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**ATTENDEE PROGRAM**

# OFC

The future of optical networking
and communications

**TECHNICAL CONFERENCE**
11 – 15 March 2018

**EXHIBITION**
13 – 15 March 2018

San Diego, California, USA

**ofcconference.org**

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IEEE ComSoc IEEE Communications Society

IEEE photonics Society

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## location

San Diego Convention Center
111 West Harbor Drive
San Diego, California 92101 USA

## 2018 dates

**10 January**
Conference Program Online

**12 February**
Advance Registration Deadline
(23:59 EST)

**15 February**
Hotel Reservation Deadline

**7 March**
Postdeadline Paper Submission Deadline

**11 – 15 March**
Technical Conference

**11 – 12 March**
Short Courses

**13 – 15 March**
Exhibit and Show Floor Programs

## support

### general information
+1.202.416.1907
+1.800.766.4672
custserv@osa.org

### customer service
+1.855.326.8341
+1.224.563.3121
OFC@compusystems.com

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+1.800.465.9101
+1.240.439.2949
OFC@experient-inc.com

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## DEAR COLLEAGUES,

The largest optical communications conference in the world, OFC, is being held in San Diego this year. It's a conference you cannot afford to miss! OFC is more than just fiber optics. It has in-depth coverage of photonic integrated circuits, optical networking, digital-signal processing, ASICs, free-space optical communications, quantum optics and more. Whether you are in the academic or the commercial community, at OFC you will have the opportunity to listen, learn, collaborate, take a course, see new products, meet with colleagues and vendors, conduct business, see the state-of-the-art and glimpse into the future of optical communications.

OFC is the only global conference that truly represents the entire ecosystem, from research to the marketplace and paints a complete picture of the industry — where it is today and where it is going tomorrow in terms of research, technologies and product solutions. Get the most up-to-the-minute, in-depth research results in your topic area in technical sessions, or explore other areas of interest in tutorials or Short Courses — all presented by internationally recognized experts. You can see how current research may impact the future of your work and generate new ideas and solutions to your current and future problems. In addition you can get a view of the competitive landscape to see what others are doing, what drives their solutions, and how they may be different from your own.

Perhaps the biggest value of OFC is the face-to-face interactions and the connections you make. Whether you talk to the experts, catch up with former colleagues, establish new relationships or find new vendors or customers, these personal interactions are invaluable; and you can make them all at one place in just 5 days.

Join us in San Diego for OFC 2018 to gain the knowledge and connections you need to stay competitive.

**See you there!**

## GENERAL CHAIRS

**Martin Birk**
*AT&T Labs, USA*

**Xiang Liu**
*FutureWei Technologies, Inc., USA*

**David J. Richardson**
*University of Southampton, UK*

## PROGRAM CHAIRS

**Robert D. Doverspike**
*Network Evolution Strategies LLC, USA*

**Daniel Kuchta**
*IBM TJ Watson Research Center, USA*

**William Shieh**
*University of Melbourne, Australia*

# it's here

**OFC 2018 is the year's premier event in telecom and data communications.**

In fact, it's the world's largest conference and exhibition for optical communication and networking professionals.

OFC draws nearly 15,000 business and technology leaders from 65 countries from around the world, who come seeking the future direction of the industry, from the latest research and developments to the newest technologies.

## get the latest advancements at OFC

**OFC brings together the people, products and information that drive optical networking and communications.**

The program is comprehensive — from research to marketplace, from components to systems and networks, from technical sessions to the exhibition.

The peer-reviewed technical conference features more than 120 invited speakers, the thought leaders in the industry who present the highlights of emerging technologies. The technical program includes special symposia, the open platform summit, one-hour in-depth tutorials, interactive workshops, panels and the stimulating rump session.

You can also take a Short Course and learn from the experts about important topics in the industry — there are over 50 to choose from at a variety of educational levels.

The show floor is buzzing with new product announcements and what's trending in the market. Over 700 exhibitors keep you current on all the latest products and innovative solutions. Three theaters feature Market Watch, The Network Operator Summit and over 20 programs covering the state-of-the-industry and hot topics.

Hear from leading industry groups on standards work, implementation agreements and technical recommendations that are defining new approaches and building solutions that incorporate emerging technologies. Hear from such groups as COBO, Ethernet Alliance, IEEE, OIF, ON2020, TIP and others.

## CONFERENCE HIGHLIGHTS

- **520+ Peer-reviewed Technical Presentations**
  Get all your education needs met under one roof
- **120+ Invited Experts in the Field**
  Hear the leaders in the industry
- **700+ Exhibits**
  Attend the world's largest optical networking and communications show
- **15,000 Attendees**
  Gain unparalleled networking opportunities
- **Postdeadline Sessions**
  Keep current with up-to-the-minute research
- **Show Floor Programs**
  Presentations by industry for industry on market trends and standards

## TRENDING TOPICS

- Advanced devices and fibers for high-speed data center links
- Enabling 5G and IoT through next-generation optical access
- Manufacturing and packaging of photonic and electronic subsystems
- Multiplexing, transmission and switching techniques for Tb/s networks
- New network architectures and applications enabled by SDN and NFV
- Open hardware and software platforms for cloud scale networks
- Optical wireless and visible light communications
- Silicon and integrated photonics for datacom and telecom

# schedule

Note the new schedule for 2018 to plan your travel accordingly. All workshops will be held on Sunday, with technical sessions starting Monday morning. The Postdeadline Paper Session will be held from 16:30 to 18:30 on Thursday.

All times reflect Pacific Time Zone.

| | SUNDAY, 11 MARCH | MONDAY, 12 MARCH | TUESDAY, 13 MARCH | WEDNESDAY, 14 MARCH | THURSDAY, 15 MARCH |
|---|---|---|---|---|---|
| **GENERAL** | | | | | |
| Registration | 08:00 – 19:30 | 07:30 – 18:00 | 07:00 – 19:00 | 07:30 – 17:00 | 07:30 – 17:00 |
| **PROGRAMMING** | | | | | |
| Short Courses | 09:00 – 20:00 | 08:30 – 17:30 | | | |
| Workshops | 12:30 – 18:30 | | | | |
| Lab Automation Hackathon | 20:00 – 22:00 | | | | |
| Technical Sessions | | 08:00 – 18:30 | 14:00 – 18:30 | 08:00 – 18:30 | 08:00 – 16:00 |
| Plenary | | | 08:00 – 10:00 | | |
| Rump Session | | | 19:30 – 21:30 | | |
| Poster Session | | | | 10:30 – 12:30 | 10:30 – 12:30 |
| Postdeadline Papers | | | | | 16:30 – 18:30 |
| **EXHIBITION & SHOW FLOOR ACTIVITIES** | | | | | |
| Exhibition and Show Floor | | | 10:00 – 17:00 | 10:00 – 17:00 | 10:00 – 16:00 |
| Unopposed Exhibit-Only Time | | | 10:00 – 14:00 | 12:30 – 14:00 | 12:30 – 14:00 |
| Expo Theater I<br>Market Watch<br>Network Operator Summit | | | 10:30 – 16:00 | 15:30 – 17:00<br>10:30 – 15:00 | 10:30 – 14:00 |
| Expo Theater II & III | | | 10:15 – 17:00 | 10:15 – 17:00 | 10:15 – 16:00 |
| OFC Career Zone Kiosks | 08:00 – 19:30 | 07:30 – 18:00 | 07:30 – 19:00 | 07:00 – 17:00 | 07:30 – 17:00 |
| OFC Career Zone Live | | | 10:00 – 17:00 | 10:00 – 17:00 | 10:00 – 16:00 |
| **SPECIAL EVENTS** | | | | | |
| Conference Reception | | | 18:30 – 20:00 | | |
| Awards Ceremony and Luncheon (add'l fee) | | | 12:00 – 14:00 | | |

