11:00 a.m.–12:00 p.m. Morning Technical Briefings, Ballroom B

1:30 p.m.–3:30 p.m.
OME • Optical Regeneration and Multichannel Systems

Ernesto Ciaramella; Scuola Superiore Sant'Anna, Italy, Presider

OME1 • 1:30 p.m.
Cascaded Modulation Scheme for Optical Multi-Channel Signal Transmission Systems, *Koji Kikushima, Toshihito Fujiwara, Satoshi Ikeda; NTT, Japan.* We report a cascaded modulation scheme that uses multiple concatenated external modulators to modulate continuous wave light. It offers better modulation performance than the conventional single modulation scheme for optical multi-channel signal transmission.

OME2 • 1:45 p.m.
140 Carrier, 20GHz SCM Signal Transmission across 200km SMF by Two-Step Sideband Suppression Scheme in Optical SSB Modulation, *Toshihito Fujiwara, Koji Kikushima; Access Network Service Systems Labs, NTT, Japan.* We propose a two-step sideband suppression scheme to realize enhanced optical SSB generation. 140 carrier, super wideband (8GHz to 20GHz) SCM transmission across 200km of SMF is demonstrated. The scheme achieves high sideband suppression ratios.

1:30 p.m.–3:30 p.m.
OMF • High Power Lasers and Amplifiers

Johan Nilsson; Univ. of Southampton, UK, Presider

OMF1 • 1:30 p.m. Invited
High Power Optical Amplifiers for Free-Space Communication Systems, *Douglas P. Holcomb; Lucent Technologies - Bell Labs, USA.* Emerging free-space optical communications applications require high power optical amplifiers (HPOAs) designed to differing requirements: wavelength band, modulation, polarization, and environment. Issues and performance are summarized, with emphasis on the 1.5 micron wavelength band.

1:30 p.m.–3:30 p.m.
OMG • Electronic Equalization

Fred Buchali; Alcatel SEL AG, Germany, Presider

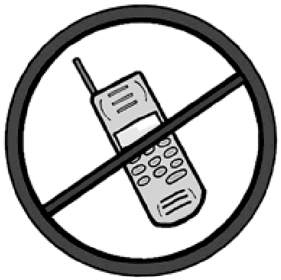
OMG1 • 1:30 p.m.
Adaptation Techniques for Electronic Equalizers for the Mitigation of Time-Variant Distortions in 43 Gbit/s Optical Transmission Systems, *Bernd Franz[1], Fred Buchali[1], Detlef Roesener[2], Henning Bülow[2]; [1]Alcatel Res. & Innovation, Germany, [2]Alcatel SEL AG, Germany.* Adaptation techniques for an adaptive 43Gbit/s electronic equalizer using either the FEC error count or the output of a novel integrated electronic eye monitor as feedback signal have been compared experimentally for the first time.

OMG2 • 1:45 p.m.
Iterative Electronic Equalization Utilizing Low Complexity MLSEs for 40 Gbit/s DQPSK Modulation, *Fabian N. Hauske[1], Berthold Lankl[1], Changsong Xie[2], Ernst-Dieter Schmidt[2]; [1]Federal Armed Forces Univ. Munich, Germany, [2]Siemens AG, Germany.* We present simulations of a novel electronic signal processing technique that allows digital equalization of optical 40Gbit/s DQPSK signals using iterative equlization with mutual exchange of information between low complexity MLSEs.

1:30 p.m.–3:30 p.m.
OMH • PMD and Transmission Mitigation

Rene-Jean Essiambre; Lucent Technologies, Inc., USA, Presider

OMH1 • 1:30 p.m. Invited
PMD Compensation Using Electronic Equalizers Particular Maximum Likelihood Sequence Estimation, *Theodor Kupfer, James Whiteaway, Stefan Langenbach; CoreOpticsGmbH, Germany.* We review the basic electronic equalization techniques. We report new results of MLSE equalizers for combined chromatic dispersion and PMD. We show first results on the dynamic channel tracking performance of MLSE equalizers for PMD.



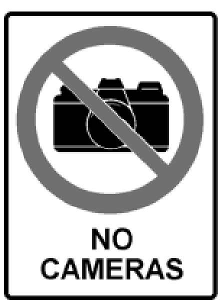
Room 304 A/B | Room 303 A | Room 303 B | Notes

11:00 a.m.–12:00 p.m. Morning Technical Briefings, Ballroom B

Room 304 A/B

1:30 p.m.–3:30 p.m.
OMI • Photonic Crystal Applications
G. Ronald Hadley; Sandia Natl. Labs, USA, Presider

OMI1 • 1:30 p.m. Invited
Photonic-Crystal-Based Chip-Scale Optical Integration, *Masaya Notomi, A. Shinya, E. Kuramochi, T. Tanabe, H. Taniyama; NTT Basic Res. Labs, Japan.* Ultrasmall and simultaneously high-Q cavities have been realized in Si photonic-crystal slabs. All-optical switches and bistable memories have been realized by them, and we discuss their potential for on-chip optical integration and digital photonics application.



Room 303 A

1:30 p.m.–3:30 p.m.
OMJ • Optical Network Applications
Yong Xue; DoD/DISA, USA, Presider

OMJ1 • 1:30 p.m. Invited
GRID and Optical Networks: How to Bridge the Gap? *Nageswara S.V. Rao, Qishi Wu, Steven M. Carter, William R. Wing; Oak Ridge Natl. Lab, USA.* By utilizing high-performance networks and end-systems, we show the challenges and approaches to making the underlying networking capabilities fully available to applications through impedance matching of the entire application-middleware-network execution and data paths.

Room 303 B

1:30 p.m.–3:30 p.m.
OMK • VCSELs and Packaging
Paul A. Morton; Morton Photonics, USA, Presider

OMK1 • 1:30 p.m.
1.1-µm-Range Tunnel Junction VCSELs with 27-GHz Relaxation Oscillation Frequency, *Kenichiro Yashiki, Naofumi Suzuki, Kimiyoshi Fukatsu, Takayoshi Anan, Hiroshi Hatakeyama, Masayoshi Tsuji; NEC Corp., Japan.* We have developed novel 1.1-µm-range InGaAs VCSELs with buried type-II tunnel junctions for high-speed optical interconnections. A relaxation oscillation frequency of 27 GHz was achieved. Error-free 30-Gbps operations were demonstrated using directly modulated multimode VCSELs.

OMK2 • 1:45 p.m.
Wide Modulation Bandwidth VCSELs with Side Current Injection and Copper-Plated Heatsink, *Naoki Jogan, Takeshi Uchida, Akihiro Matsutani, Tomoyuki Miyamoto, Kohroh Kobayashi; Tokyo Inst. of Technology, Japan.* We proposed and demonstrated a novel VCSEL structure for a wide direct modulation bandwidth. Additional current injection and heat sinking revealed the reduction of electrical and thermal resistance and achieved a modulation bandwidth of 16GHz.

Notes

Ballroom A

Ballroom B

OME • Optical Regeneration and Multichannel Systems—Continued

OME3 • 2:00 p.m. Invited

All-Optical Signal Processing Devices with (Periodically Poled) Lithium Niobate Waveguide, *Wolfgang Sohler[1], Werner Grundkötter[1], Harald Herrmann[1], H. Hu[1], S. L. Jansen[2], Jie H. Lee[1], Yoo H. Min[1], Viktor Quiring[1], Raimund Ricken[1], Selim Reza[1], Hubert Suche[1], R. B. Wehrspohn[1]; [1]Univ. of Paderborn, Germany, [2]Univ. of Technology Eindhoven, Netherlands.* Integrated optical Lithium Niobate devices for all-optical signal processing in the 1.5 µm wavelength range are reviewed. Besides nonlinear devices with periodically poled waveguides tunable Ti:Er:$LiNbO_3$ waveguide lasers are presented. Novel waveguide structures are reported.

