CONFERENCE GUIDE

ECOC 2026

52nd European Conference on Optical Communication

SEPTEMBER 20-24 2026 • MÁLAGA, SPAIN

https://www.ecoc2026.org

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Welcome to ECOC 2026 in Málaga

ECOC, the European Conference on Optical Communication, is the largest and most prestigious event on optical communications in Europe and the second largest worldwide. At ECOC, researchers from both industry and academia and professionals come together to discuss and explore advances and probe future trends that will enable scientific progress and economic growth.

With an exciting program covering all aspects in the field of optical communications and networks, ECOC offers an irreplaceable forum for observing the state of the sector and establishing relationships with the most relevant players in the ecosystem.

Expand your knowledge and discover the possibilities offered by photonics to address crucial issues that enable the growth and sustainability of the information society in emerging fields such as Artificial Intelligence, the Internet of Things, and Quantum Technologies.

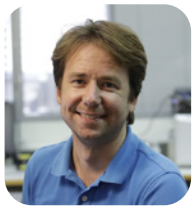
The ECOC Exhibition runs in parallel with the ECOC conference and has become the largest optical communications exhibition in Europe and the key meeting place for decision-makers in the optical communications world.

Join us in Málaga, where we expect to reach a record number of attendees, and enjoy the charming and vibrant scientific and business atmosphere of this historic Mediterranean city.

Local Organising Committee

Iñigo Molina-Fernández
General Chair
University of Málaga

Jose Capmany
General Chair
Technical University of Valencia



Robert Halir
Technical Programme Chair
University of Málaga

Ivana Gasulla
Technical Programme Chair
Technical University of Valencia

Photonics & RF Research Lab

Photonics Research Lab

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ALTER

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France | Germany | Korea | Spain | UK | USA

TÜVNORDGROUP

General Information

Venue & How to get there

FYCMA - Palacio de Ferias y Congresos de Málaga
Palacio de Ferias y Congresos, Av. de José Ortega y Gasset, 201, Cruz de Humilladero, 29006 Málaga.

Program

Please see the updated program on the conference website: **ecoc2026.org/ECOC2026/programme**

Public transportation

The Trade Fairs and Congress Center of Málaga, is the second most important communications and transport hub in Spain and the first in the south of the country – is located next to the motorway that joins the ring roads of Malaga with the Mediterranean Motorway.

The Pablo Ruiz Picasso international airport, 9 km from the Trade Fairs and Congress Center, allows you to get from Malaga to major European cities in an average of 2 to 3 hours. A railway network with a high-speed line was also added in December 2007. Furthermore, the dense network of motorways provides quick access to the city, which is surrounded by the East and West Ring Roads, which lead to the exhibition centre.

Malaga's bus and railway network guarantees quick and easy access to FYCMA.

Empresa Malagueña de Transporte (EMT) buses No. 4, No. 19 and No. 20 connect the Trade Fairs and Congress Center to the city centre; and bus No. 22 takes you from the exhibition centre to Av. Moliere and the University of Malaga (UMA) Teatinos Campus.

If you're using a navigation app (such as Google Maps), enter "**FYCMA-Palacio de Congresos**" as your destination.

Bus lines 4, 19, 20 run every 10-15 minutes from the city center. You can pay for the bus using a contactless VISA or MasterCard (either a physical or a mobile card, enabled for PIN-free operation) at the front door of the bus (you should not tap again when leaving the bus). For cash payment only notes below 5€ are allowed.

The commuter train lines C1-C2 (not the metro) run every 20 minutes, and the stop closest to the venue is Victoria Kent. You can pay by tapping your physical Mastercard or Visa card at the turnstiles (you have to tap again when leaving)

Wifi

Network: **ECOC26 -** Password: **ecoc2026**

Registration

All participants will receive a QR code via e-mail a few days prior to the conference starts. This code is for printing your name badge when you arrive to the venue. We encourage everyone to register and collect their badge as early as possible to avoid queuing.

Opening registration hours

Sunday 20 September. **08:00-20:00**
Monday 21 September. **08:00-18:30**
Tuesday 22 September. **08:00-18:30**
Wednesday 23 September. **08:00-18:30**
Thursday 24 September. **08:00-12:30**

Speaker preview room

Presentations must be uploaded in advance via the website or in person at the Speaker Preview Room. Uploads inside the session room will not be allowed. All presentations must be **uploaded by 15:00 (3:00 PM) on the day prior to the presentation.**

Opening hours

Sunday 20 September. **08:00-17:30**
Monday 21 September. **08:00-18:15**
Tuesday 22 September. **08:00-18:15**
Wednesday 23 September. **08:00-18:30**
Thursday 24 September. **08:00-16:30**

Meals

Coffee, tea, water and small snacks are included for all conference participants. The cafés and Bars at the conference venue offer hot and cold drinks, hot and cold meals, snacks and sweets for purchase.

