# **2015 International Conference on Photonics in Switching (PS 2015)**

Florence, Italy 22-25 September 2015



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#### 2015 International Conference on Photonics in Switching (PS)

### PS2015 - Invited Papers: Photonics in Switching 2015: Invited Papers

#### **SC1 Photonic Integrated Circuits**

| Feedback-Controlled | Tuning, | Switching, | and | Locking | of | Photonic | Integrated |
|---------------------|---------|------------|-----|---------|----|----------|------------|
| Circuits            |         |            |     |         |    |          |            |

Francesco Morichetti (Policom - DEI Politecnico di Milano & Fondazione Politecnico di Milano, Italy), Andrea Annoni (Politecnico di Milano, Italy), Stefano Grillanda (Politecnico di Milano, Italy), Marco Carminati (Politecnico di Milano, Italy), Pietro Ciccarella (Politecnico di Milano, Italy), Marco Sampietro (Politecnico di Milano, Italy), Andrea Melloni (Politecnico di Milano, Italy), Giorgio Ferrari (Politecnico di Milano, Italy), Michael Strain (University of Strathclyde, United Kingdom), Marc Sorel (University of Glasgow, United Kingdom)

#### PS2015: 2015 International Conference on Photonics in Switching (PS)

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#### 60 Gbit/s 400 GHz Wireless Transmission

Xianbin Yu (Technical University of Denmark, Denmark), Rameez Asif (Technical University of Denmark, Denmark), Molly Piels (Technical University of Denmark, Denmark), Darko Zibar (DTU Fotonik, depertment of Photonic Engineering, Technical University of Denmark, Denmark), Michael Galili (Technical University of Denmark, Denmark), Toshio Morioka (Technical University of Denmark, Denmark), Peter Uhd Jepsen (Denmark Technical University, Denmark), Leif Oxenløwe (Technical University of Denmark, Denmark)

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José A Altabás (University of Zaragoza & Universitat Politècnica de Catalunya, Spain), David Izquierdo (Academia Gereral Militar, Spain), Jose A Lazaro (Universitat Politècnica de Catalunya (UPC), Spain), Adolfo Lerin (Universitat Politècnica de Catalunya (UPC), Spain), Felix Sotelo (University of Zaragoza, Spain), Salvatore Spadaro (Universitat Politècnica de Catalunya (UPC), Spain), Gabriel Junyent (Universitat Politècnica de Catalunya, Spain), Ignacio Garcés (University of Zaragoza, Spain)

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#### SC2 Photonic Switching Technologies I

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Simon Arega Gebrewold (ETH Zurich, Switzerland), Romain Brenot (Alcatel-Thales III-V Lab, France), Romain Bonjour (ETH Zurich, Switzerland), David Hillerkuss (ETH Zurich, Switzerland), Christian Hafner (ETH Zurich, Switzerland), Juerg Leuthold (ETH Zurich, Switzerland)

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João Rosário (Instituto de Telecomunicações, Portugal), Ruben S Luís (NICT, USA), Benjamin J Puttnam (National Institute of Information and Communications Technology, Japan), Yoshinari Awaji (National Institute of Information and Communications Technology (NICT), Japan), Naoya Wada (NICT, Japan), Adolfo Cartaxo (IST-TUL, Portugal)

#### PS2015 - Invited Papers: Photonics in Switching 2015: Invited Papers

#### SC1 Multi-tone multi-wavelength generation

Photonic Chip Broadband Frequency Comb for Coherent Telecommunication

Victor Brasch (Ecole Polytechnique Federale de Lausanne, Switzerland),

Michael Geiselmann (Ecole Polytechnique Federale de Lausanne, Switzerland),

Tobias Herr (Centre Suisse D'Electronique et Microtechnique, Italy), Grigoriy

Lihachev (Lomonosov Moscow State University, Russia), Martin Pfeiffer (Ecole

Polytechnique Federale de Lausanne, Switzerland), Michael Gorodetsky (M. V.