Ballroom C

OMF • High Power Lasers and Amplifiers—Continued

OMF2 • 2:00 p.m.

A High-Efficiency Ytterbium-Doped Fiber Amplifier Designed for Interplanetary Laser Communications, *Neal W. Spellmeyer[1], David O. Caplan[1], Bryan S. Robinson[1], David Sandberg[1], Mark L. Stevens[1], Matt M. Willis[1], Denis V. Gapontsev[2], Nikolai S. Platonov[2], Alexander Yusim[2]; [1]MIT Lincoln Lab, USA, [2]IPG Photonics Corp., USA.* Design, performance, and environmental screening of flight prototype Ytterbium amplifiers designed for the Mars Laser Communications Demonstration are described. The high-reliability design delivered >8-W average power with low-duty-cycle PPM waveforms and >21% electrical-to-optical conversion efficiency.

OMF3 • 2:15 p.m.

High-Power CW Bismuth Fiber Laser: First Results and Prospects, *Evgeny M. Dianov, Alexey V. Shubin, Mikhail A. Melkumov, Oleg I. Medvedkov, Igor A. Bufetov; Fiber Optics Res. Ctr., Russian Federation.* CW lasing of Bi-doped fiber lasers in the wavelength range 1150-1215 nm with output power up to 15W has been obtained for the first time. The unsaturable optical losses in Bi-doped fibers have been revealed.

Ballroom D

OMG • Electronic Equalization—Continued

OMG3 • 2:00 p.m.

Maximum Likelihood Sequence Estimation for Chromatic Dispersion and Polarization Mode Dispersion Compensation in 3-Chip DPSK Modulation Format, *Jian Zhao, Lian-Kuan Chen, Chun-Kit Chan; Chinese Univ. of Hong Kong, Hong Kong.* We show that maximum-likelihood-sequence estimation (MLSE) of 10-Gbit/s 3-chip DPSK exhibits 1.6 dB penalty bound for 100-ps DGD and the CD tolerance 1.5 times of that of MLSE-equalized 10-Gbit/s 2-chip DPSK.

OMG4 • 2:15 p.m.

Experimental Measurements of the Effectiveness of MLSE against Narrowband Optical Filtering Distortion, *John D. Downie, Jason Hurley, Michael Sauer, Sergey Lobanov, Srikanth Raghavan; Corning Inc., USA.* We experimentally investigate the application of MLSE-EDC to signals transmitted through narrowband optical filters. We find MLSE affords significant OSNR improvement of ~5 dB for NRZ signals, but less or none for duobinary and DPSK.

Ballroom E

OMH • PMD and Transmission Mitigation—Continued

OMH2 • 2:00 p.m.

Adaptive Optical Compensation with Twin Fiber Gratings for First and Second Order PMD, *Shunsuke Mitani, Kazuyuki Ishida, Takashi Sugihara, Katsuhiro Shimizu, Masakazu Takabayashi, Yasuhisa Shimakura, Kiichi Yoshiara; Mitsubishi Electric Corp., Japan.* Twin tunable chirped-fiber gratings and a DOP monitoring scheme provide adaptive PMD compensation for 40-Gbps RZ-DQPSK signals. We show quantitatively the compensation scheme improves the PMD tolerance, but its effect is limited by second-order PMD.

OMH3 • 2:15 p.m.

A Novel, Easy to Use Emulator for Deterministic Generation of Pure First and Second Order PMD, *Peter M. Krummrich, Marc Bohn; Siemens Networks GmbH and Co KG, Germany.* A novel emulator model enables deterministic generation of first and second order PMD without higher orders. It was used to determine PMD tolerance of different modulation formats, revealing substantial differences in PCD and DEP tolerance.

Room 304 A/B

OMI • Photonic Crystal Applications—Continued

OMI2 • 2:00 p.m. Invited
Photonic Crystal Everywhere: Artificial Crystals Enable Diverse Key Functions, *Shojiro Kawakami; Photonic Lattice Inc., Japan.* Patterned 3D photonic crystals are fabricated by autocloning, a unique process for film deposition. Several novel devices/systems are realized. Applications to polarization imaging, fiber optic SOP monitor, biophotonics, and pickup for multilayer DVD are reviewed.

Room 303 A

OMJ • Optical Network Applications—Continued

OMJ2 • 2:00 p.m.
GMPLS-Based Multi-Ring Metro WDM Networks Employing OTN-Based Client Interfaces for 10GbE Services, *Noboru Yoshikane[1], Takehiro Tsuritani[1], Hongxiang Guo[1], Tomohiro Otani[1], Ori Gerstel[2]; [1]KDDI R&D Labs Inc., Japan, [2]Cisco Systems, Inc., USA.* Direct 10GbE LANPHY transport over GMPLS-controlled multi-WDM rings interconnected by a WXC was firstly investigated using DWDM-colored interfaces with OTN framing on IP/MPLS routers. Full-wire-rate client signal transportation and OTN-based multi-ring management was successfully confirmed.

OMJ3 • 2:15 p.m.
Field Trial of Inter-Domain Point-to-Multipoint Connections in ASON Using Web Service Mechanism, *Jun Wang[1], Yaohui Jin[1], Chao Xiang[1], Weiqiang Sun[1], Wei Guo[1], Weisheng Hu[1], Guoying Zhang[2], Yunbin Xu[2], Fang Yin[3], Guangze Wang[3], Xueqing Wei[4], Ruiquan Jing[5], Huandong Zhao[6]; [1]State Key Lab of Advanced Optical Commun. Systems and Networks, Shanghai Jiao Tong Univ., China, [2]Res. Inst. of Telecomm. Transmission, Ministry of Information Industry, China, [3]Optical Network R&D Dept., Huawei Technologies Co. Ltd., China, [4]Optical Network Product Div., Fiberhome Telecomm. Technologies Co.,Ltd., China, [5]China Telecom Beijing Res. Inst., China Telecom Corp., China, [6]Shanghai Telecomm. Tech. Res. Inst., China Telecom Corp., China.* A field trial of dynamic P2MP connections across two domains was successfully achieved in the ASON layer of the 3TNet testbed in Yangtze River Delta, China for the first time using web service mechanism.

Room 303 B

OMK • VCSELs and Packaging—Continued

OMK3 • 2:00 p.m.
A Non-Oxide 850 nm VCSEL for High-Speed Datacom Applications, *M. Ayliffe, Michael Cheng, Leo M. F. Chirovsky, Craig Ciesla, S. Demars, C. Hart, G. Hasnain, W. Hogan, Syn-Yem Hu, K. P. Jackson, W. Jiang, David Lewis, M. V. Ramana Murty, C.–l. Shieh, Die-Chi Sun, I.–h. Tan, David Venables; JDSU, USA.* We have developed an 850nm VCSEL where current and photon confinement is achieved by a mesa structure without lateral oxidation. The VCSEL performance and reliability is discussed in the context of 4xFC and 10GbE applications.

