

2012 16th International Conference on Optical Network Design and Modelling

(ONDM 2012)

**Colchester, United Kingdom
17 – 20 April 2012**



**IEEE Catalog Number: CFP1255D-PRT
ISBN: 978-1-4673-1440-4**

2012 16th International Conference on Optical Networking Design and Modelling (ONDM)

Table of Contents

Session 1

- S1-1 Routing in Dynamic Future Flexi-Grid Optical Networks** ****
Christina (Tanya) Politi (University of Peloponnese, Greece); Vassilios Anagnostopoulos (National Technical University of Athens, Greece); Chris Matrakidis (University of Peloponnese, Greece); Alexandros Stavdas (University of Peloponnese, Greece)

Session 2

- S2-1 From Static to Software-Defined Optical Networks** ****
Joerg-Peter Elbers (ADVA AG Optical Networking, Germany); Achim Autenrieth (ADVA Optical Networking, Germany)
- S2-2 Performance Modelling and Analysis of Dynamic Virtual Optical Network Composition** ****
Shuping Peng (University of Essex, United Kingdom); Reza Nejabati (University of Essex, United Kingdom); Eduard Escalona (University of Essex, United Kingdom); Dimitra Simeonidou (University of Essex, United Kingdom); Markos P. Anastasopoulos (Athens Information Technology, Greece); Konstantinos Georgakilas (Athens Information Technology & Aalborg University, Greece); Anna Tzanakaki (AIT, Greece); Alexei Vernitski (University of Essex, United Kingdom)
- S2-3 Optimal Allocation of Virtual Optical Networks for the Future Internet** ****
Albert Pagès (Universitat Politècnica de Catalunya (UPC), Spain); Joan A. García-Espín (Fundació i2CAT, Internet i Innovació Digital a Catalunya & Technical University of Catalonia, Spain); Jordi Perelló (Universitat Politècnica de Catalunya (UPC), Spain); Jordi Ferrer Riera (Fundació i2CAT, Internet i Innovació Digital a Catalunya, Spain); Salvatore Spadaro (Universitat Politècnica de Catalunya (UPC), Spain); Sergi Figuerola (Fundació i2CAT, Internet i Innovació Digital a Catalunya, Spain)
- S2-4 Adaptive Virtual Infrastructure planning over Interconnected IT and Optical Network Resources using Evolutionary Game Theory** ****
Markos P. Anastasopoulos (Athens Information Technology, Greece); Anna Tzanakaki (AIT, Greece)
- S2-5 Cognition to Design Energetically Efficient and Impairment Aware Virtual Topologies for Optical Networks** ****
Natalia Fernández (University of Valladolid, Spain); Ramón J. Durán (University of Valladolid, Spain); Ignacio de Miguel (University of Valladolid, Spain); Noemí Merayo (University of Valladolid, Spain); David Sánchez (CEDETEL, Spain); Marianna Angelou (AIT, Greece); Juan Carlos Aguado (University of Valladolid, Spain); Patricia Fernández (University of Valladolid, Spain); Tamara Jiménez (University of Valladolid, Spain); Rubén Lorenzo (CEDETEL, Spain); Ioannis Tomkos (AIT, Greece); Evaristo J. Abril (University of Valladolid, Spain)

S2-6 Experimental evaluation of a VON Resource Broker and Composer for deployment and performance of virtual GMPLS control planes

Ricard Vilalta (Centre Tecnològic de Telecomunicacions de Catalunya, Spain); Raul Muñoz (CTTC, Spain); Ramon Casellas (Centre Tecnològic de Telecomunicacions de Catalunya (CTTC), Spain); Ricardo Martinez (CTTC, Spain)

S2-7 OpenFlow and PCE Architectures in Wavelength Switched Optical Networks

Alessio Giorgetti (Scuola Superiore Sant'Anna, Italy); Filippo Cugini (CNIT, Italy); Francesco Paolucci (Scuola Superiore Sant'Anna, Italy); Piero Castoldi (Scuola Superiore Sant'Anna, Italy)

