OFC

The future of optical networking and communications

TECHNICAL CONFERENCE
3 – 7 March 2019

EXHIBITION
5 – 7 March 2019

San Diego, California, USA

ofcconference.org

Technical Conference

Attend and Immerse Yourself in the Latest Research and Technologies

SPONSORED BY:

IEEE ComSoc IEEE Communications Society

IEEE Photonics Society

OSA The Optical Society | 100 Since 1916

LOCATION

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

DATES

4 February 2019
Advance Registration Deadline
(11:59 EST)

18 February 2019
Hotel Reservation Deadline

3 – 7 March 2019
Technical Conference

3 – 4 March 2019
Short Courses

5 – 7 March 2019
Exhibit and Show Floor Programs

SUPPORT

General information
+1.202.416.1907
+1.800.766.4672
custserv@osa.org

Registration
+1.855.326.8341
+1.244.563.3121
OFC@compusystems.com

Hotel Reservations
+1.800.465.9101
+1.240.439.2949
OFC@experient-inc.com

OFC

2019 CHAIRS

General Chairs

Gabriella Bosco
Politecnico di Torino, Italy

Jörg-Peter Elbers
ADVA Optical Networking SE, Germany

Laurent Schares
IBM TJ Watson Research Center, USA

Program Chairs

Po Dong
Nokia Bell Labs, USA

Junichi Kani
NTT Labs, Japan

Chongjin Xie
Alibaba Group, USA

Dear Colleagues,

The largest optical communications conference in the world, OFC, is the event you cannot afford to miss! OFC is more than just fiber optics. It has in-depth coverage of photonic integrated circuits, optical networking, advanced digital-signal processing, quantum optics, emerging application of optics in 5G, new computing and data center infrastructure and so much more. Whether you are in the academic or the commercial community, OFC gives you 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 – where it is today and where it is going tomorrow in terms of research, technologies and product solutions. From academia to the marketplace, OFC paints a picture of the entire industry. 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 today's 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 to gain the knowledge and connections you need to stay competitive.

See you there!

OFC 2019 Chairs

Get the Latest Advancements

OFC IS THE PREMIER EVENT IN TELECOM AND DATA CENTER OPTICS.

OFC is the world's largest conference and exhibition for optical communication and networking professionals. The program is comprehensive — from research to marketplace, from components to systems and networks and from technical sessions to the exhibition.

Hear the Latest Research

The five-day technical conference features peer-reviewed presentations and more than 120 invited speakers, the thought leaders in the industry presenting the highlights of emerging technologies. Additional technical programming throughout the week includes special symposia, in-depth tutorials, workshops, panels and the thought-provoking rump session.

Take a Training Course

You can also take a Short Course and learn from the experts about important topics in the industry – there are 55 to choose from.

See New Products

The exhibition 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.

Attend Educational Programs

Three show floor theaters feature Market Watch, the Network Operator Summit, the Data Center Summit and 25 other show floor programs that cover market trends, new technologies and insight into the future. Panels of experts from global brands and key industry organizations provide high-level takes on the state of the industry, hot topics and perspectives on current and future challenges and solutions.

Register for OFC

Be part of the event that brings together the people, products and information that drive optical networking and communications.

	Sunday, 3 March	Monday, 4 March	Tuesday, 5 March	Wednesday, 6 March	Thursday, 7 March
GENERAL					
Registration	07:30 – 19:00	07:30 – 18:00	07:00 – 18:30	07:30 – 17:00	07:30 – 16:00
PROGRAMMING					
Short Courses	09:00 – 20:00	08:30 – 17:30			
Workshops	13:00 – 18:30				
Lab Automation Hackathon	20:00 – 22:00				
OFC Demo Zone		13:45 – 16:15			
Open Platform Summit		16:30– 19:00			
Technical Sessions		08:00 – 18:30	14:00 – 18:30	08:00 – 18:30	08:00 – 16:00
Symposia		14:00 – 18:30	14:30 – 18:30	14:00 – 18:30	
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 AND SHOW FLOOR PROGRAMS					
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
Market Watch - Expo Theater 1			10:30 – 16:00	15:30 – 17:00	10:30 – 14:00
Network Operator Summit - Expo Theater I				10:30 – 15:00	
Expo Theater II & III			10:15 – 17:00	10:15 – 17:00	10:15 – 16:00
OFC Career Zone			10:00 – 17:00	10:00 – 17:00	10:00 – 16:00
SPECIAL EVENTS					
Awards Ceremony and Luncheon (additional fee)			12:00 – 14:00		
Conference Reception			18:30 – 20:00		

All times reflect Pacific Time Zone

Plenary Speakers

The plenary speakers at OFC typically include an industrial leader and a research leader, both covering topics related to the technical core of the conference, and a visionary speaker. The third speaker has not been announced yet.

Dmitri Dolgov
Chief Technology Officer, Waymo, USA

From Self-driving Cars to a Vision for Future Mobility

In this presentation, learn how vehicles from Waymo, formerly the Google self-driving car project, use their powerful combination of custom-built sensors and software to safely navigate the roads, how they communicate and how machine learning and artificial intelligence touch every part of Waymo's self-driving system.

Benny P. Mikkelsen
Founder & Chief Technology Officer, Acacia Communications, USA

Tackling Capacity and Density Challenges by Electro-photonic Integration

As the industry moves to higher data rates, co-packaging of photonics and electronics – beginning with analog ASICs, then DSP ASICs, and ultimately switch ASICs – could offer additional improvements in power, density and performance. This talk provides an update and outlook of the challenges and opportunities the industry is facing as we scale to higher data rates and smaller form factor optical interfaces.

Special Sessions

Symposia

Future Photonic Devices and Materials for Optical Communications

ORGANIZERS

Roel Baets, *Ghent University, INTEC and IMEC, Belgium*
Joyce Poon, *University of Toronto, Canada*

This symposium explores the emerging physical technologies that can enable guided-wave and free-space optical communications of the future. Topics to be discussed include multi-material and multi-device integration, phase-change materials, metamaterials, 2D materials, non-planar architectures, devices for quantum information and enabling fabrication approaches.

Photonics for IoT and Sensing: Manufacturing, Packaging and Applications

ORGANIZERS

William Green, *IBM TJ Watson Research Center, USA*
Paul Westbrook, *OFS Labs, USA*
Kevin Williams, *Technische Universiteit Eindhoven, Netherlands*

This symposium focuses on emerging photonic devices for IoT and other sensing applications. Topics may include LIDAR systems using integrated photonics or VCSEL-based 3-D sensors, manufacturing and packaging challenges, photonic integrated circuits based sensors for a wide range of applications and fiber-based and distributed sensor technologies and applications.

Network Automation

ORGANIZERS

Filippo Cugini, *CNIT, Italy*
Josué Kuri, *Google, USA*
Takafumi Tanaka, *NTT Network Innovation Laboratories, Japan*
Szilard Zsigmond, *Nokia Corp., USA*

The goals of this symposium are to clarify network operator requirements for automation as well as to discuss new technologies to evolve networks toward full automation. Topics to be addressed include Zero-touch provisioning and operation, intent-based configuration, streaming telemetry, AI-based monitoring, self-optimization, programmability for end-to-end automation and automation in multi-vendor environments.

