphology and Molecular Imaging, *Yu Chen; Univ. of Maryland, USA.*

High-Speed Wavelength Swept Laser Source for Optical Coherence Tomography, *Changho Chong; Santec Corp., Japan.*

Imaging Hypoxia Using Attenuated Bacteria, *Hyon E. Choy; Chonnam Natl. Univ., Republic of Korea.*

Applying Biophotonic Science and Technology in Medicine, *Frank Chuang; Univ. of California at Davis, USA.*

Probing Phenotypic Growth Factor Receptor Signaling in Living Cells with Resonant Waveguide Grating Biosensor, *Yuhong Du; Emory Univ. School of Medicine, USA.*

Title to Be Announced, *Qiyin Fang; McMaster Univ., Canada.*

Fiber-Optic Bio-Sensors, *Israel Gannot; Tel-Aviv Univ., Israel.*

Diffuse Optical Tomography and Fluorescence Molecular Tomography: Theory and Practice, *Feng Gao; Tianjin Univ., China.*

Coherent Anti-Stokes Raman Scattering Microscopy for Sensing Molecular Orientations, *Zhiwei Huang; Natl. Univ. of Singapore, Singapore.*

Advanced Confocal Microscopy in Biophotonics and Nanobiophotonics, *Ilko K. Ilev; Food and Drug Administration (FDA), USA.*

Image-Guided Optical Tomography of Tissue and Tracking, *Shudong Jiang; Dartmouth College, USA.*

Nonlinear Spectral Imaging of Epithelial Tissue Based on Two-Photon Excited Fluorescence and Second-Harmonic Generation, *Chen Jianxin; Fujian Normal Univ., China.*

Common-Path Fourier Domain OCT with Non-Scanning, *Jin U. Kang; Johns Hopkins Univ., USA.*

Monitoring Cellular Metabolism with Fluorescence Lifetime of Reduced Nicotinamide Adenine Dinucleotide, *Fu-Jen Kao; Inst. of Biophotonics, Natl. Yang-Ming Univ., Taiwan.*

Tumor Homing Nanoparticles for Cancer Imaging and Therapy, *Gwang Myung Kim; Korean Inst. of Science and Technology, Republic of Korea.*

Novel Integrative Nanotechnology on Diagnosis and Therapy in Photodynamics, *Xianggui Kong; Chang Chun Inst. of Optics and Fine Mechanics and Physics, China.*

Biological Study Using 3-D Tissue Cytometry, *Hyuk-Sang Kwon; Gwangju Inst. of Science and Technology (GIST), Republic of Korea.*

Optical Functional Imaging, *Pengcheng Li; Huazhong Univ. of Science and Technology, China.*

Hybrid Nano Plasmonics for Integrated Biosensor, *Chii-Wann Lin; Natl. Taiwan Univ., Taiwan.*

Force Spectroscopy of Single Receptor-Ligand Bond Using an Optical Trap, *Min Long; Beijing Inst. of Mechanics, China.*

Going Deeper than Microscopy with Multi-Spectral Optoacoustic Tomography (MSOT), *Vasilis Ntziachristos; Inst. for Biological and Medical Imaging, Helmholtz Zentrum München, Germany.*

Multispectral Optoacoustic Tomography: Next Generation Platform for High Resolution Imaging of Diffuse Tissues, *Daniel Razansky; Technical Univ. of Munich, Germany.*

Hybrid Fluorescence and X-Ray Computed Tomography, *Ralf B. Schulz; Inst. for Biological and Medical Imaging, Germany.*

Depth Resolved Imaging of Neural Activity by Optical Coherence Tomography (OCT), *Manabu Tanifuji; RIKEN, Japan.*

Retinal Densitometry and Intrinsic Signal Imaging: Assessing Retinal Function by Stimulus-Evoked Light Reflectance Changes, *Kazushige Tsunoda; Natl. Inst. of Sensory Organs, Japan.*

High Speed Optical Coherence Imaging: Towards the Structure and Function of Human Eye, *Maciej Wojtkowski; Inst. of Physics, Nicolas Copernicus Univ., Poland.*

Nonlinear Endomicroscopy for Two-Photon Autofluorescence Tissue Imaging, *Yicong Wu; Johns Hopkins Univ., USA.*

Microendoscopic Imaging Rapid-Scanning Multi-Axis MEMS Devices, *Younan Xia; Washington Univ. in St. Louis, USA.*

Rapid-Scanning Multi-Axis MEMS Devices for *in vivo* Optical Endoscopic Imaging Applications, *Huikai Xie; Univ. of Florida, USA.*

Diagnosis Golden Rules of Oral Diseases Based on OCT, *C. C. Yang; Natl. Taiwan Univ., Taiwan.*

A Microfluidic System for Semincontinous Bead-Based Biosensing Platforms, *Sung Yang; Gwangju Inst. of Science and Technology (GIST), Republic of Korea.*

Tissue Contrast OCT, *Yoshiaki Yasuno; Inst. of Applied Physics, Univ. of Tsukuba, Japan.*

Raman Spectroscopy for in vivo Tissue Analysis and Diagnosis on the Macro- and Micro-Scales, *Haishan Zeng; BC Cancer Res. Ctr., Canada.*

SC6: Display, Solid-State Lighting, Photovoltaics and Optoelectronics in Energy

GaN Growth and LEDs, ***Chang-Hee Hong; Chonbuk Natl. Univ., Republic of Korea***

Title to Be Announced, ***Jian-Jang Huang, Natl. Taiwan Univ., Taiwan***

Title to Be Announced, ***Yoichi Kawakami, Kyoto Univ., Japan***

III-Nitride Light-Emitting Diodes for Solid-State Lighting Revolution, ***Jong Kyu Kim; Rensselaer Polytechnic Inst., USA.***

III-V Multi-Junction Solar Cells on Ge Substrates, ***Taek Kim; Samsung Electronics, Republic of Korea.***

Title to Be Announced, ***Jang Hyuk (Jeremy) Kwon, Kyung Hee Univ., Republic of Korea***

Polymer Solar Cell, Semiconductor Sensor, ***Hsin-Fei Meng; Natl. Chiao Tung Univ., Taiwan***

Photonic Crystal Based Structures for Silicon Thin Film Solar Cell, ***Emmanuel Drouard; Ecole Centrale de Lyon, France***

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- Modes of Presentation
- Presenter Information
- Author Timeline

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Guang Yun 1	Guang Da 7	Guang Da 9	Guang Da 11

7.30–17.00 Registration Open, *Everbright Center Lobby*

8.30–10.15
TuA • Nonlinear Optics
Xinyong Dong; Nanyang Technological Univ., Singapore, Presider

TuA1 • 8.30 Invited

Ultrafast Nonlinear Optics on a Chip: Breaking the Terabit Per-Second Barrier, *Benjamin J. Eggleton; Univ. of Sydney, Australia.* We review recent progress in the development of chalcogenide based photonic integrated circuits for ultrafast nonlinear optics. The instantaneous nonlinearity of chalcogenide combined with dispersion engineering offers almost unlimited bandwidth for information processing.

8.30–10.15
TuB • VCSELs
Tim Lu; Natl. Chiao Tung Univ., Taiwan, Presider

TuB1 • 8.30 Tutorial

Rediscovery of Gratings: Novel Properties and Applications in VCSELs and Integrated Optoelectronics, *Connie Chang-Hasnain; Univ. of California at Berkeley, USA.* We review recent advances in subwavelength high-index-contrast gratings (HCGs) and a wealth of applications in optoelectronic devices, including vertical-cavity surface-emitting lasers (VCSELs), tunable VCSELs, high-Q optical resonators, low loss hollow-core waveguides, and biosensors. I will discuss theory, simulation and experimental results, and future prospects of HCG as a universal platform for photonic integrated circuits.

Connie Chang-Hasnain is John R. Whinnery Chair Professor in the Electrical Engineering and Computer Sciences Department at the University of California, Berkeley, where she also serves as Chair of the Nanoscale Science and Engineering Graduate Group. Prior to joining the Berkeley faculty, Dr. Chang-Hasnain was a member of the technical staff at Bellcore (1987-1992) and an Associate Professor of Electrical Engineering at Stanford University (1992-1996). Her research interests have been in vertical cavity surface emitting lasers and MEMS tunable optoelectronic devices and nanostructured materials and nano-optoelectronic devices. She was awarded with a Presidential Faculty Fellowship, Packard Fellowship, Sloan Research Fellowship, IEEE LEOS Distinguished Lecturer Award, IEEE LEOS

8.30–10.15
TuC • SC 01 Best Student Paper Competition
Martijn de Sterke; Univ. of Sydney, Australia, Presider

TuC1 • 8.30

Optical Time-Slot Swapping Based on Parametric Wavelength Exchange, *Xing Xu, Mengzhe Shen, T. I. Yuk, Kenneth K. Y. Wong; Univ. of Hong Kong, Hong Kong.* We experimentally demonstrate successful simultaneous RZ-NRZ optical signal time-slot swapping based on the parametric wavelength exchange (PWE) in the highly-nonlinear dispersion shifted fiber (HNL-DSF). Clear open eye diagrams of periodic mixed RZ and NRZ signals are recorded.

TuC2 • 8.45

Phase-Tunable Polarization Division Multiplexing DPSK Receiver Using a Single Demodulator, *Ying Gao[1], Yanqiao Xie[1], Lei Xu[2], Sailing He[1]; [1]Zhejiang Univ., China, [2]NEC Labs America, USA.* We report a new differential phase-shift keying (DPSK) receiver design which utilizes a single demodulator and can receive polarization division multiplexed signals. This system provides less than 3 dB power penalty at bit-error rate (BER) of 10^{-9} after 60 km of optical fiber transmission.

8.30–10.15
TuD • SC 02 Best Student Paper Competition
Jian-Jun He; Zhejiang Univ., China, Presider

TuD1 • 8.30

Direct Mapping of UV Surface Plasmon Interference, *Qiaoqiang Gan, Liangcheng Zhou, Volkmar Dierolf, Filbert Bartoli; Lehigh Univ., USA.* We present the first direct observation of the UV SPPs using a UV compatible near field scanning optical microscope system. Subwavelength interference phenomenon in 1-D and 2-D are both observed.

TuD2 • 8.45

Multi-Photon Absorption and Second Harmonic Generation Saturation in GaAs-Filled Nanoplasmonic Arrays, *Jingyu Zhang, Steven R. J. Brueck; Univ. of New Mexico, USA.* Second harmonic generation (SHG) based on the enhancement of the local fields of nanoscale periodic, GaAs-filled holes in a metal film is presented. The highest SHG conversion efficiency achieved was 10^{-5} at 8 GW/cm^2 input peak power, limited by multi-photon absorption and the resultant free-carrier absorption.

Guang Yun 7	Guang Yun 8	Guang Da 12	Guang Da 16

7.30–17.00 Registration Open, *Everbright Center Lobby*

8.30–10.00
TuE • SC 03 Best Student Paper Competition

Dominique Chiaroni; Bell Labs, Alcatel-Lucent, France, Presider

TuE1 • 8.30

100 Gb/s OOK Transmission through 212 km Field SSMF Using Monolithically Integrated ETDM Receiver Module, *Ke Wang[1,2,3], Jie Li[3], Anders Djupsjöbacka[3], Sergei Popov[1], Gunnar Jacobsen[3], Robert Makon[4], Rachid Driad[5], Herbert Walcher[5], Andreas G. Steffan[6], Heinz Gunter Bach[5]; [1]Royal Inst. of Technology, Sweden, [2]Beijing Inst. of Technology, China, [3]Acreo AB, Sweden, [4]Fraunhofer Inst. for Applied Solid State Physics, Germany, [5]Fraunhofer Inst. for Telecommunications, Heinrich-Hertz-Inst., Germany, [6]u²t Photonics AG, Germany.* 100 Gb/s on-off-key transmission over 212 km installed standard single mode fibers using an InP-based electrical clock-data-recovery and demultiplexer module. was demonstrated. Error-free performance was achieved with 1.1 dB OSNR penalty at 10^{-9} BER after transmission.

TuE2 • 8.45

Digital Compensation of Chromatic Dispersion in 112-Gbit/s PDM-QPSK System, *Tianhua Xu[1,2], Gunnar Jacobsen[2], Sergei Popov[1], Jie Li[2], Ke Wang[1,2], Ari T. Friberg[1]; [1]Royal Inst. of Technology, Sweden, [2]Acreo AB, Sweden.* Coherent optical receivers with digital filters can mitigate the impairments in optical transmission system. In this paper, an adaptive filter employing NLMS algorithm is developed for chromatic dispersion compensation in a 112-Gbit/s PDM-QPSK coherent communication system. The performance of the adaptive filter is analyzed by comparing with present digital filters.

8.30–10.15
TuF • SC 04 Best Student Paper Competition

Jing Wu; Communications Res. Ctr. Canada, Canada, Presider

TuF1 • 8.30

Impact of Waveband Capacity on Protected Hierarchical Optical Path Networks, *Yoshiyuki Yamada, Hiroshi Hasegawa, Ken-ichi Sato; Nagoya Univ., Japan.* This paper investigates the impact of waveband capacity on the cost of hierarchical optical path networks with waveband and wavelength path protection. Numerical experiments demonstrate the importance of waveband capacity optimization.

TuF2 • 8.45

A Novel Layer 1 Virtual Private Network Provisioning Architecture in Multi-Domain Optical Networks, *Ting Sun, Dahai Han, Xiuzhong Chen, Jie Zhang, Wanyi Gu, Feng Yuan; Beijing Univ. of Posts and Telecommunications, China.* A novel multi-domain L1VPN provisioning architecture is proposed based on service plane of the adaptive multi-services provisioning platform. Moreover, the architecture we proposed was experimentally demonstrated in our AMSON testbed.

8.30–10.15
TuG • SC 05 Best Student Paper Competition

Xingde Li; Johns Hopkins Univ., USA, Presider

TuG1 • 8.30

Surface-Enhanced Raman Scattering Sensor Based on Fused Biconical Taper Fiber, *Lin Liu, Zhenyi Chen, Tingyun Wang, Fufei Pang, Na Chen, Chenglin Li; Shanghai Univ., China.* A novel Surface-enhanced Raman Scattering (SERS) sensor combining with fused taper optical fiber and the film of the silver sols is proposed. We demonstrate the sensing principle and the feasibility of the SERS sensor. Accordingly, the Raman spectrum of R6G is obtained. The detecting concentration is up to 10^{-7}M.

TuG2 • 8.45

Dynamic Optical Coherence Elastography and Applications, *Xing Liang, Stephen A. Boppart; Univ. of Illinois at Urbana-Champaign, USA.* A novel, dynamic, non-invasive, high-speed dynamic optical coherence elastography (OCE) system has been developed for quantitatively mapping tissue biomechanical properties utilizing spectral-domain optical coherence tomography (OCT) and a mechanical wave driver. This dynamic OCE technique is based on solving wave equations without speckle tracking algorithms.

8.30–10.00
TuH • SC 06 Best Student Paper Competition

C. C. Yang; Natl. Taiwan Univ., Taiwan, Presider

TuH1 • 8.30

Polarization-Dependent GaN Grating Reflector, *Joonhee Lee[1], Sungmo Ahn[1], Hojoon Jang[1], Heonsu Jeon[1,2]; [1]Dept. of Physics and Astronomy and Inter-university Semiconductor Res. Ctr., Seoul Natl. Univ., Republic of Korea, [2]Advanced Insts. of Convergence Technology, Republic of Korea.* A GaN surface-grating reflector has been designed and fabricated. The grating structure was optimized by the rigorous coupled-wave analysis, which was followed by the fabrication using holographic lithography. Reflectance measurements revealed that the grating was highly polarization-dependent, its reflectance exceeding 90% over the spectral bandwidth of 60 nm for TE-polarization.

TuH2 • 8.45

Design of Dichromatic White Light-Emitting Diodes Using InAlGaN Irregular MQW Structure, *Hui-Min Lu, Gen-Xiang Chen, Chun-Hui Qi, Tao Xia; Beijing Jiaotong Univ., China.* A new approach for the design of dichromatic white light-emitting diodes (LEDs) has been proposed by employing InAlGaN irregular multiple quantum well (IMQW) structures. The electronic and optical properties of the designed InAlGaN IMQWs have been analyzed in details using a theoretical model deduced from the **k·p** theory.

Guang Yun 1

TuA2 • 9.00
The Research on the Threshold of Brillouin Fiber Ring Laser, *Pingping Zhang, Yuanhong Yang, Shuying Chen; Beijing Univ. of Aeronautics and Astronautics, China.* The threshold of a Brillouin fiber ring laser is investigated theoretically and experimentally. It is revealed that the resonance threshold is four times larger than the threshold of stimulated Brillouin scattering for the Brillouin fiber ring laser. The experimental results are well agreed with the theoretical emulation.

TuA3 • 9.15 Tutorial
Slow Light and Fast Light in Optical Fiber, *Luc Thévenaz; EPFL Swiss Federal Inst. of Technology, Switzerland.* Fiber slow light systems are at a turning point moving from a laboratory research to real applications. The possibility to shape the spectral resonance in Brillouin slow light leads to innovative solutions and makes possible the realization of optimized configurations minimizing distortion.

Luc Thévenaz received the M.Sc. degree and the Ph.D. degree in physics from the University of Geneva, Switzerland. In 1988 he joined the Swiss Federal Institute of Technology of Lausanne (EPFL) where he currently leads a research group involved in photonics, namely fibre optics and optical sensing. Research topics include Brillouin-scattering fibre sensors, slow & fast light, nonlinear fibre optics and laser spectroscopy in gases. During his career he stayed at the PUC University in Rio de Janeiro, Brazil, at Stanford University, at the Korea Advanced Institute of Science and Technology (KAIST) and at Tel Aviv University. In 2000 he co-founded the company Omnisens that is developing and commercializing advanced photonic instrumentation. He is Chairman of the European COST Action 299 "FIDES: Optical Fibres for New Challenges Facing the Information Society" and is in the Consortium of the European FP7 project "GOSPEL: Governing the speed of light".

Guang Da 7

William Streifer Award, Gilbreth Lecturer Award from National Academy of Engineering, OSA Nick Holonyak Jr. Award (2007), DoD National Security Science and Engineering Faculty Fellowship (2008), Humboldt Research Award (2009), Guggenheim Foundation Fellowship (2009), and Microoptics Award, Japan Soc. of Appl Phys. (2009). She is a Fellow of the IEEE, OSA and IEE, and an Honorary Member of A.F. Ioffe Institute. Since January 2007, she has been the Editor-in-Chief of the Journal of Lightwave Technology.

TuB2 • 9.30
Fabrication and Characterization of 1.3-μm InAs Quantum-Dot VCSELs and Monolithic VCSEL Arrays, *Ying Ding[1], Weijun Fan[1], Dawei Xu[1], Cunzhu Tong[1], Soon Fatt Yoon[1], Daohua Zhang[1], Lingjuan Zhao[2], Wei Wang[2], Yu Liu[3], Ninghua Zhu[3]; [1]School of Electrical and Electronic Engineering, Nanyang Technological Univ., Singapore, [2]Key Lab of Semiconductor Materials Science, Inst. of Semiconductors, CAS, China, [3]Optoelectronics R&D Ctr., Inst. of Semiconductors, CAS, China.* We present fabrication of 1.3-μm InAs QD-VCSELs and arrays. The output power of single VCSEL exceeds 1.2 mW. Modulation bandwidth of 2.65 GHz and 2.5 GHz are achieved for single-mode and multi-mode VCSELs. Maximum output power of 28 mW is demonstrated for VCSEL arrays with threshold current of 50 mA.

Guang Da 9

TuC3 • 9.00
Refractive Index Sensor with Acoustic Grating in a Low Index Contrast Photonic Bandgap Fiber, *Qing Shi[1,2], Boris Timothy Kuhlmey[2], Darran Wu[2]; [1]Naikai Univ., China, [2]Univ. of Sydney, Australia.* We demonstrate and optimize a microfluidic refractive index sensor with ultra-high sensitivity based on an acoustic grating in a solid core photonic bandgap fiber. The sensitivity of the acoustic grating's resonance is 18 000 nm/RIU which corresponds to smallest detectable changes in refractive index of 8.4×10^{-6}.

TuC4 • 9.15
Simple Technique for Measuring Raman Gain Efficiency Spectrum Distribution in a Single-Mode Fiber Link, *Yasuhiro Tsutsumi, Masaharu Ohashi; Osaka Prefecture Univ., Japan.* Simple technique is proposed for measuring distributed Raman gain efficiency spectrum in a single-mode fiber based on the bidirectional OTDR. The Raman gain efficiency spectra are successfully estimated easily from the relative-index difference and wavelength dependence of the mode field radius (MFR).

TuC5 • 9.30
Long Distance Fiber Bragg Grating Sensor System Based on Erbium-Doped Fiber and Raman Amplification, *Junhao Hu[1], Zhihao Chen[2], Xiufeng Yang[2], Junhong Ng[2], Changyuan Yu[1,2]; [1]Natl. Univ. of Singapore, Singapore, [2]A*STAR Inst. for Infocomm Res. (I2R), Singapore.* A novel simple long distance FBG sensor system is proposed and demonstrated. It can easily achieve 45dB SNR after transmitting along a 50km single mode fiber (SMF) by using only one 1W Raman pump laser source at 1395nm and a segment of 5m EDF.

Guang Da 11

TuD3 • 9.00
Experimental Demonstration of an Ultracompact Polarization Beam Splitter Based on a Bidirectional Grating Coupler, *Zhechao Wang[1,2], Yongbo Tang[1,2], Ning Zhu[1,2], Lech Wosinski[1,2], Daoxin Dai[2], Urban Westergren[1,2], Sailing He[1,2]; [1]Royal Inst. of Technology, Sweden, [2]Joint Res. Ctr. of Photonics of the Royal Inst. of Technology and Zhejiang Univ., China.* A bidirectional grating serving both as a polarization beam splitter and a vertical coupler for Silicon on Insulator nanophotonic circuits is fabricated and characterized. The measured coupling efficiency is as high as 43%. The demonstrated device has a large 3-dB bandwidth and a high extinction ratio between two orthogonal polarizations.

TuD4 • 9.15
Compact Hybrid Laser Based on Semiconductor Nanowires and a Silica Biconical Fiber, *Ye Ding, Xin Guo, Guanzhong Wang, Limin Tong, Qing Yang; Zhejiang Univ., China.* We demonstrate a hybrid laser consisting of ZnO nanowires attached to a silica biconical fiber, which is pumped by 355 nm wavelength laser pulses. The laser threshold is lower than 0.1 μJ/pulse. The full-width at half-maximum of the cavity mode is 0.7 nm, indicating a quality factor of about 560.

TuD5 • 9.30
Monolithically Integrated 30-Wavelength DFB Laser Array, *Jingsi Li[1], Xiangfei Chen[1], Ning Zhou[2], Jing Zhang[3], Xiaodong Huang[2], Linsong Li[2], Huan Wang[4], Yanqing Lu[1], Hongliang Zhu[4]; [1]Nanjing Univ., China, [2]Accelink Technologies Co., Ltd., China, [3]Chongqing Optoelectronics Res. Inst., China, [4]CAS, China.* To our knowledge, this is the first report of a monolithically-integrated distributed feedback semiconductor laser array based on reconstruction-equivalent-chirp technology. A laser bar with 30 different lasers is obtained, lasing at 30 different wavelengths under single longitudinal mode. The proposed method is possible to offer low-cost laser arrays for mass-production.

Guang Yun 7

TuE3 • 9.00

4-Wavelength 2R Regeneration Based on Self-Phase Modulation and Inter-Channel Walk-off Control in Bidirectional Fiber Configuration, *Kin-Man Chong, Lian-Kuan Chen; Chinese Univ. of Hong Kong, Hong Kong.* We experimentally demonstrated an optical 2R regenerator for four 10-Gb/s WDM channels based on self-phase modulation and inter-channel walk-off control in a bidirectional fiber configuration. Both the scalability and the cascadability of our proposed regenerator were also evaluated in numerical simulations.

TuE4 • 9.15

4x40 GHz Multi-Colored Optical Pulse Generation Using Single Two-Arm Modulated Mach-Zehnder Modulator, *Ke Wang[1,2,3], Jie Li[2], Sergei Popov[1], Gunnar Jacobsen[2]; [1]Royal Inst. of Technology, Sweden, [2]Acreo AB, Sweden, [3]Beijing Inst. of Technology, China.* Picosecond 4x40 GHz multi-colored optical pulses have been generated using a single two-arm modulated Mach-Zehnder modulator. In the same time the pulses can be aligned in the time domain to form a uniform 160 GHz multi-colored pulse train.

TuE5 • 9.30

Increasing the Delay-Bit Rate Product on Silicon Chip Using Star-16QAM Signal with High Spectral Efficiency, *Liang Zhang[1], Tao Wang[1], Qi Liu[1], Xiaofeng Hu[1], Jing Wang[2], Min Qiu[2], Yikai Su[1]; [1]Shanghai Jiao Tong Univ., China, [2]Dept. of Microelectronics and Applied Physics, Royal Inst. of Technology, Sweden.* We experimentally demonstrate optical delay of a novel star-16QAM signal through a silicon microring resonator. Delay time of ~ 30ps is observed by comparing the eye diagram of the star-16QAM signal on-resonance with that off-resonance.

Guang Yun 8

TuF3 • 9.00

Overlay of Multicast Service in WDM-PON Based on Dynamic Wavelength Reflection Scheme, *Min Zhu, Shilin Xiao, Wei Guo, He Chen, Zhixin Liu, Lei Cai; State Key Lab of Advanced Optical Communication Systems and Networks, Dept. of Electronic Engineering, Shanghai Jiao Tong Univ., China.* We propose and demonstrate a novel scheme to overlay multicast service over WDM-PON based on dynamic wavelength reflection scheme. Upstream data is re-modulated on downstream unicast signal.

TuF4 • 9.15

Evaluation of Signaling Schemes under Multi-Region Survivable Network by Agent Negotiations, *Bin Li, Shanguo Huang, Yongjun Zhang, Rui Chen, Wanyi Gu; Beijing Univ. of Posts and Telecommunications, China.* A reconfigurable protection is extended in ASON survivability testbed SURBED, the performance and extra overhead are presented and also compared with several survivability techniques (1+1, shared mesh, rerouting, etc) in SURBED.

TuF5 • 9.30

A Differentiated QoS Aware Multipath Routing Algorithm for Optical Burst Switched Networks, *Yuan Chi[1], Zhenrong Zhang[2], Zhengbin Li[1], Anshi Xu[1]; [1]State Key Lab of Advanced Optical Communication Systems and Networks, Peking Univ., China, [2]School of Computer, Electronics and Information, Guangxi Univ., China.* Based on routing path competition phenomenon, a differentiated QoS aware multipath routing algorithm is proposed for OBS networks. This algorithm is evaluated through extensive numerical studies over a typical topology—the 14-node NSFnet. Results show that it outperforms the existing algorithms in terms of burst dropping probability and link utilization.

Guang Da 12

TuG3 • 9.00

Laser Intracavity Analysis of Droplets by Multicolour Microfluidic Dye Laser, *Guillaume Aubry[1,2,3], Lin Chen[1,3], Sébastien Méance[1,2,3], Anne-Marie Haghiri-Gosnet[2], Qingli Kou[1,3]; [1]Lab de Photophysique Moléculaire, CNRS, France, [2]Lab de Photonique et de Nanostructures, CNRS, France, [3]Univ. Paris-Sud, France.* An original method is investigated to carry out optic analysis of microfluidic droplets using emission of a microfluidic dye laser. Multicolour laser lines are obtained by controlling the flow rate of a dye mixture which allows to achieve a wavelength on-demand system for absorption analysis of biochemical samples in droplets.

TuG4 • 9.15

Clinical Diagnosis of Oral Submucous Fibrosis with Optical Coherence Tomography, *Cheng-Kuang Lee, Meng-Tsan Tsai, C. C. Yang, Chun-Ping Chiang; Natl. Taiwan Univ., Taiwan.* A swept-source optical coherence tomography (SS-OCT) system with a specially designed probe is built for clinical scanning of oral submucous fibrosis (OSF) patients. By analysing 44 OSF cases of SS-OCT scanning results, two indicators, including epithelium thickness and standard deviation, are found useful for real-time OSF diagnosis.

TuG5 • 9.30

Optical Coherence Tomography Imaging Based on Non-Harmonic Analysis, *Xu Cao[1], Shigeki Hirobayashi[1], Changho Chong[2], Atsushi Morosawa[2], Kouki Totsuka[2], Takuya Suzuki[2]; [1]Dept. of Intellectual Information Systems Engineering, Faculty of Technology, Univ. of Toyama, Japan, [2]Santec Corp., Japan.* A new processing technique called Non-Harmonic Analysis is proposed for OCT imaging. NHA can resolve high frequency without being influenced by window function or frame length of sampled data. The results show that NHA process realizes practical image resolution equivalent to 100nm swept range by using significantly reduced wavelength range.

Guang Da 16

TuH3 • 9.00

Design Method for Rotational Uniform Illumination System with LED, *Qihui Zhang, Hong Wang, Lingling Ji; South China Univ. of Technology, China.* Based on nonimaging-design-method, uniform illumination systems with LED source was developed to create a uniform illuminated circular region with desired size in a screen at a prescribed place. By using ray-tracing-software based on Monte-Carlo-method, the simulation results show that in the illuminated region the luminous uniformity is better than 90%.

TuH4 • 9.15

Performance of 650 nm AlGaInP RCLEDs with Different P-Type DBRs, *Yidan Tang, Xia Guo, Jun Ma, Yixin Chen, Jianjun Li, Guangdi Shen; Beijing Optoelectronic Technology Lab, Beijing Univ. of Technology, China.* The performance of 650nm RCLEDs including 34-pair AlGaAs/AlAs n-type DBRs and different pairs of AlGaInP/AlInP p-type DBRs have been investigated both theoretically and experimentally. The experimental results demonstrate that the device of optimized DBR mirrors with 10-pair p-type DBRs obtain high efficiency, low turn-on voltage and better temperature stability.

TuH5 • 9.30

Light Extraction Analysis of AlGaInP Based LED with Surface Texture, *Yuan Qin, Xia Guo, Wenjing Jiang, Rong Fang, Guangdi Shen; Beijing Optoelectronic Technology Lab, Beijing Univ. of Technology, China.* Regular, periodic arranged structures were fabricated on p-side-up AlGaInP LEDs through dry etching. The dimension of the structures was optimized by Monte Carlo ray tracing simulation. Due to the appearance of an additional escape cone for light extraction enabled by surface structures, it significantly improves the performance of the chip.

Guang Yun 1

Guang Da 7

TuB3 • 9.45
Numerical Investigation of the Effect of Base Doping Density in Transistor VCSELs, *Wei Shi, Behnam Faraji, Lukas Chrostowski; Univ. of British Columbia, Canada.* Transistor VCSELs with different base doping densities are numerically modelled. The effect of the base doping density on both optical and electrical properties, i.e., laser threshold, optical power, slope efficiency, and electrical gain, is investigated.

TuB4 • 10.00
Effect of In and N Incorporation on the GaInNAs VCSELs, *Nor Azlian Abdul Manaf, Mohd Sharizal Alias, Sufian Mousa Mithani, Mohamed Razman Yahya, Abdul Fatah Awang Mat; Telekom Malaysia Res. and Development, Malaysia.* We study the effect of In and N content in GaInNAs material system for application of 1.3 μm vertical cavity surface emitting lasers (VCSEL). The emission wavelength are successfully observed at 1.303 μm wavelength. VCSEL sample with $Ga_{0.58}In_{0.42}As$ QW give the highest output power (0.5694 mW) with threshold current 11mA.

Guang Da 9

TuC6 • 9.45
Logic Unit for CSRZ-OOK Signals with the Capability of Simultaneously Realizing Logic OR and AND Gates, *Bingbing Wu, Jian Wu, Lanlan Li, Kun Xu, Xiaobin Hong, Jintong Lin; Beijing Univ. of Posts and Telecommunications, China.* An all-optical logic unit to process CSRZ-OOK format signals based on FWM arising in an SOA is proposed. A logic OR gate and two logic AND gates with different wavelengths could be simultaneously achieved in this single unit without reconfiguration.

TuC7 • 10.00
Fusion Spliced Microfiber Ring Resonators, *Pan Wang, Lei Zhang, Zongyin Yang, Fuxing Gu, Limin Tong; Zhejiang Univ., China.* A 1.15-mm-diameter close-loop ring resonator is fabricated by fusion splicing a 4-μm-diameter microfiber. When immersed in a 6 wt.% glycerin aqueous solution, the fusion spliced microfiber ring resonator exhibits good resonance at 1.6-μm-wavelength with a Q-factor of about 23000 and an extinction of 15 dB.

Guang Da 11

TuD6 • 9.45
Anomalous Modulation Characteristics of Optical Injection-Locked VCSELs, *Peng Guo[1,2], Wei Jian Yang[1], Devang Parekh[1], Werner Hofmann[1], Markus C. Amann[3], Connie J. Chang-Hasnain[1]; [1]Dept. of Electrical Engineering and Computer Sciences, Univ. of California at Berkeley, USA, [2]State Key Lab of Advanced Optical Communication Systems and Networks, Peking Univ., China, [3]Walter Schottky Inst., Technical Univ. of Munich, Germany.* An anomalous DC-suppression in the small signal response is observed experimentally and its relationship with data pattern inversion is investigated for the first time. With the inclusion of a novel OIL reflection interference model, excellent agreement is obtained between the experiment results and theoretical analysis.

TuD7 • 10.00
Silicon-Chip-Based Frequency Quadrupling for Optical Millimeter-Wave Signal Generation, *Fangfei Liu[1], Tao Wang[1], Liang Zhang[1], Jing Wang[2], Min Qiu[2], Yikai Su[1]; [1]State Key Lab of Advanced Optical Communication Systems and Networks, Dept. of Electronic Engineering, Shanghai Jiao Tong Univ., China, [2]Dept. of Microelectronics and Applied Physics, Royal Inst. of Technology, Sweden.* We propose a prototype of a silicon-chip-based frequency quadrupling system integrating a single-drive silicon Mach-Zehnder modulator and a microring resonator. A proof-of-concept demonstration of 40-GHz millimeter-wave signal generation using 10-GHz driving signal is experimentally provided.

10.15–10.45 Tea Break, *outside of Session Rooms*

Guang Yun 7

TuE6 • 9.45
Mitigation of Sampling Clock Drift in Asynchronously under-Sampled Optical Bit Pattern Monitoring, *Huixing Zhang[1,2], Carsten Schmidt-Langhorst[2], Wei Zhao[1], Colja Schubert[2]; [1]Xi'an Inst. of Optics and Precision Mechanics, CAS, China, [2]Fraunhofer Heinrich-Hertz-Inst., Germany.* We propose a bit pattern monitoring technique which effectively mitigates the random walk clock drift between data signal and sampling source in asynchronously under-sampling systems. The method is verified by measurements of 40 Gb/s NRZ and 160 Gb/s RZ data signals. Quantitative analysis of the displayed timing jitter is performed.

Guang Yun 8

TuF6 • 9.45
Impairment Aware Routing with Service Differentiation in Heterogeneous WDM Networks, *Amornrat Jirattigalachote[1], Lena Wosinska[1], Paolo Monti[1], Kostas Katrinis[2], Anna Tzanakaki[2]; [1]Royal Inst. of Technology (KTH), Sweden, [2]Athens Information Technology (AIT), Greece.* We evaluate an Impairment Constraint Based Routing algorithm with service differentiation (ICBR-Diff) applied in WDM networks with fiber links having varying Polarization Mode Dispersion characteristics. Simulation results show high adaptability of the ICBR-Diff approach to this heterogeneous fiber scenario when compared to conventional routing schemes.

TuF7 • 10.00
Clock Synchronization in T-MPLS Network via PTP (IEEE 1588 V2), *Rui Chen, Yongjun Zhang, Chang Cao, Yongli Zhao, Bin Li, Jie Zhang, Wanyi Gu; Beijing Univ. of Posts and Telecommunications, China.* We use the OPNET simulation platform to study the key factors affect the clocks' accuracy of packet-based synchronization schemes, e.g., queuing disciplines, deployment of the PTP enabled router, and network traffic load. We intend to answer the question how much influence can each factor make to the clocks' synchronization performance.

Guang Da 12

TuG6 • 9.45
Determining the Regularization Parameter: A Hybrid Reconstruction Technique in Fluorescence Molecular Tomography, *Zhun Xu, Yan Jin, Jing Bai; School of Medicine, Tsinghua Univ., China.* Herein a two-step Tikhonov regularization-based reconstruction algorithm in fluorescence molecular tomography (FMT) was proposed. The suboptimal and optimal parameter was obtained in two steps alternately. Experimental results suggested that such technique outperform the traditional L-curve criterion that estimating the optimal parameter when applying into the FMT reconstruction.

TuG7 • 10.00
Monolithic Integrated Intracavity Biosensors Based on Interferometric Laser, *Min Lou, Tingting Yu, Jian-Jun He; Zhejiang Univ., China.* A novel monolithic integrated intracavity biosensor based on an interferometric laser is theoretically studied. The intracavity mechanism and a Vernier amplification effect can provide a high sensitivity in the order of 10^{-8} RIU with a simple relative intensity measurement.

Guang Da 16

TuH6 • 9.45
Assembly and Inspection of Liquid Crystal on Silicon Devices, *Zichen Zhang, Neil Collings, A. M. Jeziorska-Chapman, Mike Pivnenko, W. A. Crossland; Dept. of Electrical Engineering, Univ. of Cambridge, UK.* Liquid crystal on silicon (LCOS) combines the optical modulation characteristics of liquid crystals with the power and compactness of a silicon backplane. The objective of our work is to improve cell assembly and inspection methods by introducing new equipment for automated assembly and by using an optical inspection microscope.

10.15–10.45 Tea Break, *outside of Session Rooms*

Guang Yun 1

10.45–12.30
TuI • Optical Fiber
Benjamin J. Eggleton; Univ. of Sydney, Australia, Presider

TuI1 • 10.45 Invited
Brillouin Dynamic Grating in Optical Fibers and its Application, *Kwang Yong Song; Chung-Ang Univ., Republic of Korea.* A novel kind of all-optical dynamic grating with the reflectance and the center wavelength controlled by other optical waves can be realized based on Brillouin scattering in optical fibers. The operation principle and the potential applications like an optically-tunable delay line and a high performance distributed sensor will be presented.

TuI2 • 11.15 Invited
Third Harmonic Generation in Optical Fibers, *Shenping Li, Ming-Jun Li, Dmitri V. Kuksenkov, Daniel A. Nolan; Corning, Inc., USA.* Third harmonic (TH) generation by four-wave mixing is investigated in a novel design optical fiber. Numerical modeling predicts that TH conversion efficiency of > 50% is achievable in the proposed fiber design. Experimentally demonstrated TH conversion efficiency is 2.5%. The main causes for lower than expected conversion efficiency are studied.

Guang Da 7

10.45–12.15
TuJ • Optical MEMS and Vertical Cavity Tunable Devices
Jin Hong; Opnext, USA, Presider

TuJ1 • 10.45 Invited
MEMS Auto-Aligner for Free-Space Optical Interconnect in Computer Servers, *Ming Wu; Univ. of California at Berkeley, USA.* Free-space optical interconnect using arrays of VCSELs can significantly increase the board-to-board interconnect bandwidth in computer servers. However, static alignment errors due to board tilt and insertion offsets have prevented their deployment. We present a novel MEMS microlens scanner capable of correcting misalignment without zero steady-state power consumption.

TuJ2 • 11.15
Properties of Wavelength Tunable VCSELs with MEMS Cantilever, *Guan Bao-lu, Guo Xia, Jinglan Zhang, Guo Yuhan, Chuai Dongxue, Shen Guang-di; Beijing Optoelectronic Technology Lab, Beijing Univ. of Technology, China.* We present the influence of the cantilever on the tunable VCSEL and RCLED, with an external reflector apart from the lasers. The theoretically calculated results and experiments show that there is a periodical change in the output and its spectrum as airgap thickness changes by controlled the cantilever carefully.

TuJ3 • 11.30
Investigation on Tunable Wavelength and Modal Characteristics of MEMS Tunable Vertical Cavity Surface Emitting Lasers, *Jinglan Zhang, Xia Guo, Baolu Guan, Dongxu Chuai, Guangdi Shen; Beijing Optoelectronic Technology Lab, Beijing Univ. of Technology, China.* The relationship between the wavelength shift and the thickness of the air gap was investigated by the optical standing wave method; the modal characteristics of the MEMS tunable vertical cavity surface emitting lasers were also analysed in the dielectric cylindrical waveguide by the improved effective index method.

Guang Da 9

10.45–12.30
TuK • Regeneration and Processing
Mable P. Fok; Princeton Univ., USA, Presider

TuK1 • 10.45 Invited
All-Optical Regeneration, *Juerg Leuthold, W. Freude, S. Sygletos, R. Bonk, T. Vallaitis, A. Marculescu; Univ. of Karlsruhe, Germany.* All-optical regeneration principles and design guidelines for building all-optical regenerators are discussed. In this paper 2R regeneration is introduced as a concept where a multitude of frequency components are generated in a nonlinear media and where subsequent proper filtering provides the desired regeneration.

TuK2 • 11.15
A Scalable and Hardware-Efficient Architecture for Digitally Adaptive Electronic Dispersion Compensation, *Daniel Efinger[1], Stefan Payer[1], Halmo Fischer[2]; [1]Inst. of Telecommunications, Univ. of Stuttgart, Germany, [2]Agilent Technologies R&D and Marketing GmbH & Co. KG, Germany.* We present a novel hardware architecture for adaptive feed-forward equalization (FFE) on a Virtex-II FPGA and show its performance in a time-varying IM/DD optical link. Our solution can be scaled to various bit rates and our digital adaptation unit is able to track time-varying channels well within 1 ms.

TuK3 • 11.30
Experimental Investigation of All-Optical Regenerator Based on Single Pump Fiber-Optic Parametric Amplifier, *Jun Luo[1], Jinlong Yu[1], Bingchen Han[1,2], Ju Wang[1], Tingyu Wang[1], Wei Jia[1], Enze Yang[1]; [1]Tianjin Univ., China, [2]Shanxi Datong Univ., China.* All-optical regenerator based on single pump fiber-optic parametric amplifier (FOPA) is demonstrated experimentally. The input signal wavelength range of the regenerator is investigated, and its permance is further assessed by changing the signal with different distance transmission degradation and with different signal to noise ratio (SNR).

Guang Da 11

10.45–12.30
TuL • Dynamic Provisioning
George Rouskas; North Carolina State Univ., USA, Presider

TuL1 • 10.45 Tutorial
Efficient Protection and Grooming Architecture for Optical Networks, *Arun Somani; Iowa State Univ., USA.* Internet services and applications require high reliability and different bandwidth that need to be supported over the high capacity wavelength channels. We will present a short overview of issues in design of wavelength division multiplexing, efficient protection, and access and grooming mechanisms to make the network transparent, scalable, reliable, and simple.

Arun K. Somani is Jerry R. Junkins Endowed Chair and Anson Marston Distinguished Professor of Electrical and Computer Engineering at Iowa State University, Ames, Iowa. Prior to that he served as Scientific Officer in India (1973-82), earned his master and doctorate degree in electrical engineering from the McGill University, Montreal, Canada (1982-85) and served as faculty member at the University of Washington, Seattle, WA (1985 to 1997). His research interests are in the area of parallel and dependable computing and networking system design and architecture, and WDM-based optical networking. He has supervised research of more than 60 MS and 25 PhD students; published more than 250 technical papers, several book chapters, and one book; and served as IEEE distinguished visitor and IEEE distinguished tutorial speaker. He has delivered several tutorials, keynote, invited, and distinguished talks all over the world. He is a Fellow of IEEE and ACM Distinguished Scientist member.

Guang Yun 7

10.45–12.30
TuM • Multimodal Biophotonics Technologies
Jing Bai; Tsinghua Univ., China, Presider

TuM1 • 10.45 Invited
Going Deeper than Microscopy with Multi-Spectral Optoacoustic Tomography (MSOT), *Vasilis Ntziachristos; Inst. for Biological and Medical Imaging, Helmholtz Zentrum München, Germany.* We present the technology and application regimes of multi-spectral optoacoustic tomography and showcase its high resolution imaging performance in imaging fluorochromes, fluorescent proteins and other chromophoric agents *in vivo*.

TuM2 • 11.15 Invited
Multi-Modality Optical Tomography for Simultaneous Morphological and Molecular Imaging, *Shuai Yuan, Qian Li, Yu Chen; Univ. of Maryland, USA.* We present a combined optical coherence tomography (OCT) and line-scanning fluorescence laminar optical tomography (FLOT) system for simultaneous 3-D morphological and molecular imaging with 10-100 μm resolution and millimeter-scale imaging depth. Co-registration on a capillary phantom with fluorescence dye Cy5.5 using the system has been demonstrated.

Guang Yun 8

10.45–12.45
TuN • Novel Technologies for LEDs
Chang-Hee Hong; Chonbuk Natl. Univ., Republic of Korea, Presider

TuN1 • 10.45 Invited
Application of Nanosphere Lithography to the Fabrication of Nanorod LEDs and to the Performance Enhancement of Conventional LEDs, *Yun-Wei Cheng, Tzu-Chun Lu, Min-Yung Ke, Kun-Mao Pan, Liang-Yi Chen, Hung-Li Chiang, Ying-Yuan Huang, Jian-Jang Huang; Natl. Taiwan Univ., Taiwan.* The process of nanosphere lithography was developed and applied to LED epistructure. We demonstrated p-i-n nanorod LED arrays with some specific characteristics. Moreover, LEDs encompassed with self-aligned nanorods are fabricated. Light diffraction behaviors are characterized. The results are explained by photonic crystal effect.

TuN2 • 11.15 Invited
Semipolar (11-22)-Based InGaN/GaN Quantum Wells for Visible Light Emitters, *Mitsuru Funato, Yoichi Kawakami; Kyoto Univ., Japan.* Visible light emitting diodes (LEDs) using semipolar (11-22)-oriented InGaN/GaN quantum wells (QWs) were demonstrated. Three dimensional microfacet structures realized white/pastel emissions without phosphors, while planar structures led to LEDs with much less polarization-induced internal electric fields compared to the conventional LEDs on the (0001) plane, both of which cannot be realized without the (11-22) planes.

Guang Da 12

10.45–12.30
TuO • Optical Pulses
Perry Ping Shum; Nanyang Technological Univ., Singapore, Presider

TuO1 • 10.45 Invited
Silica Microtoroid and Its Applications, *Tao Lu; Univ. of Victoria, Canada.* We review the whispering gallery type microtoroid resonator fabricated on a silicon chip. Using this structure, an Erbium doped silica green laser through three-photon-absorption process is demonstrated and an on-chip Raman laser operating at single mode with fundamental linewidth as low as 3-Hz is reported.

TuO2 • 11.15
A Novel Scheme for Tunable Optical Pulse Generation Based on Fiber Sagnac Loop, *Wei Yang, Yuanhong Yang, Pingping Zhang; Beijing Univ. of Aeronautics and Astronautics, China.* A novel scheme for tunable optical pulse generation based on fiber Sagnac loop was proposed. The repetition rate of optical pulse is twice the frequency of external square wave modulation signal and can be tuned directly by varying modulation frequency. Experimental results agree well with theoretical predictions and simulations.

TuO3 • 11.30
Widely Tunable Femtosecond Soliton Pulse Generation and Spectral Compression in Highly Nonlinear Fibers, *He-Ping Li, X. L. Wu, J. K. Liao, X. G. Tang, Y. Liu, Y. Z. Liu; Univ. of Electronic Science and Technology of China, China.* We demonstrate a soliton self-frequency shift of ~140 nm and spectral compression in highly nonlinear fibers with 260-fs pulses at 1558 nm. The wavelengths of the resulting solitons can be tuned effectively by adjusting the input power. The spectral width of the solitons is compressed from 9.2 to 2.6 nm.

Guang Da 16

10.45–12.45
TuP • Planar Waveguide Devices
Chenglin Xu; RSoft Design Group, Inc., USA, Presider

TuP1 • 10.45 Tutorial
Planar Waveguide Spectrometers for Communication and Sensing Applications, *Katsunari Okamoto; AiDi Corp., Japan.* The talk will focus on two kinds of planar spectrometers; (a) SOI AWG and etched grating and (b) PLC spectrometer based on spatial heterodyne spectroscopy (SHS). Athermalization of SOI AWGs will be described. PLC-SHS is a kind of Fourier-transform spectroscopy. Operational principle and current progress of PLC-SHS will be described.

Dr. Okamoto worked at NTT Photonics Laboratories in the field of optical fibers and planar lightwave circuits. He proposed and fabricated for the first time dispersion-flattened fibers in 1979 and polarization-maintaining (PANDA) fibers in 1981. He developed various kinds of AWGs ranging from 8ch-50nm spacing AWG to 4,000ch-5GHz AWG, fully integrated-optic ROADM, and temporal pulse waveform shaper (optical arbitrary waveform generator : OAWG). From 2006 to 2008, he worked as Professor at the University of California at Davis. His research at the University of California at Davis includes passive and active photonic integrated circuits and silicon photonics. He is currently working on miniature PLC spectroscopic sensors for environmental sensing and health diagnostics.

Guang Yun 1

TuI3 • 11.45
Quantum Size Effect and Supercontinuum of Fabricated Inner Cladding Fibres with InP Nano Thin Films, *Jin Wang, Ru Zhang, Yuwen Duan, Kun Zhong; Beijing Univ. of Posts and Telecommunications, China.* This article used improved chemistry vapour deposition and drawn out the fibres with InP nano thin films. By the quantum size effect, the change of the energy band and light absorption wavelength has been calculated. By using test system, supercontinuum generation is obtained from fibres with InP nano thin films.

TuI4 • 12.00
Investigation on Temperature Sensitivity of D-Shaped Fibers by Manufacturing Specified Surface Structure, *Oh-Jang Kwon, Hyun-Joo Kim, Suho Chu, Seok Ho Song, Young-Geun Han; Hanyang Univ., Republic of Korea.* The mode coupling can be modified by the overlay structures such as a single layer and periodic grating. Temperature sensitivities of D-shaped fibers with specified surface structures such as thin film and periodic grating are investigated.

TuI5 • 12.15
High Temperature Sensing Characteristics of Erbium-Doped Fiber Using Fluorescence Intensity Ratio Technology, *Jian Peng, Lisong Liu, Yongjun Fu, Jing Wang, Shuisheng Jian; Inst. of Lightwave Technology, Beijing Jiaotong Univ., China.* The high temperature dependence of fluorescence in erbium-doped fiber between ~700 and ~1300°C is discussed by using fluorescence intensity ratio (FIR) technique. The two separate wavelengths 1450nm and 1530nm are chosen to calculate the FIR, and the temperature coefficient could achieve ~ 0.003dB/°C.

Guang Da 7

TuJ4 • 11.45
Design and Fabrication of Multichannel Tunable Photodetector Array, *Xiaofeng Duan, Yongqing Huang, Xiaomin Ren, Hui Huang, Qi Wang, Song Wang, Yufeng Shang, Xian Ye, Shiwei Cai; Beijing Univ. of Posts and Telecommunications, China.* A long-wavelength multichannel tunable photodetector array was fabricated based on multistep Fabry-Pérot filter and thermal-optic effect. The array can detect multiple channels, and the tuning range of each detector is 10nm. A spectral linewidth of 0.5nm, a quantum efficiency over 27%, and a 3dB bandwidth of 9.2GHz were simultaneously obtained.

TuJ5 • 12.00
Optical Switch Based on Nanocrystalline VO_x Thin Film, *Xiqu Chen[1], Jun Dai[2,3]; [1]Dept. of Mathematics and Physics, Wuhan Polytechnic Univ., China, [2]Dept. of Optoelectronic Engineering, Huazhong Univ. of Science and Technology, China, [3]Wuhan Natl. Lab for Optoelectronics, China.* An optical switch is fabricated based on nanocrystalline vanadium oxide thin film with micromachining technology, and has ON state with semi-conducting phase and OFF state with metallic phase. At optical communication wavelength, its power dissipation is 15mW, extinction ratio is 14dB and switching response time is 2ms.

Guang Da 9

TuK4 • 11.45
Design and Optimization of Phase Regenerator Based on Semiconductor Optical Amplifier, *Lixia Xi[1,2], Yangge Xie[3], Xianfeng Tang[1,2], Xiaoguang Zhang[1,2]; [1]Inst. of Optical Communications and Optoelectronics, Beijing Univ. of Posts and Telecommunications, China, [2]Key Lab of Information Photonics and Optical Communications, Beijing Univ. of Posts and Telecommunications, China, [3]Intl. School, Beijing Univ. of Posts and Telecommunications, China.* A novel phase regenerator with semiconductor optical amplifier is proposed. By theoretical analysis and simulation, the optimum parameters of phase regenerator are obtained. The relevant data are compared. The results show that nearly ideal phase regeneration is achieved. Bit error rate improvement is greater than ten orders of magnitude.

TuK5 • 12.00
Regenerative Balanced-Receiver for 80Gbit/s DPSK Data, *Ehab Awad; Cairo Univ., Egypt.* Regenerative receiver for 80Gbit/s RZ (NRZ) DPSK data is numerically demonstrated. Demodulated orthogonally-polarized OOK streams are reshaped and reamplified by gain-compression inside polarization-insensitive SOA. The technique is tested over wide range of input phase and amplitude noise. BER at 10^{-9} shows $OSNR_{OOK}$ improvement ≅6dB (5.3dB) for RZ (NRZ) DPSK case.

TuK6 • 12.15
Performance Monitoring on the Orthogonality Among the Multi-Subcarriers of an All-Optical OFDM System, *Shumin Zou, Nan Chi, Yufeng Shao, Xi Zheng, Junwen Zhang, Wuliang Fang, Chunning Hou, Xiao Liu; School of Information Science and Engineering, Fudan Univ., China.* All-optical OFDM transmitter and receiver with 5×20Gbit/s were simulated. We have analysed the principle of orthonogonal carrier generation, and obtained the optimal configuration for two, three and five orthonogonal carriers. Through designing proper system parameters, the clearly eye diagrames were obtained. The BER curves of five orthonogonal signals were detected.

Guang Da 11

TuL2 • 11.45
Impact of Path Granularity and Operation Interval on Dynamic Path Network Control, *Hiroyuki Ito, Hiroshi Hasegawa, Ken-ichi Sato; Dept. of Electrical Engineering and Computer Science, Nagoya Univ., Japan.* We investigate the effect of path granularity and operation interval on dynamic path network operation with the aim of minimizing unused capacity and operation frequencies. We use various Internet traffic data sets to clarify the relations, and elucidate the general trends that enable us to effectively implement dynamic path control.

TuL3 • 12.00
Evaluations on Physical and Optical Path Level Hierarchical Networks to Implement Optical Fast Circuit Switching, *Takahiro Ogawa, Yoshiyuki Yamada, Hiroshi Hasegawa, Ken-ichi Sato; Dept. of Electrical Engineering Computer Science, Nagoya Univ., Japan.* We propose an efficient network architecture to implement optical fast circuit switching. To effectively manage dynamic path operations, we introduce a hierarchical structure consisting of physical network level and optical path level. Numerical experiments show that the proposed hierarchical network greatly reduces the necessary number of switch ports.

TuL4 • 12.15
Fault-Tolerant Scheduling Using Primary-Backup Approach for Optical Grid Applications, *Min Zhu[1,2], Shilin Xiao[1], Wei Guo[1], Anne Wei[2], Yaohui Jin[1], Weisheng Hu[1], Benoit Geller[2]; [1]State Key Lab of Advanced Optical Communication Systems and Networks, Shanghai Jiao Tong Univ., China, [2]UEI Lab, ENSTA ParisTech, France.* Fault-tolerant scheduling is an important issue for optical grid applications because of various grid resource failures. To improve the availability of the DAGs (directed acyclic graphs), a primary-backup approach is considered when making DAG scheduling decision. Experiments demonstrate the effectiveness and the practicability of the proposed scheme.

Guang Yun 7

TuM3 • 11.45 Invited

Integrated CMOS Sensors for Fluorescence Spectroscopy and Imaging, *Munir El-Desouki[1], M. Jamal Deen[1], Shahram Shirani[1], Shahin Sirouspour[1], Frances Tse[2], David Armstrong[2], Qiyin Fang[3]; [1]Dept. of Electrical and Computer Engineering, McMaster Univ., Canada, [2]Dept. of Medicine, McMaster Univ., Canada, [3]Dept. of Engineering Physics, McMaster Univ., Canada.* Miniaturization of sensing and imaging devices using commercial micro/nano-fabrication technologies offers many advantages such as low-cost, small size and portability. We report our recent work in novel active pixel sensors and avalanche photodiodes that are fully integrated into multi-pixel CMOS camera-on-a-chip devices for fluorescence lifetime imaging and sensing applications.

TuM4 • 12.15

Highly-Sensitive Optical Sensor Using Two Cascaded-Microring Resonators with Vernier Effect, *Lei Jin, Mingyu Li, Jian-Jun He; Zhejiang Univ., China.* A highly-sensitive optical sensor comprising of two cascaded microring resonators with Vernier effect is investigated theoretically. It is shown that a refractive index change in the order of 10^{-7} RIU can be measured from the relative intensities of two adjacent modes.

Guang Yun 8

TuN3 • 11.45 Invited

Fabrication and Characterization of Embedded Air-Prism Light Emitting Diodes, *Chang-Hee Hong; Chonbuk Natl. Univ., Republic of Korea.* We report characteristics of the InGaN/GaN light emitting diodes (LEDs) with embedded air prisms (EAP) via a wet etching process. EAP LED output power was increased 2.1 times compared with the conventional LED due to the improvement in the scattering of photons at the EAP interface.

TuN4 • 12.15

Improvement of LED Extraction Efficiency with Antireflection Coating, *Yuhan Guo, Xia Guo, Baolu Guan, Wenjing Jiang, Rong Fang, Yuan Qin, Guangdi Shen; Beijing Optoelectronic Technology Lab, Bejing Univ. of Technology, China.* In this paper we proposed a SiON layer deposited on the surface of AlGaInP LED used to decrease total internal reflection. Light propagation property of this layer was simulated by the transmission matrix method. The results of the experiment showed that optical power increased by 11.38% after LED encapsulation.