# short course schedule

| SUNDAY, 11 MARCH | | |
|---|---|---|
| **09:00 – 12:00** | SC177 | High-speed Semiconductor Lasers and Modulators |
| | SC328 | New Developments in High-speed Optical Networking: OTN beyond 100G, 100G/200G/400G Ethernet, Flex Ethernet |
| | SC444 | Optical Communication Technologies for 5G Wireless |
| | SC447 | The Life Cycle of an Optical Network: From Planning to Decommissioning |
| | SC463 | Optical Transport SDN: Architectures, Applications and Actual Implementations [NEW] |
| **09:00 – 13:00** | SC105 | Modulation Formats and Receiver Concepts for Optical Transmission Systems |
| | SC384 | Background Concepts of Optical Communication Systems |
| | SC395 | Modeling and System Impact of Optical Transmitter and Receiver Components |
| | SC454 | [Hands-on] Introduction to Silicon Photonics Circuit Design |
| | SC461 | High-capacity Data Center Interconnects [NEW] |
| **13:00 – 16:00** | SC216 | An Introduction to Optical Network Design and Planning |
| | SC429 | Introduction to Flexible Photonic Networks |
| | SC433 | Introduction to Photodetectors and Optical Receivers |
| | SC462 | Introduction to Pluggable Optics [NEW] |
| **13:00 – 17:00** | SC203 | 100 Gb/s and Beyond Transmission Systems, Design and Design Trade-offs |
| | SC325 | Highly Integrated Monolithic Photonic Integrated Circuits |
| | SC369 | Test and Measurement for Metro and Long-haul Communications |
| **13:30 – 17:30** | SC267 | Silicon Microphotonics: Technology Elements and the Roadmap to Implementation |
| | SC327 | Modeling and Design of Fiber-optic Communication Systems |
| | SC393 | Digital Signal Processing for Coherent Optical Systems |
| | SC450 | Design, Manufacturing, and Packaging of Opto-electronic Modules |
| **17:00 – 20:00** | SC205 | Integrated Electronic Circuits for Fiber Optics |
| | SC217 | Optical Fiber Based Solutions for Next Generation Mobile Networks |
| | SC408 | SDM Based Fiber-optic Transmission Systems |
| | SC451 | Optical Fiber Sensors |

| MONDAY, 12 MARCH | | |
|---|---|---|
| **08:30 – 12:30** | SC102 | WDM in Long-haul Transmission Systems |
| | SC114 | Passive Optical Networks (PONs) Technologies |
| | SC178 | Test and Measurement for Data Center/Short Reach Communications |
| | SC443 | Optical Amplifiers: From Fundamental Principles to Technology Trends |
| | SC446 | [Hands-on] Characterization of Coherent Opto-electronic Subsystems |
| | SC452 | FPGA Programming for Optical Subsystem Prototyping |
| | SC453A | [Hands-on] Fiber Optic Handling, Measurements and Component Testing |
| | SC460 | Digital Coherent Optical System Basics: Transceiver Technology and Performance [NEW] |
| **09:00 – 12:00** | SC176 | Metro Network Evolution |
| | SC359 | Datacenter Networking 101 |
| | SC390 | Introduction to Forward Error Correction |
| | SC411 | Multi-layer Interaction in the Age of Agile Optical Networking |
| | SC428 | Link Design for Short Reach Optical Interconnects |
| | SC442 | Free Space Switching Systems: PXC and WSS |
| | SC448 | Software Defined Networking for Optical Networks: a Practical Introduction |
| | SC459 | SDM Components and Devices [NEW] |
| | SC465 | Transmission Fiber and Cables [NEW] |
| **13:30 – 16:30** | SC208 | Optical Fiber Design for Telecommunications and Specialty Applications |
| | SC261 | ROADM Technologies and Network Applications |
| | SC385 | Optical Interconnects for Extreme-scale Computing |
| | SC431 | Photonic Technologies in the Data Center |
| | SC445 | Visible Light Communications — the High Bandwidth Alternative to WiFi |
| | SC464 | SDN Inside and In Between Data Centers [NEW] |
| **13:30 – 17:30** | SC160 | Microwave Photonics |
| | SC341 | Multi-carrier Modulation: DMT, OFDM and Superchannels |
| | SC347 | Reliability and Qualification of Fiber-optic Components |
| | SC432 | [Hands-on] Silicon Photonics Component Design & Fabrication |
| | SC449 | [Hands-on] An Introduction to Writing Transport SDN Applications |
| | SC453B | [Hands-on] Fiber Optic Handling, Measurements and Component Testing |

# plenary speakers

**MARCUS WELDON**

*President, Nokia Bell Labs, USA*

Marcus Weldon is considered one of the luminaries in the industry in terms of the clarity, depth and breadth of his vision for the future of networks. He has championed many technological disruptions in telecommunications networks, from the evolution and convergence of networks to "all IP," the evolution of copper-based access networks to support sophisticated interference cancellation (so-called vectoring), the evolution of wireless networks to highly-distributed networks of small cells and the emergence of virtualization and Software Defined Networking as profound industry changing forces that will drive a new integrated and federated network architecture and economics.

**JOHN C. DOYLE**

*Jean-Lou Chameau Professor of Control and Dynamical Systems, Electrical Engineering and BioEngineering, California Institute of Technology (Caltech), USA*

John Doyle's research is on mathematical foundations for complex networks with applications in biology, technology, medicine, ecology, neuroscience and multiscale physics that integrate theory from control, computation, communication, optimization and statistics (e.g. Machine Learning). The emphasis is on universal laws and architectures, robustness/efficiency and speed/accuracy tradeoffs, adaptability, and evolvability and large scale systems with sparse, saturating, delayed, quantized, uncertain sensing, communications, computing and actuation.

**CHENGLIANG ZHANG**

*Vice President, China Telecom Beijing Research Institute, China*

Chengliang Zhang is Vice President of China Telecom Co Ltd Beijing Research Institute and Deputy Director of the China Communications Society Optical Communication Committee and is in charge of optical communication R&D in China Telecom. He has won two National Science and Technology Progress Awards of China as the leader scientist. He has also won more than 10 other major awards in China and contributed in the society both technically and economically. In 2006 the Ministry of Information Industry of China honored Mr. Zhang as "advanced researcher of information industry technology innovation". In 2013 he became an expert in the National Expert Talents Project, and was awarded the "outstanding young experts" honorary title.

# special sessions

## SYMPOSIA

### Network Management Evolution to Streaming Analytics and Cognitive Systems

ORGANIZERS
Loukas Paraschis, *Infinera, USA*
Vijay Vusirikala, *Google, USA*

In this symposium, senior architects of network operations, engineering and development teams will debate the most important characteristics, and true value of network analytics, telemetry and cognitive systems in next generation network management and mediation. Such software innovations have become increasingly important for next-generation transport networks, both packet and optical. The symposium will particularly aim to explore these topics:

- What are the key enabling technology and system innovations, and remaining limitations towards this new generation of network management and mediation for wireline transport based on streaming telemetry and network analytics? What is the current reality, and true future potential of cognitive systems?
- What are the key similarities and differences in network analytics and cognitive systems between routing and optical transport?

### Future Photonic Devices and Materials for Optical Communications

ORGANIZERS
Steven Koester, *University of Minnesota, USA*
Gunther Roelkens, *Ghent University, Belgium*
Yoichi Taira, *Keio University, Japan*

This symposium focuses on emerging photonic devices and materials for the next generation of optical communications. Topics will include 2D-, magneto-optic- and meta-materials, photonic neurons, QKD, topological photonics, entanglement, plasmonics and optomechanical resonators.

### Challenges 5G Brings to Optical Fiber Communications Systems

ORGANIZERS
Phillipe Chanclou, *Orange Labs, France*
Gee-Kung Chang, *Georgia Institute of Technology, USA*
Theodore Sizer, *Nokia Bell Labs, USA*

This symposium presents key 5G drivers and system requirements that will create market opportunities for optical fiber communications and photonic networking systems. The first session focuses on an overview of the requirements of various applications and ecosystems in 5G new radio era and the challenges that they place on the optical network solutions. The second session illustrates key optical technologies that can be developed to meet the 5G vision and goals.

