

# OFC/NFOEC 2008 Archive

**Technical Conference: February 24-28, 2008**

**Exposition: February 26-28, 2008**

**San Diego Convention Center, San Diego, California, USA**

As the world's largest conference in optical communications, **The Optical Fiber Communication Conference and Exposition (OFC)** and **The National Fiber Optic Engineers Conference (NFOEC)** is always a strong indicator of the trends in communications. For the 2008 show, the conference saw an 18% increase in paper submissions and the third highest number of submissions ever in its 33-year history, demonstrating a strong investment in the field and in technical R&D.

The 600 companies represented at the conference this year emphasized this renewed growth in optical communications. From systems companies like Cisco, Huawei, Nortel, Nokia Siemens and others to components leaders and service providers, OFC/NFOEC has always covered the entire scope of the field. The conference exhibition is a global "who's who" of optical communications.

This year the show was exploding with new technological innovations, products and services to move into next-generation networks. With nearly 12,000 attendees from all over the globe, including more than 800 paper presentations and 170 sessions, OFC/NFOEC is once again the world's largest and most prestigious optical communications event.

Following such a strong year, the 2009 show will only be more exciting. Mark your calendars for next year's show, March 22-26, 2009, back in San Diego.

For access to full conference papers please visit [Optics InfoBase](#) and [IEEE Xplore](#).

## 2008 OFC/NFOEC Technical Program

For access to full conference papers please visit [Optics InfoBase](#) and [IEEE Xplore](#).

### OFC and NFOEC Abstracts

[Monday, February 25, 2008](#)

[Tuesday, February 26, 2008](#)

[Wednesday, February 27, 2008](#)

[Thursday, February 28, 2008](#)

[Postdeadline Abstracts](#)

**Agenda of Sessions and Key to Authors and Presiders**

[Agenda of Sessions](#)

[Key to Authors and Presiders](#)

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## **Category 10. Access Solutions, Demonstrations and Non-Telecom Applications**

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# 2008 Invited Speakers

## Category 1. Fibers and Optical Propagation Effects

**OMH4, Ultra-Long Haul Fiber Transmission Technologies and Techniques**, *Morten Nissov; Tyco Telecommunications, USA*. Monday, 2:15 p.m.–2:45 p.m.

**OMP1, Highly Nonlinear Fibers for Ultrahigh-Speed Optical Signal Processing**, *Fumio Futami; Fujitsu Labs Ltd., Japan*. Monday, 4:00 p.m.–4:30 p.m.

**OMP6, Photonic Crystal Fibers for Nonlinear Signal Processing**, *K. K. Chow; Graduate School of Frontier Sciences, Univ. of Tokyo, Japan*. Monday, 5:30 p.m.–6:00 p.m.

**OTuB1, High-Power Pulse Propagation in Optical Fibers**, *G. Ronald Hadley; Sandia Natl. Labs, USA*. Tuesday, 2:00 p.m.–2:30 p.m.

**OTuJ1, Erbium Doped AirClad Fibers for High-Power Broad Band Amplifiers and Single Mode Erbium Doped Fibers for High Performance Amplifiers and Lasers**, *Bera Pálsdóttir; OFS Fitel, Denmark*. Tuesday, 4:30 p.m.–5:00 p.m.

**OTuJ6, High-Power Large-Mode Area Optical Fibers for Fiber Lasers and Amplifiers**, *Bryce Samson; Nufern, USA*. Tuesday, 6:00 p.m.–6:30 p.m.

**OWG5, 40-Gb/s in Plastic Optical Fiber**, *Stephen E. Ralph; Georgia Tech, USA*. Wednesday, 2:00 p.m.–2:30 p.m.

**OWO3, Powering Next Generation Networks by Laser Light over Fiber**, *Jan-Gustav Werthen; JDSU, USA*. Wednesday, 4:00 p.m.–4:30 p.m.

**OThR3, Photonic Bandgap Fiber for New Wavelength Range**, *Satoki Kawanishi; NTT Basic Res. Labs, Japan*. Thursday, 4:00 p.m.–4:30 p.m.

## Category 2. Amplifiers and Lasers: Fiber or Waveguide

**OML7, All-Optical Polarization Control through Brillouin Amplification**, *Luc Thevenaz; EPFL Swiss Federal Inst. of Technology, Switzerland*. Monday, 3:00 p.m.–3:30 p.m.

**OTuN1, SOA in WDM Communication Links**, *Steve Grubb; Infinera, USA*. Tuesday, 4:30 p.m.–5:00 p.m.

**OTuN2, Advances in Amplification Technology for the Agile Optical Network**, *Gregory J. Cowle; JDSU, USA*. Tuesday, 5:00 p.m.–5:30 p.m.

**OWM1, Integrated Hybrid Lasers and Amplifiers on a Silicon Platform**, *Richard Jones; Intel Corp., USA*. Wednesday, 1:00 p.m.–1:30 p.m.

**OWU4, Cladding-Pumped EDFAs: Yb Free or Co-Doped**, *John D. Minelly; Aculight Corp., USA*. Wednesday, 5:00 p.m.–5:30 p.m.

**OThF3, Fiber Lasers for Frequency Standards in Optical Communications**, *Nathan R. Newbury; NIST, USA*. Thursday, 8:30 a.m.–9:00 a.m.

**OThF6, Fiber Lasers for Secure Key Distribution**, *Jacob Scheuer; Tel-Aviv Univ., Israel*. Thursday, 9:30 a.m.–10:00 a.m.

**OThN3, Ultra-Small Photonic Crystal Lasers Near Communication Wavelength**, *Yong-Hee Lee; KAIST, Republic of Korea*. Thursday, 1:30 p.m.–2:00 p.m.

**OThN6, Stabilized Optical Frequency Combs from Diode Lasers--Applications in Optical Communications, Signal Processing and Instrumentation**, *Peter J. Delfyett; School of Optics/CREOL, Univ. of Central Florida, USA*. Thursday, 2:30 p.m.–3:00 p.m.

### **Category 3. Signal Measurement Distortion Compensation Devices and Sensors**

**OMT3, Bend and Twist Sensing in a Multiple-Core Optical Fiber**, *Charles G. Askins; NRL, USA*. Monday, 4:30 p.m.–5:00 p.m.

**OTuK2, Photonic Crystal Waveguide-Based Biosensor**, *Nina Skivesen; iNANO and Dept. of Physics and Astronomy, Univ. of Aarhus, Denmark*. Tuesday, 5:30 p.m.–6:00 p.m.

**OWD1, Grating Enhanced Continuum Generation**, *Paul S. Westbrook; OFS Labs, USA*. Wednesday, 8:00 a.m.–8:30 a.m.

**OWD6, Slow Light Generation Using Fibre Bragg Gratings**, *Joe T. Mok; ARC Ctr. of Excellence for Ultrahigh-Bandwidth Devices for Optical Systems, Univ. of Sydney, Australia*. Wednesday, 9:30 a.m.–10:00 a.m.

**OWP1, Tunable Dispersion Compensation Using Parametric Processes**, *Shu Namiki; Natl. Inst. of Advanced Industrial Science and Technology, Japan*. Wednesday, 3:30 p.m.–4:00 p.m.

**OWP2, Mid-Span Dispersion Compensation via Optical Phase Conjugation in Silicon Waveguides**, *Haisheng Rong; Intel Corp., USA*. Wednesday, 4:00 p.m.–4:30 p.m.

**OWP3, Dispersion Trimming Using a Liquid Crystal on Silicon Based Wavelength Selective Switch**, *Michael A. F. Roelens; Univ. of Sydney, Australia*. Wednesday, 4:30 p.m.–5:00 p.m.



**OWP4, Channel-by-Channel Tunable Optical Dispersion Compensator Consisting of Arrayed-Waveguide Grating and Liquid Crystal on Silicon**, *Kenya Suzuki; NTT Corp., Japan*. Wednesday, 5:00 p.m.–5:30 p.m.

**OThV1, Interferometric Synthetic Aperture Microscopy**, *Stephen A. Boppart; Beckman Inst. for Advanced Science and Technology, Univ. of Illinois at Urbana-Champaign, USA*. Thursday, 3:30 p.m.–4:00 p.m.

**OThV4, Direct Femtosecond Laser Writing of 3-D Waveguides and Gratings for Optical Communications**, *Peter Herman; Univ. of Toronto, Canada*. Thursday, 4:30 p.m.–5:00 p.m.

#### **Category 4. Switching Wavelength-Selective Filtering and Routing Devices**

**OMJ3, Electro-Optic Polymer Waveguide Devices for Telecommunications Applications**, *Robert Norwood; Univ. of Arizona, USA*. Monday, 2:00 p.m.–2:30 p.m.

**OTuF1, Concepts and Constraints of Plasmonic Waveguides Operating from the Visible to the THz Regime**, *Stefan A. Maier; Imperial College London, UK*. Tuesday, 2:00 p.m.–2:30 p.m.

**OTuF4, Hitless-Reconfigurable and Bandwidth-Scalable Silicon Photonic Circuits for Telecom and Interconnect Applications**, *Miloš A. Popović; MIT, USA*. Tuesday, 3:00 p.m.–3:30 p.m.

**OWC1, WSS Switching Engine Technologies**, *Pierre Wall; JDSU, Canada*. Wednesday, 8:00 a.m.–8:30 a.m.

**OWC4, Reprogrammable Optical Phased Array Switching**, *David Plant; McGill Univ., Canada*. Wednesday, 9:00 a.m.–9:30 a.m.

**OWI3, Hybrid Integration Technology for High Functionality Devices in Optical Communications**, *Graeme Maxwell; CIP Ltd., UK*. Wednesday, 1:30 p.m.–2:00 p.m.

**OThE3, Integrated Photonic Devices for OCDMA Using Silica Planar Lightwave Circuit Technology**, *Koichi Takiguchi; NTT Photonics Labs, NTT Corp., Japan*. Thursday, 8:30 a.m.–9:00 a.m.

**OThE4, PLZT Waveguide Devices for High Speed Switching and Filtering**, *Keiichi Nashimoto; EpiPhotonics Inc., USA*. Thursday, 9:00 a.m.–9:30 a.m.

## Category 5. Optoelectronic Devices

OMK4, **Geiger-Mode APD Single Photon Detectors**, *Mark A. Itzler; Princeton Lightwave Inc., USA*. Monday, 2:15 p.m.–2:45 p.m.

OMS1, **Photoreceivers from 40 Gbit/s to 100 Gigabit Ethernet**, *Andreas Umbach; u2t Photonics AG, Germany*. Monday, 4:00 p.m.–4:30 p.m.

OMS3, **Terahertz Transmitters and Receivers**, *Bernd Sartorius; Fraunhofer Heinrich-Hertz-Inst., Germany*. Monday, 5:30 p.m.–6:00 p.m.

OWQ1, **High-Performance Photonics on Silicon**, *Michal Lipson; Cornell Univ., USA*. Wednesday, 3:30 p.m.–4:00 p.m.

OWQ2, **Microresonators for Photonic Integrated Circuits**, *P. Daniel Dapkus; Univ. of Southern California, USA*. Wednesday, 4:00 p.m.–4:30 p.m.

OThC3, **Compact 111-Gbit/s Integrated RZ-DQPSK Modulator Using Hybrid Assembly Technique with Silica-Based PLCs and LiNbO<sub>3</sub> Devices**, *Takashi Yamada; NTT Photonics Labs, NTT Corp., Japan*. Thursday, 8:30 a.m.–9:00 a.m.

OThK3, **High-Speed Modulation of Optical Injection-Locked Semiconductor Lasers**, *Ming Wu; Univ. of California at Berkeley, USA*. Thursday, 1:30 p.m.–2:00 p.m.

OThK6, **Uncooled Electroabsorption Modulator Integrated DFB Laser**, *Shigeki Makino; Hitachi Ltd., Japan*. Thursday, 2:30 p.m.–3:00 p.m.

OThS4, **Chip-to-Chip Board-Level Optical Data Buses**, *Fuad E. Doany; IBM T. J. Watson Res. Ctr., USA, 2IBM Res. GmbH, Switzerland*. Thursday, 4:15 p.m.–4:45 p.m.

OThS5, **High-Speed 1.1- $\mu$ m-Range InGaAs VCSELs**, *Takayoshi Anan; Nanoelectronics Res. Labs, NEC Corp., Japan*. Thursday, 4:45 p.m.–5:15 p.m.

## Category 6. Digital Transmission Systems

OMI1, **Advanced Modulation Formats for Transmission Systems**, *Torger Tøkle<sup>1,2</sup>; ICOM•DTU, Technical Univ. of Denmark, Denmark, 2OFS Fitel Denmark, Denmark*. Monday, 1:30 p.m.–2:00 p.m.

OMI4, **Advanced Multi-Level Transmission Systems**, *Kenro Sekine; Hitachi Communications Technologies Ltd., Japan*. Monday, 2:30 p.m.–2:45 p.m.

**OMQ1, DQPSK Modulation for Robust Optical Transmission**, *Dirk van den Borne; Eindhoven Univ. of Technology, Netherlands.* Monday, 4:00 p.m.–4:30 p.m.

**OTuM1, Coherent Detection in Long-Haul Transmission Systems**, *Yi Cai; Tyco Telecommunications, USA.* Tuesday, 4:30 p.m.–5:00 p.m.

**OTuM6, Coherent Based Systems for High Capacity WDM Transmissions**, *Jérémie Renaudier; Alcatel-Lucent, France.* Tuesday, 6:00 p.m.–6:30 p.m.

**OWJ1, Long-Distance Quantum Key Distribution in Optical Fiber**, *Jane E. Nordholt; Los Alamos Natl. Lab, USA.* Wednesday, 1:00 p.m.–1:30 p.m.

**OWJ4, Free-Space Decoy-State Quantum Key Distribution**, *Harald Weinfurter<sup>1,2</sup>; <sup>1</sup>Ludwig Maximilians Univ., Germany, <sup>2</sup>Max Planck Inst. for Quantum Optics, Germany.* Wednesday, 2:00 p.m.–2:30 p.m.

**OWR2, High-Speed Transmission over Multimode Optical Fibers**, *Sebastian Randel; Corporate Technology, Information and Communications, Siemens AG, Germany.* Wednesday, 4:30 p.m.–5:00 p.m.