Session 3

S3-1 Applications of Sub-Wavelength Optical Networks

John Dunne (Intune Networks, Ireland)

S3-2 Bandwidth and Energy Savings of Locality-Aware P2P Content Distribution in Next-Generation PONs

Emanuele Di Pascale (CTVR - Trinity College Dublin, Ireland); David B Payne (Trinity College Dublin, United Kingdom); Marco Ruffini (University of Dublin, Ireland)

S3-3 PID Strategies for the Dynamic Allocation of Resources in LR-Passive Optical Networks

Tamara Jiménez (University of Valladolid, Spain); Noemí Merayo (University of Valladolid, Spain); Ignacio de Miguel (University of Valladolid, Spain); Ramón J. Durán (University of Valladolid, Spain); Patricia Fernández (University of Valladolid, Spain); Juan Carlos Aguado (University of Valladolid, Spain); Natalia Fernández (University of Valladolid, Spain); Rubén M. Lorenzo (University of Valladolid, Spain); Evaristo J. Abril (University of Valladolid, Spain)

S3-4 Reporting in ONUs with Reduced Buffers

Ganesh Chennimalai Sankaran (Indian Institute of Technology Madras & HCL Cisco Offshore Development Center, India); Krishna M. Sivalingam (Indian Institute of Technology Madras, India)

S3-5 A modular and hierarchically structured techno-economic model for FTTH deployments Comparison of technology and equipment placement as function of population density and number of flexibility points

Marlies Van der Wee (Ghent University, Belgium); Koen Casier (University of Ghent, Belgium); Karel Bauters (Ghent University, Belgium); Sofie Verbrugge (Ghent University - IBBT, Belgium); Didier Colle (IBBT - Ghent University, Belgium); Mario Pickavet (Ghent University, Belgium)

S3-6 Street-aware infrastructure planning tool for Next Generation Optical Access networks ...

Orthodoxos Kipouridis (Technische Universität München & ADVA Optical Networking AG, Germany); Carmen Mas (Technical University of Munich, Germany); Achim Autenrieth (ADVA Optical Networking, Germany); Klaus Grobe (ADVA, Germany)

S3-7 Deployment case studies of an energy efficient protected LR-PON architecture

Marco Ruffini (University of Dublin, Ireland); Deepak Mehta (University College Cork, Ireland); Barry O'Sullivan (University College Cork, Ireland); Luis Quesada (University College Cork, Ireland); Linda Doyle (Trinity College Dublin, Ireland); David B Payne (Trinity College Dublin, United Kingdom)