5G Trials, Pilots and Demonstrations

ORGANIZERS

Thomas Pfeiffer, *Nokia Bell Labs, Germany*
Dimitra Simeonidou, *University of Bristol, UK*
Jun Terada, *NTT, Japan*
Shan Wey, *ZTE TX, USA*

This symposium provides updates on the latest progress of 5G trials, pilots and demonstrations. It covers use case scenarios involving a wide range of relevant vertical sectors such as mobile broadband access, connected transport, digital health, smart cities/venues and creative media. The session first focuses on 5G requirements and enabling optical technologies and then showcases trials from global network and service providers active in 5G deployments.

Special Sessions

Quantum Technologies and Optical Communications

ORGANIZERS

Eleni Diamanti, *CNRS, France*
Werner Klaus, *National Inst. of Information & Comm. Tech., Japan*
Erwan Pincemin, *Orange Labs, France*

The goal of this special session is to explore and highlight the importance of emerging quantum technologies and the impact they may have on optical communications in the future. The first part of this session covers the recent developments in quantum computing devices. The second part of the session focuses on more on near-term applications using quantum key distribution (QKD) based on encoding various properties of light.

Integrated Photonics for Energy Efficient Datacenters: The ARPA-E ENLITENED Program

ORGANIZERS

Michael Haney, *Advanced Research Projects Agency-Energy, USA*
Alan Liu, *Booz Allen Hamilton, USA*

The ARPA-E ENergy-efficient Light-wave Integrated Technology Enabling Networks that Enhance Datacenters (ENLITENED) program seeks to improve datacenter energy efficiency. This session gives a comprehensive overview of the ENLITENED portfolio.

Open Platform Summit

Will Disaggregation Drive Core Network Deployments in 2025?

ORGANIZERS

Antonio D'Errico, *Ericsson Telecomunicazioni S.P.S., Italy*
Stephen Grubb, *Facebook Inc., USA*
Albert Rafel, *British Telecommunications, UK*

The event is divided in two sessions. In the first session, invited speakers give their views on network disaggregation and how it may drive network deployments in the near future, outlining progress in initiatives such as OpenRoadm, Telecom Infra Project, OpenConfig, and ONF. A discussion will follow addressing the objectives and different strategies leading to the design and deployment of more efficient, more cost-effective, greener and more sustainable network infrastructures, thus achieving a more flexible ICT services evolution in the future.

OSA Demo Zone

The Demo Zone provides the opportunity to see live demonstrations of research projects and proof-of-concept implementations for software functions as well as software tools in the space of optical communication devices, systems and networks.

Rump Session

Does Approaching Shannon Limit Leave Only Device Developments in Optical Communications?

ORGANIZERS

David Plant, *McGill Univ., Canada*
Peter Winzer, *Nokia Bell Labs, USA*

Today single mode fiber capacity is close to its fundamental limit, and most system research is focused on coding and DSP technologies to close just a couple of dB gap to Shannon limit. Although SDM promises a significant increase in fiber capacity, there is still doubt on its real applications.

- Are there research topics in the fiber transmission that can continually scale up the capacity, spectral efficiency or even a new defined parameter?
- On the other hand, the capacity in typical short-reach transmission links is still far off from Shannon limit. How do novel transmission technologies help reduce the cost and energy consumption of these links?

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 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.

Show Floor

KEYNOTE SPEAKERS

NETWORK OPERATOR SUMMIT KEYNOTE

Genia Wilbourn

Vice President of Network & Technology, Wireline Global Operations, Verizon Communication, USA

Genia Wilbourn is Vice President of Wireline Global Operations, leading wholesale and enterprise service delivery and assurance across more than 2,600 cities in 145 countries. Additionally, she leads the operation of all Verizon wireline network technical facilities across the globe. Her team includes Verizon on and offshore provisioning centers along with field forces supporting customer installation and maintenance and global mesh, transport and data networks.

DATA CENTER SUMMIT KEYNOTE

Dave Temkin

Vice President of Networks, Netflix, USA

Reaching 150 million customers across the world, Netflix's backbone and CDN connects studios around the world and delivers over 100 terabits per second of award-winning movies and TV. Dave's teams are responsible for design, deployment, and operations of all elements of networking at Netflix, from script-to-screen.

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.

Panel I

State of the Industry — Analyst Panel

Panel II

Market Projections for Wireline and Wireless Technologies to Support 5G

Panel III

High Capacity Long Distance Optical Transport: Challenges and Business Reality

Panel IV

Optical Fiber Plant Infrastructure — Technologies and Markets

Panel V

What's After 400G Ethernet Inside the Data Center?

Panel VI

Optical Network Management Using Cognitive Systems — Reality or Hype?

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HUAWEI

NETWORK OPERATOR SUMMIT

This dynamic program presents the inside perspective from network operators and service providers – 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 network operators.

Panel I

The Access Network — Next Generation PON, Mobile and Cable Network Upgrades

Panel II

5G Applications and Networks: Real-World Operator Case Studies

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DATA CENTER SUMMIT

The Importance of "Open Transport" DCI Innovations in the Evolution of Metro and Long-haul Optical Networks

This panel will debate the adoption of open transport architectures for Inter-data center; Metro and Long-Haul optical networks. It will cover the main similarities and differences of each and review relevant innovations that enable the "open" optical transport evolution. Panelists include representatives from Alibaba, EU Networks, Facebook, Google and Verizon.

N5 Network Operator Summit and Market Watch Sub-Committee Chair:
Lisa Huff, *Ovum, USA*

Technical Program

Covering Technological Breakthroughs and All the Important Optical Topics in Telecom and Data Centers Today

Trending Topics

- Advanced devices and fibers for high-speed data center links
- Digital signal processing, coding, and advanced modulation for telecom and data center
- Disaggregated systems and networks enabled by open platforms
- Enabling 5G and IoT through next-generation optical access
- Monolithic and hybrid photonic-electronic integrated subsystems
- Network automation and intelligence enabled by streaming analytics and cognitive systems
- New network architectures and applications enabled by SDN and NFV
- Optical wireless and visible light communications
- Silicon and integrated photonics for data centers and telecom

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 15 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. 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 prototypes and product developments of components and subsystems for data centers and optical networks

Invited speakers

InP PIC's Scaleability for Data Center Applications
Boudewijn Docter, *EFFECT Photonics B.V., Netherlands*

Reliable Heterogeneous and Monolithic Integrated Silicon Photonics
Robert Herrick, *Intel Corporation, USA*

Components for Highly Integrated PICs
Gloria Hoefler, *Infinera Corporation, USA*

Evolution of Pluggable Optics and What Is Beyond
Jeffery Maki, *Juniper Networks Inc., USA*

PAM4 System Performance for DCI Applications
Reza Motaghian, *Amazon, USA*

Ultra-high Bandwidth InP IQ Modulator for beyond 100-GBd Transmission
Yoshihiro Ogiso, *NTT Photonics Laboratories, Japan*

Role of Optics in High Performance Computing
John Shalf, *Lawrence Berkeley National Laboratory, USA*

Tunable Laser Drivers for Next Generation PON Networks
Tao Zhang, *Google, USA*

Workshops

Data Center Optics Reliability: Can We Standardize Requirements, and Can They be Relaxed Given Redundancies and <~5-Year Lifetimes?

ORGANIZERS

Long Chen, *Acacia Communications Inc., USA*
Maura Raburn, *Google Inc., USA*
Hanxing Shi, Finisar, USA

Will Coherent Optics Become a Reality for Intra-data Center Applications?