Guang Da 12

TuO4 • 11.45

Wavelength-Switchable Picosecond Laser Pulses Generated from a Self-Seeded Fabry-Perot Laser Diode and a Tilted Multimode Fiber Bragg Grating, *Yunqi Liu[1], Kin Seng Chiang[2]; [1]Shanghai Univ., China, [2]City Univ. of Hong Kong, China.* We demonstrate the generation of wavelength-switchable picosecond pulses using a self-seeded Fabry-Perot laser diode and a tilted multimode fiber Bragg grating, where wavelength selection is achieved by changing the modal distribution in the grating.

TuO5 • 12.00

A 100 GHz Pulse Train Generation by Spectral Filtering of a Mode-Locked Fiber Laser Output, *Jia Zhang, Wook-Jin Seo, Il-Hwan Cho, Dongsun Seo; Myongji Univ., Republic of Korea.* We demonstrate a simple method to generate a high speed pulse train from a low speed pulse source by spectral filtering using a high finesse fiber Fabry-Pérot interferometer. Reasonably stable 100 GHz pulses at 1550 nm were obtained from a 10 GHz mode-locked fiber laser.

TuO6 • 12.15

Propagation of High-Power Parabolic Pulses in Cubicon Fiber Amplifiers, *Shumin Zhang, Chunjiang Jin, Yichang Meng; Hebei Normal Univ., China.* We have theoretically studied pulse propagation in normal-dispersion optical cubicon fiber amplifier (NDOCFA) with arbitrary longitudinal gain profile, and have obtained analytical solution for nonlinear Schrödinger equation that describes such an amplifier. The results showed that the characteristics of self-similarity and linear chirp will be lost due to third-order dispersion.

Guang Da 16

TuP2 • 11.45

Multimode Waveguide Turning-Mirror Couplers, *C. L. Chiu, Tsong-Sheng Lay; Natl. Sun Yat-Sen Univ., Taiwan.* 90-degree and 60-degree multimode waveguide turning-mirror couplers are achieved by introducing a reflector at the self-image location. A compact single ring resonator with 2x2 multimode waveguide turning-mirror couplers has been demonstrated.

TuP3 • 12.00

Novel Approach for Planar Bragg Gratings Characterization Using Prism Coupling, *Josselin Pello[1,2], Tran Phuong Trinh Le[1], Chin Chye Anthony Lim[1], Elhadj Dogheche[3], Myriam Kaba[1,2], Kantisara Pita[1], Didier Decoster[3], Jean Pierre Huignard[4], Swee Chuan Tjin[1], Jean Chazelas[1,5]; [1]Nanyang Technological Univ., Singapore, [2]Thales Technology Ctr. Singapore Pte. Ltd., Singapore, [3]Univ. de Valenciennes, France, [4]Thales Res. and Technology, France, [5]Thales Systeme Aeroportes, Singapore.* We demonstrate that a prism coupling characterization technique can lead to simpler waveguide Bragg grating (WBG) designs and easier fabrication by avoiding channel transmission. The experimental results have shown that the incident laser beam's collimation was maintained after coupling to a planar waveguide with an overall efficiency of 10%.

TuP4 • 12.15

Observation of the Thermal Nonlinear Optical Effect in a Microring Resonator Based on a Small SU-8 Polymer Ridge Optical Waveguide, *Liu Yang, Daoxin Dai, Jian-Jun He, Sailing He; Ctr. for Optical and Electromagnetic Res., Zhejiang Univ., China.* The thermal nonlinear optical effect is observed in a microring resonator based on a small SU-8 polymer ridge optical waveguide. The resonant wavelength blue shifts almost linearly with a slope of about -0.8 pm/mW as the input power increases. The absorption mechanism is analyzed in detail.

12.30–14.00 Lunch Break

NOTES

Guang Yun 7

Guang Yun 8

TuN5 • 12.30

Enhancement of Polarized Light-Emitting Diode through Surface Plasmon Coupling Generated on a Metal Grating, *Kun-Ching Shen, Cheng-Yen Chen, Che-Hao Liao, Tsung-Yi Tang, C. C. Yang; Natl. Taiwan Univ., Taiwan.* Further enhancement of the polarized emission efficiency of an InGaN/GaN single quantum well (QW) light-emitting diode (LED) with the QW coupling with surface plasmon generated on an Ag nano-grating structure on the top of the LED by inserting a SiO_2 layer between semiconductor and metal is demonstrated.

Guang Da 12

Guang Da 16

TuP5 • 12.30

Enhancement of the Evanescent Coupling between Deeply-Etched IIIV-Si Hybrid Microring Laser and Its Small Si Bus Waveguide by Using a Bending Coupler, *Daoxin Dai[1,2], Di Liang[1], John E. Bowers[1]; [1]Univ. of California at Santa Barbara, USA, [2]Zhejiang Univ., China.* This paper presents the design of a bending coupler for a compact deeply-etched IIIV-Si hybrid microring laser. With the design, a relatively large gap (~ 0.45 μm) is enough to result in sufficient evanescent coupling between the IIIV-Si hybrid microring and the Si bus waveguide.

12.30–14.00 Lunch Break

NOTES

Guang Yun 1

14.00–15.45
TuQ • Polarization Effects and Measurements
Aoxiang Lin; Ctr. for Optical Technologies, Lehigh Univ., USA, Presider

TuQ1 • 14.00 Tutorial
Polarization Effects in Optical Fibers and Practical Challenges, *Lianshan Yan; Southwest Jiaotong Univ., China.* Polarization-related impairments along optical fiber links remain as challenges in high performance systems. Such degrading effects and their mitigation through either optical or electronic approaches will be reviewed, followed by recent polarization-related research highlights utilizing advanced modulation formats to increase spectral-efficiencies and overall performance. Pros and cons will be discussed.

Lianshan Yan received the B.E. degree from Zhejiang University and Ph.D. degree from University of Southern California. He was the Chief Scientist and Manager of Engineering at General Photonics Corporation. He is currently a full professor at Southwest Jiaotong University as the director of Center for Information Photonics & Communications. He serves as a frequent Referee for over ten journals. He holds seven issued U.S. patents and more than 10 pending ones. He is the author and coauthor of more than 130 papers and one book chapter, including three invited journal review papers. Prof. Yan is a senior member

Guang Da 7

13.45–15.45
TuR • Special Session on Optical Interconnect for Green ICT I
Akihiko Kasukawa; Furukawa Electric Co. Ltd., Japan, Presider

TuR1 • 13.45 Invited
Low-Power, High-Bandwidth Optical Interconnects for Computing Systems, *Shigeru Nakagawa; IBM Tokyo Res. Lab, Japan.* Power-efficient, high-performance multicore systems require high-bandwidth and low-power I/O, which can not be realized without optics. This paper will review recent progress in optical interconnects, which include low-power, high-speed optical link and high-density, chip-based, high-density optical packaging on optical PCB.

TuR2 • 14.15 Invited
Photonic Interconnects for Computer Applications, *Michael Tan, Paul Rosenberg, Sagi Mathai, Joseph Straznicky, Lennie Kiyama, Jong S. Yeo, Moray Mclaren, Wayne Mack, Plary Mendoza, Huei Pei Kuo; Hewlett Packard Labs, USA.* For intra-rack board-to-board and intra-board interconnections, photonics can enable system topologies no longer feasible with copper. In this paper, we present the design and construction of a 30cm long, 4 channel optical multidrop bus capable of interconnecting up to 8 receiver modules at 10Gbps per channel.

Guang Da 9

14.00–15.45
TuS • Transmitter and Receiver Technologies I
Yannick Keith Lize; Opnext, USA, Presider

TuS1 • 14.00 Invited
40G Backbone Deployment and Visions on 100G Design, *Michael Choy; LifeIT Technologies, USA.* This talk focuses on the field video implementation of 40G. OSNR, DCM/PMD requirements are described in the overlay environment of current 10G infrastructure. Results are extended to 100G where coherent detection in single-carrier and OFDM approaches are summarized. Also described is standard requirement of 40G for datacom migration/compatibility with 10GE.

Guang Da 11

14.00–15.45
TuT • Optical Access Networks I
Dirk Breuer; Deutsche Telekom T-Systems, Germany, Presider

TuT1 • 14.00 Invited
Challenges and Opportunities for Migration towards 10GPON, *Hans Mickelsson, Einar In De Betou, Björn Skubic, Stefan Dahlfort; Ericsson Res., Sweden.* Different technical challenges for migration from GPON to 10GPON are discussed and also put into context of standardization. The challenges include how to handle an increased uplink capacity through use of burst-mode receivers and DBA algorithms, extension of reach and wavelength planning for future proofing the fiber infrastructure.

Guang Yun 7

14.00–15.30
TuU • Diffuse Optical (Fluorescence) Tomography and Molecular Imaging I
Ralf B. Schulz; Helmholtz Zentrum München Inst., Germany, Presider

Guang Yun 8

14.00–15.30
TuV • Photonic Crystals
Yong-Won Song; Korea Inst. of Science and Technology, Republic of Korea, Presider

Guang Da 12

14.00–15.45
TuW • PMD Compensation
Ivan Glesk; Univ. of Strathclyde, UK, Presider

Guang Da 16

14.00–15.45
TuX • All-Optical Signal Processing
Wei Li; Univ. of Wisconsin-Platteville, USA, Presider

TuU1 • 14.00 Invited

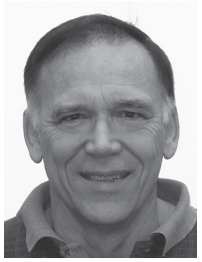
Multi-Modality Systems for Molecular Tomographic Imaging, *Jing Bai, Mingze Li; Tsinghua Univ., China.* Multi-modality imaging, which combines different imaging methods to provide structural, functional and molecular information in one single context, is an important trend in both small animal imaging and clinical research. This presentation introduces some recent advances of multimodality and highlights two systems, FMT-CT and FMT-PET to show their distinct advantages.

TuV1 • 14.00 Invited

Role of Evanescent Modes in Direct, Efficient Coupling into Slow Light Photonic Crystal Waveguides, *Martijn de Sterke[1], K. B. Dossou[2], T. P. White[3], L. C. Botten[2], R. C. McPhedran[1]; [1]Univ. of Sydney, Australia, [2]CUDOS, School of Mathematical Sciences, Univ. of Technology, Australia, [3]School of Physics and Astronomy, Univ. of St. Andrews, UK.* The assumption that coupling into slow PC waveguide modes is inefficient is shown to be incorrect. Efficient coupling is possible, provided strong evanescent modes are present to match fields at the interface with fast medium.

TuW1 • 14.00 Tutorial

Parametric Amplification in Optical Fiber, *Robert M. Jopson[1], Stojan Radic[2], Alan H. Gnauck[1], Colin J. McKinstrie[1]; [1] Bell Labs , Alcatel-Lucent, USA, [2]Univ. of California at San Diego, USA.* Fiber parametric amplifiers have demonstrated high gain with a very wide and flat bandwidth. Of great interest is their usefulness in such optical processing tasks as frequency shifting, phase conjugation, reshaping, switching, demultiplexing and sampling. We discuss the underlying physics, practical aspects and applications of parametric devices in optical fiber.



Robert M. Jopson was born in Altadena, California in 1950. He received the B.S. degree in physics from the University of California, Davis in 1972 and the Ph.D. degree in physics from Harvard University in 1981. He joined AT&T Bell Laboratories in 1981 where he worked on generating short-wavelength light and studied doubly-excited atomic states. Since 1983, he has worked on a variety of problems in lightwave communications. He is a member of The Optical Society, the American Physical Society and the IEEE.

TuX1 • 14.00

Simultaneous Demonstration on FWM-Based All-Optical 40Gbit/s Multicasting CSRZ-DPSK Logic XOR Gate and CSRZ-DPSK to RZ-DPSK Format Conversion, *Jian Wang[1,2], Qizhen Sun[1], Junqiang Sun[1]; [1]Huazhong Univ. of Science and Technology, China, [2]Dept. of Electrical Engineering, Univ. of Southern California, USA.* We propose and demonstrate the logic XOR gate and format conversion for carrier-suppressed return-to-zero differential phase-shift keying (CSRZ-DPSK) signals using non-degenerate four-wave mixing (FWM) in a highly nonlinear fiber (HNLF). All-optical 40 Gbit/s multicasting CSRZ-DPSK logic XOR operation and CSRZ-DPSK to RZ-DPSK format conversion are simultaneously substantiated in the experiment.

TuX2 • 14.15

All Optical Clock Recovery for 40Gbs Using an Amplified Feedback DFB Laser, *Yu Sun[1], J. Q. Pan[1], L. J. Zhao[1], W. X. Chen[1], W. Wang[1], L. Wang[2], X. F. Zhao[2], C. Y. Lou[2]; [1]Inst. of Semiconductors, CAS, China, [2]Dept. of Electronic Engineering, Tsinghua Univ., China.* A monolithic integrated three-section amplified feedback semiconductor laser (AFL) is demonstrated as an all optical clock regenerator. All optical clock recovery for 40Gb/s is demonstrated experimentally using AFL.

Guang Yun 1

of the IEEE Photonics Society and a member of OSA. He is one of recipients of LEOS Graduate Fellowship in 2002. He currently serves as the IEEE Photonics Associate Vice President of Membership-China, an associate editor of IEEE Photonics Journal, and was the co-chair or TPC member of various international conferences.

TuQ2 • 15.00
Experimental Demonstration of a Wavelength Tunable Polarization OTDR Using a SOA for Received Signal Amplification, *Ikuo Yamashita[1], Masaharu Ohashi[2]; [1]Kansai Electric Power Co., Inc., Japan, [2]Osaka Prefecture Univ., Japan.* A wavelength tunable polarization OTDR utilizing a semiconductor optical amplifier for the received signal amplification is proposed in order to realize stable operation. Measurement experiments are carried out for a fiber link with a length of 5.7-km and the state of polarization change along the fiber link is successfully distinguished.

Guang Da 7

TuR3 • 14.45 Invited
CMOS Photonics, *Kalpendu Shastri; Lightwire, Inc., USA.* CMOS Photonics is a platform technology. It enables CMOS ICs to process not just electrons, but also photons. We demonstrate devices to manipulate photons at very high speed with very low power and size, with efficient broadband coupling of photons to these CMOS opto-electronic ICs.

Guang Da 9

TuS2 • 14.30 Invited
Radio over Fibre Technologies for Wideband In-Building Wireless Coverage, *Richard Penty, M. J. Crisp, I. H. White; Univ. of Cambridge, UK.* This paper describes the use of radio over multimode fibre networks to allow wideband wireless coverage in building environments. It will cover basic principles, commercial applications of such networks and their extension to provide a converged communications/sensing system.

TuS3 • 15.00
Multiple Channels of ADCs for High Bit Rate Coherent Optical OFDM with Low Sampling Rate, *He Wen, Lin Cheng, Xiaoping Zheng, Hanyi Zhang, Yili Guo; Tsinghua Univ., China.* Multiple channels of ADCs for high bit rate CO-OFDM system is proposed by jointly processing outputs of all channels with a simple algorithm. The required sampling rate of ADCs is reduced lower than Nyquist rate.

Guang Da 11

TuT2 • 14.30
Improved Scheme for Estimating T-CONT Bandwidth Demand in Status Reporting DBA for NG-PON, *Björn Skubic[1], Biao Chen[2,3], Jiajia Chen[2], Jawwad Ahmed[2], Lena Wosinska[2]; [1]Ericsson Res., Sweden, [2]School of ICT, Royal Inst. of Technology (KTH), Sweden, [3]Dept. of Optical Engineering, Zhejiang Univ., China.* A scheme for estimating T-CONT bandwidth demand within NG-PON DBA is proposed and evaluated. It is shown that at high load significant improvements in delay, jitter and bandwidth utilization can be achieved. For light loads the conventional scheme shows better delay performance. However, this may be overcome by controlled over-granting.

TuT3 • 14.45
A Novel WDM-PON Architecture Enabling Multicasting with Color-Free ONUs Based on WSS and Interleaver, *Yi Xiang, Shilin Xiao, Zhixin Liu, Min Zhu, Daozi Ding, Cheng Yang, Jianwen Wei; Shanghai JiaoTong Univ., China.* We propose a novel multicast-enable WDM-PON architecture that uses the two sidebands of Optical Carrier Suppressed (OCS) DPSK signal to carry the unicast and multicast data. The multicast control is realized through a Wavelength Selective Switch (WSS).

TuT4 • 15.00
Least Imbalance Flows Decomposition Algorithm for Multi-Region Optical Networks, *Bin Li[1], Shanguo Huang[1], Kuei-Jen Lee[2], Wanyi Gu[1]; [1]Key Lab of Optical Communication and Lightwave Technologies, Beijing Univ. of Posts and Telecommunications, China, [2]Dept. of Communication Engineering, Oriental Inst. of Technology, Taiwan.* A network flow decomposition algorithm is proposed to achieve a lower block probability. The algorithm is designed to achieve a flow balance between domains, advertising TE information that is necessary for network to build a TED (Traffic Engineer Database) to calculate suitable route for each service request for network optimization.

Guang Yun 7

TuU2 • 14.30 Invited
Paper Withdrawn

TuU3 • 15.00
Measuring Optical Properties of Normal Breast Tissue with Time-Resolved Diffuse Optical Spectroscopy, *Nanguang Chen, Weirong Mo, Ling Chen; Natl. Univ. of Singapore, Singapore.* We report the quantitative measurements of optical and physiological parameters of normal breasts from 19 Asian women by using time-resolved diffuse optical spectroscopy (DOS).

Guang Yun 8

TuV2 • 14.30
The Designs of 4×2 Encoder Based on Photonic Crystals, *Kun-Yi Lee[1], Yi-Cheng Yang[1], Yen-Juei Lin[1], Wei-Yu Lee[1], Cheng-Che Lee[1], Sheng-Hsien Wong[2]; [1]Graduate Inst. of Opto-Mechatronics Engineering, China Inst. of Technology, Taiwan, [2]Graduate Inst. of Electronics Engineering, Natl. Taiwan Univ., Taiwan.* We propose a 4×2 encoder based on two dimensional triangular lattice photonic crystals composed of cylindrical silicon rods. The main structure of the device is a combination of both line defect Y branch and coupler waveguides. The simulation results confirm the proposed optical logic device can show their capabilities.

TuV3 • 14.45
Folded Mach-Zehnder Interferometer Based on Photonic Crystal Self-Collimation Effect, *Xiyao Chen[1], Yufei Wang[2], Shengyu Chen[1], Xuemei Li[1], Nan Lin[1], Guimin Lin[1], Bo Ni[3], Jibo Bai[3], Zexuan Qiang[3]; [1]Dept. of Physics and Electronic Information Engineering, Minjiang Univ., China, [2]School of Physics and Electromechanical Engineering, Longyan Univ., China, [3]School of Physics and Optoelectronics Technology, Fujian Normal Univ., China.* A Folded Mach-Zehnder interferometer (FMZI) based on self-collimation effect in a photonic crystal is proposed and investigated. As self-collimated light beams can intersect without crosstalk, this FMZI has smaller dimensions and a more flexible structure than non-folded ones and can work as a wavelength division demultiplexer in photonic integrated circuits.

TuV4 • 15.00
Terahertz Waveguides Based on Photonic Crystal, *Li Jiusheng, Zhao Xiaoli; China Jiliang Univ., China.* We experimentally demonstrate a novel compact and integrated terahertz waveguide, which consists of silicon photonic crystals with triangular lattice and a line defect waveguide in photonic crystal (PC) slabs. We also directly measured the propagation loss of the line defect waveguides and obtained a value of 0.99dB/mm.

Guang Da 12

TuW2 • 15.00
An Experiment of PMD Compensation Based on DSP in 25-Gb/s CSRZ-DQPSK System, *Xiaoguang Zhang, Xinyuan Zhao, Xuan Weng, Lixia Xi, Qianjin Xiong, Xixiang Li, Guangyong Zhang; Beijing Univ. of Posts and Telecommunications, China.* We reports an experiment of endless PMD compensation in 25-Gb/s CSRZ-DQPSK system using a DSP based PMD compensator. The control algorithm used is a modified particle Swarm Optimization. The PMD compensator can track the average SOP variation of 65 rad/s without any lost of optimum tracking.

Guang Da 16

TuX3 • 14.30
A Novel All-Optical Clock Recovery Scheme, *Fei Wang[1,2], Xinliang Zhang[1], Enming Xu[1], Yu Zhang[1]; [1]Wuhan Natl. Lab for Optoelectronics, Huazhong Univ. of Science and Technology, China, [2]School of Mathematics and Physics, Chongqing Univ. of Technology, China.* We experimentally demonstrate all-optical clock recovery (CR) from nonreturn-to-zero (NRZ) data without any preprocess measure. Multi-quantum-well (MQW) Fabry-Pérot semiconductor optical amplifier (FP-SOA) acts as dual role including both data format converter and clock recovery device. To achieve amplitude equalization of recovered clock pulses, a self-nonlinear polarization switching (SNPS) is employed.

TuX4 • 14.45
Multi-Broadcast Wavelength Conversion Using Simultaneous cSHG/DFG and cSFG/DFG, *Mingjun Gong, Yuping Chen, Feng Lu, Xianfeng Chen; Physics Dept., Shanghai Jiao Tong Univ., China.* In this paper, we experimentally observed a 35nm type-I QPM SFG bandwidth in MgO:PPLN, and energy competition between SFG and SHG has been demonstrated firstly. Based on simultaneous cSFG/DFG and cSHG/DFG, a novel multi-broadcast wavelength conversion scheme is proposed, which has the advantage of broadcasting one signal to multiple idlers.

TuX5 • 15.00
Tunable Multiple Wavelength Conversion at 40Gbit/s via cSFG/DFG in AOS Waveguide, *Weirui Dang, Yuping Chen, Xianfeng Chen; Dept. of Physics, Shanghai Jiao Tong Univ., China.* We propose a novel scheme to achieve a tunable multiple wavelength conversion in MgO:APPLN waveguide with an AOS structure. The full spectrum of input 1.57ps pulsed-signals at 40Gbit/s can be converted to outputs at a relative high and equalizing efficiency, which ensures N*M wavelength conversions in a wide-band of 100nm.

Guang Yun 1

TuQ3 • 15.15
Design of Broadband Single-Polarization Single-Mode Holey Fiber, *Guo Tieying[1,2], Lou Shuqin[1,2], Li Honglei[1,2], Wang Liwen[1,2], Chen Weiguo[1,2]; [1]Key Lab of All Optical Network and Advanced Telecommunication Network of EMC, Beijing Jiaotong Univ., China, [2]Inst. of Lightwave Technology, Beijing Jiaotong Univ., China.* Single-polarization single-mode (SPSM) operation over a wavelength range from 1.43 to 2.4μm is achieved in a holey fiber based on resonant coupling effect. The structure shows superiority in beam quality and good modal compatibility with SMF owing to its symmetric central core region and 78μm^2 effective area at 1550nm.

TuQ4 • 15.30
An Experiment of Polarization Measurement Using DSP-Based Control System, *Xuan Weng, Xinyuan Zhao, Xueguang Yuan, Feng Tian, Xiaoguang Zhang; Beijing Univ. of Posts and Telecommunications, China.* A polarization measurement using DSP-based control system has been demonstrated in the experiment. The normalized Stokes parameters and the degree of polarization which are varying at the speed of in the order of millisecond are measured in real-time manner.

Guang Da 7

TuR4 • 15.15 Invited
Integrated Circuits for Ultra Low Power Parallel Optical Interconnect, *Thomas Reunert; IPtronics A/S, Denmark.* For interconnects in servers, routers, storage systems, or even home entertainment systems, optical technology competes head on with traditional copper based technology. This imposes very different requirements to the optical solution compared to the telecommunication applications. Design concepts used to achieve power figures down to 3 mW/Gbps will be discussed.

Guang Da 9

TuS4 • 15.15
Edge-Triggered Ultra-Wideband Signal over Fiber System Using Dual-Parallel Mach-Zehnder Modulator, *Ying Zhao, Xiaoping Zheng, Hanyi Zhang, Bingkun Zhou; Tsinghua Univ., China.* The edge-triggered generation of baseband ultra-wideband (UWB) monocycle pulse using a dual-parallel Mach-Zehnder modulator is proposed and experimentally demonstrated. And further the performance of the signal transmitted by fiber link is studied.

TuS5 • 15.30
Generation of Optical Pulse at Multiplied Repetition Frequency Based on Fractional Talbot Effect in Fiber, *Bo Wu[1], Jinlong Yu[1], Zheng Wang[1], Bingchen Han[1,2], Jun Luo[1], Jinzhong Guo[1], Ju Wang[1], Enze Yang[1]; [1]Tianjin Univ., China, [2]School of Physics and Electronic Science, Shanxi Datong Univ., China.* The optical pulses at a multiplied repetition frequency is generated by Fractional Talbot effect in optical fiber. The optical pulses at 20GHz, 40GHz and 50GHz repetition frequency are obtained from the original pulse with 2.8ps width at 10GHz and the optical pulses at 5GHz is octupled to 40GHz.

Guang Da 11

TuT5 • 15.15
A Novel WDM-PON Structure Using the Orthogonal FSK/ASK Re-modulation Scheme, *Xiao Liu, Yufeng Shao, Chunning Hou, Xi Zheng, Xinying Li, Shumin Zou, Nan Chi; Fudan Univ., China.* A WDM PON (wavelength-division-multiplexed passive optical network) structure using 40Gb/s FSK signal for downstream transmission and 10Gb/s orthogonal FSK/ASK re-modulated signal for upstream transmission is demonstrated. Simulations show that the PON system can transmit for more than 20km, which is a promising candidate for future high-speed access network.

TuT6 • 15.30
A Novel DBA Algorithm Supporting QoS for EPON Networks, *Yinghui Qiu[1], Yuefeng Ji[2], Daxiong Xu[2]; [1]North China Electric Power Univ., China, [2]Beijing Univ. of Posts and Telecommunications, China.* Designing efficient bandwidth allocation algorithms is a critical issue in EPON. In this paper, a novel DBA algorithm is presented to efficiently and fairly allocate bandwidth among different users. This algorithm is integrated with non-strict priority scheduling and priority queuing to implement a cost effective EPON network with QoS support.

15.45–16.15 Tea Break, *outside of Session Rooms*

Guang Yun 7

TuU4 • 15.15
Endoscope-Based Autofluorescence Imaging and Point Spectroscopy for Improving Cancer Detection in the Larynx, *Kan Lin, Wei Zheng, Zhiwei Huang; Bioimaging Lab, Natl. Univ. of Singapore, Singapore.* AFI has shown high sensitivity for early diagnosis and detection of cancer. However, it has a limitation diagnostic specificity due to high-false-positive rates. In our study, we develop an integrated-fluorescence-endoscopic-imaging and point-spectroscopy system for real-time tissue measurements. The results show our system has potential for improving cancer diagnosis and detection.

Guang Yun 8

TuV5 • 15.15
Design of Asymmetrical Interleaver Filter Based on One-Dimensional Photonic Crystal Theory, *Shuai Yu, Juan Zhang; Shanghai Univ., China.* Based on the theory of one-dimensional photonic crystal, an asymmetrical interleaver filter composed of cascaded solid thin film cavity is proposed. Several design examples with different duty cycle are given and the influence of each structural parameter on the duty cycle is investigated.

Guang Da 12

TuW3 • 15.15
An Endless Polarization Stabilizer Based on DSP System, *Xinyuan X. Zhao, Xuan Weng, Feng Tian, Xiaoguang Zhang; Beijing Univ. of Posts and Telecommunications, China.* An endless polarization stabilizer based on DSP system is reported. It can transform SOP of optical signal to any desired SOP and maintaining output signal at the desired SOP. Under the existing condition of our laboratory, the developed SOP stabilizer has the ability of stabilization up to 65rad/s SOP changes.

TuW4 • 15.30
Research on the Principle of PSBT Modulation Format and Its Performance in the PMD Compensation System, *Feng Tian, Lixia Xi, Xinyuan Zhao, Xianfeng Tang, Shaokang Wang, Xiaoguang Zhang; Beijing Univ. of Posts and Telecommunications, China.* Phase shaped binary transmission (PSBT) is a kind of duobinary modulation formats. It has narrower spectrum structure. In this paper, we mainly investigate the performance of PSBT format in the polarization mode dispersion (PMD) system. The results show that PMD tolerance is enhanced effectively after compensation.

Guang Da 16

TuX6 • 15.15
A Method of Developing Optical Half and Full-Adders Using Optical Phase Encoding Technique, *Sourangshu Mukhopadhyay[1], Bikash Chakraborty[2]; [1]Univ. of Burdwan, India, [2]Bankura Christian College, India.* A complete analytical model of all optical half adder and full adder is proposed based on the principle of phase encoding. This architecture consists of number of optical coherent mixers and mirrors. No optical switches are used in the processing part. So real time operation may be achieved here.

TuX7 • 15.30
40Gb/s All-Optical Format Conversion from NRZ to PolSK Using a Single SOA Assisted by Optical Bandpass Filter, *Peili Li[1], Dexiu Huang[2]; [1]Nanjing Univ. of Posts and Telecommunications, China, [2]Huazhong Univ. of Science and Technology, China.* 40Gb/s all-optical nonreturn-to-zero (NRZ) to polarization-shift-keying (PolSK) format conversion, based on transient cross-phase modulation (T-XPM), is proposed and experimentally demonstrated using a single semiconductor optical amplifier (SOA) assisted by optical bandpass filter (BPF). This proposed scheme is robust in terms of simple structure and high bit rate operation.

15.45–16.15 Tea Break, *outside of Session Rooms*

Guang Yun 1

16.15–18.00
TuY • Optical Processing
Aoxiang Lin; Lehigh Univ., USA, Presider

TuY1 • 16.15 Invited
Ultrahigh-Speed Optical Signal Processing on a Silicon Chip, *Alexander Gaeta; Cornell Univ., USA.* Abstract not available.

TuY2 • 16.45 Invited
Optical Signal Processing with Delay-Asymmetric Nonlinear Loop Mirror, *Chester Shu[1], Yongheng Dai[1], Mable P. Fok[2]; [1]Chinese Univ. of Hong Kong, Hong Kong, [2]Princeton Univ., USA.* We report recent progress in optical signal processing of phase-modulated digital signals using the delay-asymmetric nonlinear loop mirror. With broadband polarization-insensitive wavelength conversion in the loop mirror, signal demodulation is achieved at continuously variable bit-rate over 3 Gbit/s. Following the demodulation, all-optical clock recovery is also demonstrated.

Guang Da 7

16.15–18.15
TuZ • Special Session on Optical Interconnect for Green ICT II
Akihiko Kasukawa; Furukawa Electric Co. Ltd., Japan, Presider

TuZ1 • 16.15 Invited
Optical Interconnects for High Performance Computing, *Marc Taubenblatt[1], Jeffrey A. Kash[1], Yoichi Taira[2]; [1]IBM T.J. Watson Res. Ctr., USA, [2]IBM Tokyo Res. Lab, Japan.* Future large scale high performance computing systems will necessitate extensive use of optical interconnects to meet system performance goals, requiring optical interconnects to greatly improve in cost, power, areal density and reliability. Optical printed circuit boards and silicon based integrated photonics are potential technologies to meet these challenges.

TuZ2 • 16.45 Invited
High Performance 1060nm VCSEL for Optical Interconnection, *Norihiro Iwai, K. Takaki, T. Kageyama, S. Imai, Y. Kawakita, K. Hiraiwa, H. Shimizu, N. Tsukiji, A. Kasukawa; Furukawa Electric Co., Ltd., Japan.* VCSELs will be reviewed in terms of power conversion efficiency in this talk. In addition, high speed VCSEL and its transmitter modules for parallel optical interconnection will be presented.

Guang Da 9

16.15–18.00
TuAA • Transmitter and Receiver Technologies II
Michael Choy; LifeIT Technologies, USA, Presider

TuAA1 • 16.15
A Novel Scheme for All-Optical Automatic Polarization Division Demultiplexing, *An-Lin Yi[1], Lian-Shan Yan[1], Jia Ye[1], Wei Pan[1], Bin Luo[1], X.Steve Yao[2]; [1]Southwest Jiaotong Univ., China, [2]General Photonics Co., USA.* We propose a new automatic optical polarization demultiplexing scheme for polarization-division-multiplexed (PDM) signals, which uses the tag light transmitted in a different but close wavelength to the data signal as the feedback control. The effectiveness of this scheme is demonstrated in a 10-Gb/s PDM optical system over 50-km SMF link.

TuAA2 • 16.30
Digital Timing Recovery Combined with Adaptive Equalization for Optical Coherent Receivers, *Xian Zhou, Xue Chen, Weiqing Zhou, Yangyang Fan, Hai Zhu, Zhiyu Li; Beijing Univ. of Posts and Telecommunications, China.* We propose a new scheme that adds a butterfly-structured adaptive equalizer in all-digital timing recovery loop to complete synchronization, equalization and polarization de-multiplexing simultaneously. It resolves the incompatible problems that adaptive equalization requires synchronous signal, timing-error detector requires compensated signal. Finally, we demonstrate the feasibility of the scheme by simulation.

TuAA3 • 16.45
A Modified CMA for Blind Equalization and Phase Recovery in Optical Coherent Receivers, *Hai Zhu, Xue Chen, Weiqin Zhou, Zhiyu Li, Xian Zhou, Zhiguo Zhang; Beijing Univ. of Posts and Telecommunications, China.* In order to solve the phase rotating problem in constant modulus algorithm (CMA) for polarization division multiplexing system with optical coherent receivers, we propose a modified CMA to simultaneously accomplish joint blind equalization, polarization de-multiplexing and phase recovery.

Guang Da 11

16.15–18.00
TuBB • Optical Access Networks II
Feng Huang; Alcatel-Lucent, China, Presider

TuBB1 • 16.15 Invited
Next Generation Access: Architecture Challenges, *Dirk Breuer, Christoph Lange, Erik Weis; Deutsche Telekom Labs, Germany.* Today's available fibre access technologies are based on point-to-point, GPON, EPON or active node solutions. This paper will focus on challenges in future access networks from an architectural, technological and economical point of view.

TuBB2 • 16.45
GPON FTTH Trial–Lessons Learned, *Erik Weis[1], Rainer Hölzel[2], Dirk Breuer[1], Christoph Lange[1]; [1]Deutsche Telekom Labs, Germany, [2]Deutsche Telekom Netzproduktion GmbH, Germany.* This paper reports on a FTTH field trial with GPON technology in the network of Deutsche Telekom AG. Focus of this trial was to gain practical experience regarding: GPON technology, fibre installation in existing ducts with micro duct technology, fibre cabling in customer buildings and impact on operational processes.

Guang Yun 7

16.15–18.00
TuCC • Diffuse Optical (Fluorescence) Tomography and Molecular Imaging II
Qingming Luo; Huazhong Univ of Science and Technology, China, Presider

TuCC1 • 16.15 Invited
Time-Domain Diffuse Optical Tomography and Fluorescence Molecular Tomography: Theory and Practice, *Feng Gao; Tianjin Univ., China.* This paper reviews the time-domain diffuse fluorescent tomography methodology developed in Tianjin University, including both the multi-channel TCSPC-based experimental setup and the inversion scheme for image reconstruction. The feasibility and potentials of the proposed techniques are demonstrated by simulative and phantom experiments.

TuCC2 • 16.45 Invited
Hybrid FMT/XCT System Validated with *ex vivo* Fluorescence, *Ralf B. Schulz, Angelica Ale, Marcus Freyer, Athanasios Sarantopoulos, Marta Zientkowska, Vasilis Ntziachristos; Inst. for Biological and Medical Imaging, Germany.* Fluorescence tomography can resolve fluorescence biodistribution *in vivo* with high sensitivity. We use structural information from X-ray CT as priors in the fluorescence reconstruction for improved accuracy, as shown previously. The method was tested on different phantoms and animal models and cross-validated with XCT data, histology and *ex vivo* fluorescence.

Guang Yun 8

16.15–18.00
TuDD • OCDMA + Repeater for Access
Yannick Keith Lize; Opnext, USA, Presider

TuDD1 • 16.15 Invited
Perspectives of Optical Coding/Decoding Techniques in OCDMA Networks, *Gabriella Cincotti[1], Nobuyuki Kataoka[2], Naoya Wada[2], Ken-ichi Kitayama[3]; [1]Univ. Roma Tre, Italy, [2] NICT, Japan, [3]Dept. of Electrical, Electronics and Information Engineering, Osaka Univ., Japan.* We review the research activities carried out during the past five years over OCDMA systems, that make a versatile use an innovative cost-effective multiport encoder/decoder to generate and process simultaneously optical codes.

TuDD2 • 16.45
Spectrally Efficient Optical CDMA System Based Chromatic Dispersion for Phase Coding of Individual Spectral Lines in the Time Domain, *Santiago Tainta[1], Waldimar Amaya[2], María J. Erro[1], María J. Garde[1], Raimundo Garcia-Olcina[2], Miguel A. Muriel[3]; [1]Univ. Pública de Navarra, Spain, [2]ITEAM Res. Inst., Univ. Politécnica de Valencia, Spain, [3]ETSIT, Univ. Politécnica de Madrid, Spain.* A WDM-compatible spectrally phase encoded-optical CDMA scheme based on second order dispersion is experimentally demonstrated. Results are given for a system transmitting at 10 Gbps within an 0.7 nm optical window using Hadamard codes.

Guang Da 12

16.15–18.00
TuEE • Fiber Lasers
Shenping Li; Corning Inc., USA, Presider

TuEE1 • 16.15 Invited
32Tb/s DWDM Transmission System, *Jianjun Yu[1], Xiang Zhou[2]; [1]NEC Labs America, Inc., USA, [2]AT&T Labs-Res., USA.* Employing multi-level modulation formats, digital coherent detection and EDFA-only amplification, we have demonstrated 25 GHz-spaced, 161x114Gb/s PDM-RZ-8PSK and 320×114Gb/s PDM-RZ-8QAM DWDM transmission with a record capacity of 17Tb/s in C-band and 32Tb/s in C+L band, respectively.

TuEE2 • 16.45
Spectral Variation in Brillouin-Raman Fiber Laser, *A. K. Zamzuri[1], M. A. Mahdi[2], M. H. Al-Mansoori[3], N. M. Samsuri[1], A. Ahmad[1], R. Mohamad[1], M. S. Yaakob[1]; [1]TM R&D Innovation Ctr., Malaysia, [2]Univ. Putra Malaysia, Malaysia, [3]Univ. Tenaga Nasional, Malaysia.* This article discusses the optical-SNR variation of Stokes lines in BRFL. This variation is partly attributed to the cavity modes interaction through intraline-FWM residing the same spectralwidth. The worst OSNR is obtained at 650mW RPP and 1555nm BPW. The improvement is obtained for the RPP beyond 650mW.

Guang Da 16

16.15–18.15
TuFF • Novel Fiber-optic Sensors I
Haishan Zeng; British Columbia Cancer Res. Ctr., Canada, Presider

TuFF1 • 16.15
Highly Sensitive Fiber-Optic Accelerometer Based on an Offset Tilted Fiber Bragg Grating, *Tuan Guo[1], Liyang Shao[1], Hwa-Yaw Tam[1], Jacques Albert[2]; [1]Hong Kong Polytechnic Univ., Hong Kong, [2]Carleton Univ., Canada.* Highly sensitive fiber-optic refractometer based on cladding-to-core recoupling is proposed by using a weakly tilted fiber Bragg grating combined with a lateral-misaligned splice structure. Reflection spectrum with two well-defined bands performs a linear response for acceleration measurement, combining with temperature immunity and power self-calibration property.

TuFF2 • 16.30
Surface Plasma Resonance Optical Analysis for Multi-Channel Refractive Index Monitoring, *Wei Peng[1], Soame Banerji[2], Yoon-Chang Kim[3], Karl S. Booksh[3]; [1]Physics and Optoelectronics College, Dalian Univ. of Technology, China, [2]Schering-Plough Corp., USA, [3]Dept. of Chemistry and Biochemistry, Univ. of Delaware, USA.* We present a multi-channel optical SPR device that can monitor SPR changes in different wavelengths and angles. The experimental results demonstrate the characteristic responses of SPR signals from multiple channels that change independently correspond to the refraction index changes of the biological solution samples with which they are in contact.

TuFF3 • 16.45
Fully Distributed Chirped FBG Sensor and Application in Laser-Induced Interstitial Thermotherapy, *Chenglin Li, Na Chen, Zhenyi Chen, Tingyun Wang; Shanghai Univ., China.* A fully distributed chirped Fiber Bragg grating (FBG) sensor is proposed to detect dynamic change of the temperature distribution of the tissue under laser induced interstitial thermotherapy (LITT). A simulate experiment of LITT is carried out, and the temperature distribution is acquired by the modified simulated annealing evolutionary (MSAE) algorithm.

Guang Yun 1

TuY3 • 17.15
Spectral Phase OCDMA Encoder/Decoder Using Travelling Interference Fringe Photo-Writing Technique, *Ihsan Fsaifes[1,2], Audrey Millaud[2], Steevy Cordette[3], Catherien Lepers[4], Marc Douay[2], Cedric Ware[3]; [1]Lab Xlim, Univ. de Limoges, France, [2]Lab PhLAM/IRCICA, Univ. de Lille, France, [3]Inst. Télécom, Télécom ParisTech, France, [4]Télécom & Management SudParis, France.* A new UV photo-writing setup using travelling interference fringe technique for Fiber Bragg Grating (FBG) fabrication is presented. High performance en/decoders with complex profiles can be fabricated using this method for different OCDMA schemes. Preliminary results are presented and discussed.

TuY4 • 17.30
Receiver Sensitivity Improvement for NRZ-OOK Signal by Optical Parametric Amplifier-Assisted Detection, *Yu Liang, P. C Chui, Kenneth K. Y Wong; Univ. of Hong Kong, Hong Kong.* By using a fiber optical parametric amplifier, we demonstrate a novel pre-amplification scheme to improve receiver sensitivity for 10-Gb/s non-return-to-zero on-off keying (NRZ-OOK) format with dual-end superposition of signal and idler. We achieve receiver sensitivity of -40.5 dBm, and improve by 2 dB when comparing to its single-end counterpart.

Guang Da 7

TuZ3 • 17.15 Invited
Specialty High Bandwidth Multimode Fiber for Optical Interconnection, *Yi Sun, Robert Lingle, David Mazzarese; OFS Optics, USA.* In this paper, we review high bandwidth mulitimode fiber and their role in upgrade path of optical interconnect to 40G and 100G in data center and high performance computing.

Guang Da 9

TuAA4 • 17.00
Satellite-Receiving-System Overlay with WDM Radio-over-Fiber on 10Gb/s Link, *Koyu Chinen, Yuki Uchima; Okinawa Natl. College of Technology, Japan.* A weather satellite receiving system is overlaid with WDM RoF technique on 10.7 Gb/s (OTU2) data stream. A clear image is received after 40km SMF without degrading the data streams.

TuAA5 • 17.15
Simple and Flexible NRZ-DQPSK Demodulation Scheme, *Yu Yu, Xinliang Zhang, Lun Wei, Fei Wang, Dexiu Huang; Huazhong Univ. of Science and Technology, China.* We propose and demonstrate a simple and flexible all-optical NRZ-DQPSK receiver based on optical detuned filtering. By adjusting the detuning of two given filters, the in-phase and quadrature data can be demodulated from 20-to-80Gb/s NRZ-DQPSK signals.

TuAA6 • 17.30
160-Gb/s Clock Recovery with an Electroabsorption Modulator and 40-Gb/s ETDM Demultiplexer, *Tao-rong Gong, Feng-ping Yan, Dan Lu, Ming Chen, Peng Liu, Pei-lin Tao, Mu-guang Wang, Tang-jun Li, Shui-sheng Jian; Beijing Jiaotong Univ., China.* A 10 GHz clock recovery from a 160-Gb/s optical time-division-multiplexed data stream is experimentally demonstrated with an electro-absorption modulator and 40-Gb/s ETDM demultiplexer. The recovered clock signal exhibits excellent stability, with mean RMS jitter of 388fs and 415fs corresponding to back-to-back and transmission over 100-km, respectively.

Guang Da 11

TuBB3 • 17.00
A Novel OFDM-PON Architecture Using Single-Side-Band OFDM for Down Stream and Sub-carrier Multiplexed ASK for Up Stream, *Xi Zheng, Xiao Liu, Chunning Hou, Yufeng Shao, Shumin Zou, Xinying Li, Junwen Zhang, Wuliang Fang, Nan Chi; Information School, Fudan Univ., China.* We propose and experimentally demonstrate a novel architecture for OFDM-PON system. The down link is based on single side band OFDM modulation while the up link makes use of the carrier information retained in another side band to intensity modulate the data.

TuBB4 • 17.15
PON Network Designing Algorithm for Suboptimal Deployment of Optical Fiber Cables, *Akira Agata, Yukio Horiuchi; KDDI R&D Labs Inc., Japan.* We propose a novel suboptimal design algorithm for PON outside plant deployment. Under realistic restrictions such as possible fiber paths, splitting ratio of optical splitters, and locations of the central office and subscribers are given, the algorithm can automatically generate the suboptimal PON network in terms of total fiber length.

TuBB5 • 17.30
A Novel Scheme of Unicast and Multicast in WDM-PON Using Reflective Semiconductor Optical Amplifier, *Cheng Yang, Shilin Xiao, Min Zhu, Weilin Xie, Zhixin Liu, Lingzhi Ge, Yi Xiang, Jianwen Wei; Shanghai Jiao Tong Univ., China.* We propose a novel scheme to realize unicast and multicast in WDM-PON. Unicast data and multicast data are modulated in DPSK format and ASK format respectively. Reflective semiconductor optical amplifier is used to selectively erase the ASK signal by adjusting the injected optical power, and multicast is realized.

Guang Yun 7

TuCC3 • 17.15
Near-Infrared Autofluorescence Polarization Imaging for Colonic Cancer Detection, *Xiaozhuo Shao, Wei Zheng, Zhiwei Huang; Natl. Univ. of Singapore, Singapore.* An NIR autofluorescence imaging system combined with polarization technique was explored for cancer diagnosis and detection. The AF and FPI images of colonic tissues were acquired. The results show that normal tissue has significantly higher NIR autofluorescence intensity than tumor tissue. The perpendicular-polarized image yields the highest diagnostic accuracy (93%).

TuCC4 • 17.30
Triangle Mesh Based 2-D Fluorescence Molecular Tomography with Spatially Smoothed Linear Scheme, *Daifa Wang, Jing Bai; Dept. of Biomedical Engineering, School of Medicine, Tsinghua Univ., China.* In 2-D fluorescence molecular tomography, there are usually discontinuities in the reconstructed image of continuous targets when using triangle mesh for discretization. A spatially smoothed linear scheme is proposed to overcome the limit. The phantom experiment on a full angle imaging system demonstrates the efficiency the proposed method.

Guang Yun 8

TuDD3 • 17.00
Experimental Demonstration of a FBG-Based Temporal Optical Pulse Shaping Scheme Dual to Spatial Arrangements for Its Use in OCDMA Systems, *Santiago Tainta[1], Waldimar Amaya[2], Raimundo García[2], María J. Erro[1], María J. Garde[1], Salvador Sales[2], Miguel A. Muriel[3]; [1]Dpto. Ingeniería Eléctrica y Electrónica, Univ. Pública de Navarra, Spain, [2]ITEAM, Univ. Politécnica de Valencia, Spain, [3]Dpto. de Tecnología Fotónica, Univ. Politecnica de Madrid, Spain.* We have demonstrated a spectral phase-encoded time spreading optical code division multiplexed scheme based on the concept of temporal pulse shaping dual to spatial arrangements. It uses fiber Bragg gratings as dispersive elements and electro-optic modulators to impose 8 chips Hadamard-codes, for a data speed of 1.25 Gbps.

TuDD4 • 17.15
Two-Level OOC-Based Fiber-Optic CDMA Systems with QoS Using Optical Analog-Digital Converter (ADC), *Babak M. Ghaffari, Jawad A. Salehi; Sharif Univ. of Technology, Iran.* A novel two-level signaling technique in OOC-based fiber-optic CDMA systems is proposed. Users of the system are categorized into two classes. Users of class 1 and 2 transmit the optical pulses at power level P and 2P respectively. At the receiver side using optical ADC multi-access interference is considerably suppressed.

TuDD5 • 17.30
Experimental Investigation of Colorless ONU Employing SSFBG in WDM/OCDMA-PON, *Dawei Wang, Liang Cheng, Biao Chen; Ctr. for Optical and Electromagnetic Res., Joint Lab of Optical Communication, Zhejiang Univ., China.* We present a novel scheme to construct non-wavelength-selective optical network unit (ONU) in hybrid wavelength division multiplexing and optical code division multiple access based passive optical networks (WDM/OCDMA-PON) by making use of the broad spectrum band of superstructure fiber Bragg gratings (SSFBGs).

Guang Da 12

TuEE3 • 17.00
Influence of Pump Power on Output Characterisics of Multiwavelength Eribum-Doped Fiber Laser Employing Symmetrical Nonlinear Optical Loop Mirror, *Jiajun Tian, Yunxu Sun, Yong Yao, Xuelian Yu, Deying Chen; Harbin Inst. of Technology, China.* The influence of pump power on the output characteristics of multiwavelength erbium-doped fiber laser is investigated, which employs the symmetrical nonlinear optical loop mirror (NOLM). The results show that the number and positions in the spectra of multiwavelength oscillations are determined by pump power for a fixed setting of NOLM.

TuEE4 • 17.15
Passive Harmonically Mode-Locked Erbium-Doped Fiber Laser, *Zuxing Zhang, Qingqiang Kuang, Minghuang Sang; Jiangxi Normal Univ., China.* Passive harmonically mode-locked erbium-doped fiber ring laser with repetition rate up to 1.2 GHz has been demonstrated. Through investigating the dynamics of pulse generation, it is found that a new operation mode, harmonic mode-locking of multipulse bunching, favors higher order harmonics.

TuEE5 • 17.30
Q-Switched Yb-Doped Microstructure Fiber Laser Using GaAs as Saturable Absorber, *Shenggui Fu, Xiaojuan Liu; School of Science, Shandong Univ. of Technology, China.* A passive Q-switched Yb-doped microstructure fiber (MF) laser is demonstrated using a GaAs wafer as the saturable absorber. A pulse duration as short as 80 ns was obtained with the maximum repetition rate of 830 Hz. The maximum average output power is 5.8 W at 1080 nm wavelength.

Guang Da 16

TuFF4 • 17.00
Temperature-Insensitive 2-D Tilt Sensor with Three Fiber Bragg Gratings, *Shaoling He[1], Xinyong Dong[1], Kai Ni[1], C. C. Chan[2], P. Shum[2]; [1]Inst. of Optoelectronic Technology, China Jiliang Univ., China, [2]Network Technology Res. Ctr., Nanyang Technological Univ., Singapore.* A novel two-dimensional (2-D) tilt sensor based on three optical fiber Bragg gratings (FBGs) is proposed and demonstrated. Preliminary experiments show that a high measurement sensitivity of 64 pm/° and resolution of 0.016° can be achieved and this sensor is insensitive to temperature.

TuFF5 • 17.15
A Novel Detection Scheme for Temperature Sensor Based on Hybrid Sagnac Interferometer, *Chunjiao Xu, Yuanhong Yang, Mingwwei Yang; Beijing Univ. of Aeronautics and Astronautics, China.* A wavelength domain scheme was proposed based on hybrid Sagnac interferometer. The temperature was measured by detecting the extremal wavelength of the interference spectrum, an experimental sensor was setup to verify the effectiveness and accuracy of the scheme. The wavelength variation with temperature was 1.36nm/°C and linear equation was obtained.

TuFF6 • 17.30
Temperature-Independent Strain Sensor Based on Intensity Measurement Using a Highly Birefringent Photonic Crystal Fiber Loop Mirror, *Chun-Liu Zhao, Xinyong Dong; College of Optical and Electronic Technology, China Jiliang Univ., China.* A cheap temperature strain sensor based on intensity measurement is demonstrated by using a DFB laser source, a optical power meter and a highly birefringent photonic crystal fibre (PCF) as the sensing element in a fiber loop morror (FLM).

Guang Yun 1

TuY5 • 17.45
DOP Ellipsoid Collection Using DSP System, *Yangan Zhang, Xiaoguang Zhang, Xueguang Yuan, Xinyuan Zhao, Xuan Weng, Feng Tian; Beijing Univ. of Posts and Telecommunications, China.* The degree of polarization (DOP) ellipsoid can be used as either feed-back or feed-forward signal for adaptive polarization mode dispersion (PMD) compensation. The collection of DOP ellipsoid in the fiber link was realized using a DSP controlled system. The data collection speed was 1 μs per one point collection.

Guang Da 7

TuZ4 • 17.45 Invited
High Speed Parallel Modules for Optical Interconnection between the Chips On-Board, *Hongda Chen; Chinese Acad. of Sciences, China.* Abstract not available.

Guang Da 9

TuAA7 • 17.45
Two-User 2.5Gbps 100km OCDMA Transmission Experiment Using EPS-SSFBG En/Decoder, *Lin Lu, Yimei Wei, Tao Pu, Yuquan Li; Inst. of Communication Engineering, PLA Univ. of Science and Technology, China.* Two-user 2.5Gbps OCDMA experiment is shown to achieve error free 100km transmission using GSLD pulse source, EPS-SSFBG phase en/decoder and threshold adjustable receiver with broadband decision. Two receiver schemes are tested, relationships between BER and decision level&time are also observed in the experiment.

Guang Da 11

TuBB6 • 17.45
SLA Aware Dynamic Bandwidth Allocation for EPONs, *Su-il Choi, Seung Jin Yoo, Young Min Noh, Jun Beom Cho; School of Electronics and Computer Engineering, Chonnam Natl. Univ., Republic of Korea.* EPON is one of the most promising broadband access networks. We propose a DBA for service differentiation that meets the SLAs. Proposed DBA provides predictable average packet delay and delay jitter of EF traffic without the influence of load variation. Performance evaluation shows the effectiveness of proposed DBA scheme.

18.00–19.30 Welcome Reception, *Presentation Hall*

NOTES

Guang Yun 7

TuCC5 • 17.45
***In vivo* Measurement of Indocyanine Green Biodistribution in Mammalian Organs Using Fiber Based System**, *Qixiao Chen, Shuo Mao, Jing Bai; Dept. of Biomedical Engineering, School of Medicine, Tsinghua Univ., China.* Indocyanine green (ICG) is a fluorescent probe widely used in clinical and animal experiment. It is important to study the ICG biodistribution in mammalian organs. We present an *in vivo* measurement method based on fiber system and the experiment on small mammal, to demonstrate the potential applications of this method.

Guang Yun 8

TuDD6 • 17.45
Reconfigurable Multi-Port EPON Repeater, *Masayuki Oishi, Ryo Inohara, Akira Agata, Yukio Horiuchi; KDDI R&D Labs Inc., Japan.* We propose a multi-port EPON repeater with reconfigurable matrix switch not only to extend EPON reach but also to increase subscriber occupancy rate for OLT. We also confirm through the numerical calculations that the proposed reconfigurable architecture is feasible to effectively suppress initial installation cost in suburb and rural areas.

Guang Da 12

TuEE6 • 17.45
Characterization of Fused-Silica Optical Fibers Delivery High-Peak Power YAG Laser Beam, *Xing-hai Zhao; Inst. of Electronic Engineering, Chinese Acad. of Engineering Physics, China.* The characteristics of optical fiber delivery Nd:YAG pulsed laser power through silica fiber are experimentally researched. The effects of laser injection condition and optical fiber macrobend on optical fiber delivery laser beam system are analyzed. The morphology characterization of laser induced damage to optical fiber end-faces were measured and investigated.

Guang Da 16

TuFF7 • 17.45
Temperature-Independent Accelerometer with a Strain-Chirped Fiber Bragg Grating, *Lan Li, Xinyong Dong, Wenjun Zhou, Yiling Sun; Inst. of Optoelectronic Technology, China Jiliang Univ., China.* An accelerometer based on measurement of the reflection bandwidth and optical power of a strain-chirped fiber Bragg grating is presented. Preliminary experimental results indicate that a good linear response range up to 8 g with very low temperature dependence. The sensitivity and resolution are 0.4023 nm/g and 0.0497 g, respectively.

TuFF8 • 18.00
Air Pressure Effect on the Temperature Characteristic of a Polarization-Maintaining Photonic Crystal Fiber, *H. Y. Fu, M. L. V. Tse, H. Y. Tam, C. Lu, P. K. A. Wai; Hong Kong Polytechnic Univ., Hong Kong.* We investigate the temperature property of a polarization-maintaining photonic crystal fiber based Sagnac interferometer. The temperature induced air pressure effect inside air holes of the fiber has been studied, from room temperature to 200 °C.

18.00–19.30 Welcome Reception, *Presentation Hall*

NOTES

7.30–17.00 Registration Open, *Everbright Center Lobby*

8.30–10.25 WA • Plenary Session I, *Ballroom*

9.00–17.00 Exhibit Open, *Everbright East Exhibition Hall*

10.25–10.45 Tea Break, *Everbright East Exhibition Hall*

10.45–12.15 WB • Plenary Session II, *Ballroom*

12.15–13.30 Lunch Break

Guang Da 7

13.30–15.00
WC • Fiber Gratings
John Canning; Univ. of Sydney, Australia, Presider

WC1 • 13.30 Invited
Advanced Fibre Grating Technologies for Application in Next Generation Lasers and Networks, *Morten Ibsen, Francesca Parmigiani, Periklis Petropoulos, David J. Richardson; Univ. of Southampton, UK.* We review the operating principles and performance of optical pulse processing systems exploiting the powerful combination of Kerr-nonlinearity based optical switches and tailored optical pulses (e.g. square, parabolic and saw-tooth) produced using superstructured fibre Bragg gratings.

Guang Da 9

13.30–15.00
WD • Photonic Integration
Valery Tolstikhin; OneChip Photonics Inc., Canada, Presider

WD1 • 13.30 Invited
InP Based Monolithic Integrated Photonic Devices, *Liming Zhang; Bell Labs, Alcatel-Lucent, USA.* I review our recent examples of monolithically integrated devices comprising a variety of functional elements such as high speed optical transmitter and receivers, electro-absorption modulators integrated with tunable dispersion compensator and fast-tunable wavelength converters.