## **Category 7. Transmission Subsystems and Network Elements**

**OMU3, Optical OFDM--A Candidate for Future Long-Haul Optical Transmission Systems**, *Sander L. Jansen; KDDI R&D Labs, Japan.* Monday, 4:30 p.m.–5:00 p.m.

**OTuO3, Digital Signal Processing Options in Long Haul Transmission**, *Seb J. Savory; Univ. College London, UK.* Tuesday, 5:00 p.m.–5:30 p.m.

**OWL1, WDM-Colored Packet Switching**, *Naoya Wada; Natl. Inst. of Information and Communications Technology (NICT), Japan.* Wednesday, 1:00 p.m.–1:30 p.m.

**OWT3, A 10.7-Gb/s DPSK Receiver with 4000-ps/nm Dispersion Tolerance Using a Shortened MZDI and 4-State MLSE**, *Mohammad S. Alfiad; Eindhoven Univ. of Technology, Netherlands.* Wednesday, 4:00 p.m.–4:30 p.m.

**OThO1, Iterative Equalization and FEC Decoding in Optical Communication Systems: Concepts and Performance**, *Wolfgang Sauer-Greff; Univ. of Kaiserslautern, Germany.* Thursday, 1:00 p.m.–1:30 p.m.

**OThO4, FEC Operation in Combination with Electronic Dispersion Compensation**, *Julien Poirrier; Orange Labs, France.* Thursday, 2:00 p.m.–2:30 p.m.

**OThW5, Monitoring and Diagnostics of Power Anomalies in Transparent Optical Networks**, *Tin Kam Ho; Bell Labs, Alcatel-Lucent, USA.* Thursday, 4:30 p.m.–5:00 p.m.

## Category 8. Optical Processing and Analog Subsystems

**OMN1, All-Optical Clock Recovery with Retiming and Reshaping Using a Silicon Evanescent Mode Locked Ring Laser**, *Brian R. Koch; Univ. of California at Santa Barbara, USA*. Monday, 1:30 p.m.–2:00 p.m.

**OMN6, Next Generation Photonics for Boeing Commercial Airplanes**, *Kien Truong; Boeing Commercial Airplanes (BCA), USA*. Monday, 3:00 p.m.–3:30 p.m.

**OTuD7, All-Optical Signal Processing Using Specialty Fibers**, *Ju Han Lee; Univ. of Seoul, Republic of Korea*. Tuesday, 3:30 p.m.–4:00 p.m.

**OTuL5, Bit Rate Transparent Optical Burst Switching with Contention Resolving Wavelength Conversion**, *Abdullah Al Amin; Univ. of Tokyo, Japan*. Tuesday, 5:30 p.m.–6:00 p.m.

**OWK3, Multiwavelength All-Optical Regeneration**, *Michael Vasilyev; Univ. of Texas at Arlington, USA*. Wednesday, 1:30 p.m.–2:00 p.m.

**OWS1, Long Distance Transmission Using Optical Regeneration**, *Jean-Claude Simon; Univ. de Rennes, France*. Wednesday, 3:30 p.m.–4:00 p.m.

**OWS6, Photonic Network R&D Activities in Japan**, *Kazuo Hagimoto; NTT Network Innovation Labs, Japan*. Wednesday, 5:00 p.m.–5:30 p.m.

**OThP3, Perspectives of Radio-over-Fiber Technologies**, *A. M. J. Koonen; COBRA Inst., Eindhoven Univ. of Technology, Netherlands*. Thursday, 1:30 p.m.–2:00 p.m.

**OThP6, Fiber Distribution of Local Oscillator for Atacama Large Millimeter Array**, *William Shillue; Natl. Radio Astronomy Observatory, USA*. Thursday, 2:30 p.m.–3:00 p.m.

## Category 9. Networks

**OTuA1, Advance Reservation-Based Network Resource Manger for Optical Networks**, *Michiaki Hayashi; KDDI R&D Labs Inc., Japan*. Tuesday, 2:00 p.m.–2:30 p.m.

**OTuI7, Development of Broadband Convergence Network and Services in Korea**, *Minho Kang; Information and Communications Univ., Republic of Korea*. Tuesday, 6:00 p.m.–6:30 p.m.

**OWA1, Physical Impairments in All-Optical Networks**, *Maurice Gagnaire; Ecole Natl. Supérieure des Télécommunications, France*. Wednesday, 8:00 a.m.–8:30 a.m.

**OWF1, Distributed Computing over Optical Networks**, *Wei Guo; Shanghai Jiao Tong Univ., China*. Wednesday, 1:00 p.m.–1:30 p.m.

**OWF5, A Grid-Enabled Control Plane Architecture: The PHOSPHORUS Approach**, *Dimitra Simeonidou; Univ. of Essex, UK*. Wednesday, 2:15 p.m.–2:45 p.m.

**OThB1, 100G and DWDM: Application Climate, Network and Service Architecture**, *Donald C. Lee; Facebook Inc., USA*. Thursday, 8:00 a.m.–8:30 a.m.

**OThI1, Power Stability and Control in Optically Transparent Mesh Networks**, *Christopher A. White; Bell Labs, Alcatel-Lucent, USA*. Thursday, 1:00 p.m.–1:30 p.m.

**OThI2, Quartzite: An Experimental Campus Testbed Involving Wavelength and Wavelength Interleaved Services**, *Philip Papadopoulos; Univ. of California at San Diego, USA*. Thursday, 1:30 p.m.–2:00 p.m.

**OThQ1, Core Network Design and Planning: Challenges and Technology Trend**, *Shinya Nakamura; NEC Corp. of America, USA*. Thursday, 3:30 p.m.–4:00 p.m.

## **Category 10. Access Solutions, Demonstrations and Non-Telecom Applications**

**OTuP2, Quantum Key Distribution Integrated into Commercial WDM Systems**, *Harald Rohde; Nokia Siemens Networks GmbH & Co. KG, Germany*. Tuesday, 5:30 p.m.–6:00 p.m.

**OWB1, Polymer Optical Fibers for Short, Shorter and Shortest Data Links**, *Olaf Ziemann; Polymer Optical Fiber Application Ctr., Univ. of Applied Sciences Nürnberg, Germany*. Wednesday, 8:00 a.m.–8:30 a.m.

**OWH1, Next Generation PON in Emerging Networks**, *Rujian Lin; Shanghai Univ., China*. Wednesday, 1:00 p.m.–1:30 p.m.

**OThD1, Super Broadband Optical Wireless Access Technologies**, *Gee-Kung Chang; Georgia Tech, USA*. Thursday, 8:00 a.m.–8:30 a.m.

**OThL2, Scalable Extended Reach PON**, *Jose A. Lázaro; Univ. Politècnica de Catalunya (UPC), Spain*. Thursday, 2:00 p.m.–2:30 p.m.

**OThT1, Cable Networks: End to End**, *Victor Blake; NewHouse Comm, USA*. Thursday, 3:30 p.m.–4:00 p.m.

## **NFOEC A. Optical Networks and Services**

NMC1, **AT&T's Photonic Network**, *Kathy Tse; AT&T, USA*. Monday, 1:30 p.m.–2:10 p.m.

NME2, **Building Agile Optical Networks**, *Serge Melle; Infinera, USA*. Monday, 4:20 p.m.–5:00 p.m.

NTuD5, **The Optimized Architecture for Transition to All Packet Transport**, *Jin-Yi Pan; Nokia Siemens Networks, China*. Tuesday, 5:50 p.m.–6:30 p.m.

NWD1, **Peeling the Reliability Onion: Telecommunications Services Reliability**, *Bruce Linick; AT&T, USA*. Wednesday, 1:00 p.m.–1:40 p.m.

NThB5, **Optical Testing for Passive Optical Networks**, *Walt Soto; iPON Systems, USA*. Thursday, 9:20 a.m.–10:00 a.m.

## **NFOEC B. Network Technologies**

NMD1, **Technological Challenges to G-PON Operation**, *Rich Baca; Tellabs Inc., USA*. Monday, 4:00 p.m.–4:40 p.m.

NMD3, **Challenges and Solutions for 10Gbps PON**, *Robert Lingle, Jr.; OFS Fitel Norcross, USA*. Monday, 5:00 p.m.–5:40 p.m.

NTuB1, **Technologies for 40Gb/s and 100 Gb/s Transmission**, *Hideo Kuwahara; Fujitsu Labs Ltd., Japan*. Tuesday, 2:00 p.m.–2:40 p.m.

NTuB3, **Multi-Rate (100G/40G/10G) Transport over Deployed Optical Networks**, *Torsten Wuth; Siemens, Germany*. Tuesday, 3:00 p.m.–3:40 p.m.

NTuC1, **Hybrid SOA-Raman Amplifiers for Fiber-to-the-Home and Metro Networks**, *Patrick P. Iannone; AT&T Labs, USA*. Tuesday, 4:30 p.m.–5:10 p.m.

NWA1, **Network Element Security in Optical Communications Equipment**, *Michael Freiburger; Verizon, USA*. Wednesday, 8:00 a.m.–8:40 a.m.

NWE2, **Evolution to Colorless and Directionless ROADM Architectures**, *Peter Roorda; JDSU, Canada*. Wednesday, 3:50 p.m.–4:30 p.m.

NThA4, **Silicon Photonics: A Low Cost Integration Platform for Datacom and Telecom Applications**, *Mehdi Asghari; KOTURA, Inc., USA*. Thursday, 9:00 a.m.–9:40 a.m.

NThE1, **Practical Solutions for PMD Compensation in Next Generation ROADM Based 40G Metropolitan Networks**, *Christian J. Rasmussen; Mintera Corp., USA*. Thursday, 3:30 p.m.–4:10 p.m.

## 2008 Market Watch

**Tuesday, February 26 - Thursday, February 28, 2008**  
**OFC/NFOEC Exhibit Floor Theater**

This three-day series of panel sessions engage the applications and business communities in the field of optical communications. Presentations and panel discussions feature esteemed guest speakers from industry, research, and the investment community.

**The program will be located on the exhibit floor, so attendees can easily attend the sessions and tour the exhibit hall. Audience members are encouraged to participate in the question and answer segments that follow the presentations.**

### **Market Watch Organizers:**

Christoph Pfistner, *NeoPhotonics, USA*

Karen Liu, *Ovum RHK Inc., USA*

### **Schedule-at-a-Glance**

#### **Tuesday, February 26**

12:00 p.m. - 2:00 p.m.      **Panel I: Business and Management Insights**

Moderator: Milton Chang, *Incubic, USA*

3:00 p.m. - 5:00 p.m.      **Panel II: Packet-Optical Migration Strategies**

Moderator: Ron Kline, *Ovum-RHK, USA*

#### **Wednesday, February 27**

2:00 p.m. - 4:00 p.m.      **Panel III: Enterprise: Will the Next Speed Jump Bring a Boost for Optical?**

Moderator: Robert Zona, *Intel, USA*

## Thursday, February 28

8:30 a.m. - 10:30 a.m.

### **Panel IV: State of the Optical Industry: Achievements, Challenges and Path to Profitability**

Moderator: Myo Ohn, *Avanex, USA*

11:00 a.m. - 1:00 p.m.

### **Panel V: From 10G to 40G to 100G to ...?: What's Happening in the Fast-Moving World of High-Speed Components and Systems?**

Moderator: Niall Robinson, *Mintera Corp., USA*

1:30 p.m. - 3:30 p.m.

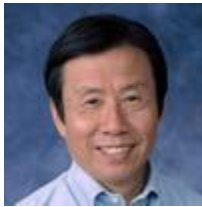
### **Panel VI: Reconfigurable Optical Networks: Beyond Core ROADMs?**

Moderator: Paul Bonenfant, *Morgan Keegan & Co., USA*

## Tuesday, February 26

12:00 p.m. - 2:00 p.m.

### **Panel I: Business and Management Insights**



**Moderator:** Milton Chang, *Incubic Venture Fund, USA*

Resurgence in the core network opportunities, as well as the continuing growth of broadband access has stirred the optical value chain in the past year. This session features leaders in key segments of our industry to address a spectrum of issues that are at the *intersection* of business and technology. The session kicks off by George Kelly who until recently was Managing Director of Morgan Stanley responsible for research by providing a financial context. Peter Bordui who has experience in managing a wide range of companies in photonics material and components will cover the components business, and Stu Elby who has been involved in a broad range of companies in the applications of photonics will describe the trends of the communications industry. The speakers will address audience questions after the speeches.

### **Panel I Speakers:**



**Will Wall Street Ever Love Telecom's Optical Stocks Again?** George Kelly, *Financial Consulting, Communications Equipment Industry, USA*

George Kelly is best known one of Wall Street's top research analysts. While at Morgan Stanley for 23 years he was involved in over 30 communications equipment IPOs including Cisco, Broadcom, Lucent, Alcatel, Ascend, Cascade, Sycamore and Redback. Last year he became an independent industry analyst advising companies on



strategic and capital raising matters.



**Fiber-Optic Components—Is This Any Way to Earn a Living?** Peter Bordui, *Chairman, Bookham Inc., USA*

Peter Bordui is Chairman of the Board of Bookham, Inc. He served as the company's interim President and CEO for much of 2007. He joined the Bookham board in 2004 following Bookham's acquisition of New Focus, Inc., on whose board he had served since 2001. Previously, he served as Vice President and General Manager of the Source Lasers business of JDS Uniphase and Vice President and General Manager of the Crystal Technology subsidiary of Siemens Corporation. Earlier in his career, he was active in research and development of optoelectronic materials and was awarded six patents in the field. He holds bachelor's, master's, and doctoral degrees from MIT's Department of Materials Science and Engineering.



**The Role of Technology in Business Transformation,** Stuart Elby, *Vice President, Network Architecture, Verizon, USA*

Dr. Stuart Elby is the Vice President of Network Architecture responsible for setting Verizon Telecomm and Verizon Business' network architecture vision encompassing broadband access, optical transport, fast packet and Ethernet switching, IP/MPLS routing, and emerging voice over IP and video technologies. Stuart is also responsible for defining service specific architectures to support product line marketing, specifying network element requirements, coordinating Verizon's Standards activities, and leading collaborative R&D activities with universities and industry partners. He has previously held several positions in Verizon including network platform testing, and technical support of product development and sales. Dr. Elby received a BS degree in Optical Engineering from the University of Rochester, NY, in 1982 and received a MSEE, MPhil, and PhD from Columbia University in 1989, 1992, and 1994, respectively. He lives in New Jersey with his wife and three children.