## RUMP SESSION

The rump session encourages audience debate presenting opposing points of view. Session organizers open with short introductory presentations, followed by one-slide presentations from opposing points of view, followed by audience participation with organizers facilitating open discussion.

### When Will Coherent Replace Direct Detection in the Data Center?

ORGANIZER
Chris Cole, *Finisar Corporation, USA*

Coherent has now replaced IMDD (Intensity Modulated Direct Detection) in long reach transmission, regional and metro applications. Coherent vs. IMDD for 20km, 40km and 80km links at 100G and 400G is the subject of intense industry debate including in standards bodies and tough competition in the marketplace. Will the trend continue, and when if ever will Coherent replace IMDD for 500m, 1km and 2km data center links? The rump session will cover the pros and cons of each in terms of power consumption, cost, latency and more.

## SPECIAL PROGRAMS

### Lab Automation Hackathon

ORGANIZERS
Nick Fontaine, *Nokia Bell Labs, USA*
Binbin Guan, *Acacia Communications, USA*
Jochen Schroeder, *Chalmers University of Technology, Sweden*

In this hackathon several researchers with 10+ years of experience of lab automation will show you the power of using Python to quickly get a lab experiment running and display the measurements in a browser. You will learn from companies that work in photonics how they take advantage of Python to create easy interfaces to their software and hardware. Bring a laptop to participate in the exercise.

## OPEN PLATFORM SUMMIT

ORGANIZERS
Ilya Baldin, *RENCI/UNC Chapel Hill, USA*
Ramon Casellas, *CTTC, Spain*
Loukas Paraschis, *Infinera, USA*
Noboru Yoshikane, *KDDI Research, Japan*

**Session I: Open Platforms for Optical Innovation**
In the first session of the Open Platform Summit, invited speakers provide an overview of key frameworks, architectures and projects within the trend of using open hardware and software platforms for designing, deploying and operating large-scale networks and complex commercial environments, showcasing the benefits behind the concepts of Software Defined Networking (SDN) and Network Functions Virtualization (NFV).

**Session II: SDN/NFV Demo Zone**
The Demo Zone provides the opportunity to see live demonstrations and prototypes of collaborative research projects, pre-commercial products and proof-of-concept implementations in the SDN and NFV space.

### Connected OFCITY Challenge 2018: Lighting Up the Emerging World

ORGANIZERS
Inder Monga, *ESNet, USA*
Marco Ruffini, *Trinity College Dublin, Ireland*
Jun Shan Wey, *ZTE, USA*

Alibaba and Google will collaboratively take on the challenge to develop communications infrastructure and services based on requirements defined by CSquared and Network Startup Resource Center (NSRC), to address the pressing needs for two cities in a fast developing area in East Africa.

The scenarios will provide a realistic insight into the major issues faced by the communications industry in the region, which include network reliability, environmental restrictions, limited funds, regulatory issues and more.


# technical program

**Presenting more than 120 invited speakers.**

OFC features peer-reviewed technical sessions, workshops, tutorials and Short Courses in 16 topic categories.

The comprehensive program covers the technological breakthroughs and all the important topics in the field today.

## tracks and topic categories

OFC features an exciting roster of invited speakers and tutorial speakers to anchor the technical sessions. These experts have been carefully chosen by subcommittees of over 150 volunteers representing the 16 topic categories. They have also put together a thought-provoking program of 10 interactive workshops designed to stimulate debate and discussion on time-critical topics highly important in the field today. Short Courses provide training from a distinguished faculty to expand your knowledge and advance your career.

The technical program and Short Courses are organized by topic category.

# TRACK D
# Devices, Optical Components and Fiber

## D1: ADVANCES IN DEPLOYABLE OPTICAL COMPONENTS, FIBERS AND FIELD INSTALLATION EQUIPMENT

### INVITED SPEAKERS

**SOA for Future PONs**
Rene Bonk, *Nokia Bell Labs, Germany*

**Traffic Engineering and Topology Programming**
Monia Ghobadi, *Microsoft, USA*

**25G Based PON Technology**
Ed Harstead, *Nokia, USA*

**Ultra-high-density MCF Connector Technology**
Tetsu Morishima, *Sumitomo Electric Industries, Ltd., Japan*

**Pizzabox Transponders Deployment in the Field and Related Issues**
Giuseppe Rizzelli, *Facebook, UK*

**High Performance InP PIC Technology Development Based on a Generic Photonic Integration Foundry**
Francisco Soares, *Fraunhofer Inst Nachricht Henrich-Hertz, Germany*

**VCSEL-based Optical Transcievers for Future Data Center Applications**
Jim Tatum, *Finisar Corporation, USA*

**Revolutionizing the Data Centers and HPCs — Optical Interconnects**
Tolga Tekin, *Fraunhofer IZM, Germany*

### WORKSHOP

**Can Undersea System Designs be Truly "Open" and Independent from Initial Terminal Equipment Selections?**
ORGANIZERS
Herve Fevrier, *Facebook, USA*
Dmitri Foursa, *TE Subcom, USA*
Lara Garrett, *TE Subcom, USA*

### PANELS

**Near Term, Large Scale Fiber Deployments for Evolving Networks**
ORGANIZERS
Jing Li, *Yangtze Optical Fibre and Cable, China*
Alan McCurdy, OFS, *Fiber Design & Simulation Group, USA*
Danny Peterson, *Verizon, USA*

**400G Optics for Hyperscale Data Centers**
ORGANIZERS
Kenneth Jackson, *Sumitomo Electric, USA*
Xiaoxia Wu, *Juniper, USA*

### SHORT COURSES

**SC178 – Test and Measurement for Data Center/Short Reach Communications**
Greg D. Le Cheminant, *Keysight Technologies, USA*

**SC208 – Optical Fiber Design for Telecommunications and Specialty Applications**
David J. DiGiovanni, *OFS Labs, USA*

**SC347 – Reliability and Qualification of Fiber-Optic Components**
David Maack, *Corning, USA*

**SC450 – Design, Manufacturing and Packaging of Opto-electronic Modules**
Twan Korthorst, *PhoeniX Software, Netherlands*
Arne Leinse, *LioniX, Netherlands*
Peter O'Brien, *Tyndall National Institute, Ireland*
Kevin Williams, *Eindhoven University of Technology, Netherlands*

**SC453A and B – [Hands-on] Fiber Optic Handling, Measurements and Component Testing**
Steve Baldo, *Seikoh Giken, USA*
Keith Foord, *Greenlee Communications, USA*
Chris Heisler, *OptoTest Corporation, USA*
Steve Lane and Julien Maille, *Data-Pixel, France*

## D2: PASSIVE OPTICAL DEVICES FOR SWITCHING AND FILTERING

### INVITED SPEAKERS

**3 Micron Silicon Photonics**
Timo Aalto, *VTT Technical Research Centre of Finland, Finland*

**Large-scale Silicon Photonic Switches**
Eric Bernier, *Huawei Technologies R&D, Canada*

**Fast, High-radix Silicon Photonic Switches**
Tao Chu, *Zhejiang University, China*

**In-line Optical Amplification for Silicon Photonics Platform by Flip-Chip Bonded InP-SOAs**
Takeshi Matsumoto, *Fujitsu Laboratories Ltd., Japan*

**Photonic Integration for Quantum Communications**
Shayan Mookherjea, *University of California San Diego, USA*

**Low-loss Silicon Photonic Switch Module Technology and its Application to Transponder Aggregators in Optical Network Nodes**
Shigeru Nakamura, *NEC Corporation, Japan*

**Packaging and Assembly Challenges for 50G Silicon Photonics Interposers**
Brad Snyder, *IMEC, Belgium*

### WORKSHOP

**Will Optical Switching Drive Data Center Design in 2028?**
ORGANIZERS
Haoshuo Chen, *Nokia Bell Labs, USA*
Piero Gambini, *STMicroelectronics, Italy*
Richard Jensen, *Polatis, USA*