Disclaimer

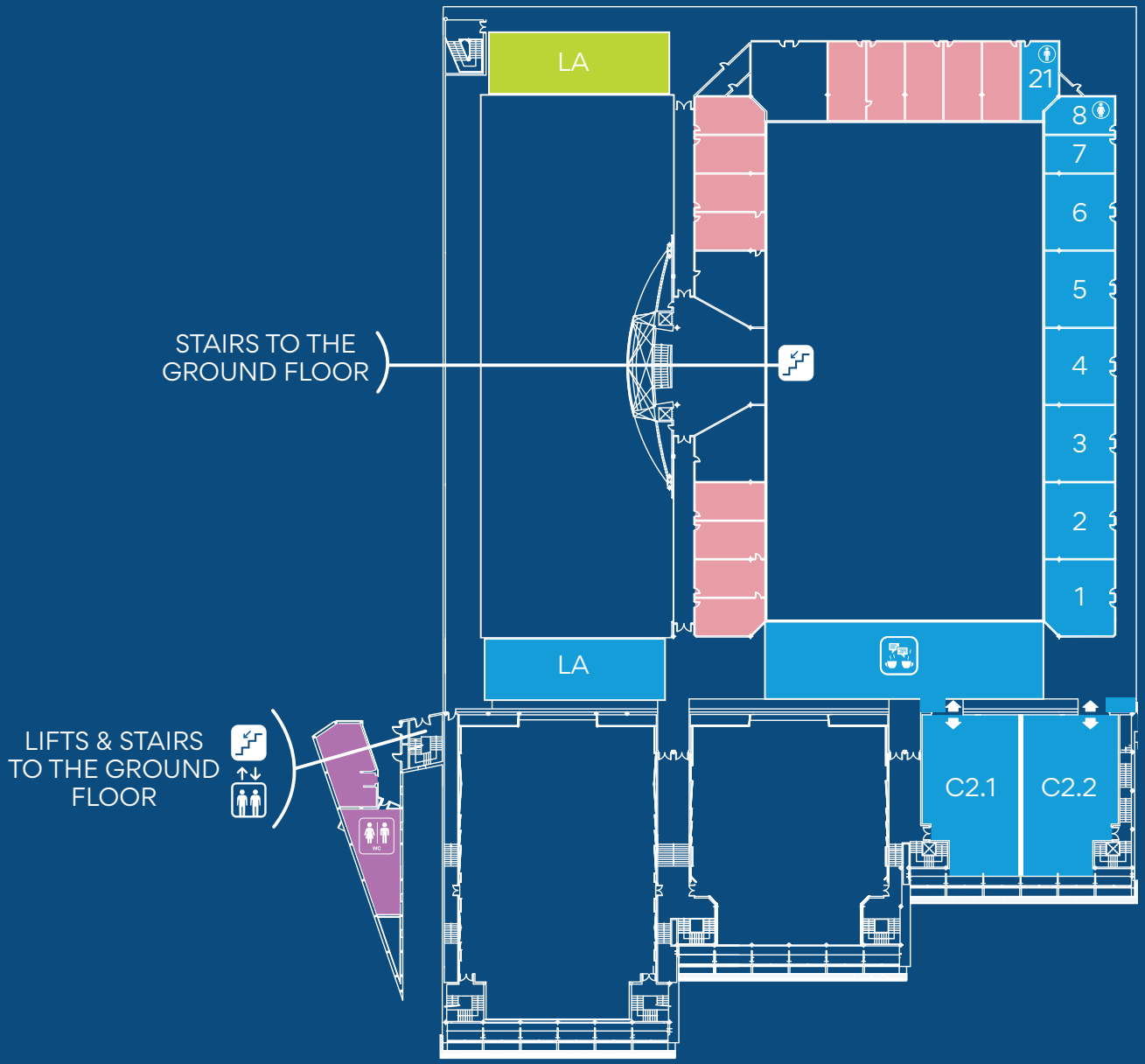
Pictures and short videos will be taken during the conference. If you do not want to be included in any photographs or videos, please let us know as early as possible.

Certificate of attendance

After the conference, you will receive an email with your certificate of attendance.

Venue Areas

TOP FLOOR



Exhibition & Conference common areas

LA Lounge area

Conference area

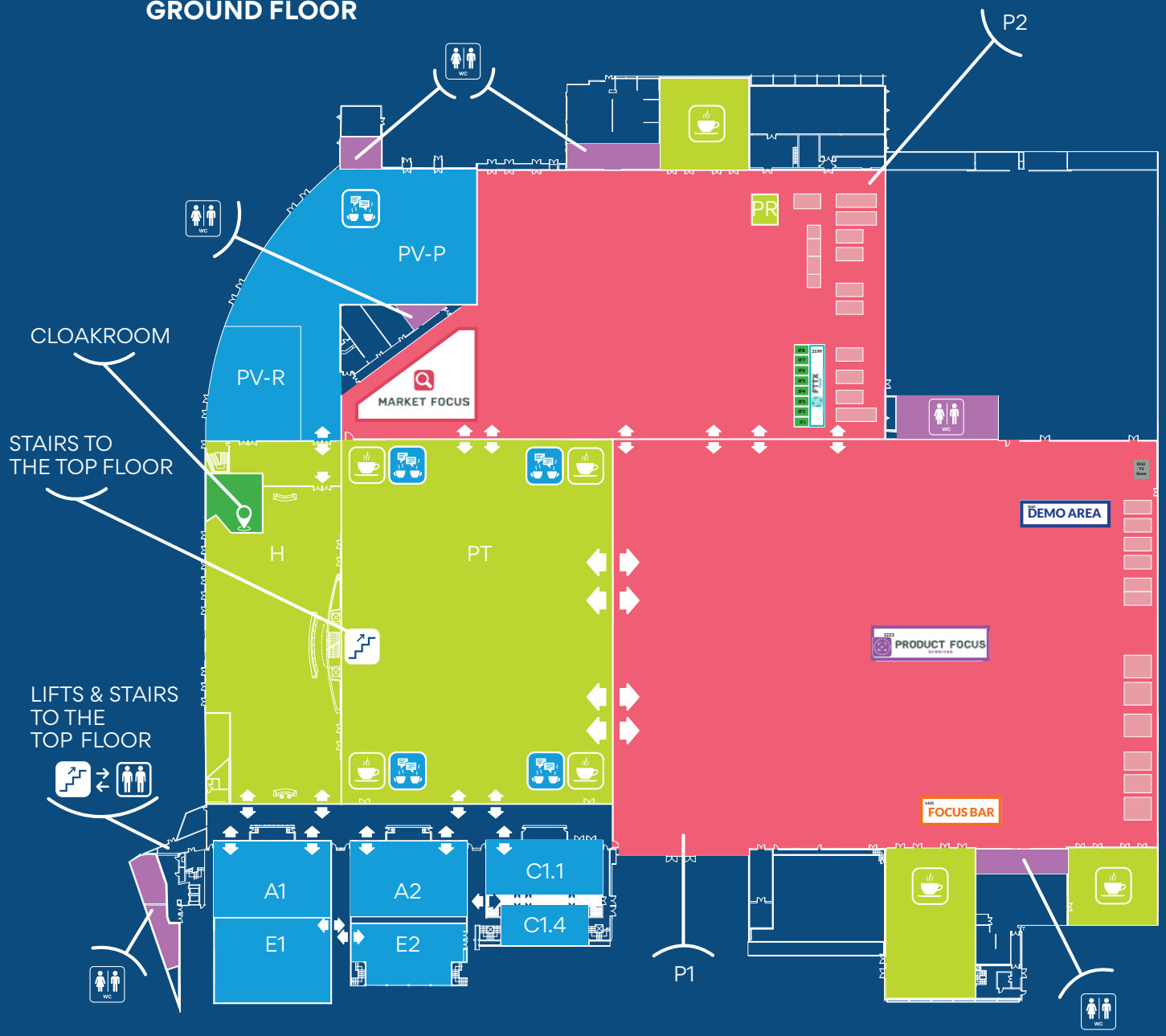
C2.1 Conference room 2.1
C2.2 Conference room 2.2
LA Lounge area
Delegate Coffee break area

Conference meeting rooms

1 Speaker preview room
2 - 7 Meeting rooms
8 Faith room women
21 Faith room men

Exhibitor meeting rooms

GROUND FLOOR



Exhibition & Conference common areas

- H Hall
- PT Patio
- PR Press room
- Coffee shop

Conference area

- A1 Auditorium 1
- A2 Auditorium 2
- E1 Exhibition room 1
- E2 Exhibition room 2
- C1.1 Conference room 1.1
- C1.4 Conference room 1.4
- PV-R Multipurpose room
- PV-P Multipurpose Poster area
- Delegate Coffee break area