**3:00 p.m. - 5:00 p.m.**

## **Panel II: Packet-Optical Migration Strategies**



**Moderator:** Ron Kline, *Research Director, Optical Networks - Ovum RHK, USA*

As network operators transition their infrastructure to support IP-based services, the optical networking market is going through a radical transformation, with equipment vendors rushing to develop converged platforms that support both TDM and packet transport and services. The goal of this panel is to provide a view of network and equipment market evolution as the shift to packet

continues.

## Panel II Speakers:



**From Optical Transport Platform (OTP) to Packet Optical Platform (P-OTP): Challenges and Strategies**, Roman Egorov, *Distinguished Member of Technical Staff (DMTS), Verizon Labs, USA*

Roman Egorov is Distinguished Member of Technical Staff (DMTS) at Verizon Laboratories in Waltham, MA. He is member of Backbone Network Technologies group and is responsible for network design of Verizon's backbone DWDM network. Roman has joined Verizon Laboratories (former GTE Laboratories) in 1996. He holds master's degree in Computer Science from Boston University (1998) and master's degree in Computer Engineering from St. Petersburg Institute of Fine Mechanics and Optics (Russia, 1994). He is also currently working on his PhD in Computer Engineering at Boston University.



**Packet Optical Networking: Evolving the Metro Infrastructure**, Sam Lisle, *Director, Market Development, Fujitsu Network Communications, USA*

Sam Lisle is director of market development at Fujitsu, where he focuses on packet optical networking technology. Sam holds U.S. patents in optical networking and was instrumental in developing the Fujitsu FLASHWAVE® 4000 MSPP platforms. Sam holds a BSEE from the University of Iowa and an MSEE from Georgia Tech.



**IP over DWDM: Near Term and Long Term Goals and Opportunity**, Loukas Paraschis, *Technical Leader, Service Provider Group, Cisco Systems, USA*

Loukas Paraschis is Technical Leader in the Service Provider group at Cisco responsible for the next generation network architectures, where he has primarily worked on WDM transport, and multi-service metro and IP-over-WDM.



**The Benefits of Packet-Optical Integration**, Tom Rarick, *Senior Principal Engineer, Tellabs, USA*

Tom Rarick is a senior principal engineer in Tellabs' transport strategy and planning organization. In this role, his responsibilities include transport strategy, planning and business development. He has more than 20 years of telecommunications industry experience with specialties in transport, networking and systems engineering. Previously, Rarick led Tellabs systems engineering teams and advanced technology groups. He also served as Tellabs' representative to the Alliance for Telecommunications Industry Solutions. Prior to Tellabs, Rarick was a development

engineer at Rockwell International. He holds a Bachelor of Science degree in electrical engineering from the Milwaukee School of Engineering and a Master of Science degree in electrical engineering from Southern Methodist University.

**Wednesday, February 27**

**2:00 p.m. - 4:00 p.m.**

**Panel III: Enterprise: Will the Next Speed Jump Bring a Boost for Optical?**



**Moderator:** Robert Zona, *Marketing Director, Optical Platform Division, Intel Corp., USA*

A generational move to Infiniband DDR/QDR, FC 8G and 10G Ethernet in the datacenter is linked to ultrahigh speed services from both traditional and non-traditional service providers as well as enterprise in-house consumption. The high speed copper interconnect market has long been an elusive but tantalizing potential market for optical interconnect. Will this generation finally see a shift towards optical for shorter distances as the speeds and densities both go up?

**Panel III Speakers:**



**Data Center Volumes Enabling High Speed Growth,** Fariba Danesh, *Vice President and General Manager, Avago Technologies, USA*

Fariba Danesh is vice president and general manager of the Fiber Optic Products Division (FOPD) for Avago Technologies. FOPD is a leading manufacturer of Ethernet, Fibre Channel and SONET/SDH fiber optic transceivers and components. Danesh most recently served as executive vice president, operations at Maxtor Corporation. Preceding Maxtor, she was chief operating officer and senior vice president operations at Finisar Corporation, a technology leader in fiber optic subsystems and network performance test systems. She was also president and CEO of Genoa Corporation and has held senior operations and engineering executive roles at Sanmina-SCI, Seagate Technology and Conner Peripherals. Danesh holds a bachelor's degree in biochemical engineering from Santa Clara University.



**Computing Clusters in Overload: Why 100G Pipes Aren't Enough for Core-Rich Datacenters,** Donn Lee, *Network Architect, Facebook, Inc., USA*

Donn Lee is a Network Engineer at Facebook, one of the largest sites on the Internet today. His duties include designing networks, evaluating/deploying products, optimizing performance, and performing escalation troubleshooting. Previous to Facebook, Donn performed similar duties as a member of the Network Architecture Team at Google. While working as a Consulting Systems Engineer at Cisco Systems

(CCIE #3262) he worked on large global networks and wrote his book, Enhanced IP Services for Cisco Networks, that is published by Cisco Press.

**Title to Be Announced,** Tom Willis, *General Manager, Intel Connects Cable, Intel Corp., USA*



**As Speeds Go from 10Gb Today to 40Gb and 100Gb Tomorrow, Optics Are the Only Way to See into the Future,** Greg Scherer, *Vice President of Products, Neterion, USA*

Greg Scherer is the former CTO of Emulex and a technology industry veteran with nearly thirty years experience in engineering and business development. His diverse career includes contributions as both a technical team member and as a proven leader in bringing new products to market.



**Enterprise: Will the Next Speed Jump Bring a Boost for Optical?** Robert Schrage, *Head of Network Architecture and Standards, Reuters, USA*

Mr. Schrage has more than 20 years of experience working at Reuters and is employed as the head of the network architecture and standards division. He is experienced in all areas of networking and telecommunications, including architecture, design, R&D, and security for the distribution and collection of financial market data. For more than 15 years, Mr. Schrage has held a variety of positions developing products for delivery of financial data and applications on both public and private networks. He has also been responsible for the initiation and ongoing management of the global network architecture, leading Reuters in its use of emerging distribution technologies.

**Title to be Announced,** Tom Fawcett, *Director of Marketing, Transmission Modules, JDSU, USA*

Tom Fawcett is an 18 year veteran of the fiber optic industry. As director of Marketing at JDSU, Tom Fawcett is responsible for datacom, telecom and tunable transceivers and transponders.

Prior to JDSU, Fawcett worked at Agilent Technologies (now Avago Technologies) in the fiber optic product division where he held positions in strategic marketing and ultimately served as director of Marketing. He began his career in 1991 with AMP Incorporated (now Tyco Electronics) holding several positions in engineering, product management and marketing management for both passive and active optical products. Fawcett received a Bachelor's degree

in mechanical engineering from Clarkson University.



**The Need for Active Optical Cables in 10GbE Server Connectivity**, Jan Meise, *Director of Strategic Marketing, Finisar, France*

Jan Meise serves as the Director of Strategic Marketing for Finisar Corporation since 2006. Prior to this, he spent five years as the Director of International Sales also with Finisar. He has held various marketing management positions with Quicklogic and Future Electronics. Jan earned an MSEE from Technical University Braunschweig in Germany.

**Thursday, February 28**

**8:30 a.m. - 10:30 a.m.**

**Panel IV: State of the Optical Industry: Achievements, Challenges and Path to Profitability**



**Moderator:** Myo Ohn, *Director, Business Development, Avanex Corp., USA*

The telecom equipment market is growing again—spurred on by escalating bandwidth demands with strong fundamental drivers such as broadband uptake to internet video traffic. The telecom system space is in consolidation. However, the optical components sector still must transition to emerge as a healthy industry. This session will include representatives from the financial analyst, venture capital and vendor community to share their insight and views on what needs to happen and how the industry players can move towards their goal of margin and market expansion.

**Panel IV Speakers:**



**State of the Optical Industry: A Wall Street Perspective**, Paul Bonenfant, *Vice President, Equity Res., Morgan Keegan & Co., USA*

Paul A. Bonenfant ([paul.bonenfant@morgankeegan.com](mailto:paul.bonenfant@morgankeegan.com)) is a Vice President in Equity Research at Morgan Keegan & Co., a unit of Regions Bank, and is based in New York City. Prior to his move to Wall Street, Paul was Principal Network Architect at Mahi Networks, Chief Architect at Photuris, and a business development manager for mergers and acquisitions in Lucent's Optical Networking Group. Before joining Lucent, he led requirements and standards development for transport systems at Bell Communications Research (Bellcore, now Telcordia Technologies). Paul received both

his B.S. in engineering and applied science, and his M.S. in electrical engineering from the California Institute of Technology. He is a member of Eta Kappa Nu, Tau Beta Pi, a Senior Member of the IEEE, and serves on the Technical Program Committee for OFC/NFOEC.



**Optical Components and Subsystems: A View From Wall Street**, Todd Koffman, *Managing Director, Equity Res., Raymond James & Associates, USA*

Managing Director, Director of Telecommunications Equipment Research  
Telecommunications Equipment Todd Koffman joined the Raymond James Equity Research Department in June 1998, focusing on telecommunications and cable equipment. He has previously held analyst positions at Lehman Brothers, from 1996 to 1998, and Dean Witter Reynolds, from 1990 to 1996. Mr. Koffman also has experience as an RF electronics engineer with Raytheon and Grumman Aerospace. He holds a Bachelor of Science degree in physics from State University of New York and an M.B.A. from Adelphi University.

**A Macro View of the Optical Component Industry**, Andrew Schmitt, *General Partner, Nyquist Capital, USA*

Andrew Schmitt is general partner of Nyquist Capital, an organization of technology advisors and investors that manages capital for high net worth individuals. In his youth he operated bulletin board systems and helped develop the first remote control software for Windows 3.0. As a student he managed a group responsible for administrating the TCP/IP 'aka the internet' network for UC Santa Barbara at a time when it was unimportant enough for students to operate it. And he subsequently spent ten years at Vitesse Semiconductor.



**Market Realities and Investment Opportunities**, Shoa-kai Liu, *Senior Advisor, Rustic Canyon Partners, USA*

Shoa-Kai Liu joined the Rustic Canyon Partners' team on 2004 with 25 years of diverse technical and management experience in telecommunication networks and services, optical/IP networking, and semiconductor fields after served at MCI as the Director of Network Technology Development. From 1998 to 1999, he was the co-founder and VP of Market Development at Avanex.

**Changing Optical Networks: Impact on Components Segment**, Michael Howard, *Principal Analyst & Co-Founder, Infonetics Research, Inc., USA*  
With over 35 years of network industry experience, Michael is recognized worldwide as one of the industry's leading experts in emerging markets, service provider network market trends and user buying patterns. After graduating from UC Berkeley with a BS in Mathematics, he worked on operating systems and programming language compilers for Arpanet, which later became the Internet. He was the IT Director at Tymshare/Tymnet in the 1970s, where he created network accounting, and in 1978, he led the First Interstate Bank project that developed the world's first pre-Internet in-home banking system. He founded several data networking research firms in the 1980s, and co-founded Infonetics Research in 1990.

Michael focuses on IP routers, MPLS, multiservice ATM switches, metro Ethernet, and optical equipment and technologies from customer CPE through the metro to the core, as well as frame relay, ATM, private line, Internet, mobile backhaul, Ethernet and optical services that service providers offer their customers. He chairs program committees and speaks at industry events around the world, including the Broadband World Forum in Europe and Asia, Telecommunications webinars, Net Events, Carrier Ethernet World Congress, Telecom India, Next Gen WDM/Optical Conference and GLOBALCOMM, and is frequently quoted in trade and business publications such as Business Week, CNN Money, The Daily Deal, Forbes, Fortune, Investor's Business Daily, Light Reading, NetworkWorld, New York Times, Telecommunications and The Wall Street Journal. He is a consultant to startups, service providers, manufacturers, and the investment community, identifying new market opportunities, providing due diligence and advising on positioning, product development, business plans and M&A activity.

**11:00 a.m. - 1:00 p.m.**

**Panel V: From 10G to 40G to 100G to ...?: What's Happening in the Fast-Moving World of High-Speed Components and Systems?**



**Moderator:** Niall Robinson, *Vice President Product Marketing, Mintera Corp., USA*

This session will explore many angles of the high speed component and systems market, from component costs to system standards development. With forward thinkers in the industry now turning to the next transmission rate, 100G, when can we expect to see 100G interfaces in the intra-office and inter-office environments? And with optical researchers competing for the longest 100G modulation-format acronym to overcome transmission impairments, what's happening in the world of next-generation components, technologies and

systems?

## Panel V Speakers:



**Bandwidth Virtualization: Preparing the Network for 100 Gb and Beyond**, David

Welch, *Chief Marketing and Strategy Officer, Infinera, USA*

David Welch is a founder and Chief Marketing and Strategy Officer of Infinera, a leading supplier of optical transmission systems based on innovative Photonic Integrated Circuit (PIC) technology. He was previously CTO and VP of Corporate Development of SDL and JDS Uniphase. He was awarded the 1992 Adolph Lomb Award from OSA, the 1998 Engineering Achievement Award from LEOS, and the 1999 OSA Joseph Fraunhofer/Robert M. Burley Award. He is currently a Director at Large, OSA. Dr. Welch earned his BS degree in electrical engineering from the University of Delaware and his PhD in electrical engineering from Cornell University.



**Smaller Modules and Higher Bit Rates—The Evolution of the Transceiver Space**,

Dhruvad Trivedi, *Vice President and General Manager for Transmission Modules, JDSU, USA*

Dhruvad Trivedi is the Vice President and General Manager for Transmission Modules at JDSU. Prior to this position, he was the Senior Director of Corporate Development at JDSU. In the past, Dhruvad has held marketing and technical positions at multiple companies. He has a PhD in electrical engineering and an MBA in finance.



**PMD Components for 100G: Leverage from 40G and New Development for 100G**,

Dave Clark, *Vice President, Optical and Defense Products, Sierra Monolithics, Inc., USA*

With SMI since 2000, David now fulfills Product Line Management & Marketing responsibilities for their Optical Networking Product Line. He previously managed spaceborne computer product development for TRW, Redondo Beach, CA, and designed digital flight controls for Lear Astronics, Santa Monica, CA. David holds a BSEE from Ohio University.