### TUTORIALS

**Photonic Switch Fabrics in Computer Communications Systems**
Benjamin Lee, *IBM TJ Watson Research Center, USA*

**Optimized Switching of Wavelength and Space Dimensions in SDM**
Dan Marom, *Hebrew University of Jerusalem, Israel*

### SHORT COURSES

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

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

**SC325 – Highly Integrated Monolithic Photonic Integrated Circuits**
Chris Doerr, *Acacia Communications, USA*

**SC384 – Background Concepts of Optical Communication Systems**
Alan Willner, *University of Southern California, USA*

**SC432 – [Hands-on] Silicon Photonics Component Design & Fabrication**
Loukas Chrostowski, *University of British Columbia, Canada*

**SC442 – Free Space Switching Systems: PXC and WSS**
David Neilson, *Nokia Bell Labs, USA*

## D3: ACTIVE OPTICAL DEVICES AND PHOTONIC INTEGRATED CIRCUITS

### INVITED SPEAKERS

**Optical Transceivers Using Heterogeneous Integration on Silicon**
Gregory Fish, *Juniper Networks Inc., USA*

**Heterogeneously Integrated III-V Lasers Fabricated Using Epitaxial Growth on an InP/SiO2/Si Substrate**
Takuro Fujii, *NTT Device Technology Laboratories, Japan*

**Nanoscale Optical Modulators: Application Drivers and Recent Developments**
Gordon Keeler, *Sandia National Labs, USA*

**Integrated Ferroelectric BaTiO3/ Si Plasmonic Modulator Operated Beyond 100 Gbit/s**
Andreas Messner, *ETH Zurich, Switzerland*

**Highly Efficient Silicon Photonics Phase Modulator using Graphene**
Marco Romagnoli, *CNIT, Italy*

**High-efficiency, Low-loss Optical Phase Modulator Based On III-V/Si Hybrid MOS Capacitor**
Mitsuru Takenaka, *University of Tokyo, Japan*

**Silicon Photonics for 56G NRZ Optical Interconnects**
Joris Van Campenhout, *IMEC, Belgium*

**DAC-less and DSP-free Transmitters Using Silicon Photonic EAMs For 100 Gb/s Optical Interconnects**
Jochem Verbist, *Ghent University — IMEC, Belgium*

### TUTORIALS

**Coherent Optics in Si Photonics**
Chris Doerr, *Acacia Communications, USA*

**Ultra-high-speed Optical-cavity-enhanced DMLs**
Johan Richard Schatz, *KTH Royal Institute of Technology, Sweden*

### SHORT COURSES

**SC177 – High-speed Semiconductor Lasers and Modulators**
John Bowers, *University of California at Santa Barbara, USA*

**SC205 – Integrated Electronic Circuits for Fiber Optics**
Y. K. Chen, *Nokia Bell Labs, USA*

**SC267 – Silicon Microphotonics: Technology Elements and the Roadmap to Implementation**
Lionel Kimmerling, *MIT, USA*

**SC325 – Highly Integrated Monolithic Photonic Integrated Circuits**
Chris Doerr, *Acacia Communications, USA*

**SC384 – Background Concepts of Optical Communication Systems**
Alan Willner, *University of Southern California, USA*

**SC428 – Link Design for Short Reach Optical Interconnects**
Petar Pepeljugoski, *IBM Research, USA*

**SC431 – Photonic Technologies in the Data Center**
Clint Schow, *University of California, USA*

**SC433 – Introduction to Photodetectors and Optical Receivers**
Joe Campbell, *University of Virginia, USA*

**SC442 – Free Space Switching Systems: PXC and WSS**
David Neilson, *Nokia Bell Labs, USA*

**SC443 – Optical Amplifiers: From Fundamental Principles to Technology Trends**
Shu Namiki, *National Institute of Advanced Industrial Science and Technology (AIST), Japan*
Michael Vasilyev, *University of Texas at Arlington, USA*

**SC454 – [Hands on] Introduction to Silicon Photonics Circuit Design**
Wim Bogaerts, *University of Gent, Belgium*

**SC459 – SDM Components and Devices [NEW]**
Nicolas Fontaine, *Nokia Bell Labs, USA*

## D4: FIBER AND PROPAGATION PHYSICS

### INVITED SPEAKERS

**Few-mode and Multicore Amplifiers for SDM Transmissions**
Laurent Bigot, *Universite de Lille 1, France*

**Universal Fibers for Both Single-mode and Multimode Transmissions in Data Centers**
Xi Chen, *Corning Research & Development Corp, USA*

**Recent Progress and Outlook on Multicore Fiber for Practical Use**
Tomohiro Gonda, *Furukawa Electric, Japan*

**Requirements For Simulation-Aided Design Of SDM Systems**
Igor Koltchanov, *VPIphotonics, Germany*

**Recent Advances on MMFs for WDM and MDM**
Denis Molin, *PRYSMIANGROUP, USA*

**Outlook on In-fiber Silicon Photonics**
Anna Peacock, *University of Southampton, UK*

**Exploiting Angular Momentum of Light for Optical Communication**
Siddharth Ramachandran, *Boston University, USA*

**Ultra-low-loss Silica-core Optical Fiber**
Yoshiaki Tamura, *sumitomo electric industry, Japan*

### TUTORIAL

**Nonlinearity of Optical Fibers**
Govind Agrawal, *University of Rochester, USA*

### SHORT COURSES

**SC205 – Integrated Electronic Circuits for Fiber Optics**
Y. K. Chen, *Nokia Bell Labs, USA*

**SC208 – Optical Fiber Design for Telecommunications and Specialty Applications**
David J. DiGiovanni, *OFS Labs, USA*

**SC347 – Reliability and Qualification of Fiber-Optic Components**
David Maack, *Corning, USA*

**SC408 – SDM Based Fiber-optic Transmission Systems**
Roland Ryf, *Nokia Bell Labs, USA*

**SC465 – Transmission Fiber and Cables [NEW]**
Michael Ellwanger and Chris Towery, *Corning Optical Communications, USA*

## D5: FIBER-OPTIC AND WAVEGUIDE DEVICES AND SENSORS

### INVITED SPEAKERS

**Applications of Multimode Fibers for Spectroscopy and Polarization Control**
Hui Cao, *Yale University, USA*

**From Spider Webs To A Biomimetic Optical Fibre Sensor**
Kenny Hey Tow, *EPFL, Switzerland*

**Ultra-large Mode Area Fibers for High Power Lasers**
Cesar Jauregui, *Friedrich-Schiller-Universität Jena, Germany*

**Enabling Technologies for Space Division Multiplexed Systems**
Yong-min Jung, *Optoelectronics Research Centre (ORC), UK*

**Image Transmission through Multi-mode Fibers**
Demetri Psaltis, *Ecole Polytechnique Federale de Lausanne, Switzerland*

**Multi-material and Multi-functional Optical Fibers**
Fabien Sorin, *Ecole Polytechnique Fédérale de Lausanne, Switzerland*

**Improving Distributed Sensing with Continuous Gratings in Single and Multi-core Fibers**
Paul Westbrook, *OFS Laboratories, USA*

### WORKSHOP

**When Will We Need to Scale the Fiber Capacity? What is the Most Realistic Approach?**
ORGANIZERS
Cristian Antonelli, *Università dell 'Aquila, Italy*
Takemi Hasegawa, *Sumitomo, Japan*
Ming-Jun Lin, *Corning, USA*
Antonio Napoli, *Coriant, Germany*

### TUTORIAL

**Optical Amplification in Extended Wavelength Windows**
Mikhail Melkumov, *Russian Academy of Sciences, Russia*

### SHORT COURSES

**SC451 Optical Fiber Sensors**
Zuyuan He, *Shanghai Jiao Tong University, China*
William Shroyer, *SageRider, Inc., USA*

