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	<p><i>Saurabh Jain (University of Southampton, United Kingdom); Takayuki Mizuno (NTT, Japan); Yongmin Jung (Optoelectronics Research Centre, University of Southampton, Southampton, United Kingdom); John Hayes (University of Southampton, United Kingdom); Guocai Bai (Optoelectronics Research Centre, United Kingdom); Hirotaka Ono (NTT Photonics Laboratories, Japan); Kohki Shibahara (NTT Innovation Laboratories, Japan); Qiongyue Kang (ORC, UNiversity of Southampton, United Kingdom); Marco Petrovich (University of Southampton, United Kingdom); Akihide Sano, Akira Isoda and Ytaka Miyamoto (NTT Network Innovation Laboratories, Japan); Yusuke Sasaki, Yoshimichi Amma, Katsuhiro Takenaga and Kazuhiko Aikawa (Fujikura Ltd., Japan); Carlos Castro (Christian-Albrecht Universität zu Kiel & Coriant GmbH, Germany); Klaus Pulverer (Coriant R&D GmbH, Germany); Md Nooruzzaman and Toshio Morioka (Technical University of Denmark, Denmark); Shaif-ul Alam and David J Richardson (University of Southampton, United Kingdom)</i></p> <p>◆ We present a high-core-count SDM amplifier, i.e. 32-core multicore-fiber amplifier, in a cladding-pumped configuration. An average gain of 17dB and NF of 7dB is obtained for -5dBm input signal power in the wavelength range 1544nm-1564nm.</p>	
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Canada); Rene Schmogrow, Jeff Rahn, Don Pavinski and Pierre Mertz (Infinera, USA); Tim Butrie (Infinera.com, USA); Kuang-Tsan Wu, Matthew Mitchell, Mehrdad Ziari, Fred Kish and Dave Welch (Infinera, USA)

◆ We introduce a scalable PIC and module platform with full C-band tunability per-channel operating at 33 and 44 Gbaud per channel under 16-QAM dual-polarization mode and demonstrate transmitter and receiver integration up to 14-channels enabling multi-Tb/s total PIC capacities.

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Sangyoon Han and Tae Seok (University of California, Berkeley, USA); Kyoungsik Yu (KAIST, Korea); Niels Quack, Richard Muller and Ming Wu (University of California, Berkeley, USA)

◆ We report on a polarization-insensitive silicon photonic MEMS switch with 50x50 ports. The switch employs a two-level waveguide-crossbar with MEMS-actuated polarization-insensitive couplers. The simulated and measured polarization-dependent losses are 1 dB and 8.5 dB, respectively.

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Th.3.B.1 Wavelength Selective Switch for Dynamic VCSEL-Based Data Center 16

Haoshuo Chen (Nokia Bell Labs, USA); Nicolas K Fontaine (Bell Labs/Alcatel-Lucent, USA); Bin Huang (Nokia Bell Labs, USA); Xian Xiao (Bell Labs/Alcatel-Lucent, USA); Roland Ryf (Bell Labs, Nokia, USA); David Neilson (Bell Labs, USA)

◆ We demonstrate a 1X7 wavelength selective switch (WSS) for multimode fiber covering more than 100 THz of spectrum (780 nm to 1080 nm). WDM VCSEL transmission over the WSS is demonstrated

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Vahid Aref (Nokia Bell Labs, Germany); Son Thai Le (Nokia-Bell-Labs, Germany); Henning Buelow (Nokia Bell Labs, Germany)

◆ We report a 3 dB increase in the nonlinear threshold of a 64 \times 0.5Gbaud 16-QAM continuous-nonlinear-spectrum modulated signal by nonlinear multiplexing with QPSK modulated multi-solitons, showing the first ever fully nonlinear-spectrum modulated system in the highly nonlinear regime.

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Pengyu Guan and Francesco Da Ros (Technical University of Denmark, Denmark); Mads Lillieholm (DTU Fotonik, Denmark); Hao Hu (Technical University of Denmark, Denmark); Kasper Røge (DTU Fotonik, Denmark); Michael Galili, Toshio Morioka and Leif Oxenløwe (Technical University of Denmark, Denmark)

◆ We demonstrate simultaneous phase regeneration of 16-WDM DPSK channels using optical Fourier transformation and a single phase-sensitive amplifier. The BERs of 16-WDM \times 10-Gbit/s phase noise degraded DPSK signals are improved by 0.4-1.3 orders of magnitude.

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Th.3.C.1	High-spectral-efficiency transmission of PDM 256-QAM with Parallel Probabilistic Shaping at Record Rate-Reach Trade-offs 34 <i>Sethumadhavan Chandrasekhar and Borui Li (Nokia Bell Labs, USA); Junho Cho (Nokia Bell labs, USA); Xi Chen (Nokia Bell Labs, USA); Ellsworth Burrows (Bell Labs, Nokia, USA); Gregory Raybon (Nokia Bell Labs, USA); Peter Winzer (Lucent Technologies, USA)</i> ♦ We demonstrate the transmission of near-optimal low-complexity probabilistically shaped PDM 256-QAM over multiple low-loss all-Raman amplified 50-km large effective area fiber spans, with spectral efficiencies from 14.1 b/s/Hz to 8.9 b/s/Hz at reaches from 500 km to 4000 km.