Lomonosov Moscow State University, Russia), Tobias Kippenberg (Ecole

Polytechnique Federale de Lausanne, Switzerland)

# PS2015 Optical Networking (Topic 4): Photonics in Switching 2015 - Optical Networking (Topic 4)

#### SC4 Spectrally and Spatially Flexible Optical Networking

On the Legacy Amplifier Limitation in Flexgrid Optical Networks

Djamel Amar (Institut Mines-Télécom/Telecom SudParis & Orange Labs,
France), Mohamad Kanj (B-com, France), Jean-Luc Auge (Orange Labs,
France), Nicolas Brochier (Orange Labs, France), Esther Le Rouzic (Orange
Labs, France), Catherine Lepers (Institut Mines Telecom- Telecom SudParis,
France), Bernard Cousin (University of Rennes 1 & IRISA Research
Laboratory, France)

PS2015 Optical Switching Technology & Devices (Topic 1): Photonics in Switching 2015 - Optical Switching Technology & Devices (Topic 1)

#### SC1 Multi-tone multi-wavelength generation

Concurrent Multi-Channel Transmission of a DWDM Silicon Photonic Transmitter Based on a Comb Laser and Microring Modulators

Chin-Hui Chen (Hewlett-Packard Company & HP Labs, USA), M. Ashkan Seyedi (Hewlett-Packard Company, USA), Marco Fiorentino (Hewlett-Packard Company, USA), Daniil Livshits (Innolume GmbH, Germany), Alexey Gubenko (Innolume GmbH, Germany), Sergey Mikhrin (Innolume GmbH, Germany), Vladimir Mikhrin (Innolume, Germany), Raymond Beausoleil (HP Laboratories, USA)

#### SC4 Spectrally and Spatially Flexible Optical Networking

| Routing | and     | Spectrum     | Allocation    | Method       | for    | Immediate      | Reservation   | and   |     |
|---------|---------|--------------|---------------|--------------|--------|----------------|---------------|-------|-----|
| Advance | Rese    | ervation Rec | quests in Ela | astic Option | cal N  | etworks        |               |       |     |
| Seitard | Sug     | ihara (Osak  | a University  | , Japan)     | , Yus  | uke Hirota (   | Osaka Univers | sity, |     |
| Japan)  | , Sho   | hei Fujii (O | saka Univer   | sity, Japa   | an), l | Hideki Tode (  | (Osaka Prefec | ture  |     |
| Univer  | sity, : | Japan), Tak  | ashi Watan    | abe (Osal    | ka U   | niversity, Jap | oan)          |       | 178 |

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| Rameez Asif (Technical University of Denmark, Denmark), Muhammad Imran (Scuola Superiore Sant'Anna, Italy), Feihong Ye (Technical University of Denmark, Denmark), Luca Potì (Consorzio Nazionale Interuniversitario per le Telecomunicazioni, Italy), Toshio Morioka (Technical University of Denmark, Denmark) | 181 |
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# PS2015 Optical Switching Technology & Devices (Topic 1): Photonics in Switching 2015 - Optical Switching Technology & Devices (Topic 1)

#### SC1 Multi-tone multi-wavelength generation

Programmable Multicarrier Generator for Elastic Superchannel Transponder/
Regenerator

Yutaka Mori (Kagawa University, Japan), Koichi Maru (Kagawa University,
Japan), Haruna Matsushita (Kagawa University, Japan), Takuya Nakagawa
(Kagawa University, Japan), Masahiko Jinno (Kagawa University, Japan)

#### SC4 Spectrally and Spatially Flexible Optical Networking

| Assessment of Flex-Grid/SDM Backbone Networks under Inter-Core XT-limited Transmission Reach  |       |
|---|-------|
| Jordi Perelló (Universitat Politècnica de Catalunya (UPC), Spain), Joan Gené<br>Bernaus (UPC, Spain), Jose A Lazaro (Universitat Politècnica de Catalunya<br>(UPC), Spain), Albert Pagès (Universitat Politècnica de Catalunya (UPC),<br>Spain), Salvatore Spadaro (Universitat Politecnica de Catalunya (UPC), |       |
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#### **SC1 Semiconductor Network Subsystems**

| Ultrafast pulse generation in semiconductor lasers                 |     |
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| Marc Sorel (University of Glasgow, United Kingdom), Michael Strain |     |
| (University of Strathclyde, United Kingdom)                        | 193 |

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#### **Poster Session**

| Fundamental performance tradeoffs for reverse biased free carrier plasma |     |
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| dispersion effect based silicon optical modulators                       |     |
| Seyedreza Hosseini (Technische Universität Dresden, Germany), Kambiz     |     |
| Jamshidi (Technische Universität Dresden, Germany)                       | 196 |