ORGANIZERS

Fred Bucahli, *Nokia Bell Labs, Germany*
Ken Jackson, *Sumitomo Electric Device Innovations, USA*

Tutorials

High Bandwidth Silicon Photonics Systems
Christian Koos, *Karlsruhe Institute of Technology KIT, Germany*

Ultra High-Speed Quantum-well Semiconductor Lasers
Kazuhisa Uomi, *Oclaro Japan Inc., Japan*

Short Courses

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*

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

SC357 Circuits and Equalization Methods for Coherent and Direct Detection Optical Links **[UPDATED]**
Alexander Rylyakov, *Elenion, USA*

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

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

SC428 Link Design and Modeling for Intra Data Center Optical Interconnects
Petar Pepeljugoski, *IBM Research, USA*

SC431 Photonic Technologies in the Data Center
Clint Schow, *University of California at Santa Barbara, USA*

SC450 Design, Manufacturing and Packaging of Opto-electronic Modules
Sylwester Latkowski, *Eindhoven University of Technology, Netherlands*
Arne Leinse, *LioniX International, Netherlands*
Twan Korthorst, *Synopsys, Netherlands*
Peter O'Brien, *Tyndall National Institute, Ireland*

SC462 Introduction to Pluggable Optics
Robert Blum, *Intel, USA*
Sharon Hall, *Oclaro, USA*

D2: Passive optical devices for switching and filtering

Invited Speakers

Tunable Filters in the Evolving Optical Communcation Network
Glenn Bartolini, *II-VI Photonics, USA*

Design, Optimization and Fabrication of Ultra-compact Nanophotonics
Rajesh Menon, *University of Utah, USA*

Photonic Packaging in Europe: The PIXAPP Pilot Line Project
Peter O'Brien, *Tyndall National Institute, Ireland*

Recent Developments in High Radix Optical Switching
Nick Parsons, *HUBER+SUHNER Polatis, Inc, UK*

Silicon Photonic Devices for Optical Switching in Wavelength, Polarization and Mode
Yikai Su, *Shanghai Jiao Tong University, China*

Low-loss, Low-crosstalk Large-Scale Silicon Photonics Switch
Keijiro Suzuki, *Natl. Inst. of Adv. Industrial Sci. & Tech, Japan*

Large Scale Silicon Photonics Switches Based on MEMS Technology
Ming Wu, *University of California Berkeley, USA*

Programmable Photonic Chips, and Signal Processing
Jianping Yao, *University of Ottawa, Canada*

Tutorial

Photonic Switching in Data Centers and Computing Systems
S. J. Ben Yoo, *University of California at Davis, USA*

Workshop

High Noon: Silicon Photonics vs. Rest of the World
Giampiero Contestabile, *Scuola Superiore Sant Anna di Pisa, Italy*
Geert Morthier, *Ghent Univ., Belgium*
Kenya Suzuki, *NTT Device Innovation Center, Japan*

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*

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

SC454 Hands-on: Introduction to Silicon Photonics Circuit Design
Roel Baets, *University of Ghent, Belgium*
Pieter Dumon, *Luceda Photonics, Belgium*

SC473 Photonic Switching Systems **[NEW]**
Benjamin Lee, *IBM, USA*
David Neilson, *Nokia Bell Labs, USA*

D3: Active optical devices and photonic integrated circuits

Invited Speakers

Realities and Challenges of III-V/Si Integration Technologies
John Bowers, *University of California at Santa Barbara, USA*

Large Optical Phase Arrays and Their Applications
Hossein Hashemi, *University of Southern California, USA*

III-V Quantum Dot Lasers Monolithically Grown on Silcion
Huiyun Liu, *University College London, UK*

Silicon Photonic Modulators for High-capacity Coherent Transmissions
Wei Shi, *Universite Laval, Canada*

A Guide for Material and Design Choices for Electro-optic Modulators
Volker Sorger, *George Washington University, USA*

Ultra Stable Comb Lasers
Kerry Vahala, *California Institute of Technology, USA*

Transfer Printing of Passive and Active Components Onto Passive Silicon Photonic ICs
Roel Baets, *Ghent University - INTEC, Belgium*

Tutorials

Optical Frequency Combs: From General Concepts to On-chip and Quantum Perspectives
Christian Reimer, *Harvard University, USA*

Design of Very High Speed InP Modulators
Urban Westergren, *Kungliga Tekniska Hogskolan, Sweden*

Panel

PIC Foundry Commercial Access: Prospects and Challenges

ORGANIZERS

Jeroen Duis, *SMART Photonics B.V., Netherlands*
Dong Pan, *Nano Photonics, USA*

Workshop

Which One Will Succeed in Data Center Applications, Multi-Chip or Monolithic Integrated Optoelectronic Chip?

ORGANIZERS

Dominic Goodwill, *Huawei Technologies R&D, Canada*
Yasuhiro Matsui, *Finisar Corporation, USA*
James (Zhou) Zhiping, *Peking University, China*

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 Kimerling, *MIT, USA*

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

SC357 Circuits and Equalization Methods for Coherent and Direct Detection Optical Links **[UPDATED]**
Alexander Rylyakov, *Elenion, USA*

SC431 Photonic Technologies in the Data Center
Clint Schow, *University of California at Santa Barbara, USA*

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

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

SC454 Hands on: Introduction to Silicon Photonics Circuit Design
Roel Baets, *Ghent University, Belgium*
Pieter Dumon, *Luceda Photonics, Belgium*

D4: Fiber and Propagation Physics

Invited Speakers

Optical Fibers for Short-reach High Density Interconnects
Scott Bickham, *Corning Research & Development Corp, USA*

Dynamic Channels in MDM Systems
Karthik Choutagunta, *Stanford University, USA*

Technical Considerations for Pairing Fiber and Cable
Jon Fitz, *Prysmian Group, USA*

Anti-resonant Bandgap Fibres
Jonathan Knight, *University of Bath, UK*

Progress on SDM Fiber Research in Japan
Kazuhide Nakajima, *Nippon Telegraph & Telephone Corp, Japan*

Impact of Modulation Format on Dynamic Channel Crosstalk Behavior in Multi-core Fibers
Georg Rademacher, *National Inst of Information & Comm Tech, Japan*

Highly Nonlinear Fiber for Optical Parametric Amplifier
Shigehiro Takasaka, *Furukawa Electric, Japan*

Practical Aspects of G.654.E Fibers for Terrestrial Long Haul Transmission
Yoshinori Yamamoto, *Sumitomo Electric Industries Ltd*

Tutorial

Advances in Hollow Optical Fiber Technologies and Applications
Francesco Poletti, *University of Southampton, UK*

Short Courses

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*

SC453A and B Hands-on: Fiber Optic Handling, Measurements and Component Testing
Steve Baldo, *Seikoh Gikken, USA*
Chris Heisler, *OptoTest Corporation, USA*
Steve Lane, *Data-Pixel, France*
Julien Maille, *Seikoh Giken Company, USA*

SC465 Transmission Fiber and Cables
Michael Ellwanger and Chris Towery, *Corning Optical Communications, USA*

D5 Fiber-optic and waveguide devices and sensors

Invited Speakers

Progresses in Submarine Optical Amplifiers
Maxim Bolshtyansky, *TE SubCom, USA*

Silicon Photonic Gas Sensing
William Green, *IBM TJ Watson Research Center, USA*

Reduction in Power Consumption in Multi-core Amplifier
Emmanuel Le Taillandier de Gabory, *NEC Corp., Japan*

New Insights on Modulation Instability in Optical Fibers
Arnaud Mussot, *University Lille 1 Laboratoire PhLAM, France*

Ultrafast Laser Processes for Photonics
Robert Thomson, *Heriot-Watt University, UK*

High Peak Power Mamyshev Oscillators
Frank Wise, *Cornell University, USA*

Tutorial

Technologies that Enable LIGO
Eric Gustafson, *California Institute of Technology, USA*

Panel

Space Photonics: Disruptive Satellite Laser Communications and Astrophotonics

ORGANIZERS

Efstratios Kehayas, *Gooch & Housego, UK*
Sergio Leon-Saval, *Univ. of Sydney, Australia*

Workshop

What is a Real Killer Application of SDM, Telecom or Non-Telecom?