Exhibition area

- P1 Exhibition hall 1
- P2 Exhibition hall 2

Exhibitor meeting rooms

AG PHOTONICS

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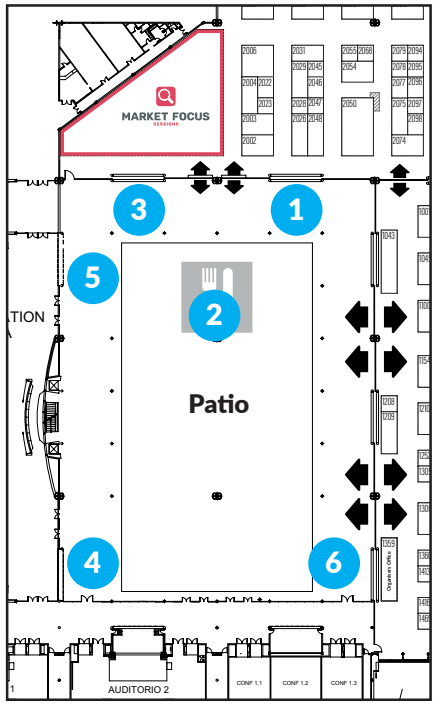
- Secure and Jamming-proof
- High-speed wireless links

Learn more at www.ag-photonics.com

ECOC 2026 - Food Court and Cafeteria Locations & Times



PATIO		Friday	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday
1	**STREET CORNER** • *220g Burger with cheese, lettuce, vine-ripened tomato, sliced pickled gherkin, onion, ketchup sachets, mustard sachets, mayonnaise sachets, and potato chips (Vegan option available)* • *XL Hot Dogs with potato chips* • *Drinks available in all the bars.*	*Closed*		*11.30 - 16.30*	*11.30 - 16.30*	*11.30 - 16.30*	*11.30 - 16.30*	*11.30 - 16.00*
2	**RICE CORNER** • *Traditional "Arroz a Banda" with king prawns* • *Vegetable Rice*	*Closed*		*11.30 - 16.30*	*11.30 - 16.30*	*11.30 - 16.30*	*11.30 - 16.30*	*11.30 - 16.00*
3	**FRESH CORNER** • *Green Salad • Caesar Salad • Chicken Wrap* • *Gazpacho (chilled tomato soup)*	*Closed*		*11.30 - 16.30*	*11.30 - 16.30*	*11.30 - 16.30*	*11.30 - 16.30*	*11.30 - 16.00*
4	**"SABOR A MÁLAGA" CORNER** **Breakfast** • *Coffee • Mollete bread with tomato and olive oil* **Lunch** • *Iberian cured ham baguette Spanish omelette sandwich • Manchego cheese sandwich Spanish omelette portion*	*Closed*		*8.00 - 16.30*	*8.00 - 16.30*	*8.00 - 16.30*	*8.00 - 16.30*	*8.00 - 16.00*
5 & 6	**DRINKS & SNACKS** • *Water and juices • Coffee • Soft drinks and beers* • *Assorted snacks: chips, chocolate bars, sweets, etc*	*Closed*			*8.00 - 18.00*	*8.00 - 18.00*	*8.00 - 18.00*	*Closed*

PAVILION 1								
1	**CAFETERIA 1 (240 seats)** • *Buffet Service • Soft drinks and beers* • *Assorted snacks: chips, chocolate bars, sweets, pastries, etc • Sandwiches*	*8.00 - 19.00* *(Only contractors)* *Food from 11.30 to 16.00*	*8.00 - 19.00* *(Only contractors)* *Food from 11.30 to 16.00*	*8.00 - 19.00* *(Only contractors)* *Food from 11.30 to 16.00*	*8.30 - 17.00* *Food from 11.30 to 16.00*	*8.30 - 17.00* *Food from 11.30 to 16.00*	*8.30 - 16.00* *Food from 11.30 to 16.00*	*8.00 - 15.00* *Food from 11.30 to 15.00*
2	**RESTAURANTE A LA CARTA* (110 seats)** • *Buffet Service • Soft drinks and beers* • *Assorted snacks: chips, chocolate bars, sweets, pastries, etc • Sandwiches*	*Closed*			*11.30 - 17.00* *Food from 11.30 to 16.00*	*11.30 - 17.00* *Food from 11.30 to 16.00*	*11.30 - 16.00* *Food from 11.30 to 16.00*	*Closed*
3	**FOCUS BAR** • *Drinks and light snacks*	*Closed*			*9.00 - 17.00*	*9.00 - 17.00*	*9.00 - 16.00*	*Closed*
PAVILION 2								
4	**CAFETERIA 2 (210 seats)** • *Buffet Service • Soft drinks and beers* • *Assorted snacks: chips, chocolate bars, sweets, pastries, etc • Sandwiches*	*Closed*			*9.00 - 17.00* *Food from 11.30 to 16.00*	*9.00 - 17.00* *Food from 11.30 to 16.00*	*9.00 - 16.00* *Food from 11.30 to 16.00*	*Closed*

Plenary Sessions

Monday, 21 September 09:30 - 12:00

Peter Winzer
Vice President of Systems Architecture at Ciena

Talk: **AI Cluster Communication**

Abstract:
The performance of ever-growing AI clusters is severely limited by interface bandwidths, from memory access to scale-up, scale-out, and scale-across. This talk will explore the I/O needs in AI clusters and review challenges and solutions, from ultra-dense wide-and-parallel die-to-die interfaces to co-packaged copper and optical scale-up and scale-out sockets all the way to coherent scale-across systems.

Bio:
Peter Winzer is Vice President of Systems Architecture at Ciena. He helps drive Ciena's strategy and innovation in AI interconnect architectures. Peter joined Ciena as part of the acquisition of Nubis Communications, the company he founded to advance highly integrated, massively parallel optical and electrical communication interfaces. Before founding Nubis, he spent many years at Bell Labs, where he set multiple high-speed optical transmission records, contributed to major optical product developments, and led fiber-optic transmission research. He has published over 500 scientific papers, holds more than 100 granted patents, and has received numerous accolades, including the John Tyndall Award. Peter is a Bell Labs Fellow, a Fellow of IEEE, Optica, and the US National Academy of Inventors, and is a Member of the US National Academy of Engineering. He holds an honorary doctorate from the Technical University of Eindhoven. He has served as Editor-in-Chief of the Journal of Lightwave Technology, Program Chair of ECOC, and Program/General Chair of OFC. Peter earned his Ph.D. in electrical engineering from the Technical University of Vienna