OMK4 • 2:15 p.m. Invited
1.3 and 1.55-µm InP-Based VCSELs for Digital and Radio Signal Transmission, *Nobuhiko Nishiyama[1], Catherine Caneau[2], Andrey Kobyakov[2], John D. Downie[2], Michel Sauer[2], Chung-en Zah[2]; [1]Tokyo Inst. of Technology, Japan, [2]Corning Inc., USA.* High performance InP-based LW-VCSELs have been realized. 10-Gbit/s error-free transmission was achieved up to 85°C as well as under high reflection. Polarization-stable operation was achieved using misoriented substrates. LW-VCSELs can be used for radio-over-fiber application.

Notes

Ballroom A

Ballroom B

OME • Optical Regeneration and Multichannel Systems—Continued

OME4 • 2:30 p.m.
SPM-Based 2R Regenerative 10Gbps Optically Linearly Controlled Delay Line with 0ps to 170ps Tuning Range, *Zhaoyang Hu, Daniel J. Blumenthal; Dept. of Electrical & Computer Engineering, Univ. of California, USA.* We demonstrate a 2R regenerative optical delay line with error-free operation, 1dB negative sensitivity penalty for degraded 10Gbps RZ packets. Its time delay can be linearly tuned from 0ps to 170ps with maintained original wavelength.

OME5 • 2:45 p.m.
Wavelength-Shift-Free SPM-Based 2R Regeneration by Bidirectional Use of a Highly Nonlinear Fiber, *Masayuki Matsumoto, Yoshiyuki Shimada, Hironobu Sakaguchi; Osaka Univ., Japan.* We propose a bidirectional configuration of self-phase-modulation-based all-optical 2R regenerator using a single nonlinear fiber for wavelength-shift-free operation. We confirm its effectiveness by a recirculating-loop transmission experiment at 80GHz repetition rate.

Ballroom C

OMF • High Power Lasers and Amplifiers—Continued

OMF4 • 2:30 p.m.
Fiber Amplifier Performance in Gamma Radiation Environment, *Mansoor Alam[1], Jaroslaw Abramczyk[1], Pratheepan Madasamy[2], William Torruellas[2], Anthony Sanchez[3]; [1]Nufern, USA, [2]Fibertek, Inc., USA, [3]AFRL, USA.* Fiber based amplifiers are being considered for use on low earth orbiting (LEO) satellites for next generation communication systems. This paper deals with evaluation of the performance of an Er/Yb fiber amplifier in γ-radiation environment.

OMF5 • 2:45 p.m.
Amplified Compression of 300-fs Er-Doped Fiber Laser Pulse to 29 fs in a Special Large-Mode-Area Er-Doped Fiber, *Gong-Ru Lin, Yin-Tsong Lin; Graduate Inst. of Electro-Optical Engineering, Natl. Taiwan Univ., Taiwan.* All-in-one pre-chirped and amplified pulse compression of passively additive-pulse mode-locked Er-doped fiber laser from 300 to 29 fs with 10-fold pulsewidth compressing ratio by using large-mode-area and dense Er-doped fiber based optical amplifier is proposed.

Ballroom D

OMG • Electronic Equalization—Continued

OMG5 • 2:30 p.m. Tutorial
Electronic Dispersion Compensation, *Henning Bülow; Alcatel SEL AG, Germany.* Electronic equalisation schemes such as analog equalisers, MLSE, electronic precompensation, coherent DSP equalisation, and optical OFDM are discussed in view of dispersion and PMD mitigation efficiency, impact of fiber-nonlinearity and electronic processing complexity.

Henning Bülow received his Dipl.-Ing. (M.Sc.) degree in electrical engineering from the University of Dortmund, Germany, in 1985, and a Ph.D. in electrical engineering from the University of Berlin in 1988, for work on integrated optical switching matrices. He joined Alcatel-Lucent Research-and-Innovation (R&I), formerly Alcatel's Research Center in Stuttgart, Germany, in 1990, where he worked on erbium-doped fiber amplifiers, optical analog TV systems, optical and electrical time-multiplexed 40Gb/s transmission systems, and the assessment of data transmission in the presence of polarization mode dispersion. Since 1998, he is heading a research team investigating the dynamic mitigation of transmission impairments at 10, 40, and 160Gb/s by adaptive analog and digital electronic equalizers circuits and by optical signal processing based on fiber-technology compensators and planar lightwave circuits.

Ballroom E

OMH • PMD and Transmission Mitigation—Continued

OMH4 • 2:30 p.m. Invited
All-Channel PMD Mitigation Using Distributed Fast Polarization Scrambling in WDM Systems with FEC, *Xiang Liu; Lucent Technologies, USA.* We review the progresses on the simultaneous PMD mitigation for all channels in a WDM system with FEC using distributed fast polarization scrambling. The benefits and implementation considerations of this PMD mitigation technique are discussed.

Room 304 A/B	Room 303 A	Room 303 B	Notes

Room 304 A/B

OMI • Photonic Crystal Applications—Continued

OMI3 • 2:30 p.m.
Experimental Demonstration of 2-D Photonic Crystal Surface Cavity in Amorphous Silicon on Silica Structure, *Ziyang Zhang[1], Matteo Dainese[1], Lech Wosinski[1], Marcin Swillo[2], Sanshui Xiao[1], Min Qiu[1]; [1]KTH (Royal Inst. of Technology), Sweden, [2]PhoXtal Communications AB, Sweden.* Design, fabrication, and characterization of an optical filter based on side coupling between silicon wire waveguide and photonic crystal surface mode cavity in silicon on silica structure is presented for the 1550nm wavelength spectral region.

OMI4 • 2:45 p.m.
Silicon Photonic Crystal Directional Couplers for Power Splitting, Wavelength Filtering, and Optical Switching, *Andrew Stapleton, Nankyung S. Cockerham, Mahmood Bagheri, Stephen Farrell, John O'Brien; Univ. of Southern California, USA.* All optical switching has been demonstrated using photonic crystal directional couplers illuminated with a 10mW control signal. Power splitters and wavelength filters are also demonstrated with these 10x12 micrometer footprint devices.

Room 303 A

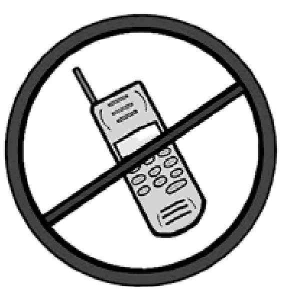
OMJ • Optical Network Applications—Continued

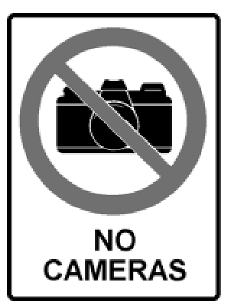
OMJ4 • 2:30 p.m. Invited
Layer 1 Virtual Private Network, *Tomonori Takeda; NTT, Japan.* This paper presents Layer 1 Virtual Private Networks (VPNs), which is a new service by utilizing optical transmission and networking technologies. It presents service concepts, network architectures and protocols based on standardization progress.

Room 303 B

OMK • VCSELs and Packaging—Continued

OMK5 • 2:45 p.m.
Optical Feedback-Tolerant 1.3 µm Gain-Coupled DFB Lasers for Isolator-Free Micro-BOSA Modules, *Koji Nakamura[1], Satoshi Miyamura[1], Ryo Sekikawa[1], Daisuke Shimura[1], Susmu Nakaya[2], Teijiro Ori[2], Hiroki Yaegashi[1], Yoh Ogawa[1]; [1]Oki Electric Industry Co., Ltd., Japan, [2]Fujikura Ltd., Japan.* Gain-coupled (GC)-DFB-LD tolerant to optical feedback was developed for low-cost, isolator-free optical subassembly module. GC-DFB-LD into isolator-free micro-BOSA module has power penalty less than 0.3dB after 25km transmissions at 1.25Gb/s with -15dB optical feedback.