**Innovation Frontier in High-Speed Opto-Electronics**, Hans-Jürgen Schmidtke, *Vice*

*President, Product and Market Management, Nokia Siemens Networks, USA*

Dr. Hans-Juergen Schmidtke manages Nokia Siemens Networks' IP Transport business unit in North America, which includes DWDM, Ethernet, Microwave, and mobile backhaul. Previously he held various product management positions at Siemens Communications. He studied physics at the University of Dusseldorf and at the Max-Planck Institute of Quantum Optics, and received his PhD from the University of



Wurzburg.



**[Transmission Systems for 40G and 100G Optical Transport](#)**, Trent Coroy, *Vice President of Business Development, Xtera Communications, USA*

Trent Coroy serves as Vice President of Business Development for Xtera Communications. As an independent consultant, Trent has provided technical, marketing and business development services in the fields of photonics and sensing since 1996. He has also held key positions with Lightcross (now Kotura) and Corning.



**100 Gb/s Ethernet Transport Technologies Enlarging the 10/40Gb/s Markets**,

Yutaka Miyamoto, *Electrical Engineer, NTT Network Innovation Labs, Japan*

Yutaka Miyamoto joined the NTT Corporation, NTT Transmission Systems Laboratories, Yokosuka, Japan in 1988, where he engaged in R&D on 10-Gb/s terrestrial optical transmission system using EDFA. Since 1997, he engaged in R&D of high-capacity WDM transport systems. He is now the group leader of photonic transmission systems research group of NTT Network Innovation Laboratories.



**Title to Be Announced**, Michael Howard, *Principal Analyst and Co-Founder, Optical, Routing, & Metro Ethernet, USA*

With over 35 years of network industry experience, Michael is recognized worldwide as one of the industry's leading experts in emerging markets, service provider network market trends, and user buying patterns. After graduating from UC Berkeley with a BS in Mathematics, he worked on operating systems and programming language compilers for Arpanet, which later became the Internet. He was the IT Director at Tymshare/Tymnet in the 1970s, where he created network accounting, and in 1978, he led the First Interstate Bank project that developed the world's first pre-Internet in-home banking system. He founded several data networking research firms in the 1980s, and co-founded Infonetics Research in 1990. Michael focuses on IP routers, MPLS, multiservice ATM switches, metro Ethernet, and optical equipment and technologies from customer CPE through the metro to the core, as well as frame relay, ATM, private line, Internet, mobile backhaul, Ethernet, and optical services that service providers offer their customers. He chairs program committees and speaks at industry events around the world, including the Broadband World Forum in Europe and Asia, Telecommunications webinars, Net Events, Carrier Ethernet World Congress, Telecom India, Next Gen WDM/Optical Conference, and GLOBALCOMM, and is frequently quoted in trade and business publications such as Business Week, CNN Money, The Daily Deal, Forbes, Fortune, Investor's Business Daily, Light Reading, NetworkWorld, New York Times, Telecommunications, and The Wall Street Journal. He is a consultant to startups, service providers, manufacturers, and the investment community, identifying new market opportunities, providing due diligence, and advising on positioning, product development, business plans, and M&A

activity.

**1:30 p.m. - 3:30 p.m.**

### **Panel VI: Reconfigurable Optical Networks: Beyond Core ROADMs?**



**Moderator:** Paul Bonenfant, *Vice President, Equity Res., Morgan Keegan & Co., USA*

By the time of this session, AT&T (led by the former SBC) and Verizon will likely have deployed several thousand reconfigurable optical ADMs (ROADMs) to upgrade their core and/or IOF networks; while ROADMs represent a successful technology, the ROADM business has provided a drag on margins for some equipment suppliers. This session will provide perspectives from established players to emerging start-ups on the market opportunity for “all-optical” products and the evolution of ROADMs—for example, is there a path to profitability? Will economics and engineering rules favor optical cross connects for ring inter-connection and mesh, or ROADMs for access networks? Or, will certain applications be served by OEO-based approaches? The session intends to consider perspectives across the supply chain from components to service providers.

#### **Panel VI Speakers:**



**Optimal Technology for ROADMs: PLC, Liquid Crystal or MEMS?** Krishna Bala, *CEO, Xtellus, USA*

Dr. Bala is a recognized innovator and leader in the optical networking industry. He is currently the CEO of Xtellus, a leading manufacturer of Wavelength-Selective-Switch Modules for optical networks. Previously, he was CTO and founder of Tellium which completed a very successful Nasdaq IPO in 2001 under his technical leadership. Dr. Bala's architecture work at Tellium revolutionized optical networks with the development of the world's first optical switch and advanced mesh networking software - a networking approach now adopted by carriers worldwide. Prior to Tellium, Dr. Bala was the lead architect for Bellcore's multiwavelength optical networking group. He completed his PhD in electrical engineering at Columbia University.



**Agile Optical Technologies for Next Generation Networks,** David Gudmundson, *President, Optical Communications Product Group, JDSU, USA*

David Gudmundson is responsible for sales, operations and product development for JDSU's Optical Communications Group. He joined JDSU in 2003 as senior vice president of corporate development and marketing. Gudmundson played an integral role in a number of strategic transactions - including the acquisitions of Lightwave Electronics, Acterna and Agility Communications - helping to diversify the company's

portfolio and expanding the company's opportunity in the growing and profitable markets for test and measurement equipment, tunable transponders and solid state lasers. Before joining JDSU, Gudmundson spent more than a decade at Cisco Systems where he served in numerous leadership roles, including: orchestrating the launch of Cisco's remote access product line to market share lead; overseeing Cisco's security server, DSL and edge routing business units as Vice President and General Manager; helping develop the company's well-respected acquisition and integration strategy; and managing the subscriber edge products group. Prior to Cisco, He held various hardware and software development and systems engineering positions at Argo Systems, Inc. (now part of Boeing Company Inc.) and ESL Incorporated (now part of TRW). Gudmundson received his bachelor's degree from University of Missouri-Rolla in electrical engineering and an MBA from San Jose State University.



**Packet Optical Networking and the ROADM Evolution**, Rod Naphan, Director, Market Development, *Fujitsu Network Communications, USA*

Rod Naphan, Vice President, Product and Strategic Planning at Fujitsu, is leading Fujitsu's packet optical networking vision and product portfolio. He has held various leadership roles in software and systems engineering, and as a program manager. Rod holds a BSc from Wilfrid Laurier University, and an MASc from the University of Waterloo in Ontario.



**Business Advantages of Zero-Touch Photonic Networks**, Tom Goodwin, *Vice President, Marketing and Communications, Optics Division, Alcatel-Lucent, USA*

Tom Goodwin provides strategic market and product positioning for the Optical portfolio. Alcatel-Lucent, a leader in Converged Packet Transport, assists Service Providers transform their networks. Tom joined Alcatel-Lucent via Lucent Technologies (Yurie Systems) in June 1998. He holds a BS in physics from Eckerd College and an MBA from Emory University.



**Evolving towards Optical Circuit Switching**, Stuart Elby, *Vice President, Verizon, USA*

Dr. Stuart Elby is the Vice President of Network Architecture responsible for setting Verizon Telecomm and Verizon Business' network architecture vision encompassing broadband access, optical transport, fast packet and Ethernet switching, IP/MPLS routing, and emerging voice over IP and video technologies. Stuart is also responsible for defining service specific architectures to support product line marketing, specifying network element requirements, coordinating Verizon's Standards activities, and leading collaborative R&D activities with universities and industry partners. He has previously held several positions in Verizon including network platform testing, and technical

support of product development and sales. Prior to joining the phone company in 1993, Dr. Elby was a Research Associate at the National Science Foundation's Center for Telecommunications Research at Columbia University. There he was responsible for leading research in optoelectronic devices, all-optical network architectures and developing early WDM/ATM platforms. He was co-director of a multi-university research program on all-optical packet switched networking, and collaborated with Teachers' College in the development and deployment of a multi-media educational network for primary and secondary schools. In 1985, Dr. Elby was the Manager of Technology in a laser surgery start-up where he was responsible for FDA clinical trials, ophthalmic and endoscopic laser surgery product development, and brought the first ever disposal plastic fiber-optic delivery system to market. In 1982, he was a Staff Engineer at StorageTek, where he contributed to the development of the first commercial optical disk system. Dr. Elby received a BS degree in optical engineering from the University of Rochester in 1982 and received his MSEE, MPhil, and PhD from Columbia University in 1989, 1992, and 1994, respectively. He lives in New Jersey with his wife and three children.



**Optical Network Evolution at AT&T, Mehran Esfandiari, *Lead Member of Technical Staff, AT&T Corp, USA***

Mehran Esfandiari is Lead Member of Technical Staff, Network Architecture and Planning at AT&T. He has over 24 years diversified experience in strategic transport network architecture, planning and design, network optimization, technology assessment and selection, and new feature/product development. He received his MSEE degree from UCLA in Los Angeles, California, and since 1983 has worked in various capacities in Pacific Bell, SBC, and now AT&T. Currently he is involved in the development of the AT&T's optical network strategic direction, and the evaluation and impact of next generation ROADMs, OXCs, MSPPs and L1/L2 convergence issues. He has authored many papers in technical conferences and holds several patents in the field of network design and survivability.

# 2008 Plenary Session

The OFC/NFOEC 2008 Plenary Session was Tuesday, February 26. Video and audio presentations of the plenary speakers are now available.



**Bob Metcalfe**  
*General Partner*  
**Polaris Ventures**

## **Toward Terabit Ethernet**

**Abstract:** At the Xerox Palo Alto Research Center in 1978, I helped build a 150 Mbps optical Ethernet, which was amazing given that transcontinental links of the Internet core then ran at 50 Kbps. In 2008, 30 years later, I want to talk not just about how we got to 10 Gbps Ethernet (10GbE), but also about how we are going to get to 40, 100, and, yes, even 1,000 Gbps Ethernet, which I hereby call Terabit Ethernet (TbE).

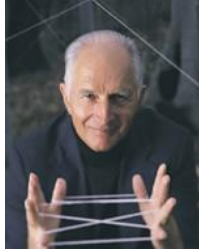
A few years after we deploy 40GbE (maybe) and then 100GbE, we are going to need TbE to carry rapidly increasing traffic on the new mobile, video, and embedded Internet. Mobile just passed a billion new cellphones per year. Video is becoming the dominant traffic on the Internet, and that's before high definition (HD) and mobile video come fully online. And then there are totally new sources of traffic, like from the 10 billion embedded micro-controllers now shipped every year, a tiny but increasing fraction of which is now being mesh networked with ZigBee/802.15.4.

The Internet is expanding at rates unimaginable even 10 years ago, and with new applications and traffic characteristics not envisioned at the start. I will walk through a roadmap to TbE, factoring in traffic drivers and volumes, key issues and tradeoffs, and the relative roles of packet and high-bandwidth optical circuit transport and switching. For example, will TbE simply hasten the routing of today's Internet Protocol (IP) packets, or will some form of lambda switching be needed to carry time-critical volume flows?

**Biography:** Dr. Robert M. Metcalfe: MIT engineer, Harvard mathematician, Internet developer, Xerox scientist, Ethernet inventor, Stanford professor, 3Com founder, Cambridge fellow, InfoWorld pundit, and now Polaris partner.

In 2005, Metcalfe received the National Medal of Technology for leadership in the invention (1973), standardization, and commercialization of Ethernet, of which a quarter billion switch ports ship each year. Metcalfe has been a General Partner of Polaris Venture Partners since January 1, 2001, and served or serves as a director of Polaris-backed start-ups including Ember, GreenFuel, Infinite Power Solutions, InvisibleHand, Mintera, Nanosys, Paratek, PhyFlex, and SiCortex. He is a member of the National Academy of Engineering, American Academy of Arts and Sciences, National Inventors Hall of Fame, and board of trustees of MIT, where he is a director of *Technology Review* magazine and Chairman of the Leadership Board of the

McGovern Institute for Brain Research. He was awarded the ACM's Hopper, IEEE's Bell and Marconi Prizes, and the IEEE Medal of Honor. He wrote *Internet Collapses*, still available at Amazon.com. He devised Metcalfe's Law, which he has been defending for over 25 years. After 22 years in Silicon Valley, Metcalfe now lives with his family in Boston and Maine.



Herwig Kogelnik

*Adjunct Photonics Systems Research Vice President*

**Bell Labs, Alcatel-Lucent**

[Perspectives on Optical Communications](#)

**Abstract:** Nearly one terameter (1000 million kilometers) of optical fiber are now deployed around the globe, providing a high-capacity network infrastructure for the world's now dominant data traffic continuing to double its volume every year. The customers of this fiber network include the over one billion internet users who continue in their demands for newer and broader bandwidth services. In response, lightwave R&D has advanced the capacity of long-haul fiber transmission systems by a factor of 100 since the WDM revolution that started a little more than ten years ago, and continues to explore the increased networking flexibility of WDM.

There is strong technological progress in the technology of components and optical integrated circuitry that promises to further reduce networking cost and enable transmission and switching at higher data rates. Examples include monolithic transceivers that are widely tunable and operate at 40 Gb/s rates, optically integrated wavelength selective switches enabling multi-degree mesh- ROADMs, and field-tested PICS with 10 WDM channels operating at 10 Gb/s each. There are also highly promising advances in the use of sophisticated modulation formats such as multi-level PSK in conjunction with receiver-side digital signal processing. System research experiments using polarization-multiplexed DQPSK have demonstrated long-haul transmission at a record capacity of 25 Terabits/sec per fiber, and are exploring the cost-effective transmission of 10 WDM channels each carrying 100 GbEthernet traffic.

In the market we note the strong resurgence of construction of undersea fiber systems in the Pacific, and the large-scale deployment of fiber to the premise, FTTP, now reaching millions of users and providing the potential for broadband services such as GbEthernet to the home and business.

**Biography:** Austrian-born Herwig Kogelnik received the Dipl.-Ing. and Dr.-techn. degrees from the Technical University (TU) Vienna in 1955 and 1958, and the D. phil. degree from Oxford University, England, in 1960.