**SC453A and B [Hands-on] Fiber Optic Handling, Measurements and Component Testing**
Steve Baldo, *Seikoh Giken, USA*
Keith Foord, *Greenlee Communications, USA*
Chris Heisler, *OptoTest Corporation, USA*
Steve Lane, *Data-Pixel, France*
Julien Maille, *Data-Pixel, France*

## TRACK S
## Systems and Subsystems

### S1: ADVANCES IN DEPLOYABLE SUBSYSTEMS AND SYSTEMS

### INVITED SPEAKERS

**Margin Requirement of Disaggregating the DWDM Transport System and its Consequence on Application Economics**
Michel Belanger, *Ciena/Nortel, Canada*

**Novel OSNR Measurement Techniques for Coherent-detection Systems**
Daniel Gariepy, *EXFO, Canada*

**Advances in 400 GbE Field Trials**
Lynn Nelson, *AT&T Labs, USA*

**Power Efficient DSP and Optical Integration**
Timo Pfau, *Acacia Communications, Inc., USA*

**Open Transport Infrastructure (TIP)**
Ihab Tarazi, *Equinix, USA*

**High-capacity SDM Transmission over Transoceanic Distances: Problems and Solutions**
Alex Turukhin, *TE SubCom, USA*

**Deployed Systems for Quantum Communications**
Qiang Zhang, *USTC, China*

### TUTORIAL

**Enabling Technologies for Fiber Nonlinearity Mitigation in High Capacity Transmission Systems**
Olga Vassilieva, *Fujitsu Laboratories of America Inc, USA*

### SHORT COURSES

**SC114 – Passive Optical Networks (PONs) Technologies**
Yuanqiu Luo, *Futurewei Technologies, Huawei R&D, USA*

**SC178 – Test and Measurement for Data Center/Short Reach Communications**
Greg D. Le Cheminant, *Keysight Technologies, USA*

**SC203 – 100 Gb/s and Beyond Transmission Systems, Design and Design Trade-offs**
Martin Birk, *AT&T Labs, USA*
Benny Mikkelsen, *Acacia Communications, USA*

**SC328 – New Developments in High-speed Optical Networking**
Stephen Trowbridge, *Nokia Bell Labs, USA*

**SC369 – Test and Measurement for Metro and Long-haul Communications**
Michael Koenigsmann and Bernd Nebendahl, *Keysight, Germany*

**SC384 – Background Concepts of Optical Communication Systems**
Alan Willner, *University of Southern California, USA*

**SC428 – Link Design for Short Reach Optical Interconnects**
Petar Pepeljugoski, *IBM Research, USA*

**SC429 – Introduction to Flexible Photonic Networks**
David Boertjes, *Ciena, Canada*

**SC442 – Free Space Switching Systems: PXC and WSS**
David Neilson, *Nokia Bell Labs, USA*

**SC462 – Introduction to Pluggable Optics [NEW]**
Robert Blum, *Intel, USA*
Sharon Hall, *Oclaro, USA*

### S2: OPTICAL, PHOTONIC AND MICROWAVE PHOTONIC SUBSYSTEMS

### INVITED SPEAKERS

**Intelligent Remote Sensing Systems Based on Microwave Photonic Technologies**
Antonella Bogoni, *CNIT, Italy*

**Nanophotonic Technology for Chip-based Quantum Light Sources**
Marcelo Davanco, *National Inst of Standards & Technology, USA*

**Injection-locked Homodyne Detection for Higher-order QAM Transmission**
Keisuke Kasai, *Tohoku University, Japan*

**Large-scale Optical Circuit Switch Architecture for Intra-Datacenter Networking**
Yojiro Mori, *Nagoya University, Japan*

**Silicon-based Brillouin Photonics and its Optical Signal Processing Applications**
Peter Rakich, *Yale University, USA*

**On-chip Quantum Optical Frequency Comb Sources**
Christian Reimer, *INRS-EMT, Canada*

**Towards Practical Implementation of Optical Parametric Amplifiers Based on PPLN Waveguides**
Takeshi Umeki, *NTT, Japan*

### WORKSHOP

**Optical Integration beyond Silicon Photonics: Why, What and How? (S2)**
ORGANIZERS
Daniel Blumenthal, *University of California, Santa Barbara, USA*
Benjamin Eggleton, *University of Sydney, Australia*
Leif Oxenløwe, *DTU, Denmark*

### TUTORIALS

**Fundamentals and Applications of Optical Parametric Amplifiers**
Peter Andrekson, *Chalmers Tekniska Hogskola, Sweden*

**All-optical Signal Processing Techniques for Flexible Networks**
Alan Willner, *University of Southern California, USA*

### SHORT COURSES

**SC114 – Passive Optical Networks (PONs) Technologies**
Yuanqiu Luo, *Futurewei Technologies, Huawei R&D, USA*

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

**SC442 – Free Space Switching Systems: PXC and WSS**
David Neilson, *Nokia Bell Labs, USA*

**SC443 – Optical Amplifiers: From Fundamental Principles to Technology Trends**
Shu Namiki, *National Institute of Advanced Industrial Science and Technology (AIST), Japan*
Michael Vasilyev, *University of Texas at Arlington, USA*

**SC446 – [Hands-on] Characterization of Coherent Opto-electronic Subsystems**
Robert Palmer and Harald Rohde, *Elenion, Germany*

## S3: RADIO-OVER-FIBER, FREE SPACE OPTICS AND SENSING SYSTEMS

### INVITED SPEAKERS

**Power-efficient Noise-insensitive Optical Modulation for High-sensitivity Laser Communications**
David Caplan, *MIT Lincoln Lab, USA*

**Research to Field Trial, an RoF Journey**
Thavamaran Kanesan, *TM Research & Development, Malaysia*

**RoF-based Optical Fronthaul Technology for 5G and Beyond**
Hoon Kim, *KAIST, South Korea*

**Fast Photonics-based 60 GHz Beam-steering**
Juerg Leuthold, *ETH Zurich, Switzerland*

**Optical-based Underwater Communications**
Hai-Han Lu, *National Taipei University of Technology, Taiwan*

**Use Cases for Optical Wireless Communication**
Dominic Schulz, *Fraunhofer Heinrich Hertz Institute, Germany*

**RoF-based mm-wave Links for High-speed Trains**
Pham Tien Dat, *National Institute of Information and Communication Technology, Japan*

### TUTORIAL

**Microwave Photonic Systems for Sensing Applications**
Dalma Novak, *Pharad, USA*

### SHORT COURSES

**SC160 – Microwave Photonics**
Vince Urick, *DARPA, USA*

**SC217 – Optical Fiber Based Solutions for Next Generation Mobile Networks**
Dalma Novak, *Pharad, LLC., USA*

**SC445 – Visible Light Communications — the High Bandwidth Alternative to WiFi**
Harald Haas, *LiFi Research and Development Centre, The University of Edinburgh, UK*

## S4: DIGITAL AND ELECTRONIC SUBSYSTEMS

### INVITED SPEAKERS

**Entropy Loading for Band-limited Meshed-optical-networks: The Multicarrier Advantage**
Di Che, *University of Melbourne, Australia*

**Optical Performance Monitoring in Fiber-Optic Networks Enabled by Machine Learning Techniques**
Faisal Khan, *The Hong Kong Polytechnic University, Hong Kong*

**DSP-Free Coherent Receivers for Data Center Links**
Jose Paulo Krause Perin, *Stanford University, USA*

**Coded Modulation for Next-generation Optical Communications**
David Millar, *Mitsubishi Electric Research Labs, USA*

**A Comparative Study Of Technology Options For Next Generation Intra- And Inter-Data Center Interconnects**
Mohamed Morsy-Osman, *McGill University, Canada*

**DSP Technologies for 100Gbaud-class Transceivers**
Masanori Nakamura, *NTT Network Innovation Laboratories, Japan*

### WORKSHOP

**DSP for Short Reach and Client Optics — What Makes Sense?**
ORGANIZERS
André Richter, *VPIphotonics, Germany*
Rene Schmogrow, *Google, USA*
Benn Thomsen, *Microsoft, UK*