OME • Optical Regeneration and Multichannel Systems—Continued

OME6 • 3:00 p.m.
Synchronization of a 160-GHz Optical Beat Signal with a 2-ps Optical RZ Signal by Phase-Locked Loop Technique, *Shigehiro Takasaka[1,2], Yasuyuki Ozeki[1], Misao Sakano[3]; [1]PRESTO, Japan Science and Technology Agency, Japan, [2]Fitel Photonics Lab, Furukawa Electric Co., Japan, [3]Furukawa Electric Co., Ltd., Japan.* We demonstrate a phase-locking of 160-GHz beat signal, which is generated by an optical comb generator and a polarization-stable, high-extinction optical filter, to a 10-Gb/s RZ signal with a residual timing jitter of 69 fs.

OME7 • 3:15 p.m.
Orthogonal Frequency Division Multiplexing Using Baseband Optical Single Sideband for Simpler Adaptive Dispersion Compensation, *Don Hewitt; Natl. ICT Australia, Univ. of Melbourne, Australia.* A novel baseband OFDM optical single-sideband system for long-haul adaptive dispersion compensation is proposed and demonstrated through simulation of a dispersive 420 km link.

OMF • High Power Lasers and Amplifiers—Continued

OMF6 • 3:00 p.m. Invited
Fiber Technologies for Terawatt Lasers, *John R. Marciante; Univ. of Rochester, USA.* Terawatt and petawatt laser systems have substantially different requirements for fiber optic technologies than those of conventional telecommunications systems. Specialty fiber-based solutions have been developed to meet the stringent requirements of these diverse applications.

OMH • PMD and Transmission Mitigation—Continued

OMH5 • 3:00 p.m.
Quantifying the Dependence of Degree of Polarization on Polarization Mode Dispersion and the Optical Spectrum, *Peter M. Farrell[1], Kate E. Cornick[1], Kerry Hinton[2], Sarah D. Dods[1]; [1]Natl. ICT Australia, Australia, [2]Univ. of Melbourne, Australia.* We derive a new, simple and exact DOP model that separates contributions from PMD and the optical spectrum. We use the model to derive two quantitative measures of spectral tolerance to PMD.

OMH6 • 3:15 p.m.
Four-Wave Mixing Compensator Based on Highly Nonlinear Fiber, *Joon Young Huh, Sang Bae Jun, Yun C. Chung; KAIST, Republic of Korea.* We demonstrate a new FWM compensation technique by using a HNLF and a pump laser. The results show that proposed technique could effectively suppress FWM crosstalk generated in transmission fiber and improve the system's performance.

3:30 p.m.–4:00 p.m. Coffee Break, 3rd Floor Lobby

Room 304 A/B	Room 303 A	Room 303 B	Notes

OMJ • Optical Network Applications—Continued

OMJ5 • 3:00 p.m.
First Demonstration of End-to-End Inter-Domain Lightpath Provisioning Using GMPLS E-NNI between US and Japan for High-End Data and Grid Services, *Shuichi Okamoto[1,2], Yasunori Sameshima[1,3], Tomohiro Otani[1,2], John Moore[4], Yufeng Xin[4], Gigi Karmous-Edwards[4], Alan Verlo[5], Tom DeFanti[5], Lawrence Mao[6], Olivier Jerphagnon[6]; [1]Natl. Inst. of Information and Communications Technology, Japan, [2]KDDI R&D Labs, Japan, [3]NTT Network Innovation Labs, Japan, [4]MCNC, USA, [5]Univ. of Illinois, USA, [6]Calient Networks, USA.* Dynamic path provisioning of 10GbE using GMPLS E-NNI was successfully achieved between Japan and the US for the first time. Without exposing routing topology of individual network domains, end-to-end optical circuits were established via PXCs.

OMJ6 • 3:15 p.m.
First Field Trial of OLS Network Testbed With All-Optical Contention Resolution of Asynchronous, Variable-Length Optical Packets, *Bo Xiang[1], Zuqing Zhu[1], Haijun Yang[1], Wei Jiang[1], David. L. Harris[2], Katsuya Ikezawa[3], Ryuji Umeda[3], S. J. Ben Yoo[1]; [1]Dept. of Electrical and Computer Engineering, Univ. of California at Davis, USA, [2]Advanced Technology Labs, Sprint Nextel, USA, [3]Photonics Business Div., Yokogawa Electric Corp., Japan.* We demonstrate field trial of asynchronous, variable-length packet contention resolution at data-rate of 10-Gb/s in an OLS network testbed built with in-ground field fiber. Both the lab-test and the field trial results indicate error-free operation.

OMK • VCSELs and Packaging—Continued

OMK6 • 3:00 p.m.
Novel TO-BOSA for FTTH Using New Optical Path Alignment Technology, *Akira Ohki, Seiji Fukushima, Mitsuru Sugo, Kazutoshi Kato, Yuji Akatsu; NTT Photonics Labs, Japan.* We propose a new assembly technique that provides a cost-effective way to integrate Tx and Rx in one TO-package. The TO-BOSA developed using this technique performed sufficiently well for FTTH service applications.

OMK7 • 3:15 p.m.
1.1W Four-Wavelength Raman Pump Using BH Lasers, *Mark Haverkamp[1], Gerd Kochem[1], Konstantin Boucke[1], Elmar Schulze[2], Helmut Roehle[2]; [1]Fraunhofer Inst. for Laser Technology, ILT, Germany, [2]Fraunhofer Inst. for Telecommunications, HHI, Germany.* A new high-power 4-wavelength extended C-band Raman pump with 1.1W total fiber output power is demonstrated enabling 60nm Raman gain bandwidth (1.6dB ripple). High-power BH lasers are fabricated and fiber-coupled with high efficiency (0.8).

3:30 p.m.–4:00 p.m. Coffee Break, 3rd Floor Lobby

Ballroom A

4:00 p.m.–6:00 p.m.
OML • Photonic Bandgap Fibers
Terence Shepherd; QinetiQ Ltd., UK, Presider

OML1 • 4:00 p.m.
Using Photonic Bandgap Fiber for Extending the Reach in Non-Repeatered Transmission Systems, *Kazunori Mukasa, Francesco Poletti, Marco N. Petrovich, Neil Broderick, Rodrigo Amezcua-Correa, Michael A. F. Roelens, David J. Richardson; Optoelectronics Res. Ctr., Univ. of Southampton, UK.* We investigate the use photonic bandgap fibers in non repeatered transmission systems. Our simulations show that the significant improvements in system reach should be possible as a result of the reduced nonlinearity.

OML2 • 4:15 p.m.
Design of Large Hollow-Core Photonic Band-Gap Fibers with Suppressed Higher-Order Modes, *Kunimasa Saitoh, Nikolaos Florous, Tadashi Murao, Masanori Koshiba; Hokkaido Univ., Japan.* We present the suppression of higher-order modes in realistic large-hollow-core photonic band-gap fibers, free of surface modes, based on the index-matching mechanism of central air-core modes with defected outer-core modes for an effectively single-mode operation.

Ballroom B

4:00 p.m.–5:45 p.m.
OMM • Optical Performance Monitoring
Ken-ichi Kitayama; Osaka Univ., Japan, Presider

OMM1 • 4:00 p.m. Invited
Monitors to Ensure the Performance of Photonic Networks, *Sheryl L. Woodward; AT&T Labs-Res., USA.* As optical networks become more transparent, it becomes increasingly difficult to monitor the integrity of signals within the network. Fortunately, techniques used to improve capacity and reach can often be used to enhance performance monitoring.