#### **SC1 Semiconductor Network Subsystems**

#### **Poster Session**

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| Kentaro Kato (Keio University, Japan), Hiroyuki Tsuda (Keio University, Japan)  | 205 |
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| Fast Wavelength Switching in Semiconductor Micro-Ring Lasers Using Filtered Optical Feedback  Mulham Khoder (Vrije Universiteit Brussel, Belgium), Jan Danckaert (Vrije Universiteit Brussel, Belgium), Guy Verschaffelt (Vrije Univerteit Brussel, Belgium)  | 214 |
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### **SC1 Semiconductor Network Subsystems**

| Third-order ring-resonator based InP Switch Matrix  Prometheus DasMahapatra (Eindhoven University of Technology & COBRA Research Institute, The Netherlands), Ripalta Stabile (Technical University of Eindhoven, The Netherlands), Kevin Williams (Eindhoven University of Technology, The Netherlands)  | . 220 |
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| Proposal of Optical Flip-Flop Operation between Two Phase States with a Single SOA and a Feedback Loop  Takahiro Kamidai (Tokushima University, Japan), Kenta Takase (The University of Tokushima, Japan), Hiroki Kishikawa (Tokushima University, Japan), Nobuo Goto (Tokushima University, Japan), Shin-ichiro Yanagiya (Tokushima University, Japan) | 223   |
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| Design and Experimental Investigation of Monolithic Polarization Controller with InGaAlAs/InAlAs Multiple Quantum Wells  Kentaro Suzuki (The University of Tokyo, Japan), Yuto Kawabata (The University of Tokyo, Japan), Takuo Tanemura (University of Tokyo, Japan), Yoshiaki Nakano (University of Tokyo, Japan)                                     | . 226 |
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| Switch  |     |
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| Cyriel Minkenberg (IBM Research - Zurich, Switzerland), German Rodriguez (IBM Research - Zurich, Switzerland), Bogdan Prisacari (IBM Research - Zurich & ETH Zurich, Switzerland), Laurent Schares (IBM T.J. Watson Research Center, USA), Philip Heidelberger (IBM Research, USA), Dong Chen (IBM Research, USA), Craig Stunkel (IBM T. J. Watson Research Center, USA), Nicolas Dupuis (IBM T. J. Watson Research Center, USA)  | 235 |
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| Single DWDM Channel 56 Gbps 2 km Transmission Based on Injection Locked FP<br>Laser Enabling Beyond Tbps Intra-DC Connection  |     |
| Jun Luo (Huawei Technologies co ltd, P.R. China), Zhi Feng (Huawei Technologies CO., LTD, P.R. China), Kangping Zhong (The Hong Kong Polytechnic University, P.R. China), Bo Wu (Huawei Technologies Co. Ltd, P.R. China), Chao Lu (The Hong Kong Polytechnic University, Hong Kong)  | 244 |
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| Soubhik Deb (IIT                 |            |              |         |          |         |              |        |     |
| Japan), Yojiro Mo                | rı (ıvagoy | 'a universit | ту, лар | an), ken | -ICUI S | sato (School | OΓ     |     |
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#### SC2 Advanced Modulation and Signal Processing

Autonomously Controlled All-Optical Signal Conditioning for Dynamic Optical Path Networks

Ken Tanizawa (National Institute of Advanced Industrial Science and Technology, Japan), Hiroyuki Matsuura (National Institute of Advanced Industrial Science and Technology, Japan), Haruhiko Kuwatsuka (National Institute of Advanced Industrial Science and Technology, Japan), Shu Namiki (National Institute of Advanced Industrial Science and Technology & Network Photonics Research Center, Japan), Kensuke Ogawa (Fujikura Ltd., Japan), Toshimitsu Kaneko (Sumitomo Electric Industries Ltd., Japan), Eiichi Banno (Sumitomo Electric Industries Ltd., Japan), Katsumi Uesaka (Sumitomo Electric Industries, Ltd., Japan), Hajime Shoji (Sumitomo Electric Industries, LTD., Japan), Shigehiro Takasaka (Furukawa Electric Co., Ltd., Japan), Takeshi Yagi (Furukawa Electric co., Ltd., Japan), Kazuya Ota (Trimatiz, Japan), Hidenori Iwai (Trimatiz Limited, Japan), Yoichi Oikawa (Trimatiz Limited, Japan)

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#### **Poster Session**

Evaluation of Frequency Utilization Enhancement with Transmission-Characteristics-Aware Grouped Optical Path Routing