Guang Da 11

13.30–14.45
WE • Networking
Jean-Christophe Antona; Bell Labs, Alcatel-Lucent, France, Presider

WE1 • 13.30 Invited
Operation and Management of Transparent Mesh Network Considering Physical Impairments, *Masatoshi Suzuki, Takehiro Turitani; KDDI R&D Labs, Japan.* A path computation-capable network management system (NMS) which enables to manage topology and physical impairments, and create GMPLS-based lightpaths according to path computation results. Control and management capabilities have been evaluated using all-optical network testbed.

Guang Da 12

13.30–15.00
WF • GMPLS Provisioning
Arun Somani; Iowa State Univ., USA, Presider

WF1 • 13.30 Invited
GMPLS Provisioning Performance: Bridging the Gap between Network and Applications, *Weiqiang Sun, Yaohui Jin, Wei Guo, Weisheng Hu; Shanghai Jiao Tong Univ., China.* Generalized MPLS is now being increasingly used in high performance optical networks. It facilitates bandwidth-demanding applications to invoke bandwidth provisioning in an on-demand fashion. However, by far the provisioning performance of GMPLS networks is under-explored. This paper introduces the ongoing standardization efforts and our testing experiences for GMPLS provisioning performance.

7.30–17.00 Registration Open, *Everbright Center Lobby*

8.30–10.25 WA • Plenary Session I, *Ballroom*

9.00–17.00 Exhibit Open, *Everbright East Exhibition Hall*

10.25–10.45 Tea Break, *Everbright East Exhibition Hall*

10.45–12.15 WB • Plenary Session II, *Ballroom*

12.15–13.30 Lunch Break

Guang Yun 7

13.30–14.45
WG • Cellular and Molecular Biophotonics Imaging
Frank Chuang; Univ. of California at Davis, USA, Presider

WG1 • 13.30 Invited
A Microfluidic System for Semincontinous Bead-Based Biosensing Platforms, *Hye Won Kim, Young Man Kim, Sung Keun Yoo, Sang Youl Yoon, Jong Hyun Lee, Sung Yang; Gwangju Inst. of Science and Technology (GIST), Republic of Korea.* Conventional bead-based micro-immunoassays do not guarantee high reliability. We present a new bead-based micro-immunoassay system for multiple or semicontinuous assays with high reliability and accuracy using hole-patterned structures and double-cladding optical fibers. Trapping tests showed selective trapping of beads and consistency of the number of the trapped beads.

Guang Yun 8

13.30–15.00
WH • Solid-State Lighting
Heonsu Jeon; Seoul Natl. Univ., Republic of Korea, Presider

WH1 • 13.30 Invited
III-Nitride Light-Emitting Diodes for Solid-State Lighting Revolution, *Jong Kyu Kim, E. Fred Schubert; Rensselaer Polytechnic Inst., USA.* This presentation will include an overview of III-Nitride LED technology, applications, key areas for future improvements, challenges such as efficiency droop. Under the "replacement paradigm", LEDs are replacing conventional light sources. In addition, transcending the replacement paradigm of solid-state lighting for future new applications will be discussed.

Guang Da 16

13.30–15.00
WI • Optical Couplers
Perry Ping Shum; Nanyang Technological Univ., Singapore, Presider

WI1 • 13.30
Bragg Grating-Assisted Optical Triplexer Using Two Silicon Nanowire-Based Directional Couplers, *Ning Zhu[1,2], Zhechao Wang[1,2], Lech Wosinski[1,2], Sailing He[1]; [1]Royal Inst. of Technology, Sweden, [2]Zhejiang Univ., China.* A triplexer based on silicon nanophotonic wires consisting of two Bragg grating-assisted directional couplers is proposed. The device has low loss, low crosstalk, and a footprint of 210 ×40 μm. The 1-dB bandwidth for the channels located at 1310, 1490 and 1550 nm are 110, 20, and 20 nm, respectively.

Guang Da 18

13.30–15.00
WJ • Mid-Infrared and THz Devices
Wei Li; Univ. of Wisconsin-Platteville, USA, Presider

WJ1 • 13.30
Strain and Crystal Orientation-Dependent Optical Properties of Mid-Infrared GaSb-Based Quantum Well Laser, *Md. Mahbub Hasan, Md. Rafiqul Islam; Khulna Univ. of Engineering and Technology, Bangladesh.* Strain- and crystal orientation-dependent optical properties of GaSb-based mid-infrared quantum well lasers are numerically studied by solving one-dimension Schrödinger equation. The simulation results demonstrate that there is a strong correlation of peak emission wavelength and optical gain with crystal orientation and strain.

Guang Da 7

WC2 • 14.00
Chirped Fiber Bragg Gratings Beamformer for SHF Phased-Array Antenna Transmissions, *Bin Li, Shanguo Huang, Wanyi Gu; Key Lab of Information Photonics and Optical Communications, Beijing Univ. of Posts and Telecommunications, China.* A multi-channel optical signal is used to provide of the required phase shift of the optically controlled phased antenna. Chirped fiber grating can provide optical time delay, and thus the steering angle of the antenna array can be controlled with specified directions.

WC3 • 14.15
Polarization Sensitivities of Demodulation Techniques for Tilted Fiber Bragg Grating Refractometer, *Yu-Chun Lu[1], Wei-Ping Huang[2], Shui-Sheng Jian[1]; [1]Inst. of Lightwave Technology, Beijing Jiaotong Univ., China, [2]Dept. of Electrical and Computer Engineering, McMaster Univ., Canada.* The polarization sensitivities of demodulation techniques for tilted fiber Bragg Grating (TFBG) refractometer are investigated theoretically. It shows that the normalized area detecting technique is polarization insensitive; the power-referenced demodulation technique is highly polarization sensitive, the polarization sensitivity increases with the grating tilted angle, thus, precise polarization control is essential.

Guang Da 9

WD2 • 14.00 Invited
InP Mach-Zehnder Modulator Monolithically Integrated with a Semiconductor Optical Amplifier, *Nobuhiro Kikuchi, Takako Yasui, Yasuo Shibata; NTT Photonics Labs, NTT Corp., Japan.* This paper reviews our recent studies of InP *n-p-i-n* Mach-Zehnder modulators monolithically integrated with a semiconductor optical amplifier. Lossless operation for the entire *C*-band and good dynamic performance are obtained.

Guang Da 11

WE2 • 14.00
Optimal Multicasting in a Multi-Line-Rate Ethernet-over-WDM Network, *Shruthi K. Harve, Marwan Batayneh, Biswanath Mukherjee; Univ. of California at Davis, USA.* We present a cost-effective algorithm that uses an auxiliary graph approach to route multicast traffic for multimedia applications such as IPTV over a multi-line-rate ethernet over WDM network. We study the algorithm by varying parameters such as cost of the channels and the order of processing multicast requests.

WE3 • 14.15
Allocation of Wavelength Selective and Convertible Cross Connects in Optical Multicast Networks, *Fangfang Yan, Weisheng Hu, Weiqiang Sun, Wei Guo, Yaohui Jin, Hao He; Shanghai Jiao Tong Univ., China.* This paper proposes a new resource allocation strategy in optical multicast network: part of optical cross-connect nodes are multicast-capable, while the other nodes are wavelength convertible. The optimal configuration of the wavelength cross-connect nodes is investigated to produce the minimal blocking probability for dynamic multicast traffic.

Guang Da 12

WF2 • 14.00
Improving the Dual-Failure Restorability in Scheduled WDM Mesh Networks, *Qingshan Li, Wenda Ni, Yanhe Li, Yili Guo, Hanyi Zhang, Xiaoping Zheng; State Key Lab on Integrated Optoelectronics, Tsinghua Natl. Lab for Information Science and Technology, Dept. of Electronic Engineering, Tsinghua Univ., China.* Backup path reprovisioning and activation planning (RAP) scheme is investigated in survivable WDM mesh networks providing shared path protection under scheduled traffic. Results show that over 70% dual-failure restorability benefits are achieved when the RAP is applied.

WF3 • 14.15
Performance Analysis of an Improved Postponed Lightpath Teardown Strategy in Multi-Layer Optical Networks, *Nan Hua[1], Hao Buchta[2], Xiaoping Zheng[1], Hanyi Zhang[1], Bingkun Zhou[1]; [1]Tsinghua Univ., China, [2]Fraunhofer-Inst. for Telecommunications, Heinrich-Hertz-Inst., Germany.* We propose an improved postponed lightpath teardown (PLT) strategy by introducing a lightpath splitting mechanism in multi-layer optical networks. Results show that the proposed strategy achieves higher utilizations of both wavelength-links and transceivers under different scenarios of load and transceiver number, and significantly reduce the blocking probability (CBP).

Guang Yun 7

WG2 • 14.00
Studying Liver Cancer Metastasis by *in vivo* Imaging and Flow Cytometer, *Xunbin Wei[1], Jin Guo[1], Guangda Liu[1], Yan Li[1], Yun Chen[1], Li Zhang[1], Yuan Tan[1], Tong Chen[2], Chen Wang[3], Zhenqin Gu[4]; [1]Inst. of Biomedical Sciences, Fudan Univ., China, [2]Dept. of Hematology, Huashan Hospital, Fudan Univ., China, [3]Univ. of Shanghai for Science and Technology, China, [4]Dept. of Endocrinology, Xinhua Hospital, Jiaotong Univ., China.* An *in vivo* flow cytometer and optical imaging are used to assess liver tumor cell spreading. A real- time quantitative monitoring of circulating liver tumor cells by the *in vivo* flow cytometer will be useful to assess the effectiveness of the potential therapeutic interventions.

WG3 • 14.15 Invited
Imaging Hypoxic Injury Sites Using Live Bacteria, *Hyon E. Choy, Jung-Joon Min; Chonnam Natl. Univ., Republic of Korea.* Certain strain of *Salmonella typhimurium* is capable of targeting infracted myocardium as well as various tumors, as demonstrated by tracking bioluminescence bacteria in animal using *in vivo* imaging system. To exploit this bacterial tropism, we engineered the *Salmonella* to express and secrete a reporter protein specifically in infarcted myocardium.

Guang Yun 8

WH2 • 14.00
Optical Design of a High Brightness LED Street Lamp, *Yang Liu, De Liang Ding, C. H. Leung, Y. K. Ho, M. Lu; Hong Kong Applied Science and Technology Res. Inst. Co. Ltd., Hong Kong.* We propose and develop a high brightness LED street lamp to provide a uniform and wide illumination area, which can eliminate the lamp installation numbers and electrical power consumption effectively.

WH3 • 14.15
Free-Form Micro-Lens for LED General Illumination, *Liwei Sun[1,2,3], Shangzhong Jin[1,2], Songyuan Cen[1]; [1]China Jiliang Univ., China, [2]Zhejiang Province Key Lab of Modern Measurement Technology and Instrument, College of Opto-electronics Engineering, China Jiliang Univ., China, [3]Lighting Res. Ctr., College of Opto-electronics Engineering, China Jiliang Univ., China.* To redistribute any patterns of LED radiation distributions onto a target surfaces to achieve a prescribed distribution, the free-form micro-lens is designed by using the "edge-ray principle". Some modules were done, and the simulation results show that the design of free-form micro-lens is applicable in LED illumination with competitive advantages.

Guang Da 16

WI2 • 13.45
Index Profile Engineering of Multimode Interference Couplers, *Alejandro Ortega-Moñux, Íñigo Molina-Fernández, J. Gonzalo Wangüemert-Pérez; Univ. de Málaga, Spain.* We propose a technique to improve the performance of high index contrast multimode interference couplers. It is shown that imaging errors can be almost completely removed if the refractive index profile of the multimode region is properly designed. Optimized devices exhibit very low excess losses, power imbalance and phase errors.

WI3 • 14.00
Modified Hamming Function Weighted Waveguide Structure for the Broadband and Minimized Mismatched Switching Couplers, *Chi-Feng Chen[1], Yun-Sheng Ku[1], Tsu-Te Kung[1,2], Hau-Wei Wang[3], Mau-Shiun Yeh[4]; [1]Dept. of Mechanical Engineering, Natl. Central Univ., Taiwan, [2]Dept. of Electro-Optical Engineering, Natl. United Univ., Taiwan, [3]Ctr. for Measurement Standards, Industrial Technology Res. Inst., Taiwan, [4]Materials and Electro-Optics Res. Div., Chung-Shan Inst. of Science and Technology, Taiwan.* We investigate modified Hamming function to apply in weighting the waveguide structure of mismatched switching coupler with low crosstalk, short length, and broad bandwidth. After numerical design of waveguide structure parameters, the M-HWF waveguide with the coupling length of 4.5 mm can reach bandwidth within 1.50~1.70 μm.

WI4 • 14.15
Low-Crosstalk, Short-Length Mismatched Optical Coupler Designed by New Weighting Function, *Chi-Feng Chen; Dept. of Mechanical Engineering, Natl. Central Univ., Taiwan.* A self-developed weighting function called Chen function is disclosed to show that the excellent results are obtained to compare with the Blackman and Hamming function in mismatched optical couplers. The coupler with a coupling length of 2.5 mm and crosstalk of -35 dB can reach the bandwidths within 1.36~1.7 μm.

Guang Da 18

WJ2 • 13.45
Dual-Color Mid-Infrared Quantum Cascade Photodetector in Coupled Quantum Well Structure, *Ali Rostami[1], A. Motmaen[2], H. Baghban[1], H. Rasooli Saghai[1,2]; [1]Univ. of Tabriz, Iran, [2]Islamic Azad Univ., Iran.* A novel structure for detection of two different wavelengths in mid-infrared region is proposed. Using a capturing well, a common transportation path for electron excited by two different wavelengths is introduced. Calculated values for responsivity and detectivity in the designed Quantum Cascade Photodetector structure at 120K are so interesting.

WJ3 • 14.00
Design and Theoretical Analysis of Optical Waveguides of Quantum Cascade Laser at λ~ 9.5 μm, *Yeong Hwan Ko, Bum Doo Park, Jae Su Yu; Kyung Hee Univ., Republic of Korea.* We report the design and theoretical analysis of optical waveguides of the InP-based quantum cascade laser (QCL) operating at wavelength of ~ 9.5 μm. The effective refractive index, optical confinement and absorption coefficient are calculated by using the finite element method (FEM).

WJ4 • 14.15
Fiber-Based THz Sources Based on Monolithic Single-Frequency Pulsed Fiber Lasers in the C-Band, *Wei Shi[1], Eliot B. Petersen[1,2], Jonathan Meair[1,2], Dan T. Nguyen[1], Jie Zong[1], Zhidong Yao[1], Arturo Chavez-Pirson[1], Nasser Peyghambarian[1,3]; [1]NP Photonics, Inc., USA, [2]Physics Dept., Univ. of Arizona, USA, [3]College of Optical Sciences, Univ. of Arizona, USA.* Compact, efficient, narrow linewidth, fiber based THz sources have been achieved by using the monolithic high power single-frequency pulsed fiber lasers in MOPA based on difference-frequency generation (DFG) in nonlinear optical crystals. We have observed the external cavity enhancement of DFG THz generation by using $ZnGeP_2$ for the first time.

Guang Da 7

WC4 • 14.30
The Experimental Fabrication of Add/Drop Filters Using a Bragg Grating-Assisted Mismatched Coupler, *Linyong Fan[1], Weiwei Jiang[1], Jian Li[1,2], Jingjing Zheng[1], Zhiming Liu[1], Shuisheng Jian[1]; [1]Beijing Jiaotong Univ., China, [2]Signal and Communication Res. Inst., China Acad. of Railway Sciences, China.* An add/drop filter using a Bragg grating-assisted mismatched coupler is fabricated. The maximum reflectivity, bandwidth, insert loss at the drop port and reflective loss at the input port of the filter are measured to be about 12 dB, 0.5 nm, 3.91 dB and -7.39 dB, respectively.

WC5 • 14.45
Bandwidth Tunable Band-Rejection Filter Based on Twisting a Rotary Long-Period Fiber Grating, *Tao Zhu[1,2], Yunjiang Rao[1,2], Cuihua Shi[1], K. S. Chiang[1,2,3]; [1]Chongqing Univ., China, [2]Univ. of Electronic Science and Technology of China, China, [3]City Univ. of Hong Kong, China.* We present a bandwidth tunable band-rejection filter based on a rotary long-period fiber grating. The grating shows split resonance bands, which can be tuned effectively by twisting the grating.

Guang Da 9

WD3 • 14.30
Nitrogen Plasma Enhanced Quantum Well Intermixing in InGaAsP/InP Laser Structure, *Shenghua Peng, Xin Zhang, Jian-Jun He; Zhejiang Univ., China.* Experimental results on a new method of plasma enhanced quantum well intermixing is presented. Using nitrogen plasma treatment followed by rapid thermal annealing, a 100nm-blueshift of photoluminescence peak is obtained. The new method has much weaker side-effect of etching than previously reported method using Argon plasma.

WD4 • 14.45
Design of Complex Semiconductor Integrated Structures, *Cristina Arellano[1], Sergei Mingaleev[2], Andrey Novitsky[2], Igor Koltchanov[1], André Richter[1]; [1]VPIsystems GmbH, Germany, [2]VPIsystems Development Ctr., Belarus.* We present the benefits and limitations for designing complex optical semiconductor-based integrated structures by means of advanced numerical modeling. Multi-section tunable laser designs are presented in this summary; and their tuning properties are analyzed for different architectures. Other applications and their performance characteristics will be presented in the final paper.

Guang Da 11

WE4 • 14.30
High Bit Rate WDM System Performance Evaluation, Effect of Seasonal Temperature Fluctuations, *Hadj Bourdoucen; Sultan Qaboos Univ., Oman.* Performance evaluation of WDM optical fiber networks for bit rates up to 160 Gbps was investigated and effect of seasonal temperature variations for Muscat area studied. Compensation of these variations using adjustable length of dispersion compensation fiber (DCF) was performed and system performance was studied by simulation.

Guang Da 12

WF4 • 14.30
Blocking-Differentiated Path Provisioning in Semi-Dynamic Survivable WDM Networks, *Wenda Ni[1], Michael Schlosser[2], Hanyi Zhang[1], Erwin Patzak[2]; [1]Tsinghua Univ., China, [2]Heinrich-Hertz-Inst., Germany.* A post path calculation process considering the flexibility of rerouting backup paths is proposed in this paper to achieve blocking-differentiated path provisioning for two classes of connection requests in semi-dynamic optical networks.

WF5 • 14.45
Approach for Building the Next Generation Green Optical Network Based on Optical Flow Switching, *Kwok Shing Ho, Kwok Wai Cheung; Dept. of Information Engineering, Chinese Univ. of Hong Kong, Hong Kong.* Optical Flow Switching (OFS) can solve the scalability and power consumption problems of electronic packet switching systems. We propose a new approach to build up the next generation core optical network based on OFS that is suitable for data traffic with short flows (sub-second).

14.00–17.00 WK • INDUSTRY FORUM: Communications for a Green Environment, *Guang Yun 1*

15.00–15.30 Tea Break, *Everbright East Exhibition Hall*

Guang Yun 7

Guang Yun 8

WH4 • 14.30
The Application Study on Laser Scanning Tridimensional Modeling of Human Body, *Tao Wang[1,2], Ling Guo[1], Yuxiang Li[1], Jianquan Yao[3], Guilan Ma[2]; [1]Hebei Engineering Univ., China, [2]Wuxi Hope Optoelectronics Co. Ltd., China, [3]Tianjin Univ., China.* The paper is about a novel three-dimensional human body modeling method on laser technology, using CCD camera to receive scanning information, based on the theory of aerial photography surveying and 36 characteristic measuring points. We introduce the mode integration and principle of human body feature identifying, and establish the model.

WH5 • 14.45
Investigation on the Aging Characteristics of High-Power White LEDs under Different Stresses, *Jing Yan, Zhendong Shang, Jianxin Chen; Beijing Optoelectronic Technology Lab, Beijing Univ. of Technology, China.* In accelerated life tests, the 1-W white LEDs were treated with high temperature and DC current distinctively. The tendencies of the light output decaying in the two conditions were basically the same, while the changing trends of the color temperature were different. The hard silica gels have better stability.

Guang Da 16

WI5 • 14.30
Silicon-Wires and Compact Multi-Mode Interference Splitters with an Uneven Splitting-Ratio, *Jingtao Zhou, Huajun Shen, Huihui Zhang, Xinyu Liu; Inst. of Microelectronics, CAS, China.* We report the fabrication and measurement of silicon-wires and multi-mode interference splitters based on silicon-wires structures. The low propagation loss of 0.71±0.03dB/mm and bending loss of 0.01dB/90° were obtained for silicon-wires. The splitting-ratios of the splitters are respectively 50:50, 15:85, and 28:72. They exhibited low excess loss and exact splitting-ratios.

WI6 • 14.45
Analysis and Fabrication of Broadband Add/Drop Filters Using a Bragg Grating-Assisted Mismatched Coupler, *Linyong Fan[1], Jian Li[1,2], Weiwei Jiang[1], Jingjing Zheng[1], Zhiming Liu[1], Shuisheng Jian[1]; [1]Beijing Jiaotong Univ., China, [2]Signal and Communication Res. Inst., China Acad. of Railway Sciences, China.* A Broadband add/drop filter using a linearly chirped Bragg grating-assisted mismatched coupler is fabricated. The maximum reflectivity and 3dB bandwidth of the filter at the drop port are measured to be about 20 dB and 0.8 nm, respectively.

Guang Da 18

WJ5 • 14.30
Two-Wavelength THz Quantum Cascade Laser with Highly Enhanced Temperature Characteristics, *Ali Rostami, B. Mirzaei, H. Baghban; Univ. of Tabriz, Iran.* We demonstrate a novel THz quantum cascade laser (QCL), emitting at two widely separated wavelengths 33 μm, 51 μm, simultaneously, based on GaN/AlGaN quantum wells. The large LO-phonon energy (~ 90 meV) and ultrafast resonant phonon depopulation of lower radiative levels lead to an excellently enhancement in operating temperature.

WJ6 • 14.45
Research on Dielectric Properties of Gallium Arsenides by Using THz-TDS, *Li Jiusheng, Zhao Xiaoli; China Jiliang Univ., China.* By using THz-TDS, the dielectric properties of various GaAs were tested in frequency from 0.2 to 1.5 THz. The absorption coefficient and refractive index of various resistivity GaAs were measured and compared. The results show that the ultra-resistivity GaAs will be a good candidate material for terahertz transmission waveguide.

14.00–17.00 WK • INDUSTRY FORUM: Communications for a Green Environment, *Guang Yun 1*

15.00–15.30 Tea Break, *Everbright East Exhibition Hall*

Exhibition Floor

15.30–17.00
WL • Poster Session

WL1
Ultra-Broadband Light Source for Optical Coherence Tomography, *Wang Zhaoying, Zhang Lei, Jia Dongfang; Tianjin Univ., China.* An ultra-broadband light source for optical coherence tomography (OCT) was obtained by supercontinuum generated in combination of 120m highly-nonlinear fiber, 4.5km dispersion-shifted fiber and 2km single-mode fiber. 140.6nm 3dB bandwidth around 1300nm was obtained. 4.1 μm longitudinal resolution could be obtained theoretically by using this light source for OCT system.

WL2
Femtosecond Pulse Compression in Hollow-Core Photonic Bandgap Fibers, *Zhang Shumin, Meng Yichang, Jin Chunjiang; Hebei Normal Univ., China.* Compression of chirped free femtosecond pulses in hollow core photonic bandgap fibers is investigated numerically. The results show that the combined effect of the intrapulse stimulated Raman scattering and the negative third-order dispersion can form still shorter pulses than is possible with intrapulse stimulated Raman scattering alone.

WL3
Bending Sensor with Tilted Fiber Bragg Grating Interacting with Multimode Fiber, *Yongxing Jin[1,2], C. C. Chan[2], Xinyong Dong[1], Y. F. Zhang[2]; [1]Inst. of Optoelectronic Technology, China Jiliang Univ., China, [2]Nanyang Technological Univ., Singapore.* A new type fiber bending sensor based on a TFBG interacting with a multimode fiber is presented. The sensing head is formed by inserting a small section of MMF between SMF and the TFBG. The reflective power in the cladding modes is decreased with the increase of curvature.

WL4
C+L Band Multi-Wavelength Fiber Laser Based on Cascaded Semiconductor Optical Amplifier, *Wang Zhaoying, Zhang Lei, Jia Dongfang; Tianjin Univ., China.* A C+L band multi-wavelength fiber laser based on cascaded semiconductor optical amplifier (SOA) was proposed, by using a high birefringence fiber loop mirror (Hi-Bi FLM) as wavelength filter. Experimentally, 26 wavelengths spacing on 100GHz were obtained with more than 25dB SNR. The linewidth of each channel was 0.102nm.

WL5
A Novel Technique to Generate Microwave Signal Based on Multiple-Frequency Brillouin Fiber-Ring Laser, *Ying Shen, Rong Wang, Tao Pu; Dept. of Telecommunications Engineering ICE, PLA Univ. of Science and Technology, China.* A novel multiple-frequency Brillouin fiber-ring laser is proposed and experimentally demonstrated. Based on this laser, the mechanism for the generation of high frequency microwave signal is proposed and partly realized. To confirm the feasibility of this method, 11GHz microwave signal is obtained by the experiment.

WL6
Novel Technique for the Measurement of Photonic Crystal Fiber Numerical Aperture Properties, *Ying Han[1], Lantian Hou[1], Yanyan Guo[1], Shuguang Li[2], Xingtao Zhao[3], Zhaoyuan Song[4]; [1]College of Information Science and Engineering, Yanshan Univ., China, [2]College of Science, Yanshan Univ., China, [3]College of Electrical Engineering, Yanshan Univ., China, [4]College of Science, Liaoning Shihua Univ., China.* A spectrometer is used to measure numerical aperture (NA) of photonic crystal fibers (PCFs), and the high-precision result is obtained. We get the NA at any wavelength in 500~900nm range, which is determined by light source and spectrometer. The measured results and theoretical calculation value match very well.

WL7
Influence of Cores' Shape on Coupling Length of Dual-Core Fiber, *Li-Bo Wang, Zhi-Dong Shi, Ye Bai, Jian-Qiang Lin, Quan Ge; Shanghai Univ., China.* For the same given cores' area in three kinds of dual (circular, elliptical, egg-shaped) core fiber, the relationship of the coupling length with different wavelength is calculated and examined. The influence of the cores' shape and pitch in dual-core fiber on the modal field profile and coupling characteristics is discussed.

WL8
Switchable Dual-Wavelength Fiber Laser Based on PCF Sagnac Loop and Broadband FBG, *Weiguo Chen, Shuqin Lou, Liwen Wang, Honglei Li, Tieying Guo, Shuisheng Jian; Inst. of Lightwave Technology, Beijing Jiaotong Univ., China.* Switchable dual-wavelength fiber laser with photonic crystal fiber (PCF) Sagnac loop and broadband fiber Bragg grating (FBG) at room temperature is demonstrated. By adjusting the polarization controller appropriately, the laser can be switched between stable single- and dual-wavelength lasing operations by exploiting polarization hole burning and spectral hole burning effects.

WL9
Refractive-Sensitivity of Mechanical Long-Period Fiber Grating in Side-Hole Fiber, *Yongxing Jin[1,2], C. C. Chan[2], Xinyong Dong[1], Y. F. Zhang[2]; [1]Inst. of Optoelectronic Technology, China Jiliang Univ., China, [2]Div. of Bioengineering, School of Chemical and Biomedical Engineering, Nanyang Technological Univ., Singapore.* The refractive index sensor based on using of a stress MLPG that is made by pressing a plate with periodic groove against a short length of side-hole fiber is proposed. The resonance wavelengths are shifted as two side-holes of the fiber core were filled with the different refractive index liquids.

WL10
The Dispersion and Dispersion Slope Characteristics of the Fiber Gratings Fabricated in Tapered Fiber, *Bin Li[1], Huai Wei[2], Zhongwei Tan[2]; [1]Information Engineering School, Communication Univ. of China, China, [2]Key Lab of All Optical Network and Advanced Telecommunication Network of EMC, Beijing Jiaotong Univ., China.* A novel method to compensate dispersion and dispersion slope at the same time by using fiber Bragg grating written on the tapered core fiber has been presented. These characteristics can be used in high speed optical fiber communication systems which need the dispersion and dispersion slope be compensated.

WL11
Multiwavelength Erbium-Doped Fiber Laser with a Nonlinear Optical Fiber Loop Mirror, *Shuang Liu[1,2], Xinyong Dong[3], Junqiang Sun[1], Ping Shum[2]; [1]Div. of Optoelectronic Devices and Integration, Wuhan Natl. Lab for Optoelectronics, China, [2]Network Technology Res. Ctr., Nanyang Technological Univ., Singapore, [3]Inst. of Optoelectronic Technology, China Jiliang Univ., China.* In this paper, we proposed a stable multiwavelength erbium-doped fiber laser by incorporating a HNLF and a PMF based Sagnac filter. The laser is able to realize 16~wavelengths spaced at 0.4nm with an extinction ratio of higher than 50dB and excellent stability within the power non-uniformity of less than 0.5dB.

WL12
Study on Characteristics of Optical Bistable Devices Based on Fiber Bragg Grating, *Yongjun Peng, Kun Qiu, Baojian Wu, Siwei Ji; Univ. of Electronic Science and Technology of China, China.* The simulation model to bistable characteristics of grating is established by using semi-implicit Runge-Kutta method. The bistable characteristics of grating are researched. The results show that the area of S-shaped hysteresis loop, bistable operating condition, bistable threshold and dynamic range can be adjusted by changing grating parameters.

WL13
Multiwavelength Erbium-Doped Fiber Ring Laser Employing Fabry-Perot Etalon, *C. H. Yeh[1], C. W. Chow[2], Y. F. Wu[2], F. Y. Shih[2], C. H. Wang[2], S. Chi[2,3]; [1]Information and Communications Res. Labs, Industrial Technology Res. Inst., Taiwan, [2]Dept. of Photonics and Inst. of Electro-Optical Engineering, Natl. Chiao Tung Univ., Taiwan, [3]Dept. of Electro-Optical Engineering, Yuan Ze Univ., Taiwan.* We propose a multiwavelength erbium-doped fiber (EDF) ring laser using a Fabry-Perot etalon inside the ring cavity with optimal fiber length to satisfy the least common multiple number for generating multiwavelength at room temperature.

Exhibition Floor

WL14
Supercontinuum Generation in Tapered Fibers, *Huihui Li, Lixiao Wei, Xiao Zhang, Yanyong Song; Beijing Univ. of Technology, China.* We present supercontiuum generation in tapered fiber by ultrashort laser pulses (800nm, 130fs). We made a tapered fiber which the diameter is 1.25μm. The output spectra is obtained in the tapered fibers. The output spectra of supercontiuum is compared with the theory, and the experiment result is anastomosed very well with the theory-analyze.

WL15
Apodization Method by Nonuniform Spatial Distribution of Diffraction Gratings for Photorefractive Wavelength Filter, *Katsuhito Suzuki[1], Atsushi Okamoto[1], Satoshi Honma[2]; [1]Hokkaido Univ., Japan, [2]Univ. of Yamanashi, Japan.* We proposed two apodization methods by controlling nonuniform spatial distribution of diffraction gratings for the transmission type of the holographic wavelength filter with photorefractive medium. Optimizing the intensity ratio and shapes of two writing beams, the improvement of transmission capacity is greatly improved to suppress the crosstalk.

WL16
Volume Holographic Demultiplexer for Spatial Mode Division Multiplexing in Optical Fiber Communication, *Kazuyuki Morita, Atsushi Okamoto, Junya Tanaka; Hokkaido Univ., Japan.* We propose a volume holographic demultiplexer in which each modal component can be separated spatially by phase matching characteristic of volume holograms combined with a phase conjugator. A dramatical improvement of the communication capacity can be expected by transmitting two or more WDM signals through one multimode fiber.

WL17
Pole-Zero Diagram Approach to the Design of Michelson Gires-Tournois Interferometer Interleaver, *Juan Zhang, Xiaowei Yang, Shuai Yu; Shanghai Univ., China.* A novel and simple design method based on pole-zero diagram is proposed for optical interleaver based on Michelson multi-cavity Gires-Tournois (G-T) interferometer. Design examples of the interleaver with different cascaded G-T etalon structure are given.

WL18
Frequency Response of Fiber-Optic Hydrophone with a Novel Mechanical Anti-Aliasing Filter of Side Cavities, *Zefeng Wang, Yongming Hu; Natl. Univ. of Defense Technology, China.* We demonstrate a novel fiber-optic hydrophone with a mechanical anti-aliasing filter of side cavities. The amplitude and phase frequency response properties are presented with an acoustic equivalent circuit. The hydrophone is tested in a standing-wave tube filled with water, and the measured frequency responses accord well with the theoretical results.

WL19
Widely Tunable L-Band Brillouin Fiber Laser Incorporating a Bismuth-Based Erbium-Doped Fiber, *Yizhen Wei[1,2], Bing Sun[1,2], Tianshu Wang[1,2], Daru Chen[1,2]; [1]Ctr. for Optical and Electromagnetic Res., Zhejiang Univ., China, [2]Joint Res. Ctr. of Photonics of the Royal Inst. of Technology and Zhejiang Univ., China.* We proposed a widely tunable single-wavelength Brillouin fiber laser (BFL) by employing a bismuth-based erbium-doped fiber (Bi-EDF). The BFL operates in a range from 1555 nm to 1632 nm, which is the widest to the best of our knowledge. It's an attractive narrow linewidth laser source on the L-band.

WL20
Absolutely Single Polarization Photonic Crystal Fiber Based on a Structure of Sub-Wavelength Hole Pitch, *Daru Chen[1,2]; [1]Joint Res. Lab of Optics of Zhejiang Normal Univ. and Zhejiang Univ., China, [2]Ctr. for Optical and Electromagnetic Res., Zhejiang Univ., China.* By employing circular air holes in the fiber cladding area and elliptical air holes in the fiber core area, an absolutely single polarization photonic crystal fiber based on a structure of sub-wavelength hole pitch, which is with a single polarization operation region from 1300 nm to 1600 nm, is proposed.

WL21
Multiple Dissipative Soliton Evolution in an Erbium-Doped Fiber Laser with Large Normal-Cavity-Dispersion, *Leiran Wang, Hongbo Sun, Xiaohui Li, Yongkang Gong, Xueming Liu; Xi'an Inst. of Optics and Precision Mechanics, CAS, China.* Experimental observations of multiple dissipative solitons are reported in a fiber laser with large normal-cavity-dispersion. Eight solitons can be generated from the laser cavity at pump power of about 310mW. Results show that the stable propagation of dissipative solitons may be limited by the accumulation of excessive pulse chirps.

WL22
Study and Fabrication of Add/Drop Filter Based on Bragg Gratings Reflection Coupler, *Weiwei Jiang[1], Linyong Fan[1], Zhiming Liu[1], Peilin Tao[1], Jian Li[1,2], Shuisheng Jian[1]; [1]Inst. of Lightwave Technology, Beijing Jiaotong Univ., China, [2]Signal and Communicaiton Res. Inst., China Acad. of Railway Sciences, China.* The coupler-mode equation for analysing Bragg-grating reflection coupler was presented. The influences of different gratings' position in the coupling region and grating length on the filtering spectra were investigated based on the equation. A Bragg-grating reflection coupler with reflectivity 20dB was achieved by fused taper technology and Phase Mask method.

WL23
Growth of Ultraviolet-Induced H_2-Loaded Long Period Fiber Grating Immediately after Fabrication, *Jingjing Zheng, Wenhua Ren, Linyong Fan, Zhiming Liu, Tigang Ning, Shuisheng Jian; Inst. of Lightwave Technology, Beijing Jiaotong Univ., China.* Growth of LPG written in H_2-loaded fiber within one hour after fabrication was measured and analyzed. Fast deepen on difference of refraction index was obviously observed. The peak wavelength and cross-coupling coefficient to time curves that suggest same variation pattern in refraction index-changing are fitted better in exponential decay function.

WL24
Finite Element Analysis of InP Nano Inner Cladding Fiber, *Yuwen Duan, Ru Zhang, Peilin Lang, Jin Wang; Beijing Univ. of Posts and Telecommunications, China.* InP nano inner cladding fiber was fabricated by the means of MCVD. The thickness of the InP film is about 60nm. The electric field distribution is simulated through the FEM. It is shown that the InP nano film can confine the electric distribution in the core and the n_{eff}=1.585.

WL25
Optimal Design of Birefringent Gires-Tournois Optical Interleaver, *Wei Wu, Peng Liu; Wuhan Univ. of Technology, China.* A single-stage BGTI and a two cascaded BGTI are designed to reduce PMD and improve isolation rate of BGTI. Simulation and experiment results show that isolation rate is improved, the bandwidth is remained and PMD also reaches requirement design, successfully optimizing the system performance.

WL26
Optimal Control of Light Storage in Atomic Ensemble Based on Photon Echoes, *Tingwan Wu, Chen Qinzhi; South China Univ. of Technology, China.* We provide a numerical analysis for a simple quantum-memory method to efficiently store and retrieve photon in a two-level atoms ensemble, based on photon-echo techniques. We show that storage efficiency can reach nearly 100% with a high optical depth, and we analyze the optimal broadening for a given pulse width.

WL27
Fiber Bragg Grating Sensors Interrogation System Using Arrayed Waveguide Gratings Demultiplexer, *Wei Wu, Xin Liu; Wuhan Univ. of Technology, China.* A Fiber Bragg Grating (FBG) sensor interrogation system using Arrayed Waveguide Gratings (AWGs) demultiplexer is designed and studied theoretically and experimentally. Initial results show that the proposed technology using AWG demultiplexer could offer a low-cost, compact, and high-performance solution for the interrogation of FBG distributed sensors and multisensor arrays.

WL28
Highly Compact Organic Electro-Optic Modulator Based on Nanoscale Plasmon Metal Gap Waveguides, *Shin-Ichiro Inoue, Shiyoshi Yokoyama; Inst. for Materials Chemistry and Engineering, Kyushu Univ., Japan.* A highly compact Mach-Zehnder (MZ) electro-optic (EO) modulator composed of nanoscale metal gap waveguides has been numerically demonstrated. Nanoscale propagations and their EO modulations are investigated by the FDTD method. The half-wave voltage (Vπ) of the resulting MZ modulator is 1.73 V using the interference arm with a sub-micron length.

WL29
Enhanced Electro-Optic Response of a Poled Polymer in Reflective Planar Microcavities, *Azusa Inoue, Shin-ichiro Inoue, Shiyoshi Yokoyama; Kyushu Univ., Japan.* The electro-optic (EO) responses of poled polymers were enhanced by incorporating them into reflection-type planar microcavities. We fabricated the microcavity with an enhanced local field in the EO polymer and evaluated the resultant enhancement of phase sensitivity to induced refractive-index changes in the EO polymer using spectroscopic reflection ellipsometry.

Exhibition Floor

WL30
InP Nanowires with Various Morphologies Formed by Au-Assisted Metal-Organic Chemical Vapor Deposition, *Hui Huang, Xiaomin Ren, Xian Ye, Jingwei Guo, Yisu Yang, Qi Wang, Yongqing Huang; Beijing Univ. of Posts and Telecommunications, China.* InP nanowires were grown on InP(100) substrates via VLS mechanism with Au particles as catalyst. Various morphologies of the nanowires such as straight, L-branch, Y-branch, K-branch, bottle-shape, cone-shape, needle-shape were obtained.

WL31
The Formation of Optical Waveguide in KTP Crystal by Combining Ion Implantation with Ion Exchange, *Xianbing Ming[1], Fei Lu[1], Xiaomei Wang[1], Ming Chen[2], Xiangzhi Liu[1,3]; [1]School of Information Science and Engineering, Shandong Univ., China, [2]School of Physics, Shandong Univ., China, [3]Inst. of Automation, Shandong Acad. of Sciences, China.* KTP planar optical waveguide was fabricated by combining He^+ ion implantation with Rb-K ion exchange in pure $RbNO_3$. The refractive index profiles in the novel waveguide were reconstructed by analyzing dark mode spectra. The influence of irradiation damage on the Rb distribution was investigated by means of RBS technique.

WL32
Large Separating Angle Multiway Beam Splitter Based on Photonic Crystal Ring Resonators, *Hao Guo, Qinghua Liao; Dept. of Physics, Nanchang Univ., China.* A novel beam splitter is designed on the basis of the coupling characteristics between the waveguide and ring resonator. By simply adjusting the effective refractive of the coupling rods, uniform or free splitting can be achieved. The characteristics of the structure are investigated by FDTD and PWE methods.

WL33
Growth of GaAs Nanowires with Various Thickness of Au Film, *Xian Ye, Hui Huang, Xiaomin Ren, Yisu Yang, Shiwei Cai, Yongqing Huang, Qi Wang; Beijing Univ. of Posts and Telecommunications, China.* GaAs nanowires were grown on GaAs (111) B-substrates via VLS mechanism with various Au film thickness. Experiment results indicated that thicker Au film results in larger diameters, more dispersed size distribution, and lower density of the nanowires. The growth rate is independent on diameters, while it decreases with the density.

WL34
Large Absolute Photonic Band Gaps Design in Two-Dimensional Photonic Crystals Using a Modified Genetic Algorithm, *Liyong Jiang, Haipeng Li, Wei Jia, Xiangyin Li; Nanjing Univ. of Science and Technology, China.* Large absolute photonic band gaps (PBGs) are searched among several two-dimensional photonic crystals (PCs) using a genetic algorithm (GA). As numerical examples, we present three optimum PCs, the unit cell of which comprises five round rods, square rods, and hexagon rods, respectively. The maximum absolute bandwidth reaches $0.1648(2\pi c/a)$.

WL35
Ultra-Broadband Dispersion Measurement of Photonic Crystal Fiber Based on Supercontinuum Pulses, *Xiaoming Liu, Zefeng Wang, Jing Hou, Jin Aijun, Liang Dongming; College of Photoelectric Science and Engineering, Natl. Univ. of Defense Technology, China.* We present an ultra-broadband dispersion measurement method for photonic crystal fiber (PCF) based on Michelson interferometer and supercontinuum pulses. A PCF with hole diameter and pitch, 2.17μm and 3.47μm respectively, is measured. The measured dispersion coefficients are well in agreement with the simulation results of the same fiber.

WL36
Surface-Plasmons Enhanced Light Emitter Based on Ag Film in GaN, *Jia Zhao, K. Li, Fanmin Kong, Liuge Du, Yizhu Lin, Hui Gao; Shandong Univ., China.* We study the contribution of surface-plasmons (SPs) coupling with single dipole to enhance the emitter emission. When Ag film is inserted, the emission efficiency can be enhanced greatly. With 3-D-FDTD method, our numerical simulation results demonstrate that SPs play a key role and are important to improve the light-emitting devices.

WL37
Study of Photoluminescence Properties of Nd-O^+-Codoped Si-Based Thin Film, *Meiling Yuan, Chenfa Li, Xinli Leng; Dept. of Physics, Nanchang Univ., China.* The photoluminescence (PL) spectra at room temperature for the Si-based samples doped by Nd,O^+ are measured. All the samples possess blue-violet PL properties and light-emission is stable. The PL spectra has multiple peak structure. The intensity of PL spectra is relative to Nd and O^+ implantation and the annealing temperature.

WL38
Design of High Frequency Compensation Submount for 40Gbit/s Lumped Electroabsorption Modulated Lasers, *Yang Wang, Yuanbing Cheng, Fan Zhou, Hongliang Zhu, Lingjuan Zhao, Wei Wang; Inst. of Semiconductors, CAS, China.* A high frequency compensation technique is proposed by a T-resonator scheme on the submount for 40Gbit/s lumped electroabsorption modulated lasers (EMLs) package. Reflected microwave generated by the T-resonator enhances the electrical signal over the modulator, which can be controlled by the size of the T-resonator.

WL39
Thermal Annealing Effect on the Mg Doped AlGaN/GaN Superlattice, *Baozhu Wang[1,2], Xiaoliang Wang[2]; [1]Inst. of Information Science and Engineering, Hebei Univ. of Science and Technology, China, [2]Inst. of Semiconductors, CAS, China.* Mg-doped AlGaN/GaN superlattice has been grown by metalorganic chemical vapor deposition (MOCVD). Rapid thermal annealing (RTA) treament are carried out on the samples under nitrogen as protect gas. Hall, photoluminescence, X-ray diffraction and atomic-force microscopy are used to characterize the electrical, optical and structural properties of the samples.

WL40
Low-Temperature Si/Si Wafer Bonding Using Boride Treated Surface, *Hailan Song, Hui Huang, Xiaomin Ren, Wenjuan Wang, Yongqing Huang; Beijing Univ. of Posts and Telecommunications, China.* An approach for Si/Si wafer bonding based on boride-solution treatment was presented. The bonding energy is higher than the Si fracture energy by annealing at 180°C. The properties of the bonding structures were studied in terms of the interface shape, electrical and optical characteristic through SEM, and interface I-V curve.

WL41
A Ultra-Short 1×2 Double-Wavelength Optical Power Splitter for 1310/1550 nm Operation Based on Photonic Crystal Multimode Interference, *Wei Li[1], Xu-ming Xu[2], Yu-ping He[1], Wei-feng Lu[1], Shen-yu Qiu[1]; [1]Dept. of Nature Science, Nangchang Engineering Inst. College, China, [2]Dept. of Physics, Nanchang Univ., China.* We design a ultra-short 1×2 1310/1550 nm double-waveguide optical power splitter The device can be used to divide the input beam equally for both 1310nm and 1550nm at the same time. The total multimode waveguide length is about 13 μm, which is one 210th of the conventional dielectric counterparts reported.

WL42
A Novel Dual-Absorption Resonant Cavity Enhanced Photodetectors, *Peng Fu, Yongqing Huang, Xiaofeng Duan, Xiaomin Ren, Hui Huang, Qi Wang; Beijing Univ. of Posts and Telecommunications, China.* A novel resonant cavity enhanced photodetector with asymmetric dual-absorption layer structures that shifts the limitation on bandwidth-efficiency further than is possible in conventional photodetector is proposed. The quantum efficiency and frequency bandwidth are 93% with a low reflectivity of top mirror, and 88GHz with mesa area for $100\mu m^2$, respectively.

WL43
Dye-Sensitized Solar Cell Using Natural Dyes Extracted from Spinach and Amaranth, *Guizhi Wu, Yue Shen, Feng Gu, Huina Lu, Yian Xie, Jiangcheng Zhang; School of Materials Science and Engineering, Shanghai Univ., China.* The performances of natural dye-sensitized solar cells (N-DSSCs) assembled by using natural dyes extracted from spinach, amaranth and a mixture of them were investigated. In the sun, the V_{oc} of cells sensitized by spinach extract was 450 mv, while those sensitized by the mixture showed a V_{oc} above 500 mv.

WL44
Design of Hollow-Core Photonic Bandgap Fibers for CH_4 and C_2H_2 Optical Fiber Sensors, *Qiuguo Wang, Bojun Yang; School of Electronic Engineering, Beijing Univ. of Posts and Telecommunications, China.* A hollow-core photonic bandgap fiber for optical fiber sensors is designed, the parameters of the PBFis d=0.94*2.60μm,R=Λ=2.60μm for C_2H_2, and d=0.94*2.41μm,R=Λ=2.41μm for CH_4. 98% of the energy is propagated in the core, the fiber is suitable to be used to detect the gas CH_4 and C_2H_2.

WL45
Coupling Characteristics of Electromagnetic Waves in Ultra-Short Parallel Four Photonic Crystal Waveguides and Its Application, *Wei Li, Xu-ming Xu; Dept. of Nature Science, Nanchang Engineering Inst. College, China.* We consider the coupling between four photonic crystal waveguide as a multimode interference system and showed the dispersion curves of the eigenmodes intersect or almost intersect. At the crossing-point, the multimode interference is deprived and power is confined to its input direction without observable transfering to other photonic crystal waveguides.

Exhibition Floor

WL46
Electronic Dispersion Compensation for PMD in 40-GB/s Optical Links, *Kang Yang, Jianfei Liu, Xiangye Zeng; Hebei Univ. of Technology, China.* We analyzed the performance of DFE in PMD-limited 40 GB/s Optical links by using Matlab/Simulink. We also provided a description of the equalizer circuit design, and described the results of circuit simulations; it is found that a DFE consisting of a 3-tap FFE and a 2-tap FBE could compensate PMD.

WL47
Analysis of the Dynamics of Frequency Upconversion in Er^{3+}/Yb^{3+} co-Doped $KY(WO_4)_2$ Crystal, *Jianfeng Lin, Zhouhong Feng, Lin Lin, Kehua Shi, Zhiqiang Zheng; Fujian Normal Univ., China.* The absorption spectra and the luminescence decay curve of Er^{3+}/Yb^{3+} co-doped $KY(WO_4)_2$ crystal was measured. The radiative transition rates were calculated by Judd-Ofelt theory. The Yb-to-Er energy-transfer rate and the cooperative upconversion coefficients were estimated by numerically solving the rate equations and fitting simulated curve to the measured data.

WL48
The Influence of Interlayer on Thermal Stress in Nano-diamond Thin Films, *Yongjie Wang, Zhanlong Zhao; North China Electric Power Univ., China.* Thermal stress comes from the difference in coefficient of thermal expansion (CTE) between the films and the substrate. The results show that thermal stress is sensitive to deposition temperature and interlayer thickness, it gives the support of some technique parameters for the diamond thin films growth with lower thermal stress.

WL49
Synthesis and Photoelectrical Properties of Zinc Phthalocyanine-Bisphenol A Epoxy Derivative, *Wanxi Cheng, Yue Shen, Fei Zheng, Feng Gu, Jiangcheng Zhang; School of Materials Science and Engineering, Shanghai Univ., China.* A novel soluble zinc phthalocyanine derivative was synthesized and characterized by infrared (IR) and electronic absorption spectra. Current-voltage characteristics of the films were measured and photoconductivity was increased by an order of magnitude compared with dark conductivity, which indicates the product is a promising functional material for photovoltaic cells.

WL50
Optical Characteristic of Cotton in the THz Frequency Region, *Jianrui Li, Jiusheng Li; China Jiliang Univ., China.* The spectral characteristics of cotton in the range of 0.2~2.5THz have been measured with THz time-domain spectroscopy. Its absorption and refraction spectra are obtained at room temperature. The results provided in this paper will help us to study the THz application to cotton commercial transaction inspection further.

WL51
The Electrical Properties of the Diamond Optoelectronic Device, *Yi Zhang, Linjun Wang, Jian Huang, Ke Tang, Fengjuan Zhang, Qian Fang, Qingkai Zeng, Run Xu, Jijun Zhang, Jiahua Min, Yiben Xia; Shanghai Univ., China.* 200 μm free-standing polycrystalline diamond films were grown by microwave plasma chemical vapor deposition (MPCVD) method. The nucleation surfaces of diamond were characterized by XRD, Raman scattering, atomic force microscopy (AFM) method. An ultraviolet (UV) optoelectronic device was fabricated on diamond nucleation surface, showing clear modulation of channel current.

WL52
Theoretical and Experimental Research of Lens Duct as Coupling System for Laser Diode Array, *Xiaojuan Liu, Shenggui Fu; School of Science, Shandong Univ. of Technology, China.* Based on the theoretical simulation, a lens duct using as coupling system for laser diode array was designed and fabricated. A smooth and symmetric output beam with high quality was obtained. The coupling efficiency of the lens duct was larger than 91% which was better than the results reported previously.

WL53
Demonstration of Hybrid 10Gb/s PON and 10Gb/s OFDM ROF Architecture towards Next Generation Access Networks, *C. H. Wang[1], C. W. Chow[1], C. H. Yeh[2], Y. F. Wu[1], F. Y. Shih[1], S. Chi[1,3]; [1]Dept. of Photonics and Inst. of Electro-Optical Engineering, Natl. Chiao Tung Univ., Taiwan, [2]Information and Communications Res. Labs, Industrial Technology Res. Inst., Taiwan, [3]Dept. of Electro-Optical Engineering, Yuan Ze Univ., Taiwan.* To meet the ever-increasing demand of data and mobility of access networks, we demonstrate a hybrid-wire/wireless network, using 10Gb/s NRZ and 10Gb/s OFDM signals. 1-dB power-penalty was observed in 25km single-mode-fiber transmission without dispersion compensation.

WL54
Spatial Filtering System on Optical Intersatellite Communication with Double Phase Conjugate Mirror, *Tomohiro Fujita[1], Kohei Simayabu[1], Atsushi Okamoto[1], Yoshihisa Takayama[2]; [1]Hokkaido Univ., Japan, [2]NICT, Japan.* We propose a spatial filtering system on optical intersatellite communication with a double phase conjugate mirror. This system can reduce the background light components which cannot be filtered out ever. With a 2-D simulator, we practically calculate the amount of reduction of the background light and design an optimal spatial flter.

WL55
A Scheme to Realize Multicast/Broadcast by Superimposing DPSK Signal onto Manchester/NRZ Signal, *Lingzhi Ge, Shilin Xiao, Zhixin Liu, Min Zhu, Lei Cai, Tao Xiao, Daozi Ding; Shanghai Jiao Tong Univ., China.* A multicast scheme in WDM-PON is realized by superimposing multicast DPSK signal onto downstream point-to-point Manchester/NRZ signal. The proposed system is experimentally demonstrated with 5-Gb/s point-to-point Manchester/NRZ format signal and 1.25-Gb/s DPSK signal. At the receiver side, a MZDI and a LPF are employed to retrieve the multicast DPSK signal.

WL56
Bidirectional Single-Ring-Architecture Self-Protected TDM Passive Optical Network, *C. H. Yeh[1], C. W. Chow[2], C. H. Wang[2], F. Y. Shih[2], Y. F. Wu[2], S. Chi[2,3]; [1]Information and Communications Res. Labs, Industrial Technology Res. Inst., Taiwan, [2]Dept. of Photonics and Inst. of Electro-Optical Engineering, Natl. Chiao Tung Univ., Taiwan, [3]Dept. of Electro-optical Engineering, Yuan Ze Univ., Taiwan.* We propose and experimentally demonstrate a protection apparatus in ring-architecture time-division-multiplexed passive optical network with self-healing mechanism against the fiber fault promptly. Besides, the proposed system performances are also measured and analyzed.

WL57
A Flexible Scheme of Reflective ONU Based on RSOA-Assisted Michelson Interferometer, *Lei Liu, Min Zhang, Lian Lu, Mingtao Liu, Peida Ye; Beijing Univ. of Posts and Telecommunications, China.* A new scheme of colorless ONU with RSOA-assisted Michelson Interferometer is proposed, for Rayleigh backscattering suppression in single fiber WDM-PON systems. Simulations and discussions have been conducted to validate the proposal. The results are useful for designing cost-effective multi-wavelength PON or point-to-point radio over fiber system.

WL58
Demonstration of Clock Recovery for 80Gb/s OTDM Signals, *Ming Chen, Tangjun Li, Muguang Wang, Shuisheng Jian; Beijing Jiaotong Univ., China.* A novel but simply implemented clock recovery for 80Gb/s OTDM signals based on stimulated brillouin scattering is presented and demonstrated experimentally. According to the unequal-amplitude even-multiplexed OTDM signals, the frame clock is extracted. In addition, the clock with multiple tributary rates is recovered in simulation utilizing the clock recovery module.

WL59
Single Carrier Frequency Domain Equalization Based on SSB Modulation, *Junwen Zhang, Wuliang Fang, Chunning Hou, Xiao Liu, Xi Zheng, Nan Chi; School of Information Science and Engineering, Fudan Univ., China.* We propose a novel and effective EDC scheme, single-carrier frequency domain equalization (SC-FDE), for fiber chromatic dispersion compensation utilizing high-speed DSP based on SSB modulation. Simulation results with FDE validate signal quality improvements for 10Gb/s ASK PRBS with 120 km SSMF transmission.

WL60
In-Service Chromatic Dispersion Monitoring Based on Imperfect Phase Tuned Delay Interferometer for NRZ-DPSK Systems, *Jian Zhao, Zhaohui Li, K. K. Qureshi, A. P. T. Lau, Chao Lu, H. Y. Tam; Hong Kong Polytechnic Univ., Hong Kong.* A chromatic dispersion (CD) monitoring method for differential phase-shift keying (DPSK) signals using an optical delay interferometer with phase error has been demonstrated. This method can be used for CD monitoring and discriminate dispersion polarity.

WL61
Analysis of OSNR Margin Improvement in beyond 100Gb/s PDM-DQPSK Systems Due to FEC, *Deyuan Chang, Fan Yu, Yuanda Huang, Bangning Mao, Yuanyuan Fang, Li Zeng, Qianjin Xiong; Network Res. Dept., Huawei Technologies Co., Ltd., China.* The OSNR margin improvements due to FEC limit elevation in 112Gb/s PDM-DQPSK systems under two different receiver schemes, direct detection and coherent detection with digital signal processing (DSP), are analyzed. FEC limit elevation provides more benefit to the direct detection scheme than to the coherent detection scheme in 112Gb/s PDM-DQPSK system.

Exhibition Floor

WL62
Performance Comparison of Coherent Time-Spreading PPM-OCDMA and OOK-OCDMA Systems, *Xiaogang Chen[1], Dexiu Huang[2]; [1]College of Science, China Three Gorges Univ., China, [2]Wuhan Natl. Lab for Optoelectronics, Huazhong Univ. of Science and Technology, China.* We compared the bit-error-rate (BER) and throughput performance of coherent time-spreading (TS) optical code division multiple access (OCDMA) systems with PPM and OOK signaling. The results indicate that PPM-OCDMA with an appropriate pulse position multiplicity performs better than OOK-OCDMA in the receivers' bandwidth limitation case.

WL63
Experimental and Theory Study the System Performance of TOAD Using for Demultiplexing in 160Gb/s OTDM Transmission System, *Dan Lu, Nan Jia, Kang-ping Zhong, Gong-tao Rong, Tang-jun Li, Shui-sheng Jian; Beijing Jiaotong Univ., China.* The system performance of TOAD are experimentally studied, the non-ideal problems encountered in the experiment are numerically simulated. The results show the opposite direction fibre lengths are not needed to be equal while unperfected coupling ratio, signal polarization rotation are crucial limit for the demultiplexing application in 160Gb/s OTDM system.