ORGANIZERS

Rodigro Amezcua-Correa, University of Central Florida, *CREOL, USA*

Haoshuo Chen, *Nokia Bell Labs, USA*

Takemi Hasegawa, *Sumitomo Electric Industries Ltd., Japan*

Short Courses

SC208 Optical Fiber Design for Telecommunications and Specialty Applications

David J. DiGiovanni, *OFS Labs, USA*

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 Gikken, USA*

Chris Heisler, *OptoTest Corporation, USA*

Steve Lane, *Data-Pixel, France*

Julien Maille, *Seikoh Giken Company, USA*

SC459 Space Division Multiplexing Components and Devices

Nicolas Fontaine, *Nokia Bell Labs, USA*

TRACK S: SYSTEMS AND SUBSYSTEMS

S1: Digital subsystems and systems for data centers

Invited Speakers

Enabling Technologies for In-router DWDM Interfaces for Intra-data Center Networks

Kevan Jones, *Juniper Networks Inc., Canada*

400G and Beyond: Coherent Evolution to High-capacity Inter-data Center Links

Eric Maniloff, *Ciena Corporation*

Stokes Vector Modulation and Detection with Monolithic InP Photonic Integrated Circuits

Yoshiaki Nakano, *University of Tokyo, Japan*

Beyond 200Gbps per Lane Intensity Modulation Direct Detection (IM/DD) Transmissions for Optical Interconnects: Challenges and Recent Developments

Xiaodan Pang, *Kungliga Tekniska Hogskolan Kista, Sweden*

Energy Consumption Modelling of Coherent Transmission in Data Centres

Rodney Tucker, *University of Melbourne, Australia*

SDM Fibers for Data Center Applications, the Challenges and Future Opportunities

Benyuan Zhu, *OFS Laboratories, USA*

Tutorials

Direct-Detection Technologies for Intra- and Inter-data Center Optical Links
Mathieu Chagnon, *Nokia Bell Labs, Germany*

Short-reach Datacenter Interconnect Systems with Coherent Detection
Radhakrishnan Nagarajan, *Inphi Corporation, USA*

Panel

Beyond 400G for Hyperscale Data Centers

ORGANIZERS

Katharine Schmidtke, *Facebook Inc., USA*
Xiaoxia Wu, *Juniper Networks, Inc., USA*

Short Courses

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

SC203 400 Gb/s and Beyond Transmission Systems, Design and Design Trade-offs
Martin Birk, AT&T Labs, USA
Benny Mikkelsen, *Acacia Communications, USA*

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

SC328 New Developments in High Speed Optical Networking: OTN beyond 100G, 100G/200G/400G Ethernet, Flex Ethernet
Stephen Trowbridge, *Nokia Bell Labs, USA*

SC357 Circuits and Equalization Methods for Coherent and Direct Detection Optical Links **[UPDATED]**
Alexander Rylyakov, *Elenion, USA*

SC428 Link Design and Modeling for Intra Data Center Optical Interconnects
Petar Pepeljugoski, *IBM Research, USA*

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

SC462 Introduction to Pluggable Optics
Robert Blum, *Intel Corp., USA*
Sharon Hall, *Oclaro, USA*

S2: Optical, photonic and microwave photonic subsystems

Invited Speakers

Enhanced Optical Communications Through Joint Time-frequency Multiplexing Strategies
Gabriella Cincotti, *University Roma Tre, Italy*

Optical Real-time Fourier Transformation with Kilohertz Resolutions
Hughes Guillet de Chatellus, *Université Grenoble Alpes, France*

Phase Regeneration of WDM Signals Using Optical Time Lenses
Leif Oxenløwe, *DTU Fotonik, Denmark*

High-speed Waveform Generation and Analysis through Short-pulse Sampling and Dispersion
Chester C.T. Shu, *Chinese University of Hong Kong, Hong Kong*

Nonlinear Fourier Transform for Nonlinear Fibre Channels
Sergei Turitsyn, *Aston University, UK*

Multi-channel All-optical Regeneration
Michael Vasilyev, *University of Texas at Arlington, USA*

Microwave Photonic Subsystems-on-chip
Siva Yegnanarayanan, *MIT Lincoln Lab, USA*

Tutorials

Subsystem Requirements for Photonic Integrated Quantum Information Processing
Saikat Guha, *University of Arizona, USA*

Programmable Integrated Optical Processors: Towards an Optical Heart for Communication Devices
Leimeng Zhuang, *imec, USA*

Panel

Optical and RF Photonic Signal Processing Based on Frequency Combs

ORGANIZERS

Maurizio Burla, *ETH Zurich, Switzerland*
Victor Krozer, *University Frankfurt, Germany*

Workshop

Super DACs and ADCs — To Interleave or not to Interleave
Daniel Blumenthal, *University of California at Santa Barbara, USA*
Robert Elschner, *Fraunhofer Inst Nachricht Henrich-Hertz, Germany*
Takayuki Mizuno, *NTT Network Innovation Laboratories, Japan*

Short Courses

SC160 Microwave Photonics
Vince Urick, *DARPA, 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*

S3: Radio-over-fiber, free space optics and sensing systems

Invited Speakers

Spacecom Links and Integration with Ground 5G Networks
Jose Estaran Tolosa, *Nokia Bell Labs France, France*

Optical Fiber Feeded Focal-plane-array (FPA) Antenna Architectures for 5G Networks
Ulf Johannsen, *Technische Universiteit Eindhoven, Netherlands*

Converging Underwater and FSO Ground Communication Links
Antonio Jurado-Navas, *Universidad de Malaga, Spain*

Photonics-aided Mm-wave Communication for 5G
Xinying Li, *Georgia Institute of Technology, USA*

Optical Wireless Underwater Communication
Boon Ooi, *King Abdullah University of Sci. & Technology, Saudi Arabia*

Microwave Photonics for Optical Sensing
Salvador Sales, *PRL, Universitat Politècnica Valencia, Spain*

Visible Light Communications: From Theory to Industrial Standardization
Murat Uysal, *Özyeğin Universitesi, Turkey*

Tutorial

Terahertz Photonics
Hartmut Roskos, *University Frankfurt am Main, Germany*

Short Courses

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

SC445 Optical Wireless for Mobile Communications
Harald Haas, *LiFi Research and Development Centre, The University of Edinburgh, UK*

S4: Digital and electronic subsystems

Invited Speakers

Partition-based Probabilistic Shaping
Tobias Fehenberger, *Technische Universität Munchen, Germany*

Processing for Nonlinear Fourier Transform-based Transmissions
Alan Pak Tao Lau, *Hong Kong Polytechnic University, Hong Kong*

Non-orthogonal WDM Systems with Faster Than Nyquist Technology
Liangchuan Li, *Huawei Technologies Co Ltd, China*

On the Analysis and Emulation of Nonlinear Component Characteristics
Andre Richter, *VPIphotonics, Germany*

Direct Detection of the Optical Field Beyond Single Polarization Mode
William Shieh, *University of Melbourne, Australia*

Beyond 1 Tb Data Center Interconnect Technology
Xiang Zhou, *Google, USA*

Tutorials

High-speed DAC/ADC and ASIC Technologies
Tomislav Drenski, *Socionext Europe GmbH, Germany*

Optical Injection Locking Based Transceivers for Data Center Communications
Zhixin Liu, *University College London, UK*

Workshops

Optical Experiments and Testing: With or Without FEC?