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#### **SC2 Advanced Modulation and Signal Processing**

| Analytical Investigation of All-Optical FEC Coding Scheme with Convolutional                                  |     |
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| Yohei Aikawa (Tokyo Institute of Technology, Japan), Hiroyuki Uenohara (Tokyo Institute of Technology, Japan) | 259 |
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#### **Poster Session**

CAPEX and OPEX Saving in SDN-Compliant Sub-Wavelength Switching Solution
Ahmed Triki (Insititut mines Télécom, Télécom Bretagne, France), Annie
Gravey (Institut Mines Telecom - Telecom Bretagne & UMR CNRS 6074 IRISA,
France), Philippe Gravey (Télécom Bretagne, France)

### PS2015 Optical Switching Functions & Building Blocks (Topic 2): Photonics in Switching 2015 - Optical Switching Functions & Building Blocks (Topic 2)

#### **SC2 Advanced Modulation and Signal Processing**

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| A Low-cost OFDMA-PON Upstream Architecture Using Direct-Detection for Front- |     |
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| Haul Service in Cloud Radio Access Networks                                  |     |
| Ahmed Galib Reza (KAIST, Korea), June-Koo Kevin Rhee (KAIST, Korea),         |     |
| Geun Young Kim (HFR Inc., Korea)   | 268 |

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### **SC2 Advanced Modulation and Signal Processing**

| Simple and effective solutions for low-cost coherent WDM-PON Ernesto Ciaramella (Scuola Superiore Sant'Anna, Pisa, Italy), Fabio Bottoni (via Moruzzi 1 & Scuola Superiore Sant'Anna, Italy), Raffaele Corsini (Scuola Superiore Sant'Anna University, Italy), Marco Presi (Scuola Superiore Sant'Anna University, Italy), Massimo Artiglia (CNIT, Italy) |
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| SC2 Photonic Switching Technologies II  |
| Large Port Count Optical Switch Systems for Future Datacenters  Ken-Ichi Sato (School of Engineering - Nagoya University, Japan)  |
| PS2015 Optical Networking (Topic 4): Photonics in Switching 2015 -<br>Optical Networking (Topic 4)  |
| Poster Session  |
| Dynamically Reconfigurable Low-cost Sub-band OFDMA for Front-haul Downlink in Cloud Radio Access Networks  Ahmed Galib Reza (KAIST, Korea), June-Koo Kevin Rhee (KAIST, Korea), Jong Heon Lee (HFR, Inc., Korea)  |
| PS2015 Optical Switching Functions & Building Blocks (Topic 2): Photonics in Switching 2015 - Optical Switching Functions & Building Blocks (Topic 2)   |
| SC2 Photonic Switching Technologies II  |
| Injection-locked weak-resonant-cavity laser diode with transient response switching for wavelength reused full-duplex transmission  Yu-Chieh Chi (National Taiwan University, Taiwan), Chung-Yu Lin (National Taiwan University, Taiwan), Hsiang-Yu Chen (National Taiwan University, Taiwan), Gong-Ru Lin (National Taiwan University, Taiwan)           |

#### **Poster Session**

| Demonstration of Dynamic Congestion Control in Optical Packet Switching<br>Network employing Rate-Adaptive Transmitter and Receiver   |     |
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| Noboru Yoshikane (KDDI R&D Laboratories, Japan), Xiaoyuan Cao (KDDI R&D Laboratories, Japan), Yuki Yoshida (Osaka University, Japan), Masato Nishihara (Fujitsu Limited, Japan), Masaki Shiraiwa (National Institute of Information and Communications Technology, Japan), Takehiro Tsuritani (KDDI R&D Laboratories, Inc., Japan), Itsuro Morita (KDDI R&D Laboratories, Japan), Tomoo Takahara (Fujitsu Laboratories Limited, Japan), Toshiki Tanaka (Fujitsu Laboratories Ltd., Japan), Jens C. Rasmussen (Fujitsu Laboratories Limited, Japan), Naoya Wada (NICT, Japan), Ken'ichi Kitayama | 282 |
| Flexrate technology for multi-layer interworking - the practical benefit of fine-<br>granular rate adaptability in aggregation networks   | 202 |
| Matthias Gunkel (Deutsche Telekom Technik & Fixed Mobile Engineering Deutschland, Germany), Felix Wissel (Deutsche Telekom Technik, Germany)  | 285 |