WL64
Effect of Mach-Zehnder Modulator DC Extinction Ratio on Single Sideband Modulation Radio over Fiber Link, *Xiaogang Chen[1], Dexiu Huang[2]; [1]College of Science, China Three Gorges Univ., China, [2]Wuhan Natl. Lab for Optoelectronics, Huazhong Univ. of Science and Technology, China.* The impact of modulator chirp on single sideband (SSB) modulation radio over fiber (RoF) link is investigated and simulated. For a nonideal modulator with low extinction ratio, optimum drive signal unbalanced ratio could be applied to minimize the power variation of targeted signal and obtain a high quality microwave signal.

WL65
The Study of DPSK Dispersion Management on Kerr Nonlinear Suppression, *Ming Xu, Zhi Ying Zhu, Jun Luo, Jianhua Ji; Shenzhen Univ., China*. Based on RZ-DPSK DWDM system, the four dispersion management programs are proposed to suppress kerr nonlinear effect including SPM and XPM. The tolerance against effects is studied through detailed numerical simulation by Split-Step Fourier Method. The results show that DPSK system must be having 2dB performance improvement.

WL66
Electronic Dispersion Compensation for High-Speed Rate Coherent Optical Communication Systems with QAM Signals, *Li Lu[1,2], Jianming Lei[1], Xuecheng Zou[1]; [1]Dept. of Electronic Scicence and Technology, Huazhong Univ. of Science and Technology, China, [2]Air Force Radar Acad., China.* A coherent optical communication system of 40 Gb/s 16QAM signals using electronic dispersion compensation technique is proposed, which can generally perform carrier-phase estimation and electronic equalization at the same time. Simulation results prove the transmission distance can be up to 160-km at 10^{-7} bit-error-rate.

WL67
Study on Multiple-Hops Performance of Multiple-OOC Sequences-Based Optical Labels for OPS Networks, *Chongfu Zhang, Kun Qiu, Chunli Ma; Univ. of Electronic Science and Technology of China, China.* We show firstly multiple hops system of multiple OOC sequences-based optical labels for optical packets switching (MOOCS-OPS), we then consider the performance of MOOCS-OPS, for the first time. Some results of MOOCS-OPS are obtained and analyzed to verify accepted tolerance of multiple hops performance of MOOCS-OPS.

WL68
Research of Nonlinearity in OOFDM Communication, *Guodan Sun, Rong Wang, Tao Pu, Zhishuang Zhao; Inst. of Communication Engineering, PLA Univ. of Science and Technology, China.* The impact of MZM and fiber nonlinearity on DDO-OFDM transmission is studied. OSNR after MZM is calculated and proved by simulation. The optimal fiber launch power and MZM modulated depth is obtained. A method that can improve system performance is proposed.

WL69
Code Design and Performance Analysis in Coherent 2-D OCDMA System, *Zhiwen Chen[1], Jianhua Ji[2], Songlin Zhuang[1]; [1]Univ. of Shanghai, China, [2]Shenzhen Univ., China.* Bipolar one-coincidence sequence (BOCS) is constructed for coherent 2-D optical code-division multiple access system. Compared with OCS, BOCS has much larger code cardinality under the same code length and the same wavelengths. Furthermore, BOCS has the same cross-correlation and auto-correlation performance, but has lower crosstalk value.

WL70
A Novel Quasi-Synchronous Coherent Time-Spreading Optical CDMA System, *Jianhua Ji, Fangping Gong; Shenzhen Univ., China.* We propose a novel quasi-synchronous coherent time-spreading optical CDMA, where the synchronization among users can be controlled within permissible time delay. Relationship between the system performance and code parameters is analyzed. Within permissible time delay, the mean intensity of aperiodic cross-correlation equals zero, and the beat noise can be removed.

WL71
Normalized Throughtput of Coherent Time-Spreading OCDMA under Chip-Asynchronous Assumption, *Jianhua Ji, Qing Wu; Shenzhen Univ., China.* The effects of pulse shape and pulse width on chip-asynchronous coherent time-spreading OCDMA system are evaluated by the aperiodic cross-correlation function of up-sampled sequence. For 127 length gold sequence, normalized throughtput of OCDMA is derived. It can be shown that the shorter optical pulse will obtain larger normalized throughtput.

WL72
The Numerical Fitting on Ultrashort Optical Soliton Self-Frequency Shifting, *Ming Xu, Jun Luo, Zhiying Zhu, Jianhua Ji; Shenzhen Univ., China.* Based on the analysis of the characteristic of ultrashort optical soliton, the quantitative relationship between the self-frequency shifting and the pulse time delay with distance, pulse width and TOD are found out using the numerical simulation and fitting method. The results are very important for the high-speed optical switch.

WL73
Orthogonal Wavelength-Division-Multiplexing Using SSFBGs in Passive Optical Networks, *Zhihua Zheng, Zongjue Qian, Guochu Shou, Yihong Hu; Beijing Univ. of Posts and Telecommunications, China.* We propose a novel scheme of orthogonal wavelength-division-multiplexing (WDM) using superstructure fiber Bragg gratings (SSFBGs) as a square pulse shaper in passive optical networks (PONs). The system supports large numbers of subscribers by the orthogonal interleaving of the sinc-shaped spectrum from each channel and expends the capacity.

WL74
Optimizing TCP Window for Grid over OBS Networks, *Shuping Peng[1], Zhengbin Li[1], Zhenrong Zhang[1,2], Yongqi He[1], Anshi Xu[1]; [1]State Key Lab of Advanced Optical Communication Systems and Networks, Peking Univ., China, [2]School of Computer, Electronics and Information, Guangxi Univ., China.* According to the established analytical model, the TCP window size is optimized in Grid over OBS network. The analytical results show that the optimization of TCP window can improve the TCP throughput significantly.

WL75
A Novel Routing and Wavelength Assignment Algorithm Based on Colored Multigraph Model in WDM Networks, *Qiwu Wu[1], Jianping Wang[1], Xianwei Zhou[1], Lingzhi Jiang[1], Yu Deng[2]; [1]School of Information Engineering, Univ. of Science and Technology Beijing, China, [2]Dept. of Electronics, Univ. of York, UK.* In this paper, we propose a colored multigraph model for the temporarily available wavelengths. Based on this colored multigraph model, a polynomial time algorithm with complexity $O(N^2)$ is also proposed to develop an integrated dynamic routing and wavelength assignment, where N is the number of nodes in a WDM network.

WL76
A New Method for Solving Routing and Wavelength Assignment Problems under Inaccurate Routing Information in Optical Networks with Conversion Capability, *Yanting Luo, Yongjun Zhang, Wanyi Gu; Beijing Univ. of Posts and Telecommunications, China.* In large dynamic networks it is extremely difficult to maintain accurate routing information on all network nodes. We introduce a novel algorithm which can decrease the impact of the problem greatly. Simulations show that it improves the blocking performance significantly in optical networks with conversion capability.

WL77
An Improved Multicast Routing Algorithm in Sparse Splitting Optical Networks, *Jianping Wang, Xiaosong Yu, Junling Yuan, Zhijun Wu; Dept. of Communication Engineering, School of Information Engineering, Univ. of Science and Technology Beijing, China*. The construction of multicast light-trees in WDM network with sparse splitting has been proved to be an NP-complete problem. To reduce the diameter of the tree and average delay, an improved algorithm called Nearest Connector First Heuristic (NCFH) is proposed. The simulation results show that the proposed algorithm performs well.

Exhibition Floor

WL78
A RSVP-TE Reservation Protocol Based on Priority in Multi-Domain Optical Network, *Jianping Wang, Kai Yang; Dept. of Communication Engineering, School of Information Engineering, Univ. of Science and Technology Beijing, China.* Since forward reservation protocol (FRP) and backward reservation protocol (BRP) both have apparent drawbacks when they are used in multi-domain optical network. So we propose a reservation protocol based on priority in multi-domain optical network with wavelength conversion, which achieves the trade-off between blocking probability and connection setup time.

WL79
A Novel Fair Active Queue Management Algorithm Based on Traffic Delay Jitter, *Xue-Shun Wang[1], Shao-Hua Yu[2], Jin-You Dai[1,2], Ting Luo[1,2]; [1]College of Computer Science and Technology, Huazhong Univ. of Science and Technology, China, [2]Wuhan Res. Inst. of Posts and Telecommunications, China.* Congestion control is an important strategy to switches and routers, this paper proposes a novel congestion control algorithm based on active queue management, which control the buffer queue size by delay jitter. Simulation results show that the proposed algorithm outperforms these popular algorithms in quality of service and fairness.

WL80
A Novel Highly Reliable WDM-PON System, *Xinzhu Wang, Suyi Wang, Ao Zhang, Jianli Wang; Wuhan Res. Inst. of Posts and Telecommunications, China.* We proposed and experimentally investigated a highly reliable WDM-PON system. In the system, the software manages and controls the link's switching, the system management module can detect the feeder fiber's failure through sending polling frame, and judges whether it is necessary to send trigger signals to the OSW.

WL81
PCE-Based Service Level Agreement Constraint Routing Strategy in Multi-Domain Optical Network, *Ying Chen, Dahai Han, Jie Zhang, Xiuzhong Chen, Wanyi Gu; Key Lab of Information Photonics and Optical Communications, Beijing Univ. of Posts and Telecommunications, China.* We developed a framework for constraint routing in multi-domain optical network which combines PCE with service plane. With the distributed routing computation characteristic of PCE and the adaptability of service plane for service attributes, the framework provides an optimal SLA-based constraint routing strategy. Experiment results verify our framework and strategy.

WL82
Performance Evaluation of the Ant-Based Dynamic RWA on WDM Optical Network, *Kharina Khairi[1], Rajendran Parthiban[2], Aijiwati Tjiam[2], K. C. Lee[2], Romli Mohamad[1]; [1]TM Res. and Development, Malaysia, [2]School of Engineering, Monash Univ., Sunway Campus, Malaysia.* This paper presents a dynamic Routing and Wavelength Assignment (RWA) for a Dense Wavelength Division Multiplexed (DWDM) network under the wavelength continuity constraint using ant colony optimization (ACO). Simulations are run to compare the performance of ACO-based dynamic RWA (ADR) with the common static RWA on a mesh network.

WL83
An Adaptive Routing Algorithm for Flooding Performance Improving in GMPLS Based WDM Networks, *Jia Ren, Jie Zhang, Lei Wang, Guanjun Gao, Dahai Han, Wanyi Gu, Yuefeng Ji; Key Lab of Information Photonics and Optical Communications, Ministry of Education, Beijing Univ. of Posts and Telecommunications, China.* In this paper, we propose a novel routing algorithm, Rank Total wavelengths and Available wavelengths (RTAW), which dramatically reduces the flooding frequency while guaranteeing a low blocking rate. Compared with other algorithms, simulations are conducted to prove the benefits of this algorithm.

WL84
Temperature-Insensitive FBG Tilt Sensor with a Large Measurement Range, *Hualong Bao[1], Xinyong Dong[1], Huaping Gong[1], C. C. Chan[2], P. Shum[2]; [1]Inst. of Optoelectronic Technology, China Jiliang Univ., China, [2]Network Technology Res. Ctr., Nanyang Technological Univ., Singapore.* A novel two-dimensional tilt sensor is demonstrated by using four fiber Bragg gratings (FBGs) interacting with a cylindrical cantilever-based pendulum. Preliminary results show that tilt accuracy of 0.4° and resolution of 0.013° can be easily achieved in a large measurement range from -40° to 40°, with no temperature dependence.

WL85
Improved Model and Dynamic Mechanism of a Semiconductor Fiber Ring Laser for Distributed Sensing, *Chao Shan, Nian Fang, Lutang Wang, Zhaoming Huang; Shanghai Univ., China.* The dynamic model of semiconductor fiber ring laser (SFRL) is improved by employing the distributed birefringence model of the fiber. The framing structure characteristic of chaos waveform and the similarity of adjacent frames are observed with this improved model. The dynamic mechanism of the SFRL for distributed sensing is presented.

WL86
Coherent OTDR Used for Fibre Faults Detection, *Zhiyong Feng, Shaofeng Qiu, Yijia Wei, Liangchuan Li, Gordon Ning Liu, Qianjin Xiong; Huawei Technology Co. Ltd., China.* We have demonstrated a coherent OTDR based on log-detector. The effect of laser linewidth and electrical filter bandwidth on coherent OTDR performance is theoretically analyzed and experimentally investigated.

WL87
Frequency Swept Laser with a Rotating Slit Disk for Fiber Bragg Grating Sensor Interrogation, *Mansik Jeon, Unsang Jung, Namhyun Cho, Jeehyun Kim; Kyungpook Natl. Univ., Republic of Korea.* We demonstrate a frequency swept laser using a simple wavelength selection filter for fiber bragg grating sensor. The proposed laser consisting of a semiconductor optical amplifier based ring laser with a wavelength selection filter. Wavelength selection filter includes a diffraction grating, a reflective mirror, and a simple rotating slit.

WL88
Imaging of Matrix-Disorder in Normal and Pathological Human Dermis Using Nonlinear Optical Microscopy, *Shuangmu Zhuo, Jianxin Chen, Shusen Xie, Xingshan Jiang, Liqin Zheng; Inst. of Laser and Optoelectronics Technology, Fujian Normal Univ., China.* In dermis, collagen and elastin are important structural proteins of extracellular maxtrix. The matrix-disorder is associated with various physiologic processes, such as localized scleroderma, anetoderma, photoaging. In this work, we demonstrate the capability of nonlinear optical microscopy in imaging structural proteins in normal and pathological human dermis.

WL89
A Novel Interferometric Sensor for Measuring the Refractive Index of a Solution Based on Nanofiber, *Pinghui Wu, Chenghua Sui, Gaoyao Wei, Danyang Xu; School of Science, Zhejiang Univ. of Technology, China.* A novel refractometric sensor based on nanofiber is presented. It is used to measure the refractive indices of glucose solutions of different concentrations. The sensor has a high sensitivity and can detect an index variation of $\sim 10^{-6}$ as the excellent properties of nanofiber, which may be applied in various fields.

WL90
A Comparison of Au and Ag Metalized Layer in Microstructured Optical Fibers for Surface Plasmon Resonance Excitation, *Long Zheng, Xia Zhang, Xiaomin Ren, Yamiao Wang, Xiaolong Liu, Yongqing Huang; Key Lab of Information Photonics and Optical Communications, Ministry of Education, Inst. of Optical Communications and Optoelectronics, Beijing Univ. of Posts and Telecommunications, China.* Plasmons on the surface of large metalized holes containing analyte are excited by the fundamental mode of a microstructured fiber. Phase matching between Plasmon and core modes is facilitated by the perforation of fiber core. A comparison of Au and Ag metalized layer is illustrated.

Exhibition Floor

WL91
Reconstructing Fluorescent Parameters Using Time-Resolved Data Based on Reflection and Transmittance Measurements, *Limin Zhang, Jiao Li, Feng Gao, Huijuan Zhao; Tianjin Univ., China.* We present a method based on Laplace transform and normalized Born ratio to reconstruct fluorescence yield and lifetime for time-domain fluorescence diffuse optical tomography. The methodology is experimentally validated in reflection and transmittance measurements by use of time-correlation single photon counting system.

WL92
Quantitative Analysis for the Fluorescence Detection of Actinic Keratosis Using the Hyperspectral Imaging Camera, *Yong-Jin Cho[1], Kyung Hwan Kim[1], Chi Hyun Kim[1], Chang-Hwan Im[1], Eung-Ho Choi[2], Byungjo Jung[1]; [1]Dept. of Biomedical Engineering, Yonsei Univ., Republic of Korea, [2]Dept. of Dermatology, Yonsei Univ., Republic of Korea.* In this study, we present results to demarcate the AK lesions from the normal tissue based on the spectrum analysis using the hyperspectral imaging (HSI) camera. We also confirmed photosensitizer is more accumulated preferentially in AK lesions in comparison with the surrounding healthy tissue.

WL93
Double-Sided Polishing Long Period Fiber Grating Sensors for Measuring Liquid Refractive Index, *Chuen-Lin Tien[1], Tsai-Wei Lin[2], Hung-Yi Hsu[1], Wen-Feng Liu[1]; [1]Feng Chia Univ., Taiwan, [2]Chung Hua Univ., Taiwan.* A new liquid refractive index sensor using double-sided polishing long-period fiber grating is presented. The influence of residual cladding thickness on the sensitivity of measuring liquid refractive index is investigated. Experimental results show that well-controlled polishing parameters can significantly increase the sensitivity. The sensitivity of 143.396 nm/RIU can be obtained.

WL94
Frequency Domain NIR System for Diagnosis of Early Cancer, *Huijuan Zhao, Julan Liang, Jierong Ma, Zhongwei Yang; College of Precision Instrument and Optic Electronic Engineering, Tianjin Univ., China.* To facilitate the diagnosis of early cervical cancer, a frequency domain near infrared (NIR) optical measurement system was presented in this paper. A detailed primary measurement as well as the corresponding accuracy calculation is carried out to justify the reliability of the established instrument.

WL95
Study on Optical Frequency Domain Reflectometry Based on Tunable Semiconductor Laser, *Guoyu Li, Tongqing Liu, Liwei Zhang, Bai-ou Guan; School of Physics and Optoelectronic Engineering, Dalian Univ. of Technology, China.* The relation of beat frequency, sweep rate, optical frequency modulation excursion and length of fiber under test (FUT) based on tunable semiconductor laser is studied. Experimental results show that the frequency of beat signal will increase when the length of the FUT, optical frequency modulation excursion or sweep rate increases.

WL96
Walking Intrusion Signal Recognition Method for Fiber Fence System, *Nian Fang, Lutang Wang, Dongjian Jia, Chao Shan, Zhaoming Huang; Shanghai Univ., China.* A recognition method based on the gait characteristic for walking intrusion signal is presented. The vibration signal caused by a walker is intermittent and periodical. This signal characteristic can distinguish a human intrusion from an animal and other random disturbance. The experimental results verified the effectiveness of the proposed method.

WL97
Acceleration Detecting Using MOEMS Ultrahigh Q Microcavities, *Yingzhan Yan, Zhe Ji, Baohua Wang, Guoqing Jiang, Shubin Yan, Jijun Xiong; North Univ. of China, China.* A novel acceleration detecting method using high-Q microcavities is presented. Induced displacement due to the minute acceleration is monitored through resonant frequency shift of the microtoroid cavity coupled to a fixed coupling waveguide. Placing a piezoresistance on the root of cavity chip cantilever, a multi-ranged micro accelerometer can be designed.

WL98
Study on the Displacement Sensor Based on FBG, *Jun He, Huijuan Dong, Guangyu Zhang; Harbin Inst. of Technology, China.* A new kind of FBG displacement sensor which can be temperature self-compensation is developed. Experiments were carried out to validate the characters of the sensor which has good linearity and repetition. The displacement resolution is 0.01mm, and the correlation coefficient is within touch 0.9999.

WL99
Ambipolar Organic Phototransistor Based on F_{16}CuPc/α6T pn Heterojunction, *Rongbin Ye[1], Mamoru Baba[1], Koji Ohta[1], Takanori Suzuki[2], Kunio Mori[1]; [1]Iwate Univ., Japan, [2]Iwate Industrial Res. Inst., Japan.* We reported on ambipolar organic phototransistor based on F_{16}CuPc/α6T pn heterojunction. The drain current is significantly increased (n-channel) or decreased (p-channel) by a visible light is used as an additional control parameter, making the device interesting for sensor applications.

WL100
The Characteristics of Grating Structure in Magnetic Field Measurements Based on Polarization Properties of Fiber Gratings, *Yang Su, Hui Peng, Kui Feng, Yuquan Li; Inst. of Communications Engineering, PLA Univ. of Science and Technology, China.* The influence of grating structure on magnetic field measurements based on differential group delay of fiber gratings is presented. Theoretical simulations are realized using the coupled mode theory. The experiments show good agreement with simulations. The compares show that the non-uniform Bragg gratings can improve the sensitivity of sensor system.

WL101
Discrimination of Normal Myometrial Tissues, Hysteromyoma and Endometrial Carcinoma with HATR-FTIR Spectroscopy, *Jia Liu[1], Miao-Zhen Cai[1], Hong Wang[1], Cungui Cheng[1], Wen-Ying Jin[2]; [1]Zhejiang Normal Univ., China, [2]Dept. of Computer Science and Engineering, Yiwu Industrial and Commercial College, China.* Normal myometrial tissues, hysteromyoma and endometrial carcinoma were determined by HATR-FTIR directly. The results showed that there are obvious and regularity differences of them such as frequency, intensity and shape of the bands. Through the criticisms of goodness-of-fit tests, the probability is less than 0.01 and the result is significant.

WL102
The Model and Its Solution's Uniqueness of a Portable 3-D Vision Coordinate Measuring System, *Fengshan Huang[1,2], Huifen Qian[1]; [1]Hebei Univ. of Science and Technology, China, [2]State Key Lab of Precision Measuring Technology and Instrument, Tianjin Univ., China.* A portable 3-D vision coordinate measuring system using a light-pen is proposed. The system's mathematical model, which is a particular case of Perspective of Three-Points-Problem (P3P), is established. Then, it is verified that the system's model has a unique solution. Finally, the effectiveness of the model is confirmed by experiments.

WL103
Optical Fiber Extrinsic Fabry-Perot Interferometer Sensors for Ultrasound Detection, *Qingguo Sun, Na Chen, Yuetong Ding, Zhenyi Chen, Tingyun Wang; Shanghai Univ., China.* A new method is proposed to fabricate an optical fiber extrinsic Fabry-Perot interferometer (EFPI) as an ultrasonic sensor. An acoustic emission detecting system was constructed and ultrasound detection experiments were done from both traditional Piezoelectric transducer (PZT) and high voltage discharge. Strong ultrasound signals were detected in both cases.

WL104
A Novel FBG Sensing Head Geometry for Strain-Temperature Discrimination, *Wenjun Zhou, Chunliu Zhao, Jie Huang, Xinyong Dong; China Jiliang Univ., China.* A novel FBG sensing head geometry with partially corroded by hydrofluoric acid has been demonstrated. Simultaneous measurement of temperature and strain has been obtained.

WL105
Polarization Effects in the Sagnac Distributed Disturbance Fiber-Optic Sensor, *Peilin Tao, Fengping Yan, Wenhua Ren, Weiwei Jiang, Zhong Wei Tan, Shuisheng Jian; Inst. of Lightwave Technology, Beijing Jiaotong Univ., China.* An analysis, based on mode coupled equation, is presented of polarization effects in the Sagnac interferometer sensor for distributed detection. The Sagnac distributed disturbance location sensor with polarization controller is established. With a modified demodulation method, experiment results show the system's sensitivity can be improved effectively.

Exhibition Floor

WL106
Cantilever-Based FBG Sensor for Temperature-Independent Acceleration Measurement, *Wenjun Zhou, Xinyong Dong, Yongxing Jin, Chunliu Zhao; China Jiliang Univ., China.* The FBG is glued in a slanted direction onto the lateral surface of a right-angled triangle cantilever beam with a mass. Vertical acceleration applied to the beam leads to a uniform bending along the beam length. The FBG is chirped and its reflection bandwidth changes linearly with the acceleration.

WL107
Measurement of the Inner Scale of Laboratory-Simulated Atmospheric Turbulence, *Xiwen Qiang[1,2], Fei Zong[2], Jianping Song[1], Junwei Zhao[2], Yan Li[2], Jingru Liu[2]; [1]Xi'an Jiaotong Univ., China, [2]Northwest Inst. of Nuclear Technology, China.* The inner scale of atmospheric turbulence could results in irradiance scintillation on optical waves. A experiment system was built for simulating turbulence and measuring inner scale by optical method based on irradiance fluctuations. The inner scale were about 3cm and the uncertainty of measurement was less than 5%.

WL108
Low Refractive Index Contrast Double Slot Structure Based Cantilever Type Sensor, *Muddassir Iqbal[1], Zheng Zheng[2], Jiansheng Liu[2]; [1]Natl. Univ. of Science and Technology, Pakistan, [2]Beihang Univ., China.* Power inside low index slot region for a double slot structure, central high index slab acting as cantilever is computed. Novel optomechanical sensor is proposed based on variation in power confined inside low index slot due to the movement of central high index slab under the action of external force.

WL109
Glasses-Free 3-D Display System Using Grating Film for Stereo Image Superimpose, *Takashi Ohara, Kunio Sakamoto; Konan Univ., Japan.* We developed a glasses-free 3-D stereoscopic display using an LCD display panel, a view control film and a grating film for stereoscopic viewing. The observer can watch overlapped stereoscopic images for left and right eyes without special glasses such as polarized glasses.

WL110
Monocular Display Unit for 3-D Display with Correct Depth Perception, *Takashi Hosomi, Kunio Sakamoto; Konan Univ., Japan.* The human vision system has visual functions for viewing 3-D images with a correct depth. These functions are called accommodation, vergence and binocular stereopsis. Most 3-D display system utilizes binocular stereopsis. The authors have developed a monocular 3-D vision system with accommodation mechanism, which is useful function for perceiving depth.

WL111
White-Light-Emitting Diodes Based on Ba^{2+} Co-Doped Sr_3SiO_5: Ce^{3+}, Li^+ Phosphor, *Changyu Shen, Yi Yang; Inst. of Optoelectronic Technology, China Jiliang Univ., China.* Sr_3SiO_5: Ce^{3+}, Li^+ phosphors were prepared by solid-state reaction. By co-doping Ba^{2+} into them, the emission band of the phosphors showed a red shifts with a broad emission band peaking at 590nm. The InGaN-based 0.35Ba^{2+} co-doped Sr_3SiO_5: 0.018Ce^{3+}, 0.018Li^+ LED presented white emitting and color rendering index of 88.

WL112
A Trichromatic Phosphor-Free White Light-Emitting Diode by Using Adhesive Bonding Scheme, *D. X. Chuai, X. Guo, B. L. Guan, J. L. Zhang, G. D. Shen; Beijing Optoelectronic Technology Lab, Beijing Univ. of Technology, China.* A trichromatic phosphor-free white light-emitting diode has been implemented by using adhesive bonding scheme. As 25mA and 60mA was injected into the red and blue-green LED chips at room temperature respectively, white light emission could be observed with CIE chromaticity coordinates (0.3330,0.3241), correlated color temperature Tc=5467K and optical power Φ_e=2.223mW.

WL113
Directional Light Scanning 3-D Display, *Yoji Aoki[1], Hideyoshi Horimai[2], Pang Boey Lim[1], Mitsuteru Inoue[1]; [1]Toyohashi Univ. of Technology, Japan, [2]HolyMine Corp., Japan.* This paper presents a new type of three-dimensional (3-D) display method, namely directional light scanning 3-D display. By using holographic screen as a beam scanner, this method provides us high-resolution 3-D images with a spatial light modulator.

18.00–19.00 Cocktail Hour, *Shanghai Lu Bo Lang Restaurant*

19.00–22.00 Banquet, *Shanghai Lu Bo Lang Restaurant*

Guang Da 7	Guang Da 9	Guang Da 11	Guang Da 12

8.00–17.00 Registration Open, *Everbright Center Lobby*

8.30–10.00
ThA • Photonic Crystal Fibers I
Heike Ebendorff-Heidepriem; Univ. of Adelaide, Australia, Presider

ThA1 • 8.30 Invited

Advances in Solid-Core Photonic Bandgap Fibre Devices and Sensors, *Boris T. Kuhlmey; Univ. of Sydney, Australia.* We review advances in devices and sensors based on fluid-filled solid-core photonic bandgap fibers. We present the mechanisms and models of light guidance in these fibers, and discuss applications such as fibre-based microfluidic refractive index sensing based on long period gratings or selectively filled, coated and uncoated photonic crystal fibers.

ThA2 • 9.00

Transverse Multimode Evolution in Micro/Nanofiber Tapers, *Jian Fu, Yingying Xu, Shaofang Tang, Hongtao Dong, Limin Tong; Zhejiang Univ., China.* The mode conversions of micro/nanofiber (MNF) tapers are numerically simulated by using 3-Dimension Finite-Difference Beam Propagation Method (FD-BPM). We consider the behaviors of adiabatic MNF tapers and discussed that the non-adiabatic MNF taper behaves more complex multimode interference and beat effects in the transition and waist sections.

8.30–10.00
ThB • Silicon Photonics
Zhiping Zhou; Peking Univ., China, Presider

ThB1 • 8.30 Invited

Single Wavelength Silicon Evanescent Lasers, *Alexander W. Fang[1], Brian R. Koch[2], Richard Jones[2], Erica Lively[1], Di Liang[1], John E. Bowers[1]; [1]Electrical and Computer Engineering Dept., Univ. of California at Santa Barbara, USA, [2]Intel Corp., USA.* We review here recent work in the area of single wavelength silicon evanescent lasers that utilize distributed feedback, distributed Bragg reflector, and sampled grating distributed Bragg reflector laser topographies.

ThB2 • 9.00

Low-Power Electro-Optical Switch Based on a III-V Microdisk Cavity on a Silicon-on-Insulator Circuit, *Liu Liu[1], Günther Roelkens[1], Thijs Spuesens[1], Richard Soref[2], Philippe Regreny[3], Dries Van Thourhout[1], Roel Baets[1]; [1]Photoics Res. Group, Ghent Univ.-IMEC, Belgium, [2]AFRL, USA, [3]Univ. de Lyon, France.* We introduce a compact, low-power electro-optical switch on a silicon-on-insulator circuit through heterogeneous integration. A 10μm diameter III-V microdisk cavity is employed as the switching element. Switching of a 10Gbps optical signal is demonstrated by sweeping the bias between -1.1V and +0.9V with 15dB extinction ratio and 1.2ns switching speed.

8.30–10.00
ThC • 100 and 40 Gb/s Transmission Systems I
Sander L. Jansen; Nokia Siemens Networks GmbH & Co. KG, Germany, Presider

ThC1 • 8.30 Invited

Challenges of High-Capacity Undersea Long-Haul Systems, *Alexei Pilipetskii; Tyco Telecommunications, USA.* The deployment of 10 Gb/s RZ-DBPSK transponders has led to high capacity transoceanic systems with large repeater spacing. To satisfy future capacity demands more complex undersea network topologies will be required for high spectral efficiency systems that operate at 40 G and 100 G rates.

ThC2 • 9.00 Invited

Ultra-High-Capacity Optical Transmissions, *Dayou Qian, Jianjun Yu, Ting Wang; NEC Labs America, Inc., USA.* Employing PDM-RZ-8QAM modulation, digital coherent detection and EDFA-only amplification, we demonstrated 25GHz-spaced, 320×114Gb/s DWDM transmission through seven spans of ultra-low-loss fiber with a record capacity of 32Tb/s.

8.30–10.00
ThD • Applications of Optical Systems in Networks I
Ken-ichi Kitayama; Osaka Univ., Japan, Presider

ThD1 • 8.30 Invited

Recent Progress on Planar Lightwave Circuit Technology for Optical Communication, *Hiroshi Takahashi; NTT Photonics Labs, NTT Corp., Japan.* Silica waveguide planar lightwave circuit (PLC) technology is very useful for fabricating compact and high performance optical devices for optical communication. Wavelength multiplexers and optical switches for ROADM and OXC are still being developed to improve performance further. New devices for an advanced modulation format can also be fabricated with PLC technology.

ThD2 • 9.00 Invited

Monolithically-Integrated SOA Gate Switch and Its Application to High-Speed Switching Systems, *Susumu Kinoshita[1,2]; [1]Fujitsu Labs Ltd., Japan, [2]Fujitsu Ltd., Japan.* We developed an 8-input and 1-output (8:1) monolithically-integrated SOA module for high-speed and large-scale switching systems. An 8×8 gate switch subsystem consisting of eight 8:1 SOA modules (72-SOAs) achieved a high-speed switching and lossless operation.

Guang Yun 7	Guang Yun 8	Guang Da 16	Guang Da 18

8.00–17.00 Registration Open, *Everbright Center Lobby*

8.30–10.00
ThE • Optical Waveguide Devices I
Wolfgang Sohler; Univ. of Paderborn, Germany, Presider

ThE1 • 8.30 Invited

Signal Processing in Silicon Waveguides, *Yikai Su[1], Tao Wang[1], Fangfei Liu[1], Qiang Li[2], Qingjiang Chang[1], Liang Zhang[1], Xiaohui Li[1], Ziyang Zhang[2], Min Qiu[2]; [1]Shanghai Jiao Tong Univ., China, [2]Dept. of Microelectronics and Applied Physics, Royal Inst. of Technology (KTH), Sweden.* We experimentally demonstrate optical signal processing in silicon ring resonators, including slow and fast light in silicon rings, optical delay of digital and microwave photonic signals, dense wavelength conversions/multicasting, optical up-conversion, format conversions, temporal differentiation, and bio-sensing.

ThE2 • 9.00

Design of Suspended SU-8 Optical Waveguides for Ultrasmall Bendings, *Bo Yang, Zhen Sheng, Daoxin Dai; Zhejiang Univ., China.* The design of small suspended SU-8 optical waveguides is presented. A very small bending radius (~5μm) can be achieved because of the high-index contrast. A crossing structure is designed and optimized with low loss (<0.1dB) as the arms to support the suspended waveguides.

8.30–10.00
ThF • OFDM I
William Shieh; Univ. of Melbourne, Australia, Presider

ThF1 • 8.30 Invited

Fiber Nonlinear Impairments and Their Mitigation in Coherent Optical OFDM Transmission, *Xiang Liu; Bell Labs, Alcatel-Lucent, USA.* We discuss the impact of fiber nonlinearity on the transmission performance of coherent optical orthogonal frequency-division multiplexing (CO-OFDM) in both single-channel and wavelength-division multiplexed (WDM) transmission systems. Recently developed techniques to mitigate nonlinear impairments in CO-OFDM transmission are reviewed.

ThF2 • 9.00

Effect of Coherent Crosstalk on Optical OFDM Transmission, *Abdullah Al Amin, Hidenori Takahashi, Itsuro Morita, Hideaki Tanaka; KDDI R&D Labs, Inc., Japan.* We investigate the effect of reflection-generated coherent crosstalk on the performance of optical OFDM transmission. From simulation, allowable total crosstalk at a given OSNR was found to be independent of the number of subcarriers. Experimental comparison is provided, showing a similar crosstalk-generated variance for optical OFDM and NRZ-OOK format.

8.30–10.00
ThG • Fabrication Technologies
Buwen Cheng; Inst. of Semiconductors, CAS, China, Presider

ThG1 • 8.30

A Study on the $Cl_2/C_2H_4/Ar$ Plasma Etching of ITO Using Inductively Coupled Plasma, *Rong Fang, Xia Guo, Wen Jing Jiang, Yu Han Guo, Yuan Qin, Guang Di Shen, Jin Ru Han; Beijing Optoelectronic Technology Lab, Beijing Univ. of Technology, China.* In this study, the indium tin oxide (ITO) was etched by an inductively coupled plasma (ICP) etcher using $Cl_2/C_2H_4/Ar$ as the etching gases. A detailed study on the samples etched in different parameters was performed.

ThG2 • 8.45

Production of Chirped Volume Grating by a Plane and a Cylindrical Wave, *Hualiang Zhang, Yi Ruan, Guangwei Zheng, Jichun Tan; College of Science, Natl. Univ. of Defense Technology, China.* This paper studies the method of making chirped volume grating by a plane and a cylindrical wave in laboratory. The results show that refractive index and chirped quotiety of grating made can be at different position. And the diffraction characteristic of chirped volume grating is presented.

ThG3 • 9.00

SiO_2-TiO_2 Nano Composite Film by Flame Hydrolysis Deposition, *Jaspal P. Bange[1], L. S. Patil[2], D. K. Gautam[2]; [1]Dept. of Electrical and Electronics Engineering, Gunma Univ., Japan, [2]Dept. of Electronics, North Maharashtra Univ., India.* SiO_2-TiO_2 nano composite films were synthesized by indigenously developed Flame Hydrolysis Deposition system. SEM study reveal the surface morphology of films. XRD spectrum shows two strong peaks correponding to the (004) anatase phase and (210) rutile phase of TiO_2. The broad peak between $2\theta = 20°$-$30°$ corresponds to SiO_2.

8.30–10.00
ThH • Novel Fiber-optic Sensors II
Tingyun Wang; Shanghai Univ., China, Presider

ThH1 • 8.30

Demonstration of Fiber-Optic Distributed Monitoring System Using Birefringent Optical Circuit Synthesis, *Lutang Wang, Chao Zhang, Nian Fang, Zhaoming Huang; Shanghai Univ., China.* A novel fiber-optic distribution monitoring system using birefringent optical circuit synthesis for monitoring the external perturbations on the fiber is demonstrated. The detection is based on the measurements of frequency-dependent Stokes parameters and the estimation of the variations of mode coupling angle distributed along the sensing fiber.

ThH2 • 8.45

Refractive Index Sensing Characteristics of Alternate Au-Ag Surface Gratings on Optical Waveguides, *Saurabh M. Tripathi[1], Arun Kumar[1], Emmanuel Marin[2], Jean-Pierre Meunier[2]; [1]Indian Inst. of Technology Delhi, India, [2]Lab Hubert Curien, Univ. de Lyon, France.* We present a theoretical study of the ambient refractive index sensing characteristics of Au-Ag surface gratings written on a planar waveguide. Exact coupled-mode-theory has been used to consider the power coupling from guided mode to Surface-Plasmon-Polariton. A very high sensitivity ~1360 nm/RIU has been observed at metal thickness ~14 nm.

ThH3 • 9.00

High Performance Distributed Feedback Fiber Laser Sensor Array System, *Jun He, Fang Li, Tuanwei Xu, Yan Wang, Yuliang Liu; Optoelectronic System Lab, Inst. of Semiconductors, Chinese Acad. of Sciences, China.* This paper presents a high performance distributed feedback fiber laser sensor array system. The system adopts PGC-based interferometric wavelength shift demodulation technique and wavelength division multiplexing technique. A strain resolution of 305 fε/√Hz (@ 1 kHz) and the multiplexing of eight channels have been achieved.

Guang Da 7

ThA3 • 9.15
Enhancement of Atom-Guiding Efficiency in Hollow Optical Fibers, *Kyu-Tae Lee, Chang-Min Kim; Univ. of Seoul, Republic of Korea.* We carried out analyses of HOFs using the FEM. Simulation results showed that repulsive forces on atoms at the interface of hollow/core in graded-index HOF was almost three times as strong as that in step-index HOF, and acknowledged the possibility of more effective atom guiding in GRIN HOF.

ThA4 • 9.30
Ultra-Wideband Single-Polarization Single-Mode Photonic Crystal Fiber with High Nonlinearity and Low Dispersion, *Lin An[1], Zheng Zheng[1], Zheng Li[1], Yang Liu[1], Tao Zhou[2], Jiangtao Cheng[3]; [1]Beihang Univ., China, [2]New Jersey Inst. of Technology, USA, [3]Pennsylvania State Univ., USA.* An ultra-wideband single-mode single-polarization photonic crystal fiber design is proposed. Simulations indicate it has a 1540 nm SMSP range with the confinement loss being < 0.25 dB/km and an effective area of 2.2 μm^2. Meanwhile, the flat, near-zero group velocity dispersion can also be achieved at ~800 nm.

ThA5 • 9.45
A Novel Proposal for DWDM Demultiplexer Design Using Resonance Cavity in Photonic Crystal Structure, *Ali Rostami[1], H. Habibiyan[2], F. Nazari[1], A. Bahrami[1], H. Alipour Banaei[1]; [1]Univ. of Tabriz, Iran, [2]Amirkabir Univ. of Technology, Iran.* We propose an ultra compact structure for DWDM systems using resonance cavity in Photonic Crystal structure. This is for the first time that a PC-based demultiplexer has been achieved with 0.8nm channel spacing, -18.77dB and 4170 average crosstalk and quality factor, respectively without using particular materials or complexities in fabrication.

Guang Da 9

ThB3 • 9.15
A Compact Electrically-Pumped Hybrid Silicon Microring Laser, *Di Liang[1], Tadashi Okumura[1], Hsu-Hao Chang[1], Daryl Spencer[1], Ying-Hao Kuo[1], Alexander Fang[1], Daoxin Dai[1], Marco Fiorentino[2], Raymond Beausoleil[2], John Bowers[1]; [1]Univ. of California at Santa Barbara, USA, [2]Hewlett Packard Labs, USA.* We demonstrate an electrically-pumped hybrid silicon evanescent microring laser fabricated by a self-aligned process. Low-threshold operation as small as 8.37 mA in continuous-wave (cw) mode is observed due to its compact structure (D=50 μm) and small electrical and optical losses.

ThB4 • 9.30
Photoluminescence with Ultra-Wide Spectrum from Radiative Defects in Si-Rich SiN_x, *Weiwei Ke[1], Xue Feng[1], Xuan Tang[1], Yoshinori Tanaka[2], Dai Ohnishi[2], Yidong Huang[1]; [1]State Key Lab of Integrated Optoelectronics, Dept. of Electronic Engineering, Tsinghua Univ., China, [2]Photonics R&D Ctr.. ROHM CO., Ltd., Japan.* The photoluminescence from the radiative recombination defects in Si-rich SiN_x with various Si concentrations was investigated. Due to the Si and N dangling bonds, ultra-wide spectra with full width at half maximum of ~250nm were achieved in visible region.

ThB5 • 9.45
Enhancement and Stabilization of Photoluminescence of Porous Silicon by LaF_3 Passivation, *Sinthia Shabnam Mou[1], Md. Abdur Rahman[2], Abu Bakar M. Ismail[2]; [1]Independent Univ., Bangladesh, [2]Rajshahi Univ., Bangladesh.* E-beam evaporated LaF_3 passivation of porous silicon (PS) has been investigated in this report. Heat treatment of the LaF_3-passivated PS structure improves the PL characteristics. Passivation with thinner layer of LaF_3 leaded to a good enhancement of photoluminescence intensity while thicker layer showed stabilization of photoluminescence.

Guang Da 11

ThC3 • 9.30
40 Gbit/s, 16-QAM, Transmission Utilizing Electronic Sub-Carrier Technique and Direct Detection Reception, *Bengt-Erik Olsson, Anna Kristiansson, Arne Alping; Ericsson AB, Sweden.* Electronically generated 16-QAM at 40 Gbit/s was transmitted by means of sub-carrier modulation (SCM) using intensity modulation and direct detection. Transmission over 80 km standard single-mode fiber and electronic dispersion compensation was demonstrated.

ThC4 • 9.45
On the Channel Capacity of Multilevel Modulation Schemes with Coherent Detection, *Ivan B. Djordjevic[1], Lei Xu[2], Ting Wang[2]; [1]Univ. of Arizona, USA, [2]NEC Labs, USA.* We describe a method to determine the channel capacity of an arbitrary multilevel modulation scheme by modeling the fiber-optic channel as a dynamical *nonlinear* intersymbol interference (ISI) channel with *memory*. We also propose a multilevel low-density parity-check (LDPC)-coded turbo-equalization scheme that is able closely to approach the channel capacity.

Guang Da 12

ThD3 • 9.30
Deflection Routing in Multi-Channel Photonic Network on Chip Architecture, *Jianxiong Tang, Yaohui Jin, Zhijuan Chang; State Key Lab of Advanced Optical Communication System and Network, Shanghai Jiao Tong Univ., China.* This paper presents a multi-channel photonic network on chip architecture employing deflection routing. Simulation result shows this network architecture has 60% latency decrease compared to generic photonic network on chip.

ThD4 • 9.45
A Performance Evaluation for Optical Network-on-Chip Interconnect Architectures, *Shiqing Wang, Huaxi Gu; State Key Lab of ISN, Xidian Univ., China.* Based on silicon optical interconnect, optical networks-on-chip has significant bandwidth and power advantages. We simulated and compared several ONoCs based on the topologies including 2-D-mesh, 3-D-mesh, 2-D-FT (Fat-tree) and 2-D-BFT (Butterfly Fat-tree) in terms of the end-to-end delay and network throughput. The results show that 3-D-mesh has the best performance.

9.00–17.00 Exhibit Open, *Everbright East Exhibition Hall*

10.00–10.30 Tea Break, *Everbright East Exhibition Hall*

10.30–12.00 ThI • INDUSTRY FORUM: Photonics for Green Energy–Photovoltaics, *Guang Yun 1*

Guang Yun 7

ThE3 • 9.15
Polarization-Insensitive Electro-Optical Modulator Based on Polymer-Filled Silicon Cross-Slot Waveguide, *Wanjun Wang, Haifeng Zhou, Jianyi Yang, Minghua Wang, Xiaoqing Jiang; Dept. of Information Science and Electronics Engineering, Zhejiang Univ., China.* A cross-slot waveguide filled with electro-optic polymer is proposed to release the polarization-dependent issue of the electro-optic modulator. This waveguide can confine both the TE and TM modes. The silicon regions can be doped as the electrodes. With optimal voltages, the Mach-Zehnder modulator based on such waveguide can achieve polarization-insensitive.

ThE4 • 9.30
Analysis and Design of Box-Like Filters Based on 3×2 Microring Resonator Arrays, *Xiaobei Zhang[1], Xinliang Zhang[2], Dexiu Huang[2]; [1]School of Communication and Information Engineering, Shanghai Univ., China, [2]Wuhan Natl. Lab for Optoelectronics, Huazhong Univ. of Science and Technology, China.* This paper theoretically investigates spectral characteristics of 3×2 microring resonator arrays, and then performs the design of box-like filters based on them with the FWHM adjustable in some range.

ThE5 • 9.45
Integrated Optical Microwave Channeliser, *Michael W. Austin; RMIT Univ., Australia.* An integrated optical chip based on an array of silica waveguide Fabry-Perot filters with dielectric mirrors has been fabricated as part of a photonic microwave channelising receiver. Thin-film heaters enabled the resonant frequency of the filters to be tuned. Filter 3 dBe bandwidths of ~1 GHz were measured.

Guang Yun 8

ThF3 • 9.15
Adaptive LDPC-Coded Polarization Multiplexed Coherent Optical OFDM in Optically-Routed Networks, *Ivan B. Djordjevic[1], Lei Xu[2], Ting Wang[2]; [1]Univ. of Arizona, USA, [2]NEC Labs America, Inc., USA.* We present a power-variable rate-adaptive LDPC-coded polarization multiplexed coherent OFDM scheme, suitable for use in optically routed networks in which different lightwave paths experience different penalties due to deployment of ROADMs and WXCs. We demonstrate that channel capacity can be closely approached with proposed scheme.

ThF4 • 9.30
An All-Optical OFDM System Based on Time Lenses, *Junyao Mei, Wei Li, Qingsheng Han; Wuhan Natl. Lab for Optoelectronics, Huazhong Univ. of Science and Technology, China.* We experimentally demonstrate a multi-pulse all-optical time domain continuous Fourier transformation (MOFT) based on a time lens. With two of MOFT devices, one is at transmitter, the other is at receiver, we experimentally show a successful all-optical OFDM fiber transmission system with 20Gb/s 200km transmission without any dispersion compensations.

ThF5 • 9.45
Spectrum Efficiency Improvement of Directly Detected OFDM Based on Balance Receiver, *Chao Tang, Hongwei Chen, Minghua Chen, Shizhong Xie; Dept. of Electronic Engineering, Tsinghua Univ., China.* A novel optical single-sideband DD-OFDM system based on balance receiver is proposed and demonstrated. With elimination of intermodulation distortion (IMD) near the optical carrier, our system achieves spectrum efficiency about 1.54 bps/Hz with 4QAM mapping and CSPR is improved by 3 dB with negligible EVM penalty.

Guang Da 16

ThG4 • 9.15
Point Defects in Relaxed and Strained Si Studied by Molecular Dynamics Method, *Zhihui Chen, Zhongyuan Yu, Pengfei Lu, Yumin Liu; Beijing Univ. of Posts and Telecommunications, China.* Molecular dynamics simulations using the Tersoff potential have been performed to investigate the perturbation effects caused by the point defects in relaxed and strained Si matrices. As different kinds of point defects are introduced, Lattice distortion, mean square displacement, and vibrational spectra change obviously.

ThG5 • 9.30
Photoresist Removal on a 90nm-Patterned Si Wafer by Excimer Laser Irradiation, *Hoon Jeong, Jiyoung Baek, Myunghwa Lee, Sojung Na, Jongseok Kim; Korea Inst. of Industrial Technology, Republic of Korea.* Photoresist stripping on 90nm-patterned Si wafer was demonstrated by excimer laser irradiation. A 90nm-patterned Si wafer with PR coating was irradiated at various laser conditions and observed the surface by SEM and EDS. PR was perfectly removed by laser irradiation with energy density of 250 mJ/cm^2 and 10 laser shots.

ThG6 • 9.45
Effect of Fabrication Parameters on Luminescent Properties of ZnS:Mn Nanocrystals, *Sahbudin Shaari, Mohd Syuhaimi Ab-Rahman, Noor Azie Azura Mohd Arif; Univ. Kebangsaan Malaysia, Malaysia.* In this work, we mainly focused on the luminescence properties of ZnS:Mn nanocrystals. Various samples of ZnS:Mn have been characterized at different doping concentration, annealing temperature, speed and rotation time. Luminescent intensity increased with higher annealing temperature, doping concentration but decreased with higher speed and rotation time during stirring process.

Guang Da 18

ThH4 • 9.15
Underwater Fiber Laser Geophone: Theory and Experiment, *Wentao Zhang, Xuecheng Li, Faxiang Zhang, Fang Li, Yuliang Liu; Inst. of Semiconductors, Chinese Acad. of Sciences, China.* A novel underwater fiber laser geophone is presented. Theoretical and experimental analyses are carried out to test the performance of the geophone, which shows a sensitivity of 25 pm/g and a flat frequency response in the range of 5 Hz~200 Hz are achieved.

ThH5 • 9.30
Optical Liquid Level Sensor Based on Cladding-Mode Resonance of Specialty Double-Cladding Fiber, *Huanhuan Liu, Fufei Pang, Na Chen, Zhenyi Chen, Tingyun Wang; Shanghai Univ., China.* A novel liquid-level sensor was proposed and studied by using a specialty double-cladding fiber (DCF). The resonant wavelength shift of DCF linearly depends on the fraction change of DCF immersed into the liquid. The sensor has the advantages large linear response range, high sensitivity and simple structure etc.

ThH6 • 9.45
Refractive Index Sensor for Ultra-Thin Layer Based on Short Range Surface Plasmon Polariton Hybrid Coupler, *Ruiyuan Wan, Fang Liu, Yidong Huang, Boyu Fan, Shuai Hu, Jiangde Peng; Dept. of Electronic Engineering, Tsinghua Univ., China.* A highly integrated sensor based on the hybrid coupling between short range surface plasmon polariton (SRSPP) and dielectric waveguide mode is proposed for ultra-thin analytic layer detection. For an analytic layer thinner than 1/10 wavelength, the refractive index resolution can be as high as 5.5×10^{-6}.

9.00–17.00 Exhibit Open, *Everbright East Exhibition Hall*

10.00–10.30 Tea Break, *Everbright East Exhibition Hall*

10.30–12.00 ThI • INDUSTRY FORUM: Photonics for Green Energy–Photovoltaics, *Guang Yun 1*

Guang Da 7

10.30–12.00
ThJ • Fiber Design and Fabrication
Limin Tong; Zhejiang Univ., China, Presider

ThJ1 • 10.30 Invited

Soft Glass Microstructured Optical Fibres: Recent Progress in Fabrication and Opportunities for Novel Optical Devices, *Heike Ebendorff-Heidepriem, Tanya M. Monro; Univ. of Adelaide, Australia.* This paper reviews recent progress in the fabrication of soft glass microstructured optical fibers with nanowire core sizes, nanoscale holes in the fiber core and with large mode areas. We demonstrate the potential of these fibres for applications including high optical nonlinearity, bio/chemical sensing, high-resolution imaging, mid-infrared generation and delivery.

ThJ2 • 11.00

Silicon Nanowire for Soliton-Effect Compression of Femtosecond Laser Pulses, *Mohammad Mohebbi; Dept. of Electrical Engineering, Qazvin Islamic Azad Univ., Iran.* Soliton-effect compression of femtosecond laser pulses in a silicon photonic nanowire at 1.5 μm is numerically investigated. A region of anomalous group velocity dispersion (GVD), small third-order dispersion (TOD), and large nonlinearity of silicon is used to show compression of 30 fs input pulses below 3 fs.

Guang Da 9

10.30–12.00
ThK • Nonlinear Optics
Junqiang Sun; Huazhong Univ of Science and Technology, China, Presider

ThK1 • 10.30

Study on Third-Order Nonlinear Optical Properties of $[(C_4H_9)_4N]Au(dmit)_2$ Using Z-Scan Technique, *Hongliang Yang, Wei Ji, Quan Ren, Fujun Zhan, Xinqiang Wang; Shandong Univ., China.* A $dmit^{2-}$ salt ($[(C_4H_9)_4N]Au(dmit)^2$) was synthesized and its acetone solution's third-order nonlinear optical properties were investigated by Z-scan technique using a pulsed laser with 28 ps duration and 10 Hz repetition at 532 nm. The second-order hyperpolarizability for its molecular was estimated to be as large as 2.74×10^{-31} esu.

ThK2 • 10.45

Linear and Nonlinear Optical Properties of an Organic Polymer Composite Film, *Qiang Sun[1], Quan Ren[1], Xinqiang Wang[2], Tingbin Li[3], Hongliang Yang[1], Fujun Zhang[1], Jingwei Chen[1]; [1]Dept. of Optics, Shandong Univ., China, [2]State Key Lab of Crystal Material, Shandong Univ., China, [3]Dept. of Materials and Chemical Engineering, Taishan Univ., China.* An organic polymer composite film, BBDT/PMMA, was prepared. Its linear and nonlinear optical properties were characterized using prism coupler(SPA-4000, Korea) and Z-scan technique. The results show that the film exhibits a great nonlinear optical response.

ThK3 • 11.00

Experimental Investigation on Transverse Profile and Spatial Evolution of SBS Beam, *Huaping Gong[1], Zhiwei Lu[2], Dianyang Lin[2]; [1]China Jiliang Univ., China, [2]Harbin Inst. of Technology, China.* Focusing Q-switched laser pulses into FC-72 medium, the transverse profiles and spatial evolution of backward stimulated Brillouin scattering (SBS) beam are investigated experimentally by CCD camera and digital image processing technology.

Guang Da 11

10.30–12.00
ThL • 100 and 40 Gb/s Transmission Systems II
Alexei Pilipetskii; Tyco Telecommunications, USA, Presider

ThL1 • 10.30 Invited

40G DWDM: A Case Study in Market Fragmentation, *Ted Schmidt, Jin Hong; Opnext, USA.* In an effort to meet core, regional, and metro network requirements, 40G DWDM suppliers have employed numerous modulation formats. A combination of market segmentation and lack of investment in standardization has resulted in a highly fragmented market for suppliers of 40G technology. We explore how the 100G market may differ.

ThL2 • 11.00 Invited

Past, Present and Future of Optical OFDM, *Sander Lars Jansen[1], Dirk van den Borne[1], Susmita Adhikari[2]; [1]Nokia Siemens Networks GmbH & Co. KG, Germany, [2]Christian-Albrechts-Univ. zu Kiel, Germany.* Rapid advances in high-speed digital signal processing have recently enabled the use of orthogonal frequency division multiplexing (OFDM) for fiber-optic transmission systems. Since then, optical OFDM is a very active research topic in the fiber-optic community. In this paper, we will discuss the past, present and future of optical OFDM.

Guang Da 12

10.30–11.45
ThM • Applications of Optical Systems in Networks II
Lena Wosinska; Royal Inst. of Technology (KTH), Sweden, Presider

ThM1 • 10.30 Tutorial

OCDMA Systems and the Enabling Technologies, *Ken-ichi Kitayama; Osaka Univ., Japan.* OCDMA system are reviewed, particularly focusing on asynchronous coherent technology. Key techniques enabling asynchronous coherent OCDMA are discussed, including en/decoding techniques such as ultra-long superstructured FBG and multi-port encoder/decoder; differential-phase-shift-keying (DPSK) modulation, and forward-error-correction and M-ary OCDM will be also introduced aiming at the transmission security enhancement.

Ken-ichi Kitayama received the M.E. degree from Osaka University, Osaka, Japan, in 1976. He joined the NTT Laboratories in 1976. In 1995, he joined the Communications Research Laboratory (presently, National Institute of Information and Communications Technology, NICT), Tokyo. Since 1999, he has been the Professor of the Department of Electrical, Electronic and Information Engineering at Osaka University. His research interests are in photonic networks, optical signal processings, optical code division multiple access (OCDMA) systems, and radio-over-fiber systems. He has published over 240 papers in refereed journals and holds more than 30 patents. He currently serves on the Editorial Boards of the IEEE/OSA J. Lightwave Technol., IEEE Transactions on Communications, and Optical Switching and Networking as the Associate Editor. He is a Fellow of IEEE and a Fellow of IEICE of Japan.

Guang Yun 7

10.30–12.00
ThN • Optical Waveguide Devices II
Yikai Su; Shanghai Jiao Tong Univ., China, Presider

ThN1 • 10.30 Invited
Wavelength Conversion and Optical Signal Processing in PPLN Waveguides, *Wolfgang Sohler[1], D. Büchter[1], L. Gui[1], H. Herrmann[1], H. Hu[1], H. Hu[2], R. Ludwig[2], R. Nouroozi[1], V. Quiring[1], R. Ricken[1], C. Schubert[2], H. Suche[1]; [1]Univ. of Paderborn, Germany, [2]Fraunhofer Inst. for Telecommunications, Heinrich-Hertz-Inst., Germany.* Recent progress of wavelength conversion and all-optical signal processing in periodically poled lithium niobate (PPLN) waveguides is reported. Applications for optical communications in the near-infrared, as well as for tuneable absorption spectroscopy in the mid-infrared are highlighted. Novel waveguide structures and fabrication methods are presented.