Session 5

- S5-1 Intra and Inter Datacenter Networking: The Role of Optical Packet Switching and Flexible Bandwidth Optical Networking**
S. J. Ben Yoo (University of California, Davis, USA); Yawei Yin (University of California, Davis, USA); Ke Wen (University of California, Davis, USA)
- S5-2 Cost-Effective Sub-wavelength Solution for Data Centre Location in Scaled Next-Generation Networks**
Csaba Kiss Kalló (Intune Networks Ltd, Ireland); Jim Shields (Intune Networks, United Kingdom); Conor O'Malley (Intune Networks, Ireland); Raymond Carley (Intune Networks, Ireland); Victor Lopez (Telefonica I+D, Spain); Juan P. Fernández-Palacios (Telefónica I+D, Spain)
- S5-3 Proposal and Implementation of an Autonomous Distributed Control for Elimination of Incomplete Lightpaths in Optical Packet and Circuit Integrated Networks**
Takaya Miyazawa (National Institute of Information and Communications Technology(NICT), Japan); Hideaki Furukawa (NICT, Japan); Hiroaki Harai (National Institute of Information and Communications Technology, Japan); Naoya Wada (NICT, Japan)
- S5-4 Experimental Demonstration of OBS/WSON Multi-layer Optical Switched Networks with an OpenFlow-based Unified Control Plane**
Dongxu Zhang (Beijing University of Posts and Telecommunications & State Key Laboratory of Information Photonics and Optical Communications, P.R. China); Lei Liu (KDDI R&D Laboratories Inc, Japan); Linfeng Hong (Beijing University of Posts and Telecommunications, P.R. China); Hongxiang Guo (Beijing University of Posts and Telecommunications, P.R. China); Takehiro Tsuritani (KDDI R&D Laboratories, Inc., Japan); Jian Wu (Beijing University of Posts and Telecommunications, P.R. China); Itsuro Morita (KDDI R&D Laboratories, Japan)
- S5-5 On the Usage of FDLs in Optical Parallel Transmission to Support High Speed Ethernet**
Xiaomin Chen (Technische Universität Carolo-Wilhelmina zu Braunschweig, Germany); Admela Jukan (Technische Universität Carolo-Wilhelmina zu Braunschweig, Germany); Ashwin A Gumaste (Indian Institute of Technology, Bombay, India)
- S5-6 Study of the performance of an optical packet switch architecture with highly distributed control in a data center environment**
S. Di Lucente (Eindhoven University of Technology, The Netherlands); Roger Pueyo Centelles (TU/e, The Netherlands); Dorren Harm (Eindhoven University of Technology, The Netherlands); Nicola Calabretta (COBRA Research Institute, The Netherlands)
- S5-7 Analytical Model for Anycast Service Provisioning in Data Center Interconnections**
Walter Cerroni (University of Bologna, Italy); Franco Callegati (Universita` di Bologna, Italy); Barbara Martini (CNIT, Italy); Piero Castoldi (Scuola Superiore Sant'Anna, Italy)

Session 6

- S6-1 Evolution of dynamic optical networks**
Naoya Wada (NICT, Japan); Hideaki Furukawa (NICT, Japan)
- S6-2 Defragmentation and Grooming on 85.4 Gb/s by Simultaneous Format and Wavelength Conversion in an Integrated Quad SOA-MZI**
Muhammad Irfan (University of Essex, United Kingdom); Norberto Amaya (University of Essex, United Kingdom); Georgios S. Zervas (University of Essex, United Kingdom); Reza Nejabati (University of Essex, United Kingdom); Dimitra Simeonidou (University of Essex, United Kingdom); Mirco Scaffardi (CNIT, Italy); Antonella Bogoni (CNIT, Italy); Sergio Pinna (Scuola Superiore Sant'Anna, Italy); Francesco Fresi (Scuola Superiore Sant'Anna, Italy)
- S6-3 Lightpath Fragmentation for Efficient Spectrum Utilization in Dynamic Elastic Optical Networks**
Albert Pagès (Universitat Politècnica de Catalunya (UPC), Spain); Jordi Perelló (Universitat Politècnica de Catalunya (UPC), Spain); Salvatore Spadaro (Universitat Politècnica de Catalunya (UPC), Spain)
- S6-4 Architecture on Demand: Synthesis and Scalability**
Miquel Garrich (Politecnico di Torino, Italy); Paolo Giaccone (Politecnico di Torino, Italy); Norberto Amaya (University of Essex, United Kingdom); Georgios S. Zervas (University of Essex, United Kingdom); Dimitra Simeonidou (University of Essex, United Kingdom)
- S6-5 Software/Hardware defined NETWORK (SHINE): A Novel Adaptive Optical Network Framework for Future Internet**
Yixuan Qin (University of Essex, United Kingdom); Yan Yan (University of Essex, United Kingdom); Georgios S. Zervas (University of Essex, United Kingdom); Bijan Rofoee (University of Essex, United Kingdom); Norberto Amaya (University of Essex, United Kingdom); Dimitra Simeonidou (University of Essex, United Kingdom)
- S6-6 Routing and Spectrum Allocation Policies for Time-Varying Traffic in Flexible Optical Networks**
Kostas Christodoulopoulos (Trinity College Dublin, Ireland); Emmanouel Varvarigos (University of Patras & Computer Technology Institute, Greece)
- S6-7 Regenerator Site Selection for Mixed Line Rate Optical Networks with Flexible Routing**
Weisheng Xie (University of Texas at Dallas, USA); Jason P. Jue (University of Texas at Dallas, USA); Xi Wang (Fujitsu Laboratories of America, USA); Qiong Zhang (Fujitsu Laboratories of America, USA); Qingya She (Fujitsu Network Communications, USA); Paparao Palacharla (FLA, USA); Motoyoshi Sekiya (Fujitsu Laboratories of America, Inc., USA)