# PS2015 Optical Switching Functions & Building Blocks (Topic 2): Photonics in Switching 2015 - Optical Switching Functions & Building Blocks (Topic 2)

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| C | ross-talk Tolerant Multicarrier Optical Packet: Concept and Demonstration  |     |
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|   | Daoxin Dai (Zhejiang University, P.R. China)   | 291 |

### SC3 Optical Packet Switching technologies

| Monolithic InP-based fast optical switch module for optical networks of the future Xi Chen (University of Bristol, United Kingdom), James Regan (Venture Photonics Ltd, United Kingdom), Tim Durrant (Venture Photonics Ltd, United Kingdom), Yi Shu (University of Bristol, United Kingdom), George Saridis (University of Bristol, United Kingdom), Georgios Zervas (University of Bristol, United Kingdom), Dimitra Simeonidou (University of Bristol, United Kingdom), Valerija Kamchevska (Technical University of Denmark, Denmark), Anna Manolova Fagertun (Technical University of Denmark, Denmark), Siyuan Yu (University of Bristol, United Kingdom) | 294 |
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| SDN solutions for 5G transport networks Paola Iovanna (Ericsson, Italy), Fabio Ubaldi (Ericsson, Italy)   | 297 |
| SC3 Optical Packet Switching technologies   |     |
| 100-Gbps Technologies of Hybrid Optoelectronic Routers for a Torus Datacenter Network  Toru Segawa (NTT Device Technology Laboratories, Japan), Salah Ibrahim (NTT Device Technology Laboratories, Japan), Tatsushi Nakahara (NTT Device Technology Laboratories, Japan), Hiroshi Ishikawa (NTT Device Technology Laboratories, Japan), Ryo Takahashi (NTT Device Technology Laboratories, Japan)  PS2015 Optical Networking (Topic 4): Photonics in Switching 2015 - Optical Networking (Topic 4)  | 300 |
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| Virtual Private Networks in RoF-OFDM-PON with Physical-layer Network Coding Xun Guan (The Chinese University of Hong Kong, Hong Kong), Tianwai Bo (The Chinese University of Hong Kong, Hong Kong), Calvin C K Chan (The Chinese University of Hong Kong, Hong Kong)  | 303 |

# PS2015 Optical Systems (Topic 3): Photonics in Switching 2015 - Optical Systems (Topic 3)

### **SC3 Optical Packet Switching technologies**

| Novel Mode-selective Packet Switching  Masahiro Hayashi (Osaka University, Japan), Nikolaos Panteleimon Diamantopoulos (Osaka University, Japan), Yuki Yoshida (Osaka University, Japan), Akihiro Maruta (Osaka University, Japan), Ryo Maruyama (Fujikura Ltd., Japan), Nobuo Kuwaki (Fujikura Ltd., Japan), Katsuhiro Takenaga (Fujikura Ltd., Japan), Hitoshi Uemura (Fujikura Ltd. & Optics And Electronics Laboratory, Japan), Matsuo Shoichiro (Fujikura Ltd., Japan), Ken'ichi Kitayama (Osaka University, Japan)  Novel Flat DCN Architecture Based on Optical Switches with Fast Flow Control Fulong Yan (Eindhoven University of Technology & TU/e, P.R. China), Wang Miao (Eindhoven University of Technology, The Netherlands), H. J. S Dorren (Eindhoven University of Technology, The Netherlands), Nicola Calabretta (COBRA Research Institute, The Netherlands) | 06 |
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| Mode-unbundled Transmission over a 30-km Two-mode Fiber via OFDM-based Pre-crosstalk Suppression Technique  Shota Noguchi (Osaka University, Japan), Nikolaos Panteleimon Diamantopoulos (Osaka University, Japan), Yuki Yoshida (Osaka University, Japan), Akihiro Maruta (Osaka University, Japan), Ken'ichi Kitayama (Osaka University, Japan), Ryo Maruyama (Fujikura Ltd., Japan), Matsuo Shoichiro (Fujikura Ltd., Japan), Nobuo Kuwaki (Fujikura Ltd., Japan)  | 12 |
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| Networking & Technische Universität München, Germany), Pawel Kaczmare   |           |
| (ADVA Optical Networking, Poland), Wolfgang Kellerer (Technische Univers  |           |
| München, Germany)   |           |
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| SC4 Optical Network Control   |           |
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| Luis Velasco (Universitat Politècnica de Catalunya (UPC), Spain), Lluis Gifre   | <u>.</u>  |
| (Universitat Politècnica de Catalunya (UPC), Spain)   |           |
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#### PS2015 - Invited Papers: Photonics in Switching 2015: Invited Papers