Patrick Vandenameele
CEO at IMEC

Talk: **Integrated photonics at the heart of a scalable AI revolution**

Abstract:
Artificial intelligence is becoming the defining technology of our era, but its long-term impact depends on one critical challenge: scalability. As AI evolves toward complex, agentic systems operating from cloud to edge, demands on compute, memory, and connectivity are growing at an unprecedented pace. Sustaining the AI revolution will require innovation across the entire technology stack, from advanced CMOS and heterogeneous integration to photonic interconnects and system-level co-optimization. This presentation will explore how integrated photonics is emerging as a critical enabler for this next wave of scaling. Innovations across integrated photonic technologies - spanning both scale-up and scale-out fabrics - are reshaping the future of pluggable optics, co-packaged optics (CPO), and next-generation optical interconnects. These advances are essential to unlock the bandwidth, power efficiency, and manufacturing maturity required for tomorrow's AI infrastructure

Bio:
Patrick Vandenameele is EVP and CEO-elect (effective April 1, 2026) at imec, the globally recognized R&D center for nanoelectronics and digital technologies. As EVP and chief architect of imec's research direction, Patrick has been responsible for shaping and driving the center's innovation agenda, ensuring alignment between research initiatives, market needs, and partner priorities.
His appointment as CEO underpins imec's commitment to addressing market-driven application challenges while advancing its technology platforms. Patrick holds a PhD from KU Leuven and began his career at imec in 1996. In 2000, he transitioned to entrepreneurship, founding and leading several deep-tech ventures. He held senior positions at leading semiconductor companies, including Qorvo and Hisilicon/ Huawei. His efforts resulted in 11 product launches and more than 100 million units shipped. Returning to imec in 2017, Patrick played a key role in scaling the R&D center's venturing activities, before stepping into his current leadership positions.

Plenary Sessions

Monday, 21 September 09:30 - 12:00

Mark Thompson
Co-Founder and CTO at PsiQuantum

Talk: **Photonics for Quantum Computing**

Abstract:
Powered by breakthroughs in integrated photonics and fault-tolerant quantum architecture, PsiQuantum is building the first industrial-scale quantum computer to solve problems beyond the reach of the world's most powerful supercomputers. Our approach is based on photonic qubits, which offer significant advantages at the scale required to deliver fault-tolerant, general-purpose quantum computing.

In this talk, I will describe how our ultra-low-loss, high-performance photonic platform provides a path to scale. I will outline how we generate and detect photonic qubits, how we manipulate and route them using fast barium titanate (BTO) electro-optic switching networks, and how we enable module-to-module connectivity through photonic qubit interconnects. We are building photonic systems of an unprecedented scale—combining advanced chip technology, cryogenics, control electronics, and architecture into a manufacturable quantum computing platform.

Bio
Prof. Mark Thompson is Co-Founder and Chief Technologist of PsiQuantum, where he leads the development of large-scale photonic quantum computing hardware. He has more than 25 years of experience in photonics and quantum technologies, spanning research, industrial innovation, and system-scale engineering. He received his PhD from the University of Cambridge and has held senior roles in both industry and academia, including positions at Toshiba, Corning, and Bookham Technology. He is Professor of Quantum Photonics at the University of Bristol and previously a Fellow of the University of Cambridge. Prof. Thompson founded the Bristol Centre for Quantum Engineering and the Bristol Quantum Technology Enterprise Centre, helping to establish the UK as a leader in quantum technologies. He has authored more than 200 publications and patents, received prestigious UK and European awards, and co-founded two quantum technology startups.

Jiangwei Man
Director of Advanced Optoelectronics Laboratory at Huawei

Talk: **Scaling AI From Optical Innovation to NPO and CPO Solutions**

Abstract:
With the explosive growth of artificial intelligence, traditional optical interconnect technologies for AI computing networks have become critical bottlenecks in terms of density and energy efficiency. This report focuses on the innovative architectures of NPO (Near-Packaged Optics) and CPO (Co-Packaged Optics), providing an in-depth analysis of their advantages in reducing power consumption and improving integration density. Through a systematic analysis of technological evolution, we demonstrate that standardized NPO/CPO represents the inevitable path to overcome current limitations and sustain the scalability of AI computing networks.

Bio
Dr. Jiangwei Man is Director of Advanced Optoelectronics Laboratory and Principal Researcher of Optoelectronics at Huawei. He leads the team that have pioneered a technological revolution in optical interconnects for data centers, with speeds spanning 25 to 400 Gbps per lane. He oversees the architectural and system design of the solution, defining critical design requirements for core components. He has also made outstanding contributions to IEEE, OIF, IPEC and other industry organizations—championing the development of international standards for short-reach interconnects, and actively participating in premier international conferences including ECOC and OFC to advance the collaborative evolution of cutting-edge industrial technologies. His team is dedicated to technical research and innovation across diverse optoelectronic fields and related application.

With over 20 years of expertise in optical communications, Dr. Man holds a PhD from the Institute of Semiconductors, Chinese Academy of Sciences and a Bachelor's Degree in Physics from Nankai University

Workshops Schedule

Sunday, 20 September

09:00–10:30 - Coffee Break - 11:00–12:30

A1 Auditorium 1
Light sources for next-generation optical communication systems for AI datacenters
Despoina Petousi, *(Adtran Networks SE, Germany)* Abdul Rahim, *(PhotonDelta)*; Wei Shi, *(Canada Research Chair in Silicon Photonics)*; Wilfried Maineult, *(Coherent)*.

A2 Auditorium 2
How can we overcome the power wall across optical communication systems – from AI clusters to submarine networks?
Shu Namiki, *(The National Institute of Advanced Industrial Science and Technology (AIST))*; Peter Winzer, *(Ciena Corporation)*; Jean-Christophe Antona, *(Alcatel Submarine Networks)*.

E1 Exhibition room 1
From idea to product: How to speed up innovation in integrated photonics?
Oded Raz, *(TU/e)*; Wim Bogaerts, *(UGent)*; Antonio Teixeira, *(Universidade de Aveiro)*.

E2 Exhibition room 2
Can Global and Federated Optical Testbeds Power AI-Native Networks and Telecom Data Spaces?
Behnam Shariati, *(Fraunhofer Heinrich Hertz Institute (HHI))*; Marco Ruffini, *(Trinity College Dublin, The University of Dublin)*; Yusuke Hirota, *(National Institute of Information and Communications (NICT))*; Achim Autenrieth, *(Adtran)*.

C1.1 Conference room 1.1
Optical in-building networks – More than higher speed: Quality of experience, centralized coordination and decentralized AI
Volker Jungnickel, *(Fraunhofer Heinrich Hertz Institute (HHI))*; *(Christian Bluemm, (Huawei Technologies Duesseldorf GmbH)*; Philippe Chanclou, *(Orange)*.

PV-R Multipurpose room
Scaling Sustainable AI Data Centers and Green Access Networks: How can optical innovations contribute to energy and resource-efficient connectivity?
Salvatore Spadaro, *(Universitat Politècnica de Catalunya)*; Paola Parolari, *(Politecnico di Milano)*; Michela Svaluto Moreolo, *(Centre Tecnològic de Telecomunicacions de Catalunya (CTTC))*; Jeremy Potet, *(Orange)*.