ThN2 • 11.00
Spectroscopic Studies of Tm^{3+} Ions in Tm^{3+}/Yb^{3+} Codoped Tellurite Glass, *Qingjie Huang[1], Qingpu Wang[1], Jun Chang[1], Xingyu Zhang[1], Zejin Liu[2], Guangyi Yu[1]; [1]School of Information Science and Engineering, Shandong Univ., China, [2]Inst. of Optoelectronics, Natl. Univ. of Defense Technology, China.* In this paper, spectroscopic properties of Tm^{3+}/Yb^{3+} codoped tellurite glass were analyzed by J-O theory. The glass was pumped by 808nm and 980nm laser respectively. Results indicate to Tm^{3+}/Yb^{3+} codoped glass, 980nm laser can be a good pump source to get a laser working in 1.4μm.

Guang Yun 8

10.30–12.00
ThO • OFDM II
Xiang Liu; Bell Labs, Alcatel-Lucent, USA, Presider

ThO1 • 10.30 Invited
High Spectral Efficiency Coherent Optical OFDM Transmissions, *William Shieh, Qi Yang, Yiran Ma, Simin Chen, Yan Tang; Univ. of Melbourne, Australia.* We show 1-Tb/s single-channel CO-OFDM transmission consisting of continuous 4,104 spectrally-overlapped subcarriers generated using a novel device of recirculating frequency shifter (RFS). The 1-Tb/s CO-OFDM signal with a spectral efficiency of 3.3 bit/s/Hz is successfully received after transmission over 600-km SSMF fiber without either Raman amplification or dispersion compensation.

ThO2 • 11.00
OOFDM System with Multiple Low Bandwidth Receivers, *Lin Cheng, He Wen, Xiaoping Zheng, Hanyi Zhang, Yili Guo, Bingkun Zhou; Tsinghua Univ., China.* We propose a cost-efficient method of multiple receiver optical OFDM system that reduces the ADC requirement and FFT size of receiving. Aided by signal predistortion, aliasing free signal can be retrieved independently and directly at the low bandwidth receivers. Simulation results are given.

Guang Da 16

10.30–12.00
ThP • Ultra-Short Optical Pulses
Katsunari Okamoto; AiDi Corp., Japan, Presider

ThP1 • 10.30
Group-Velocity Compensation in Mixing Process of Third-Harmonic Generation of Ultra-Short Pulses, *Yizhou Tan, Yisheng Yang, Shuihua Huang, Guangwei Zheng; Natl. Univ. of Defense Technology, China.* Group-velocity mismatch in third harmonic generation (THG) is investigated. A new walk-off compensated crystal is used as the mixer. Theoretical results show that THG conversion efficiency of ultra-short pulses can be increased dramatically with this design. Influence of fast-wave-delaying to frequency conversion properties of ultra-short pulses is analyzed.

ThP2 • 10.45
Optical Pulses Compression Using Time Lens, *Tan Zhongwei, Zhou Nan, Gong Taorong, Chen Ming, Chang Yanling, Jian Shuisheng; Beijing Jiaotong Univ., China.* Temporal imaging is one of the important research issues using time-lens. The theory of temporal imaging using time lens is discussed briefly. The experiment to perform optical pulses compression is demonstrated and the problem is further discussed by numerical simulation in this article.

ThP3 • 11.00
Soliton Compression of Femtosecond Pulses in Two-Segment Quasi-Phase-Matching Grating, *Xianglong Zeng, Zijie Wang, Tingyun Wang; Shanghai Univ., China.* We theoretically propose soliton-like compression of femtosecond pulses in two-segment quasi-phase-matching grating by using group-velocity matching scheme. We also numerically show soliton compression of femtosecond pulses with higher quality factor, lower intensity threshold and better spatial-temporal pattern than periodic quasi-phase-matching structure with the same total crystal length.

Guang Da 18

10.30–12.00
ThQ • Photonic Crystal Fibers II
Boris T. Kuhlmey; CUDOS, Univ. of Sydney, Australia, Presider

ThQ1 • 10.30
Ultra-Flattened Chromatic Dispersion Photonic Crystal Fiber with High Nonlinearity for Supercontinuum Generation, *Yamiao Wang, Xia Zhang, Xiaomin Ren, Long Zheng, Xiaolong Liu, Yongqing Huang; Beijing Univ. of Posts and Telecommunications, China.* We propose a novel design for photonic crystal fiber, which has flattened-dispersion (between -1.65 and 0.0 ps/nm/km from 1.45 to 1.65μm), high nonlinearity (larger than 33 $W^{-1}km^{-1}$) and low confinement loss (order of 10^{-4} dB/km). Analysis shows flat supercontinuum (70nm) at 1550nm is achieved through only 150m-long fiber.

ThQ2 • 10.45
Bend Insensitive Single Polarization Single Mode Photonic Crystal Fiber, *Prathyusha Peddi, S. Sivabalan; VIT Univ., India.* We presented a Single Polarization Single Mode PCF which is bend insensitive till 1cm. Slow axes is made to propagate over wide range of wavelength while suppressing the fast axes. Due to the enlargement of holes around the core the confinement loss is very less in the order of 10^{-7}.

ThQ3 • 11.00
Slope-Matching Profile Optimization of Dual-Concentric-Core Photonic Crystal Fiber for Broadband Dispersion Compensation, *Han Jiawei, Hou Shanglin; School of Science, Lanzhou Univ. of Technology, China.* Slope-matching profile of a dual-concentric-core photonic crystal fiber for broadband dispersion compensation is optimized. The dispersion of proposed fiber is -3179.9ps/nm/km at 1550nm, and it can compensate (to within 0.56%) a dispersion of 187 times of the length of single mode fiber over the 100-nm broadband centered at 1550nm.

Guang Da 7

ThJ3 • 11.15
Composition Optimization of Tellurite Glass for Low-Loss and Robust Fiber Fabrication, *Aoxiang Lin[1,2], Aidong Zhang[1], Jean Toulouse[1]; [1]Ctr. for Optical Technologies, Physics Dept., Lehigh Univ., USA, [2]Xi'an Inst. of Optics and Precision Mechanics, CAS, China.* Tellurite glass with composition of $80TeO_2$-10ZnO-$10Na_2O$ (TZN-80) was made by melting and quenching techniques. This glass shows high transmission (≥80%) at 0.87~3.00 μm and good IR transmission up to 6 μm, and exhibits excellent physical properties against surface crystallization during fiber drawing.

ThJ4 • 11.30
Fabrication and Design of Asymmetrical Twin Core Fiber for Passive Mode-Locking, *Lei Yao, Shuqin Lou, Lisong Liu, Jian Peng, Shuisheng Jian; Inst. of Lightwave Technology, Beijing Jiaotong Univ., China.* We demonstrate the fabrication of a kind of asymmetrical twin core fiber, which is easy spliced with standard single mode fiber. This fiber is designed to be used for passive mode-locking in fiber lasers.

ThJ5 • 11.45
Theoretical Design of Low-Loss Single-Polarization Single-Mode Microstructured Polymer Optical Fiber, *Zhang Ya-ni[1,2]; [1]Dept. of Physics and Information Technology, Baoji College of Arts and Science, China, [2]State Key Lab of Transient Optics and Photonics, Xi'an Inst. of Optics and Precision Mechanics, CAS, China.* A new structure for single-polarization single-mode photonic-crystal fiber is proposed and numerically analyzed by using a full vector finite element method with anisotropic perfectly matched layers. The confinement loss are also numerically calculated and optimized at 650-nm communication wavelength of polymer optical fiber.

Guang Da 9

ThK4 • 11.15
Measurement of the Carrier Recovery Time in SOA Based on Dual Pump FWM, *Cheng Cheng, Xinliang Zhang, Yu Zhang, Lei Liu, Dexiu Huang; Wuhan Natl. Lab for Optoelectronics, Huazhong Univ. of Science and Technology, China.* A measurement of carrier recovery time in semiconductor optical amplifiers (SOAs) based on dual pumps four-wave mixing (FWM) is presented. The results show the carrier time is 91 ps, 79 ps and 63 ps at 120 mA, 180 mA and 240 mA, respectively, which agree to our expectation.

ThK5 • 11.30
Mathematical Modeling and Statistical Analysis of SPE-OCDMA Systems Utilizing Second Harmonic Generation Effect in Thick Crystal Receivers, *Mehdi D. Matinfar, Jawad A. Salehi; Sharif Univ. of Technology, Iran.* In this paper we evaluate the performance of a spectrally-phase-encoded-OCDMA system using a receiver structure based on second harmonic generation effect. We approximate the decision variable moment generating function and obtain the error probability using saddle-point approximation. The impact of different parameters, e.g., code length, and photodetectors' speed, is studied.

ThK6 • 11.45
Temperature Investigation of Frequency Upconversion in Er^{3+}/Yb^{3+}-Codoped PLZT Electro-Optic Ceramic, *Zhuohong Feng, Lin Lin, Kehua Shi, Jianfeng Lin, Guohua Zhuang, Zhiqiang Zheng; Fujian Normal Univ., China.* The upconversion fluorescence spectra of Er^{3+}/Yb^{3+}: PLZT exciting at 980nm were measured from 10K to 320K. A model for the dynamics of upconversion processes was proposed. Based on the model, the upconversion luminescence intensities curves with different temperature were fitted and the temperature characteristics of upconversion luminescence were discussed.

Guang Da 11

ThL3 • 11.30
Extending 40G DPSK Reach Using Co-Propagating Raman and EDFA Booster Amplifier, *Julia Y. Larikova, Oleg B. Leonov, Richard C. Younce; Tellabs, Inc., USA.* Two transmit amplifier approaches to extending 40G DPSK transmission reach are evaluated. Simulation and experimental results are presented for co-propagating Raman and EDFA high-launch-power amplifiers. The results show significant improvement in the supportable span loss.

ThL4 • 11.45
40 Gbit/s on-off-Keyed System with 5.71 GHz Clock Recovery Circuit Using Duty Cycle Division Multiplexing, *Ghafour Amouzad Mahdiraji[1], Amin Malekmohammadi[1], Ahmad Fauzi Abas[1], Mohamad Khazani Abdullah[2]; [1]Univ. Putra Malaysia, Malaysia, [2]Significant Technologies Sdn. Bhd., Malaysia.* We show the realization of 40 Gbit/s on-off-keyed system that can be recovered at 5.71 GHz clock using duty cycle division multiplexing technique with the receiver sensitivity of -22.1 dBm.

Guang Da 12

ThM2 • 11.30
Experimental Temporal and Power Misalignment Monitoring for All-Optical Ultrawideband Pulse Generation Based on Dark RZ Pulse, *Junwen Zhang, Wuliang Fang, Chunning Hou, Xiao Liu, Xi Zheng, Nan Chi; School of Information Science and Engineering, Fudan Univ., China.* We propose and experimentally demonstrate a simple all-optical scheme to generation ultrawideband pulse utilizing dark RZ pulse generation. The effect of some key parameters in UWB generation on signal quality is also investigated.

12.00–13.30 Lunch Break

Guang Yun 7

ThN3 • 11.15
Cu-Na Ion Exchange Soda-Lime Glass Planar Waveguides and Their Photoluminescence, *Yunqiang Ti[1], Xin He[1], Jian Zhang[1], Jie Zheng[1], Pengfei Wang[2], Gerald Farrell[2]; [1]Jilin Univ., China, [2]Dublin Inst. of Technology, Ireland.* Copper ion exchange technique was used to fabricate soda-lime glass planar waveguides. The refractive indices profile was constructed through Inverse WKB method. Optical absorption and photoluminescence analysis were performed as well. Ion exchange time and temperature were both found to play an important role in waveguides photoluminescence properties.

ThN4 • 11.30
Variable Optical Power Splitter Based on Channel Waveguide, *Liming Zheng, Meili Zhu; Dept. of Electronic Engineering, Jinan Univ., Guangzhou, China.* A new variable optical power splitter based on channel waveguide proposed in this paper is to use the principle of optical field effect. The import light in the device is divided dynamically and continuously into two output beams by changing the width of the gap between two channel waveguides.

ThN5 • 11.45
Design of Athermal All-Polymer Waveguide Microring Resonator, *Xiuyou Han, Mingshan Zhao, Jianing Zhang, Linghua Wang, Jie Teng, Jinyan Wang, Xigao Jian; Dalian Univ. of Technology, China.* The athermal all-polymer waveguide microring resonator is realized by selecting polymer substrate with proper thermal expansion coefficient to substitute the silicon one. The designed results show that the maximal resonant wavelength shift is -0.0085nm when the temperature varies from 20°C to 65°C and the maximal wavelength shift slope is -0.0009nm/K.

Guang Yun 8

ThO3 • 11.15
160 Gb/s OFDM Transmission Utilizing All Optical Discrete Fourier Transform Processor Based on PLC, *Xiaojun Liang, Wei Li, Kai Wang; Huazhong Univ. of Science and Technology, China.* We demonstrate a 4×40Gb/s OFDM system using silica PLC based all optical discrete Fourier transform processor. Excellent BER and OSNR are observed after 400km transmission. The comparisons with single channel 160Gb/s systems are given.

ThO4 • 11.30
On the Timing Synchronization Methods for Optical Orthogonal Frequency Division Multiplexing (OOFDM) Systems: Comparisons and Improvement, *Xiaoyong Hao, Kun Qiu, Chongfu Zhang, Yonggang Li; Univ. of Electronic Science and Technology of China, China.* We show simulation results of three different timing synchronization methods in OOFDM system using Intensity-Modulation and Direct-Detection (IMDD) in Multi-Mode Fiber (MMF) channel and do comparative study of the three algorithms. Based on Park's algorithm, we present a modification to it that gets a very sharp timing metric curve.

ThO5 • 11.45
Investigations of SPM Suppression by PAPR Reduction in Coherent Optical OFDM Systems, *Zhiyuan Huang, Juhao Li, Su Zhang, Fan Zhang, Zhangyuan Chen; State Key Lab of Advanced Optical Communication Systems and Networks, Peking Univ., China.* We investigate SPM suppression for coherent optical OFDM systems utilizing three PAPR reduction methods including the clipping, the selective mapping and the partial transmit sequence.

Guang Da 16

ThP4 • 11.15
High Diffraction Efficiency for Ultra-Short Laser Pulse by Superposed Transmission Volume Phase Gratings, *Guangwei Zheng, Jichun Tan, Yanlan He; College of Science, Natl. Univ. of Defense Technology, China.* A configuration-two transmission volume phase gratings superposed is presented, where the gratings' vectors are parallel to each other. Its diffraction efficiency is up to 90% for ultra-short laser pulse. The configuration enhances the gratings' performance for ultra-short laser pulse, such as its spatial filtering, beam deflecting, and so on.

ThP5 • 11.30
Investigation of the Doping Profile Effect on Operation of Internally Q-Switched Laser Diodes Aiming at High-Power Picosecond Light Source, *Brigitte Lanz[1], Sergey Vainshtein[1], Juha Kostamovaara[1], Vladimir Lantratov[2], Nikolay Kaluzhniy[2]; [1]Electronics Lab, Dept. of Electrical and Information Engineering, Univ. of Oulu, Finland, [2]Ioffe Physico-Technical Inst., RAS, Russian Federation.* Lately demonstrated high-power (50W from 20μm stripe) picosecond (30ps) lasing from a laser diode has addressed us to internal Q-switching phenomenon, discovered four decades ago and not understood so far. We found that the realization of nanosecond or picosecond mode from a diode depends on doping profile across the structure.

ThP6 • 11.45
High Power Ultra-Short Pulse UV Laser System, *Junewen Chen[1], Kai-Chun Chung[2], Jung-Chao Chen[1], Shu-Yuan Lin[1], Chi-Feng Chen[2]; [1]Inst. of Mechanical and Aerospace Engineering, Chung-Hua Univ., Taiwan, [2]Inst. of Mechanical Engineering, Natl. Central Univ., Taiwan.* We have developed a terawatts high intensity sub-hundred femtosecond ultra-short pulses 248.6 nm ultraviolet laser systems.

Guang Da 18

ThQ4 • 11.15
Two-Mode Photonic Crystal Fiber Interferometer for Temperature and Strain Sensing, *Honglei Li, Shuqin Lou, Suchun Feng, Tieying Guo, Liwen Wang, Weiguo Chen, Shuisheng Jian; Inst. of Lightwave Technology, Beijing Jiaotong Univ., China.* A compact in-line interferometer is demonstrated by splicing a piece of two-mode photonic crystal fiber (TPCF) between single mode fibers (SMFs). The TPCF is homemade and simulated based on extracted real cross section. The temperatures and strain induced interference pattern shifts with sensitivities of -43pm/°Cand -0.62pm/με are experimentally monitored.

ThQ5 • 11.30
Spectral Compression of Femtosecond Pulses in Photonic Crystal Fiber with Anomalous Dispersion, *H, P. Li, X. J. Zhang, J. K. Liao, X. G. Tang, Y. Liu, Y. Z. Liu; Univ. of Electronic Science and Technology of China, China.* We numerically analyze the nonlinear propagation of femtosecond pulses in nonlinear photonic-crystal fiber (PCF) with anomalous dispersion. The results show efficient spectral compression of chirp-free femtosecond pulses at 1550-nm wavelength is induced in PCF. The compressed spectral width can be controlled by the input pulse power.

ThQ6 • 11.45
Single-Mode Solid-Core Tellurite Glass Fiber with Large Mode Area and Low Loss for Infrared Applications, *Aoxiang Lin[1,2], Aidong Zhang[1], Elizabeth J. Bushong[1], Jean Toulouse[1]; [1]Ctr. for Optical Technologies, Physics Dept., Lehigh Univ., USA, [2]Xi'an Inst. of Optics and Precision Mechanics, CAS, China.* We report on the fabrication of a single-mode solid-core tellurite glass fiber with large mode area of 103 μm^2 and low loss of 0.24~0.7 dB/m at 1550 nm. By using the continuous-wave self-phase modulation method, the non-resonant nonlinear refractive index n_2 is estimated to be 3.8×10^{-19} m^2/W at 1550 nm.

12.00–13.30 Lunch Break

Guang Da 7

13.30–15.30
ThR • Optical Amplifiers
John Ballato; Clemson Univ., USA, Presider

ThR1 • 13.30 Invited
Semiconductor Specialty Fiber Optics for Wideband Optical Amplifiers, *Tingyun Wang; Shanghai Univ., China.* We fabricated an InP doped silica optical fiber by using the conventional modified chemical vapor deposition process. We will present the experimental X-ray analysis on the optical properties and the results that compound InP was contained in the fiber core after annealing process. Another wideband optical amplifiers will also been presented by depositing PbS quantum dots on a fused tapered optical evanescent wave fiber coupler.

ThR2 • 14.00 Invited
Second-Order Effects in Fiber Optical Parametric Amplifiers, *Kenneth Kin-Yip Wong; Univ. of Hong Kong, Hong Kong.* Until recently, impressive performance of fiber optical parametric amplifiers (OPAs) has been demonstrated in different respects. However, second-order effects should be addressed before OPAs can be practical. Here we report some of these effects, either exploiting them as in the parametric processor or suppressing them as in the optical amplifier.

Guang Da 9

13.30–15.30
ThS • Plasmonic Nanostructures
Christian Lerminiaux; Univ. de Technologie de Troyes, France, Presider

ThS1 • 13.30 Invited
Silver Nanostructures for Plasmonics and Nanophotonics, *Younan Xia; Washington Univ. in St. Louis, USA.* In this talk, I will discuss shape-controlled synthesis of silver nanocrystals and their applications in nanophotonics and plasmonics. Specifically, I will focus on silver nanocubes and their use in surface plasmon resonance and surface-enhanced Raman scattering, as well as nanowires and their use for plasmonic waveguiding.

ThS2 • 14.00 Invited
Simulation of Surface Plasmon and Its Application on in On-Chip Interconnect for Future IC, *Chenglin Xu; RSoft Design Group, Inc., USA.* Surface plasmonics, which merges electronics and photonics at nano scale, could provide a solution to the on-chip interconnect, the bottleneck of future integrated circuits. It will be shown that computer simulation is an intuitive approach to understand the underlying physics and an efficient tool for design optimization.

Guang Da 11

13.30–15.30
ThT • Modeling and Modulation Formats
Presider to Be Announced

ThT1 • 13.30
BER Estimation for Multilevel Modulation Formats, *Hadrien Louchet[1], Konstantin Kuzmin[2], Igor Koltchanov[1], André Richter[1]; [1]VPIsystems, Germany, [2]VPIdevelopment Ctr., Belarus.* We review existing BER estimation methods and propose alternative methods to assess the performance of multilevel-modulation formats with both direct and coherent detection. The impact of digital signal processing on the BER estimation procedure is discussed for the latter case. The different approaches are illustrated by simulating exemplary transmission systems.

ThT2 • 13.45
Wide-Range and Fast-Convergence Frequency Offset Estimator by BER-Aiding for Optical Coherent Receivers, *Zhiyu Li, Xue Chen, Weiqin Zhou, Hai Zhu, Xian Zhou, Zhiguo Zhang; Beijing Univ. of Posts and Telecommunications, China.* PADE, a digital frequency offset (FO) estimator for optical coherent receivers, has a wide stable-running estimation range. But it converges correctly only when initialized FO is near to real FO. We present a solution to break the restriction by BER aiding, which is proved to be effective by simulation.

ThT3 • 14.00
Accurate Computation of the BER in DPSK/MZI Receiver with Balanced Detection Thereafter of 40Gbit/s Optical System, *Junyao Mei, Wei Li, Qingsheng Han, Teng Wang; Wuhan Natl. Lab for Optoelectronics, Huazhong Univ. of Science and Technology, China.* This paper analyses and achieves the accurate computational expression of nonlinear phase noise in DPSK receivers using optical Mach-Zehnder interferometer (MZI) demodulation and balanced detection of 40Gbit/s system. Then we use it in the BER computation expression considering all the noises to achieve a final accurate computation expression of BER.

Guang Da 12

13.30–15.30
ThU • Next Generation Optical Networks
Angela L. Chiu; AT&T Labs, USA, Presider

ThU1 • 13.30 Invited
Structural Change of Networks Enabled by Optical Transmission, *Andreas Gladisch; Deutsche Telekom, Germany.* Besides the capacity increasing optical technology will change the network structure. The layering is simplified by IP over optics and topology is changed by enlarged access areas and by functional optimisation of aggregation and backbone.

ThU2 • 14.00 Invited
100G–Key Technology for Next Generation Transport Networks, *Tiejun J. Xia; Verizon Communications, USA.* 100G emerges as a key technology for the next generation transport network. We have studied the performance of three different 100G modulation formats: DQPSK, CP-QPSK, and DC-CP-QPSK, in Verizon's fiber networks. The conclusion is the 100G technology is getting mature quickly and its deployment is expected in a few years.

Guang Yun 7

13.30–15.30
ThV • Functional Imaging with Biophotonics
Nanguang Chen; Natl. Univ. of Singapore, Singapore, Presider

ThV1 • 13.30 Tutorial
Optoelectronic Neuroimaging Approaches, *Qingming Luo; Huazhong Univ of Science and Technology, China.* For neuroscience research, optoelectronic imaging has the advantages of noninvasive or least invasive, functional imaging with high or good imaging contrast, high temporal/spatial resolution, and multi-parameters/parallel-measurements. We introduce the approaches of imaging neural activities from neuron, neuronal network, cerebral cortex, to brain level, with or without the optical molecular biomarkers.

Qingming Luo, Ph.D., is a Cheung Kong Professor, an SPIE Fellow, the Director, Britton Chance Center for Biomedical Photonics, the Executive Deputy Director, Wuhan National Laboratory for Optoelectronics, the Vice President, Huazhong University of Science and Technology, the Chair, Biomedical Photonics Committee of Chinese Optical Society and the Managing Editor, Journal of Innovative Optical Health Sciences. Dr. Luo's research interests have focused on Biomedical Photonics and Bioinformatics. He has systematically carried out the studies on optical molecular imaging and tissue optical imaging based on tissue structure and function. Collaborating with Dr. Britton Chance, he invented the functional near-infrared spectroscopy brain imager in 1996. His group developed the methodology and applications of optical intrinsic signal imaging and laser speckle imaging on the high resolution imaging of cortical activities, and performed the optical molecular imaging studies in living cells and model animals. Dr. Luo has published over 100 peer-reviewed journal papers and owns about 20 patents.

Guang Yun 8

13.30–15.15
ThW • High-Speed Devices
Koji Otsubo; Fujitsu Labs Ltd., Japan, Presider

ThW1 • 13.30 Invited
40G and 100G Modules Enable Next Generation Networks, *Jin Hong, Ted Schmidt; Opnext, USA.* With the widescale deployment of 40Gb/s in networks underway and 100Gb/s products on the horizon, DWDM modules based on Multi-Source Agreements are gaining considerable interest and market acceptance. This paper discusses developments in the 40Gb/s and 100Gb/s DWDM module markets as suppliers strive to address various system and network applications.

ThW2 • 14.00
Advanced InP Technology for High Performance 40 Gb/s (RZ-) DQPSK Transponder, *Jinyu Mo[1], Robert Griffin[2], Thomas Goodall[3], Zheng He[1]; [1]Oclaro Inc., Shenzhen Office, China, [2]Oclaro Inc., Caswell Office, UK, [3]Oclaro Inc., Paignton Office, UK.* Advanced InP technology is the enabling technology to achieve monolithic integrated 300-pin MSA compatible 43 Gb/s (RZ-)DQPSK transponder module with high performance. The integrated platform offers footprint, power, and cost reduction for next generation products.

Guang Da 16

13.30–15.30
ThX • Nano-biophotonics for Imaging and Therapy I
Chii-Wann Lin; Natl. Taiwan Univ., Taiwan, Presider

ThX1 • 13.30 Invited
A Novel Design of Liquid Bio-chip Based on Biomolecules Optical Switch of Upconversion Fluorescence Nanocrystal and Quantum Dots, *Xianggui Kong[1], Kai Song[1], Yajuan Sun[1], Yi Yu[1], Xiaomin Liu[1], Qinghui Zeng[1], Youling Zhang[1], Chuang Du[1], Hong Zhang[2]; [1]Chang Chun Inst. of Optics and Fine Mechanics and Physics, China, [2]Faculty of Science, Van't Hoff Inst. for Molecular Sciences, Univ. of Amsterdam, Netherlands.* A novel prototype liquid bio-chip based on molecules optical switch of upconversion fluorescence nanocrystal (UCP) as a donor attached with anti-BSA antibody and quantum dots (QDs) as an acceptor conjugated with antigen (BSA) was designed and constructed for a innovative element of liquid biochip used in BSA detection.

ThX2 • 14.00 Invited
Optical Molecular Imaging for Early Tumor Diagnosis and Drug Development, *Zhihong Zhang, Jie Yang, Qingming Luo; Britton Chance Ctr. for Biomedical Photonics, Wuhan Natl. Lab for Optoelectronics, Huazhong Univ. of Science and Technology, China.* Optical molecular imaging can characterize and monitor multi molecular events *in vivo*, which providing a practical tool for early tumor diagnosis and drug development. To establish a research platform for optical molecular imaging, we develop the fluorescent protein-based genetically encoded optical probes, lipoprotein-based multi-functional nanocarrier, and optical molecular imaging systems.

Guang Da 18

13.30–15.15
ThY • Organic LEDs
Hsin-Fei Meng; Natl. Chiao Tung Univ., Taiwan, Presider

ThY1 • 13.30 Invited
Multilayer Polymer Light-Emitting Diode and Solar Cell by Blade Coating, *Shin-Rong Tseng Tseng, Yu-Han Chang, Hsin-Fei Meng; Natl. Chiao Tung Univ., Taiwan.* Multilayer large-area polymer light-emitting diode and solar cell are fabricated by blade coating. High efficiency and uniformity are achieved for fluorescent and phosphorescent devices with all colors. For polymer solar cell good power conversion efficiency is achieved by blade coating in toluene solution.

ThY2 • 14.00 Invited
High Efficiency and Simple Architecture Phosphorescent OLEDs, *Tae Jin Park, Woo Sik Jeon, Jang Hyuk (Jeremy) Kwon; Kyung Hee Univ., Republic of Korea.* We present an ideal host-guest concept for high efficient phosphorescent OLEDs (PHOLEDs). An extremely low doping technique of 1% are developed in PHOLEDs. Simple architectures are also realized based on this ideal host guest concept. Organic double layer and triple layer architectures for PHOLEDs with high efficiency are reported.

Guang Da 7

ThR3 • 14.30
Multi-Tap Photonic Microwave Filter Based on Two-Pump Fiber Optical Parametric Amplifier, *Jia Li, Kim Ka-Yi Cheung, Xing Xu, Kenneth Kin-Yip Wong; Univ. of Hong Kong, Hong Kong.* A multi-tap photonic microwave filter based on two-pump fiber optical parametric amplifier (OPA) is proposed and an 8-tap filter is experimentally demonstrated. Tunability of the filter is also investigated in the paper, which shows consistency between experimental and theoretical results.

ThR4 • 14.45
Impact of Imperfect Directivity of Optical Circulators on the in-Band Crosstalk Tolerance in Bidirectional Amplifiers, *Byeong-Uk Gang, Chul Han Kim; Univ. of Seoul, Republic of Korea.* We investigated the in-band crosstalk tolerance in a typical bidirectional amplifier without inter-stage components. From the experimental results, we found that the imperfect directivity of optical circulators might improve the crosstalk tolerance with the linewidth broadening effect in a bidirectional amplifier implemented with only two circulators.

Guang Da 9

ThS3 • 14.30
Integration of Dielectric and Plasmonic Nanowires, *Xin Guo, Xining Zhang, Yaoguang Ma, Zhe Ma, Limin Tong; Dept. of Optical Engineering, Zhejiang Univ., China.* We demonstrate the evanescent coupling of light from a silica nanofiber into a silver nanowire to excite propagating plasmons in the silver nanowire. The plasmons can be transferred back to light at the other end of the silver nanowire. The polarization property of the output light is also investigated.

ThS4 • 14.45
Direct Measurements of Propagation Losses in Silver Nanowires, *Yaoguang Ma, Xiyuan Li, Limin Tong; Zhejiang Univ., China.* Propagation losses of surface plasmons in single silver nanowire waveguides were obtained by measuring light intensity at the end of a silver nanowire. Surface plasmons were excited directly by a tapered fiber. A typical propagation loss of 0.53 dB/μm was obtained.

Guang Da 11

ThT4 • 14.15
A LMMSE Channel Estimator for Coherent Optical OFDM System, *Song Yu, Mingying Lan, Weilin Li, Wanyi Gu, JianQuan Yao; Beijing Univ. of Posts and Telecommunications, China.* The CO-OFDM is sensitive to noises and dispersion, so the channel estimation becomes a key issue in performance improvements. An effective method based on LMMSE can compensate the losses more accurately than LS. It can bring in 2dB SNR gains compared with LS under the condition of BER=10^{-4}.

ThT5 • 14.30 Invited
High-Speed Photonic Integrated Devices for Advanced Modulation Formats, *Inuk Kang; Bell Labs, Alcatel-Lucent, USA.* We review recent developments of novel hybrid photonic-integrated modulators consisting of III-V devices and silica-on-silicon planar lightwave circuits. We discuss the device technology platform and the device applications to 80/100-Gb/s optical transmission and beyond.

Guang Da 12

ThU3 • 14.30
Capacity Planning of WDM Networks Using Cost-Based Ant Colony Algorithm, *Pei Luo, Shanguo Huang, Lin Lv, Bin Li, Jie Zhang, Wanyi Gu; Beijing Univ. of Posts and Telecommunications, China.* A cost-effective capacity planning method of WDM networks is proposed for increase of traffic load. An improved cost-based ant colony algorithm is presented from pheromone increase and update mechanisms to solve the planning problem. Simulation results show the applicability of our planning method.

ThU4 • 14.45
The Design and Implementation of Distributed Resource Manager in Optical Grid Networks, *Siwei Chen, Weisheng Hu, Wei Guo, Yaohui Jin; Shanghai Jiao Tong Univ., China.* Effective management of large amount of heterogeneous resources in optical grid is critical to the performance of the grid. This article proposes a distributed system for an integrated management of both application and network resources in Distributed Hash Table (DHT) mode.

Guang Yun 7

ThV2 • 14.30 Invited

Retinal Densitometry and Intrinsic Signal Imaging: Assessing Retinal Function by Stimulus-Evoked Light Reflectance Changes, *Kazushige Tsunoda[1,2]; [1]Natl. Inst. of Sensory Organs, Japan, [2]RIKEN Brain Science Inst., Japan.* Retinal function can be objectively evaluated by measuring the light reflectance changes of the ocular fundus following light stimulation. Two independent methods using either infrared light or visible light for illumination will be presented: the former is called intrinsic signal imaging and the latter is retinal densitometry.

Guang Yun 8

ThW3 • 14.15

Integrated 40 Gb/s DPSK Receiver Module for C+L Band with Athermal Free-Space Delay-Line Interferometer, *Andreas G. Steffan[1], Mads L. Nielsen[1], Andreas Umbach[1], Aurelien Boutin[2], Ludovic Fulop[2], Frederic Verluise[2]; [1]u2t Photonics AG, Germany, [2]Kylia, France.* We present a 40Gb/s DPSK receiver module with athermal free-space DLI. It offers wideband operation in the C+L band, a FSR of 43GHz, PDFS of 350MHz, TDFS (0-75°C) of 0.8GHz and a differential output voltage-swing of 600mVpp. 43Gb/s NRZ-DPSK back-to-back OSNR sensitivity is 18dB (PRBS 2^{31}-1).

ThW4 • 14.30

Analysis of Key Methods of MZ Setup in TTA, *Mike Wang, Yunhua Xu, Stephen Gardner; Oclaro, Inc., Shenzhen Office, China.* A dynamic control method for accurately setting up the operating point for MZ in Tunable Transmitter Assembly (TTA) AC test have been presented. Experiment results of a transmitter module with the method implemented have been presented. It demonstrates the methods improve application performance of the TTA.

ThW5 • 14.45

High Data Rate 850 nm Oxide VCSEL for 20 Gb/s Application and beyond, *Chen Ji, Jingyi Wang, David Söderström, Laura Giovane; Avago Technologies, USA.* In this paper we report 850nm oxide VCSEL operating at up to 25Gb/s (PRBS31) with 5dB ER, based on a high volume manufacturing platform with MOCVD grown GaAs/AlGaAs epi-material. We will also discuss VCSEL characterization results relevant for optical transceiver applications beyond 10Gb/s.

Guang Da 16

ThX3 • 14.30 Invited

Tumor Homing Nanoparticles for Cancer Imaging and Therapy, *Kwangmeyung Kim; Korean Inst. of Science and Technology, Republic of Korea.* This presentation proposes a new polymeric nanoparticle-based technology that offers unprecedented paradigm shift opportunity to cancer theragnosis (therapy and diagnosis). For example, chitosan-based nanoparticles were labeled or loaded of various imaging agents and therapeutic drugs which demonstrated specific cancer imaging and therapy. Nanoparticles based cancer theragnosis holds great promise for a myriad of cancer treatment.

Guang Da 18

ThY3 • 14.30

Dependence of the Photophysical Properties of the Exciplex in the Polymer Blends on the Composite Ratio and the Excitation Wavelengths, *Fei Dou, Xinping Zhang; Beijing Univ. of Technology, China.* We investigate the dependence of the optical spectral properties of the exciplex in a polymer blend consisting of Poly(9,9'-dioctylfluorene-co-benzotiadiazole)(ADS133YE) and poly(9,9'-dioctylfluorene-co-bis-N,N'-(4-butylphenyl)-bis-N,N'-phenyl-l,4-phenylenediamine)(ADS232GE) on the excitation wavelengths and on the composite ratio using steady-state and transient spectroscopy. Experimental results show the most efficient exciplex's emission at 1:6 (ADS133YE: ADS232GE) in 380 nm.

ThY4 • 14.45

Influence of Visual Feature for Application of High-Light Emitting Diode Arrays, *Shu-wang Chen, Hongxia Ma, Congcong Wang; HeBei Univ. of Science and Technology, China.* Light emitting diode (LED) display arrays have emerged as the leading technology for large indoor or outdoor display applications. The vision characteristics for the person's eye and the LED features and some methods for solving a certain factors that influence LED picture quality are described.

Guang Da 7

ThR5 • 15.00
Experimental Research on Secondary Pulsation in an All-Fiber Pulsed Amplifier, *Li Weiran, Tao Kuiyuan, Wang Zhi, Liu Yan-ge; Inst. of Modern Optics, Nankai Univ., China.* In this paper, secondary pulsation phenomenon occuring in the pulsed amplifier system is investigated. We find that this phenomenon depends a lot on the quality of splicing between different fibers. By controlling the pump power and choosing the suitable splicing parameters, we can get stable high power pulsed lasing output.

ThR6 • 15.15
A New Adaptive Erbium-Doped Fiber Amplifier, *Tao Xiao, Shilin Xiao, He Chen, Lingzhi Ge, Daozi Ding, Zhixin Liu; Shanghai JiaoTong Univ., China.* A new adaptive erbium-doped fiber amplifier (EDFA) is proposed. In the amplifier, an array of 1×2 optical switches is controlled to select the optimum erbium-doped fiber length for different input power, and meanwhile pump power is regulated. Simulation experiments have demonstrated that this amplifier can get good adaptability.

Guang Da 9

ThS5 • 15.00
Miniaturized Plasmonic Sensors Based on Semiconductor Laser Diode Packages, *Qiaoqiang Gan, Filbert Bartoli; Lehigh Univ., USA.* We combine plasmonic grating structures with commercially available semiconductor laser diode packages to realize a prototype miniaturized chemical/bio-sensor.

ThS6 • 15.15
"Rainbow" Trapping and Temperature Tunable Structures for Telecom Waves, *Qiaoqiang Gan, Filbert Bartoli; Lehigh Univ., USA.* We show that graded metallic gratings are capable of trapping electromagnetic waves at multiple frequencies within a certain band, manifesting itself as a trapped rainbow in the telecom frequency range. Thermo-optic material could be employed to make the structure to be temperature tunable.

Guang Da 11

ThT6 • 15.00
Long Haul WDM Transmission of Optical Minimum Shift Keying Format with Narrow Channel Spacing, *Andreas Hachmeister[1], Michael Rohde[1], Ronald Freund[2]; [1]Beuth Hochschule für Technik Berlin, Germany, [2]Fraunhofer Inst., Heinrich-Hertz-Inst. Berlin, Germany.* We investigated DWDM transmission performance of 10 GBit/s optical MSK format with narrow channel spacing by numerical simulations. On the 12.5 GHz ITU grid MSK was shown to bridge higher transmission distances than the reference format DQPSK.

ThT7 • 15.15
Staggered Differential Phase-Shift Keying Format with RZ or CSRZ Clock for 100Gbit/s Transmission, *Yufeng Shao, Nan Chi, Xinying Li, Chunning Hou, Shumin Zou, Xiao Liu, Xi Zheng, Junwen Zhang, Wuliang Fang; Dept. of Communication Science and Engineering, Fudan Univ., China.* Two novel optical phase modulation formats, the staggered SDPSK with RZ and CSRZ shape, are proposed and compared for 100 Gbit/s medium-range transmission applications. The demodulation of two phase formats can be achieved on 1 bit rate through only one balanced receiver. The transmission performance of two signals are compared.

Guang Da 12

ThU5 • 15.00
Dynamic Domain-Sequencing Scheme for Inter-Domain Path Computation in WDM Networks, *Xin Wan, Yue Chen, Hanyi Zhang, Xiaoping Zheng; Tsinghua Univ., China.* A dynamic domain-sequencing scheme is proposed for Backward Recursive Path Computation Element (PCE) -Based Computation (BRPC) in multi-domain WDM networks. Simulation evaluation shows that the proposed scheme is effective in inter-domain path computation with more efficient resource utilization and lower blocking probabilities.

ThU6 • 15.15
Dynamic Overlay Routing Based on Active Probing Measurements: An Emulation Study, *Xinxin Zhang, Wei Ye, Yaohui Jin; State Key Lab of Advanced Optical Communication System and Network, Shanghai Jiao Tong Univ., China.* Path diversity provided by overlay networks brings about possibilities to choose alternate optimal path against default one. In this paper, we present a routing mechanism which chooses path based on a composite metric, whose comprising metrics are determined by active probing measurements on the overlay network in a real-time fashion.

14.30–18.30 ThZ • INDUSTRY FORUM: Photonics for Green Energy–LED Lighting, *Guang Yun 1*

15.30–16.00 Tea Break, *Everbright East Exhibition Hall*

15.30–17.00 Exhibit Only Time, *Everbright East Exhibition Hall*

Guang Yun 7

ThV3 • 15.00 Invited

Applying Biophotonic Science and Technology in Medicine and the Life Sciences, *Frank Chuang, Thomas Huser, Stephen Lane, Dennis Matthews; Univ. of California at Davis, USA.* We present an overview of research at the NSF Center for Biophotonics Science and Technology (CBST) to develop and apply new optical tools and techniques for the advancement of basic science and to address critical challenges in medicine, including cancer, infectious disease, cardiovascular disease, stem cell research, and neuroscience.

Guang Yun 8

ThW6 • 15.00

Energy Level Properties of Coupled Quantum Well and the Optimal Design for Traveling-Wave Modulators, *Zhixin Xu; Zhejiang Univ. of Science and Technology, China.* The formation of the lowest subband states in symmetric coupled quantum-well are analyzed with the use of two-energy-level system. Based on perfect work condition of traveling-wave modulators, the structure of coupled quantum-well is optimized and the optimized coupled quantum well has a large electro-refractive index variation at low absorption loss.

Guang Da 16

ThX4 • 15.00 Invited

Gold Nanocages for Optical Imaging and Therapeutic Applications, *Younan Xia; Washington Univ. in St. Louis, USA.* In this talk, I will discuss how gold nanocages have been engineered with optimal scattering and absorption properties for a range of applications, including their use as contrast agents for optical coherence tomography, photoacoustic tomography, and as therapeutic agents for photothermal treatment.

Guang Da 18

ThY5 • 15.00

Study on a Quasi-CW Nd:YAG Frequency-Doubled Laser at 660nm, *Tao Wang[1,2], Ling Guo[1], Jianquan Yao[3], Guilan Ma[2]; [1]Hebei Industry Univ., China, [2]Wuxi Hope Optoelectronics Co. Ltd., China, [3]Tianjin Univ., China.* A QCW Nd:YAG intracavity frequency doubled red laser was made. Using a flat_flat laser cavity, 2 Kr-lamps , KTP crystal and an AO Q-switch, 2 W output power at 660 nm was obtained. The relationship between laser cavity length and output power is analyzed.

14.30–18.30 ThZ • INDUSTRY FORUM: Photonics for Green Energy–LED Lighting, *Guang Yun 1*

15.30–16.00 Tea Break, *Everbright East Exhibition Hall*

15.30–17.00 Exhibit Only Time, *Everbright East Exhibition Hall*

Guang Da 7

17.00–18.30
ThAA • Microstructured Fibers
Morten Ibsen; Univ. of Southampton, UK, Presider

ThAA1 • 17.00 Invited
Structured Fibres and Gratings for Sensing, *John Canning; Univ. of Sydney, Australia.* Structured fibres are heralding new ways to deal with old problems, allowing the tailoring of the macro properties of fibres such as temperature and strain coefficients. Combining these channels with new materials that exploit the localisation of light at the interface to enhance sensitivity with laser processed components offers an unprecedented level of device complexity.

ThAA2 • 17.30 Tutorial
Microfiber and Nanofiber Optics: Principles and Applications, *Limin Tong; Zhejiang Univ., China.* When its diameter goes down to or below the wavelength of the light, an optical micro-/nanofiber exhibits interesting properties such as tight optical confinement, high fractional evanescent waves, steep field gradient, enhanced field intensity and large waveguide dispersion, which opens a variety of opportunities for connecting fiber optics with near-field optics, nonlinear optics, quantum optics and plasmonics on a micro or nanoscale.

Guang Da 9

17.00–18.45
ThBB • Nanophotonics
Fumio Koyama; Tokyo Inst. of Technology, Japan, Presider

ThBB1 • 17.00 Invited
Coherently Controlled Photonic Band Gap and Its Applications in Optoelectronic Devices, *Wei Li[1], Seyed M. Sadeghi[2], Xun Li[3], Wei-Ping Huang[3]; [1]Univ. of Wisconsin-Platteville, USA, [2]Univ. of Alabama at Huntsville, USA, [3]McMaster Univ., Canada.* We investigate the coherent control of an asymmetric-multiple-quantum-well structure. Due to the quantum interference effect, the probe light optical properties can be manipulated by a control laser beam. This phenomenon can be used to realize coherently controlled photonic band gap. Some novel applications are demonstrated by computer simulation.

ThBB2 • 17.30
A 1550nm PbSe Quantum Dots Fiber Amplifier Excited by Evanescent Wave, *Jing Wang, Fufei Pang, Xianglong Zeng, Zhenyi Chen, Tingyun Wang; Shanghai Univ., China.* A novel evanescent wave excited PbSe quantum dots fiber amplifier was proposed and studied. The PbSe quantum dots doped film was as the gain material which was dip-coated on to a fusion tapered fiber coupler. With 980nm wavelength LD as pump, optical amplification was observed at 1550nm wavelength.

Guang Da 11

17.00–18.15
ThCC • Hybrid Wireless and Optical Networks
Gert Grammel; Alcatel-Lucent, Germany, Presider

ThCC1 • 17.00 Invited
Towards Seamless Hybrid Communications System, *Yinghua Ye[1], Hui Zang[2]; [1]Res., Technology and Platforms, Nokia Siemens Networks, USA, [2]Sprint Applied Res. Group, USA.* By capitalizing emerging technologies from both the RF and the optical domains, this paper proposes a hybrid system architecture by leveraging the programmable/cognitive radio technology and free space optical communication. We identify some key research issues to enable such a system with high data rate, mobility, and heterogeneous QoS support.

ThCC2 • 17.30 Invited
Principle, Technology and Challenge of Radio over Fiber (RoF) Based Broadband Access for Metro and Inter-City Trains, *Michael Minli Zhou; Shanghai Univ. of Engineering Science, China.* The paper performs investigation to the solution of the metro or inter-city train broadband access network utilizing the Radio over Fiber (RoF) technology. The author proposes the network architecture, addresses the requirements establishing the objective network, and analyzes the issues and challenges of the system realization.

Guang Da 12

17.00–18.30
ThDD • Survivable Networks I
Lena Wosinska; KTH, Royal Inst. of Technology, Sweden, Presider

ThDD1 • 17.00 Invited
Dynamic Lightpath Networking via Overlay Control of Static Optical Connections, *George Rouskas; North Carolina State Univ., USA.* To bridge the gap between the current practice of setting up expensive, dedicated, lightpath connections (i.e., static topologies), and the distant future vision of inexpensive access to dynamically switched end-to-end lightpaths, we propose a medium term solution in the form of edge-reconfigurable optical networks (ERONs).

ThDD2 • 17.30 Invited
Green Wireless-Optical Broadband Access Network (WOBAN), *Biswanath Mukherjee, Pulak Chowdhury; Univ. of California at Davis, USA.* Energy consumption in next-generation access networks is rapidly increasing with the increase of traffic demands generated by end users. In this paper, we outline challenges and solution approaches for designing "green" Wireless-Optical Broadband Access Network (WOBAN).

Guang Yun 7

17.00–18.30
ThEE • Magneto-optics and Acousto-optics
Yi Sun; OFS Fitel, USA, Presider

ThEE1 • 17.00
RF-Sputtered Bi-Substituted Iron Garnet Composite Films for Visible-Range Magnetooptics, *Mohammad Nur-E-Alam[1], Mikhail Vasiliev[1], Kamal Alameh[1], Viacheslav Kotov[2]; [1]Electron Science Res. Inst., Edith Cowan Univ., Australia, [2]Inst. of Radio Engineering and Electronics, RAS, Russian Federation.* We report on the synthesis of new magneto-optical materials with excellent optical and magneto-optical properties for visible-range and near-infrared applications. Bi-substituted composite garnet films fabricated with excess bismuth oxide content using RF co-sputtering and oven-annealing processes have been found to possess simultaneously record MO quality and uniaxial magnetic anisotropy.

ThEE2 • 17.15
A Novel Magneto-Optic Switch Based on Nanosecond Pulse, *Jianjian Ruan, Zihua Weng, Shaohan Lin; Xiamen Univ., China.* In this paper, a novel magneto-optic switch based on nanosecond pulse and high-speed magnetic field is proposed and analyzed. The switching time of the device is about 100~400ns, which is desirable for bit-level switching in fiber communication networks.

ThEE3 • 17.30
Effects of Magnetic Field on Photorefractive Compound Semiconductors, *Sunayana Mahajan; Northern India Engineering College, India.* Using two-waves mixing of pico-second pulses in photorefractive-crystal, the role of the magneto-static field on photorefractive parameters is analyzed. It is found that magnetic-field plays a crucial role near the resonance condition when time delay is order of recombination time and diffraction efficiency of recorded hologram can be significantly enhanced.

Guang Yun 8

17.00–18.30
ThFF • Optical Packet Switched Networks
Ken-ichi Sato; Nagoya Univ., Japan, Presider

ThFF1 • 17.00 Invited
High-Performance Multicasting Schemes in Optical Packet Switched Networks, *Yuefeng Ji, Xin Liu, Jie Zhang, Min Zhang; Beijing Univ. of Posts and Telecommunications, China.* Different multicasting schemes and their performance in the Optical Packet Switched networks are investigated in this paper. Computer simulation results show that compared with the parallel-mode and serial-mode multicasting schemes, hybrid-mode multicasting scheme is the best way to deliver multicast sessions in the OPS networks due to its highest performance.

ThFF2 • 17.30 Invited
Key Requirements of Packet Transport Network Based on MPLS-TP, *Feng Huang, Xiaobo Yi, Hanzheng Zhang, Ping Gong; Alcatel Shanghai Bell, China.* Requirement of packet transport network based on MPLS-TP are analyzed including in transport plane, OAM, survivability, QoS, control plane and management plane. MPLS-TP standard status is also introduced.

Guang Da 16

17.00–18.45
ThGG • Nano-biophotonics for Imaging and Therapy II
Zhihong Zhang; Huazhong Univ. of Science and Technology (HUST), China, Presider

ThGG1 • 17.00 Invited
Advanced Confocal Microscopy in Biophotonics and Nanobiophotonics, *Ilko K. Ilev[1], Yu Chen[2]; [1]U.S. Food and Drug Administration (FDA), USA, [2]Univ. of Maryland, USA.* Based on simple fiber-optic confocal approaches, we have developed some advanced biophotonics and nanobiophotonics imaging and sensing techniques which can be used as ultrahigh-resolution systems for imaging/sensing beyond the diffraction barrier in the subwavelength nanometric range at cellular, intracellular and bulk tissue level.

ThGG2 • 17.30 Invited
Upconverting Luminescence Nanocrystals for Biomedical Applications, *Stefan Andersson-Engels[1], Can Xu[1], Johan Axelsson[1], Haichun Liu[1], Pontus Svenmarker[1], Gabriel Somesfalean[1], Zhiguo Zhang[2]; [1]Lund Inst. of Technology, Sweden, [2]Harbin Inst. of Technology, China.* We have demonstrated luminescence imaging using upconverting nanocrystals in a liquid tissue phantom. A very sensitive instrument employing excitation at 980 nm, and luminescence at 800 nm is utilized. This scheme avoids any background from tissue autofluorescence. The signal-to-background contrast obtainable is much better as compared to ordinary Stokes-shifting dyes.

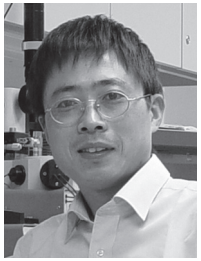
Guang Da 18

17.00–18.30
ThHH • Solar Cells
Hao-chung Kuo; Natl. Chiao-Tung Univ., Taiwan, Presider

ThHH1 • 17.00 Invited
Development of III-V Multi-Junction Solar Cells on Ge Substrates, *Taek Kim, Joo Sung Kim, Sang Moon Lee, Dong Ho Kim, Myoung Gyun Suh, Jieun Chang, Young Soo Park; Semiconductor Lab, Materials and Devices Res. Ctr., Samsung Advanced Inst. of Technology, Republic of Korea.* III-V multi junction solar cell has of great potential to generate the lowest cost electricity due to its highest efficiency. In this talk, we will review how multi junction cell can achieve the grid parity electricity and some development procedure of triple junction cell on a germanium substrate.

ThHH2 • 17.30 Invited
Photonic Crystal Silicon Based Structures for Thin Film Solar Cell, *Emmanuel Drouard[1], Yeonsang Park[1,2], Ounsi El Daif[1,2], Xavier Letartre[1], Pierre Viktorovitch[1], Alain Fave[2], Anne Kaminski[2], Mustapha Lemiti[2], Christian Seassal[1]; [1]École Centrale de Lyon, France, [2]INSA de Lyon, France.* The absorption of an ultra-thin layer can be significantly increased by patterning a photonic crystal. The incident light couples into slow Bloch modes, enabling a robust control of the photon lifetime and then, the enhancement of the absorption integrated over the whole solar spectrum.

Guang Da 7



Limin Tong received B.S., M.S., and Ph.D. degrees from Zhejiang University, Hangzhou, China, in 1991 (Physics), 1994 (Optics), and 1997 (Materials Science and Engineering), respectively. Since 1997, he has worked in the Department of Physics at Zhejiang University (1997-2001), Mazur group at Harvard University (2001-2004) and the Department of Optical Engineering at Zhejiang University (since 2004), and is currently a professor and director of the Department of Optical Engineering at Zhejiang University. His research interest covers nanophotonics and fiber optics including theory, materials and applications of nanophotonic structures and optical fibers, with emphases on optical micro/nanofibers and nanowires. He has published more than 100 original publications in refereed journals and conferences, several book chapters and one book. He has received several awards including "Wang-Da-Heng Optics Award" from the Optical Society of China (2007), China Youth Science and Technology Prize (2006) and Young Teachers award from Fok Ying Tung education foundation (2006).

Guang Da 9

ThBB3 • 17.45
Enhanced Spontaneous Emission of Electric Dipole by Nano-Optical Antenna, *Hui Gao, Kang Li, Fan Min Kong, Hao Xie, Jia Zhao; School of Information Science and Engineering, Shandong Univ., China.* Characteristics of gold nano optical antennas in 500-900 nm are studied by FDTD method. Huge confined electric field and 4500-fold Purcell factor enhancement are obtained by surface plasmons. We find nano-ellipsoids with L/R=4 is best to enhance spontaneous emission and piecewise linearity lies between our particle length and resonant wavelength.

ThBB4 • 18.00
Yb-Doped Silica Preform Precursor Nanoparticles and the Photodarkening in Them, *Liangming Xiong, Edson H. Sekiya, Kazuya Saito; Toyota Technological Inst., Japan.* Yb-doped silica nanoparticles were fabricated in a MCVD process. Their compositions and doping levels were well controlled. The nanoparticles are of about 21.3 ± 4.6 nm in size, and exhibit the Yb^{3+}-absorption in NIR and several photodarkening bands in UV-Vis. The photodarkening strongly depends on the compositions.

ThBB5 • 18.15
Influence of Nanoparticles Concentration on Fluorescence Quenching in Gold/Rhodamine 6G Nanoassemblies, *Lin Dong[1], Jun Hu[1,2], Fei Ye[1], Sergei Popov[1], Ari T. Friberg[1,3,4], Mamoun Muhammed[1]; [1]Royal Inst. of Technology, Sweden, [2]Zhejiang Univ., China, [3]Helsinki Univ. of Technology, Finland, [4]Univ. of Joensuu, Finland.* Fluorescence enhancement of dye solution doped with gold nanoparticles is a well-known effect. However, depending on size and concentration, nanoparticles can also deteriorate dye lasing properties due to increased quenching of the excited molecules. Here we report experimental results on such dependence of fluorescence degradation on the nanoparticle concentration.

ThBB6 • 18.30
Preparation and Optical Characteristics of BBO Nanowires, *Qu Guangyuan, Tong Limin; Zhejiang Univ., China.* BBO nanowires have been synthesized using a hydrothermal method followed by a post-sintering. The results show that the products are well crystallized and have good morphology. Optical characteristics of the nanowires are investigated, which indicate that BBO nanowires have potential applications in optical waveguides and nanoscale nonlinear optical devices.

Guang Da 11

ThCC3 • 18.00
Communication Protocol Based on Optical Low-Energy-Adaptive-Clustering-Hierarchy (O-LEACH) for Hybrid Optical Wireless Sensor Networks, *Lianshan Yan, Wei Pan, Bin Luo, Jiangtao Liu, Mingfeng Xu; Southwest Jiaotong Univ., China.* We propose an energy-efficient communication protocol, called optical-LEACH (O-LEACH), for hybrid sensor networks that consist of distributed optical fiber sensor links located at the center and two isolated wireless sensor networks (WSNs) with randomly scattered nodes. Network performances in terms of lifetime are simulated with ~30% improvement over LEACH protocol.

Guang Da 12

ThDD3 • 18.00
Reliability Guaranteed Path Protection under Multiple Constraints, *Yang Liu, Zheng Zheng, Xingchun Liu; Beihang Univ., China.* A scheme based on a modified multi-constrained k-shortest path algorithm and a cost function with high efficiency for backup path selecting is proposed to provide path protection under multi-constraints. Simulation results demonstrate its significant superiority in restoration path-finding capability for QoS routing.

ThDD4 • 18.15
A PCE-Based Fast Reroute Algorithm for Multi-Failures in Multi-Domain Optical Networks, *Xuping Cao[1], Jie Zhang[1], Yongli Zhao[1], Jian Liu[2], Dahai Han[1], Wanyi Gu[1]; [1]Key Lab of Information Photonics and Optical Communications, Inst. of Optical Communications and Optoelectronics, Beijing Univ. of Posts and Telecommunications, China, [2]Hunan Environmental Protection Bureau, China.* A routing architecture based on PCE has been designed for the large, multi-layer and multi-domain optical networks, and a PCE-based fast reroute algorithm has been proposed for multi-failures in multi-domain optical networks.