### TUTORIALS

**On Joint Design of Probabilistic Shaping and Forward Error Correction for Optical Systems**
Georg Böcherer, *Technical University of Munich, Germany*

**Scaling and Enabling Technologies for Large Scale Integration for Next Gen SDM Systems**
Peter Winzer, *Nokia Bell Labs, USA*

### SHORT COURSES

**SC105 – Modulation Formats and Receiver Concepts for Optical Transmission Systems**
Xi Vivian Chen and Peter Winzer, *Nokia Bell Labs, USA*

**SC205 – Integrated Electronic Circuits for Fiber Optics**
Y. K. Chen, *Nokia Bell Labs, USA*

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

**SC341 – Multi-carrier modulation: DMT, OFDM and Superchannels**
Sander L. Jansen, *ADVA Optical Networking, Germany*
Dirk van den Borne, *Juniper Networks, Germany*

**SC390 – Introduction to Forward Error Correction**
Frank Kschischang, *University of Toronto, Canada*

**SC393 – Digital Signal Processing for Coherent Optical Systems**
Chris Fludger, *Cisco Optical GmbH, Germany*

**SC446 – [Hands-on] Characterization of Coherent Opto-electronic Subsystems**
Robert Palmer and Harald Rohde, *Elenion, Germany*

**SC452 – FGPA Programming for Optical Subsystem Prototyping**
Noriaki Kaneda, *Nokia Bell Labs, USA*
Laurent Schmalen, *Nokia Bell Labs, Germany*

## S5: DIGITAL TRANSMISSION SYSTEMS

### INVITED SPEAKERS

**Balancing Probabillistic Shaping and FEC for Optimal System Performance**
Junho Cho, *Nokia Bell Labs, USA*

**ADC & DAC — Technology Trends and Steps to Overcome Current Limitations**
Tomislav Drenski, *socionext, UK*

**The Kramers-Kronig Receiver**
Antonio Mecozzi, *University of L'Aquila, Italy*

**Secure Transmission Using QAM Quantum Noise Stream Cipher with Continuous-variable QKD**
Masataka Nakazawa, *Tohoku University, Japan*

**Digital Pre-compensation Techniques Enabling Cost-efficient High-order Modulation Formats Transmission**
Dan Sadot, *Ben Gurion University of the Negev, Israel*

**Probabilistic Constellation Shaping: Challenges and Opportunities for Forward Error Correction**
Laurent Schmalen, *Nokia Bell Labs, Germany*

**Learning from the Optical Spectrum: Applications for Soft-failure Localization**
Luis Velasco, *Universitat Politecnica de Catalunya, Spain*

### WORKSHOP

**Field Trials: Is it Make or Break for Innovative Technologies?**
ORGANIZERS
S. Chandrasekhar, *Nokia Bell Labs, USA*
Robert Killey, *University College London, UK*

### TUTORIALS

**Flexible Transponders and the Rate/Reach Trade-off**
Gabriella Bosco, *Politecnico di Torino, Italy*

**Equalization for Combating the Effects of Nonlinear Noise in Long-haul Transmission: Limits and Prospects**
Mark Shtaif, *Tel-Aviv University, Israel*

### SHORT COURSES

**SC102 – WDM in Long-haul Transmission Systems**
Neal S. Bergano, *TE Subcom, USA*

**SC203 – 100 Gb/s and Beyond Transmission Systems, Design and Design Trade-offs**
Martin Birk, *AT&T Labs, Res., USA*
Benny Mikkelsen, *Acacia Communications, USA*

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

**SC327 – Modeling and Design of Fiber-optic Communication Systems**
Rene-Jean Essiambre, *Nokia Bell Labs, USA*

**SC341 – Multi-carrier Modulation: DMT, OFDM and Superchannels**
Sander L. Jansen, *ADVA Optical Networking, USA*
Dirk van den Borne, *Juniper Networks, Germany*

**SC384 – Background Concepts of Optical Communication Systems**
Alan Willner, *University of Southern California, USA*

**SC393 – Digital Signal Processing for Coherent Optical Systems**
Chris Fludger, *Cisco Optical GmbH, Germany*

**SC395 – Modeling and System Impact of Optical Transmitter and Receiver Components**
Robert Palmer and Harald Rohde, *Elenion, Germany*

**SC408 – SDM Based Fiber-optic Transmission Systems**
Roland Ryf, *Nokia Bell Labs, USA*

**SC429 – Introduction to Flexible Photonic Networks**
David Boertjes, *Ciena, Canada*

**SC460 – Digital Coherent Optical System Basics: Transceiver Technology and Performance [NEW]**
John Cartledge, *Queen's University, Kingston, Ontario, Canada*
Maurice O'Sullivan, *Ciena, Canada*

# TRACK N
# Networks, Applications and Access

## N1: ADVANCES IN DEPLOYABLE NETWORKS AND THEIR APPLICATIONS

### INVITED SPEAKERS

**Scenarios and Economic Analysis of Fronthaul**
Andrea Di Giglio, *Telecom Italia Lab, Italy*

**Submarine Cables: Deployment, Evolution and Perspectives**
Stephen Grubb, *Facebook Inc., USA*

**Extension of SDN Networks to the Satellite Domain: Integration of an SDN Enabled WAN Network, with Terrestrial and Submarine Elements, with Command and Control of Multiple Satellite Constellations**
Robert Kimball, *Ciena Corporation, USA*

**Present and Future Optical Technology Deployments in Facebook's Terrestrial Networks**
Gaya Nagarajan, *Facebook, USA*

**Design Of Submarine "Open" Cables**
Pascal Pecci, *ASN, France*

**Benefits of Performance Awareness in Coherent Dynamic Optical Networks**
Juraj Slovak, *Coriant, Germany*

### TUTORIALS

**Content Distribution Networks and their Impact on Optical Networks**
Jeff Bower, *Akamai Physics, Inc., USA*

**Edge Compute and At&T'S Pon Deployment Vision**
Edward Walter, *AT&T, USA*

### PANELS

**Flexible Grid Deployments**

ORGANIZER

Dave Boertjes, *Ciena Corp., Canada*

**2020 Network Vision 5G and Optical Networking**

ORGANIZERS

Gee-Kung Chang, *Georgia Inst. of Technology, USA*
Doug Freimuth, *IBM Almaden Research Center, USA*
Christina Lim, *University of Melbourne, Australia*
Rod Waterhouse, *Pharad, LLC, USA*

### SHORT COURSES

**SC176 – Metro Network Evolution**

Loudon Blair and David Krauss, *Ciena Corp., USA*

**SC216 – An Introduction to Optical Network Design and Planning**

Jane M. Simmons, *Monarch Network Architects, USA*

**SC359 – Datacenter Networking 101**

Hong Liu, *Google, USA*

**SC447 – The Life Cycle of an Optical Network: From Planning to Decommissioning**

Andrew Lord, *BT Labs, BT, UK*

## N2: CONTROL AND MANAGEMENT OF MULTILAYER NETWORKS

### INVITED SPEAKERS

**OpenROADM over ONOS**

Marc De Leenheer, *Open Networking Lab, USA*

**Softwarized, Elastic and Agile Optical Networks for Dynamic Environmental Change and Failure Recovery**

Hiroaki Harai, *National Inst. of Information & Comm Tech, Japan*

**Machine Learning-assisted Management of Virtualized Network**

Michiaki Hayashi, *KDDI Research, Japan*

**Application Aware Multilayer Control and Optimization of Elastic WDM/SDM Switched Optical Networks**

Ioannis Tomkos, *Athens Information Technology Center, Greece*

**Converged Access/Metro Infastructures for 5G services**

Anna Tzanakaki, *University of Athens, Greece*

**Optical Networks Virtualization and Slicing in the 5G Era**

Ricard Vilalta, *CTTC, Spain*

**Software Defined Optical Network from the Perspective of a Software Developer**

Lihua Yuan, *Microsoft Corp, USA*

### WORKSHOP

**AI-Assisted Automated Network Operation: Getting Matured or Not?**

ORGANIZERS

Reza Nejabati, *University of Bristol, UK*
Luis Velasco, *Universitat Politècnica de Catalunya, Spain*
Qunbi Zhuge, *Ciena, USA*