C2.1 Conference room 2.1
Atmospheric Turbulence Mitigation for High-Rate, Coherent Ground-to-Space Optical Links: Final Hurdles to Commercialization
Anaëlle Maho, *(TAS)*; Mustafa Cardakli, *(Amazon)*; Morio Toyoshima, *(NICT)*; Christian Fuchs, *(DLR)*; Yan Li, *(BUPT)*.

C2.2 Conference room 2.2
Quantum Repeaters – Recent Progress and Open Challenges
Wolfgang Tittel, *(University of Geneva)*; Adam Kinos, *(Lund University)*; Andreas Reiserer, *(Technical University of Munich)*.

Workshops Schedule

14:00–15:30 - Coffee Break - 16:00–17:30

A1 Auditorium 1
Meeting Diverse AI Connectivity Needs: Architectural Choices for Next-Generation Pluggable Transceivers
Andrea Carnio, *(Nokia)*; Adonis Bogris, *(University of West Attica)*; Mads Lønstrup Nielsen, *(Nvidia)*.

A2 Auditorium 2
Could 100s-km long unrepeatered HCF links redefine the economics and design of terrestrial and submarine optical networks?
Jeremie Renaudier, *(Nokia)*; Ruben S. Luis, *(National Institute of Information and Communications Technology (NICT))*; Georg Rademacher, *(University of Stuttgart)*; Ben Puttnam, *(Microsoft Azure)*.

E1 Exhibition room 1
Will the AI workload require an end-to-end-optimized network infrastructure?
Yvan Pointurier, *(Huawei)*; Raul Muñoz, *(Centre Tecnològic de Telecomunicacions de Catalunya (CTTC))*; Shuangyi Yan, *(University of Bristol)*.

E2 Exhibition room 2
Confluence at the Edge: Rethinking Networks for 6G and Beyond
Paolo Monti, *(Chalmers University of Technology)*; Aleksandra Kaszubowska, *(Trinity College Dublin)*; Marco Ruffini, *(Trinity College Dublin)*, Ireland.

C1.1 Conference room 1.1
How Will We Manage the Heterogeneous Optical Communication Networks of the Future?
Tom Bradley, *(Eindhoven University of Technology)*; Natalie Wheeler, *(University of Southampton)*.

PV-R Multipurpose room
Can fast narrow channels keep rising without limit or will slow and wide become the winner?
Eric Bernier, *(Leader Advanced Photonics, Huawei Technologies Canada)*; Peter Winzer, *(VP, Systems Architecture,)*; Tony Chan Carusone, *(CTO, Alphawave Semi)*; Marianna Pantouvaki, *(Principal Integrated Photonics Microsoft Research)*.

C2.1 Conference room 2.1
Hybrid Solutions for Very High Speed PON – the best — or worst — of Coherent and IMDD worlds?
Derek Nesset, *(Huawei)*; Gael Simon, *(Orange/INNOV/NET/WNI/FUN/FAN)*; Rene Bonk, *(Nokia)*; Roberto Gaudino, *(Politecnico di Torino)*.

C2.2 Conference room 2.2
Telecom Fiber as a Geophysical Sensor for Earthquake, Tsunami and Microseismic Monitoring
Oskars Ozolinš, *(Riga Technical University)*; Steinar Bjørnstad, *(Tampnet)*, Guy Torfs, *(Ghent University)*.

Tutorial Speakers Schedule

Monday, 21 September

14:00-15:30

A2 Auditorium 2
Mo3-B - Hollow-core fibre fabrication and deployment
Mo3-B1 - Breaking the Loss Barrier: Hollow-Core Fibers from Physical Limits to Mass Production
Yingying Wang, *(Linfiber Technology)*

16:45-18:15

A1 Auditorium 1
Mo5-A - Distributed optical sensing: from physics to network deployment
Mo5-A1 Distributed Optical Fibre Sensing: Where Elegant Physics Gives Rise to Smart Systems
Luc Thévenaz, *(EPFL Ecole Poytechnique Fédérale de Lausanne)*

Tuesday, 22 September

09:00-10:00

A1 Auditorium 1
Tu1-A - From high-Q resonators to frequency comb generation
Tu1-A1 - High-Q Integrated Photonics
Kerry Vahala, *(California Institute of Technology)*

14:00-15:00

A1 Auditorium 1
Tu3-A AI and advanced processing for optical communication systems
Tu3-A1 Communication engineering in the age of AI
Darko Zibar, *(Technical University of Denmark)*

14:30-15:30

A2 Auditorium 2
Tu3-B - Light propagation and manipulation from short to long distance
Tu3-B2 - Hollow Core Photonic Crystal Fibre: Perfect Light Pipe?
Philip St. John Russell, *(RCALS, Hangzhou)*

16:30-17:30

A1 Auditorium 1
Tu4-A - Access network evolution
Tu4-A2 - 25 Years of PON standardization Tracking the Evolution of Technology and its Market
Frank Effenberger, *(Futurewei)*

Tutorial Speakers Schedule

Wednesday, 23 September

09:00-10:00

A1 Auditorium 1
We1-A - SDM systems
We1-A1 - High capacity SDM transmission
Ruben Luis, *(National Institute of Information and Communications Technology)*

11:00-12:00

A1 Auditorium 1
We2-A - Advancements on optical fiber transmission
We2-A1 - Optical fibre communications and network innovations: the past 60 years and what the future holds
Russell Davey, *(British Telecom)*

14:00-15:00

A2 Auditorium 2
We3-B - Integration of magneto-optics
We3-B1 - Nonreciprocal integrated magneto-optics: from optical isolators to new applications in communications, sensing, and computing
Paolo Pintus, *(University of Cagliari)*

17:00-18:00

A1 Auditorium 1
We5-A - Network operation and fault management in optical networks
We5-A1 - SDN Agents for IPoWDM Routers and Coherent Pluggables
Andrea Sgambelluri, *(Scuola Superiore Sant'Anna)*

Thursday, 24 September

09:00-10:00

A1 Auditorium 1
Th1-A - Novel modulators
Th1-A1 - Silicon Slow-Light-Based Modulators and High-Efficiency Optical Transmitters
Toshihiko Baba, *(Yokohama National University)*

A2 Auditorium 2
Th1-B - Turbulence mitigation in free-space optical communications
Th1-B1 - Coherent Free-Space Optical Communications in Atmospheric Turbulence: Principles, Limits, and Emerging Strategies
Aniceto Belmonte, *(UPC)*

11:00-12:00

A1 Auditorium 1
Th2-A - Security of optical communication systems
Th2-A1 - Quantum Physical Unclonable Functions: Foundations and Applications
Mina Doosti, *(University of Edinburgh, Quantum Software Lab)*