Session 9

- S9-1 A Research and Experimentation Overview on Future Optical Network Control Plane in the ADRENALINE Testbed**
Raul Muñoz (CTTC, Spain); Ramon Casellas (Centre Tecnologic de Telecomunicacions de Catalunya (CTTC), Spain); Ricardo Martinez (CTTC, Spain); Ricard Vilalta (Centre Tecnològic de Telecomunicacions de Catalunya, Spain)
- S9-2 Iteration-Free Node-Disjoint Paths Search in WDM Networks with Asymmetric Nodes**
Tomohiro Hashiguchi (Fujitsu Laboratories Limited, Japan); Yi Zhu (Hawaii Pacific University, USA); Kazuyuki Tajima (Fujitsu Labs. LTD., Japan); Yutaka Takita (Fujitsu Labs. LTD., Japan); Takao Naito (Fujitsu Labs. LTD., Japan); Jason P. Jue (University of Texas at Dallas, USA)
- S9-3 Traffic Prediction Based Wavelength Resource Management Considering Holding Time**
Naohiro Wakabayashi (Osaka University, Japan); Yusuke Hirota (Osaka University, Japan); Hideki Tode (Osaka Prefecture University, Japan); Koso Murakami (Osaka University, Japan)
- S9-4 Scheduled Multicast Overlay for Bandwidth-Intensive Applications**
Tim Entel (University of Massachusetts Dartmouth, USA); Arush G Gadkar (University of Massachusetts, Dartmouth, USA); Vinod M. Vokkarane (Massachusetts Institute of Technology (MIT) / University of Massachusetts Dartmouth, USA)
- S9-5 On Extending ESnet's OSCARS with a Multi-Domain Anycast Service**
Mark Boddie (University of Massachusetts Dartmouth, USA); Tim Entel (University of Massachusetts Dartmouth, USA); Chin Guok (Energy Sciences Network, USA); Andrew Lake (Energy Sciences Network, USA); Jeremy Plante (University of Massachusetts Dartmouth, USA); Eric Pouyoul (Energy Sciences Network, USA); Bharath Honnenahalli Ramaprasad (University of Massachusetts Dartmouth, USA); Joan Triay (Universitat Politècnica de Catalunya (UPC) & i2CAT Foundation, Spain); Brian L Tierney (LBL, USA); Vinod M. Vokkarane (Massachusetts Institute of Technology (MIT) / University of Massachusetts Dartmouth, USA)
- S9-6 Survivable Multicast Routing in Mixed-Graph Mesh Optical WDM Networks**
Costas Constantinou (University of Cyprus, Cyprus); Georgios Ellinas (University of Cyprus, Cyprus)
- S9-7 Fair Scheduling of Dynamically Provisioned WDM Connections with Differentiated Signal Quality**
Ajmal Muhammad (Linköping University, Sweden); Cicek Cavdar (Royal Institute of Technology (KTH), Sweden); Paolo Monti (Royal Institute of Technology (KTH), Sweden)

Session 10

- S10-1 Energy-Efficient Core Networks**
Xiaowen Dong (University of Leeds, United Kingdom); Ahmed Lawey (University of Leeds, United Kingdom); Taisir El-Gorashi (University of Leeds, United Kingdom); Jaafar Elmirghani (University of Leeds, United Kingdom)
- S10-2 Dimensioning and energy efficiency of optical metro rings**
Yvan Pointurier (Alcatel-Lucent Bell Labs, France); Bogdan Uscumlic (Institute Mihailo Pupin, University of Belgrade, Serbia); Isabella Cerutti (Scuola Superiore Sant'Anna, Italy); Annie Gravey (Institut Telecom - Telecom Bretagne, France); Jean-Christophe Antona (Alcatel-Lucent, France)
- S10-3 The Role of Network Topology on the Energy Efficiency of IP-over-WDM Architectures**
Francesco Musumeci (Politecnico di Milano, Italy); Massimo Tornatore (Politecnico di Milano & University of California, Davis, Italy); Achille Pattavina (Politecnico di Milano, Italy)