ORGANIZERS

Alex Alvarado, Eindhoven *Univ. of Technology, Netherlands*
Yi Cai, *ZTE USA Inc., USA*

Will Advanced Direct-detection Systems Ever be the Solution of Choice for Metro and Access Applications?

ORGANIZERS

Cristian Antonelli, *Universita degli Studi dell'Aquila, Italy*
Robert Killey, *University College London, UK*
Lilin Yi, *Shanghai Jiao Tong University, China*

Short Courses

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

SC114 Technologies and Applications for Passive Optical Networks (PONs)
Yuanqiu Luo, *Huawei, USA*

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

SC328 New Developments in High Speed Optical Networking: OTN beyond 100G, 100G/200G/400G Ethernet, Flex Ethernet
Stephen Trowbridge, *Nokia Bell Labs, USA*

SC341 Multi-carrier Modulation and Superchannels for Terabit-class Transceivers **[UPDATED]**
Sander L. Jansen, *ADVA Optical Networking, Germany*
Dirk van den Borne, *Juniper Networks, Germany*

SC357 Circuits and Equalization Methods for Coherent and Direct Detection Optical Links **[UPDATED]**
Alexander Rylyakov, *Elenion, USA*

SC369 Test and Measurement for Signals with Complex Optical Modulation
Michael Koenigsmann and Bernd Nebendahl, *Keysight Technologies, Germany*

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

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

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

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

SC408 Space Division Multiplexing in Optical Fibers
Roland Ryf, *Nokia Bell Labs, USA*

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

SC452 FPGA Programming for Optical Subsystem Prototyping
Noriaki Kaneda, *Nokia Bell Labs, USA*

SC460 Digital Coherent Optical System Performance Basics
John Cartledge, *Queen's University, Canada*
Maurice O'Sullivan, *Ciena, Canada*

SC468 Advanced FEC Techniques for Optical Communications **[NEW]**
Laurent Schmalen, *Nokia Bell Labs, USA*

SC469 Laboratory Automation and Control Using Python **[NEW]**
Nicolas Fontaine, *Nokia Bell Labs, USA*
Binbin Guan, *Acacia Communications, USA*
Jochen Schröder, *Chalmers University of Technology, Sweden*

S5: Digital transmission systems

Invited Speakers

Approaching Shannon Limit with Advanced Modulation and Coding Techniques
Hussam Batshon, *TE SubCom, USA*

Performance and Impairments of Submarine Systems
Dmitri Foursa, *TE SubCom, USA*

Low-complexity Coherent and Direct-detection Transceiver Technologies for Metro, Access and Inter-data Center Applications
Robert Killey, *University College London, UK*

Kramers Kronig Transmission Systems for Next Gen 5G and DCI Transport
Son Le, *Nokia Bell Labs, Germany*

Enabling Technologies for 5G-oriented Optical Networks
Xiang Liu, *Futurewei Technologies, Inc., USA*

Mode-division-multiplexing Systems for High-capacity Optical Transport Network
Yutaka Miyamoto, *NTT Network Innovation Laboratories, Japan*

On Perspectives of Semiconductor Optical Amplifiers in Long-haul WDM Transmission; or Recent Advances in Continuous Band WDM Transmission
Jeremie Renaudier, *N*okia Bell Labs, France

Panel

SDM Technology Solutions for Next Generation Submarine Transmission

ORGANIZERS

Takayuki Mizuno, *NTT Network Innovation Laboratories, Japan*
Lara Garrett, *TE SubCom, USA*

Tutorials

Modeling of Multiple-mode Propagation in Fibers for Space-division Multiplexing
Cristian Antonelli, *Universita degli Studi dell'Aquila, Italy*

Transmission of Flexible High Spectral Efficiency and Noise Tolerant Modulation Formats
Sethumadhavan Chandrasekhar, *Nokia Bell Labs, USA*

Short Courses

SC102 WDM in Long-haul Transmission Systems
Neal S. Bergano, *Retired, USA*

SC203 400 Gb/s and Beyond Transmission Systems, Design and Design Trade-offs
Martin Birk, *AT&T Labs, USA*
Benny Mikkelsen, *Acacia Communications, USA*

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

SC341 Multi-carrier Modulation and Superchannels for Terabit-class Transceivers **[UPDATED]**
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*

SC408 Space Division Multiplexing in Optical Fibers
Roland Ryf, *Nokia Bell Labs, USA*

SC429 Advances in Flexible Photonic Networks and Open Architectures
David Boertjes, *Ciena, Canada*

SC460 Digital Coherent Optical System Performance Basics
John Cartledge, *Queen's University, Canada*
Maurice O'Sullivan, *Ciena, Canada*

SC469 Laboratory Automation and Control Using Python **[NEW]**
Nicolas Fontaine, *Nokia Bell Labs, USA*
Binbin Guan, *Acacia Communications, USA*
Jochen Schröder, *Chalmers University of Technology, Sweden*

SC470 Secure Optical Communications **[NEW]**
Helmut Griesser, *ADVA Optical Networking SE, Germany*
Andrew Shields, *Toshiba Research Europe Ltd., UK*

TRACK N: NETWORKS, APPLICATIONS AND ACCESS

N1: Advances in systems, networks and service developments and field trials in commercial data centers and networks

Invited Speakers

Next Generation Silicon Photonic Interconnect Solutions
Marc Bohn, *Elenion Technologies LLC, USA*

Network Requirements of the Future
Herve Fevrier, *Facebook Inc., USA*

Interoperability and High-capacity Transmission Using Multi-core Fiber with Standard Cladding Diameter
Takashi Matsui, *NTT Access Service Systems Laboratories*

Closer to Shannon
Christian Rasmussen, *Acacia Communications, Inc., USA*

Nonlinear Mitigation Enabling Next Generation High-speed Optical Transport beyond 100G
Kim Roberts, *Ciena Corporation, Canada*

Optical Network Technologies for 5G Mobile Network
Jun Terada, *NTT Access Service Systems Laboratories, Japan*

High-speed Transport and Aggregation for Ethernet Fronthaul with Low and Bounded Delay
Raimena Veisllari, *TransPacket AS, Norway*

Field Trial of Machine-learning-assisted and SDN-based Optical Network Management
Shuangyi Yan, *University of Bristol, UK*

Tutorials

Demystifying Transceiver and Line Characterization Metrics
Loren Berg, *Ciena Corporation, USA*