Invited Speakers Schedule

Monday, 21 September

14:00 – 14:30

A1 Auditorium 1
Mo3-A Photonic-driven architectures for access networks and AI clusters
The role of programmable photonics in AI data centers
Daniel Perez, *(Ipronics)*

C2.2 Conference room 2.2
Mo3-G Submarine and unrepeatered systems
Technologies and Challenges for beyond Petabit Submarine Cable
Pascal Pecci, *(META)*

14:30 – 15:00

E1 Exhibition room 1
Mo3-C Lasers and sources
Rare-earth ion doped on-chip amplifiers in the Al2O3 platform
Sonia Garcia Blanco, *(Aluvia Photonics)*

E2 Exhibition room 2
Mo3-H New approaches for linear and nonlinear functionalities
Sputtered AlN buffer layer for low loss crystalline AlN on sapphire integrated photonic
Camille Bres, *(EPFL)*

C1.4 Conference room 1.4
Mo3-E Optical non-terrestrian networks
Intelligent Empowerment of Optical-Computation Synergy: Signal Processing and Resource Management for Multi-Band Optical Networks
Rentao Gu, *(Beijing University of Post)*

15:00 – 15:30

E2 Exhibition room 2
Mo3-H New approaches for linear and nonlinear functionalities
Harnessing nonlinear and optomechanical phenomena in silicon nanostructures
Carlos Ramos, *(Paris Saclay)*

C1.1 Conference room 1.1
Mo3-D Integrated quantum photonics (I)
Thin-film lithium niobate for quantum photonics: perspectives and challenges
Yunhong Ding, *(DTU)*

C 2.1 Conference room 2.1
Mo3-F DSP for high spectral efficiency and SDM
Advances in High-Spectral-Efficiency Formats: Modulation and Coding
Hussam Batshon, *(Nokia)*

16:45 – 17:15

A2 Auditorium 2
Mo5-B Hollow-core fibre design
Hollow Core Fibres: from visionary concept to multi-problem solution
Francesco Poletti, *(University of Southampton)*

C1.1 Conference room 1.1
Mo5-D Integrated quantum photonics (II)
Photonic integrated circuits on SOI and SiN for quantum communications and quantum computing
Segolène Olivier, *(CEA Leti)*

17:15 – 17:45

E1 Exhibition room 1
Mo5-C Resonators, TFLT and integrated routing devices
Thin film Lithium tantalate photonic integrated circuits for next generation high speed communications and lasers
Tobias J. Kippenberg, *(EPFL)*

C1.1 Conference room 1.1
Mo5-D Integrated quantum photonics (II)
Quantum and Classical Photonics for Advanced Smart Applications
Roberto Morandotti, *(INRS Canada)*

17:45 – 18:15

C1.1 Conference room 1.1
Mo5-D Integrated quantum photonics (II)
III-V nanostructures for lasers and quantum emitters
Hoe Tan, *(Australian National University)*

C2.2 Conference room 2.2
Mo5-G Very high speed PON
Research directions on Hybrid PON for Very High Speed-PON
Ivan Cano, *(Huawei)*

Invited Speakers Schedule

Tuesday, 22 September

09:00 – 09:30

C2.1 Conference room 2.1
Tu1-F AI-driven control and monitoring in optical access networks
Digital Twin, Agent and Artificial Intelligence towards ION-2030
Italo Busi, *(Huawei)*

C2.2 Conference room 2.2
Tu1-G Short reach interconnects
Scalable, High-Capacity Optical Transmission for AI Data Centre Networks
Yuta Wakayama, *(KDDI)*

09:30 – 10:00

A2 Auditorium 2
Tu1-B Hollow core fibers in optical networks
New opportunities in optical networks enabled by hollow-core fibres
Periklis Petropoulos, *(University of Southampton)*

C1.1 Conference room 1.1
Tu1-D Optical amplification
Optical Amplification in the S-band and Beyond: From Materials and Mechanisms to Practical Deployment
Aleksandr Donodin, *(Aston University)*

C1.4 Conference room 1.4
Tu1-E Optical switches and demultiplexers
Breaking the AI networking and memory wall with a wide-andslow architecture and micro-LEDs
Paolo Costa, *(Microsoft)*

10:00 – 10:30

A1 Auditorium 1
Tu1-A From high-Q resonators to frequency comb generation
Flattop soliton microcombs for low power optical data links
Scott B. Papp, *(NIST)*

E1 Exhibition room 1
Tu1-C Advanced enabling technologies for free-space optical and optical wireless communications
Free-space optical communication using photonic crystal surface emitting lasers
Shota Ishimura, *(KDDI)*

E2 Exhibition room 2
Tu1-H Microwave photonics and radio over fiber
Processing THz signals with GHz electronics
Thomas Schneider, *(Technische Universität Braunschweig)*

C1.1 Conference room 1.1
Tu1-D Optical amplification
Energy Harvesting over Optical Communication Networks Using Discarded Light from a Gain-Flattening Filter
Masaki Wada, *(NTT, Inc.)*

14:00 – 14:30

A2 Auditorium 2
Tu3-B Light propagation and manipulation from short to long distance
Metamaterial integrated photonics for light coupling, beam steering and spectral filtering
Jens Schmid, *(CNRS Canada)*

E2 Exhibition room 2
Tu3-H Long-haul HCF systems
Tu3-H1 Hollow-Core Fibre Transmission Systems: From Metro to Long-Haul Applications
Yang Hong, *(Microsoft)*

C2.2 Conference room 2.2
Tu3-G Turbulence-resilient underwater optical wireless links
Optical Wireless Communications - Progress and Challenges
Ampalavanapillai Nirmalathas, *(University of Melbourne)*

14:30 – 15:00

C1.4 Conference room 1.4
Tu3-E Digital twin and autonomous network intelligence
ROADM and AI: A Perfect Symbiosis for Autonomous Optical Networks
Annalisa Morea, *(Nokia)*

PV-R Multipurpose room
Tu3-I Quantum state transmission and manipulation
Quantum Advantage with Optical Systems
Ulrik Andersen, *(DTU)*

Invited Speakers Schedule

16:00 – 16:30

A1 Auditorium 1
Tu4-A Access network evoluction.
Optical Access Network Evolution and Transformation Enabled by AI
Xuming Wu, *(Huawei Technologies France)*

C1.1 Conference room 1.1
Tu4-D Long-range QKD and fields trials
Practical quantum communications in deployed optical telecom networks
Mirko Pittaluga, *(Wavephotonics LTD)*

C2.2 Conference room 2.2
Tu4-G Optical sensing in telecommunications networks
Enhancing Telecommunications Network Availability through Infrastructure Protection with High-Spatial-Resolution Sensing
André Sandmann, *(Adtran)*