Session 11

- S11-1 The Internet and Transport Network Management Ecosystems: A Roadmap Toward Convergence** ****
Marcelo Yannuzzi (Technical University of Catalonia (UPC), Spain); Admela Jukan (Technische Universität Carolo-Wilhelmina zu Braunschweig, Germany); Xavier Masip-Bruin (Universitat Politècnica de Catalunya & Advanced Network Architectures Lab (CRAAX), Spain); Mohit Chamanian (Technische Universität Carolo-Wilhelmina zu Braunschweig, Germany); René Serral-Gracià (Technical University of Catalunya (UPC), Spain); Victor Lopez (Telefonica I+D, Spain); Oscar González de Dios (Telefonica I+D, Spain); Maciej Maciejewski (ADVA Optical Networking, Poland); Jörn Altmann (Seoul National University, Korea); M Roth (ADVA Optical Networking, Germany); C Brunn (ADVA Optical Networking, Germany); A Azanon (Telefonica, Spain)
- S11-2 Cloud-based Architecture for deploying Ultra-High-Definition Media over Intelligent Optical Networks** ****
Okung-Dike Ntofon (University of Essex, United Kingdom); Dimitra Simeonidou (University of Essex, United Kingdom); David K. Hunter (University of Essex, United Kingdom)
- S11-3 Impact of Node Clustering on Network Cost and Resource Utilization** ****
Theofanis G. Orphanoudakis (University of Peloponnese, Greece); Andreas Drakos (University of Peloponnese, Greece); Alexandros Stavdas (University of Peloponnese, Greece)
- S11-4 Overlaying rings onto a mesh network** ****
Yvan Pointurier (Alcatel-Lucent Bell Labs, France)
- S11-5 Robust Upgrade in Optical Networks under Traffic Uncertainty** Ramon Aparicio-Pardo ****
(Technical University of Cartagena, Spain); Pablo Pavon-Marino (Technical University of Cartagena, Spain); Biswanath Mukherjee (- University of California Davis, USA)
- S11-6 Getting routers out of the core: Building an all-optical network with "multipaths"** ****
Davide Cuda (Orange Labs, France); Raluca Indre (Orange Labs, France); Esther Le Rouzic (Orange Labs, France); James Roberts (INRIA, France)
- S11-7 Optimal degree of optical circuit switching in IP-over-WDM networks** ****
Ulrich Menne (atesio GmbH, Germany); Christian Raack (Zuse-Institute Berlin, Germany); Roland Wessaely (atesio GmbH, Germany); Daniel Kharitonov (Juniper Networks, USA)