### TUTORIAL

**The Role of Open-source Network Optimization Software in the SDN/NFV World**

Pablo Pavon-Marino, *Universidad Politécnica de Cartagena, Spain*

### SHORT COURSES

**SC411 – Multi-layer Interaction in the Age of Agile Optical Networking**

Ori A. Gerstel, *Sedona Systems, Israel*

**SC429 – Introduction to Flexible Photonic Networks**

David Boertjes, *Ciena, Canada*

**SC448 – SDN for Optical Networks: a Practical Introduction]**

Ramon Casellas, *CTTC, Spain*

**SC449 – [Hands-on] Introduction to Writing Transport of SDN Applications**

Karthik Sethuraman, *NEC Corporation of America, USA*
Ricard Vilalta, *CTTC, Spain*

**SC463 – Optical Transport SDN: Architectures, Applications and Actual Implementations [NEW]**

Achim Autenrieth and Jörg-Peter Elbers, *ADVA Optical Networking SE, Germany*

**SC464 – SDN Inside and In Between Data Centers [NEW]**

David Maltz, *Microsoft, USA*

## N3: NETWORK ARCHITECTURES AND TECHNO-ECONOMICS

### INVITED SPEAKERS

**Design and Deployment of Optical White Box**

Niall Robinson, *ADVA Optical Networking AG, USA*

**"OPEN" and its Impact on Engineering, Design, Operations and Profitability in the Communication Network**

Kirsten Rundberget, *Fujitsu Network Communications Inc, USA*

**Long-term Capacity Planning in Facebook Network**

Yuri Smirnov, *Facebook Inc., USA*

**Data-analytics-based Optical Performance Monitoring Technique for Optical Transport Networks**

Takahito Tanimura, *Fujitsu Laboratories Ltd., Japan*

**Agile Optical Networking: Beyond Filtered Solutions**

Christine Tremblay, *École de Technologie Supérieure, Canada*

**Progress Toward an Open, SDN Controlled Photonic Network**

Kathy Tse, *AT&T Corp, USA*

### WORKSHOP

**Will Cloud-Optical Boxes Change the Way Today's Networks are Deployed?**

ORGANIZERS

Harald Bock, *Coriant, USA*
Andrew Lord, *British Telecom, UK*

### TUTORIALS

**The Software-defined Flexible Optical Network**

António Eira, *Coriant, Portugal*

**Data Analytics and Machine Learning Applied to Transport Layer**

Massimo Tornatore, *Politecnico di Milano, Italy*

### SHORT COURSES

**SC176 – Metro Network Evolution**

Loudon Blair and David Krauss, *Ciena Corp., USA*

**SC216 – An Introduction to Optical Network Design and Planning**

Jane M. Simmons, *Monarch Network Architects, USA*

**SC328 – New Developments in High-speed Optical Networking**

Stephen Trowbridge, *Nokia Bell Labs, USA*

**SC384 – Background Concepts of Optical Communication Systems**

Alan Willner, *University of Southern California, USA*

**SC429 – Introduction to Flexible Photonic Networks**

David Boertjes, *Ciena, Canada*

**SC447 – The Life Cycle of an Optical Network: From Planning to Decommissioning**

Andrew Lord, *BT Labs, BT, UK*

## N4: OPTICAL ACCESS NETWORKS FOR FIXED AND MOBILE SERVICES

### INVITED SPEAKERS

**Flexible Access System Architecture (FASA)**
Kota Asaka, *NTT Photonics Laboratories, Japan*

**Components for High Speed 5G Access**
Helene Debregeas, *III-V Lab, France*

**Low Latency Networks: Future Service Level Use Cases and their Requirements**
Michael Freiberger, *Verizon Communications Inc, USA*

**Bandwidth Extension Techniques for Optical Access**
Christoph Kottke, *Technische Universität Berlin, Germany*

**Recent Progress and Outlook for Coherent PON**
Domanic Lavery, *University College London, UK*

**What Applications are Driving Higher Capacity in Access?**
Phil Miguelez, *Comcast, USA*

**DSP for High-speed Fiber-wireless Convergence**
Huaiyu Zeng, *Futurewei Technologies, USA*

### WORKSHOP

**Ultimate Capacity Limits for TDM/TDMA PON**

ORGANIZERS
Derek Nesset, *Huawei, UK*
Naoki Suzuki, *Mitsubishi Electric, Japan*
Lilin Yi, *Shanghai Jiao Tong University, China*

### TUTORIALS

**Photonic Integrated Circuits for NGPON2 Tunable ONUs**
John O'Carroll, *Eblana Photonics, Ltd., Ireland*

**Edge Compute and At&T'S Pon Deployment Vision**
Edward Walter, *AT&T, USA*

**Mobile Xhaul Evolution: Enabling Tools for a Flexible 5G Xhaul Network**
Yuki Yoshida, *NICT, Japan*

### PANEL

**Is the Lack of Resilience in Access Networks a Potential Showstopper for Future 5G Services?**

ORGANIZERS
Volker Jungnickel, *Fraunhofer HHI, Germany*
Thomas Pfeiffer, *Nokia Bell Labs, USA*

### SHORT COURSES

**SC114 – Passive Optical Networks (PONs) Technologies**
Yuanqiu Luo, *Futurewei Technologies, Huawei R&D, USA*

**SC444 – Optical Communication Technologies for 5G Wireless [NEW]**
Xiang Liu, *Futurewei Technologies, Huawei R&D, USA*

## DSN6: OPTICAL DEVICES, SUBSYSTEMS AND NETWORKS FOR DATACOM AND COMPUTERCOM

### INVITED SPEAKERS

**Open Compute Project Data Centers**
Omar Baldonado, *Facebook Inc., USA*

**Network Traffic Characteristics of Data Centers**
Theophilus Benson, *Duke University, USA*

**Bridging the Last Mile for Optical Switching in Data Centers**
Paolo Costa, *Microsoft Research, UK*

**Role of Standards in Web-Scale Datacenters**
Mark Filer, *Microsoft Corp., USA*

**The ARPA-E ENLITENED Program — Integrated Photonic Technology for Energy-efficient Data Center Networks**
Michael Haney, *Advanced Research Projects Agency-Energy, USA*

**Silicon Photonics and plasmonics towards Network-on-Chip functionalities for disaggregated computing**
Nikos Pleros, *Aristoteleio Panepistimio Thessalonikis, Greece*

**Analog Optical Signaling for Large Scale Radio Telescopes in Harsh Environments**
Jonas Weiss, *IBM, Zurich, Switzerland*

### WORKSHOP

**Electro-optical Integration in a Package. What Technologies and Business Models can Make it Happen?**

ORGANIZERS
Marco Fiorentino, *Hewlett Packard Labs, USA*
Bert Offrein, *IBM Research GmbH, USA*
Samuel Palermo, *Texas A&M University, USA*

### TUTORIAL

**Silicon Photonics For High Performance Interconnection Networks**
Keren Bergman, *Columbia University, USA*

### PANEL

**Machine Learning and SDN: Towards Intelligent Data Centers (DSN6)**

ORGANIZERS
Payman Samadi, *Columbia University, USA*
Dimitra Simeonidou, *University of Bristol, UK*

### SHORT COURSES

**SC178 – Test and Measurement for Data Center/Short Reach Communications**
Greg D. Le Cheminant, *Keysight Technologies, USA*

**SC359 – Datacenter Networking 101**
Hong Liu, *Google, USA*

**SC385 – Optical Interconnects for Extreme-scale Computing**
Keren Bergman, *Columbia University, USA*
John Shalf, *Lawrence Berkeley National Laboratory, USA*

**SC428 – Link Design for Short Reach Optical Interconnects**
Petar Pepeljugoski, *IBM Research, USA*

**SC431 – Photonic Technologies in the Data Center**
Clint Schow, *University of California, USA*

**SC461 – High-capacity Data Center Interconnects**
Sander L. Jansen, *ADVA Optical Networking, Germany*
Dirk van den Borne, *Juniper Networks, Germany*

# new short courses for 2018

**SC459 – Space Division Multiplexing Components and Devices**

**Monday, 12 March, 09:00 - 12:00**

INSTRUCTOR

Nicolas Fontaine, *Nokia Bell Labs, USA*

This course is an introduction into components and devices that enable space-division multiplexing (SDM) over optical fibers supporting multiple spatial modes/cores.