Ballroom C

4:00 p.m.–5:45 p.m.
OMN • Doped Amplifiers and their Dynamics
Atul Srivastava; OneTerabit, USA, Presider

OMN1 • 4:00 p.m. Invited
Novel Dopants for Silica-Based Fiber Amplifiers, *Bernard Dussardier, Wilfried Blanc; CRNS - Univ. of Nice Sophia-Antipolis, France.* We review on some studies of the potential of new dopants in silica fibers for ultrabroadband amplification coverage in the 800-1700 nm range, including transition metal and rare-earth ions, and sensitized nano-particles.

Ballroom D

4:00 p.m.–6:00 p.m.
OMO • OCDMA
Mike O'Mahony; Univ. of Essex, UK, Presider

OMO1 • 4:00 p.m.
Demonstration of 16-User OCDMA over 3-Wavelength WDM Using 511-Chip, 640 Gchip/s SSFBG En/Decoder and Single Light Source, *Taro Hamanaka[1], Xu Wang[2], Naoya Wada[2], Ken-ichi Kitayama[1]; [1]Osaka Univ., Japan, [2]Natl. Inst. of Information and Communication Technology, Japan.* We experimentally demonstrated 16-user OCDMA over 3-wavelength, 100-GHz spacing WDM system using 640 Gchip/s super-structured FBG en/decoder and single light source, with the frequency interval far narrower than 640 GHz.

OMO2 • 4:15 p.m.
Demonstration of a 16-Channel Code-Reconfigurable OCDMA/DWDM System, *Chun Tian, Zhaowei Zhang, Morten Ibsen, Periklis Petropoulos, David J. Richardson; Optoelectronics Res. Ctr., UK.* We report a reconfigurable 16-channel OCDMA/DWDM system (4OCDMAx4DWDMx 62Mbit/s) based on novel 31-chip, 40 Gchip/s quaternary phase coding gratings operating at a channel spacing of just 50GHz. Error free performance is achieved for all channels.

Ballroom E

4:00 p.m.–6:00 p.m.
OMP • System Implication of Modulation Formats
Tetsuya Miyazaki; Natl. Inst. of Info. & Com. Technology, Japan, Presider

OMP1 • 4:00 p.m. Invited
Coherent Detection for Optical Communications Using Digital Signal Processing, *Michael Taylor; Univ. College London, UK.* Coherent detection offers a viable alternative to direct detection following the arrival of real-time digital signal processing technology. Experimental results show how coherent detection gives better performance. Some challenges of the digital approach are addressed.

Room 304 A/B	Room 303 A	Room 303 B	Notes

4:00 p.m.–6:00 p.m.
OMQ • Fiber Optic Sensors
Joseph Friebele; NRL, USA, Presider

OMQ1 • 4:00 p.m. Invited
Distributed Acoustic and Seismic Sensing, *Clay Kirkendall; NRL, USA.* An overview of fiber optic distributed acoustic and seismic sensor system architectures is presented.

4:00 p.m.–6:00 p.m.
OMR • Ultra-Short Reach Interconnects
Ashok Krishnamoorthy; Sun Microsystems Inc., USA, Presider

OMR1 • 4:00 p.m.
Equalization Techniques for 100Mb/s Data Rates on SI-POF for Optical Short Reach Applications, *Antonino Nespola[1], Stefano Camatel[1], Silvio Abrate[1], Daniel Cardenas[2], Roberto Gaudino[2]; [1]Inst. Superiore Mario Boella, Italy, [2]Politecnico di Torino, Italy.* In this paper, we propose the combination of 8-PAM modulation, pre-emphasis and adaptive equalization to overcome 1mm-SI-POF bandwidth limitations in optical short reach links. An error-free transmission at 100Mbit/s over 200m SI-POF is experimentally demonstrated.

OMR2 • 4:15 p.m.
10.7 Gbit/s Data Transmission over 220m of Perfluorinated Graded-Index Polymer Optical Fiber Using Maximum Likelihood Sequence Estimation Equalizer, *Jeffrey Lee[1], Florian Breyer[2], Sebastian Randel[3], Bernhard Spinnler[3], Iveth L. Lobato Polo[4], Dirk van den Borne[1], Jianming Zeng[1], Erik de Man[5], Henrie P. A. van den Boom[1], Ton Koonen[1]; [1]Univ. of Technology Eindhoven, Netherlands, [2]Univ. of Technology Munich, Germany, [3]Siemens AG, Corporate Technology, IC[2], Germany, [4]Siemens AG, Program and System Engineering, Germany, [5]Siemens AG, Communications, Fixed Networks, Germany.* 10 Gbit/s NRZ-signals are transmitted for the first time over 220 m of multimode 120 µm core-diameter perfluorinated graded-index polymer optical fiber using an MLSE equalizer.

4:00 p.m.–6:00 p.m.
OMS • Optical Sources
Hiroshi Yasaka; NTT Photonics Labs, Japan, Presider

OMS1 • 4:00 p.m.
Wide Temperature (15ºC to 95ºC), 80-km SMF Transmission of a 1.55-µm, 10-Gbit/s InGaAlAs Electroabsorption Modulator Integrated DFB Laser, *Shigeki Makino[1], Kazunori Shinoda[1], Takashi Shiota[1], Takeshi Kitatani[1], Toshihiko Fukamachi[1], Masahiro Aoki[1], Noriko Sasada[2], Kazuhiko Naoe[2], Kenji Uchida[2], Hiroaki Inoue[2]; [1]Hitachi, Ltd., Central Res. Lab, Japan, [2]Opnext Japan, Inc., Japan.* Uncooled 10-Gbit/s, 80-km SMF transmission was demonstrated for the first time using a 1.55-µm InGaAlAs EA/DFB laser. A power penalty below 2-dB was achieved over a wide temperature range from 15ºC to 95ºC.

OMS2 • 4:15 p.m.
10 Gb/s 100km Transmission Up to 80°C over Single Mode Fiber at 1.55 µm with an Integrated Electro-Absorption Modulator Laser, *Jean-René Burie[1], Genevieve Glastre[1], Simon Fabre[2], Gérard Beuchet[2], Jean-Francois Paret[2], Dominique Bigot[2], Pascale Ratel[2], Chantal Scribe[2], Jean-Philippe Fié[2], Francois Laruelle[2]; [1]Avanex France, France, [2]AVANEX France, France.* We present the first results of transmission up to 80°C over 100 km of standard fiber using an integrated electro-absorption modulator lasers. This enables uncooled small form factor metropolitan transmitters.

Ballroom A

OML • Photonic Bandgap Fibers—Continued

OML3 • 4:30 p.m.
Effects of Structural Distortions on Photonic Band-Gap Fibers, *Ming-Jun Li, James A. West, Karl W. Koch; Corning Inc., USA.* A scanning electron micrograph of a photonic band-gap fiber profile is analyzed using a finite element method. It is shown that structural distortions have significant impacts on fiber properties such as bandwidth and tunneling loss.

OML4 • 4:45 p.m.
Parasitic Modes in Large Mode Area Microstructured Fibers, *Joanne C. Flanagan, Rodrigo Amezcua-Correa, Francesco Poletti, John R. Hayes, Neil G. R. Broderick, David J. Richardson; Optoelectronics Res. Ctr., UK.* We present experimental evidence for parasitic modes guided by both bandgap and low density of state effects in large mode area silica microstructured fibers and explore ways of minimizing their presence via the fiber geometry.