Poster Session

- P1 Loss, Complexity and Cost Analysis of an Optical Switching Fabric Using Fixed Converters**
Michele Savi (Norwegian University of Science and Technology, Norway); Harald Øverby (Norwegian University of Science and Technology, Norway); Norvald Stol (Norwegian University of Science and Technology, Norway); Carla Raffaelli (University of Bologna, Italy)
- P2 A Novel Meta-Heuristic Approach for Optical Monitoring-Tree Design in WDM Networks**
Elias A. Doumith (TELECOM ParisTech, France); Sawsan Al Zahr (TELECOM ParisTech, France); Maurice Gagnaire (Telecom ParisTech (Ecole Nationale Supérieure des Telecommunications) & Institut Telecom, France)
- P3 Optical Switching for Dynamic Distribution of Wireless-over-Fiber Signals**
Guillermo Arturo Rodes (Technical University of Denmark, Denmark); Juan Jose Vegas Olmos (Technical University of Denmark, Denmark); Fotini Karinou (Technical University of Denmark, Denmark); Ioannis Roudas (University of Patras, Greece); Lei Deng (Technical University of Denmark, Denmark); Xiaodan Pang (Technical University of Denmark, Denmark); Idelfonso Tafur Monroy (Technical University of Denmark, Denmark)
- P4 Minimum CAPEX Design of Segment p-Cycles with Full Node Protection**
Brigitte Jaumard (Concordia University, Canada); Honghui Li (Concordia University, Canada)
- P5 Large-Core Plastic Optical Fibre Based In-home Optical Networks**
Yan Shi (COBRA, Eindhoven University of Technology, The Netherlands); Chigo Okonkwo (Eindhoven University of Technology, The Netherlands); Ton Koonen (COBRA, Eindhoven University of Technology, The Netherlands); Eduward Tangdionga (Eindhoven University of Technology, The Netherlands)
- P6 P-cycle Design for Mixed-Line Rate Optical Networks**
Hamza Drid (Orange Labs, France); Nicolas Brochier (Orange Labs, France); Nasir Ghani (University of New Mexico, USA); Esther Le Rouzic (Orange Labs, France)
- P7 Economic Modelling of Uncertain Next-Generation Network Evolution**
Csaba Kiss Kalló (Intune Networks Ltd, Ireland); John Dunne (Intune Networks, Ireland); Raymond Carley (Intune Networks, Ireland); Conor O'Malley (Intune Networks, Ireland); Victor Lopez (Telefonica I+D, Spain); Juan P. Fernández-Palacios (Telefónica I+D, Spain)
- P8 Upgrading cost modelling of capacity-exhausted static WDM networks**
Ariel Leiva (Pontificia Universidad Católica de Valparaíso, Chile); Carmen Mas (Technical University of Munich, Germany); Alejandra Beghelli (Universidad Tecnica Federico Santa Maria & University College London, Chile)
- P9 Suboptimal PON Network Designing Algorithm for Minimizing Deployment Cost of Optical Fiber Cables**
Akira Agata (KDDI R&D Laboratories Inc., Japan); Kosuke Nishimura (KDDI R&D Laboratories Inc. & Optical Access Network Laboratory, Japan)
- P10 Optimization of the Knowledge Base of a Cognitive Quality of Transmission Estimator for Core Optical Networks**
Tamara Jiménez (University of Valladolid, Spain); Juan Carlos Aguado (University of Valladolid, Spain); Ignacio de Miguel (University of Valladolid, Spain); Ramón J. Durán (University of Valladolid, Spain); David Sánchez (CEDETEL, Spain); Marianna Angelou (AIT, Greece); Noemí Merayo (University of Valladolid, Spain); Patricia Fernández (University of Valladolid, Spain); Natalia Fernández (University of Valladolid, Spain); Rubén Lorenzo (CEDETEL, Spain); Ioannis Tomkos (AIT, Greece); Evaristo J. Abril (University of Valladolid, Spain)
- P11 Degradation Attacks on Passive Optical Network**
Sandra Drakulic (Politecnico di Milano, Italy); Massimo Tornatore (Politecnico di Milano & University of California, Davis, Italy); Giacomo Verticale (Politecnico di Milano, Italy)
- P12 Scheduling Techniques in an Integrated Hybrid Node with Electronic Buffers**
Raimena Veislari, Steinar Bjornstad, Norvald Stol (ITEM, Norwegian University of Science

and Technology, Norway)

P13 Analysis of a GMPLS Enabled Hybrid Optical Switching Network

Matteo Fiorani (University of Modena and Reggio Emilia, Italy); Maurizio Casoni (University of Modena and Reggio Emilia, Italy); Slavisa Aleksic (Vienna University of Technology, Austria)

P14 Stochastic Energy-Efficiency Optimization in Photonic Networking by use of Master-Slave Equipment Configurations

Michael Parker (University of Essex, United Kingdom); Stuart D Walker (University of Essex, United Kingdom)