Open Transport Infrastructure (TIP)
Luis Martin Garcia, *Facebook Inc., UK*

Short Courses

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

SC328 New Developments in High Speed Optical Networking: OTN beyond 100G, 100G/200G/400G Ethernet, Flex Ethernet
Stephen Trowbridge, *Nokia Bell Labs, USA*

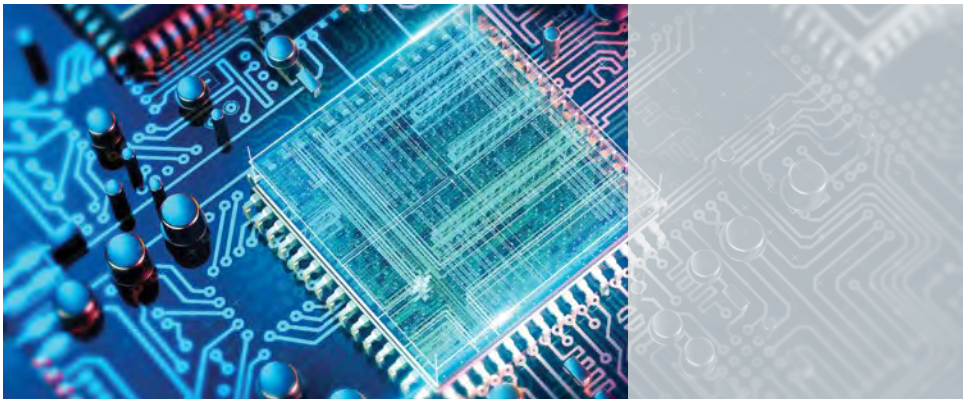
SC429 Advances in Flexible Photonic Networks and Open Architectures
David Boertjes, *Ciena, Canada*

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

SC463 Optical Transport SDN: Architectures, Applications and Actual Implementations
Achim Autenrieth and Jörg-Peter Elbers, *ADVA Optical Networking SE, Germany*

SC464 SDN Inside and In Between Data Centers
David Maltz, *Microsoft, USA*

SC472 Hands-on: Controlling and Monitoring Optical Network Equipment with Netconf/YANG **[NEW]**
Ricard Vilalta, *CTTC, Spain*
Noboru Yoshikane, *KDDI Research, Japan*



N2: Architectures and software-defined control for intra-data center networks

Invited Speakers

Data Models for Optical Devices/ Components in Data Centers
Eric Breverman, *Google, USA*

Slotted Optical Datacenter Network with Sub-wavelength Resource Allocation
Konstantinos (Kostas) Christodoulopoulos, *National Technical University of Athens, Greece*

Top Down Approach in Controlling and Managing Optical DC Networks
Jamie Gaudette, *Microsoft Corp, USA*

Novel Lambda-rich Torus DC Network: From Underlying Principles to Candidate Technologies
Salah Ibrahim, *NTT Device Technology Laboratories, Japan*

Scalable Optical Data Center Networks
William Mellette, *University of California San Diego, USA*

Optical Edge Data Center Network Architecture and Technology for Supporting 5G
Maria Yuang, *National Chiao Tung University, Taiwan*

Predictive Analytics in Hybrid Optical/ Electrical DC Networks
Zuqing Zhu, *Univeristy of Science and Technology of China, China*

Tutorial

Enabling Technologies for Optical Data Center Networks: Spatial Division Multiplexing
Lena Wosinska, *Kungliga Tekniska Hogskolan, Sweden*

Workshops

Opportunities and Challenges for Optical Switching in the Data Center

ORGANIZERS

Paolo Costa, *Microsoft, USA*
Yvan Pointurier, *Nokia Bell Labs, France*
S.J. Ben Yoo, *Univ. of California at Davis, USA*

Short Courses

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

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

SC448 Software Defined Networking for Optical Networks: A Practical Introduction
Ramon Casellas, *CTTC, Spain*

SC464 SDN Inside and In Between Data Centers
David Maltz, *Microsoft, USA*

SC472 Hands-on: Controlling and Monitoring Optical Network Equipment with Netconf/YANG **[NEW]**
Ricard Vilalta, *CTTC, Spain*
Noboru Yoshikane, *KDDI Research, Japan*

N3: Architectures and software-defined control for metro and core networks

Invited Speakers

Joint Optimization of Packet and Optical Layers of a Core Network Using SDN Controller, CD ROADMs and Machine-learning-based Traffic Prediction
Gagan Choudhury, *AT&T Labs*

ONOS-controlled Disaggregated Optical Networks
Alessio Giorgetti, *Scuola Superiore Sant Anna di Pisa, Italy*

Autonomous Network Management and Maintenance Using Artificial Intelligence
Akira Hirano, *NTT Network Innovation Labs, Japan*

White Box Flavors in Carrier Networks
Victor López, *Telefonica R&D, Spain*

Optical Network Design Beyond 100GBaud
João Pedro, *Coriant, Portugal*

Optical Network Control and Management Plane Evolution
Vijay Vusirikala, *Google, USA*

Applications of SDN-enabled Optical Transport Networks and Cloud/Edge Computing Technology
Noboru Yoshikane, *KDDI Research, Japan*

Tutorials

Challenges and Solutions on Supporting Sub-second Restoration in Centralized SDN Control Architectures in L1 Optical Transport Networks
Fred Gruman, *Fujitsu Network Communications Inc., USA*

State of the Art and Best Practices for Optical Network Self-monitoring and Optimization
Marc Lyonnais, *Ciena, Canada*

Panel

Network Infrastructure Virtualization and Network Slicing

ORGANIZERS

Ramon Casellas, *CTTC, Spain*
Vishnu Shukla, *Verizon Communications Inc., USA*

Workshop

Artificial Intelligence for Data Centers Operators and Optical Network Providers - Why and When?

ORGANIZERS

Antonio Napoli, *Infinera, Germany*
Danish Rafique, *ADVA Optical Networking, Germany*
Yawei Yin, *Alibaba Group, China*

Short Courses

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

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

SC328 New Developments in High Speed Optical Networking: OTN beyond 100G, 100G/200G/400G Ethernet, Flex Ethernet
Stephen Trowbridge, *Nokia Bell Labs, USA*

SC429 Advances in Flexible Photonic Networks and Open Architectures
David Boertjes, *Ciena, Canada*

SC448 Software Defined Networking for Optical Networks: A Practical Introduction
Ramon Casellas, *CTTC, Spain*

SC463 Optical Transport SDN: Architectures, Applications and Actual Implementations
Achim Autenrieth and Jörg-Peter Elbers, *ADVA Optical Networking SE, Germany*

SC472 Hands-on: Controlling and Monitoring Optical Network Equipment with Netconf/YANG **[NEW]**
Ricard Vilalta, *CTTC, Spain*
Noboru Yoshikane, *KDDI Research, Japan*

N4: Optical access networks for fixed and mobile services

Invited Speakers

APDs for Future Optical Access Systems beyond 25G
Mohand Achouche, *III-V Lab, France*

Quasi-coherent Detection Techniques for Optical Access
Sezer Erkılınç, *Fraunhofer Heinrich-Hertz Institute, Germany*

Optical Strategies for Economical Next Generation 50 and 100G PON
Vincent Houtsma, *Nokia Bell Labs, USA*

Exploiting General Purpose Hardware in Optical Access Networks
Sangyeup Kim, *NTT Access Service Systems Labs, Japan*

Optical Access Technology for B5G MFH/MBH
Kohsuke Nishimura, *KDDI Research Inc., Japan*