Guang Yun 7

ThEE4 • 17.45
Multipartite Entanglement in a Discrete Magnetic Bands Magnetic Lattice, *Ahmed M. Abdelrahman[1], Peter Hannaford[2], Mikhail Vasiliev[1], Kamal Alameh[1]; [1]Electron Science Res. Inst., Edith Cowan Univ., Australia, [2]Swinburne Univ. of Technology, Australia.* An asymmetric multi-quantum state magnetic lattice is proposed to host entangled system formed by using Bose Einstein Condensate. Discrete magnetic bands magnetic lattice is devised to locate a controllable long-range entanglement of a many qubits well separated in space. Confinement of the system may improve the condition for long-range entanglement.

ThEE5 • 18.00
Magnetic Hyper-Rayleigh Scattering in Core (Shell) Nanoparticles, *Irina A. Kolmychek, Tatyana V. Murzina, Oleg A. Aktsipetrov; Moscow State Univ., Russian Federation.* The films containing core (shell) Fe_2O_3 (Au) nanoparticles that possess the plasmon resonance at the wavelength 550 nm are prepared. The second harmonic generation in these structures is shown to be in the form of hyper-Rayleigh scattering. The magnetization-induced partial coherence of second harmonic is observed in specular scattering direction.

ThEE6 • 18.15
Suppression Sidelobes of AOTF with Different Weighting Functions, *Yuehong Zhu[1], Hai Qi[2], Jihua Wen[1], Qiang Liu[1], Yuan Wang[1]; [1]Shijiazhuang Univ. of Economics, China, [2]Hebei Univ. of Science and Technology, China.* AOTF has sidelobe as well as other filters and sidelobe level reaches to some extent, cross-talk will occur, then sidelobe suppression becomes essential. Ways of Apodization are birefringent apodization, weighted coupling, etc. The optimal optical filter responses of AOTF with weighting function is gained, which is lower than -41dB.

Guang Yun 8

ThFF3 • 18.00
An Effective Routing Strategy through Impairment-Aware RWA in Transparent Optical Network, *Wanshu Guo, Jie Zhang, Guanjun Gao, Dahai Han, Wanyi Gu, Yuefeng Ji; Key Lab of Information Photonics and Optical Communications, Ministry of Education, Beijing Univ. of Posts and Telecommunications, China.* A dynamic impairment-aware RWA algorithm is proposed in this paper. By jointly consideration of both available wavelength and wavelength dependent impairments, the routing weight functions can be dynamically updated to accommodate between wavelength blocking and physical layer blocking. Simulation results indicate that the proposed algorithm can achieve lower blocking probability.

ThFF4 • 18.15
Novel Multi-Granularity Optical Switching Node with Wavelength Management Pool Resources, *Guangyong Zhang, Qianjin Xiong, Shuqiang Shen; Huawei Technologies Co., Ltd., China.* A novel multi-granularity optical switching node with wavelength management poll resource is presented, which is much more cost effective and multifunctional than the conventional architectures.

Guang Da 16

ThGG3 • 18.00
Carbon Nanotube Assisted Laser Thermotherapy of Skin Cancers - Pilot Proof-of-Principle Study in a Murine Model, *Naiyan Huang[1,2,3], Hequn Wang[1,2], Jianhua Zhao[1,2], Harvey Lui[2], Mladen Korbelik[1], Haishan Zeng[1,2]; [1]British Columbia Cancer Res. Ctr., Canada, [2]Lab for Advanced Medical Photonics, Photomedicine Inst., Dept. of Dermatology and Skin Science, Univ. of British Columbia and Vancouver Coastal Health Res. Inst., Canada, [3]Dept. of Laser Medicine, Chinese PLA General Hospital, China.* Ten groups of mice were exposed to 785 nm laser after intratumoral injection of single-wall carbon nanotubes (SWNTs). The temperature within the tumors increased in light- and drug-dose dependent manner; optimized light and drug dose combinations resulted in eradication of skin tumors. SWNTs persisted within the tumor tissue for months.

ThGG4 • 18.15 Invited
Hybrid Nano Plasmonics for Integrated Biosensor, *Chii-Wann Lin[1], Jiun-Haw Lee[1], Jacob Kou-Chen Liu[2], Feng-Yu Tsai[1], Chia-Yu Yen[1], Chun-Nan Lee[1]; [1]Natl. Taiwan Univ., Taiwan, [2]Chang Gung Univ., Taiwan.* SPR biosensor with OLED and nano-grating for HBV LAMP product detection is reported. Directional emissions by grating-coupler match the resonant condition of SP modes. Concentration changes result in color shift at specific angle. Real time detection of virus load down to 5 copies/25 μl can be achieved in 30 minutes.

Guang Da 18

ThHH3 • 18.00
Numerical Study on Efficiency Enhancement of an InGaN Solar Cell with Embedded Metal Nanoparticles for Surface Plasmon Interaction, *Jyh-Yang Wang, Fu-Ji Tsai, Yean-Woei Kiang, C. C. Yang; Natl. Taiwan Univ., Taiwan.* Numerical simulations of an InGaN-based solar cell with embedded Ag nanoparticles in the absorption layer show significant efficiency increase through surface plasmon induced absorption enhancement. Carrier transport blocking by the embedded nanoparticles affects little the efficiency. An increase of 19% in maximum output power density is demonstrated.

ThHH4 • 18.15
New Materials of Co-Doped ZnO for LEDs and Thin Films Solar Cells, *Yuzhen Yuan[1], Hui Wang[2]; [1]School of Science, Shandong Univ. of Technology, China, [2]School of Materials Science and Engineering, Shandong Univ. of Technology, China.* Zr-Al co-doped ZnO were prepared by DC magnetron sputtering on glass substrates. Microstructure, optoelectrical properties of the films were investigated. The films with resistivity of $1.07\times10^{-3}\Omega$cm and an average optical transmission of 88.5% in the visible range were obtained. The optical bandgap was about 3.48-3.57 eV.

Guang Yun 1	Guang Da 7	Guang Da 9	Guang Da 11

8.00–17.00 Registration Open, *Everbright Center Lobby*

8.30–10.15
FA • Optical Devices I
Perry Ping Shum; Nanyang Technological Univ., Singapore, Presider

FA1 • 8.30 Invited

Wideband Parametric Delay Dispersion Tuner: A New Class of Devices for All Optical Networks, *Shu Namiki, Takayuki Kurosu; AIST, Japan.* This talk will argue that the parametric processes in fiber have many unique features that can be exploited for the future dynamic all optical networks, and will review authors' recent research activities, i.e. parametric tunable dispersion compensator and parametric delay dispersion tuner.

FA2 • 9.00

A Novel FBG Laser Sensor Based on Beat Frequency Modulation Technology, *Liang Zhang[1], Shengchun Liu[1,2], Zuowei Yin[1], Liang Gao[1], Xiangfei Chen[1]; [1]Nanjing Univ., China, [2]Heilongjiang Univ., China.* Based on the beat frequency demodulation technology, a novel dual-wavelength fiber laser sensor with a strain sensitivity of about (-3.92) MHz/με is proposed and experimentally realized. By employing a $LiNbO_3$ modulator, the high-frequency beating signal can be tuned arbitrarily to tens or hundreds of megahertz without distortion.

FA3 • 9.15

Metal-Based 1X2 Plastic Optical Fiber (POF) Splitter for Video over POF System Application, *Abang Annuar Ehsan[1], Sahbudin Shaari[1], Mohd Kamil Abd Rahman[2]; [1]Univ. Kebangsaan Malaysia, Malaysia, [2]Univ. Teknologi MARA, Malaysia.* A 1X2 POF splitter based on a Y-branch metal hollow POF coupler design has been developed. The POF splitter has an insertion loss of 5.8 ± 0.2 dB, excess loss of 2.7 dB and coupling ratio of 1:1. The POF splitter has been tested in a video-over POF system application.

8.30–10.15
FB • Semiconductor Lasers I
Liming Zhang; Bell Labs, Alcatel-Lucent, USA, Presider

FB1 • 8.30 Invited

InAs/InP Based Quantum Dash Mode-Locked Lasers for WDM Transmission and Millimeter Wave Generation, *Guang-Hua Duan; Alcatel Thales III-V Lab, France.* This paper summarizes recent advances on InAs/InP mode-locked quantum dashes lasers operating in the 1.5 μm wavelength range. In particular, this paper will address two main applications of these mode-locked lasers: comb generation for wavelength-division-multiplexing transmission and millimeter wave generation.

FB2 • 9.00 Invited

Quantum Dot Microlasers, *S. Reitzenstein, C. Kistner, S. Münch, T. Heindel, C. Schneider, M. Strauss, A. Rahimi-Iman, S. Höfling, M. Kamp, A. Forchel; Technische Physik, Roentgen Res. Ctr. for Complex Material Systems, Würzburg Univ., Germany.* Laser emission from a low number of InGaAs quantum dots embedded in optically and electrically pumped high-Q micropillar laser structures will be presented. The talk will focus on the demonstration of high-beta low threshold lasing with threshold currents below 10μA and single quantum dot controlled gain modulation under optical excitation.

8.30–10.00
FC • Physical Effects Studies I
Masatoshi Suzuki; KDDI R&D Labs, Japan, Presider

FC1 • 8.30 Invited

Physical Impairment Aware Transparent Optical Networks, *Jean-Christophe Antona, Thierry Zami, Annalisa Morea, Florence Leplingard; Bell Labs, Alcatel-Lucent, France.* This paper discusses the impact of physical impairments estimation in designing and operating reconfigurable optically transparent networks, accounting for uncertainties and the level of confidence of the connection feasibility predictions.

FC2 • 9.00

Electrical Compensation of FWM Impairment by Phase Diversity Detection via Backward Propagation, *Jing Liang, Katsushi Iwashita; Kochi Univ. of Technology, Japan.* The nonlinear impairment of FWM is compensated by phase diversity detection. Two optical signals and the generated FWM components are through 20-km DSF, detected by phase diversity detection with one local oscillator. The detected signals are compensated by off-line signal processing using backward propagation.

FC3 • 9.15

ADC Bandwidth Optimization for Coherent Optical Detection in Phase-Modulated Systems, *Shaoliang Zhang[1], Jian Chen[2], Changyuan Yu[1,2], Weifeng Rong[2], Pooi Yuen Kam[1]; [1]Natl. Univ. of Singapore, Singapore, [2]A*STAR Inst. for Infocomm Res., Singapore.* We studied the impact of the bandwidth of an analog-to-digital converter (ADC) on coherent optical detection. The optimum bandwidth is found to be 0.5 times symbol rate for both RZ- and NRZ- PSK systems, different from the direct-detection counterparts.

8.30–10.15
FD • Survivable Networks II
Hiroaki Harai; NICT, Japan, Presider

FD1 • 8.30 Invited

Integrated Restoration for Next-Generation IP-over-Optical Networks, *Gagan Choudhury, Angela L. Chiu, John Strand, Robert Doverspike, Guangzhi Li; AT&T Labs Res., USA.* We proposed an integrated restoration method for next generation IP-over-Optical networks and conducted cost analysis demonstrating significant cost saving using the method compared to optimized IP-only restoration.

FD2 • 9.00 Invited

Constraint-Aware Policy-Enabled Routing Strategy for Scalable Multi-Domain Multi-Layer Optical Networks, *Min Zhang, Yuefeng Ji, Jie Zhang; Key Lab of IPOC, MOE, Beijing Univ. of Posts and Telecommunications, China.* Proposed in this paper is a dual routing engine-based routing architecture for multi-domain multi-layer networks. An interpreter-based modeling of the group engine is discussed and a preliminary routing strategy is designed with consideration of scalability and flexibility.

Guang Yun 7	Guang Yun 8	Guang Da 12	Guang Da 16

8.00–17.00 Registration Open, *Everbright Center Lobby*

8.30–10.15
FE • New Biophotonics Technologies I
Jin U. Kang; Johns Hopkins Univ., USA, Presider

FE1 • 8.30 Invited

Active Thermal Imaging, *Israel Gannot; Tel Aviv Univ., Israel.* Alternating magnetic fields controls the temperature elevation of super-paramagnetic nanoshells, specifically bound to tumor area. A thermal camera captures images those nanoshells and relates them to a tumor location. Additional alteration of the external field enables higher confined temperature elevation that creates specific local necrosis of the tumor.

FE2 • 9.00 Invited

Multi-Spectral Optoacoustic Tomography: Next Generation Platform for High Resolution Imaging of Diffuse Tissues, *Daniel Razansky[1,2], Vasilis Ntziachristos[1,2]; [1]Inst. for Biological and Medical Imaging, Technical Univ. of Munich, Germany, [2]Helmholtz Ctr. Munich, Germany.* This paper focuses on multi-spectral optoacoustic tomography (MSOT), a new powerful addition to the molecular imaging arsenal that brings the best out of the optical imaging potential. Multispectral excitation combines ability to resolve diverse contrast mechanisms provided by the optical wavelengths with high resolution deep tissue penetration of optoacoustics.

8.30–10.15
FF • Access Technology
Christina Lim; Univ. of Melbourne, Australia, Presider

FF1 • 8.30 Invited

Radio-over-Fiber Systems for Multi-Gbps Wireless Communication, *Anthony Ng'oma, Michael Sauer; Corning Inc., USA.* The paper discusses the challenges of using radio-over-fiber systems to distribute multi-gigabit-per-second wireless signals at mm-wave frequencies. We propose possible solutions to the challenges, and demonstrate the potential of radio-over-fiber systems to support multi-standard wireless communication at data speeds exceeding 14Gbps using the 60 GHz band.

FF2 • 9.00 Invited

Demonstration of Real-Time Multi-Gigabit Optical OFDM Modems for Optical Access Networks, *R. P. Giddings, X. Q. Jin, X. L. Yang, Jianming Tang; Bangor Univ., UK.* The first experimental demonstration of real-time 3Gb/s Optical OFDM (OOFDM) modems is reported, using off-the-shelf components and improved IFFT/FFT design. In directly modulated DFB laser-based, optical-amplifier- and dispersion-compensation-free, IMDD systems, 16QAM-encoded OOFDM transmission over 500m MMFs (75km MetroCor SMFs) is achieved with optical power penalties of 1.7dB (-1.9dB) at $1.0x10^{-4}$ BERs.

8.30–10.15
FG • Dynamic Lightpath Control
Yuefeng Ji; Beijing Univ. of Posts and Telecommunications, China, Presider

FG1 • 8.30 Invited

Lightpath Routing Considering Differentiated Physical Layer Constraints in Transparent WDM Networks, *Lena Wosinska[1], Amornrat Jirattigalachote[1], Paolo Monti[1], Anna Tzanakaki[2], Kostas Katrinis[2]; [1]Royal Inst. of Technology (KTH), Sweden, [2]Athens Information Technology, Greece.* We investigate WDM network performance improvement by applying routing algorithms taking into account differentiated signal quality requirement. We consider network survivability based on dedicated and shared path protection where both working and protection paths are calculated according to our algorithm. A significant improvement is obtained compared with the conventional algorithms.

FG2 • 9.00 Invited

The Challenge of Controlling Zero Touch Photonics with GMPLS, *Gert Grammel; Alcatel-Lucent, Germany.* Zero Touch photonic solutions require a carefully designed control plane to cope with physical impairments and the need for 3R regeneration. GMPLS extends the reach of WDM network domains beyond the physical limits of pure wavelength switching.

8.30–10.15
FH • Photodetectors
Yong-Zhen Huang; Inst. of Semiconductors, CAS, China, Presider

FH1 • 8.30 Invited

Silicon-Based Long Wavelength Photodetectors, *Buwen Cheng, Haiyun Xue, Chunlai Xue, Chuanbo Li, Cheng Li, Weixuan Hu, Yuhua Zuo, Qiming Wang; Inst. of Semiconductors, CAS, China.* Three types of Si-based photodetectors (PD) operating at long wavelength were introduced, the strained SiGe/Si multi-quantum-wells PD and Ge/Si islands PD with resonant cavity enhanced (RCE) structure, Ge p-i-n PD on silicon and SOI, Ge/Si avalanche photodetectors (APDs) with separate absorption, charge and multiplication (SACM) structure.

FH2 • 9.00

50-MHz High Speed Bilayered Organic Photodetector, *Wu-Wei Tsai[1], Yu-Chiang Chao[2], Hsiao-Wen Zan[1], Hsin-Fei Meng[2], Yu-Tai Tao[3]; [1]Dept. of Photonics and Inst. of Electro-Optical Engineering, Natl. Chiao Tung Univ., Taiwan, [2]Inst. of Physics, Natl. Chiao Tung Univ., Taiwan, [3]Inst. of Chemistry, Academia Sinica, Taiwan.* A bilayered organic photo diode for the detection of 50-MHz signals is firstly demonstrated. With C60 as the acceptor material and pentacene as the hole transport layer, high electron/hole mobility enlarges operation bandwidth. The results enable the development of low-cost organic image sheets for the detection of high-frequency signals.

FH3 • 9.15

Study on High Speed Photodetectors with Plasmonics Flilter, *Yufeng Shang, Yongqing Huang, Xiaofeng Duan, Xian Ye, Hui Huang, ShiWei Cai, Qi Wang, Xiaomin Ren; Beijing Univ. of Posts and Telecommunications, China.* A new photodetector was designed with Metal Aperture Arrays filter in this paper. The shape and dimensions of the holes in an array do influence its transmission spectrum compare to the conventional photodetector. Hole array and annular aperture arrays were discussed.

Guang Yun 1

FA4 • 9.30
Eight-Channel Wavelength Division Demultiplexer Using Multimode Interference, *Ali Rostami, Ali Bahrami, Fakhroddin Nazari, Hamed Alipour Banaei; Univ. of Tabriz, Iran.* A new wavelength division demultiplexer based on multimode interference is presented. We think that this work presented for the first time in MMI structure with almost 5nm channel spacing and 2451 average quality factor in the telecommunication range. The beam propagation method is used for simulation of this device.

FA5 • 9.45
Investigation of a Fabry-Perot-Based Optical Filter for Broadband Multichannel Communication Systems, *Jinrong Zhang, Yubin Guo, Jiayu Huo, Gang Wang, Shuming Zhang; Dept. of Optical Communication, College of Communication Engineering, Jilin Univ., China.* This paper is concerned with the design of an optical filter, based on Fabry-Perot structure, for multichannel optical communication systems with Ta_2O_5 and SiO_2 materials for 1550 nm operation. The angular performance of the filter is investigated in terms of spectral shift of transmittance towards shorter wavelengths (blue shifted).

FA6 • 10.00
Compact In-Fiber Mach-Zehnder Interferometer Using a Twin-Core Fiber, *Suchun Feng, Honglei Li, Ou Xu, Shaohua Lu, Shuisheng Jian; Beijing Jiaotong Univ., China.* A compact in-fiber Mach-Zehnder interferometer is demonstrated by splicing a section of twin-core fiber (TCF) between two single mode fibers (SMFs). Redshift is observed with a sensitivity of about 0.037 nm/°C for increased temperature, whereas blueshift is observed with a sensitivity of about 0.866 pm/με for applied strain changes.

Guang Da 7

FB3 • 9.30
A Widely Tunable Ridge Width Varied Two-Section Partly Gain-Coupled DFB Self-Pulsation Laser for Optical Microwave Generation, *Duanhua Kong[1], Hongliang Zhu[1], Song Liang[1], Xiaofan Zhao[2], Li Wang[2], Lingjuan Zhao[1]; [1]Inst. of Semiconductors, CAS, China, [2]Dept. of Electronic Engineering, Tsinghua Univ., China.* A partly gain-coupled ridge varied two-section DFB self-pulsation laser for optical microwave generating has been fabricated. It produces microwave with a wide tuning range of more than 135GHz. A successful locked to the microwave frequencies of 30GHz, 40GHz, 50GHz, 60GHz are demonstrated and a timing jitter below 300fs is detected.

FB4 • 9.45
Mode-Hop-Free Tunable Laser Based on Waveguide Echelle Grating Structure, *Ruixing Zeng, Lei Wang, Jian-Jun He; Zhejiang Univ., China.* A monolithic semiconductor laser based on waveguide echelle grating is proposed for mode-hop-free wavelength tuning. By properly designing the shape of the tuning section, a mode-hop-free tuning range of 3.6nm is achieved within a tuning current range of 300mA.

FB5 • 10.00
A Tunable and Switchable Multiwavelength Laser Based on Broadband Quadratic Nonlinearity, *Gang Qu, Yuping Chen, Feng Lu, Xianfeng Chen; Dept. of Physics, Shanghai Jiao Tong Univ., China.* A novel scheme to achieve a tunable and switchable multiwavelength laser is proposed here, which is based on broadband quadratic nonlinearity with cascaded second-harmonic generation and difference-frequency generation (cSHG/DFG) process in waveguide.

Guang Da 9

FC4 • 9.30
Impact and Improvement of Power Balance on Optical Beamforming Networks, *Xi Wu, Xiaoping Zheng, He Wen, Hanyi Zhang; Dept. of Electronic and Engineering, Tsinghua Univ., China.* The impact of optical power imbalance among all channels on optical beamforming networks is analyzed and an improvement scheme is presented. Both experiment and simulation results prove the power imbalance seriously impairs the system functions and a suitable power-balanced element can improve the whole system performance remarkably.

FC5 • 9.45
Study of IQ Imbalance Effect in Direct-Detection Optical OFDM Systems, *Xinying Li, Yufeng Shao, Shumin Zou, Chunning Hou, Xi Zheng, Xiao Liu, Junwen Zhang, Wuliang Fang, Nan Chi; School of Information Science and Engineering, Fudan Univ., China.* IQ imbalance can cause severe performance degradation in direct-detection architectures. We build two DD-OFDM systems, which implement DSB and SSB, respectively. The tolerance to IQ imbalance is analyzed using EVM and SER. We conclude the DSB system has a stronger robustness to IQ imbalance than the SSB system.

Guang Da 11

FD3 • 9.30
Improving Robustness of Complex Communication Networks by Allocating Redundancy Links, *Yue Zhuo, Yunfeng Peng, Keping Long, Yingkai Liu; Res. Ctr. for Optical Internet and Mobile Information Networks, Univ. of Electronic Science and Technology of China, China.* This paper proposes a novel probabilistic approach to allocate redundancy links and hiding redundancy links (HRL) strategy to improve robustness of complex communication networks. We find that allocating redundancy links can efficiently improve robustness against coordinated attack. The simulation shows that HRL strategy can achieve the better performance.

FD4 • 9.45
A Novel Survivable Traffic Grooming Algorithm with Inter-Layer Sharing in IP/MPLS-over-WDM Mesh Networks, *Dayue Gong[1], Xiaoning Zhang[1], Hongfang Yu[1], Ximo Ling[1], Dan Liao[1], Hongbin Luo[2]; [1]Key Lab of Broadband Optical Fiber Transmission and Communication Networks, China, [2]School of Electronics and Information Engineering, Beijing JiaoTong Univ., China.* We propose a Mixed Sharing Auxiliary Graph (MSAG) for dynamic traffic grooming in heterogeneous WDM mesh networks. Based on MSAG model, a novel heuristic named BLSW-ILMS (Backup LSP Shared Working Lightpath with Inter-layer Mixed Sharing) is proposed. Simulation results show that the proposed algorithm can efficiently decrease the blocking probability.

FD5 • 10.00
A Novel Segment Protection with Segment Route Scheme in Multicasting Survivable Networks, *Zhijun Zhu, Wen Dong, Zichun Le; Zhejiang Univ. of Technology, China.* We investigate the problem of multicast requests in survivable networks against any single-link failure and propose a novel scheme called segment protection with segment route (SPSR). Simulation results show that with the consideration of load balance SPSR exhibits better blocking probability and resource utilization performance relative to other schemes.

9.00–16.00 Exhibit Open, *Everbright East Exhibition Hall*

10.15–10.45 Tea Break, *Everbright East Exhibition Hall*

Guang Yun 7

FE3 • 9.30
Liquid Lens: Advances in Adaptive Optics, *Shawn P. Casey; IEEE Photonics Society, USA.* "Liquid lens" technologies promise significant advancements in machine vision and optical communications systems. Adaptations for machine vision, human vision correction, and optical communications are used to exemplify the versatile nature of this technology. Utilization of liquid lens elements allows the cost effective implementation of optical velocity measurement.

FE4 • 9.45 Invited
Monitoring Cellular Metabolism with Fluorescence Lifetime of Reduced Nicotinamide Adenine Dinucleotide, *Vladimir V. Ghukasyan[1], Fu-Jen Kao[1,2]; [1]Inst. of Biophotonics, Natl. Yang-Ming Univ., Taiwan, [2]Dept. of Photonics, Natl. Sun Yat-sen Univ., Taiwan.* Fluorescence lifetime imaging has gained popularity as a sensitive technique to monitor the functional/conformational states of NADH - one of the main compounds of the oxidative phosphorylation. We hereby review the development and application of cellular metabolism observation via NADH FLIM, illustrating it with examples of physiological and pathological states.

Guang Yun 8

FF3 • 9.30
A 2.5 Gbit/s Free Space Transmission Link over 1km, *Hongqiang Lu[1,2], Wei Zhao[1], Wei Wang[1], Hui Hu[1], Xiaoping Xie[1]; [1]State Key Lab of Transient Optics and Photonics, Xi'an Inst. of Optics and Precision Mechanics, CAS, China, [2]Graduate School of CAS, China.* We demonstrate error free transmission of a single 2.5Gbit/s NRZ data channel at 1550nm over 1 km of free space, and the transmitted beam is detected by APD. With the change of transmitting optical power, BER, SNR and eye diagrams of the detected signals are measured.

FF4 • 9.45
Reconfigurable Free-Space Optical Switching Technologies for Storage Area Networks, *Neil Collings[1], Hsi-Hsir Chou[1,2], Fan Zhang[1], William A. Crossland[1]; [1]Univ. of Cambridge, UK, [2]Yuan Ze Univ., Taiwan.* Reconfigurable shutter-based free-space optical switching technologies using fiber ribbon and multiple wavelengths per fiber for Storage Area Networks (SANs) application are presented and demonstrated.

FF5 • 10.00
Design of Indoor Wireless Communication System Using LEDs, *Yu Yang, Xiongbin Chen, Lin Zhu, Bo Liu, Hongda Chen; Inst. of Semiconductors, CAS, China.* An indoor wireless communication system using off-the-shelf components was presented. We adopted on-off keying to modulate LEDs and realized data transmission using RS-485 protocol with a DC-balanced coding with error check and correction abilities. The system can keep 10^{-7} error rate within 2.5m reach at a rate of 115200 bps.

Guang Da 12

FG3 • 9.30
A Dynamic Routing Algorithm for Multi-Domain Photonic Networks Using Averaged Link Load Information, *Kohei Shimada[1], Soichiro Araki[1,2], Hiroshi Hasegawa[1], Ken-ichi Sato[1]; [1]Dept. of Electrical Engineering and Computer Science, Nagoya Univ., Japan, [2]NEC Corp., Japan.* We propose an inter-domain path routing algorithm for multi domain photonic networks. The proposed algorithm introduces a step-wise weighting technique and utilizes averaged link load information of each domain. Numerical experiments demonstrate that the proposed algorithm matches the blocking probability achieved without domain segmentation.

FG4 • 9.45
Novel Iterative P-Cycle Configure Model in WDM Intelligent Optical Network, *Bin Li, Shanguo Huang, Wanyi Gu, Kuei-Jen Lee; Key Lab of Optical Communication and Lightwave Technologies, Ministry of Education, Beijing Univ. of Posts and Telecommunications, China.* Iterative p-cycle configure model is proposed and also a platform is constructed in OPNET modeler to verify the performance of this algorithm. Simulation results show that the iterative p-cycle expansions can significantly improve the controlling bandwidth efficiency of the intelligent WDM networks.

FG5 • 10.00
Mobile Agent-Based Platform for ASON Management, *Xin Li, Shanguo Huang, Bingli Guo, Ru Wang, Yanlei Zheng, Wanyi Gu; Key Lab of Optical Communication and Lightwave Technologies, Ministry of Education, Beijing Univ. of Posts and Telecommunications, China.* It is essential for us to do research on collaboration mechanism in management-control plane in intelligent optical networks. We propose an interaction schemes using mobile agent between the control plane and management plane to solve information collection delay and management messages congestion. We construct the integrated platform by mobile agent.

Guang Da 16

FH4 • 9.30
Net-Grid Subwavelength Gratings as Reflectors for Designing Resonant Cavity Enhanced Photodetectors, *Yang Yisu, Huang Yongqing, Ren Xiaomin; Beijing Univ. of Posts and Telecommunications, China.* Subwavelength gratings (SWGs) that consist of net-grid structure are studied .They are applied as infrared reflectors whose reflectivity can achieve 99.98% at 1.55μm and larger than 99% across 1.47~1.59μm range. SWGs are designed as bottom mirrors in resonant cavity enhanced photodetectors to improve quantum efficiency and realize size reduction.

FH5 • 9.45
Flat-Top Steep-Edge Photodetector with Cascaded Grating Structure, *Xu Zhang, Yongqing Huang, Xiaomin Ren, Hui Huang, Qi Wang; Beijing Univ. of Posts and Telecommunications, China.* New type of photodetector with cascaded waveguide grating filters as bottom reflection mirror is proposed. Compared with traditional photodetector with distributed Bragg reflectors (DBRs), this new type of photodetector require significantly fewer layer for narrow flat-top response, high peak efficiency and low sideband reflectance.

FH6 • 10.00
Low Cost Camera Modules Using Integration of Wafer-Scale Optics and Wafer-Level Packaging of Image Sensors, *Hongtao Han, Keith Main; Tessera, USA.* Using wafer scale optics, wafer scale integration, and wafer level packaging of image sensor, we developed small form factor (3.3mmx3.3mmx2.4mm), low manufacturing cost, Pb-free solder reflow compatible digital camera modules which are suitable for many applications including mobile electronic devices, automotives, security, and medical applications.

9.00–16.00 Exhibit Open, *Everbright East Exhibition Hall*

10.15–10.45 Tea Break, *Everbright East Exhibition Hall*

Guang Yun 1

10.45–12.30
FI • Optical Fiber
*Ching E. Png; Inst. of High Performance Computing, A*Star, Singapore, Presider*

FI1 • 10.45 Invited
Progress in Semiconductor Optical Fibers, *John Ballato[1], T. Hawkins[1], P. Foy[1], B. Kukuoz[1], C. McMillen[2], R. Stolen[1], N. K. Hon[3], B. Jalali[3], R. Rice[4]; [1]School of Materials Science and Engineering, Clemson Univ., USA, [2]Dept. of Chemistry, Clemson Univ., USA, [3]Dept. of Electrical Engineering, Univ. of California at Los Angeles, USA, [4]Northrop Grumman Space Technology, USA.* The properties of glass-clad fibers containing cores of phase pure and highly crystalline silicon and germanium are reviewed. Although further optimization is required, losses of about 4 dB/m have been achieved at 3 μm and suggest that such semiconductor core fibers could be of value for nonlinear and infrared applications.

FI2 • 11.15 Invited
Recent Progress in Carbon Nanotube-Enhanced Fiber Optics, *Yong-Won Song; Korea Inst. of Science and Technology, Republic of Korea.* We demonstrate carbon nanotube (CNT)-incorporated optical nonlinear devices employing the interaction of CNTs with the evanescent field of propagating light in fibers for both passive mode-lockers of high-power fiber lasers and Kerr switches. We achieve 6.5-nJ picosecond output pulses as well as >20-dB switching extinction ratio with the proposed scheme.

Guang Da 7

10.45–12.30
FJ • Semiconductor Lasers II
Guang-Hua Duan; Alcatel Thales III-V Lab, France, Presider

FJ1 • 10.45 Invited
AlGaInAs Quantum-Well Lasers with Semi-Insulating Buried-Heterostructure for High-Speed Direct Modulation up to 40 Gbps, *Koji Otsubo[1,2,3], Manabu Matsuda[1,2,3], Kan Takada[1], Shigekazu Okumura[1], Ayahito Uetake[1,2,3], Mitsuru Ekawa[1,2,3], Tsuyoshi Yamamoto[1,2,3]; [1]Fujitsu Labs Ltd., Japan, [2]Fujitsu Ltd., Japan, [3]Optoelectronic Industry and Technology Development Association (OITDA), Japan.* We introduce our recent works on AlGaInAs quantum-well lasers with semi-insulating buried-heterostructure for ultra-high-speed transmission. The short-cavity DFB lasers show high-speed direct modulation at 25 and 40 Gbps, and the distributed reflector lasers with shortened active-region length provide reduced driving current in ultra-high-speed direct modulation.

FJ2 • 11.15
Laser Diode Comb Spectrum Amplification Preserving Low RIN for High-Speed Modulation, *Dongliang Yin[1], Alexey Gubenko[2], Igor Krestnikov[2], Daniil Livshits[2], Sergey Mikhrin[2], Alexey Kovsh[1], Greg Wojcik[1]; [1]Innolume, Inc., USA, [2]Innolume, GmbH, Germany.* Quantum dot-based diode comb lasers enable a single multi-channel-laser source for short-reach, high-speed WDM interconnects. In this paper, we demonstrated a quantum dot SOA with 18dB gain to compensate transmitter loss from comb channel de-multiplexing and other losses without adding noise.

FJ3 • 11.30
Injection Locked Fabry-Perot Laser Diode for 10Gbps WDM Access Network Applications, *Alexandre Shen[1], Akram Akrout[1,2], François Lelarge[1], Frédéric Pommereau[1], Francis Poingt[1], Alain Accard[1], Abderrahim Ramdane[2], Guanghua Duan[1]; [1]Alcatel-Thales III-V Lab, France, [2]Lab de Photonique et Nanostructures, CNRS, France.* In this paper, we report on quantum dash based injection locked Fabry-Perot laser diode, which allowed us to demonstrate a 231-1 PRBS 10Gb/s coded signal over 20km SMF error-free transmission and over a spectral bandwidth more than 20nm.

Guang Da 9

10.45–12.30
FK • Physical Effects Studies II
Ted Schmidt; Opnext, USA, Presider

FK1 • 10.45 Invited
Physical Layer Security in Data Networks Using Optical Signal Processing, *Paul R. Prucnal, Mable P. Fok, Yanhua Deng, Zhenxing Wang; Princeton Univ., USA.* Using optical processing techniques, we experimentally enhance the physical layer security of optical communication systems. The multilevel security provided improves the confidentiality and availability of the network. We also introduce the use of optical CDMA as backup channels to achieve a bandwidth-effective way to counter physical infrastructure attacks.

FK2 • 11.15
SPM Suppression by Clipping for Optical Transmission Systems with Electrical Dispersion Predistortion, *Su Zhang, Juhao Li, Fan Zhang, Zhangyuan Chen; State Key Lab of Advanced Optical Communication Systems and Networks, Peking Univ., China.* We investigate amplitude clipping for electrical-dispersion-predistorted 10-Gb/s optical fiber transmission systems. Simulation shows that amplitude clipping can effectively suppress SPM-induced nonlinear impairment.

FK3 • 11.30
Analyses of Variations of Non-Degenerated Four-Wave Mixing between Co-Pump Fabry-Perot Modes and Signal in a Non-Zero Dispersion Shifted Fiber, *Tsu-Te Kung[1,2], Chi-Feng Chen[3]; [1]Dept. of Mechanical Engineering, Natl. Central Univ., Taiwan, [2]Dept. of Electro-Optical Engineering, Natl. United Univ., Taiwan, [3]Inst. of Opto-Mechatronics Engineering, Dept. of Mechanical Engineering, Natl. Central Univ., Taiwan.* We theoretically and experimentally study the four-wave mixing between co-propagated pump and signal in a non-zero dispersion shifted fiber. The maximum four-wave mixing generated power ratio is found in the matching of the group delay between the signal and the two adjacent modes with larger powers of pump LD.

Guang Da 11

10.45–12.30
FL • Network Architecture
Weiqiang Sun; Shanghai Jiao Tong Univ., China, Presider

FL1 • 10.45 Invited
Design of Hierarchical WDM Networks, *Miguel Razo[1], Shreejith Billenahalli[1], Wanjun Huang[1], Arularasi Sivasankaran[1], Limin Tang[1], Hars Vardhan[1], Marco Tacca[1], Paolo Monti[2], Andrea Fumagalli[1], Young Lee[3], Xinchao Liu[3], Zhicheng Sui[3]; [1]Univ. of Texas at Dallas, USA, [2]NeGONet Group, School of Information and Communication Technology, ICT-FMI, The Royal Inst. of Technology, Sweden, [3]Huawei Technologies, USA.* Hierarchical WDM networks present a challenging design problem in that maximizing fiber utilization and minimizing wavelength conversion may be conflicting objectives. Two design solutions, offering alternative tradeoff options, are presented and compared.

FL2 • 11.15 Invited
Designing New-Generation Network: Overview of AKARI Architecture Design, *Hiroaki Harai; NICT, Japan.* AKARI Architecture Design Project was launched May 2006, in order to deliver blueprint of new-generation network. We address AKARI's new-generation network architecture design. We show design principles consisting of crystal synthesis, reality connection, and sustainable and evolutional principles. We also describe principle-oriented component technologies such as optical packet/path integrated network.

Guang Yun 7

10.45–12.30
FM • New Biophotonics Technologies II
Israel Gannot; Tel Aviv Univ., Israel, Presider

FM1 • 10.45 Invited
Biological Study Using 3-D Tissue Cytometry, *Hyuk-Sang Kwon[1], Richard Gilbert[2], Hayden Huang[3], Peter So[2]; [1]Gwangju Inst. of Science and Technology (GIST), Republic of Korea, [2]MIT, USA, [3]Columbia Univ., USA.* 3-D tissue cytometry has been successfully developed to optimize biological specimen throughput allowing the characterization of cell-cell, cell-tissue interaction to be quantified in 3-D tissue by combining high speed TPM, automated x-y specimen stage, and precision specimen sectioning mechanism. 3-D tissue cytometry is applied in two biomedical applications.

FM2 • 11.15 Invited
High Speed Parallel Processing of Biomedical Optics Data with PC Graphic Hardware, *Chao Jiang, Pengcheng Li, Qingming Luo; Huazhong Univ. of Science and Technology, China.* We present and review several successful applications using graphic processing unit to accelerate the processing of biomedical optics data including image processing, Monte Carlo simulation, image reconstruction and statistics analysis. It is shown that using GPU can obtain significant performance enhancement comparing with that based on CPU calculation.

Guang Yun 8

10.45–12.30
FN • Radio over Fibre
Jianming Tang; Bangor Univ., UK, Presider

FN1 • 10.45 Invited
Radio-over-Fiber Systems, *Christina Lim[1], Ampalavanapillai Nirmalathas[1], Yizhuo Yang[1], Dalma Novak[1,2], Rod Waterhouse[1,2]; [1]Univ. of Melbourne, Australia, [2]Pharad, LLC, USA.* Radio-over-Fiber (RoF) systems have been actively researched to provide future broadband services. In this paper we review the schemes and strategies that have been carried out in Radio-over-Fiber (RoF) networks over the years to realize high-performance RoF links.

FN2 • 11.15
Generation of a 16-Star/Square Quadrature Amplitude Modulation (QAM) Signal in Radio over Fiber System, *Yanzhi Wu, Tong Ye, Liang Zhang; Shanghai Jiao Tong Univ., China.* Using two cascaded optical modulators, we propose a scheme to generate a 16-Star/Square QAM radio frequency (RF)-signal, where the RF carrier is obtained by quintupling the frequency of the employed local oscillator signal.

FN3 • 11.30
Multichannel Optical Millimeter-Waves Generation for Radio-over-Fiber by Slicing Super-Continuum without Modulator for DWDM-ROF System, *Wenjing Li, Chongxiu Yu, Xinzhu Sang, Daxiong Xu; Beijing Univ. of Posts and Telecommunications, China.* We demonstrate a new scheme of 60GHz multichannel mm-waves generation in DWDM-ROF based on spectrum broadening, superstructure fiber Bragg grating (SSFBG) comb filtering and two wavelength waves heterodyning. This scheme has excellent advantages, for example, simple structures, multichannel carrier generation, multi-frequency mm-wave generation, easily controlled frequency by choosing suitable parameters.

Guang Da 12

10.45–12.30
FO • Virtual Network
Jin U. Kang; Johns Hopkins Univ., USA, Presider

FO1 • 10.45 Invited
Network Virtualization, *Jing Wu, Michel Savoie; Communications Res. Ctr. Canada, Canada.* We present a framework of managing optical networks using network virtualization. We use Web Services to achieve network management functions. Through network virtualization, service brokers can compose usage cases for the created virtual networks, so that end users are able to reconfigure the virtual networks without realtime interventions of administrators.

FO2 • 11.15 Invited
Concept and Enabling Technologies of Spectrum-Sliced Elastic Optical Path Network (SLICE), *Masahiko Jinno, Hidehiko Takara, Bartlomiej Kozicki; NTT Network Innovation Labs, NTT Corp., Japan.* A novel, spectrum-efficient and scalable optical transport network architecture called spectrum-sliced "elastic optical path" network (SLICE) is presented. The SLICE architecture enables sub-wavelength, super-wavelength, multiple-rate data traffic accommodation, and elastic variation of allocated resources in a highly spectrum-efficient manner.

NOTES

Guang Yun 1

FI3 • 11.45
The Improvement of Transmission Properties for Multi-Mode Fiber Based on Launching Optical Field Shaping and Feedback Equalization, *Wuliang Fang, Junwen Zhang, Chunning Hou, Xiao Liu, Xi Zheng, Nan Chi; School of Information Science and Engineering, Fudan Univ., China.* In this paper, a novel scheme to improve the transmission properties for a MMF based on launching optical field shaping and feedback equalization is proposed, theoretically analyzed and investigated by simulation.

FI4 • 12.00
Wave Breaking in Dispersion-Decreasing Fiber with Normal Group-Velocity Dispersion, *Ge Xia, Li Liu, Songzhan Li, Libing Zhou, Dejun Li; Wuhan Univ. of Science and Engineering, China.* We show wave breaking can occur in a dispersion-decreasing fiber with normal group-velocity dispersion preceding the parabolic pulse formation (PPF), and the distance where it happens can be described by two equations. This fact reveals that four-wave mixing also plays an important role in the process of PPF.

FI5 • 12.15
Longitudinal Fiber Parameter Measurements of Pure Silica Core Fibers Based on OTDR Technique, *Masaharu Ohashi[1], Yasuhiro Tsutsumi[1], Ikuo Yamashita[2]; [1]Osaka Prefecture Univ., Japan, [2]Kansai Electric Power, R&D Ctr., Japan.* A simple technique for measuring fiber parameter distribution of the pure silica core fiber using a conventional OTDR is proposed. This technique is based on the relationships among fiber parameters and the bidirectional OTDR technique. The fiber parameter distributions are successfully evaluated for a silica core fiber link.

Guang Da 7

FJ4 • 11.45
Analysis of the External Feedback Effects on the Relative Intensity Noise Characteristics of the Strained AlGaInN LDs, *Hyung Uk Cho, Jong Chang Yi; Electronic Engineering Dept., Hongik Univ., Republic of Korea.* The RIN characteristics in blue laser diodes on wurtzite AlGaInN MQW structures were investigated using the rate equations with the quantum Langevin noise model. The device parameters were extracted from the band structures of the MQW active region by using the self-consistent multiband Hamiltonian for the strained wurtzite crystal structure.

FJ5 • 12.00
High Power Cooled Mini-DIL Pump Lasers, *Bo Liang[1], Nadhum Zayer[2], Bob Chen[1], Dylan He[1], Tomas Pliska[3]; [1]Oclaro, Inc., Shenzhen Office, China, [2]Oclaro, Inc., Paignton Office, UK, [3]Oclaro Inc., Zürich Office, Switzerland.* The miniature dual-inline (mini-DIL) pump laser becomes more attractive for compact optical amplifiers designs due to the advantage of smaller footprint, lower power consumption and lower cost. In this paper we report the development of small form factor, high power "cooled" mini-DIL 980-nm pump lasers module for compact EDFA application.

FJ6 • 12.15
Temperature Characteristics Improvement Using Strain in Barriers of 1.3μm AlGaInAs-InP Multiple Quantum Well Laser, *Vahid Bahrami Yekta, Hassan Kaatuzian; Amirkabir Univ. of Technology, Iran.* Compressive strain is applied in barriers of multiple quantum well AlGaInAs-InP 1.3μm lasers and cause to better gain and current density in high temperatures. Multi band effective mass and quantum electrodynamics theories are used to simulate the structure. The mode gain-current density characteristic is improved more than 20% in 85°C.

Guang Da 9

FK4 • 11.45
Brillouin Scattering in Raman-Pumped Fibers: An Experimental Investigation, *Xiufeng Yang[1], Junfa Zhao[2], Tong Zheng-rong[1], Zhihao Chen[3], Yange Liu[2], Renwei Wan[1]; [1]School of Computer and Communication Engineering, Tianjin Univ. of Technology, China, [2]Inst. of Modern Optics, Nankai Univ., China, [3]Inst. for Infocomm Res., Singapore.* We study the impact of the distributed second order Raman amplification on brillouin scattering in a long haul fiber system experimentally. Experimental results show that, both the brillouin scattering efficiency at high powers and the brillouin threshold are reduced.

FK5 • 12.00
Propagation Characteristics of a Soliton in Dispersion-Flatted Fibers with Concave Dispersion Profile, *Xin Li, Hongjun Zheng, Shanliang Liu; School of Physics Science and Information Technology, Liaocheng Univ., China.* The sub-picosecond chirped soliton propagation in dispersion-flatted fibers with concave dispersion profile (DFF-CCDP) is proposed. The effects of pulse characteristics and the fiber dispersion parameters on propagation characteristics of the soliton are numerically investigated in the DFF-CCDP by use of the split-step Fourier method.

FK6 • 12.15
Method of Improving Bandwidth Efficiency for OTDM Transmission Systems, *Ming Chen, Bo Lv, Tangjun Li, Muguang Wang, Shuisheng Jian; Inst. of Lightwave Technology, Beijing Jiaotong Univ., China.* Spectrum compression based on filters for improving bandwidth efficiency is presented and demonstrated experimentally in 40Gb/s OTDM system. Even after 100km transmission, demultiplexing and clock recovery can be implemented successfully, and the data rate-to-bandwidth ratio has been improved to 4 times.

Guang Da 11

FL3 • 11.45
A PCE-Based Redundancy-Aware Path Selection Scheme for Multi-Layer Network, *Yu Yao, Yongjun Zhang, Chuanhao Lu, Zhihui Zhang, Bin Li, Wanyi Gu; Key Lab of Information Photonics and Optical Communications, Ministry of Education, Inst. of Optical Communications and Optoelectronics, Beijing Univ. of Posts and Telecommunications, China.* An improved scheme of path selection for multi-layer network based on PCE and VNTM is present and evaluated on the simulation platform of NSFNET, which is used to avoid traffic redundancy caused by low layer's invisibility to the high layer.

FL4 • 12.00
Performance Evaluation of *k*-ary Data Vortex Networks with Bufferless and Buffered Routing Nodes, *Qimin Yang; Harvey Mudd College, USA.* This paper studies *k*-ary Data Vortex networks with/without node buffering. The 4-ary networks gain more performance benefit than that in the original binary Data Vortex with the buffer due to significantly reduced traffic backpressure that is present in bufferless operations. Additional cost should be justified for such performance enhancement.

FL5 • 12.15
Improving Robustness against Coordinated Attack by Removing Crashed Hub Nodes in Complex Communication Network, *Yue Zhuo, Yunfeng Peng, Keping Long; Res. Ctr. for Optical Internet and Mobile Information Networks, Univ. of Electronic Science and Technology of China, China.* Along with a distributed attack called coordinated attack, its crashed nodes network will become larger and larger, which makes coordinated attack crash each node in the same time virtually impossible. So we propose R.C.H. strategy by removing the crashed hub nodes to improve network robustness against coordinated attack.

12.30–14.00 Lunch Break

Guang Yun 7

FM3 • 11.45
Thickness Resolution of Localized Surface Plasmon Microscope, *Koyo Watanabe, Janne Katainen; Measurement and Sensor Lab, Univ. of Oulu, Finland.* We report on the thickness resolution of a localized surface plasmon microscope in the observation of lipid bilayers. We calculated plots of the effective refractive index as a function of the bilayer thickness. On the basis of measured effective refractive indices, we theoretically determined the resolution to be ~0.33 nm.

FM4 • 12.00 Invited
Force Spectroscopy of Single Receptor-Ligand Bond Using an Optical Trap, *Yan Zhang, Ganyun Sun, Ning Li, Bo Huo, Shouqin Lü, Mian Long; Natl. Microgravity Lab and Ctr. for Biomechanics and Bioengineering, Inst. of Mechanics, CAS, China.* Here we developed a thermal fluctuation assay using optical trap technique, which enables to visualize consecutive binding-unbinding transition and to unravel the bond dissociation at low spring constant and low loading rate. This novel method provided further understandings in monitoring biophysics of receptor-ligand interactions.

Guang Yun 8

FN4 • 11.45
BER Analysis of Radio-over-Fiber System with Different Modulation Schemes, *Xi Wu, Xiaoping Zheng, He Wen, Hanyi Zhang; Dept. of Electronic and Engineering, Tsinghua Univ., China.* An analytical model to describe the BER and power penalty of a radio-over-fiber system is derived. It proves DPSK provides 3-dB higher receiver sensitivities than OOK, and the optimal radio-over-fiber structure is DPSK- PM or IM, depending on the microwave frequency and fiber transmission distance.

FN5 • 12.00
Dual-Level Optical Single Side Band Modulation Scheme for 0.1 Tera Hz Radio-over-Fiber Systems, *Chunning Hou, Yufeng Shao, Xiao Liu, Xi Zheng, Xinying Li, Shumin Zou, Nan Chi; School of Information Science and Engineering, Fudan Univ., China.* In this paper, we proposed a dual-step optical single sideband (SSB) modulation scheme for the RoF systems application. Through comparing the power penalty of DSB and SSB, we demonstrated the optical SSB modulation has better dispersion tolerance. After the 50km SMF transmission, the received sensitivity is 16.3 dBm.

FN6 • 12.15
Schemes of Generating M-ASK Signals and Remote Local Oscillator in Millimeter-Wave Radio over Fiber System, *Haoshuo Chen, Rujian Lin, Jiajun Ye; Shanghai Univ., China.* This paper introduces two schemes of generating millimeter-wave M-ASK signals and remote local oscillator at base station in RoF system, realized by series connection of two dual drive Mach-Zehnder modulators. The proposed schemes are verified by theoretical derivation and simulation.

Guang Da 12

FO3 • 11.45
Generalized Survivable Network with Wavelength Continuity Constraints, *Kwok Shing Ho, Kwok Wai Cheung; Dept. of Information Engineering, Chinese Univ. of Hong Kong, Hong Kong.* Generalized Survivable Network (GSN) guarantees full survivability under dynamic demand changes. We solve the capacity planning problem for GSN with wavelength continuity constraints for arbitrary mesh topologies. The worst case cost can be reduced by more than 70% with the proposed approach in several regular network scenarios.

FO4 • 12.00
The Research of Cloud Computing Based on Service Plane over Optical Networks, *Zhen Li, Jie Zhang, Xiuzhong Chen, Dahai Han, Wanyi Gu, Yuefeng Ji; Key Lab of Information Photonics and Optical Communications, Ministry of Education, Beijing Univ. of Posts and Telecommunications, China.* A novel cloud computing architecture over optical networks is proposed based on the service plane. An experiment of resources dynamic co-schedule is deployed on our AMSON testbed and the result of it demonstrates the validity of the architecture we proposed.

FO5 • 12.15
Survivability Optimization and Analysis of Network Topology Based on Average Distance, *Yunji Li, Yunfeng Peng, Shu Du, Keping Long, Yue Zhuo; Res. Ctr. for Optical Internet and Mobile Information Networks, Univ. of Electronic Science and Technology of China, China.* A method is proposed to optimize the network survivability based on average distance. We explain the merit of shorter average distance and design the topologies which have minimum average distance then choose the optimal network from them by the network performance analysis under random failure.

12.30–14.00 Lunch Break

NOTES

Guang Yun 1

14.00–15.45
FP • Optical Devices II
Tao Lu; Univ. of Victoria, Canada, Presider

FP1 • 14.00 Invited
Hybrid WDM/TDM Sensor Passive Optical Network (HSPON) and Its Applications, *Deming Liu; Huazhong Univ. of Science and Technology, China.* A new technology for the Hybrid WDM/TDM Sensor Passive Optical Network (HSPON) is put forward and studied. The network protocol and the key devices as well as the related sensing technologies used in this HSPON are introduced. A 256-unit HSPON has been developed which could find many applications in the fields of monitoring of disaster of earthquake, coal mine, huge bridge, blue water, and so on.

FP2 • 14.30
Two- and Three-Dimensional Studies of a Silicon-Based Chromatic Dispersion Compensator, *Ching Eng Png[1], Soon Thor Lim[1], Er Ping Li[1], A. J. Danner[2], Kensuke Ogawa[3], Yong Tsong Tan[3]; [1]Inst. of High Performance Computing, A*Star, Singapore, [2]Natl. Univ. of Singapore, Singapore, [3]Fujikura Ltd., Japan.* We demonstrate two- and full three-dimensional simulation of an active silicon-based photonic crystal chromatic dispersion compensator with low power consumption of 114nW and functioning at 40.5MHz. The novel device allows waveguiding and electrical transport to be individually tailored to a large extent.

FP3 • 14.45
Optimal Design of Cascaded Long-Period Waveguide Grating Equalizer for Broadband Er-Yb Co-Doped Phosphate Glass Waveguide Amplifiers, *Haiyan Chen; School of Physics Science and Technology, Yangtze Univ., China.* Broadband integrated Er-Yb doped phosphate glass waveguide amplifier based on cascaded long-period waveguide grating is proposed. The effect of transmittance spectrum of the proposed cascaded long-period waveguide grating on flattening gain is discussed. The transmission function of the cascaded long-period waveguide grating is obtained.

Guang Da 7

14.00–16.00
FQ • Photonic Crystals I
Younan Xia; Washington Univ. in St. Louis, USA, Presider

FQ1 • 14.00 Invited
Light-Matter Interaction in 2-D/3-D Photonic Crystal Nanocavity with Quantum Dots, *Yasuhiko Arakawa; Univ. of Tokyo, Japan.* We discuss recent advances in exaction-photon interaction in single quantum dot with 2-D photonic crystal nanocavity, showing successful realization of single artificial atom lasers. Moreover, an experimental demonstration of coupling of quantum dots with a point-defect nanocavity is also presented in a 3-D photonic crystal with the highest Q factor.

FQ2 • 14.30
Coherent Control of Targeted Quantum Dot in Photonic Crystals for Nanophotonics Devices, *Hiroyuki Nihei[1], Fumiaki Matsuoka[2], Atsushi Okamoto[2]; [1]Health Sciences Univ. of Hokkaido, Japan, [2]Hokkaido Univ., Japan.* We propose coherent control of a targeted quantum dot embedded in three-dimensional photonic crystals, which provides the basis of optical information processing that can be used for nanophotonics devices.

FQ3 • 14.45 Invited
GaN-Based Blue Vertical Cavity and Photonic Crystal Surface Emitting Lasers, *Shing Chung Wang, Tien-Chang Lu, Hao-Chung Kuo, Shih-Wei Chen, Tsung-Ting Kao; Natl. Chiao Tung Univ., Taiwan.* Two types of GaN-based blue surface emitting lasers recently developed were presented. One was a vertical cavity surface emitting laser which achieved laser action under CW current injection at 77K. Another is a photonic crystal surface emitting laser operated at room temperature. Detailed fabrication techniques and performance characteristics are described.

Guang Da 9

14.00–15.45
FR • Optical Processing I
Jean-Christophe Antona; Bell Labs, Alcatel-Lucent, France, Presider

FR1 • 14.00 Invited
All Optical Processing of Optical Packets, *Nicola Calabretta, H.-D Jung, E. Tangdiongga, A. M. J. Koonen, H. J. S. Dorren; COBRA Res. Inst., Eindhoven Univ. of Technology, Netherlands.* We present two paradigms to realize a scalable and low latency all-optical packet switch. We report for both techniques experimental results showing the routing operation of the 160 Gb/s packets and beyond. Photonic integrated sub-systems required to implement the packet switch are reviewed.

FR2 • 14.30 Invited
Approaches to Ultrafast All-Optical Signal Processing, *Ivan Glesk; Univ. of Strathclyde, UK.* Rapidly growing demands triggered unparallel needs for fast-reliable-reconfigurable and secure networks. Current solutions are governed by the reappearance of electronic bottleneck which imposes many limitations. It is believed ultrafast all-optical signal processing may offer some alternatives by supplementing the lack of high-speed electronics. Promising optical approaches will be discussed.

Guang Da 11

14.00–16.00
FS • Optical Access Networks I
Yikai Su; Shanghai Jiao Tong Univ., China, Presider

FS1 • 14.00 Tutorial
Next-Generation Broadband Access Networks, *Patrick Iannone; AT&T Labs, USA.* This tutorial first describes the current evolution in time-division multiplexed (TDM) passive optical networks (PON) from today's commercially available 2.5-Gb/s TDM PONs to the newly standardized 10-Gb/s TDM PONs. The second part of the tutorial focuses on the diverse set of PON technologies under consideration for standardization beyond 10 Gb/s.

Patrick Iannone (BS Columbia 1985; PhD Princeton 1994) joined AT&T Bell Laboratories (later AT&T Labs) in 1985 where he did research in multibeam microwave antennas, semiconductor laser nonlinearities, subcarrier-multiplexed lightwave communication systems and dense wavelength division multiplexed (DWDM) systems. Over the past several years, he has worked on WDM optical networks and subsystems for residential access, business access, and metro transport. He holds 28 patents and has authored or co-authored lots of mediocre publications (and a few good ones). He has served as IEEE-LEOS Meeting Chair, as an elected member of the IEEE-LEOS Board of Governors and has chaired technical subcommittees for both the IEEE-LEOS Annual Meeting and the Optical Fiber Communication Conference (OFC). He has served as OFC Technical Program Co-Chair in 2004 and OFC General Co-Chair in 2006, and is currently a member of the OFC Steering Committee. Dr. Iannone is a Fellow of the IEEE.