OML5 • 5:00 p.m.
Comparison of Mode Properties of 7 and 19 Cells Core Hollow-Core Photonic Crystal Fibers, *Rodrigo Amezcua Correa, Neil N. G. Broderick, Marco N. Petrovich, Francesco Poletti, David J. Richardson; Optoelectronics Res. Ctr., UK.* We compare the mode properties of fibers with 7 and 19 cells core, the operational bandwidth and loss of the fibers is compared and trade offs between low loss and wide operational bandwidth are presented.

Ballroom B

OMM • Optical Performance Monitoring—Continued

OMM2 • 4:30 p.m.
Monitoring Technique for ASE and MPI Noises in Distributed Raman Amplified Systems, *Hyeon Y. Choi[1], Sang B. Jun[1], Seung K. Shin[2], Yun C. Chung[1]; [1]KAIST, Republic of Korea, [2]TeraLink Communications, Inc., Republic of Korea.* We develop a new technique for monitoring the ASE and MPI noises in a distributed Raman amplified system. The results showed that this technique could monitor these noises regardless of bit rates and modulation formats.

OMM3 • 4:45 p.m.
Robust, Low Cost, In-Band Optical Signal to Noise Monitoring Using Polarization Diversity, *Trevor B. Anderson, Ken Clarke, Sarah D. Dods, Masudazzaman Bakaul; Natl. ICT Australia Ltd, Univ. of Melbourne, Australia.* We demonstrate a robust in-band OSNR monitor using polarization diversity and low-cost optoelectronics. The proposed technique offers relaxed manufacturing tolerances and is insensitive to extinction ratio, bit rate, chromatic dispersion and first order PMD.

OMM4 • 5:00 p.m.
Novel OSNR Monitoring Technique in Dense WDM Systems Using Inherently Generated CW Monitoring Channels, *Martin N. Petersen, Torger Tokle; COM-DTU, Dept. of Communications, Optics, and Materials, Denmark.* We present a simple, yet effective OSNR monitoring technique based on an inherent effect in the optical modulator. Highly accurate OSNR monitoring is demonstrated in a 40-Gb/s dense WDM system with 50-GHz channel spacing.

Ballroom C

OMN • Doped Amplifiers and their Dynamics—Continued

OMN2 • 4:30 p.m.
Dynamic Behavior of Spectral Hole Burning in EDFA with 980nm Pumping, *Maxim Bolshtyansky, Nicholas King, Gregory Cowle; JDSU, USA.* EDFA dynamic behavior is studied with respect to the influence of spectral hole burning on surviving channel power. Simulation results are compared with measurements and importance of new 3-level EDFA model with SHB is demonstrated.

OMN3 • 4:45 p.m.
Amplification of Optical Bursts in Gain-Stabilized Erbium-Doped Optical Amplifier, *Stefano Taccheo[1], Giuseppe Della Valle[1], Alessandro Festa[1], Karin Ennser[1], Javier Aracil[2]; [1]Politecnico di Milano - CNISM, Italy, [2]Univ. Autónoma de Madrid, Spain.* Optical-burst amplification in a gain-stabilized-amplifier may generate complex gain dynamics with chaotic behavior. This phenomenon is thoroughly investigated using a theoretical model and dedicated experiments. Optimized device designs to avoid optical-burst transmission impairments are proposed.

OMN4 • 5:00 p.m.
Fast Control of Inter-Channel SRS and Residual EDFA Transients Using a Multiple-Wavelength Forward-Pumped Discrete Raman Amplifier, *Xiang Zhou, Mark Feuer, Martin Birk; AT&T Lab, USA.* We propose to use a forward-pumped discrete Raman amplifier with a linear feed-forward pump control algorithm to compensate accumulated inter-channel-SRS and residual-EDFA transients. The method was shown to perform well in static and dynamic experiments.

Ballroom D

OMO • OCDMA—Continued

OMO3 • 4:30 p.m.
Resiliency of OCDM-PON against Near-Far Problem, *Kazuho Ohara[1], Vincent J. Hernandez[2], Yixue Du[2], Zee Ding[2], S. J. Ben Yoo[2], Yukio Horiuchi[1]; [1]KDDI R&D Labs Inc., Japan, [2]Univ. of California at Davis, USA.* Resiliency of OCDM-PON is investigated through theoretical and numerical simulation. A 32-ONU system can achieve BER=10^{-9} and overcome the near-far problem when synchronous operation, power leveling, and LDPC error correction are used.

OMO4 • 4:45 p.m.
Network Performance Evaluation of End-to-End Application over SPECTS O-CDMA Testbed, *Junqiang Hu, Wei Cong, Vincent Hernandez, Brian H. Kolner, Jonathan P. Heritage, S. J. B. Yoo; Univ. of California at Davis, USA.* This paper experimentally demonstrates end-to-end applications over a SPECTS O-CDMA network including edge routers and end hosts. We measure the 2x2 network performance running video streaming and FTP applications.

OMO5 • 5:00 p.m.
Spectrally Efficient DPSK-OCDMA Coherent System Using Integrated Ring-Resonator-Based Coders, *Anjali Agarwal, Paul Toliver, Thomas Banwell, Ronald Menendez, Janet Jackel, Shahab Etemad; Telcordia Technologies, USA.* We demonstrate the highest spectral efficiency of 0.5 bit/s/Hz for a multi-user spectral phase encoded OCDMA system, which operates within an 80 GHz transparent optical window using DPSK format and programmable ring-resonator based integrated coders.

Ballroom E

OMP • System Implication of Modulation Formats—Continued

OMP2 • 4:30 p.m.
Experimental Demonstration of Transmission of Coherent Optical OFDM Systems, *William Shieh, Xingwen Yi, Yang Tang; Univ. of Melbourne, Australia.* We show the first experimental demonstration of coherent optical OFDM systems (CO-OFDM). 128 OFDM subcarriers with nominal data-rate of 8 Gb/s are successfully processed and recovered after 1000-km transmission through SSMF fibre without dispersion compensation.

OMP3 • 4:45 p.m.
1 Gsymbol/s, 64 QAM Coherent Optical Transmission over 150 km with a Spectral Efficiency of 3 Bit/s/Hz, *Jumpei Hongou, Keisuke Kasai, Masato Yoshida, Masataka Nakazawa; Res. Inst. of Electrical Communication, Tohoku Univ., Japan.* A 1 Gsymbol/s, 64 QAM coherent signal was successfully transmitted over 150 km using heterodyne detection with a frequency-stabilized fiber laser and an optical phase-locked-loop technique. The spectral efficiency reached as high as 3 bit/s/Hz.

OMP4 • 5:00 p.m.
40-Gb/s QPSK with Inserted Pilot Symbols Using Self-Homodyne Detection, *Guo-Wei Lu, Moriya Nakamura, Yukiyoshi Kamio, Tetsuya Miyazaki; Natl. Inst. of Information and Communications Technology, Japan, Japan.* We experimentally demonstrated a 40-Gb/s QPSK transmission system with inserted pilot symbols, using an RZ-RF driving signal in the transmitter and self-homodyne direct detection in the receiver, without any complicated precoder, post-processor or local oscillator.