**SC460 – Digital Coherent Optical System Performance Basics: Transceiver Technology and Performance**

**Monday, 12 March, 08:30 - 12:30**

INSTRUCTORS

John Cartledge, *Queen's University, Canada*

Maurice O'Sullivan, *Ciena, Canada*

This course is designed to equip participants with a basic understanding of implemented electric field modulation and coherent detection on two polarizations, and the ability to estimate and compare link performance in practical coherent transmission applications including nonlinear WDM propagation.

**SC461 – High-capacity Data Center Interconnects**

**Sunday, 11 March, 09:00 - 13:00**

INSTRUCTORS

Sander L. Jansen, *ADVA Optical Networking, Germany*

Dirk van den Borne, *Juniper Networks, Germany*

This course gives a broad overview of data center interconnect (DCI) architectures and technology, ranging from short-haul interconnects to metro and to long-haul deployments.

**SC462 – Introduction to Pluggable Optics**

**Sunday, 11 March, 13:00 - 16:00**

INSTRUCTORS

Robert Blum, *Intel, USA*

Sharon Hall, *Oclaro, USA*

This course enables you to better understand the different pluggable optics solutions and form factors ranging from 1Gbps to the latest 400Gbps.

**SC463 – Optical Transport SDN: Architectures, Applications and Actual Implementations**

**Sunday, 11 March, 09:00 - 12:00**

INSTRUCTORS

Achim Autenrieth and Jörg-Peter Elbers, *ADVA Optical Networking SE, Germany*

This course covers practical applications of SDN in optical transport networks. It aims to bridge the gap between pure architectural concepts and real-life implementations.

**SC464 – SDN Inside and In Between Data Centers**

**Monday, 12 March, 13:30 - 16:30**

INSTRUCTOR

David Maltz, *Microsoft, USA*

This course explains each of the layers of the network, from the physical switches and fiber, through the software that runs on the switches, through the Software Defined Networking layers that provide a customizable virtual network. Drawing examples from Microsoft Azure, the course covers how large cloud networks are designed and operate.

**SC465 – Transmission Fiber and Cables**

**Monday, 12 March, 09:00 - 12:00**

INSTRUCTORS

Michael Ellwanger and Chris Towery, *Corning Optical Communications, USA*

This course discusses optical fiber attributes and their importance to network performance, compares the different transmission optical fiber types and their associated ITU-T standards and intended uses and provides an overview on the primary optical cable types and their relevant applications in transmission networks from the LAN to trans-oceanic.


# exhibition

**The world's largest exhibit hall in the industry.**

Over 700 participating companies will showcase solutions to build your competitive edge. See what's new and identify technology must-haves for your business.

Only OFC offers the size and scope to compare and contrast vendors, giving you the information you need to make all your technology purchasing decisions in one place.

In addition to the exhibits, OFC offers educational programs on the show floor covering market trends, new technologies and insight into the future. Hear from industry groups such as COBO, Ethernet Alliance. IEEE, OCP, OIF, ON2020, TIP and more.

# Market Watch

This three-day series of panel discussions engages the latest application topics and business issues in the field of optical communications. Presentations and panel sessions feature esteemed guest speakers from industry, research and the investment community.

N5 NETWORK OPERATOR SUMMIT AND MARKET WATCH SUB-COMMITTEE CHAIR
Frank Chang, *Inphi Corporation, USA*

SPONSORED BY

HUAWEI

**PANEL I**

**State of the Industry — Analyst Panel**

**PANEL II**

**Optical Bearer Technologies for 5G Networks**

**PANEL III**

**Challenges and Solutions for Delivering 400G+ Client and Line Side Optics**

**PANEL IV**

**High Capacity, Long Distance Transport: Innovation vs. Reality**

**PANEL V**

**Software Innovations in the Next-generation Optical Transport**

**PANEL VI**

**IP and Optical Integration: Physical or Control/Management Plane?**

# Network Operator Summit

This dynamic program presents the inside perspective from service providers and network operators — their issues, drivers and how their requirements may impact the future of the industry. Everyone in the supply chain, from equipment manufacturer to components, will want to hear what's next in meeting the needs of service providers.

N5 SERVICE PROVIDER SUMMIT AND MARKET WATCH SUB-COMMITTEE CHAIR
Frank Chang, *Inphi Corporation, USA*

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**KEYNOTE**

**Najam Ahmad, *Vice-President, Network Engineering, Facebook, USA***

**PANEL I**

**The role of "Open Transport" in the new Metro and Inter-Data-Center Architectures**

**PANEL II**

**On the Road to 100G PON (beyond 10G PON)**



# exhibitors

View the floor plan, review company descriptions and find products and vendors of interest. **ofcconference.org/exhibithall**

**Exhibitors as of Oct. 2017**

3M Electronics Materials Solutions Division
AC Photonics, Inc.
Accelink Technologies Co., Ltd. & WTD
AC-UNION Technology Co., Ltd.
Adamant Co., Ltd.
Adolite, Inc.
ADVA Optical Networking
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# registration and travel

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Consider the new schedule for OFC when you plan your travel. All workshops will be held on Sunday from 12:30 to 18:30, with technical sessions starting Monday morning at 08:00. The Postdeadline Paper Session will be held from 16:30 to 18:30 on Thursday.

## registration

| Categories | Full Conference Registration (US$) | Exhibit Pass Plus** (US$) |
|---|---|---|
| **Advance Registration thru 12 February** | | |
| Member * | $665 | $0 |
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| Workshops | • | • |
| Poster Sessions | • | • |
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| Technical Digest (USB Drive) | • | |
| Postdeadline Papers Book | • | |
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** Not for use by technical program presiders, poster presenters or speakers

## SHORT COURSE REGISTRATION

Each Short Course requires a separate registration fee. Register early as each course has limited seating. Last year 85% of courses were sold out prior to the conference, and there will not be a wait list for sold out courses. Tickets are required for admission to Short Courses and for Short Course Notes, which are distributed on-site. Short Course Notes are not available for purchase separately.

Short Course registration also includes admission to the plenary session, exhibit hall, Market Watch, Network Operator Summit, the OFC Career Zone, workshops, poster sessions and Exhibits 2018 Buyers' Guide.

| | Half Day Short Course (US$) | Hands-On Course (US$) | SC432 Hands-On Course (US$) |
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Student members of IEEE/COMSOC, IEEE/Photonics Society and OSA may register for US$ 30 for select Short Courses not yet at capacity after 14 February 2018. New this year, student members will receive a copy of the full color Short Course notes.

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| The Pendry | .3 miles | $259 |
| The Sofia Hotel | .9 miles | Standard $229 SGL<br>Student Only $189 SGL |
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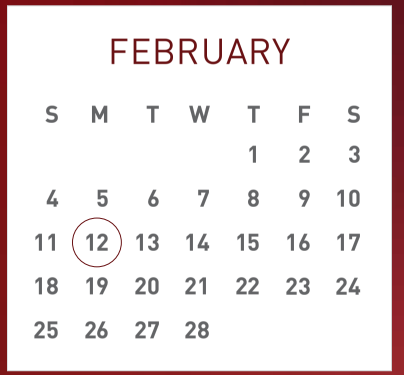


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