Guang Yun 7

14.00–16.00
FT • Optical Packet/Burst Systems and Networks I
Takuo Tanemura; Univ. of Tokyo, Japan, Presider

FT1 • 14.00 Invited
Optical RAM Buffer for All-Optical Packet Switches, *Ken-ichi Kitayama[1], A. Shinya[2], S. Matsuo[3], R. Takahashi[3], M. Murata[1], S. Arakawa[1]; [1]Osaka Univ., Japan, [2]NTT Basic Res. Labs, Japan, [3]NTT Photonics Labs, Japan.* Progresses of 5-year-long government-supported R&D program, aiming at all-optical RAM buffer will be presented. Focuses are on nano-structured optical bit memory for RAM, the optical interfaces such as serial/parallel converter and optical addressor as well as architecture design of optical packet switch with small-size buffers and the performance evaluation.

FT2 • 14.30
10-Gb/s Burst-Mode Receiver for Fast Settling Time, *Daisuke Mashimo[1], Jun Sugawa[1], Hiroki Ikeda[1], Katsuya Minatozaki[2], Nobuhiro Matsudaira[2]; [1]Central Res. Lab, Hitachi Ltd., Japan, [2]Hitachi Information and Communication Engineering, Ltd., Japan.* We developed a 10-Gb/s burst-mode receiver for a fast receiver settling time. The receiver has an ATC boost function and a differential output stabilization circuit to realized a fast settling time. We achieved 50-ns receiver settling time.

FT3 • 14.45
Optical Static Random Access Memory Cell Using an Integrated Semiconductor Ring Laser, *Bei Li[1], Muhammad Irfan Memon[1], Zhuoran Wang[1], Siyuan Yu[1], Gabor Mezosi[2], Marc Sorel[2]; [1]Univ. of Bristol, UK, [2]Univ. of Glasgow, UK.* This paper proposes and demonstrates an all-optical static random access memory (SRAM) cell using a bistable semiconductor ring laser set-reset flip-flop integrated with four SOAs at each output. Read and write operation at 1Gb/s are achieved with extinction ration >10dB.

Guang Yun 8

14.00–16.00
FU • Optical Coherence Tomography: Novel Technologies and Applications I
C. C. Yang; Natl. Taiwan Univ., Taiwan, Presider

FU1 • 14.00 Invited
High-Speed Wavelength Swept Laser Source for Optical Coherence Tomography, *Changho Chong; Santec Corp., Japan.* SS-OCT is a promising imaging modality for optical diagnostics. We introduced several novel methods for swept source that overcome design trade-offs and realize a highly k-linear wavelength sweep, a large coherence length as well as efficient tuning mechanism for wide range sweep while achieving high swept rate.

FU2 • 14.30 Invited
High Speed Optical Coherence Imaging: Towards the Structure and Function of Human Eye, *Maciej Wojtkowski; Inst. of Physics, Nicolas Copernicus Univ., Poland.* I will demonstrate new advancements of ophthalmic OCT instrumentation both in morphological and the functional imaging. I will show how the speed and the resolution can be converted into a functional information by an efficient use of the phase and the amplitude of measured signal in Fourier domain systems.

Guang Da 12

14.00–16.00
FV • Nonlinear Optical Imaging Technologies I
Hyuk-Sang Kwon; Gwangju Inst. of Science and Technology (GIST), Republic of Korea, Presider

FV1 • 14.00 Tutorial
Second Harmonic Generation Imaging Microscopy of Fibrillar Tissues, *Paul Campagnola; Univ. of Connecticut Health Ctr., USA.* This tutorial will cover the essentials of Second Harmonic Generation (SHG) imaging microscopy of tissues. The SHG photophysics and required instrumentation will be discussed in detail. Current applications of the technology will also be summarized, with an emphasis on the potential in disease diagnostics including cancer and connective tissue disorders.

Paul J. Campagnola received his Ph.D in physical chemistry from Yale in 1992. He was a postdoctoral fellow at JILA at the University of Colorado between 1992 and1995. He then joined the faculty of the Cell Biology Department and Center for Cell Analysis at the University of Connecticut Health Center. He has adjunct appointments in the Physics and Biomedical Engineering departments at the University of Connecticut. He is currently visiting faculty at the University of Wisconsin in the Biomedical Engineering Department. He has been developing Second Harmonic Generation imaging microscopy for biological and biophysical applications, with an emphasis on implementing quantitative metrics for diagnosing cancer and connective tissue disorders. A second research area uses multiphoton excited nano/microfabrication for tissue engineering and cancer biology applications.

NOTES

Guang Yun 1

FP4 • 15.00
Polarization Mode Conversion in an Optical Microdisk Resonator Vertically Coupled to a Waveguide Bus, *Hooman Akhavan; Iran Univ. of Science and Technology, Iran.* Due to the existence of non-zero, and asymmetric cross-polarization coupling coefficients between a microdisk and a waveguide, microdisks with minimal internal losses and small radii vertically coupled to waveguides can be engineered as a polarization rotator. A semi-analytical calculation method is presented to realize microdisk-waveguide system as a polarization rotator.

FP5 • 15.15
A Study of Mux and Demux for DWDM Based on Gires-Tournois Etalons, *Shu-Fen Liu[1], Yi-Long Chen[2], Bo-Cong Wu[2], Huei-Min Yang[2]; [1]Harbin Inst. of Technology, China, [2]I-Shou Univ., Taiwan.* A flat-top of 50-GHz Mux/Demux of DWDM exhibits a characteristic of $2.25x10^{-5}$ dB, an improvement of 2-order than previous study. The channel isolation reaches a high performance of 52.89dB, which is better than the previous study 16.51dB. The dispersion has a more than 50% enhancement compared to the previous investigations.

FP6 • 15.30
Low-Loss Bend-Bend Coupler for Si-Based Ultra-Small Microrings Resonator, *Jing Hu, Daoxin Dai; Zhejiang Univ., China.* This paper presents a bend-bend coupler for an ultrasmall silicon-on-insulator based microring resonator to reduce the loss at the coupling region between the access waveguides and the microring. Furthermore, a large free-spectral range as well as an enhanced coupling coefficient is obtained. The multi-mode effect is also reduced.

Guang Da 7

FQ4 • 15.15
Novel Analytical Band-Gap Analysis of Rectangular Photonic Crystals, *Guo Xiaotao, Yu Zhongyuan, Liu Yumin, Zhao Long, Wang Donglin; Beijing Univ. of Posts and Telecommunications, China.* A novel analytical band-gap analysis of one-dimensional or two-dimensional rectangular photonic crystals is presented. Compared with earlier analytical analysis, the transfer matrix method used in this paper has made the conclusions more directly. And the analytical expression of the band-gap can be generalized to complicated situations.

FQ5 • 15.30
A Special Kind of Photonic Crystal and Enlargement of Omnidirectional Total Reflection Band, *Haixia Qiang, Wei Jia, Liyong Jiang, Xiangyin Li; Nanjing Univ. of Science and Technology, China.* A one-dimensional magnetic photonic crystal (MPC) with the same refractive indices of the composites is investigated. Based on the incident angle domain method, the omnidirectional total reflection (ODTR) band can be enlarged using a heterostructure. The requirement of ODTR of each sub-PC is unnecessary, which extends the range of materials.

Guang Da 9

FR3 • 15.00
Clip-on Fiber Identifier Using Digital Lightpath Labels, *Mark D. Feuer, Vinay A. Vaishampayan; AT&T Labs, Res., USA.* We demonstrate a reader for digital lightpath labels that can be clipped onto a fiber to allow identification of lightpaths in the fiber without disturbing service traffic. Label error-rate measurements of labeled signals at ~10Gb/s confirm that simple fiber bends serve as effective clip-on power taps.

FR4 • 15.15
Simultaneous Optical Signal Extracting and Erasing Based on Four-Wave Mixing in Optical Fiber, *Yang Jiang[1], Jinlong Yu[2], Bo Wu[2], Jun Luo[2], Yujin Li[1], Bingchen Han[2], Enze Yang[2]; [1]Guizhou Univ., China, [2]Tianjin Univ., China.* A simultaneous optical signal extracting and erasing scheme is presented by utilizing four-wave mixing in optical fiber. Two synchronized gate and negation gate pulses, coupled with data stream, produce FWM effect to implement extracting and erasing functions. Experimental results are successfully demonstrated with NRZ data at 10 Gb/s.

FR5 • 15.30
Novel Scheme of Packet Header Extraction Using SOA-MZI with Asymmetric Control Light, *Huanlin Liu, Xiaotang Bai, Zhonghua Zhang, Erlong Li; Chongqing Univ. of Posts and Telecommunications, China.* An all optical header extraction using semiconductor optical amplifier and Mach-Zehnder-Interferometer with asymmetric control light was proposed. Numerical and simulation show that more than 18dB contrast ratio could be achieved at packet rate 100Gbit/s. Parameters of the SOA-MZI and the input signal are also discussed to optimize the performance.

Guang Da 11

FS2 • 15.00 Invited
Migration towards High Speed Optical Access Enabled by WDM Techniques, *Fabio Cavaliere[1], F. Ponzini[1], M. Presi[2], E. Ciaramella[2]; [1]Ericsson Res., Italy, [2]Scuola di Studi Superiori S. Anna, Italy.* Different options for the evolution of WDM PON toward 10 Gb/s are compared and investigated. Although 10 Gb/s is not yet cost effective for a fibre access networks, it can become a viable option in the next years, pushed by the demand of new services and enabled by recent technology advancements.

FS3 • 15.30
Novel Implementations of Optical Switch Control Module and 3-D-CSP for 10 Gbps Active Optical Access System, *Koji Wakayama, Michitaka Okuno, Yasunobu Matsuoka, Kazuhiko Hosomi, Misuzu Sagawa, Toshiki Sugawara; Hitachi Ltd., Japan.* We propose an optical switch control procedure and 3-D-CSP for high-performance and cost-effective 10 Gbps Active Optical Access System in which optical switches are used instead of optical splitters in PON. We demonstrate the implemented optical switch control module with logic circuits and the compact optical 3-D-CSP work effectively.

Guang Yun 7

FT4 • 15.00
Wavelength Converted Broadcast-Selective Buffer and Contention Resolution in Synchronous OPS Networks, *Ming Cheng, Weisheng Hu; State Key Lab of Advanced Optical Communication Systems and Networks, Shanghai Jiao Tong Univ., China.* This work presents a new wavelength converted broadcast-selective (WCBS) buffer structure. We use it to construct an OPS node in output-buffered pattern. The packet performance is studied under different traffic loads at different WCBS dimension. The result shows that the performance of high priority packets is improved effectively.

FT5 • 15.15
AIMD Control for Deflection Routing in OBS Networks, *Wen Dong, Minglei Fu, Zichun Le; Zhejiang Univ. of Technology, China.* A novel scheme entitled as Additive Increase Multiplicative Decrease control with the Number of Burst Control Packet (AIMD-NBCP) is proposed. Simulation results show that AIMD-NBCP scheme is efficient for keeping network stable and enhancing the performance of deflection routing in terms of good-put, burst loss probability as well as fairness.

FT6 • 15.30 Invited
A 3-Stage CLOS Architecture for High-Throughput Optical Packet Switching, *H. J. S. Dorren, Nicola Calabretta, Oded Raz; COBRA Res. Inst., Eindhoven Univ. of Technology, Netherlands.* We present a CLOS architecture for optical packet switching that allows for large throughput, low latency and contention resolution in the optical domain. The switch is scalable in terms of bit-rate and data-format and port-number. We describe devices and subsystems that support this architecture.

Guang Yun 8

FU3 • 15.00 Invited
Depth Resolved Imaging of Neural Activity by Optical Coherence Tomography (OCT), *Manabu Tanifuji, Wataru Suzuki, R. Uma Maheswari, Kazushige Tsunoda; RIKEN, Japan.* We have developed a functional imaging technique based on optical coherence tomography (OCT). This technique resolves 0.01-0.1 mm functional structures along the depth axis. The basis of the technique is that neural activation changes light scattering of the light penetrating the neural tissue due to activity dependent structural changes.

FU4 • 15.30
Dynamic Scanning of Drosophila Heart Beat with Optical Coherence Tomography, *Meng-Tsan Tsai, Cheng-Kuang Lee, C. C. Yang, June-Tsai Wu, Lian-Yu Lin; Natl. Taiwan Univ., Taiwan.* An optical coherence tomography system is used to observe the dynamics of the heart beats of drosophila. Several parameters can be obtained, including the end-diastolic dimension, end-systolic dimension, fractional shortening and heart rate. Based on OCT scanning, we can track the heart rate of normal and abnormal Drosophilae.

Guang Da 12

FV2 • 15.00 Invited
Coherent Anti-Stokes Raman Scattering Microscopy for Sensing Molecular Orientations, *Fake Lu, Wei Zheng, Zhiwei Huang; Natl. Univ. of Singapore, Singapore.* We report a radially polarized coherent anti-Stokes Raman scattering (CARS) microscopy to facilitate longitudinally oriented molecules detection. We demonstrate that combining both the radially and linearly polarized excitation schemes, CARS microscopy can be a very powerful tool for identifying the 3-D orientations of molecules with high sensitivity and chemical specificity.

FV3 • 15.30 Invited
Nonlinear Endomicroscopy for Two-Photon Autofluorescence Imaging of Biological Tissues, *Yicong Wu[1], Ming-Jun Li[2], Xingde Li[1]; [1]Johns Hopkins Univ., USA, [2]Corning Inc., USA.* A scanning fiber-optic endomicroscope with enhanced signal collection efficiency was developed for intrinsic two-photon fluorescence imaging of epithelial tissue. *Ex vivo* two-photon autofluorescence imaging were demonstrated for the first time from both epithelium and stroma of various biological tissues with such a flexible fiber-optic endomicroscope.

NOTES

Guang Yun 1

Guang Da 7

FQ6 • 15.45
Analysis of Mode Characteristics for Square Resonators with a Center Hole, *Shi-Jiang Wang, Yong-Zhen Huang, Yue-De Yang, Jin-Long Xiao; State Key Lab on Integrated Optoelectronics, Inst. of Semiconductors, CAS, China.* Square microresonator with a center hole is simulated by the finite-difference time-domain technology. The results indicate that the hole with a suitable size can result in enhancements of mode *Q* factor and output coupling efficiency.

Guang Da 9

Guang Da 11

FS4 • 15.45
Long Reach Passive Optical Networks with Adaptive Power Equalization Using Semiconductor Optical Amplifiers, *Ning Cheng[1], She-Hwa Yen[2], Jinwoo Cho[2], Zhiguang Xu[1], Tao Yang[1], Yingying Tang[2], Leonid G. Kazovsky[2]; [1]Huawei Technologies, USA, [2]Stanford Univ., USA.* A new scheme for power equalization in passive optical networks is proposed using adaptive gain control of semiconductor optical amplifiers. With this new scheme, continuous-mode receiver front-end can be used for upstream burst-mode transmission. Experimental testbed is demonstrated with -31dBm receiver sensitivity and >34dB dynamic range using continuous-mode receiver front-end.

16.00–16.30 Tea Break, *Everbright East Exhibition Hall*

16.30–18.00
FW • Quantum Dot Materials and Devices
Stephan Reitzenstein; Technische Physik, Univ. Würzburg, Germany, Presider

FW1 • 16.30
SPICE Equivalent Circuit Model of Quantum-Dot Semiconductor Optical Amplifiers, *Ali Rostami[1], R. Maram[1], H. Baghban[1], H. Rasooli Saghai[2], R. Ghorbani[1]; [1]Univ. of Tabriz, Iran, [2]Islamic Azad Univ., Iran.* We derive an equivalent circuit model for quantum dot semiconductor optical amplifier by employing rate equations between QD's levels and optical power propagation. The different parts of equivalent circuits interact together to represent the gain recovery process, saturation properties and chirp behavior in both linear and nonlinear operation.

FW2 • 16.45
Electronic Structure of Quantum Dots in (111) Direction, *Zhao Wei, Yu Zhongyuan, Liu Yumin; Beijing Univ. of Posts and Telecommunications, China.* This paper presents electronic structure of InAs/GaAs quantum dots in (111) direction. The cubic and truncated pyramidal shaped quantum dots are adopted. The electronic energy levels are calculated by solving a three-dimensional effective mass Shrödinger equation including a strain modified confinement potential and piezoelectric effects.

16.30–18.30
FX • Photonic Crystals II
Min Qiu; Royal Inst. of Technology (KTH), Sweden, Presider

FX1 • 16.30 Invited
Photonic Crystal Nanobeam Cavities for Reconfigurable Nanophotonics and Cavity QED, *Marko Loncar; Harvard Univ., USA.* Ultra-high-Q photonic crystal nanobeams cavities ($Q\sim10^6$) will be presented. Realization of reconfigurable optical filters that can be dynamically and reversibly tuned via electrostatic force, using coupled nanobeams, will be discussed. Tuning range of ~10nm was achieved in such system with less than 6V of external bias, and negligible steady-state power consumption.

16.30–18.15
FY • Optical Processing II
Nicola Calabretta; Technical Univ. of Eindhoven, Netherlands, Presider

FY1 • 16.30
Cavity-Enhanced Four-Wave-Mixing in an Integrated Semiconductor Ring Laser for All-Optical Logic Operations, *Bei Li[1], Muhammad Irfan Memon[1], Dan Lu[2], Gabor Mezosi[3], Zhuoran Wang[1], Marc Sorel[3], Siyuan Yu[1]; [1]Univ. of Bristol, UK, [2]Beijing Jiaotong Univ., China, [3]Univ. of Glasgow, UK.* This paper describes all-optical digital logic AND and XOR gates based-on cavity-enhanced four-wave-mixing in an integrated semiconductor ring laser at 2.5Gb/s. Error free operation with extinction ratio higher than 10dB is achieved.

FY2 • 16.45
Multilevel All-Optical Format Conversion from NRZ Signal to RZ Signal, *Yu Yu, Xinliang Zhang, Fei Wang, Dexiu Huang; Huazhong Univ. of Science and Technology, China.* We propose and demonstrate a multi-level all-optical format conversion from NRZ signal to RZ signal, using a semiconductor optical amplifier (SOA) and a detuned optical filter. NRZ signal with three intensity levels can be converted to corresponding RZ signal with error free.

16.30–18.30
FZ • Optical Access Networks II
Jean-Christophe Antona; Bell Labs, Alcatel-Lucent, France, Presider

FZ1 • 16.30 Invited
Bidirectional WDM-RoF Transmission for Wired and Wireless Signals, *Hyun-Seung Kim, Thang T. Pham, Yong-Yuk Won, Sang-Kook Han; Yonsei Univ., Republic of Korea.* Architectures of wired/wireless signal transmission based on RoF access network are proposed and experimentally verified. Both a wired and a wireless signals with a same data and heterogeneous data are simultaneously generated using an injection locking technique and optical carrier suppression modulation in F-P LD.

Guang Yun 7

Guang Yun 8

FU5 • 15.45
Highly Nonlinear Photonic Crystal Fibers for Optical Coherence Tomography Applications, *Feroza Begum[1], Yuncui Zhang[1], Shubi Kaijage[2], Yoshinori Namihira[2], Nianyu Zou[1]; [1]Dalian Polytechnic Univ., China, [2]Univ. of the Ryukyus, Japan.* Based on the finite difference method, different properties of highly nonlinear photonic crystal fibers are calculated. It is demonstrated that the nonlinear coefficients more than 64 and 55 $[Wkm]^{-1}$ at 1.06 μm and 1.3 μm, respectively, with flattened chromatic dispersion of 0 ± 3.7 ps/(nm.km) and low confinement losses, simultaneously.

Guang Da 12

16.00–16.30 Tea Break, *Everbright East Exhibition Hall*

16.30–18.30
FAA • Optical Packet/Burst Systems and Networks II
Yikai Su; Shanghai Jiao Tong Univ., China, Presider

FAA1 • 16.30 Invited
Multiple Wavelength Optical Packet Switching by InP Integrated Photonic Devices, *Yoshiaki Nakano; Univ. of Tokyo, Japan.* A monolithically integrated InGaAsP/InP 1x5 optical phased-array switch has been utilized for broadband wavelength-division multiplexed (WDM) optical packet switching (OPS) application. Using the wide optical bandwidth of the switch, we have achieved error-free forwarding of 320-Gbps (40-Gbps x 8 channel) WDM signal with less than 1.3 dB penalty.

16.30–18.30
FBB • Optical Coherence Tomography: Novel Technologies and Applications II
Xingde Li; Johns Hopkins Univ., USA, Presider

FBB1 • 16.30 Invited
Tissue Contrast Imaging by Polarization Sensitive Optical Coherence Tomography, *Yoshiaki Yasuno[1,2], Arata Miyazawa[1,2], Shuichi Makita[1,2], Masahiro Yamanari[1,2]; [1]Computational Optics Group in the Univ. of Tsukuba, Japan, [2]Computational Optics and Ophthalmology Group, Japan.* A tissue discriminating tomographic imaging by polarization sensitive optical coherence tomography (PS-OCT) is reported. The PS-OCT provides a standard OCT and phase retardation OCT. These images are processed by a newly developed algorithm which classifies each pixel to tissue types based on the optical properties of the pixels.

16.30–18.15
FCC • Nonlinear Optical Imaging II and Raman/Fluorescence Spectroscopy and Imaging Technologies
Fu-Jen Kao; Inst. of Biophotonics, Natl. Yang-Ming Univ., Taiwan, Presider

FCC1 • 16.30 Invited
Alterations of the ECM During Ovarian Carcinogenesis Studied by Second Harmonic Generation Imaging Microscopy, *Oleg Nadiarnykh, Ronald B. LaComb, Molly A. Brewer, Paul J. Campagnola; Univ. of Connecticut Health Ctr., USA.* We have used Second Harmonic Generation (SHG) imaging microscopy to quantify alterations in the fibrillar collagen assembly in *ex vivo* human malignant and normal ovarian tissues. We integrate 3-D imaging measurements, bulk optical parameter measurements, and Monte Carlo simulations to isolate the structural factors that are different in these tissues.

NOTES

Guang Yun 1

FW3 • 17.00
Calculation of Exciton Energy in InAs/InP Self-Assembled Semiconductor Quantum Wires, *Xu Zihuan, Liu Yumin, Yu Zhongyuan, Yao Wenjie; Beijing Univ. of Posts and Telecommunications, China.* Theoretical calculations of exciton in InAs/InP self-assembled quantum wires are presented in this paper. Coulomb interaction between electron and hole is calculated by fast Fourier transformation. In our simulations, strain effects are considered. Finally, we obtain the exciton binding energy by solving 1-D Schrodinger equation along the quantum wire direction.

FW4 • 17.15
Energy Transfer in Colloid CdSe Quantum Dots, *Qiguang Yang[1], JaeTae Seo[1], Bagher Tabibi[1], William Yu[2]; [1]Hampton Univ., USA, [2]Worcester Polytechnic Inst., USA.* Colloid CdSe quantum dots have been synthesized and their photonic application as a two-wave mixing medium has been demonstrated. Large energy transfer from a strong pump beam to a weak signal beam has been observed.

FW5 • 17.30
Pump Controllable Optical Delay and Advance Lines Using CdSe Quantum Dots, *Qiguang Yang[1], JaeTae Seo[1], Bagher Tabibi[1], William Yu[2]; [1]Hampton Univ., USA, [2]Worcester Polytechnic Inst., USA.* Pump controllable nanosecond optical delay and advance lines have been demonstrated using colloid CdSe quantum dots. The delay/advance time and the transition between delay and advance can be easily manipulated by a pump beam.

Guang Da 7

FX2 • 17.00
Optical Channel Drop Filters Based on 45° Photonic-Crystal Ring Resonators, *Jibo Bai[1], Junqin Wang[2], Bo Ni[1], Junzhen Jiang[1], Xiyao Chen[3], Yishen Qiu[1], Zexuan Qiang[1]; [1]School of Physics and Optoelectronics Technology, Fujian Normal Univ., China, [2]College of Chemistry and Material Science, Fujian Normal Univ., China, [3]Dept. of Physics and Electronic Information Engineering, Minjiang Univ., China.* A new optical channel drop filter was proposed based on two-dimensional (2-D) 45° photonic crystal ring resonators. Its spectral information including intensity, dropped efficiency and quality factor affected by different physical parameters were numerically analyzed with 2-D finite-difference time-domain technique. Near 100% dropped efficiency can be achieved at 1550-nm channel.

FX3 • 17.15
New Design of a Triplexer Using Ring Resonator Integrated with Directional Coupler Based on Photonic Crystals, *Yaw-Dong Wu, Tien-Tsorng Shih, Jian-Jang Lee; Electronic Engineering of Natl. Kaohsiung Univ. of Applied Sciences, Taiwan.* In this paper, we proposed the design of directional coupler integrated with ring-resonator based on photonic crystals (PCs) to develop a triplexer filter, which can separate the wavelengths at 1550nm, 1490nm, and 1310nm.

FX4 • 17.30
A New Method for Optimization of a Photonic Crystal Waveguide Termination, *Wang Donglin, Yu Zhongyuan, Liu Yumin, Lu Pengfei; Beijing Univ. of Posts and Telecommunications, China.* This work adopts the adjoin optimization of the shape and the position of dielectric rods surrounding the termination of a photonic crystal waveguide, to realize the efficient directional emission. More than fivefold improvement in power incident upon a target area over a simple termination is achieved.

Guang Da 9

FY3 • 17.00
Optical Frequency up-Conversion of UWB Monocycle Pulse Based on Pulsed-Pump Fiber Optical Parametric Amplifier, *Jia Li, Yu Liang, Xing Xu, Kim Ka-Yi Cheung, Kenneth Kin-Yip Wong; Univ. of Hong Kong, Hong Kong.* We propose a method to realize frequency up-conversion of UWB monocycle pulse using pulsed-pump fiber optical parametric amplifier (OPA). We demonstrate frequency up-conversion to 22 GHz in the experiment and 60 GHz in the simulation.

FY4 • 17.15
A Microwave Photonic Interference Mitigation Filter Based on Semiconductor Optical Amplifier, *Enming Xu, Xinliang Zhang, Lina Zhou, Yu Zhang, Yuan Yu, Fei Wang, Dexiu Huang; Wuhan Natl. Lab for Optoelectronics, Huazhong Univ. of Science and Technology, China.* A microwave photonic interference mitigation filter is proposed and experimentally demonstrated. The structure is based on a recirculating delay line comprising a semiconductor optical amplifier used to generate negative tap. A bandpass response with negative coefficients and a broadband allpass response are combined to achieve notch response with flat passband.

FY5 • 17.30
Comparison of Three Types of Wavelength Conversion Schemes Based on Nonlinear Polarization Rotation, *Chuanfen Feng[1], Jintong Lin[2]; [1]China Mobile Group Design Inst. Co., Ltd., Shandong Branch, China, [2]Beijing Univ. of Posts and Telecommunications, China.* The performance of three types of wavelength conversion schemes based on nonlinear polarization rotation (NPR) is investigated at 640Gbit/s. Analytic results show that the wavelength conversion based on NPR assisted with blue-shifted filtering scheme exhibits the best performance in the same conditions.

Guang Da 11

FZ2 • 17.00
Visible LED Wireless Optical Transmission in Optical Access Network Using Electroabsorption Transceiver, *Sung-Chan An, Yong-Hwan Son, Yong-Wuk Won, Sang-Kook Han; Yonsei Univ., Republic of Korea.* Visible LED wireless system based on the existing optical access network is proposed for the first time. Electroabsorption transceiver is used to construct LED wireless optical link with optical access network. 5Mbps downlink and uplink transmission is verified through 23Km standard single mode fiber and 40cm wireless channel experimentally.

FZ3 • 17.15
A Novel Evolution from TDM-PON to WDM-PON Based on DPSK/NRZ Orthogonal Modulation, *Yang Lu, Jie Liu, Xuezhi Hong, Duoduo Zeng; Ctr. for Optical and Electromagnetic Res., Zhejiang Univ., China.* A novel evolution from TDM-PON to WDM-PON based on DPSK/NRZ orthogonal modulation is proposed. No change for ONU of the existing TDM-PON is required. The good performance and feasibility of the method after a 20-km transmission is experimentally demonstrated.

FZ4 • 17.30
Proposal of a Flexible RSOA-Based Remote Node in Bi-Directional Single-Fiber Transmission Systems, *Lian Lu, Ming Zhang, Lei Liu, Mingtao Liu, Peida Ye; Beijing Univ. of Posts and Telecommunications, China.* Proposed in this paper is a novel flexible scheme of remote node for the full-duplex single fiber transmission systems. Simulations are conducted to validate that proposal based system realizes transmission with baseband signal in downstream and OSSB signal in upstream.

Guang Yun 7

FAA2 • 17.00 Invited

Hybrid Optoelectronic Router for Asynchronous High-Speed Optical Packets, *Hirokazu Takenouchi, R. Urata, T. Nakahara, R. Takahashi; NTT Photonics Labs, NTT Corp., Japan.* A hybrid optoelectronic packet switched router which optimally combines the intelligence of electronics with the high capacity and speed of optics is promising for reducing power, size and latency, while maintaining the ability to process arbitrary-length high-speed asynchronous optical packets and support flexible network services.

FAA3 • 17.30

Optimized Block Synchronization of Optical Packet Overhead in OPS Networks, *Shaozhong Zheng, Minghua Chen, Ming Xin, Hongwei Chen, Shizhong Xie; Tsinghua Univ., China.* A packet format employed in optical packet switching (OPS) networks is proposed. The performance of block synchronization of the burst-ode optical packets is analyzed. Based on the analysis, the length of overhead synchronization bits is optimized to achieve high framing efficiency.

Guang Yun 8

FBB2 • 17.00 Invited

Diagnosis Golden Rules of Oral Diseases Based on Optical Coherence Tomography, *Meng-Tsan Tsai, Cheng-Kuang Lee, C. C. Yang, Hsin-Ming Chen, Chun-Pin Chiang; Natl. Taiwan Univ., Taiwan.* A swept-source optical coherence tomography system is used to clinically scan oral squamous cell carcinoma (SCC) patients of various evolution stages for diagnosis purpose. Based on the analyses of scan images, dysplasia and SCC can be differentiated from normal control by evaluating the depth-dependent standard deviation values of lateral variations.

FBB3 • 17.30 Invited

3-D Endoscopic Optical Coherence Tomography Based on Rapid-Scanning MEMS Mirrors, *Huikai Xie; Univ. of Florida, USA.* The paper reports 3-D *in vivo* endoscopic imaging enabled by integrating rapid-scanning MEMS mirrors into an optical coherence tomography (OCT) imaging probe. The MEMS mirrors have large aperture size, large scan range and low drive voltage. Polarization-sensitive OCT imaging has also been demonstrated.

Guang Da 12

FCC2 • 17.00 Invited

Nonlinear Spectral Imaging of Esophageal Tissue Based on Two-Photon Excited Fluorescence and Second-Harmonic Generation, *Jianxin Chen, Shuangmu Zhuo, Xingshan Jiang; Fujian Normal Univ., China.* In this paper, we report on nonlinear spectral imaging of rabbit esophageal tissue, and *ex vivo* human normal and neoplastic esophageal stroma. Our results show that nonlinear spectral imaging has a capability to identify the layered structures of epithelial tissue, and differentiate between normal and neoplastic human esophageal stroma.

FCC3 • 17.30 Invited

Raman Spectroscopy for *in vivo* Tissue Analysis and Diagnosis at the Macro- and Microscopic Levels, *Haishan Zeng[1,2], Jianhua Zhao[1,2], Michael Short[1], Hequn Wang[1,2], David I. McLean[2], Stephen Lam[1], Annette McWilliams[1], Harvey Lui[1,2]; [1]British Columbia Cancer Res. Ctr., Canada, [2]Univ. of British Columbia, Canada.* We report various technologies developed in our lab for *in vivo* Raman spectroscopy and related clinical applications. This includes macroscopic probes and endoscopy catheters that interrogate millimeter-scale tissue volumes for skin and lung cancer detection and a confocal microscopy system for depth-resolved Raman measurements of the skin *in vivo*.

NOTES

Guang Yun 1

FW6 • 17.45

Measurement of Radiative Lifetime in CdSe/CdS Core/Shell Structured Quantum Dots, *Lin Dong[1], Andrea Pinos[1], Abhilash Sugunan[1], Shanghua Li[1], Sergei Popov[1], Muhammet Toprak[1], Ari T. Friberg[1,2,3], Mamoun Muhammed[1]; [1]Dept. of Microelectronics and Applied Physics, Royal Inst. of Technology, Sweden, [2]Dept. of Engineering Physics, Helsinki Univ. of Technology, Finland, [3]Dept. of Physics and Mathematics, Univ. of Joensuu, Finland.* Radiative lifetime of chemically synthesized colloidal CdSe/CdS core/shell quantum dots is measured. Influence of the core size on the electron-hole pair separation is analyzed. A long radiative lifetime and the existence of electron-hole pair separation suggest high potential of these dots as gain material to achieve lasing under continuous-wave excitation.

Guang Da 7

FX5 • 17.45

Fabrication of the Amendatory One-Dimensional Photonic Crystals for SHF Reflector Antennas, *Bin Li[1], Shanguo Huang[1], Kuei-Jen Lee[2], Hsi-Tseng Chou[3], Wanyi Gu[1]; [1]Key Lab of Optical Communication and Lightwave Technologies, Beijing Univ. of Posts and Telecommunications, China, [2]Dept. of Communication Engineering, Oriental Inst. of Technology, Taiwan, [3]Dept. of Communications Engineering, Yuan Ze Univ., Taiwan.* The energy distribution of TE/TM polarizations are regulated with a one dimensional photonic crystal to achieve a broader beamwidth, also the reflector antenna is fabricated and measured to validate the efficiency of the proposed approach.

FX6 • 18.00

Decoupling Efficiency of Multiple Coupled Photonic Crystal Waveguides, *Tianbao Yu, Lingjuan He, Liguang Fang, Ping Wu; Nanchang Univ., China*. Decoupling of multiple coupled photonic crystal waveguides are investigated numerically on the basis of self-imaging principle. An optimization way is utilized to enhance the decoupling efficiency.

FX7 • 18.15

Fabry-Perot Interferometer in a Rod-Type Photonic Crystal Based on Self-Collimation, *Guimin Lin[1], Xiyao Chen[1], Nan Lin[1], Yufei Wang[2], Bo Ni[3], Jibo Bai[3], Zexuan Qiang[3], Yishen Qiu[3]; [1]Minjiang Univ., China, [2]Longyan Univ., China, [3]Fujian Normal Univ., China.* Low-loss Fabry-Perot interferometer consisting of two reflectors in a rod-type photonic crystal based-on the self-collimation effect is proposed and investigated. Free spectral range and peaks frequencies of its transmission decrease when the resonant cavity length increases. By raising the reflector reflectivity, the quality factor of peaks can be easily improved.

Guang Da 9

FY6 • 17.45

640Gbit/s All-Optical Demultiplexing Scheme Based on Nonlinear Polarization Rotation, *Chuanfen Feng[1], Jintong Lin[2]; [1]China Mobile Group Design Inst. Co., Ltd., Shandong Branch, China, [2]Beijing Univ. of Posts and Telecommunications, China.* 640Gbit/s to 80Gbit/s all-optical demultiplexing scheme based on nonlinear polarization rotation is numerically analyzed in details. For the higher output channel suppression ratio of the demultiplexing scheme, the input clock signal with TE mode is required.

FY7 • 18.00

Clock Pump Preprocessing to Reduce the XPM Effect in the Optical Decision Based on Optical Fiber Parametric Amplifier, *Bingchen Han[1,2], Jinlong Yu[1], Chengquan Yang[2], Bo Wu[1], Jun Luo[1], Ju Wang[1], Wenrui Wang[1], Jingzhong Guo[1], Enze Yang[1]; [1]Tianjin Univ., China, [2]Shanxi Datong Univ., China.* A novel approach is proposed to reduce the cross phase modulation between multiple clock pump in the multi-wavelength optical decision based optical fiber parametric amplifier. The dispersive media is used to preprocess the pump clock, and then the clock pump is changed from intensity modulation into phase modulation.

Guang Da 11

FZ5 • 17.45

An Enhanced Dynamic Wavelength and Bandwidth Allocation Method in WDM-EPON, *Zhiwei Zeng, Yang Ran, Hongbin Huang, Weiping Liu; Dept. of Electronics Engineering, Jinan Univ., China.* A kind of dynamic wavelength and bandwidth allocation (DWBA) algorithm of WDM-EPON was studied and then improved to guarantee QoS of miltiple-services access. MPCP extention with modified REQUEST message and GRANT message are also proposed.The simulation results based on OPNET indicates the improved algorithm performed well in successful QoS assurance.

FZ6 • 18.00

An OFDMA-PON Enabling Optical Interconnections Among the Optical Network Units, *Cishuo Yan, Yanzhi Wu, Tong Ye; Shanghai JiaoTong Univ., China.* In this paper, we have proposed an orthogonal frequency division multiple access-passive optical networks (OFDMA-PON) that support communication between different optical network units (ONUs) assisted with a FBG. Simulations are made to demonstrate the effectiveness of the proposal.

FZ7 • 18.15

Broadcasting Overlay Transmission on WDM-PON Using ASE Seeding Source in RSOA, *Hyun-Seung Kim, Sung-Chan An, Yong-Hwan Son, Yong-Yuk Won, Sang-Kook Han; Yonsei Univ., Republic of Korea.* The simultaneous wired and broadcasting signals transmission based on WDM-PON access network are proposed and their experimental results are shown in this paper. Simultaneous downstream transmission of wired and broadcasting signals over 23-km SMF is experimentally verified and mutual interference between wired and broadcasting signals is analyzed.

Guang Yun 7

FAA4 • 17.45
BFD-Triggered Failure Detection and Fast Reroute for OBS Networks, *Minglei Fu, Wen Dong, Zichun Le; Zhejiang Univ. of Technology, China.* Bidirectional Forwarding Detection (BFD) is introduced into node failure or link failure detection for OBS networks. And a BFD-triggered failure detection mechanism combines with Fast Reroute (FRR) is proposed and simulated. Simulation results verify the feasibility and effectiveness of the proposed mechanism.

FAA5 • 18.00
Cross Counter-Based Adaptive Assembly Scheme in Optical Burst Switching Networks, *Zhijun Zhu, Wen Dong, Zichun Le; Zhejiang Univ. of Technology, China.* A novel adaptive assembly algorithm is proposed in this paper. The threshold can be dynamically adjusted according to the cross counter and step length. In terms of assembly period and the burst loss probability, we compare the performance of CBAAP with three typical algorithms in the simulation part.

FAA6 • 18.15
Performance Analysis of a Selective Burst Discarding Scheme for Deflection Routing in OBS Networks, *Yinghui Qiu[1], Yuefeng Ji[2], Daxiong Xu[2]; [1]North China Electric Power Univ., China, [2]Beijing Univ. of Posts and Telecommunications, China.* We propose a selective burst discarding scheme for deflection routing in OBS networks. The discarding scheme is based on the priority of deflected and undeflected bursts and the number of elapsed and remaining hops. The proposed scheme controls superfluous deflection in order to use the network resource efficiently.

Guang Yun 8

FBB4 • 18.00 Invited
Functional Common-Path Fourier-Domain OCT for Hemoglobin Oxygen Saturation Imaging, *Jin U. Kang, Xuan Liu; Johns Hopkins Univ., USA.* We propose and analyze functional Common-Path Fourier-domain Optical Coherence Tomography (CP-FDOCT) for providing localized and quantitative estimation of hemoglobin oxygen saturation (SO_2) level in tissue. Result using a chicken embryo *in vivo* is presented.

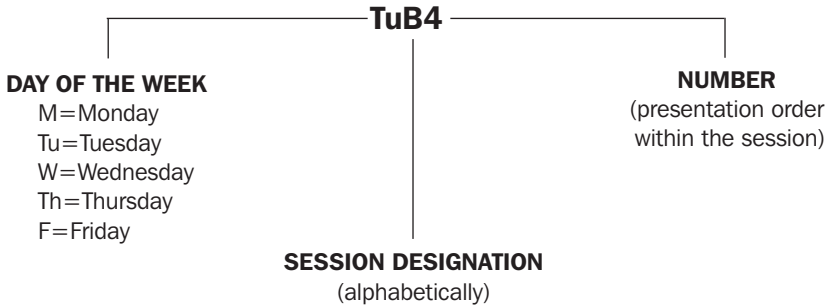
Guang Da 12

FCC4 • 18.00
Low Contrast Double Slot Structure Based Optomechanical Sensor, *Muddassir Iqbal[1], Zheng Zheng[2], Jiansheng Liu[2]; [1]Natl. Univ. of Science and Technology, Pakistan, [2]Beihang Univ., China.* High e-field confinement in slotwaveguide is dependent upon various parameters. A double slot structure where two low index slots of hard material in high index cladding of compressible material is proposed. Power confinement dependency upon distance between slots have been numerically computed, lead to the proposal of optomechanical sensor.

NOTES

Monday, 2 November				
	Guang Da 7	**Guang Da 9**	**Guang Da 11**	**Guang Da 12**
12.00–18.00	**Registration Open,** *Everbright Center Lobby*			
13.30–18.00	**MA • Challenges and Opportunities in Fiber-Based Devices and Applications**	**MB • Photonics and Optoelectronics Integration for Real-Life Applications: Promises, Opportunities, Challenges and Achievements**	**MC • Next Generation FTTH Technologies**	**MD • Meeting the Need for Speed—40G and the Road to 100G**
14.00–18.00	**SC345 • Biophotonics-The What, How and Why of Applying Optical Sciences and Technologies to the Life Sciences,** *Brian Wilson; Univ. of Toronto, Canada;* **SC346 • Resilience of Multilayer IP over Optical Networks,** *Andrzej Jajszczyk; AGH Univ. of Science and Technology, Poland*			

Explanation of Session Codes



The first letter of the code denotes the day of the week (Monday=M, Tuesday=Tu, Wednesday=W, Thursday=Th, Friday=F). The second element indicates the session within the particular day the talk is being given. Each day begins with the letter A and continues alphabetically. The number on the end of the code signals the position of the talk within the session (first, second, third, etc.). For example,a session coded TuB4 indicates that this paper is being presented on Tuesday (Tu) during the second session (B), and is the fourth paper (4) presented in that session.

Program Updates and Changes may be found on the Update Sheet distributed at registration.

Tuesday, 3 November								
	Guang Yun 1	**Guang Da 7**	**Guang Da 9**	**Guang Da 11**	**Guang Yun 7**	**Guang Yun 8**	**Guang Da 12**	**Guang Da 16**
7.30–17.00	**Registration Open,** *Everbright Center Lobby*							
8.30–10.15	**TuA • Nonlinear Optics**	**TuB • VCSELs**	**TuC • SC 01 Best Student Paper Competition**	**TuD • SC 02 Best Student Paper Competition**	**TuE • SC 03 Best Student Paper Competition** (ends at 10.00)	**TuF • SC 04 Best Student Paper Competition**	**TuG • SC 05 Best Student Paper Competition**	**TuH • SC 06 Best Student Paper Competition** (ends at 10.00)
10.15–10.45	**Tea Break,** *outside of Session Rooms*							
10.45–12.30	**TuI • Optical Fiber**	**TuJ • Optical MEMS and Vertical Cavity Tunable Devices** (ends at 12.15)	**TuK • Regeneration and Processing**	**TuL • Dynamic Provisioning**	**TuM • Multimodal Biophotonics Technologies**	**TuN • Novel Technologies for LEDs** (ends at 12.45)	**TuO • Optical Pulses**	**TuP • Planar Waveguide Devices** (ends at 12.45)
12.30–14.00	**Lunch Break**							
14.00–15.45	**TuQ • Polarization Effects and Measurements**	**TuR • Special Session on Optical Interconnect for Green ICT I** (starts at 13.45)	**TuS • Transmitter and Receiver Technologies I**	**TuT • Optical Access Networks I**	**TuU • Diffuse Optical (Fluorescence) Tomography and Molecular Imaging I** (ends at 15.30)	**TuV • Photonic Crystals** (ends at 15.30)	**TuW • PMD Compensation**	**TuX • All-Optical Signal Processing**
15.45–16.15	**Tea Break,** *outside of Session Rooms*							
16.15–18.00	**TuY • Optical Processing**	**TuZ • Special Session on Optical Interconnect for Green ICT II** (ends at 18.15)	**TuAA • Transmitter and Receiver Technologies II**	**TuBB • Optical Access Networks II**	**TuCC • Diffuse Optical (Fluorescence) Tomography and Molecular Imaging II**	**TuDD • OCDMA + Repeater for Access**	**TuEE • Fiber Lasers**	**TuFF • Novel Fiber-optic Sensors I** (ends at 18.15)
18.00–19.30	**Welcome Reception,** *Presentation Hall*							

Wednesday, 4 November								
	Guang Da 7	**Guang Da 9**	**Guang Da 11**	**Guang Da 12**	**Guang Yun 7**	**Guang Yun 8**	**Guang Da 16**	**Guang Da 18**
7.30–17.00	**Registration Open,** *Everbright Center Lobby*							
8.30–10.25	**WA • Plenary Session I,** *Ballroom*							
9.00–17.00	**Exhibit Open,** *Everbright East Exhibition Hall*							
10.25–10.45	**Tea Break,** *Everbright East Exhibition Hall*							
10.45–12.15	**WB • Plenary Session II,** *Ballroom*							
12.15–13.30	**Lunch Break**							
13.30–15.00	**WC • Fiber Gratings**	**WD • Photonic Integration**	**WE • Networking** (ends at 14.45)	**WF • GMPLS Provisioning**	**WG • Cellular and Molecular Biophotonics Imaging** (ends at 14.45)	**WH • Solid-State Lighting**	**WI • Optical Couplers**	**WJ • Mid-Infrared and THz Devices**
14.00–17.00	**WK • INDUSTRY FORUM: Communications for a Green Environment,** *Guang Yun 1*							
15.00–15.30	**Tea Break,** *Everbright East Exhibition Hall*							
15.30–17.00	**WL • Poster Session,** *Exhibition Floor*							
18.00–22.00	**Conference Banquet,** *Shanghai Lu Bo Lang Restaurant*							
18.00–19.00	**Cocktail Hour**							
19.00–22.00	**Banquet**							

Thursday, 5 November								
	Guang Da 7	**Guang Da 9**	**Guang Da 11**	**Guang Da 12**	**Guang Yun 7**	**Guang Yun 8**	**Guang Da 16**	**Guang Da 18**
8.00–17.00	**Registration Open,** *Everbright Center Lobby*							
8.30–10.00	**ThA • Photonic Crystal Fibers I**	**ThB • Silicon Photonics**	**ThC • 100 and 40 Gb/s Transmission Systems I**	**ThD • Applications of Optical Systems in Networks I**	**ThE • Optical Waveguide Devices I**	**ThF • OFDM I**	**ThG • Fabrication Technologies**	**ThH • Novel Fiber-optic Sensors II**
9.00–17.00	**Exhibit Open,** *Everbright East Exhibition Hall*							
10.00–10.30	**Tea Break,** *Everbright East Exhibition Hall*							
10.30–12.00	**ThI • INDUSTRY FORUM: Photonics for Green Energy–Photovoltaics,** *Guang Yun 1*							
10.30–12.00	**ThJ • Fiber Design and Fabrication**	**ThK • Nonlinear Optics**	**ThL • 100 and 40 Gb/s Transmission Systems II**	**ThM • Applications of Optical Systems in Networks II** (ends at 11.45)	**ThN • Optical Waveguide Devices II**	**ThO • OFDM II**	**ThP • Ultra-Short Optical Pulses**	**ThQ • Photonic Crystal Fibers II**
12.00–13.30	**Lunch Break**							
13.30–15.30	**ThR • Optical Amplifers**	**ThS • Plasmonic Nanostructures**	**ThT • Modeling and Modulation Formats**	**ThU • Next Generation Optical Networks**	**ThV • Functional Imaging with Biophotonics**	**ThW • High-Speed Devices** (ends at 15.15)	**ThX • Nano-biophotonics for Imaging and Therapy I**	**ThY • Organic LEDs** (ends at 15.15)
14.30–18.30	**ThZ • INDUSTRY FORUM: Photonics for Green Energy–LED Lighting,** *Guang Yun 1*							
15.30–16.00	**Tea Break,** *Everbright East Exhibition Hall*							
15.30–17.00	**Exhibit Only Time,** *Everbright East Exhibition Hall*							
17.00–18.30	**ThAA • Microstructured Fibers**	**ThBB • Nanophotonics** (ends at 18.45)	**ThCC • Hybrid Wireless and Optical Networks** (ends at 18.15)	**ThDD • Survivable Networks I**	**ThEE • Magneto-optics and Acousto-optics**	**ThFF • Optical Packet Switched Networks**	**ThGG • Nano-biophotonics for Imaging and Therapy II** (ends at 18.45)	**ThHH • Solar Cells**

Friday, 6 November								
	Guang Yun 1	**Guang Da 7**	**Guang Da 9**	**Guang Da 11**	**Guang Yun 7**	**Guang Yun 8**	**Guang Da 12**	**Guang Da 16**
8.00–17.00	**Registration Open,** *Everbright Center Lobby*							
8.30–10.15	**FA • Optical Devices I**	**FB • Semiconductor Lasers I**	**FC • Physical Effects Studies I** (ends at 10.00)	**FD • Survivable Networks II**	**FE • New Biophotonics Technologies I**	**FF • Access Technology**	**FG • Dynamic Lightpath Control**	**FH • Photodetectors**
9.00–16.00	**Exhibit Open,** *Everbright East Exhibition Hall*							
10.15–10.45	**Tea Break,** *Everbright East Exhibition Hall*							
10.45–12.30	**FI • Optical Fiber**	**FJ • Semiconductor Lasers II**	**FK • Physical Effects Studies II**	**FL • Network Architecture**	**FM • New Biophotonics Technologies II**	**FN • Radio over Fibre**	**FO • Virtual Network**	
12.30–14.00	**Lunch Break**							
14.00–16.00	**FP • Optical Devices II** (ends at 15.45)	**FQ • Photonic Crystals I**	**FR • Optical Processing I** (ends at 15.45)	**FS • Optical Access Networks I**	**FT • Optical Packet/ Burst Systems and Networks I**	**FU • Optical Coherence Tomography: Novel Technologies and Applications I**	**FV • Nonlinear Optical Imaging Technologies I**	
16.00–16.30	**Tea Break,** *Everbright East Exhibition Hall*							
16.30–18.30	**FW • Quantum Dot Materials and Devices** (ends at 18.00)	**FX • Photonic Crystals II**	**FY • Optical Processing II** (ends at 18.15)	**FZ • Optical Access Networks II**	**FAA • Optical Packet/Burst Systems and Networks II**	**FBB • Optical Coherence Tomography: Novel Technologies and Applications II**	**FCC • Nonlinear Optical Imaging II and Raman/ Fluorescence Spectroscopy and Imaging Technologies** (ends at 18.15)	

ACP Key to Authors and Presiders

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

Abd Rahman, Mohd Kamil—FA3
Abdelrahman, Ahmed M.—**ThEE4**
Abdul Manaf, Nor Azlian—**TuB4**
Ab-Rahman, Mohd Syuhaimi—ThG6
Accard, Alain—FJ3
Adhikari, Susmita—ThL2
Agata, Akira—**TuBB4**, TuDD6
Ahmad, A.—TuEE2
Ahmed, Jawwad—TuT2
Ahn, Sungmo—TuH1
Aijun, Jin—WL35
Akhavan, Hooman—**FP4**
Akrout, Akram—FJ3
Aktsipetrov, Oleg A.—ThEE5
Al Amin, Abdullah—**ThF2**
Alameh, Kamal—ThEE1, ThEE4
Albert, Jacques—TuFF1
Ale, Angelica—TuCC2
Alias, Mohd Sharizal—TuB4
Al-Mansoori, M. H.—TuEE2
Alping, Arne—ThC3
Amann, Markus C.—TuD6
Amaya, Waldimar—TuDD2, TuDD3
Amouzad Mahdiraji, Ghafour—**ThL4**
An, Lin—ThA4
An, Sung-Chan—**FZ2**, FZ7
Andersson-Engels, Stefan—**ThGG2**
Antona, Jean-Christophe— **WE, FC1, FR, FZ**
Aoki, Yoji—**WL113**
Arakawa, S.—FT1
Arakawa, Yasuhiko—**FQ1**, **FX**
Araki, Soichiro—FG3
Arellano, Cristina—**WD4**
Arif, Noor Azie Azura Mohd—**ThG6**
Armstrong, David—TuM3
Aubry, Guillaume—**TuG3**
Austin, Michael W.—**ThE5**
Awad, Ehab—**TuK5**
Axelsson, Johan—ThGG2

Baba, Mamoru—WL99
Bach, Heinz G.—TuE1
Baek, Jiyoung—ThG5
Baets, Roel—ThB2
Baghban, H.—WJ2, WJ5, FW1
Bahrami Yekta, Vahid—**FJ6**
Bahrami, Ali—ThA5, FA4
Bai, Jibo—TuV3, **FX2**, FX7
Bai, Jing—**TuCC4**, TuCC5, TuG6, **TuM**, **TuU1**
Bai, Xiaotang—FR5
Bai, Ye—WL7
Ballato, John— **ThR, FI1**
Banaei, Hamed A.—ThA5, FA4
Banerji, Soame—TuFF2
Bange, Jaspal P.—**ThG3**
Bao, Hualong—**WL84**
Bao-lu, Guan—**TuJ2**
Bartoli, Filbert—TuD1, ThS5, ThS6
Batayneh, Marwan—WE2
Beausoleil, Raymond—ThB3
Begum, Feroza—FU5
Billenahalli, Shreejith—FL1
Bonk, R.—TuK1
Booksh, Karl S.—TuFF2
Boppart, Stephen A.—TuG2
Botten, L. C.—TuV1
Bourdoucen, Hadj—**WE4**
Boutin, Aurelien—ThW3
Bowers, John E.—TuP5, ThB1, ThB3
Breuer, Dirk—**TuBB1**, **TuBB2**, **TuT**
Brewer, Molly A.—FCC1
Brueck, Steven R. J.—TuD2
Buchta, Hao—WF3
Büchter, D.—ThN1
Bushong, Elizabeth J.—ThQ6

Cai, Lei—TuF3, WL55
Cai, Miao-Zhen—WL101
Cai, ShiWei—TuJ4, WL33, FH3
Calabretta, Nicola—**FR1,** FT6, **FY**
Campagnola, Paul J.—**FCC1, FV1**
Canning, John—**WC, ThAA1**
Cao, Chang—TuF7
Cao, Xu—**TuG5**
Cao, Xuping—**ThDD4**
Casey, Shawn P.—**FE3**
Cavaliere, Fabio—**FS2**
Cen, Songyuan—WH3
Chakraborty, Bikash—TuX6
Chan, C. C.—TuFF4, WL3, WL9, WL84
Chang, Deyuan—**WL61**
Chang, Hsu-Hao—ThB3
Chang, Jieun—ThHH1
Chang, Jun—ThN2
Chang, Qingjiang—ThE1
Chang, Yu-Han—ThY1
Chang, Zhijuan—ThD3
Chang-Hasnain, Connie J.—**TuB1,** TuD6
Chao, Yu-Chiang—FH2
Chavez-Pirson, Arturo—WJ4
Chazelas, Jean—TuP3
Chen, Biao—TuDD5, TuT2
Chen, Bob—FJ5
Chen, Cheng-Yen—TuN5
Chen, Chi-Feng—**WI3**, **WI4,** ThP6, **FK3**
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Chen, Deying—TuEE3
Chen, Gen-Xiang—TuH2
Chen, Haiyan—**FP3**
Chen, Haoshuo—**FN6**
Chen, He—TuF3, ThR6
Chen, Hongda—**TuZ4,** FF5
Chen, Hongwei—ThF5, FAA3
Chen, Hsin-Ming—FBB2
Chen, Jiajia—TuT2
Chen, Jian—FC3
Chen, Jianxin—WH5, WL88, **FCC2**
Chen, Jingwei—ThK2
Chen, Junewen—**ThP6**
Chen, Jung-Chao—ThP6
Chen, Liang-Yi—TuN1
Chen, Lian-Kuan—TuE3
Chen, Lin—TuG3
Chen, Ling—TuU3
Chen, Ming—TuAA6, WL31, **WL58, FK6**
Chen, Minghua—ThF5, FAA3
Chen, Na—TuFF3, TuG1, WL103, ThH5
Chen, Nanguang—**TuU3, ThV**
Chen, Qixiao—**TuCC5**
Chen, Rui—TuF4, **TuF7**
Chen, Shengyu—TuV3
Chen, Shih-Wei—FQ3
Chen, Shu-wang—**ThY4**
Chen, Shuying—TuA2
Chen, Simin—ThO1
Chen, Siwei—**ThU4**
Chen, Tong—WG2
Chen, W. X.—TuX2
Chen, Weiguo— **WL8,** ThQ4
Chen, Xianfeng—TuX4, TuX5, FB5
Chen, Xiangfei—TuD5, FA2
Chen, Xiaogang—**WL62**, **WL64**
Chen, Xiongbin—FF5
Chen, Xiqu—**TuJ5**
Chen, Xiuzhong—TuF2, WL81, FO4
Chen, Xiyao—**TuV3,** FX2, FX7
Chen, Xue—TuAA2, TuAA3, ThT2
Chen, Yi-Long—FP5
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Chen, Yu—**TuM2, ThGG1**
Chen, Yue—ThU5
Chen, Yun—WG2
Chen, Yuping—TuX4, TuX5, FB5
Chen, Zhangyuan—ThO5, FK2
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Chen, Zhihao—TuC5, FK4
Chen, Zhihui—**ThG4**
Chen, Zhiwen—**WL69**
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Cheng, Cheng—**ThK4**
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Cheng, Jiangtao—ThA4
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Cheng, Ming—**FT4**
Cheng, Ning—**FS4**
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Chi, S.—WL13, WL53, WL56
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Chiang, Chun-Pin—FBB2
Chiang, Chun-Ping—TuG4
Chiang, Hung-Li—TuN1
Chiang, K. S.—WC5
Chiang, Kin Seng—TuO4
Chiaroni, Dominique—**TuE**
Chinen, Koyu—**TuAA4**
Chiu, Angela L.—**ThU, FD1**
Chiu, C. L.—TuP2
Cho, Hyung Uk—**FJ4**
Cho, Il-Hwan—TuO5
Cho, Jinwoo—FS4
Cho, Jun Beom—TuBB6
Cho, Namhyun—WL87
Cho, Yong-Jin—WL92
Choi, Eung-Ho—WL92
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Chong, Kin-Man—**TuE3**
Chou, Hsi-Hsir—FF4
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Choudhury, Gagan—FD1
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Chowdhury, Pulak—ThDD2
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Chu, Suho—TuI4
Chuai, Dongxu—TuJ3, **WL112**
Chuang, Frank—**WG, ThV3**
Chui, P. C.—TuY4
Chung, Kai-Chun—ThP6
Chunjiang, Jin—WL2
Ciaramella, E.—FS2
Cincotti, Gabriella—**TuDD1**
Collings, Neil—TuH6, **FF4**
Cordette, Steevy—TuY3
Crisp, M. J.—TuS2
Crossland, William A.—TuH6, FF4