16:30 – 17:00

A2 Auditorium 2
Tu4-B Optical networks for AI datacenters and workloads
The Role of Optics in Next-Generation Multi-Gigawatt Datacenters
Bodhisattwa Gangopadhyay, *(Meta)*

E2 Exhibition room 2
Tu4-H Impairments monitoring in optical networks
First Implementation of NLI Estimation on Coherent DSP Enabled by On-Chip Longitudinal Power Monitoring
Takeo Sasai, *(NTT)*

17:00 – 17:30

A2 Auditorium 2
Tu4-B Optical networks for AI datacenters and workloads
Optical networks for AI: the challenge and optimization for LLM training and inference across datacenters
Jiawei Zhang, *(BUPT)*

Wednesday, 23 September

09:00 – 09:30

A2 Auditorium 2
We1-B Optical computing
Microring Resonators as Neuromorphic Primitives for Optical Computing: Spiking Networks, Complex Perceptrons, and Photonic Preprocessing
Lorenzo Pavesi, *(University of Trento)*

09:30 – 10:00

E1 Exhibition room 1
We1-C Advanced integrated modulators and transmitters
Reconfigurable Integrated Photonics for Massively Scaling AI Systems
Keren Bergman, *(Columbia University)*

10:00 – 10:30

C2.2 Conference room 2.2
We1-G DSP-based optical network monitoring
Digital Signal Processing for Longitudinal Power Monitoring and Nonlinear Interference Estimation
Dario Pilori, *(Politecnico di Torino)*

PV-R Multipurpose room
We1-I Quantum networks
A quantum internet based on solid-state quantum nodes
Samuele Grandi, *(ICFO)*

Invited Speakers Schedule

11:00 – 11:30

A2 Auditorium 2
We2-B SiP Based Modulators
Pushing Terabits: 800G and 1.6T Silicon Photonic Transmitters at Scale
Erman Timurdogan, *(Lumentum)*

E2 Exhibition room 2
We2-H SDM transmission
Space Division Multiplexing for Ultra-High Capacity Optical Communications
Chigo Okonkwo, *(Tue)*

11:30 – 12:00

E1 Exhibition room 1
We2-C LLM-driven control and automation in optical networks
LLMs and Optical Networks: A Symbiotic Relationship
Massimo Tornatore, *(Politecnico di Milano)*

C2.2 Conference room 2.2
We2-G Optical processing
Heterogeneous Photonic Integration for High-Performance Communication and Computing
Liangjun Lu, *(Shanghai Jiao Tong University)*

12:00 – 12:30

C1.1 Conference room 1.1
We2-D Ultra-wideband systems
Enabling technologies for long-haul ultra-wideband transmission utilizing extremely long wavelengths
Shimpei Shimizu, *(NTT)*

C1.4 Conference room 1.4
We2-E Advanced distributed fiber sensing
Distributed measurement of hollow core optical fibres
Radan Slavik, *(Southampton)*

14:00 – 14:30

A1 Auditorium 1
We3-A Switching architectures in optical networks
Automated Performance Optimization for Data Center Exchange over Open Optical Networks: Challenges and Future Perspectives
Toru Manu, *(NTT)*

E1 Exhibition room 1
We3-C On-chip light emission and detection
Coherent and silicon photonics: a marriage for the long and short haul.
Christopher Doerr, *(Aloe Semiconductor)*

PV-R Multipurpose room
We3-I Hollow-core fibre characterisation and standardisation
Rayleigh Speckle backscatter measurements of hollow core fiber
Nicolas Fontaine, *(Nokia Bell Labs)*

14:30 – 15:00

E1 Exhibition room 1
We3-C On-chip light emission and detection
The development of avalanche photodetectors for silicon photonics
Andy Knights, *(McMaster University)*

PV-R Multipurpose room
We3-I Hollow-core fibre characterisation and standardisation
Distributed Measurement of Magnitude and Orientation of the Local Birefringence Vector in a 5-Tube NANF
Silvia Zampato, (*University of Padova)*

C1.4 Conference room 1.4
We3-E Innovations in high capacity, short reach links
Accelerating the Terabit Breakthrough: Defining the Future of Ultra-High-Speed Ethernet
John D'Ambrosia, *(Huawei)*

15:00 – 15:30

E1 Exhibition room 1
We3-C On-chip light emission and detection
Recent progress on III-V on Si photonic transmitters
Joan Ramirez, *(Nokia)*

C1.1 Conference room 1.1
We3-D Signal processing for high-speed IMDD
Direct detection with high electrical spectral efficiency
Yikai Su, *(Shanghai Jiao Tong University)*

Invited Speakers Schedule

17:00 – 17:30

A2 Auditorium 2
We5-B Optical transmitters and transceivers
Progress of High-speed VCSELs and VCSEL-based Co-Packaging for Short Reach Communications
Daniel Kuchta, *(Nvidia)*

C1.1 Conference room 1.1
We5-D Optical wireless technologies for next-generation networks systems
In-Orbit Demonstration of Dual-ITLA Silicon Photonics Coherent Optical Module Supporting 100/200 Gbps Communications
Quan Li, *(Shanghai Optoelectronics Science and Technology Innovation Center)*

C1.4 Conference room 1.4
We5-E PON sensing, monitoring & energy efficiency
Sensing in PON – techniques and applications
Jochen Maes, *(Nokia)*

17:30 – 18:00

E1 Exhibition room 1
We5-C Integrated sensing and communication
Advancing Forward-Transmission Fibre Sensing for Precise Event Localisation
Jian Fang, *(Nec Labs)*

C2.1 Conference room 2.1
We5-F Quantum devices
Engineering Deterministic Quantum Light Sources at Telecom Wavelengths
Elizaveta Semenova, *(DTU)*

17:45 – 18:15

C1.1 Conference room 1.1
We5-D Optical Wireless technologies for next-generation networks systems
We5-D3 Optical Satellite Communication Systems- A Canadian Perspective
Steve Hranilovic, *(McMaster University)*

18:00 – 18:30

A2 Auditorium 2
We5-B Optical transmitters and transceivers
Advanced Industrial Silicon Photonics Platform on 300mm wafer for Optical Interconnect and Beyond
Frederic Boeuf, *(STM Microelectronics)*

C2.2 Conference room 2.2
We5-G Advance phase and timing recovery
Modeling and Mitigation of Equalization-Enhanced Phase Noise
Benedikt Geiger, *(KIT)*

PV-R Multipurpose room
We5-I VCSELs
Performance, Reliability and Manufacturability of 1060nm VCSEL Arrays for AI Data Center Scale-Up
Matthew Peters, *(Lumentum)*

Thursday, 24 September

09:00 – 09:30

E2 Exhibition room 2
Th1-H Coherent systems
High Capacity Coherent Systems: EEPN Characterization, System Impact and Mitigation
Fred Buchali, *(Nokia)*