Room 304 A/B	Room 303 A	Room 303 B	Notes

OMQ • Fiber Optic Sensors
Joseph Friebele; NRL, USA, — Continued

OMQ2 • 4:30 p.m.
Detection Sensitivity of Brillouin Sensors Located near Fresnel Reflection, *Daisuke Iida, Yusuke Koshikiya, Nazuki Honda, Fumihiko Ito; NTT Corp., Japan.* This paper discusses the effect of Fresnel reflection on BOTDR measurement. We show that a detectable sensor length can be determined from the intensity of the returning light and it depends on the laser linewidth.

OMQ3 • 4:45 p.m.
An Ultra-Long-Distance FBG Sensor System Based on a Tunable Fiber Ring Laser Configuration, *Yun-Jiang Rao, Zeng-Ling Ran, Xiao-Dong Luo; Univ. of Electronics Science and Technology of China, China.* A novel tunable fiber ring laser configuration with multi-stage hybrid Raman/EDF amplification is first proposed and demonstrated for realizing an ultra-long-distance (~100km) fiber Bragg grating (FBG) sensing system with a high optical SNR of >50dB.

OMQ4 • 5:00 p.m.
Temperature Insensitive Bending Sensor Based on a Sampled Fiber Bragg Grating, *Young-Geun Han[1,2], Xingyong Dong[3], Ju Han Lee[1], Sang Bae Lee[1]; [1]KIST, Republic of Korea, [2]Caltech, USA, [3]Nanyang Technological Univ., Singapore.* We propose and experimentally demonstrate a simple and practical scheme for temperature insensitive bending sensor based on a single sampled chirped-fiber Bragg grating with multiple resonant peaks, which is embedded in a flexible cantilever beam.

OMR • Ultra-Short Reach Interconnects—Continued

OMR3 • 4:30 p.m. Invited
Short Distance Optical Connections for Home Networks, Sensing and Mobile Systems, *Olaf Ziemann, Hans Poisel; POF-AC Polymer Optical Fiber Application Ctr., Germany.* Singlemode and multimode glass fibers are widely used in telecommunication. This paper will summarize the wide field of applications for large diameter optical fibers, first of all the Polymer Optical Fiber e.g. in home networks.

OMR4 • 5:00 p.m. Invited
Data Center and High Performance Computing Intreconnects for 100 Gb/s and Beyond, *Petar K. Pepeljugoski, Fuad Doany, Daniel Kuchta, Laurent Schares, Clint Schow, Mark Ritter, Jeffrey A. Kash; IBM Res., USA.* We review architectures enabling >100 Gb/s interconnects in data centers. Parallel optical interconnects are cost effective for rack to rack interconnects. On-board optical waveguides offer data rate scalability, density and performance advantages over electrical interconnects.

OMS • Optical Sources—Continued

OMS3 • 4:30 p.m.
Long-Term Wavelength Reliability in Semi-Cooled 11.1 Gbps-80 km EAM-LDs for DWDM XFPs, *Takeshi Yamatoya, Yasunori Miyazaki, Takeshi Saito, Toshitaka Aoyagi, Takahide Ishikawa; Mitsubishi Electric Corp., Japan.* We have developed semi-cooled 11.1 Gbps-80 km EAM-LDs optimized for long-term wavelength reliability for DWDM applications. Estimated MTTF over 105 hours to 100 pm wavelength drift was demonstrated for the first time.

OMS4 • 4:45 p.m.
10 Gb/s Wavelength-Tunable EML with Continuous Wavelength Tuning Covering 50 GHz x 8 Channels on ITU Grid, *Shigeaki Sekiguchi, Kazumasa Takabayashi, Akinori Hayakawa, Shuichi Tomabechi, Ayahito Uetake, Mitsuru Ekawa, Haruhiko Kuwatsuka; Fujitsu Labs Ltd., Japan.* A wavelength-tunable EA-modulated laser using tunable distributed amplification (TDA) structure was demonstrated. An 80 km transmission of 10 Gb/s signals was confirmed on 8 channels on ITU grid using the device's simple, continuous tuning mechanism.

OMS5 • 5:00 p.m.
Tunable Laser Source for Fast Wavelength Switching Using a Short-Cavity DBR Laser Packaged with Wavelength Locker, *Tatsuro Kurobe[1,2], Tatsuya Kimoto[1,2], Kengo Muranushi[1,2], Taishi Kagimoto[1,2], Nobuyuki Kagi[1,2], Akihiko Kasukawa[1,2], Jie Wu[1], Eisuke Otani[1], Hideo Arimoto[3,2], Shinji Tsuji[4,2]; [1]Furukawa Electric, Japan, [2]Optical Industry and Technology Development Association, Japan, [3]Central Res. Lab Hitachi, Ltd, Japan, [4]Central Res. Lab Hitachi, Ltd., Japan.* Simple switching scheme of frequency with precise feedback control of robust wavelength locker has been presented for a short-cavity DBR laser array. Switching time was less than 13 µsec within +/- 2.5GHz from ITU grid.

Ballroom A

OML • Photonic Bandgap Fibers—Continued

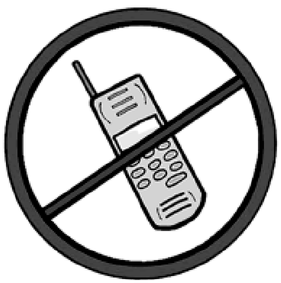
OML6 • 5:15 p.m.
Use of Fingers in the Core to Reduce Leakage Loss in Air-Core Photonic Bandgap Fibers, *Jonathan Hu, Curtis R. Menyuk; Univ. of Maryland, Baltimore County, USA.* We show that the leakage loss with small fingers pointing into the core is three orders of magnitude lower than the loss without small fingers. A PBGF core design with low leakage loss is suggested.

OML7 • 5:30 p.m.
Solid Photonic Band Gap Fiber with 400 nm Bandwidth and Loss below 4 dB/km at 1520 nm, *Ryuichiro Goto, Katsuhiro Takenaga, Shoichiro Matsuo, Kuniharu Himeno; Fujikura Ltd., Japan.* We demonstrate a wide band and low loss (< 4 dB/km at 1520 nm) solid photonic band-gap fiber (PBGF). The fiber is practically single-mode in a long length regime and has a large anomalous dispersion.

Ballroom B

OMM • Optical Performance Monitoring—Continued

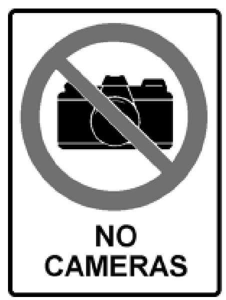
OMM5 • 5:15 p.m. Invited
Asynchronous Sampling for Optical Performance Monitoring, *Sarah D. Dods, Trevor B. Anderson, Ken Clarke, Masudazzaman Bakaul, Adam Kowalczyk; Natl. ICT Australia Ltd, Australia.* We present two novel performance monitoring techniques for optically switched networks, based on asynchronous multi-tap sampling. We show that multiple simultaneous impairments can be separated and quantified by a single monitor.



Ballroom C

OMN • Doped Amplifiers and their Dynamics—Continued

OMN5 • 5:15 p.m. Invited
High Power Mid-IR Fiber Lasers and Amplifiers, *Ravi Jain; Univ. of New Mexico, USA.* Abstract not available.



Ballroom D

OMO • OCDMA—Continued

OMO6 • 5:15 p.m.
Variable Bit Rate Optical CDMA Networks Using Multiple Pulse Position Modulation, *Vahidreza R. Arbab, Poorya Saghari, Narender M. Jayachandran, Alan E. Willner; Univ. of Southern California, USA.* We have demonstrated multiple-pulse position modulation to achieve a variable bit rate OCDMA system, operating at different bit rates of 2.5, 4.3, and 5.7 Gbps, with the identical pulse-width, encoders/decoders, and utilized bandwidth.