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Eggleton, Benjamin J.—**TuA1**, **TuI**
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Ekawa, Mitsuru—FJ1
El Daif, Ounsi—ThHH2
El-Desouki, Munir—TuM3
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Foy, P.—FI1
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Friberg, Ari T.—TuE2, ThBB5, FW6
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Garde, María J.—TuDD2, TuDD3
Gardner, Stephen—ThW4
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Geller, Benoit—TuL4
Ghaffari, Babak M.—**TuDD4**
Ghorbani, R.—FW1
Ghukasyan, Vladimir V.—FE4
Giddings, R. P.—FF2
Gilbert, Richard—FM1
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Guo, Tieying—WL8, ThQ4
Guo, Tuan—**TuFF1**
Guo, Wanshu—**ThFF3**
Guo, Wei—TuF3, TuL4, WE3, WF1, ThU4
Guo, Xia—TuH4, TuH5, TuJ3, TuN4, WL112, ThG1
Guo, Xin—TuD4, **ThS3**
Guo, Yanyan—WL6
Guo, Yili—TuS3, WF2, ThO2
Guo, Yu Han—ThG1
Guo, Yubin—FA5
Guo, Yuhan—**TuN4**

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Hachmeister, Andreas—**ThT6**
Haghiri-Gosnet, Anne-Marie—TuG3
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Han, Hongtao—**FH6**
Han, Jin Ru—ThG1
Han, Qingsheng—ThF4, ThT3
Han, Sang-Kook—**FZ1**, FZ2, FZ7
Han, Xiuyou—**ThN5**
Han, Ying—**WL6**
Han, Young-Geun—**TuI4**
Hannaford, Peter—ThEE4
Hao, Xiaoyong—**ThO4**
Harai, Hiroaki—**FD**, **FL2**
Harve, Shruthi K.—**WE2**
Hasan, Md. M.—**WJ1**
Hasegawa, Hiroshi—TuF1, TuL2, TuL3, FG3
Hawkins, T.—FI1
He, Dylan—FJ5
He, Hao—WE3
He, Jian-Jun—**TuD**, TuG7, TuM4, TuP4, WD3, FB4
He, Jun—**ThH3**
He, Jun—**WL98**
He, Lingjuan—FX6
He, Sailing—TuC2, TuD3, TuP4, WI1
He, Shaoling—**TuFF4**
He, Xin—ThN3
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Ho, Kwok Shing—**WF5, FO3**
Ho, Y. K.—WH2
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Hofmann, Werner—TuD6
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Hon, N. K.—FI1
Hong, Chang-Hee—**TuN**, **TuN3**
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Hu, Junhao—**TuC5**
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Hu, Weisheng—TuL4, WE3, WF1, ThU4, FT4
Hu, Weixuan—FH1
Hu, Xiaofeng—TuE5
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Huang, Dexiu—TuAA5, TuX7, WL62, WL64, ThE4, ThK4, FY2, FY4
Huang, Feng— **TuBB, ThFF2**
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Huang, Shanguo—TuF4, TuT4, WC2, ThU3, FG4, FG5, FX5
Huang, Shuihua—ThP1
Huang, Wanjun—FL1
Huang, Wei-Ping—WC3, ThBB1
Huang, Xiaodong—TuD5
Huang, Yidong—ThB4, ThH6
Huang, Ying-Yuan—TuN1
Huang, Yongqing—TuJ4, WL30, WL33, WL40, WL42, WL90, ThQ1, FH3, FH5
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In De Betou, Einar—TuT1
Inohara, Ryo—TuDD6
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Islam, Md. R.—WJ1
Ismail, Abu Bakar M.—**ThB5**
Ito, Hiroyuki—**TuL2**
Iwai, Norihiro—**TuZ2**
Iwashita, Katsushi—FC2

Jacobsen, Gunnar—TuE1, TuE2, TuE4
Jalali, B.—FI1
Jang, Hojoon—TuH1
Jansen, Sander L.—**ThC**, **ThL2**
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Jiang, Lingzhi—WL75
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Jiang, Xingshan—WL88, FCC2
Jiang, Yang—**FR4**
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Jin, Chunjiang—**TuO6**
Jin, Lei—**TuM4**
Jin, Shangzhong—WH3
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Kageyama, T.—TuZ2
Kaijage, Shubi—FU5
Kaluzhniy, Nikolay—ThP5
Kam, Pooi Yuen—FC3
Kaminski, Anne—ThHH2
Kamp, M.—FB2
Kang, Inuk—**ThT5**
Kang, Jin U.—**FBB4, FE**
Kao, Fu-Jen—**FCC**, **FE4**
Kao, Tsung-Ting—FQ3
Kash, Jeffrey A.—TuZ1
Kasukawa, Akihiko—**TuR**, **TuZ,** TuZ2
Katainen, Janne—FM3
Kataoka, Nobuyuki—TuDD1
Katrinis, Kostas—TuF6, FG1
Kawakami, Yoichi—TuN2
Kawakita, Y.—TuZ2
Kazovsky, Leonid G.—FS4
Ke, Min-Yung—TuN1
Ke, Weiwei—**ThB4**
Khairi, Kharina—**WL82**
Khazani Abdullah, Mohamad—ThL4
Kiang, Yean-Woei—ThHH3
Kikuchi, Nobuhiro—**WD2**
Kim, Chang-Min—ThA3
Kim, Chi Hyun—WL92
Kim, Chul Han—**ThR4**
Kim, Dong Ho—ThHH1
Kim, Hye Won—WG1
Kim, Hyun-Joo—TuI4
Kim, Hyun-Seung—FZ1, **FZ7**
Kim, Jeehyun—WL87
Kim, Jong Kyu—**WH1**
Kim, Jongseok—ThG5
Kim, Joo Sung—ThHH1
Kim, Kwangmeyung—**ThX3**
Kim, Kyung Hwan—WL92
Kim, Taek—**ThHH1**
Kim, Yoon-Chang—TuFF2
Kim, Young Man—WG1
Kinoshita, Susumu—**ThD2**
Kistner, C.—FB2
Kitayama, Ken-ichi—TuDD1, **ThD**, **ThM1**, **FT1**
Kiyama, Lennie—TuR2
Ko, Yeong Hwan—**WJ3**
Koch, Brian R.—ThB1
Kolmychek, Irina A.—**ThEE5**
Koltchanov, Igor—WD4, ThT1
Kong, Duanhua—**FB3**
Kong, Fan M.—ThBB3
Kong, Fanmin—WL36
Kong, Xianggui—**ThX1**
Koonen, A. M. J.—FR1
Korbelik, Mladen—ThGG3
Kostamovaara, Juha—ThP5
Kotov, Viacheslav—ThEE1
Kou, Qingli—TuG3
Kovsh, Alexey—FJ2
Koyama, Fumio—**ThBB**
Kozicki, Bartlomiej—FO2
Krestnikov, Igor—FJ2
Kristiansson, Anna—ThC3
Ku, Yun-Sheng—WI3
Kuang, Qingqiang—TuEE4
Kuhlmey, Boris T.—TuC3, **ThA1**, **ThQ**
Kuiyuan, Tao—ThR5
Kuksenkov, Dmitri V.—TuI2
Kukuoz, B.—FI1
Kumar, Arun—ThH2
Kung, Tsu-Te—WI3, FK3
Kuo, Hao-Chung—**ThHH,** FQ3
Kuo, Huei Pei—TuR2
Kuo, Ying-Hao—ThB3
Kurosu, Takayuki—FA1
Kuzmin, Konstantin—ThT1
Kwon, Hyuk-Sang—**FM1**, **FV**
Kwon, Jang Hyuk (Jeremy)—**ThY2**
Kwon, Oh-Jang—TuI4

LaComb, Ronald B.—FCC1
Lam, Stephen—FCC3
Lan, Mingying—**ThT4**
Lane, Stephen—ThV3
Lang, Peilin—WL24
Lange, Christoph—TuBB1, TuBB2
Lantratov, Vladimir—ThP5
Lanz, Brigitte—**ThP5**
Larikova, Julia Y.—**ThL3**
Lau, A. P. T.—WL60
Lay, Tsong-Sheng—**TuP2**
Le, Tran Phuong Trinh—TuP3
Le, Zichun—FAA4, FAA5, FD5, FT5
Lee, Cheng-Che—TuV2
Lee, Cheng-Kuang—**TuG4,** FBB2, FU4
Lee, Chun-Nan—ThGG4
Lee, Jian-Jang—FX3
Lee, Jiun-Haw—ThGG4
Lee, Jong Hyun—WG1
Lee, Joonhee—**TuH1**

Lee, K. C.—WL82
Lee, Kuei-Jen—TuT4, FG4, FX5
Lee, Kun-Yi—**TuV2**
Lee, Kyu-Tae—**ThA3**
Lee, Myunghwa—ThG5
Lee, Sang Moon—ThHH1
Lee, Wei-Yu—TuV2
Lee, Young—FL1
Lei, Jianming—WL66
Lei, Zhang—**WL1**, **WL4**
Lelarge, François—FJ3
Lemiti, Mustapha—ThHH2
Leng, Xinli—WL37
Leonov, Oleg B.—ThL3
Lepers, Catherien—TuY3
Leplingard, Florence—FC1
Lerminiaux, Christian—**ThS**
Letartre, Xavier—ThHH2
Leung, C. H.—WH2
Leuthold, Juerg—**TuK1**
Li, Bei—**FT3, FY1**
Li, Bin—**TuF4**, TuF7, **TuT4**, **WC2**, **WL10,** ThU3, **FG4,** FL3, **FX5**
Li, Chenfa—**WL37**
Li, Cheng—FH1
Li, Chenglin—**TuFF3**, TuG1
Li, Chuanbo—FH1
Li, Dejun—FI4
Li, Er P.—FP2
Li, Erlong—FR5
Li, Fang—ThH3, ThH4
Li, Guangzhi—FD1
Li, Guoyu—**WL95**
Li, H. P.—**ThQ5**
Li, Haipeng—WL34
Li, He-Ping—**TuO3**
Li, Honglei—WL8, **ThQ4,** FA6
Li, Huihui—**WL14**
Li, Jia—ThR3, FY3
Li, Jian—WC4, WI6, WL22
Li, Jianjun—TuH4
Li, Jianrui—**WL50**
Li, Jiao—WL91
Li, Jie—TuE1, TuE2, TuE4
Li, Jingsi—**TuD5**
Li, Jiusheng—WL50
Li, Juhao—ThO5, FK2
Li, Kang—WL36, ThBB3
Li, Lan—**TuFF7**
Li, Lanlan—TuC6
Li, Liangchuan—WL86
Li, Linsong—TuD5
Li, Ming-Jun— TuI2, FV3
Li, Mingyu—TuM4
Li, Mingze—TuU1
Li, Ning—FM4
Li, Peili—**TuX7**
Li, Pengcheng—**FM2**
Li, Qian—TuM2
Li, Qiang—ThE1
Li, Qingshan—**WF2**
Li, Shanghua—FW6
Li, Shenping—**TuEE, TuI2**
Li, Shuguang—WL6
Li, Songzhan—FI4
Li, Tangjun—TuAA6, WL58, WL63, FK6
Li, Tingbin—ThK2
Li, Wei—**ThBB1**, ThF4, ThO3, ThT3
Li, Wei—**TuX**, **WJ**, **WL41**, **WL45**
Li, Weilin—ThT4
Li, Wenjing—**FN3**
Li, Xiangyin—WL34, FQ5
Li, Xiaohui—ThE1
Li, Xiaohui—WL21
Li, Xin—**FG5**, **FK5**
Li, Xingde—**TuG, FBB,** FV3
Li, Xinying—TuBB3, TuT5, ThT7, **FC5,** FN5
Li, Xixiang—TuW2
Li, Xiyuan—ThS4
Li, Xuecheng—ThH4
Li, Xuemei—TuV3
Li, Xun—ThBB1
Li, Yan—WG2
Li, Yan—WL107
Li, Yanhe—WF2
Li, Yonggang—ThO4
Li, Yujin—FR4
Li, Yunji—**FO5**
Li, Yuquan—TuAA7, WL100
Li, Yuxiang—WH4
Li, Zhaohui—WL60
Li, Zhen—**FO4**
Li, Zheng—ThA4
Li, Zhengbin—TuF5, WL74
Li, Zhiyu—TuAA2, TuAA3, **ThT2**
Liang, Bo—**FJ5**
Liang, Di—TuP5, ThB1, **ThB3**
Liang, Jing—**FC2**
Liang, Julan—WL94
Liang, Song—FB3
Liang, Xiaojun—**ThO3**
Liang, Xing—**TuG2**
Liang, Yu—**TuY4, FY3**
Liao, Che-Hao—TuN5
Liao, Dan—FD4
Liao, J. K.—TuO3, ThQ5
Liao, Qinghua—WL32
Lim, Chin Chye Anthony—TuP3
Lim, Christina—**FF**, **FN1**
Lim, Pang Boey—WL113
Lim, Soon T.—FP2
Limin, Tong—ThBB6
Lin, Aoxiang—**TuQ**, **TuY, ThJ3**, **ThQ6**
Lin, Chii-Wann—**ThGG4**, **ThX**
Lin, Dianyang—ThK3
Lin, Guimin—TuV3, **FX7**
Lin, Jianfeng—**WL47,** ThK6
Lin, Jian-Qiang—WL7
Lin, Jintong—TuC6, FY5, FY6
Lin, Kan—**TuU4**
Lin, Lian-Yu—FU4
Lin, Lin—WL47, ThK6
Lin, Nan—TuV3, FX7
Lin, Rujian—FN6
Lin, Shaohan—ThEE2
Lin, Shu-Yuan—ThP6
Lin, Tsai-Wei—WL93
Lin, Yen-Juei—TuV2
Lin, Yizhu—WL36
Ling, Ximo—FD4
Lingle, Robert—TuZ3
Liu, Bo—FF5
Liu, Deming—**FP1**
Liu, Fang—**ThH6**
Liu, Fangfei—**TuD7,** ThE1
Liu, Gordon Ning—WL86
Liu, Guangda—WG2
Liu, Haichun—ThGG2
Liu, Huanhuan—**ThH5**
Liu, Huanlin—**FR5**
Liu, Jacob Kou-Chen—ThGG4
Liu, Jia—WL101
Liu, Jian—ThDD4
Liu, Jianfei—WL46
Liu, Jiangtao—ThCC3
Liu, Jiansheng—WL108, FCC4
Liu, Jie—FZ3
Liu, Jingru—WL107
Liu, Lei—ThK4
Liu, Lei—**WL57,** FZ4
Liu, Li—FI4
Liu, Lin—**TuG1**
Liu, Lisong—TuI5, ThJ4
Liu, Liu—**ThB2**
Liu, Mingtao—WL57, FZ4
Liu, Peng—TuAA6, WL25
Liu, Qi—TuE5
Liu, Qiang—ThEE6
Liu, Shanliang—FK5
Liu, Shengchun—FA2
Liu, Shuang—**WL11**
Liu, Shu-Fen—**FP5**
Liu, Tongqing—WL95
Liu, Weiping—FZ5
Liu, Wen-Feng—WL93
Liu, Xiang—**ThF1, ThO**
Liu, Xiangzhi—WL31
Liu, Xiao—TuBB3, TuK6, **TuT5,** WL59, ThM2, ThT7, FC5, FI3, FN5
Liu, Xiaojuan—TuEE5, **WL52**
Liu, Xiaolong—WL90, ThQ1
Liu, Xiaomin—ThX1
Liu, Xiaoming—**WL35**
Liu, Xin—ThFF1
Liu, Xin—WL27
Liu, Xinchao—FL1
Liu, Xingchun—ThDD3
Liu, Xinyu—WI5
Liu, Xuan—FBB4
Liu, Xueming—WL21
Liu, Y.—TuO3, ThQ5
Liu, Y. Z.—TuO3, ThQ5
Liu, Yang—**ThA4**, **ThDD3**
Liu, Yang—**WH2**
Liu, Yange—FK4
Liu, Yingkai—FD3
Liu, Yu—TuB2
Liu, Yuliang—ThH3, ThH4
Liu, Yumin—ThG4
Liu, Yunqi—**TuO4**
Liu, Zejin—ThN2
Liu, Zhiming—WC4, WI6, WL22, WL23
Liu, Zhixin—TuBB5, TuF3, TuT3, WL55, ThR6
Lively, Erica—ThB1
Livshits, Daniil—FJ2
Liwen, Wang—TuQ3
Lize, Yannick Keith—**TuDD, TuS**
Loncar, Marko—**FX1**
Long, Keping—FD3, FL5, FO5
Long, Mian—**FM4**
Long, Zhao—FQ4
Lou, C. Y.—TuX2
Lou, Min—**TuG7**
Lou, Shuqin—WL8, ThJ4, ThQ4
Louchet, Hadrien—**ThT1**
Lu, C.—TuFF8
Lu, Chao—WL60
Lu, Chuanhao—FL3
Lu, Dan—TuAA6, **WL63,** FY1
Lu, Fake—FV2
Lu, Fei—WL31
Lu, Feng—TuX4, FB5
Lu, Hongqiang—**FF3**
Lu, Hui-Min—**TuH2**
Lu, Huina—WL43
Lu, Li—**WL66**
Lu, Lian—WL57, **FZ4**
Lu, Lin—**TuAA7**
Lu, M.—WH2
Lu, Pengfei—ThG4
Lu, Shaohua—FA6
Lü, Shouqin—FM4
Lu, Tao—**TuO1, FP**
Lu, Tien-Chang—FQ3
Lu, Tim—**TuB**
Lu, Tzu-Chun—TuN1
Lu, Wei-feng—WL41
Lu, Yang—**FZ3**
Lu, Yanqing—TuD5
Lu, Yu-Chun—**WC3**
Lu, Zhiwei—ThK3
Ludwig, R.—ThN1
Lui, Harvey—ThGG3, FCC3
Luo, Bin—TuAA1, ThCC3
Luo, Hongbin—FD4
Luo, Jun—**TuK3**, TuS5, WL65, WL72, FR4, FY7
Luo, Pei—**ThU3**
Luo, Qingming—**TuCC, ThV1**, ThX2, FM2,
Luo, Ting—WL79
Luo, Yanting—**WL76**
Lv, Bo—FK6
Lv, Lin—ThU3

Ma, Chunli—WL67
Ma, Guilan—WH4, ThY5
Ma, Hongxia—ThY4
Ma, Jierong—WL94
Ma, Jun—TuH4
Ma, Yaoguang—ThS3, **ThS4**
Ma, Yiran—ThO1
Ma, Zhe—ThS3
Mack, Wayne—TuR2
Mahajan, Sunayana—**ThEE3**
Mahdi, M. A.—TuEE2
Maheswari, R. Uma—FU3
Main, Keith—FH6
Makita, Shuichi—FBB1
Makon, Robert—TuE1
Malekmohammadi, Amin—ThL4
Mao, Bangning—WL61
Mao, Shuo—TuCC5
Maram, R.—FW1
Marculescu, A.—TuK1
Marin, Emmanuel—ThH2
Mashimo, Daisuke—**FT2**
Mat, Abdul F. Awang—TuB4
Mathai, Sagi—TuR2
Matinfar, Mehdi D.—**ThK5**
Matsuda, Manabu—FJ1
Matsudaira, Nobuhiro—FT2
Matsuo, S.—FT1
Matsuoka, Fumiaki—FQ2
Matsuoka, Yasunobu—FS3
Matthews, Dennis—ThV3
Mazzarese, David—TuZ3
McKinstrie, Colin J.—TuW1
Mclaren, Moray—TuR2
McLean, David I.—FCC3
McMillen, C.—FI1
McPhedran, R. C.—TuV1
McWilliams, Annette—FCC3
Meair, Jonathan—WJ4
Méance, Sébastien—TuG3
Mei, Junyao—**ThF4**, **ThT3**
Memon, Muhammad Irfan—FT3, FY1
Mendoza, Plary—TuR2
Meng, Hsin-Fei—**ThY, ThY1,** FH2
Meng, Yichang—TuO6
Meunier, Jean-Pierre—ThH2
Mezosi, Gabor—FT3, FY1
Mickelsson, Hans—**TuT1**
Mikhrin, Sergey—FJ2
Millaud, Audrey—TuY3
Min, Jiahua—WL51
Min, Jung-Joon—WG3
Minatozaki, Katsuya—FT2
Ming, Chen—ThP2
Ming, Xianbing—**WL31**
Mingaleev, Sergei—WD4
Mirzaei, B.—WJ5
Mithani, Sufian M.—TuB4
Miyazawa, Arata—FBB1
Mo, Jinyu—**ThW2**
Mo, Weirong—TuU3
Mohamad, Romli—TuEE2, WL82
Mohebbi, Mohammad—**ThJ2**
Molina-Fernández, Íñigo—WI2
Monro, Tanya M.—ThJ1
Monti, Paolo—TuF6, FG1, FL1
Morea, Annalisa—FC1
Mori, Kunio—WL99
Morita, Itsuro—ThF2
Morita, Kazuyuki—**WL16**
Morosawa, Atsushi—TuG5
Motmaen, A.—WJ2
Mou, Sinthia Shabnam—ThB5
Muhammed, Mamoun—ThBB5, FW6
Mukherjee, Biswanath—WE2, **ThDD2**
Mukhopadhyay, Sourangshu—**TuX6**
Münch, S.—FB2
Murata, M.—FT1
Muriel, Miguel A.—TuDD2, TuDD3
Murzina, Tatyana V.—ThEE5

Na, Sojung—ThG5
Nadiarnykh, Oleg—FCC1
Nakagawa, Shigeru—**TuR1**
Nakahara, T.—FAA2
Nakano, Yoshiaki—**FAA1**
Namihira, Yoshinori—FU5
Namiki, Shu—**FA1**
Nan, Zhou—ThP2
Nazari, Fakhroddin— ThA5, FA4
Ng, Junhong—TuC5
Ng'oma, Anthony—**FF1**
Nguyen, Dan T.—WJ4
Ni, Bo—TuV3, FX2, FX7
Ni, Kai—TuFF4
Ni, Wenda—WF2, **WF4**
Nielsen, Mads L.—ThW3
Nihei, Hiroyuki—**FQ2**
Ning, Tigang—WL23
Nirmalathas, Ampalavanapillai—FN1
Noh, Young Min—TuBB6
Nolan, Daniel A.—TuI2
Nouroozi, R.—ThN1
Novak, Dalma—FN1
Novitsky, Andrey—WD4
Ntziachristos, Vasilis—TuCC2, **TuM1,** FE2
Nur-E-Alam, Mohammad—**ThEE1**

Ogawa, Kensuke—FP2
Ogawa, Takahiro—**TuL3**
Ohara, Takashi—WL109
Ohashi, Masaharu—TuC4, TuQ2, **FI5**
Ohnishi, Dai—ThB4
Ohta, Koji—WL99
Oishi, Masayuki—**TuDD6**
Okamoto, Atsushi—WL15, WL16, WL54, FQ2
Okamoto, Katsunari—**TuP1, ThP**
Okumura, Shigekazu—FJ1
Okumura, Tadashi—ThB3
Okuno, Michitaka—FS3
Olsson, Bengt-Erik—**ThC3**
Ortega-Moñux, Alejandro—**WI2**
Otsubo, Koji—**ThW, FJ1**

Pan, J. Q.—TuX2
Pan, Kun-Mao—TuN1
Pan, Wei—TuAA1, ThCC3
Pang, Fufei—TuG1, ThBB2, ThH5
Parekh, Devang—TuD6
Park, Bum Doo—WJ3
Park, Tae Jin—ThY2
Park, Yeonsang—ThHH2
Park, Young Soo—ThHH1
Parmigiani, Francesca—WC1
Parthiban, Rajendran—WL82
Patil, L. S.—ThG3
Patzak, Erwin—WF4
Payer, Stefan—TuK2
Peddi, Prathyusha—ThQ2
Pello, Josselin—TuP3
Peng, Hui—WL100
Peng, Jian—**TuI5,** ThJ4
Peng, Jiangde—ThH6
Peng, Shenghua—**WD3**
Peng, Shuping—**WL74**
Peng, Wei—**TuFF2**
Peng, Yongjun—**WL12**
Peng, Yunfeng—FD3, FL5, FO5
Pengfei, Lu—FX4
Penty, Richard—**TuS2**
Petersen, Eliot B.—WJ4
Petropoulos, Periklis—WC1
Peyghambarian, Nasser—WJ4
Pham, Thang T.—FZ1
Pilipetskii, Alexei—**ThC1**, **ThL**
Pinos, Andrea—FW6
Pita, Kantisara—TuP3
Pivnenko, Mike—TuH6
Pliska, Tomas—FJ5
Png, Ching E.—**FI**, **FP2**
Poingt, Francis—FJ3
Pommereau, Frédéric—FJ3
Ponzini, F.—FS2
Popov, Sergei—TuE1, TuE2, TuE4, ThBB5, FW6
Presi, M.—FS2
Prucnal, Paul R.—FK1
Pu, Tao—TuAA7, WL5, WL68

Qi, Chun-Hui—TuH2
Qi, Hai—ThEE6
Qian, Dayou—**ThC2**
Qian, Huifen—WL102
Qian, Zongjue—WL73
Qiang, Haixia—**FQ5**
Qiang, Xiwen—**WL107**
Qiang, Zexuan—TuV3, FX2, FX7
Qin, Yuan—**TuH5**, TuN4, ThG1
Qinzhi, Chen—WL26
Qiu, Kun—WL12, WL67, ThO4
Qiu, Min—TuD7, TuE5, ThE1, **FX**
Qiu, Shaofeng—WL86
Qiu, Shen-yu—WL41
Qiu, Yinghui—**TuT6, FAA6**
Qiu, Yishen—FX2, FX7
Qu, Gang—**FB5**
Quiring, V.—ThN1
Qureshi, K. K.—WL60

Radic, Stojan—TuW1
Rahimi-Iman, A.—FB2
Rahman, Md. Abdur—ThB5
Ramdane, Abderrahim—FJ3
Ran, Yang—FZ5
Rao, Yunjiang—**WC5**
Rasooli Saghai, H.—WJ2, FW1
Raz, Oded—FT6
Razansky, Daniel—**FE2**
Razo, Miguel—FL1
Regreny, Philippe—ThB2
Reitzenstein, Stephan—**FB2, FW**
Ren, Jia—**WL83**
Ren, Quan—ThK1, ThK2
Ren, Wenhua— WL23, WL105
Ren, Xiaomin—TuJ4, WL30, WL33, WL40, WL42, WL90, ThQ1, FH3, FH5,
Reunert, Thomas—**TuR4**
Rice, R.—FI1
Richardson, David J.—WC1
Richter, André—WD4, ThT1
Ricken, R.—ThN1
Roelkens, Günther—ThB2
Rohde, Michael—ThT6
Rong, Gong-tao—WL63
Rong, Weifeng—FC3
Rosenberg, Paul—TuR2
Rostami, Ali—**WJ2**, **WJ5, ThA5**, **FA4**, **FW1**
Rouskas, George—**TuL, ThDD1**
Ruan, Jianjian—**ThEE2**
Ruan, Yi—ThG2

Sadeghi, Seyed M.—ThBB1
Sagawa, Misuzu—FS3
Saito, Kazuya—ThBB4
Sakamoto, Kunio—**WL109**, **WL110**
Salehi, Jawad A.—TuDD4, ThK5
Sales, Salvador—TuDD3
Samsuri, N. M.—TuEE2
Sang, Minghuang—TuEE4
Sang, Xinzhu—FN3
Sarantopoulos, Athanasios—TuCC2
Sato, Ken-ichi—TuF1, TuL2, TuL3, **ThFF,** FG3
Sauer, Michael—FF1
Savoie, Michel—FO1
Schlosser, Michael—WF4
Schmidt, Ted—**ThL1**, ThW1, **FK**
Schmidt-Langhorst, Carsten—TuE6
Schneider, C.—FB2
Schubert, Colja—TuE6, ThN1
Schubert, E. Fred—WH1
Schulz, Ralf B.—**TuCC2**, **TuU**
Seassal, Christian—ThHH2
Sekiya, Edson H.—ThBB4
Seo, Dongsun—TuO5
Seo, JaeTae—FW4, FW5
Seo, Wook-Jin—TuO5
Shaari, Sahbudin—ThG6, FA3
Shan, Chao—WL85, WL96
Shang, Yufeng—TuJ4, **FH3**
Shang, Zhendong—WH5
Shanglin, Hou—**ThQ3**
Shao, Liyang—TuFF1
Shao, Xiaozhuo—**TuCC3**
Shao, Yufeng—TuBB3, TuK6, TuT5, **ThT7**, FC5, FN5
Shastri, Kalpendu—**TuR3**
Shen, Alexandre—**FJ3**
Shen, Changyu—**WL111**
Shen, Guangdi—TuH4, TuH5, TuJ3, TuN4, WL112, ThG1
Shen, Huajun—WI5
Shen, Kun-Ching—TuN5
Shen, Mengzhe—TuC1
Shen, Shuqiang—ThFF4
Shen, Ying—**WL5**
Shen, Yue—WL43, WL49
Sheng, Zhen—ThE2
Shi, Cuihua—WC5
Shi, Kehua—WL47, ThK6
Shi, Qing—**TuC3**
Shi, Wei—**TuB3**, **WJ4**
Shi, Zhi-Dong—**WL7**
Shibata, Yasuo—WD2
Shieh, William—**ThF**, **ThO1**
Shih, F. Y.—WL13, WL53, WL56
Shih, Tien-Tsorng—FX3
Shimada, Kohei—**FG3**
Shimizu, H.—TuZ2
Shinya, A.—FT1
Shirani, Shahram—TuM3
Short, Michael—FCC3
Shou, Guochu—WL73
Shu, Chester—**TuY2**
Shuisheng, Jian—ThP2
Shum,Perry Ping—TuFF4, **TuO, WI,** WL11, WL84, **FA**
Shumin, Zhang—WL2
Shuqin, Lou—TuQ3
Simayabu, Kohei—WL54
Sirouspour, Shahin—TuM3
Sivabalan, S.—**ThQ2**
Sivasankaran, Arularasi—FL1
Skubic, Björn—TuT1, **TuT2**
So, Peter—FM1
Söderström, David—ThW5
Sohler, Wolfgang—**ThE**, **ThN1**
Somani, Arun—**TuL1**, **WF**
Somesfalean, Gabriel—ThGG2
Son, Yong-Hwan—FZ2, FZ7
Song, Hailan—**WL40**
Song, Jianping—WL107
Song, Kai—ThX1
Song, Kwang Yong—**TuI1**
Song, Seok Ho—TuI4
Song, Yanyong—WL14
Song, Yong-Won—**TuV, FI2**
Song, Zhaoyuan—WL6
Soref, Richard—ThB2
Sorel, Marc—FT3, FY1
Spencer, Daryl—ThB3
Spuesens, Thijs—ThB2
Steffan, Andreas G.— TuE1, **ThW3**
Stolen, R.—FI1
Strand, John—FD1
Strauss, M.—FB2
Straznicky, Joseph—TuR2
Su, Yang—**WL100**
Su, Yikai—TuD7, TuE5, **ThE1**, **ThN, FAA, FS**
Suche, H.—ThN1
Sugawa, Jun—FT2
Sugawara, Toshiki—FS3
Sugunan, Abhilash—FW6
Suh, Myoung Gyun—ThHH1
Sui, Chenghua—WL89
Sui, Zhicheng—FL1
Sun, Bing—WL19
Sun, Ganyun—FM4
Sun, Guodan—**WL68**
Sun, Hongbo—WL21
Sun, Junqiang—TuX1, WL11, **ThK**
Sun, Liwei—**WH3**
Sun, Qiang—**ThK2**
Sun, Qingguo—**WL103**
Sun, Qizhen—TuX1
Sun, Ting—**TuF2**
Sun, Weiqiang—WE3, **WF1, FL**
Sun, Yajuan—ThX1
Sun, Yi—**TuZ3, ThEE**
Sun, Yiling—TuFF7
Sun, Yu—**TuX2**
Sun, Yunxu—TuEE3
Suzuki, Katsuhito—**WL15**
Suzuki, Masatoshi—**WE1, FC**
Suzuki, Takanori—WL99
Suzuki, Takuya—TuG5
Suzuki, Wataru—FU3
Svenmarker, Pontus—ThGG2
Sygletos, S.—TuK1

Tabibi, Bagher—FW4, FW5
Tacca, Marco—FL1
Tainta, Santiago—**TuDD2**, **TuDD3**
Taira, Yoichi—**TuZ1**
Takada, Kan—FJ1
Takahashi, Hidenori—ThF2
Takahashi, Hiroshi—**ThD1**
Takahashi, R.—FAA2, FT1
Takaki, K.—TuZ2
Takara, Hidehiko—FO2
Takayama, Yoshihisa—WL54
Takenouchi, Hirokazu—**FAA2**
Tam, Hwa-Yaw—TuFF1, TuFF8, WL60
Tan, Jichun—ThG2, ThP4
Tan, Michael—**TuR2**
Tan, Yizhou—**ThP1**
Tan, Yong T.—FP2
Tan, Yuan—WG2
Tan, Zhongwei—WL10, WL105
Tanaka, Hideaki—ThF2
Tanaka, Junya—WL16
Tanaka, Yoshinori—ThB4
Tanemura, Takuo—**FT**
Tang, Chao—**ThF5**
Tang, Jianming—**FF2**, **FN**
Tang, Jianxiong—**ThD3**
Tang, Ke—WL51
Tang, Limin—FL1
Tang, Shaofang—ThA2
Tang, Tsung-Yi—TuN5
Tang, X. G.—TuO3, ThQ5
Tang, Xianfeng—TuK4, TuW4
Tang, Xuan—ThB4
Tang, Yan—ThO1
Tang, Yidan—**TuH4**
Tang, Yingying—FS4
Tang, Yongbo—TuD3
Tangdiongga, E.—FR1
Tanifuji, Manabu—**FU3**
Tao, Peilin—TuAA6, WL22, **WL105**
Tao, Yu-Tai—FH2
Taorong, Gong—ThP2
Taubenblatt, Marc—TuZ1
Teng, Jie—ThN5
Thévenaz, Luc—**TuA3**
Ti, Yunqiang—ThN3
Tian, Feng—TuQ4, TuW3, **TuW4**, TuY5
Tian, Jiajun—**TuEE3**
Tien, Chuen-Lin—**WL93**
Tieying, Guo—**TuQ3**
Tjiam, Aijiwati—WL82
Tjin, Swee Chuan—TuP3
Tolstikhin, Valery—**WD**
Tong, Cunzhu—TuB2
Tong, Limin—TuC7, TuD4, ThA2, **ThAA2**, **ThJ**, ThS3, ThS4
Toprak, Muhammet—FW6
Totsuka, Kouki—TuG5
Toulouse, Jean—ThJ3, ThQ6
Tripathi, Saurabh M.—**ThH2**
Tsai, Feng-Yu—ThGG4
Tsai, Fu-Ji—ThHH3
Tsai, Meng-Tsan—TuG4, FBB2, **FU4**
Tsai, Wu-Wei—FH2
Tse, Frances—TuM3
Tse, M. L. V.—TuFF8
Tseng, Shin-Rong Tseng—ThY1
Tsukiji, N.—TuZ2
Tsunoda, Kazushige—**ThV2,** FU3
Tsutsumi, Yasuhiro—**TuC4,** FI5
Turitani, Takehiro—WE1
Tzanakaki, Anna—TuF6, FG1

Uchima, Yuki—TuAA4
Uetake, Ayahito—FJ1
Umbach, Andreas—ThW3
Urata, R.—FAA2

Vainshtein, Sergey—ThP5
Vaishampayan, Vinay A.—FR3
Vallaitis, T.—TuK1
van den Borne, Dirk—ThL2
Van Thourhout, Dries—ThB2
Vardhan, Hars—FL1
Vasiliev, Mikhail—ThEE1, ThEE4
Verluise, Frederic—ThW3
Viktorovitch, Pierre—ThHH2

Wada, Naoya—TuDD1
Wai, P. K. A.—TuFF8
Wakayama, Koji—**FS3**
Walcher, Herbert—TuE1
Wan, Renwei—FK4
Wan, Ruiyuan—ThH6
Wan, Xin—**ThU5**
Wang, Baohua—WL97
Wang, Baozhu—**WL39**
Wang, C. H.—WL13, **WL53**, WL56
Wang, Chen—WG2
Wang, Congcong—ThY4
Wang, Daifa—TuCC4
Wang, Dawei—**TuDD5**
Wang, Fei—TuAA5, **TuX3,** FY2, FY4
Wang, Gang—FA5
Wang, Guanzhong—TuD4
Wang, Hau-Wei—WI3
Wang, Hequn—ThGG3, FCC3
Wang, Hong—TuH3

Wang, Hong—WL101
Wang, Huan—TuD5
Wang, Hui—ThHH4
Wang, Jian—**TuX1**
Wang, Jianli—WL80
Wang, Jianping—WL75, WL77, WL78
Wang, Jin—**TuI3,** WL24
Wang, Jing—**ThBB2**
Wang, Jing—TuD7, TuE5
Wang, Jing—TuI5
Wang, Jingyi—ThW5
Wang, Jinyan—ThN5
Wang, Ju—TuK3, TuS5, FY7
Wang, Junqin—FX2
Wang, Jyh-Yang—ThHH3
Wang, Kai—ThO3
Wang, Ke—**TuE1**, TuE2, **TuE4**
Wang, L.—TuX2
Wang, Lei—FB4
Wang, Lei—WL83
Wang, Leiran—**WL21**
Wang, Li—FB3
Wang, Li-Bo—WL7
Wang, Linghua—ThN5
Wang, Linjun—WL51
Wang, Liwen—WL8, ThQ4
Wang, Lutang—WL85, WL96, **ThH1**
Wang, Mike—**ThW4**
Wang, Minghua—ThE3
Wang, Muguang—TuAA6, WL58, FK6
Wang, Pan—**TuC7**
Wang, Pengfei—ThN3
Wang, Qi—TuJ4, WL30, WL33, WL42, FH3, FH5
Wang, Qiming—FH1
Wang, Qingpu—ThN2
Wang, Qiuguo—**WL44**
Wang, Rong—WL5, WL68
Wang, Ru—FG5
Wang, Shaokang—TuW4
Wang, Shi-Jiang—**FQ6**
Wang, Shing Chung—**FQ3**
Wang, Shiqing—**ThD4**
Wang, Song—TuJ4
Wang, Suyi—WL80
Wang, Tao—TuD7, TuE5, ThE1, **ThY5**
Wang, Tao—**WH4**
Wang, Teng—ThT3
Wang, Tianshu—WL19
Wang, Ting—ThC2, ThC4, ThF3
Wang, Tingyu—TuK3
Wang, Tingyun—TuFF3, TuG1, WL103, ThBB2, **ThH**, ThH5, ThP3, **ThR1**
Wang, Wanjun—**ThE3**
Wang, Wei—FF3
Wang, Wei—TuB2, TuX2, WL38
Wang, Wenjuan—WL40
Wang, Wenrui—FY7
Wang, Xiaoliang—WL39
Wang, Xiaomei—WL31
Wang, Xinqiang—ThK1, ThK2
Wang, Xinzhu—**WL80**
Wang, Xue-Shun—**WL79**
Wang, Yamiao—WL90, **ThQ1**
Wang, Yan—ThH3
Wang, Yang—**WL38**
Wang, Yongjie—**WL48**
Wang, Yuan—ThEE6
Wang, Yufei—TuV3, FX7
Wang, Zefeng—**WL18**, WL35
Wang, Zhechao—**TuD3**
Wang, Zhechao—WI1
Wang, Zheng—TuS5
Wang, Zhenxing—FK1
Wang, Zhuoran—FT3, FY1
Wang, Zijie—**ThP3**
Wangüemert-Pérez, J. Gonzalo—WI2
Ware, Cedric—TuY3
Watanabe, Koyo—**FM3**
Waterhouse, Rod—FN1
Wei, Anne—TuL4
Wei, Gaoyao—WL89
Wei, Huai—WL10
Wei, Jianwen—TuBB5, TuT3
Wei, Lixiao—WL14
Wei, Lun—TuAA5
Wei, Xunbin—**WG2**
Wei, Yijia—WL86
Wei, Yimei—TuAA7
Wei, Yizhen—**WL19**
Wei, Zhao—**FW2**
Weiguo, Chen—TuQ3
Weiran, Li—ThR5
Weis, Erik—TuBB1, TuBB2
Wen, He—**TuS3,** ThO2, FC4, FN4
Wen, Jihua—ThEE6
Weng, Xuan—**TuQ4**, TuW2, TuW3, TuY5
Weng, Zihua—ThEE2
Wenjie, Yao—FW3
Westergren, Urban—TuD3
White, I. H.—TuS2
White, T. P.—TuV1
Wilson, Brian—**SC345**
Wojcik, Greg—FJ2
Wojtkowski, Maciej—**FU2**
Won, Yong-Wuk—FZ2
Won, Yong-Yuk—FZ1, FZ7
Wong, Kenneth Kin-Yip—TuC1, TuY4, **ThR2,** ThR3, FY3
Wong, Sheng-Hsien—TuV2
Wosinska, Lena—TuF6, TuT2, **ThDD, ThM, FG1**
Wosinski, Lech—TuD3, WI1
Wu, Baojian—WL12
Wu, Bingbing—**TuC6**
Wu, Bo—**TuS5,** FR4, FY7
Wu, Bo-Cong—FP5
Wu, Darran—TuC3
Wu, Guizhi—**WL43**
Wu, Jian—TuC6
Wu, Jing—**TuF, ThCC, FO1**
Wu, June-Tsai—FU4
Wu, Ming—**TuJ1**
Wu, Ping—FX6
Wu, Pinghui—**WL89**
Wu, Qing—WL71
Wu, Qiwu—**WL75**
Wu, Tingwan—**WL26**
Wu, Wei—**WL25, WL27**
Wu, X. L.—TuO3
Wu, Xi—**FC4**, **FN4**
Wu, Y. F.—WL13, WL53, WL56
Wu, Yanzhi—**FN2,** FZ6
Wu, Yaw-Dong—**FX3**
Wu, Yicong—**FV3**
Wu, Zhijun—WL77

Xi, Lixia—**TuK4**, TuW2, TuW4
Xia, Ge—**FI4**
Xia, Guo—TuJ2
Xia, Tao—TuH2
Xia, Tiejun J.—**ThU2**
Xia, Yiben—WL51
Xia, Younan—**ThS1**, **ThX4, FQ**
Xiang, Yi—TuBB5, **TuT3**
Xiao, Jin-Long—FQ6
Xiao, Shilin—TuBB5, TuF3, TuL4, TuT3, WL55, ThR6
Xiao, Tao—WL55, **ThR6**
Xiaoli, Zhao—TuV4, WJ6
Xiaomin, Ren—FH4
Xiaotao, Guo—**FQ4**
Xie, Hao—ThBB3
Xie, Huikai—**FBB3**
Xie, Shizhong—ThF5, FAA3
Xie, Shusen—WL88
Xie, Weilin—TuBB5
Xie, Xiaoping—FF3
Xie, Yangge—TuK4
Xie, Yanqiao—TuC2
Xie, Yian—WL43
Xin, Ming—FAA3
Xiong, Jijun—WL97
Xiong, Liangming—**ThBB4**
Xiong, Qianjin—TuW2, WL61, WL86, ThFF4
Xu, Anshi—TuF5, WL74
Xu, Can—ThGG2
Xu, Chenglin—**TuP, ThS2**
Xu, Chunjiao—**TuFF5**
Xu, Danyang—WL89
Xu, Dawei—TuB2
Xu, Daxiong—TuT6, FAA6, FN3
Xu, Enming—TuX3, **FY4**
Xu, Kun—TuC6
Xu, Lei—TuC2, ThC4, ThF3
Xu, Ming—**WL65**, **WL72**
Xu, Mingfeng—ThCC3
Xu, Ou—FA6
Xu, Run—WL51
Xu, Tianhua—**TuE2**
Xu, Tuanwei—ThH3
Xu, Xing—**TuC1,** ThR3, FY3
Xu, Xu-ming—WL41, WL45
Xu, Yingying—**ThA2**
Xu, Yunhua—ThW4
Xu, Zhiguang—FS4
Xu, Zhixin—**ThW6**
Xu, Zhun—TuG6
Xue, Chunlai—FH1
Xue, Haiyun—FH1

Yaakob, M. S.—TuEE2
Yahya, Mohamed R.—TuB4
Yamada, Yoshiyuki—**TuF1**, TuL3
Yamamoto, Tsuyoshi—FJ1
Yamanari, Masahiro—FBB1
Yamashita, Ikuo—**TuQ2,** FI5
Yan, Cishuo—**FZ6**
Yan, Fangfang—**WE3**
Yan, Feng-ping—TuAA6, WL105
Yan, Jing—**WH5**
Yan, Lianshan—TuAA1, **TuQ1, ThCC3**
Yan, Shubin—WL97
Yan, Yingzhan—**WL97**
Yang, Bo—**ThE2**
Yang, Bojun—WL44
Yang, C. C.—TuG4, **TuH**, **TuN5, ThHH3, FBB2, FU,** FU4
Yang, Cheng—**TuBB5,** TuT3
Yang, Chengquan—FY7
Yang, Enze—TuK3, TuS5, FR4, FY7
Yang, Hongliang—**ThK1**, ThK2
Yang, Huei-Min—FP5
Yang, Jianyi—ThE3
Yang, Jie—ThX2
Yang, Kai—**WL78**
Yang, Kang—**WL46**
Yang, Liu—**TuP4**
Yang, Mingwwei—TuFF5
Yang, Qi—ThO1
Yang, Qiguang—**FW4**, **FW5**
Yang, Qimin—**FL4**
Yang, Qing—TuD4
Yang, Sung—**WG1**
Yang, Tao—FS4
Yang, Wei—**TuO2**
Yang, Wei J.—TuD6
Yang, X. L.—FF2
Yang, Xiaowei—WL17
Yang, Xiufeng—TuC5, **FK4**
Yang, Yi—WL111
Yang, Yi-Cheng—TuV2
Yang, Yisheng—ThP1
Yang, Yisu—WL30, WL33
Yang, Yizhuo—FN1
Yang, Yu—**FF5**
Yang, Yuanhong—TuA2, TuFF5, TuO2
Yang, Yue-De—FQ6
Yang, Zhongwei—WL94
Yang, Zongyin—TuC7
Yan-ge, Liu—**ThR5**
Ya-ni, Zhang—**ThJ5**
Yanling, Chang—ThP2
Yao, JianQuan—WH4, ThT4, ThY5
Yao, Lei—**ThJ4**
Yao, X. Steve—TuAA1
Yao, Yong—TuEE3
Yao, Yu—**FL3**
Yao, Zhidong—WJ4
Yasui, Takako—WD2
Yasuno, Yoshiaki—**FBB1**
Ye, Fei—ThBB5
Ye, Jia—TuAA1
Ye, Jiajun—FN6
Ye, Peida—WL57, FZ4
Ye, Rongbin—**WL99**
Ye, Tong—FN2, FZ6
Ye, Wei—ThU6
Ye, Xian—TuJ4, WL30, **WL33,** FH3
Ye, Yinghua—ThCC1
Yeh, C. H.—**WL13,** WL53, **WL56**
Yeh, Mau-Shiun—WI3
Yen, Chia-Yu—ThGG4
Yen, She-Hwa—FS4
Yeo, Jong S.—TuR2
Yi, An-Lin—**TuAA1**
Yi, Jong Chang—FJ4
Yi, Xiaobo—ThFF2
Yichang, Meng—**WL2**
Yin, Dongliang—**FJ2**
Yin, Zuowei—FA2
Yisu, Yang—**FH4**
Yokoyama, Shiyoshi—WL28, WL29
Yongqing, Huang—FH4
Yoo, Seung Jin—TuBB6
Yoo, Sung Keun—WG1
Yoon, Sang Youl—WG1
Yoon, Soon Fatt—TuB2
Younce, Richard C.—ThL3
Yu, Changyuan—TuC5, FC3
Yu, Chongxiu—FN3
Yu, Fan—WL61
Yu, Guangyi—ThN2
Yu, Hongfang—FD4
Yu, Jae Su—WJ3
Yu, Jianjun—**TuEE1,** ThC2
Yu, Jinlong—TuK3, TuS5, FR4, FY7
Yu, Shao-Hua—WL79
Yu, Shuai—**TuV5**, WL17
Yu, Siyuan—FT3, FY1
Yu, Song—ThT4
Yu, Tianbao—**FX6**
Yu, Tingting—TuG7
Yu, William—FW4, FW5
Yu, Xiaosong—**WL77**
Yu, Xuelian—TuEE3
Yu, Yi—ThX1
Yu, Yu—**TuAA5, FY2**
Yu, Yuan—FY4
Yu, Zhongyuan—ThG4
Yuan, Feng—TuF2
Yuan, Junling—WL77
Yuan, Meiling—WL37
Yuan, Shuai—TuM2
Yuan, Xueguang—TuQ4, TuY5
Yuan, Yuzhen—**ThHH4**
Yuhan, Guo—TuJ2
Yuk, T. I.—TuC1
Yumin, Liu—FQ4, FW2, FW3, FX4

Zami, Thierry—FC1
Zamzuri, A. K.—**TuEE2**
Zan, Hsiao-Wen—**FH2**
Zang, Hui—**ThCC1**
Zayer, Nadhum—FJ5
Zeng, Duoduo—FZ3
Zeng, Haishan—**TuFF**, ThGG3, **FCC3**
Zeng, Li—WL61
Zeng, Qinghui—ThX1
Zeng, Qingkai—WL51
Zeng, Ruixing—**FB4**
Zeng, Xianglong—ThBB2, ThP3
Zeng, Xiangye—WL46
Zeng, Zhiwei—**FZ5**
Zhan, Fujun—ThK1
Zhang, Aidong—ThJ3, ThQ6
Zhang, Ao—WL80
Zhang, Chao—ThH1
Zhang, Chongfu— **WL67,** ThO4
Zhang, Daohua—TuB2
Zhang, Fan—FF4, FK2
Zhang, Fan—ThO5
Zhang, Faxiang—ThH4
Zhang, Fengjuan—WL51
Zhang, Fujun—ThK2
Zhang, Guangyong—TuW2, **ThFF4**
Zhang, Guangyu—WL98
Zhang, Hanyi—TuS3, TuS4, WF2, WF3, WF4, ThO2, ThU5, FC4, FN4
Zhang, Hanzheng—ThFF2
Zhang, Hong—ThX1
Zhang, Hualiang—**ThG2**
Zhang, Huihui—WI5
Zhang, Huixing—**TuE6**
Zhang, J. L.—WL112
Zhang, Jia—**TuO5**
Zhang, Jian—ThN3
Zhang, Jiangcheng—WL43, WL49
Zhang, Jianing—ThN5
Zhang, Jie—TuF2, TuF7, WL81, WL83, ThDD4, ThFF1, ThFF3, ThU3, FD2, FO4
Zhang, Jijun—WL51

Zhang, Jing—TuD5
Zhang, Jinglan—TuJ2, **TuJ3**
Zhang, Jingyu—**TuD2**
Zhang, Jinrong—**FA5**
Zhang, Juan—TuV5, **WL17**
Zhang, Junwen—TuBB3, TuK6, **WL59, ThM2,** ThT7, FC5, FI3
Zhang, Lei—TuC7
Zhang, Li—WG2
Zhang, Liang—**FA2**
Zhang, Liang—TuD7, **TuE5,** ThE1, FN2
Zhang, Limin—**WL91**
Zhang, Liming—**WD1, FB**
Zhang, Liwei—WL95
Zhang, Min—WL57, ThFF1, **FD2**
Zhang, Ming—FZ4
Zhang, Pingping—**TuA2**, TuO2
Zhang, Qihui—**TuH3**
Zhang, Ru—TuI3, WL24
Zhang, Shaoliang—**FC3**
Zhang, Shumin—TuO6
Zhang, Shuming—FA5
Zhang, Su—ThO5, **FK2**,
Zhang, Wentao—**ThH4**
Zhang, X. J.—ThQ5
Zhang, Xia—WL90, ThQ1
Zhang, Xiao—WL14
Zhang, Xiaobei—**ThE4**
Zhang, Xiaoguang—TuK4, TuQ4, **TuW2**, TuW3, TuW4, TuY5
Zhang, Xiaoning—FD4
Zhang, Xin—WD3
Zhang, Xingyu—ThN2
Zhang, Xining—ThS3
Zhang, Xinliang—TuAA5, TuX3, ThE4, ThK4, FY2, FY4
Zhang, Xinping—ThY3
Zhang, Xinxin—**ThU6**
Zhang, Xu—**FH5**
Zhang, Y. F.—WL3, WL9
Zhang, Yan—FM4
Zhang, Yangan—**TuY5**
Zhang, Yi—**WL51**
Zhang, Yongjun—TuF4, TuF7, WL76, FL3
Zhang, Youling—ThX1
Zhang, Yu—TuX3, ThK4, FY4
Zhang, Yuncui—FU5
Zhang, Zhenrong—TuF5, WL74
Zhang, Zhiguo—ThGG2
Zhang, Zhiguo—TuAA3, ThT2
Zhang, Zhihong—**ThGG, ThX2**
Zhang, Zhihui—FL3
Zhang, Zhonghua—FR5
Zhang, Zichen—**TuH6**
Zhang, Ziyang—ThE1
Zhang, Zuxing—**TuEE4**
Zhao, Chun-Liu—**TuFF6**
Zhao, Chunliu—WL104, WL106
Zhao, Huijuan—WL91, **WL94**
Zhao, Jia—**WL36,** ThBB3
Zhao, Jian—**WL60**
Zhao, Jianhua—ThGG3, FCC3
Zhao, Junfa—FK4
Zhao, Junwei—WL107
Zhao, Lingjuan— TuB2, TuX2, WL38, FB3
Zhao, Mingshan—ThN5
Zhao, Wei—TuE6, FF3
Zhao, Xiaofan—TuX2, FB3
Zhao, Xing-hai—**TuEE6**
Zhao, Xingtao—WL6
Zhao, Xinyuan—TuQ4, TuW2, TuW4, TuY5
Zhao, Xinyuan X.—**TuW3**
Zhao, Ying—**TuS4**
Zhao, Yongli—TuF7, ThDD4
Zhao, Zhanlong—WL48
Zhao, Zhishuang—WL68
Zhaoying, Wang—WL1, WL4
Zheng, Fei—WL49
Zheng, Guangwei—ThG2, ThP1, **ThP4**
Zheng, Hongjun—FK5
Zheng, Jie—**ThN3**
Zheng, Jingjing—WC4, WI6, **WL23**
Zheng, Liming—**ThN4**
Zheng, Liqin—WL88
Zheng, Long—**WL90,** ThQ1
Zheng, Shaozhong—**FAA3**
Zheng, Wei—TuCC3, TuU4, FV2
Zheng, Xi—**TuBB3**, TuK6, TuT5, WL59, ThM2, ThT7, FC5, FI3, FN5
Zheng, Xiaoping—TuS3, TuS4, WF2, WF3, ThO2, ThU5, FC4, FN4
Zheng, Yanlei—FG5
Zheng, Zheng—WL108, ThA4, ThDD3, FCC4
Zheng, Zhihua—**WL73**
Zheng, Zhiqiang—WL47, ThK6
Zheng-rong, Tong—FK4
Zhi, Wang—ThR5
Zhong, Kang-ping—WL63
Zhong, Kun—TuI3
Zhongwei, Tan—**ThP2**
Zhongyuan, Yu—FQ4, FW2, FW3, FX4
Zhou, Bingkun—TuS4, WF3, ThO2
Zhou, Fan—WL38
Zhou, Haifeng—ThE3
Zhou, Jingtao—**WI5**
Zhou, Liangcheng—TuD1
Zhou, Libing—FI4
Zhou, Lina—FY4
Zhou, Michael M.—**ThCC2**
Zhou, Ning—TuD5
Zhou, Tao—ThA4
Zhou, Weiqin—TuAA3, ThT2
Zhou, Weiqing—TuAA2
Zhou, Wenjun—TuFF7, **WL104**, **WL106**
Zhou, Xian—**TuAA2**, TuAA3, ThT2
Zhou, Xiang—TuEE1
Zhou, Xianwei—WL75
Zhou, Zhiping—**ThB**
Zhu, Hai—ThT2, TuAA2, **TuAA3**
Zhu, Hongliang—TuD5, WL38, FB3
Zhu, Lin—FF5
Zhu, Meili—ThN4
Zhu, Min—TuBB5, **TuF3**, **TuL4**, TuT3, WL55
Zhu, Ning—TuD3, **WI1**
Zhu, Ninghua—TuB2
Zhu, Tao—WC5
Zhu, Yuehong—**ThEE6**
Zhu, Zhi Ying—WL65
Zhu, Zhijun—**FAA5**, **FD5**
Zhu, Zhiying—WL72
Zhuang, Guohua—ThK6
Zhuang, Songlin—WL69
Zhuo, Shuangmu—**WL88,** FCC2
Zhuo, Yue—**FD3**, **FL5**, FO5
Zientkowska, Marta—TuCC2
Zihuan, Xu—**FW3**
Zong, Fei—WL107
Zong, Jie—WJ4
Zou, Nianyu—**FU5**
Zou, Shumin—TuBB3, **TuK6**, TuT5, ThT7, FC5, FN5,
Zou, Xuecheng—WL66
Zuo, Yuhua—FH1

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