From 1955 to 1958 he was Assistant Professor at the TU, engaged in microwave research and teaching. He won a British Council Scholarship to Oxford from 1958 to 1960, where he did research on electromagnetic radiation in magnetoplasmas and anisotropic media. He joined Bell Labs (earlier owned by AT&T, currently by Alcatel-Lucent) in 1961, where he conducted research in optics, electronics and communications, including work on lasers, holography, optical guided-wave devices and integrated optics. He was head of the Coherent Optics Research

Department from 1967 to 1976, director of the Electronics Research Laboratory from 1976 to 1983, and director of the Photonics Research Laboratory from 1983 to 1997. He is presently Adjunct Photonics Research VP.

Kogelnik is a Fellow of the IEEE and of OSA and was recently awarded the 2006 National Medal of Technology. He was elected to the National Academy of Engineering in 1978 and to the National Academy of Sciences (NAS) in 1994, and served as chairman of the Engineering Sciences section of the NAS from 1999 to 2002. He is the recipient of the 1984 Frederic Ives Medal of OSA, the 1989 David Sarnoff Award of the IEEE, the 1990 Joseph Johann Ritter von Prechtel Medal from the TU Vienna, Austria, and the 1991 Quantum Electronics Award from IEEE LEOS. He served as President of OSA in 1989. He was elected Honorary Fellow of St. Peter's College at Oxford University in 1992, is the recipient of the 2001 IEEE Medal of Honor, received the 2001 Marconi International Fellowship Award in Telecommunications, and was inducted into the New Jersey Inventors Hall of Fame in 2002. In 2006 Kogelnik was awarded the "Ehrenkreuz für Wissenschaft und Kunst 1. Klasse" by the President of Austria, was named Honorary Member of OSA, and was awarded the Okawa Prize by the Okawa Foundation of Information and Telecommunications.

Kogelnik served as Program Chair and Chair of the IEEE/OSA conferences on Laser Applications and Engineering (CLEA), Integrated Optics, and the International Quantum Electronics Conference (IQEC).



Pieter Poll

*Chief Technology Officer*

**Qwest Communications Corporation Inc.**

**[Evolving Carrier Networks to Cost-Effectively Manage Proliferating Traffic Growth](#)**

**Abstract:** Network traffic grows at an ever-increasing rate and carriers cannot assume vendors and other carriers will effectively keep pace with the increasing demands. It is a challenge the industry faces as a whole and carriers and vendor partners will need to find innovative ways to increase network capacity and improve network efficiency while driving costs down so end users can continue to benefit from current and emerging services without dramatic increases in cost. Dr. Poll will discuss potential strategies and the outlook for managing the increasing network requirements in order to economically deliver the services customers want today and in the future.

**Biography:** Pieter Poll is the Chief Technology Officer at Qwest. He is responsible for the strategic technological direction of the company. In this role, he oversees the evolution of the network and technologies utilized to manage the various network layers and drive future product and service capabilities. Additionally, he is responsible for network planning and engineering functions.

Dr. Poll has spent more than 20 years in the telecommunications industry. Previously, he served as Vice President – Corporate Strategy for Mahi Networks where he was responsible for corporate technology and product strategy, business partnership development and business development.

Prior to his role at Mahi Networks, Dr. Poll held a variety of leadership positions at Qwest, including those of Vice President – Worldwide Technology Management, Vice President – Worldwide Emerging Technologies, and General Manager – Network Architecture and Strategy. Before that time, he played an integral role at AT&T Bell Laboratories in the development of architectural and evolutionary plans for digital switches and the AT&T long-distance network.

Dr. Poll graduated from the University of Toronto with a Bachelor of Science degree in physics and mathematics. He earned his Doctor of Philosophy degree in physics at Cornell University.

Dr. Poll currently serves on the Board of Directors of the Alliance for Telecommunications Industry Solutions (ATIS) and the Center for Telecom Management at the University of Southern California's Marshall School of Business. He participates on the Advisory Board for the Interdisciplinary Telecommunications Program at the University of Colorado – Boulder and the Metro Denver Wired Initiative.

Dr. Poll, his wife, Christine, and son, Alastair, reside in the Denver area.

## **2008 Service Provider Summit**

**Wednesday, February 27, 2008  
OFC/NFOEC Exhibit Floor Theater**

**The Service Provider Summit is open to all Conference and Exhibit-only Attendees!** Join your colleagues for this dynamic program with topics and speakers of interest to CTOs, network architects, network designers and technologists within the service provider and carrier sector. The program includes panel discussions, keynote presentations, exhibit time, and networking time.

**The program will be located on the exhibit floor, so attendees can easily attend the sessions and tour the exhibit hall. Audience members are encouraged to participate in the question and answer segments that follow the presentations.**

**Service Provider Summit Organizers:**  
Christoph Pfister, *NeoPhotonics, USA*  
Serge Melle, *Infinera, USA*



## Schedule-at-a-Glance

8:15 a.m. - 9:00 a.m.	Continental Breakfast
9:00 a.m. - 9:30 a.m.	Keynote Presentation: The Coming Global Triumph of Communications and the Threat to American Standards of Living
9:45 a.m. - 11:15 a.m.	Panel I: Ultra-High Bandwidth Services: Applications Drivers and Implementation Status
11:15 a.m. - 11:45 a.m.	Coffee Break
11:45 a.m. - 1:15 p.m.	Panel II: FTTx: Deployment Models, Market Drivers and Implementation Status around the World
1:15 p.m. - 2:30 p.m.	Lunch
2:30 p.m. - 5:00 p.m.	Exhibit Time

## Keynote Presentation



[The Coming Global Triumph of Communications and the Threat to American Standards of Living](#), Reed Hundt, *Former FCC Chairman, USA*

The rise of emerging economies and especially China will surely have a negative effect on the wages and career choice of millions of Americans. What is less clear is how those skilled in communications technologies can help America respond positively and effectively to the China challenge. As it happens, communications technologies are part of the problem—they aid job loss—and part of the solution—they greatly enhance the single biggest opportunity for Americans: leading the world in green technology.

Mr. Hundt served four years as Chairman of the Federal Communications Commission (FCC), from 1993 to 1997. Hundt serves on the board of directors of Intel, Data Domain, Infinera, Nexort, Vanu, Inc. and Access Spectrum. He is Vice-Chair of Frontline Wireless. He serves as a special advisor to the Blackstone Group, a New York based private equity firm. He is also a part-time advisor to McKinsey & Company and Co-Chairman of The Forum on Communications and Society at the Aspen Institute. Mr. Hundt is the author of *You Say You Want a Revolution: A Story of Information Age Politics* (Yale University Press, 2000) and *In China's Shadow: The Crisis of American Entrepreneurship* (Yale University Press, 2006).

## **Panel I: Ultra-High Bandwidth Services: Applications Drivers and Implementation Status**



**Moderator:** Serge Melle, *VP Technical Marketing, Infinera, USA*

New broadband services and related infrastructure upgrades are driving significant increases in network capacity requirements. New service examples include internet video, broadband Ethernet business services, video/movie peer-peer file sharing, online gaming, HDTV and IPTV, channeled over increasingly broadband infrastructures including FTTx, WDM PONs and next-generation cable modems, supported by ever-higher-capacity WDM backbone networks. This panel will look at the high end of optical services, and focus on next-gen high bandwidth services such as 40Gb/s, 100 Gigabit Ethernet, Layer 1 Optical-VPNs, UNI services, end-user demand, and carriers' deployment plans to support these. The panel will solicit views from both end-users and service providers on applications and drivers for ultra-high bandwidth services and connectivity, review standardization activities, for example at the IEEE or ITU, and provide an overview of the implementation status to support these services.

### **Panel I Speakers:**



**When Ultra-High Bandwidth Meets Internet-Scale Services and Why More Is Still Needed,** Donn Lee, *Network Architect, Facebook, Inc., USA*

Donn Lee is a Network Engineer at Facebook, one of the largest sites on the Internet today. His duties include designing networks, evaluating/deploying products, optimizing performance, and performing escalation troubleshooting. Previous to Facebook, Donn performed similar duties as a member of the Network Architecture Team at Google. While working as a Consulting Systems Engineer at Cisco Systems (CCIE #3262) he worked on large global networks and wrote his book, *Enhanced IP Services for Cisco Networks*, that is published by Cisco Press.



**The Next Generation of Ethernet,** John D'Ambrosia, *Scientist, Components Technology, Force10 Networks, USA*

As a scientist at Force10 Networks, John D'Ambrosia focuses on components technology and leads the company's involvement in industry groups. John has been an active participant in the development of Ethernet-related technologies since 1999. Presently he is the chair of the IEEE 802.3 Higher Speed Study Group, which is driving the standards development process for the next speed of Ethernet. John served as secretary for the IEEE 802.3ap Backplane Ethernet Task Force, and participated in the development of XAUI for 10 Gigabit Ethernet. John, also, served as a director and secretary for the Ethernet Alliance

and was the chair of the XAUI Interoperability work group for the 10 Gigabit Ethernet Alliance. For all of his efforts related to Ethernet, John was recognized by Network World in 2006, as part of its “50 Most Powerful People in Networking” list. John also acted as secretary for the High Speed Backplane Initiative and chair of the Optical Internetworking Forum's Market Awareness & Education committee. Prior to joining Force10, John was with Tyco Electronics for 17 years.



**Next Generation Core Optical Networking Directions**, Chuck Kalmanek, *Vice President, Internet and Network Systems Res., AT&T Labs, USA*

Charles R. Kalmanek is Vice President of Internet and Network Systems Research in AT&T Labs. Chuck manages research in algorithms and optimization; IP network management; network architecture and protocols; optical systems; wireless and mobile networking; security; and network software and systems. Chuck’s lab also supports organizations throughout AT&T as a Center of Excellence for network design and performance analysis. Chuck joined AT&T Bell Labs in 1980. He has extensive experience in network architecture, protocols and distributed systems. Chuck’s research background spans IP network management, access network architectures, wireless networks, voice over IP, multimedia streaming, content distribution networks, storage networks, as well as packet switch and host interface design. Chuck received his undergraduate degree from Cornell University and M.S. degrees in electrical engineering and computer science from Columbia University and New York University respectively. He is a recipient of AT&T’s Strategic Patent and Strategic Standards Awards. Chuck is a former co-chair of the IEEE Internet Technical Committee.

## **Panel II: FTTx: Deployment Models, Market Drivers and Implementation Status around the World**



**Moderator:** Chris Pfistner, *VP Product Marketing, NeoPhotonics, USA*

Join us in this exciting session where executives from major service providers will present their views on the opportunities and challenges for FTTx around the world. The individual presentations will be followed by a panel discussion and open Q&A session.

## Panel II Speakers:



**Overview of the Japanese FTTH Market**, Hiromichi Shinohara, *Associate Senior Vice President, Executive Director Information Sharing Lab Group, NTT, Japan*

Mr. Hiromichi Shinohara has been a Vice President of NTT, Executive Director of NTT Information Sharing Laboratory Group since June 2007. He joined NTT Laboratories in 1978. He has consistently been spending his carrier to realize FTTH. In addition, he has recently been engaged in strategic planning and promoting of research and development for NGN architecture and platform technologies.

**Verizon's FiOS Deployment**, Vincent O'Byrne, *Director of Technology, Verizon, USA*

Vincent O'Byrne received his B.S.C. from Trinity College Dublin, Ireland, his PhD from the University of North Wales and his MBA from Babson College, USA. He has over 19 years experience in the Wireline and Wireless Telecommunications industry. He is a Director of Technology within Verizon Technology Organization (VTO). He is responsible for the specification, design and integration of new "Wireline" access technologies within the Verizon Network for the residential and small business markets. This responsibility includes the leadership of wireline access RFPs, the vendor management through to the realization of those technologies as stable platforms in the Network. Primary focus is on BPON and GPON, expansion of FTTP to the Multiple Dwelling Unit and overall Network Stability.



**AT&T U-verse – Past, Present, and Future**, Matthew Wallace, *Executive Director, Advanced Access Technologies, USA*

Matthew Wallace is the Executive Director of Advanced Access Technologies with AT&T. Matthew is responsible for all Network Integration aspects of Project Lightspeed including technology planning, technical requirements, architecture, testing, and first office applications. This includes multiple technologies across the network, spanning home networking, access technologies, routing and switching, IPTV middleware, encoding, and content

reception.

Matthew has been with AT&T for over 10 years, starting with Southwestern Bell Telephone in 1996. Other responsibilities have included positions for Senior Director of New Technology Introduction for Project Pronto, AT&T's initiative to expand DSL coverage to 80% through deployment of Next Generation Digital Loop Carrier, and General Manager of Central Office Engineering for Houston and Southeast Texas. He has a Bachelor's degree in Computer Engineering from the University of Kansas and a Master of Science in Information Networking from Carnegie Mellon University.