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Daiki Soma (KDDI R&D Laboratories Inc., Japan); Yuta Wakayama (KDDI R&D, Japan); Shohei Beppu (KDDI R&D Laboratories, Japan); Koji Igarashi (Osaka University, Japan); Takehiro Tsuritani (KDDI R&D Laboratories, Inc., Japan); Hidenori Taga (KDDI R&D Laboratories Inc., Japan); Itsuro Morita and Masatoshi Suzuki (KDDI R&D Laboratories, Japan)
◆ 665 and 947b/s/Hz ultra-highly aggregate spectral-efficient SDM transmission over 9.8 km 6-mode 19-core fibre has been successfully demonstrated using 5.7-GHz-spaced 5-Gbaud DP-16QAM/64QAM Nyquist WDM signals with pre-emphasis-based MDL compensation and cladding-pumped 6-mode pre-amplification.
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Roland Ryf (Bell Labs, Nokia, USA); Juan Alvarado-Zacarias (CREOL, USA); Bin Huang (Nokia Bell Labs, USA); Jose Antonio-Lopez (CREOL, USA); Sun Hyok Chang (ETRI, Korea); Nicolas K Fontaine (Bell Labs/Alcatel-Lucent, USA); Haoshuo Chen (Nokia Bell Labs, USA); Rene Essiambre (Nokia, USA); Ellsworth C. Burrows (Bell Labs, Alcatel-Lucent, USA); Rodrigo Anezcuia-Correa (CREOL, USA); Tetsuya Hayashi and Yoshiaki Tamura (Sumitomo Electric Industries, Ltd., Japan); Takemi Hasegawa and Toshiki Taru (Sumitomo Electric Industries, Ltd.)
◆ We demonstrate combined wavelength- and space-multiplexed long-distance transmission over a coupled-core fiber with 4 cores. The fiber shows a very small impulse response spread, achieves performance that can exceed single-mode fiber, while providing 4 times the capacity.
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Amirhossein Ghazisaeidi, Ivan Fernandez de Jauregui Ruiz and Rafael Rios-Müller (Nokia Bell Labs, France); Laurent Schmalen (Nokia Bell Labs, Germany); Patrice Tran, Patrick Brindel and Alexis Carbo Meseguer (Nokia Bell Labs, France); Qian Hu (Bell Labs, Nokia, Germany); Fred Buchali (Nokia Bell Labs, Germany); Gabriel Charlet and Jeremie Renaudier (Bell Labs Nokia, France)
◆ We report on a C+L-band transoceanic transmission using capacity-approaching probabilistically-shaped 64QAM. Digital nonlinear compensation and adaptive-rate spatially-coupled LDPC decoding enable transmission of 65 Tb/s over 6600km, with spectral efficiency of 7.3 b/s/Hz.
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Stefano Straullu, Paolo Savio and Giuseppe Franco (Istituto Superiore Mario Boella, Italy); Roberto Gaudino (Politecnico di Torino, Italy); Stephane Bernabé, Maryse Fournier, Viviane Muffato, Sylvie Menezo and Benoit Charbonnier (CEA-LETI, France); Enrico Temporiti, Daniele Baldi, Gabriele Minoia and Matteo Repossi (STMicroelectronics, Italy); Lee Carroll, Junsu Lee and Peter O'Brien (Tyndall National Institute, Ireland); Riccardo Marchetti (Università degli Studi di Pavia, Italy); Guang-Hua Duan (III-V Lab, France); Fabienne Saliou (Orange, France); Silvio Abrate (Istituto Superiore Mario Boella, Italy)
◆ We report about the transmission experiments of a self-coherent reflective PON using a partially integrated silicon-photonics ONU, demonstrating 500 Mbps per user with a power budget of 24 dB in off-line processing and 21 dB in real-time.

Th.3.C.6 High-Split Intelligent TWDM PON Enabled by Distributed Raman Amplification49

Patrick Iannone and Alan Gnauck (Nokia Bell Labs, USA); Michael Straub, Jörg Hehmann, Lothar Jentsch and Thomas Pfeiffer (Nokia Bell Labs, Germany); Mark Earnshaw (Nokia Bell Labs, USA)

◆ We demonstrate a symmetric-rate, 8 x 10-Gb/s, bi-directional TWDM-PON with 42-km reach, and 1:256 split. Distributed Raman amplification provides gain for the upstream channels (allowing low-cost low-power transmitters) and powering for an intelligent splitter module for supervision of mission-critical services.