OMO7 • 5:30 p.m.
SPECTS O-CDMA 80.8-km BOSSNET Field Trial Using a Compact, Fully Integrated, AWG-Based Encoder/Decoder, *Vincent J. Hernandez[1], Ryan P. Scott[1], Nicolas K. Fontaine[1], Francisco M. Soares[1], Ronald Broeke[1], Kevin Perry[2], George Nowak[2], Chunxin Yang[1], Katsunari Okamoto[1], Jonathan P. Heritage[1], Brian H. Kolner[1], S. J. Ben Yoo[1]; [1]Univ. of California at Davis, USA, [2]MIT, Lincoln Lab, USA.* We demonstrate successful encoding and decoding of SPECTS O-CDMA signals using a compact, fully integrated, AWG-based encoder/decoder. The signal is recovered in the presence of an interferer after transmission across an 80.8-km BOSSNET link.

Ballroom E

OMP • System Implication of Modulation Formats—Continued

OMP5 • 5:15 p.m.
Comparison of Two Carrier Phase Estimation Schemes in Optical Coherent Detection Systems, *Yi Cai, Alexei N. Pilipetskii; Tyco Telecommunications, USA.* We compare the performance of two carrier-phase-estimation schemes, the decision-feedback and the Mth power schemes. We discuss the advantages and disadvantages of the two schemes in terms of performance limit, laser-linewidth tolerance, and polarization tracking.

OMP6 • 5:30 p.m. Invited
Coherent Receivers for Phase-Shift Keyed Transmission, *Christoph Wree, Don Becker, Dan Mohr, Abhay Joshi; Discovery Semiconductors, Inc., USA.* We review coherent receiver implementations and their performance for phase-shift keyed transmission. Experimental results of a heterodyne receiver for 10 Gb/s DPSK is presented.

OMQ • Fiber Optic Sensors
Joseph Friebele; NRL, USA, —Continued

OMQ5 • 5:15 p.m.
Long-Distance and Quasi-Distributed FBG Sensor System Using a SOA Based Ring Cavity Scheme, *H.Y. Fu, H.L. Liu, H.Y. Tam, P.K.A. Wai, C. Lu; Hong Kong Polytechnic Univ., Hong Kong.* A simple long-distance and quasi-distributed FBG sensor system using a pulsed SOA is investigated. In the proposed system, OSNR greater than 20 dB from 6 FBGs quasi-distributed along a 40-km fiber was achieved.

OMQ6 • 5:30 p.m. Invited
Microfiber Photonics, *Misha Sumetsky; OFS Labs, USA.* This paper reviews recent progress in understanding the transmission properties of microfiber and nanofiber waveguides and tapers. Prospects for optical microfiber devices are also discussed.

OMR • Ultra-Short Reach Interconnects—Continued

OMR5 • 5:30 p.m.
40Gbps Links Using Plastic Optical Fiber, *Arup Polley, Rohan J. Gandhi, Stephen E. Ralph; Georgia Tech, USA.* We demonstrate that plastic optical fiber can support 40Gbps for short link lengths ~200m via DMD and impulse measurements. We report BER and eye measurements for 10, 20 and 30Gbps links confirming the DMD results.

OMS • Optical Sources—Continued

OMS6 • 5:15 p.m.
10-Gbps DWDM Transmission Using Multi-Frequency Light Source with 50-GHz Channel Spacing, *Takahiro Hoshi, Tatsutoshi Shioda, Yosuke Tanaka, Takashi Kurokawa; Graduate School of Technology, Tokyo Univ. of Agriculture and Technology, Japan.* A multi-frequency light source with 50-GHz channel spacing was constructed based on optical frequency comb generation. The error-free 10-Gbps WDM transmission over 100-km was successfully achieved using the multi-frequency light source.

OMS7 • 5:30 p.m.
Stabilized Optical Frequency Comb Source for Coherent Communication and Signal Processing, *Franklyn J. Quinlan, Sangyoun Gee, Sarper Ozharar, Peter J. Delfyett; CREOL, College of Optics and Photonics, Univ. of Central Florida, USA.* A semiconductor based, low noise mode-locked laser with 195 10.24 GHz spaced stabilized optical frequencies and a pulse timing jitter (1 Hz -100 MHz) of 11.4 fs for optical communication applications is demonstrated.

OML • Photonic Bandgap Fibers—Continued

OML8 • 5:45 p.m.
Silica Bridge Impact on Hollow-Core Bragg Fiber Transmission Properties, *Federica Poli[1], Matteo Foroni[1], Daniele Giovanelli[1], Annamaria Cucinotta[1], Stefano Selleri[1], Jesper Bo Jensen[2], Jesper Lægsgaard[2], Anders Bjarklev[2], Guillaume Vienne[3], Christian Jakobsen[4], Jes Broeng[4]; [1]Univ. of Parma, Italy, [2]COM•DTU, Technical Univ. of Denmark, Denmark, [3]Zhejiang Univ., Dept. of Optical Engineering, China, [4]Crystal Fibre A/S, Denmark.* The silica bridges impact on the hollow-core Bragg fiber guiding properties is investigated. Results demonstrate that silica nanosupports are responsible for the surface mode presence, which causes the peaks experimentally measured in the transmission spectrum.

OMO • OCDMA—Continued

OMO8 • 5:45 p.m.
Optical Approach to Avionic Platforms Based on OCDMA, *Ivan Glesk[1], Yue-Kai Huang[1], Camille-Sophie Bres[1], Paul R. Prucnal[1], Thomas H. Curtis[2], Wing C. Kwong[3]; [1]Princeton Univ., USA, [2]Kambrook Technical Associates, USA, [3]Hofstra Univ., USA.* We built scalable OCDMA platform under DARPA contract and delivered to Lockheed-Martin for additional testing. Demonstrated platform enables secure communications among users using an optical XOR gate at OC-24 with 10^{-12} or better raw BER.

OMR • Ultra-Short Reach Interconnects—Continued

OMR6 • 5:45 p.m.

High-Capacity Data Transport via Large-Core Plastic Optical Fiber Links Using Quadrature Amplitude Modulation, *A. M. J. Koonen, J. Yang, M. S. Alfiad, X. Li, H. P. A. van den Boom; COBRA Inst., Eindhoven Univ. of Technology, Netherlands.* Low-cost QAM chip sets enable high-capacity data transport over highly-dispersive POF links. The feasibility of QAM-64 and -256 system implementation options is shown. Wavelength-sliced QAM-64 performs the best regarding bandwidth consumption and link power budget.

OMS • Optical Sources—Continued

OMS8 • 5:45 p.m.

22-Channel Detuning Capacity of a Side-Mode Injection Locked FPLD for Directly Modulated 2.5Gbit/s DWDM-PON, *Yu-Sheng Liao[1], Gong-Ru Lin[2]; [1]Dept. of Photonics and Inst. of Electro-Optical Engineering, Natl. Chiao Tung Univ., Taiwan, [2]Natl. Taiwan Univ., Taiwan.* 22-channel detuning capacity of a 2.5Gbit/s directly modulated FPLD under side-mode injection-locking for DWDM-PON is demonstrated with SMSR >35dB, Q-factor 6.8-9.2, locking range of 24nm, power penalty of -0.7dB, and BER of 10^{-10} at -17dBm.