## 2008 Short Courses

### Schedule by Topic Category

#### 1. Fibers and Optical Propagation Effects

SC186 **Hands-on Specialty Fiber Splicing**, *Clyde J. Troutman; 3SAE Technologies, USA.*

SC208 **Specialty Optical Fiber Design and Applications**, *David DiGiovanni; OFS Labs, USA.*

SC210 **Hands-on Polarization-Related Measurements Workshop**, *Danny Peterson<sup>1</sup>, Kent Rochford<sup>2</sup>, Ivan T. Lima<sup>3</sup>, Paul Williams<sup>2</sup>; <sup>1</sup>Verizon Business, USA, <sup>2</sup>NIST, USA, <sup>3</sup>North Dakota State Univ., USA.*

SC288 **Fundamentals of Polarization, PMD and PDL in Lightwave Systems**, *Robert Jopson; Bell Labs, Alcatel-Lucent, USA.*

#### 2. Amplifiers and Lasers: Fiber or Waveguide

SC123 **Erbium-Doped Fiber Amplifiers and Raman Fiber Amplifiers**, *John Zyskind; JDSU, USA.*

SC290 **High Power Fiber Lasers and Amplifiers**, *Johan Nilsson; Univ. of Southampton, UK.*

**NEW! SC312 Parametric Optical Processing and Systems**, *Stojan Radic; Univ. of California at San Diego, USA.*

### **3. Signal Measurement, Distortion Compensation Devices and Sensors**

**SC265 Passive Optical Components and Filtering Technologies**, *Bruce Nyman<sup>1</sup>, Christi Madsen<sup>2</sup>; <sup>1</sup>Princeton Lightwave, USA, <sup>2</sup>Texas A&M Univ., USA.*

**SC293 Introduction to Fiber Sensors**, *Michel Digonnet; Stanford Univ., USA.*

### **4. Switching Wavelength-Selective Filtering and Routing Devices**

**SC292 Planar Integrated Optics**, *Christopher R. Doerr; Bell Labs, Alcatel-Lucent, USA.*

### **5. Optoelectronic Devices**

**SC125 Tunable Lasers**; *Jens Buus; Gayton Photonics Ltd., UK.*

**SC175 Packaging of Optoelectronic, Photonic and MEMS Components**, *Paul Haugsjaa; Polycision Inc., USA.*

**SC177 High-Speed Semiconductor Lasers and Modulators**, *John Bowers; Univ. of California at Santa Barbara, USA.*

**SC178 Test and Measurement of High-Speed Communications Signals**, *Greg D. Le Cheminant; Agilent Technologies, USA.*

**SC215 Nanofabricated Lasers, Waveguides and Dispersive Elements**, *Axel Scherer; Caltech, USA.*

**SC267 Silicon Microphotonics: Technology Elements and the Roadmap to Implementation**, *Lionel Kimerling; MIT, USA.*

### **6. Digital Transmission Systems**

**SC102 WDM in Long-Haul Transmission Systems**, *Neal S. Bergano; Tyco Telecommunications, USA.*

**SC184 Introduction to Modeling High Data Rate Optical Fiber Communications Systems**, *Curtis R. Menyuk; Univ. of Maryland Baltimore County, USA.*

SC203 **40 Gb/s Transmission Systems, Design and Design Trade-offs**, *Martin Birk<sup>1</sup>, Benny Mikkelsen<sup>2</sup>; <sup>1</sup>AT&T Labs - Res., USA, <sup>2</sup>Mintera, USA.*

## **7. Transmission Subsystems and Network Elements**

SC101 **Hands-on Workshop on Fiber Optic Measurements and Component Testing**, *Lorenz Cartellieri<sup>1</sup>, Peter Schweiger<sup>2</sup>, John Kim<sup>1</sup>, Karl Merkel<sup>3</sup>, Michael Kelly<sup>4</sup>, Caroline Connolly<sup>5</sup>, Richard Buerli<sup>5</sup>; <sup>1</sup>Experior Photonics Inc., USA, <sup>2</sup>Agilent Technologies, Canada, <sup>3</sup>Agilent Technologies, USA, <sup>4</sup>Agilent Technologies GmbH, Germany, <sup>5</sup>OptoTest, USA.*

SC103 **Fast Reconfigurable WDM Optical Networks**, *Daniel Blumenthal; Univ. of California at Santa Barbara, USA.*

SC105 **Modulation Formats and Receiver Concepts for Optical Transmission Systems**, *Peter J. Winzer, Sethumadhavan Chandrasekhar; Bell Labs, Alcatel-Lucent, USA.*

SC141 **Combating and Monitoring Data-Degrading Effects in Non-Static WDM Systems**, *Alan E. Willner; Univ. of Southern California, USA.*

SC239 **Short-Reach Optical Interconnects**, *Brian E. Lemoff; Scientific Res. Group, West Virginia High Technology Consortium Foundation, USA.*

SC259 **Electronic and Optical Impairment Mitigation**, *Chris Fludger; CoreOptics GmbH, Germany.*

SC289 **Basics of Optical Communication Systems and WDM**, *Gerd Keiser; Natl. Taiwan Univ. of Science & Technology, Taiwan.*

## **8. Optical Processing and Analog Subsystems**

SC205 **Integrated Electronic Circuits for Fiber Optics**, *Y. K. Chen; Bell Labs, Alcatel-Lucent, USA.*

SC217 **Hybrid Fiber Radio: The Application of Photonic Links in Wireless Communications**, *Dalma Novak; Pharad LLC, USA.*

SC266 **Quantum Cryptography and Quantum Information**, *Richard Hughes<sup>1</sup>, Tom Chapuran<sup>2</sup>; <sup>1</sup>Los Alamos Natl. Labs, USA, <sup>2</sup>Telcordia, USA.*

**NEW!** SC315 **Recent Advances in Polymer Waveguides**, *Paul Ashley; U.S. Army Aviation and Missile Command, Redstone Arsenal, USA.*

## **9. Networks**

**SC114 Passive Optical Networks (PONs)**, *Paul W. Shumate; IEEE Lasers & Electro-Optics Society, USA.*

**SC171 Introduction to Optical Control Plane Standards and Technology: OIF UNI, GMPLS, G.ASON and All That!** *Greg Bernstein; Grotto Networking, USA.*

**SC176 Metro Network Architectures, Today and Tomorrow**, *Joseph Berthold; Ciena Corp., USA.*

**SC216 An Introduction to Optical Network Design and Planning**, *Jane Simmons; Monarch Network Architects, USA.*

**SC243 Next Generation Transport Networks: The Evolution from Circuits to Packets**, *Ori Gerstel; Cisco Systems, USA.*

**SC261 ROADM Technologies and Network Applications**, *Thomas Strasser; Nistica Inc., USA.*

**SC264 Optical Ethernet and Data Networking for Large Enterprises**, *Jeffrey L. Cox; JP Morgan Chase, USA.*

**SC268 Hands-on Workshop on Outside Plant Splicing, Testing and Troubleshooting for FTTx Networks**, *Larry Johnson; Light Brigade Inc., USA.*

## **10. Access Solutions, Demonstrations and Non-Telecom Applications**

**SC160 Microwave Photonics**, *Keith J. Williams; NRL, USA.*

**SC185 Hands-on Polishing, Inspection and Testing of Connectors**, *Jason Sloan<sup>1</sup>, Steve Baldo<sup>2</sup>, Neal Wagman<sup>3</sup>; <sup>1</sup>Light Brigade Inc., USA, <sup>2</sup>Seikoh Giken USA, USA, <sup>3</sup>Norland Products, USA.*

**SC187 Hands-on Basic Fiber Optics for the Absolute Beginner**, *Dennis Horwitz; Micronor Inc., USA.*

**SC260 Biomedical Diagnostic Applications of Communications Technologies**, *Brett E. Bouma; Harvard Medical School and Massachusetts General Hospital, USA.*

**SC262 Alternative Broadband Access: Wired and Wireless Technologies for the Last Mile**, *Paul S. Henry; AT&T Labs -- Res., USA.*



**SC291 Hands-on Fiber Optics for Engineers Designing for Military, Aerospace, Shipboard and Industrial Harsh Environmental Applications**, *Dennis Horwitz; Micronor Inc., USA.*

## **NFOEC B: Network Technologies**

**NEW! SC313 OTN/G.709 Technology Overview and Role in the “New Transport” Network**, *Frank D. Ferrara; JDSU, USA.*

**NEW! SC314 Hands-on Fiber Characterization for the Engineering of Long Haul and Metro Deployments**, *Danny Peterson<sup>1</sup>, Joachim Peerlings<sup>2</sup>; <sup>1</sup>Verizon Business, USA, <sup>2</sup>Agilent Technologies, Germany.*

## **Reliability and Qualifications**

**SC133 Reliability Methodologies for Fiber-Optic Components**, *David Maack; Intel Corporation, USA.*

**SC294 Qualification Programs for Fiber-Optic Components**, *David Maack; Intel Corporation, USA.*

# **2008 Tutorial Speakers**

## **Category 1. Fibers and Optical Propagation Effects**

**OThJ1, Recent Progress in Design and Fabrication of High-Nonlinear Fibers**, *Tanya M. Monro; Univ. of Adelaide, Australia.* Thursday, 1:00 p.m.–2:00 p.m.

## **Category 2. Amplifiers and Lasers: Fiber or Waveguide**

**OWM4, Fiber Supercontinuum Generation: Fundamentals to Applications**, *John M. Dudley; Univ. de Franche-Comté, France.* Wednesday, 2:00 p.m.–3:00 p.m.

**OWU1, Pulse Shaping in High Power Fiber Laser Systems**, *David Richardson; Optoelectronics Res. Ctr., Univ. of Southampton, UK.* Wednesday, 3:30 p.m.–4:30 p.m.

## **Category 3. Signal Measurement, Distortion Compensation Devices and Sensors**

**OTuK1, Optical Technologies for Early GI Cancer Detection: Many Ways to Skin a Cat**, *Brian Wilson; Univ. of Toronto, Canada.* Tuesday, 4:30 p.m.–5:30 p.m.

**OThG1, PMD Compensation at Ultra-High Bit Rates**, *Andrew Weiner; Purdue Univ., USA.* Thursday, 8:00 a.m.–9:00 a.m.

#### **Category 4. Switching, Wavelength-Selective Filtering and Routing Devices**

**OMJ4, Recent Advances in Polymer and Silicon Nanophotonics**, *Ray Chen; Univ. of Texas, USA.* Monday, 2:30 p.m.–3:30 p.m.

**OThM1, Manipulation of Photons by 2-D and 3-D Photonic Crystals**, *Susumu Noda; Kyoto Univ., Japan.* Thursday, 1:00 p.m.–2:00 p.m.

#### **Category 5. Optoelectronic Devices**

**OMS2, InP-Based High-Speed Photonic Devices**, *Andreas Beling; Univ. of Virginia, USA.* Monday, 4:30 p.m.–5:30 p.m.

**OWE3, InP-Based Photonic Devices**, *Christopher Doerr; Bell Labs, Alcatel-Lucent, USA.* Wednesday, 8:30 a.m.–9:30 a.m.

#### **Category 6. Digital Transmission Systems**

**OTuE5, Next Generation FEC for Optical Communication**, *Takashi Mizuochi; Mitsubishi Electric Corp., Japan.* Tuesday, 3:00 p.m.–4:00 p.m.

**OWR1, Multimode Fiber Data Communication**, *David Cunningham; Avago Technologies, UK.* Wednesday, 3:30 p.m.–4:30 p.m.

#### **Category 7. Transmission Subsystems and Network Elements**

**OMM1, OFDM: From Copper and Wireless to Optical**, *Jean Armstrong; Monash Univ., Australia.* Monday, 1:30 p.m.–2:30 p.m.

**OTuG1, 100 Gb/s Challenges and Solutions**, *Gregory Raybon, Peter Winzer; Alcatel-Lucent, USA.* Tuesday, 2:00 p.m.–3:00 p.m.

#### **Category 8. Optical Processing and Analog Subsystems**

**OMV1, Technologies for Optical Processing**, *Kristian Stubkjær; Technical Univ. of Denmark, Denmark.* Monday, 4:00 p.m.–5:00 p.m.

**OThH1, Microwave Photonics**, *Jianping Yao; Univ. of Ottawa, Canada.* Thursday, 8:00 a.m.–9:00 a.m.

#### **Category 9. Networks**

**OMG1, Optical Packet-Switched WDM Networks—A Cost and Energy Perspective**, *Rodney S. Tucker; Univ. of Melbourne, Australia.* Monday, 1:30 p.m.–2:30 p.m.

**OMO1, IPTV Challenges**, *K. K. Ramakrishnan, Bob Doverspike; AT&T Labs Res., USA.* Monday, 4:00 p.m.–5:00 p.m.

## Category 10. Access Solutions, Demonstrations and Non-Telecom Applications

OTuP1, **Optical Layer Security**, *Chip Elliot; BBN Technologies, USA*. Tuesday, 4:30 p.m.–5:30 p.m.

OThL1, **Next Generation Extended Reach PON**, *Russell Davey; BT, UK*. Thursday, 1:00 p.m.–2:00 p.m.

## NFOEC B. Network Technologies

NMB1, **Optical Technologies for High Speed Signal Communications in High Performance Servers**, *Jeffrey Kash; IBM, USA*. Monday, 1:30 p.m.–2:30 p.m.

NTuC3, **Bend Insensitive Fiber Design Strategies**, *David Peckham; OFS Labs, USA*. Tuesday, 5:30 p.m.–6:30 p.m.

NWC3, **Expanding Network Application with Coherent Detection**, *Maurice O'Sullivan; Nortel, Canada*. Wednesday, 1:40 p.m.–2:40 p.m.

# 2008 Workshops and Panels

**Workshop presentations available now! Presentation slides will be posted in PDF format as they are received.**

**OFC/NFOEC workshops** provide opportunities to discuss and debate the latest technologies. Many workshops will be highly interactive, among both the speakers and the audience. The format of each session is determined by the organizers. In the past, many workshops have consisted of a series of short, contributed presentations (5 to 10 minutes) from people involved in the field followed by a panel discussion driven by questions from the audience.

This year the conference features workshops in current areas of interest in OFC and NFOEC categories alike. Details on all workshops are listed below. All OFC/NFOEC attendees are encouraged to participate. Workshops will be held on Sunday, February 24, 4:30 p.m. - 7:30 p.m., and Monday, February 25, 8:00 a.m. - 11:00 a.m. The workshops provide an interactive learning environment and are open to all conference registrants.

***Sunday, February 24, 4:30 p.m. - 7:30 p.m.***

[OSuA — Is Optical Transmission Fiber a Commodity or is Further Innovation Required?](#)

**Organizers:** Ming-Jun Li<sup>1</sup>, Georg Mohs<sup>2</sup>; <sup>1</sup>*Corning Inc.*, <sup>2</sup>*Tyco Telecommunications, USA*.  
Category 1. Fibers and Optical Propagation Effects — Room 5

After more than 30 years of advances in optical fiber and system technologies, is optical fiber a commodity today? If not, what technological advances are possible and what applications should

they target? This workshop intends to discuss these two questions. It will feature invited talks from industry experts including fiber manufacturers, system suppliers and network operators as well as researchers from academia to present their views on:

- Is there a need for further innovations in optical fiber technology?
- What are the desired fiber attributes?
- Is there a market for photonic crystal fiber or other novel technology?
- What applications will drive new fiber designs?

The presentations will be followed by a panel discussion with the participation from the audience.