Lessons Learned from NG-PON2 Systems Developments and Deployment
Hal Roberts, *Calix Inc., USA*

Electronic Circuits for High Speed PON beyond 25G
Xin Yin, *Ghent University, INTEC, Belgium*

Tutorials

Photonic Integrated Circuits for NG-PON2 ONU Transceivers
Antonio Teixeira, *DETI, Instituto de Telecomunicacoes, Portugal*

The Outlook for PON Standardization: 2019-2022
Jun Shan Wey, *ZTE USA, Inc., USA*

Short Courses

SC114 Technologies and Applications for Passive Optical Networks (PONs)
Yuanqiu Luo, *Huawei, USA*

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

Short Course Schedule

Sunday, 3 March		
09:00 – 12:00	SC177	High-speed Semiconductor Lasers and Modulators
	SC359	Datacenter Networking 101
	SC444	Optical Communication Technologies for 5G Wireless
	SC460	Digital Coherent Optical System Performance Basics
	SC470	Secure Optical Communications **[NEW]**
09:00 – 13:00	SC105	Modulation Formats and Receiver Concepts for Optical Transmission Systems
	SC328	New Developments in High-speed Optical Networking
	SC341	Multi-carrier Modulation and Superchannels for Terabit-class Transceivers **[UPDATED]**
	SC384	Background Concepts of Optical Communication Systems
	SC395	Modeling and System Impact of Optical Transmitter and Receiver Components
	SC432	Hands-on: Silicon Photonics Component Design & Fabrication
13:00 – 16:00	SC216	An Introduction to Optical Network Design and Planning
	SC431	Photonic Technologies in the Data Center
	SC433	Introduction to Photodetectors and Optical Receivers
	SC459	Space Division Multiplexing Components and Devices
13:00 – 17:00	SC203	400 Gb/s and Beyond Transmission Systems, Design and Design Trade-offs
	SC267	Silicon Microphotonics: Technology Elements and the Roadmap to Implementation
	SC369	Test and Measurement for Signals with Complex Optical Modulation
	SC443	Optical Amplifiers: From Fundamental Principles to Technology Trends
	SC450	Design, Manufacturing and Packaging of Opto-electronic Modules
	SC463	Optical Transport SDN: Architectures, Applications and Actual Implementations
13:30 – 17:30	SC451	Optical Fiber Sensors
	SC452	FPGA Programming for Optical Subsystem Prototyping
17:00 – 20:00	SC205	Integrated Electronic Circuits for Fiber Optics
	SC385	Optical Interconnects for Extreme-scale Data Centers and HPC
	SC390	Introduction to Forward Error Correction
	SC408	Space Division Multiplexing in Optical Fibers
	SC428	Link Design and Modeling for Intra Data Center Optical Interconnects

Monday, 4 March		
08:30 – 12:30	SC102	WDM in Long-haul Transmission Systems
	SC160	Microwave Photonics
	SC178	Test and Measurement for Data Center/Short Reach Communications
	SC357	Circuits and Equalization Methods for Coherent and Direct Detection Optical Links **[UPDATED]**
	SC446	Hands-on: Characterization of Coherent Opto-electronic Subsystems
	SC453A	Hands-on: Fiber Optic Handling, Measurements and Component Testing
	SC454	Hands-on: Introduction to Silicon Photonics Circuit Design
	SC468	Advanced FEC Techniques for Optical Communications **[NEW]**
	SC473	Photonic Switching Systems **[NEW]**
09:00 – 12:00	SC114	Technologies and Applications for Passive Optical Networks (PONs)
	SC261	ROADM Technologies and Network Applications
	SC448	Software Defined Networking for Optical Networks: a Practical Introduction
	SC461	High-capacity Data Center Interconnects
	SC465	Transmission Fiber and Cables
13:30 – 16:30	SC208	Optical Fiber Design for Telecommunications and Specialty Applications
	SC217	Optical Fiber Based Solutions for Next Generation Mobile Networks
	SC325	Highly Integrated Monolithic Photonic Integrated Circuits
	SC429	Advances in Flexible Photonic Networks and Open Architectures
	SC462	Introduction to Pluggable Optics
	SC464	SDN Inside and In Between Data Centers
13:30 – 17:30	SC327	Modeling and Design of Fiber-optic Communication Systems
	SC347	Reliability and Qualification of Fiber-optic Components
	SC393	Digital Signal Processing for Coherent Optical Transceivers
	SC445	Optical Wireless for Mobile Communications
	SC453B	Hands-on: Fiber Optic Handling, Measurements and Component Testing
	SC469	Laboratory Automation and Control Using Python **[NEW]**
	SC472	Hands-on: Controlling and Monitoring Optical Network Equipment with Netconf/YANG **[NEW]**

Short Courses

NEW AND UPDATED FOR 2019

Stay current in your field by taking a Short Course at OFC. Learn from the experts. These half-day Short Courses are a good way to get clear, concise overviews of important topics in optical communications and networking. Hands-on courses provide demonstrations and the opportunity to use optical equipment.

New

SC468 Advanced FEC Techniques for Optical Communications

Monday, 4 March, 08:30 – 12:30

INSTRUCTOR

Laurent Schmalen, *Nokia Bell Labs, USA*

The course provides insights on the selection of FEC schemes for different applications, the design of LDPC-based schemes and the design of hardware-emulators to simulate very low bit error rates.

SC469 Laboratory Automation and Control Using Python

Monday, 4 March, 13:30 – 17:30

INSTRUCTORS

Nicolas Fontaine, *Nokia Bell Labs, USA*
Binbin Guan, *Acacia Communications, USA*
Jochen Schröder, *Chalmers University of Technology, Sweden*

This course provides participants with the tools and knowledge to create sustainable automation of your experiments using the Python programming language.

SC470 Secure Optical Communications

Sunday, 3 March, 09:00 – 12:00

INSTRUCTORS

Helmut Griesser, *ADVA Optical Networking SE, Germany*
Andrew Shields, *Toshiba Research Europe Ltd., UK*

This is an introductory course on encryption for optical networks that explains the basic principles of quantum cryptography and how it can be applied to quantum safe communications.

SC472 Hands-on: Controlling and Monitoring Optical Network Equipment with Netconf/YANG

Monday, 4 March, 13:30 – 17:30

INSTRUCTORS

Ricard Vilalta, *CTTC, Spain*
Noboru Yoshikane, *KDDI Research, Japan*

This course offers an overview and hands-on experience on programming the necessary tools to control and monitor network equipment.

SC473 Photonic Switching Systems

Monday, 4 March, 08:30 – 12:30

INSTRUCTORS

Benjamin Lee, *IBM, USA*
David Neilson, *Nokia Bell Labs, USA*

This course consists of two parts focusing respectively on free-space switching systems with near-term commercial impact and on chip-scale photonic switching systems with potential for future commercial impact.

Updated

SC341 Multi-carrier Modulation and Superchannels for Terabit-class Transceivers

Sunday, 3 March, 09:00 – 13:00

INSTRUCTORS

Sander L. Jansen, *ADVA Optical Networking, Germany*
Dirk van den Borne, *Juniper Networks, Germany*

This course focuses in detail on the use of Superchannels and multi-carrier modulation formats for next-generation optical transport systems.