#### **SC1 Switching elements**

| Silica MEMS c | antilever | arrays |
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# PS2015 Optical Systems (Topic 3): Photonics in Switching 2015 - Optical Systems (Topic 3)

#### **SC3 Transmission Systems**

Extended Distance Transmission over Wideband MMF using Multi-wavelength VCSEL based Transceivers

Rakesh Sambaraju (Berk-Tek LLC, USA), Adrian Amezcua-Correa (Prysmian Group, France), Scott Steinhauer (Berk-Tek LLC, USA), Matt Schumacher (Berk-Tek LLC, USA), Mike Good (Berk-Tek LLC, USA), Paul Vanderlaan (Berk-Tek LLC, USA), Denis Molin (Prysmian Group, France), Marianne Bigot (Prysmian Group, France), Frank Achten (Prysmian Group, The Netherlands), Pierre Sillard (Prysmian Group, France)

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# PS2015 Optical Networking (Topic 4): Photonics in Switching 2015 - Optical Networking (Topic 4)

#### **SC4 Optical Network Control**

Alien Wavelength Modeling Tool and Field Trial

Nicola Sambo (Scuola Superiore Sant'Anna, Italy), Andrea Sgambelluri (Scuola Superiore Sant'Anna, Italy), Marco Secondini (Scuola Superiore Sant'Anna, Italy), Martin Nordal Petersen (Technical University of Denmark, Denmark), Guy Roberts (GEANT, United Kingdom), Anna Manolova Fagertun (Technical University of Denmark, Denmark)

#### PS2015 - Invited Papers: Photonics in Switching 2015: Invited Papers

#### **SC3 Optical Switch Architecture**

| Spatial and Planar Optical Circuit for Wavelength Selective Switch Applications |     |
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# PS2015 Optical Switching Technology & Devices (Topic 1): Photonics in Switching 2015 - Optical Switching Technology & Devices (Topic 1)

#### **SC1 Switching elements**

Reconfigurable Quantum Photonic Circuits based on Nano-Electro-Mechanical Systems

Leonardo Midolo (Niels Bohr Institute, University of Copenhagen, Denmark),

Tommaso Pregnolato (Niels Bohr Institute, University of Copenhagen, Denmark), Gabija Kiršanskė (Niels Bohr Institute, University of Copenhagen, Denmark), Maurangelo Petruzzella (COBRA Research Institute, Eindhoven University of Technology, The Netherlands), Francesco Pagliano (COBRA Research Institute, Eindhoven University of Technology, The Netherlands), Tian Xia (COBRA Research Institute, Eindhoven University of Technology, The Netherlands), Frank van Otten (COBRA Research Institute, Eindhoven University of Technology, The Netherlands), Andrea Fiore (COBRA Research Institute, Eindhoven University of Technology, The Netherlands), Søren Stobbe (Niels Bohr Institute, University of Copenhagen, Denmark), Peter Lodahl (Niels Bohr Institute, University of Copenhagen, Denmark)

Performance Analysis of a Hybrid Opto-Electronic Packet Switch using WDM Technology

Wiem Samoud (Institut Mines Telecom, Telecom ParisTech, CNRS LTCI, France), Cedric Ware (Institut Mines-Télécom, Télécom ParisTech, CNRS LTCI, France), Mounia Lourdiane (TELECOM SudParis, France)

PS2015 Optical Systems (Topic 3): Photonics in Switching 2015 - Optical Systems (Topic 3)

#### **SC3 Optical Switch Architecture**

| Benchmark Analysis of AWGR-based Optical Tiled Architectures for Multi-Socket<br>HPC Boards   |     |
|---|-----|
| Paolo Grani (University of California, Davis & ECE, USA), Roberto Proietti (University of California, Davis, USA), S. J. Ben Yoo (University of California, Davis, USA) | 354 |

# PS2015 Optical Switching Technology & Devices (Topic 1): Photonics in Switching 2015 - Optical Switching Technology & Devices (Topic 1)

#### SC1 Silicon devices

| Experimental Demonstration of Bidirectional Transmissions in a Photonic   |     |
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