Speakers include:

[Michel P. Belanger](#), *Nortel*

[C.-A Bunge, J.K. Fischer and K. Petermann](#), *Technische Universitat Berlin*

[Jörg-Peter Elbers](#), *ADVA Optical Networking*

[R. Matai and Han Qingrong](#), *Yangtze Optical Fibre and Cable Company*

[P. Nouchi and P. Sillard](#), *Draka*

[Marsha Spalding](#), *Tyco Telecommunications*

[Robet Tkach](#), *Transmission Systems Research, Bell Laboratories, Alcatel-Lucent*

## **OSuB — Silicon Photonics Integrated Devices**

**Organizers:** Haifeng Li; *Tyco Telecommunications, USA.*

Category 4. Switching, Wavelength-Selective Filtering and Routing Devices — Room 6B

Silicon Photonics, the technology of using standard silicon and CMOS manufacturing techniques to make optical devices, has become a reality with the current achievements in both the academic research and industrial development. With the high index contrast of SOI structure, silicon photonic devices can be made more than 10 times smaller than its conventional silica counterparts. By making the silicon photonic devices on top of CMOS circuits, the photonic devices can be seamlessly integrated with electronic driving circuit to achieve higher level of integration to further reduce the interconnection and packaging cost and improve operating speed. This workshop will focus on two general categories: 1) what can silicon photonics technology do? To explore new device structures and functions being realized by this technology, and 2) how can silicon photonics do it? To discuss the practical aspects of the technology, such as input/output coupling, and polarization diversity, etc.

Speakers include:

**High Bandwidth Silicon Photonics Components Research**, Andrew Alduino, *Intel Corp., USA*  
**Basics of Light Modulation and Off Chip Coupling in Micron-Scale Si Photonics**, Mehdi Asghari, *Kotura Inc, USA*

**Resonator-Based CMOS Compatible Optical Filters and Modulators**, Douglas Gill, *Alcatel-Lucent, USA*

**CMOS Photonics - Roadmap to \$1/Gb**, Cary Gunn, *Luxtera, USA*

**Electrical Tuning of Dispersion in Silicon Waveguides**, Bahram Jalali, *Univ. of California at Los Angeles, USA*

**Wavelength Selective Elements on Silicon: Implementation and Applications**, Siegfried Janz, *Inst. for Microstructural Sciences, Natl. Res. Council Canada, Canada*

**High Speed Photonics on Silicon**, Michal Lipson, *Cornell Univ., USA*

**Advances in Silicon Microphotonics: From Telecom-Grade Filters to Light-Powered Micromachines**, Milos Popovic, *Res. Lab of Electronics, MIT, USA*

**Interfacing a Silicon Photonic Integrated Circuit with the Outside World: Diffractive Grating Couplers**, Gunther Roelkens, *Photonics Res. Group, IMEC/Ghent Univ., Belgium*

**Hermetic Laser Sources for Silicon Photonics and Waveguide Devices**, David Sherrer, *Rohm & Haas, USA*

**Silicon Integrated Nanophotonics for On-Chip Interconnects**, Yurii Vlasov, *IBM Watson Res. Center, USA*

## **OSuC — Planning Tools for Transparent Optical and Multilayer Networks**

**Organizers:** Jane M. Simmons<sup>1</sup>, Dion Leung<sup>2</sup>, Claus Gruber<sup>3</sup>, Dominic Schupke<sup>3</sup>; <sup>1</sup>*Monarch Network Architects, USA*, <sup>2</sup>*Tellabs, USA*, <sup>3</sup>*Nokia Siemens Networks, Germany*.

Category 9. Networks — Room 6D

Optical networks have grown in size and complexity to the extent that design tools are an integral part of the design process. This is especially true for network designs based on optical-bypass technology and designs requiring optimization across multiple layers. This workshop will examine the current state of optical network design tools from several perspectives. Carriers will discuss what they look for in a design tool and how tools can be improved to meet their needs. System vendors and design-tool developers will discuss the major challenges of, and their approach to, developing algorithms to optimize transparent and multilayer networks. This will include a discussion of techniques that are a departure from traditional design methodologies. The speakers' presentations will be followed by a panel discussion.

Speakers include:

**[Planning Tools: A Planner's Perspective](#)**, Scott Mountford, *Network Planning & Advanced Services, AT&T Services, USA*

**[Transport-Layer Aware Engineering of an IP Backbone](#)**, Martin Horneffer, *Deutsche Telekom AG, Germany*

**[Taking IP Layer Needs into Account during the Optical Layer Planning Process](#)**, Ori Gerstel, *IPoDWDM Architecture, Cisco, USA*

**[Constraints in Multilayer Optimization for IP Traffic over Optical WDM Networks](#)**, Detlef Stoll, *Nokia Siemens Networks, Germany*

**[Multilayer Design with a Grooming Layer over an Optical Layer](#)**, Raghu Ranganathan, *Ciena Corporation, USA*

**Physical Layer Modeling for Network Configuration and Planning Tools**, Paul Claisse, *Alcatel-Lucent, USA*

**Network Planning for Dynamic Impairment Constraint Optical Networking: The Activities of DICONET EU Project**, Ioannis Tomkos, *DICONET Project Leader, AIT, Greece*

**OSuD — Optical Versus Electronic Techniques for Distortion Compensation**

**Organizer:** Peter Winzer; *Alcatel Lucent Bell Labs, USA.*

Category 3. Signal Measurement, Distortion Compensation Devices and Sensors — Room 6E

Recent developments in high-speed digital signal processing hardware have enabled powerful electronic impairment mitigation engines, such as 10-Gb/s maximum likelihood sequence estimation, 10-Gbaud electronic pre-distortion, and coherent detection with digital phase locking. In contrast to optical impairment mitigation techniques, which can simultaneously operate on multiple WDM channels and which can be distributed throughout the network in order to optimize fiber transmission performance, electronic techniques inherently work as lumped transponder elements and on a per-channel basis. This workshop will discuss the evolution of optical and electronic impairment mitigation methods and devices as well as their advantages and shortcomings in the light of optically-routed transport networks.

Speaker include:

[Henning Bülow](#), *Alcatel-Lucent*

[Steve Grubb](#), *Infinera*

[Christopher Lin](#), *Avanex*

[Lynn Nelson](#), *AT&T Labs*

[Yves Painchaud](#), *TeraXion*

[Subhash Roy](#), *AMCC*

**OSuE — The Roles of Electronics and Photonics in Signal Processing**

**Organizers:** Rodney S. Tucker<sup>1</sup>, Djan Khoe<sup>2</sup>, David Miller<sup>3</sup>; <sup>1</sup>*Univ. of Melbourne, Australia*,  
<sup>2</sup>*Technical Univ. of Eindhoven, Netherlands*, <sup>3</sup>*Stanford Univ., USA.*

Category 8. Optical Processing and Analog Subsystems — Room 6F

The processing power of digital electronic circuits continues grow according to Moore's law. But to maintain this growth, electronic chip designers are struggling against thermal limitations caused by energy dissipation in the devices and in interconnects between devices. The ultra-high bandwidth of optics, and the high switching speed in photonics devices based on nonlinear optics suggests that digital optical devices may eventually replace electronics in very high speed signal processing, especially in applications where the data to be processed is already in optical form. This workshop will explore the underlying issues that will determine the future roles of electronics and photonics in digital signal processing. Topics to be covered include power and energy considerations in electronics and photonics, processing speed, device integration issues, and intra-chip and inter-chip interconnects.

## OSuF — Extended Reach PON and Central Office By-Pass

**Organizer:** Russell Dave; *British Telecom, UK.*

Category 10. Access Solutions, Demonstrations and Non-Telecom Applications — Room 7

FTTP is becoming a mainstream access technology, typified by large GEAPON deployments in the Far East and BPON/GPON deployments in the USA. In Europe FTTP is largely confined to municipality and local initiatives with incumbent operators confining themselves mainly to new build/niche markets where FTTP is economically attractive. For FTTP to be viable as a mass-market replacement for xDSL both the capital expenditure and the operational cost of the complete end to end network must be reduced. Extending access network reach, bypassing Central Offices and Metro transmission networks, has become a topic of growing interest in the last few years. This workshop explores the latest thinking on Long Reach Access, its potential for cost reduction and progress towards realising commercially viable standards based solutions.

Extending the reach of PONs has been a research topic for some years and is now getting close to commercial application. In this workshop four major operators from around the worldwide will describe network applications and technical progress to date. Three vendors will then describe progress towards commercial products. Finally a major university will review technology challenges and compare architectures.

Speakers include:

[Dan Grossman](#), *Motorola*

[Patrick Iannone](#), *AT&T*

[Fred Leonberger](#), *EOvation Technologies LLC*

[Soo Jin Park](#), *KT*

David Piehler, *Alphion*

[Albert Rafel](#), *BT*

[Michael Rastovits-Wiech](#), *Nokia Siemens Networks*

[Ken-Ichi Suzuki](#), *NTT*

## NSuA — Packet/TDM Network Convergence: Opportunities and Challenges

**Organizer:** Bob Doverspike; *AT&T Labs Res., USA.*

Robert Doverspike (IEEE SM 1997) received his undergraduate degree from the University of Colorado and Masters and Ph.D. degrees from Rensselaer Polytechnic Institute (RPI). He began with Bell Labs in 1979 and, upon divestiture of the Bell System, went to Bellcore (now Telcordia). In 1997 he returned to AT&T Labs (Research) where he is now Executive Director of Transport Network Evolution Research. Dr. Doverspike has made extensive contributions to the field of optimization in multi-layered transmission and switching networks and pioneered the concept of packet transport in metro and long distance networks. He also pioneered work in advanced transport and IP network architectures, network restoration methods for optical cross-

connects (for which he holds numerous patents and patent applications), and methods for integrated network management and restoration of IP-over-optical-layer networks. Dr. Doverspike is a member of INFORMS and the Optical Society of America (OSA), a senior member of IEEE Communications Society, an INFORMS Fellow and a co-founder INFORMS Technical Section on Telecommunications.

**Packet & TDM Networks: Convergence or Replacement?** Mehran Esfandiari, *Lead Member of Technical Staff, AT&T Labs*

Mehran Esfandiari is Lead Member of Technical Staff, in the “Network Architecture & Planning” organization at AT&T. He has over 24 years diversified experience in strategic transport network architecture, planning & design, network optimization, technology assessment & selection, and new feature/product development. He received his MSEE degree from UCLA in Los Angeles, California, and since 1983 has worked in various capacities in Pacific Bell, SBC, and now AT&T. Currently he is involved in the development of the AT&T’s optical network strategic direction and the evaluation& impact of next generation ROADM, OXC, MSPP & L1/L2 convergence issues. He has authored many papers in technical conferences and holds several patents in the field of network design & survivability.

**Optical Burst Transport: Enabling the Co-Existence of Packet and TDM Services in a Packet Optical Network,**Luis Aguirre-Torres, *Director of Technical Marketing, Matisse Networks*

Prior to joining Matisse Networks in 2007, Luis Aguirre-Torres joined AT&T in 2001, where his main focus as a Researcher and later on as a Network and Services Architect was the development of new packet transport and control plane architectures. He joined Corrigent Systems in 2004 as Director of Product Marketing where he contributed to the development and promotion of packet-efficient transport technologies. In 2007, he joined Matisse Networks where he currently holds the position of Director of Technical Marketing, focused on the development and promotion of optical burst transport technology. For the past several years he has made numerous contributions in the areas of Ethernet and MPLS control plane architectures as well as packet transport and control plane resiliency, resulting in multiple patents and publications.

**Using Ethernet for Ubiquitous Packet Transport Networks – What it Would Take?** Gady Rosenfeld, *Vice President Marketing, Corrigent Systems*

Gady Rosenfeld has more than 15 years of experience in marketing, business development, and strategic planning, and is responsible for defining the marketing and product planning strategies for Corrigent Systems. Prior to assuming his current position, Mr. Rosenfeld led Corrigent's product marketing since its inception. Formerly, Mr. Rosenfeld served as a marketing and business development manager for Orckit Communications, where he led planning and market research initiatives. He holds a B.Sc. in Physics and Mathematics and M.Sc. in Theoretical Physics.

**Last Mile Packet/TDM Convergence,** Ralph Ballart, *Vice President, Portfolio Strategy, Alcatel/Lucent*



Ralph Ballart joined Alcatel-Lucent in 2006 and in his current position helps ensure that the company's Ethernet/IP/MPLS-based products are coordinated with respect to technology choices and market positioning. Ballart retired in 2005 from AT&T Laboratories, where he was VP, Broadband and managed the broadband approval for use lab. While at SBC Labs, Ballart initiated then SBC's work in the area of PON, DSL and metro Ethernet. Ballart has a Ph.D. in Physics from the University of Arizona and began his career with Bell Laboratories in 1980. He joined Bellcore in 1984 and worked on SONET, writing the first contribution proposing SONET for standardization in the ITU in 1987.

**Transport Network Evolution – TDM and Packet Services**, Nabil Bitar, *Principal Member of Technical Staff, Verizon*

Nabil Bitar holds BS, MS and PhD degrees in Electrical Engineering from Boston University, Boston, Massachusetts, USA. He is currently a Principal Member of Technical Staff at Verizon in the Packet Network Architecture department. He leads the network architecture for metro packet services, including Ethernet Services, Metro packet transport, video packet transport (video on demand, IPTV), IPVPN, VoIP routing, and IP and Ethernet services over FTTP. He is also a principle member of a team working on IP-MPLS backbone convergence. Prior to joining Verizon in 2004, Dr. Bitar worked at Ascend/Lucent as a system architect for ATM and IP-MPLS services (forwarding, traffic management, signaling and routing). Prior to Ascend/Lucent, he worked at GTE Laboratories for 5 years on wireless AIN, ADSL architecture, IP Intserv and Diffserv, MPLS, VoIP and traffic management. He holds several patents and has others pending on traffic management, forwarding, switching and IP routing. He is also a regular contributor at the IETF and IP/MPLS Forum.

**Packet Transport Evolution – Combining Ethernet Simplicity and Optical Transport Efficiency**, Achim Autenrieth, *Head of Innovation, IP Transport R&D Management, Nokia Siemens Networks, Nokia Siemens Networks*

Achim Autenrieth received his Dipl.-Ing. and Dr.-Ing. degree in Electrical Engineering and Information Technology from the Munich University of Technology (TUM), Germany, in 1996 and 2003, respectively. In January 2003 he joined Siemens Corporate Technology as Senior Research Scientist. In January 2006 he moved to the Fixed Networks Business Unit at Siemens Com, where he was working in the development of advanced concepts for multilayer optical transport networks. In October 2006 the department was transferred to Siemens Networks which became part of the joint-venture Nokia Siemens Networks in April 2007. His research interests are in the area of multilayer transport networks (OTN/DWDM, SDH/SONET, Ethernet/PBB-TE/T-MPLS, IP/MPLS), control plane protocols (ASON/GMPLS), network architecture evaluation, network design, resilience, routing and grooming in multilayer networks. Achim Autenrieth is a member of IEEE and VDE/ITG.