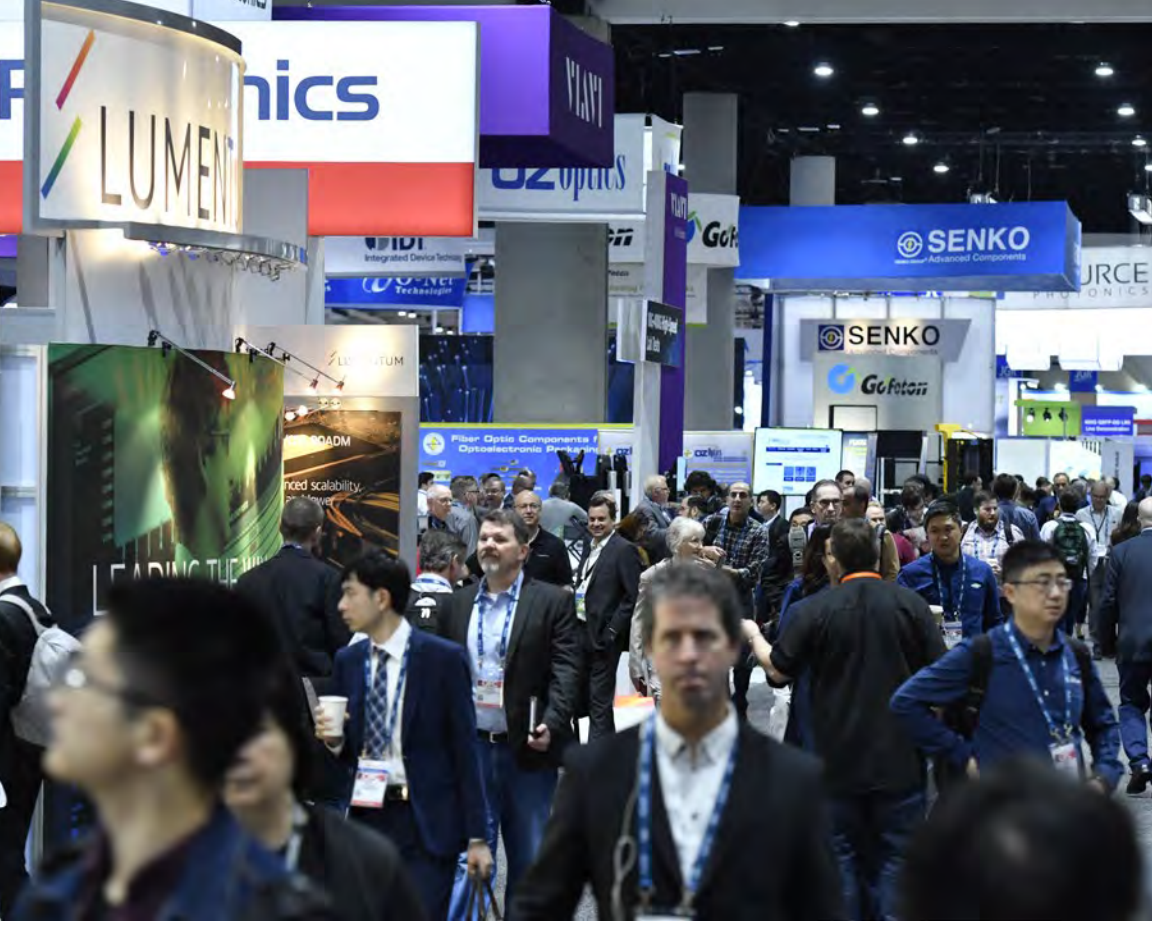
SC357 Circuits and Equalization Methods for Coherent and Direct Detection Optical Links

Monday, 4 March, 08:30 – 12:30

INSTRUCTOR

Alexander Rylyakov, *Elenion, USA*

This course covers overall transceiver architectures of optical and wireline links and compares coherent vs direct detection.



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, OIF, ON2020, OpenConfig, TIP and more.

EXHIBITORS *as of October 2018*

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

3D Glass Solutions
3M Electronics Materials Solutions Division
3SAE Technologies
7 Pennies Consulting
AC Photonics, Inc.
Acacia Communications, Inc.
Accelight Technologies, Inc.
Accelink Technologies Co., Ltd.
Accumold
ACON Optics Communications
Adamant Namiki Precision Jewel
Adolite, Inc.
ADVA Optical Networking
Advanced Fiber Resources, Ltd.
Advanced Microoptic Systems GmbH
Aerotech Inc.
AFL
Agilecom Photonics Solutions Guangdong Limited
Agiltron, Inc.
AIM Photonics
AIO Core Co., Ltd.
Aitelong Technology Co., Ltd.
Akribis Systems, Inc.
Albis Optoelectronics
Alibaba Group
Alight Technologies APS
Allwave Lasers Devices, Inc.
Alnair Labs Corporation
Alpine Optoelectronics, Inc.
America Ilsintech, LLC
American Technical Ceramics
AMETEK Electronic Components & Packaging
Analog Devices
Analog Photonics
Anritsu Company
A-One Technology Ltd.
APAC Opto Electronics, Inc.
APAT Optoelectronics
APEX Technologies
Apogee Optocom Co., Ltd.
Applied Optoelectronics, Inc.
Applied Thin-Film Products
Aragon Photonics Labs
Arden Photonics, Ltd.
Ardent Concepts, Inc.
Arista
Arrayed Fiberoptics Corporation
Artech Co.
ASI/Silica Machinery, LLC
Asia Optical Co., Inc.
ASM AMICRA Microtechnologies
ASM Pacific Technology
AtGrating Technologies
ATOP Corporation
Auxora, Inc.
AVIC Jonhon Optronic Technology Co.
Avo Photonics, Inc.
Axetris AG
AXSUN Technologies
Bandwidth10 Ltd.
Beijing Grish Hitech Co., Ltd.
Benchmark Electronics, Inc.
BKTEL Photonics
Bola Technologies
Brimrose Corporation of America
Bristol Instruments, Inc.
Broadcom Limited
BROLINK Technologies
Browave Corporation
Cadence Design Systems, Inc.
CAILabs SAS
CALIENT Technologies
Cambridge Industries USA, Inc.
Canovate Elektronik Endustri Ticaret A.S.
Centera Photonics, Inc.
ChemOptics
Chengdu Huajing Keli Industry Co.
Chengdu Superxon Communication Technology Co.
Chengdu Tsuhan Science & Technology Co., Ltd.
Chengdu Xinruixin Optical Communication Tech. Co., Ltd.
China Cloud Electro Optics Technology Co., Ltd.
Chiral Photonics
Chroma ATE Inc.
Chuxing Optical Fiber Application Technologies, Lt
Cicor Group
CIENA Corporation
Cisco Systems, Inc.
CN-J Technology Co., Ltd.
CoAdna Photonics, Inc.
CODIXX AG
Coherent Solutions
Coherent, Inc.
ColorChip
Connected Fibers
Consortium for On-Board Optics
CorActive High-Tech, Inc.
Corning Inc.orporated
COSET, Inc.
Craftmark Cable Markers
CreaLights Technology Co., Ltd.
Crestec Corporation
Crowntech Photonics Co., Ltd.
CST Global, Ltd.
Daitron, Inc.
Danyang Yuqiao Precision Component Co., Ltd.
DATA-PIXEL
Delta Electronics, Inc.
Denselight Semiconductors PTE
Deviser Instrument, Inc.
Diamond USA, Inc.
DiCon Fiberoptics, Inc.
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