**Emerging IP-over-WDM Architectures**, Loukas Paraschis, *Business Development Manager of Emerging Markets and Service Providers, Cisco Systems, Inc.*

Loukas Paraschis is Business Development Manager at Cisco, responsible for next generation IP core, edge, and optical network solutions in the Emerging Markets Service Provider Solution

Architectures and Scaling group. At Cisco, he has worked primarily on transport and WDM networks, and multi-service metro and IP-over-WDM architectures. Prior to his current role, Loukas worked as an R&D Engineer, Product Manager, and Technical Leader in optical networks and completed graduate studies at Stanford University (Ph.D. 1999, M.S. 1998). He has (co)-authored more than 50 technical reports, peer-reviewed publications, invited and tutorial presentations, a book chapter, and three patent applications. Loukas was born and raised in Athens, Greece, where he completed his undergraduate studies.

**Organizer:** Bob Doverspike; *AT&T Labs Res., USA.*  
NFOEC A. Optical Networks and Services — Room 8

Today by encapsulating packets into TDM payloads, links of packet networks are transported via TDM circuits and thus create “overlay networks” over the legacy SONET/SDH layer. In contrast, Ethernet is emerging as the preferred physical layer technology in the enterprise market and residential video network. However, TDM Private Lines (DS1 through OC-N) continue to be transported via SONET/SDH. Does Ethernet result in yet another overlay network or is there a simpler “converged” vision at the end of the tunnel that will transport all services? Will the converged network be Ethernet, WDM, or a hybrid? How will TDM Private Lines be transported over the converged network and what is the fate of the legacy TDM layer? This workshop will assemble top experts in the field to help answer these questions.

Speakers include:

**Packet & TDM Networks: Convergence or Replacement?** Mehran Esfandiari, *Lead Member of Technical Staff, AT&T Labs*

**Optical Burst Transport: Enabling the Co-Existence of Packet and TDM Services in a Packet Optical Network**, Luis Aguirre-Torres, *Director of Technical Marketing, Matisse Networks*

**Using Ethernet for Ubiquitous Packet Transport Networks – What it Would Take?** Gady Rosenfeld, *Vice President Marketing, Corrigent Systems*

**Last Mile Packet/TDM Convergence**, Ralph Ballart, *Vice President, Portfolio Strategy, Alcatel/Lucent*

**Transport Network Evolution – TDM and Packet Services**, Nabil Bitar, *Principal Member of Technical Staff, Verizon*

**Packet Transport Evolution – Combining Ethernet Simplicity and Optical Transport Efficiency**, Achim Autenrieth, *Head of Innovation, IP Transport R&D Management, Nokia Siemens Networks, Nokia Siemens Networks*

**[Emerging IP-over-WDM Architectures](#)**, Loukas Paraschis, *Business Development Manager of Emerging Markets and Service Providers, Cisco Systems, Inc.*

**Monday, February 25, 8:00 a.m. - 11:00 a.m.**

### **OMA — Optical Parametric Amplifiers**

**Organizers:** Colin J. McKinstrie<sup>1</sup>, Stojan Radic<sup>2</sup>; <sup>1</sup>*Lucent Technologies, USA*, <sup>2</sup>*Univ. of California at San Diego, USA*.

Category 2. Amplifiers and Lasers: Fiber or Waveguide — Room 5

Recent improvements in fiber manufacturing have enabled demonstrations of broad-bandwidth signal amplification, frequency conversion and phase conjugation by four-wave mixing in highly-nonlinear and micro-structured fibers. Other applications, such as amplitude and phase regeneration, sampling and switching, have also been demonstrated. A panel of leading researchers will review where the parametric-device community is, and discuss where it needs to go and how it should get there. The workshop will include time for a discussion, between the panel and the attendees, of future directions for fiber-based optical signal processing.

### **OMB — Ultimate High Spectral Efficiency: Towards the Shannon Limit**

**Organizers:** Michel Joindot<sup>1</sup>, Robert Tkach<sup>2</sup>, Hoon Kim<sup>3</sup>; <sup>1</sup>*ENSSAT, France*, <sup>2</sup>*Alcatel-Lucent, USA*, <sup>3</sup>*Samsung Electronics, Republic of Korea*.

Category 6. Digital Transmission Systems — Room 6B

Following the path of radio some decades ago, today, research in optical communications is actively investigating “advanced” modulation formats, with the objective of increasing the spectral efficiency. This workshop will examine the most recent results, how they can be potentially and practically applicable, and what can be expected in the future. In addition to experimental results the workshop will consider the ultimate limits, imposed by information theory, taking into account the specific properties of the optical channel as compared to the classical radio channel in terms of capacity limits, system complexity, and optimization of the modulation constellations.

### **[OMC — Optical/Wireless Integration for Enhanced Broadband Access and Transmission](#)**

**Organizers:** Steve Weistein<sup>1</sup>, Ting Wang<sup>2</sup>, Hussein Mouftah<sup>3</sup>, Sudhir Dixit<sup>4</sup>, Chunming Qiao<sup>5</sup>; <sup>1</sup>*CTTC Services, USA*, <sup>2</sup>*NEC Labs, USA*, <sup>3</sup>*Univ. of Ottawa, Canada*, <sup>4</sup>*Nokia Res., USA*, <sup>5</sup>*SUNY at Buffalo, USA*.

Category 9. Networks — Room 6D

This light technical and business-oriented workshop, consisting of presentations by researchers, developers and network operators coupled with active discussion, addresses the integration of optical and wireless technologies and networks. It will clarify the service benefits and operational savings of a closer integration of wireless and optical systems and subsystems.

The topics include but are not limited to:

- FMC(Fixed-Mobile Convergence), architectures and trends integrating the metropolitan optical network with diverse broadband wireless access systems.
- More effective use of the public optical network as the backbone for cellular mobile, WiMAX and other wireless systems.
- IMS (IP multimedia subsystems), including QoS (quality of service) continuity between wireless and optical segments.
- Wireless systems combined with PON (passive optical network) for greater broadband access service flexibility and reliability.
- Network elements integrating radio, optical, and routing functions.
- Minimizing investment and operational costs through closer optical/wireless integration.
- "Radio-over-fiber" technologies and systems.
- Modulation technologies (such as OFDM) used in both wireless and optical subsystems, and other enabling technologies.

Speakers include:

**Convergence of Broadband Optical and Wireless Access Networks**, *G. K Chang; Georgia Tech, USA*

**Radio-over-Multimode Fibre Networks**, *Ton Koonen; Eindhoven Univ. of Technology, Netherlands*

**Transport of Wireless Bandwidth over Ethernet Networks**, *Tod Sizer; Alcatel-Lucent, USA*

**Optical Network Technologies for Converged Broadband Fixed and Mobile Services**, *Masatoshi Suzuki; KDDI R&D Labs, Japan*

**Next Generation PON System for Access Service Integration**, *Akio Tajima; NEC Japan, Japan*

**Verizon's Optical Network Strategy**, *Willaim Uliasz; Verizon, USA*

## **OMD — All-Optical Signal Processing and Conditioning**

**Organizers:** Benjamin J. Eggleton<sup>1</sup>, Jürg Leuthold<sup>2</sup>; <sup>1</sup>*Univ. of Sydney, Australia*, <sup>2</sup>*Karlsruhe Univ., Germany*.

Category 3. Signal Measurement, Distortion Compensation Devices and Sensors — Room 6E

This workshop will review state-of-the art all-optical signal processing technologies and address current research trends in the field of nonlinear optics. The workshop covers both second and third order nonlinear effects with an emphasis on technologies to implement these materials in novel devices for use in high-speed optical communication systems. The workshop will consist of three sessions dealing with different aspects of nonlinear all-optical signal processing technologies:

- Platforms for nonlinear devices;
- Novel material physics; and
- Applications

The first session will focus on the different platforms that have been developed, e.g. HNLF, PCF, Silicon, PPLN, Chalcogenide and SOA and will attempt to develop Figures of Merit that

characterizes the key performance aspects of these different platforms. The second session will consider the key physical processes underpinning these different nonlinear platforms, specifically the role and impact of free-carriers in semiconductors, two-photon absorptive effects and will discuss phase matched and non-phase matched processes. Finally, the third session will consider the emerging applications in high speed optical communication systems and will attempt to establish a roadmap that connects the materials and platforms discussed in the earlier sessions with the applications, examples being optical regeneration, wave-length conversion, optical performance monitoring, optical switching and routing and optical logic.

## **OME — Can Optical Packet Switching Solve the Bottleneck Problem in Electronic Routers?**

**Organizers:** Ken Ichi Kitayama<sup>1</sup>, Keren Bergman<sup>2</sup>; <sup>1</sup>*Osaka Univ., Japan*, <sup>2</sup>*Columbia Univ., USA*.  
Category 7. Transmission Subsystems and Network Elements — Room 6F

There are growing concerns that throughput bottlenecks and the ever-increasing power consumption/footprint in electronic routers will eventually limit network capacity. Optical packet switching (OPS), in which optical packets are buffered and forwarded in optical form, and optical burst switching (OBS), in which buffers are completely eliminated, may provide solutions to this “electronic bottleneck.” This workshop will feature invited talks from different sectors to present views on outstanding issues in OPS and OBS, including; (i) capabilities, limitations, and future prospects of electronic routers, (ii) how far optical technologies such as optical interconnects, optical switching, and optical buffering can penetrate into electronic router architectures, (iii) new approaches to optical buffering, and (iv) whether OPS and OBS can be scaled up to realistic sizes.

## **OMF — Device Requirements for Advanced Modulation Formats**

**Organizers:** Charles Joyner<sup>1</sup>, Paul Morton<sup>2</sup>; <sup>1</sup>*Infinera, USA*, <sup>2</sup>*Morton Photonics, USA*.  
Category 5. Optoelectronic Devices — Room 7

Advanced modulation formats provide increased communication capacity and transmission distance, and are increasingly being used in experimental and deployed systems. This workshop will investigate methods for encoding and decoding data with amplitude, phase, and frequency; comparing maximum data rate, overall capacity and transmission distance. Candidates for comparison include: RZ, NRZ, duo-binary, DQPSK, PM-QPSK and coherent transmission. Systems expert speakers are encouraged to choose and defend methods that have the highest theoretical information capacity x distance product, with a practical implementation strategy. Device designers will speak on the relative difficulties of producing the more complex transmitters and receivers required for these advanced modulation formats. Following presentations, a panel discussion will highlight tradeoffs between performance, complexity and overall system cost for the various modulation formats.

[NMA — Options for Optical Networks Routing Protocols Now and in the Future](#)

**Organizers:** Jim Jones<sup>1</sup>, Monica Lazer<sup>2</sup>; <sup>1</sup>*Alcatel, USA*, <sup>2</sup>*AT&T, USA*.  
NFOEC A. Optical Networks and Services — Room 8

A critical component in the optical control plane is development and testing of mature, interoperable routing protocols. This workshop will review the following topics:

- Technical requirements and high-level architecture for optical network routing.
- Progress of standards definition and interoperability trials:
  - ITU-T has defined requirements and architecture for routing in Automatically Switched Optical Networks (ASON)
  - IETF has defined extensions for ASON routing and has ongoing work for Path Computation Entity (PCE) and wavelength routing
  - Optical Internetworking Forum (OIF) has conducted multi-vendor interoperability trials which has demonstrated optical routing protocols
- Overview of multi-vendor interoperability tests and lessons learned.
- Examples of carrier deployments of multi-domain routing.

This workshop will explore the current state and future direction of optical routing protocols.

Speakers include:

[Greg Bernstein](#), *Grotto Networking*

[Angela Chiu](#), *AT&T Labs*

[Wataru Imajuku](#), *NTT Network Innovation Labs*

[Lyndon Ong](#), *Ciena*

[Jonathan Sadler](#), *Tellabs*

[Mike Soulakis](#), *Alcatel-Lucent*

**NFOEC panel sessions** provide interactive discussions focused on topics of interest to the industry.

## **NTuA — FTTX towards Gb/s per Subscriber**

**Organizer:** William C. Uliasz; *Verizon, USA*.

NFOEC B. Network Technologies — Tuesday, February 26, 2:00 p.m. - 4:00 p.m., Room 8

The deployment of FTTX based fiber access is growing rapidly and users are starting to request more bandwidth, richer applications and more control over the network they subscribe to. Broadcast video, interactive gaming, streaming video, and an ever increasing number of HDTV channels are accelerating the bandwidth requirements a distribution system must deliver. The recently ratified G984.5 contains options for adding wavelengths that would co-exist with the current GPON architecture. In addition, other technologies are being developed or optimized to improve network performance, simplify equipment installation, and reduce costs. This panel will examine industry trends and technology advancements relating to G-PON, 10G-PON and WDM-PON systems. Many real world issues faced in building a carrier access network will be discussed.

## **NWB — IPTV and Video Deployment Architectures and Implementations**

**Organizer:** Zouheir Mansourati; *Telus, Canada.*

NFOEC A. Optical Networks and Services — Wednesday, February 27, 8:00 a.m. - 10:00 p.m.,  
Room 9

While circumstances of various incumbent service providers may differ, their goals for IPTV and video are the same: minimizing total cost of ownership and ensuring that current deployments are scalable enough to satisfy the bandwidth requirements of future applications. In this session, we will explore the strategies and tactics followed by various service providers in the architecture and implementation of their current or future IPTV and Video deployments with emphasis on the following topics:

- Market conditions: triple or quadruple play, Brownfield or Greenfield;
- Services: HDTV, PVR, nPVR, and VoD;
- Architectures: switched or broadcast; multicast or unicast;
- Access infrastructure: FTTx, xDSL, or combination thereof;

Panel members will share their own experience and draw the lessons they learned from recent deployments.

Speakers include:

Joe Huggins; *Director, Access and Transport Technology Management, Qwest Communications, USA*

Tim Fell; *Director, Broadband Services Development TELUS Communications Inc., USA*

Jeff Weber; *AT&T, USA*

Patrick Case; *RealPage, Inc., USA*