10:00 – 10:30

C2.2 Conference room 2.2
Th1-G Ai-training in optical networks
Trade-offs of AI-based optical performance monitoring and sensing techniques
Lena Wosinska, (*Chalmers)*

11:00 – 11:30

E1 Exhibition room 1
Th2-C End-to-end optical communications systems for space: demonstration and validation
Satellite to Ground FSO Communication Links enhanced by Mode Diversity Reception and Adaptive Optics
Jian Wu, *(Beijing University of Posts and Telecommunications (BUPT))*

12:00 – 12:30

A2 Auditorium 2
Th2-B SoP sensing and aplications
The Mediterranean as an Earth-Scale Geophysical Sensor: Polarization Sensing on Subsea Fiber Infrastructure
Antonio Mecozzi, (*University of L'Aquila)*

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Special Events Schedule

Tuesday, 22 September

17:30-19:30

E2 Exhibition room 2
European Photonic Integration Forum (EPIF)

The European Photonic Integration Forum is organized every year at ECOC by ePIXfab and JePPIX, and is this year again supported by PhotonDelta. In the 2026 edition, EPIF focuses on the pathways to European scaling of the photonics ecosystem: from public funding to venture capital.

Keynote speakers:

- Claudia Hoessbacher (Polariton) will tell the exceptional story of Polariton, going from an academic spin-off setting world-record modulator speeds to a successful acquisition by Marvell in 2025.
- Ewit Roos (PhotonVentures) will give insights in the investment strategies in Europe, and how new pathways to venture capital can enable photonic start-ups and scale-ups in the European ecosystem/

Each of the keynotes will be accompanied by a one-on-one interview diving deeper into the topic, followed by an interactive panel discussion session. The event will be closed by a networking drink.

17:45-19:30

E1 Exhibition room 1
Hack Your Research! Tools and Tricks for Today's Telecommunications Techies

Organizers:

- Besma Kalla
  Eindhoven University of Technology, the Netherlands
- Giammarco Di Sciullo
  Università degli Studi dell'Aquila, Italy
- Vincent van Vliet
  Eindhoven University of Technology, the Netherlands
- Rekha Yadav
  University College London, United Kingdom
- Amol Delmade
  Pilot Photonics, Ireland

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  Chalmers University of Technology, Sweden
- Marco Eppenberger
  PsiQuantum, USA
- Menno van den Hout
  Eindhoven University of Technology, the Netherlands

Wednesday, 23 September

12:30-14:00

C1.4 Conference room 1.4
Women in Photonics

"WIP-BEAM: Women in Photonics-Bridging Excellence and Advancement through Mentorship"

Organizers:

- Carmen Mas Machuca
  Bundeswehr University Munich, Germany
- Anjali Sharma
  Bundeswehr University Munich, Germany

Panelists:

- Lena Wosinska
  Chalmers University, Sweden
- Olga Vassilieva
  Fujitsu, USA
- Anna Tzanakaki
  National and Kapodistrian University of Athens, Greece
- Jelena Pesic
  Nokia

Programme at a Glance

Explanation of presentation IDs (for example Th1-E-1)			
DAY	SESSION ORDER	ROOM	PRESENTATION ORDER
MO: MONDAY	1 - FIRST SESSION	A - AUDITORIUM 1	1 - FIRST TALK
TU: TUESDAY	2 - SECOND SESSION	B - AUDITORIUM 2	2 - SECOND TALK
WE: WEDNESDAY	3 - THIRD SESSION	C - EXHIBIT 1	3 - THIRD TALK
TH: THURSDAY	4 - FOURTH SESSION	D - CONFERENCE 1.1	4 - FOURTH TALK
	5 - FIFTH SESSION	E - CONFERENCE 1.4	5 - FIFTH TALK
		F - CONFERENCE 2.1	6 - SIXTH TALK
		G - CONFERENCE 2.2	
		H - EXHIBIT 2	
		I - MULTIPURPOSE	
		P - POSTER AREA	
		EX - EXHIBITION AREA	

Programme at a Glance

Sunday, 20 September

	A1 Auditorium 1	A2 Auditorium 2	E1 Exhibition room 1	C1.1 Conference room 1.1	C1.4 Conference room 1.4
	GROUND FLOOR				
8:30 - 9:00	**Morning Coffee**				
9:00 - 10:30	Light sources for next-generation optical communication systems for AI datacenters	How can we overcome the power wall across optical communication systems – from AI clusters to submarine networks?	From idea to product: how to speed up innovation in integrated photonics?	Optical in-building networks - more than higher speed: quality of experience, centralized coordination and decentralized AI	
10:30 - 11:00	**Coffee break**				
11:00 - 12:30	Light sources for next-generation optical communication systems for AI datacenters	How can we overcome the power wall across optical communication systems – from AI clusters to submarine networks?	From idea to product: how to speed up innovation in integrated photonics?	Optical in-building networks - more than higher speed: quality of experience, centralized coordination and decentralized AI	
12:30 - 14:00	**Lunch Break (on your own)**				
14:00 - 15:30	Meeting diverse AI connectivity needs: architectural choices for next-generation pluggable transceivers	Could 100s-km long unrepeatered HCF links redefine the economics & design of terrestrial and submarine optical networks?	Will the AI workload require an end-to-end-optimized network infrastructure?	How will we manage the heterogeneous optical communication networks of the future?	
15:30 - 16:00	**Afternoon Coffee break**				
16:00 - 17:30	Meeting diverse AI connectivity needs: architectural choices for next-generation pluggable transceivers	Could 100s-km long unrepeatered HCF links redefine the economics & design of terrestrial and submarine optical networks?	Will the AI workload require an end-to-end-optimized network infrastructure?	How will we manage the heterogeneous optical communication networks of the future?	
18:00 - 20:00	**Get-together at FYCMA**				

C2.1 Conference room 2.1	C2.2 Conference room 2.2	E2 Exhibition room 2	PV-R Multipurpose room	
TOP FLOOR		GROUND FLOOR		
Morning Coffee				8:30 - 9:00
Atmospheric turbulence mitigation for high-rate, coherent ground-to-space optical links: final hurdles to commercialization	Quantum repeaters - recent progress and open challenges	Can global and federated optical testbeds power AI-native networks and telecom data spaces?	Scaling sustainable AI data centers and green access networks: how can optical innovations contribute to energy and resource efficient connectivity?	9:00 - 10:30
Coffee break				10:30 - 11:00
Atmospheric turbulence mitigation for high-rate, coherent ground-to-space optical links: final hurdles to commercialization	Quantum repeaters - recent progress and open challenges	Can global and federated optical testbeds power AI-native networks and telecom data spaces?	Scaling sustainable AI data centers and green access networks: how can optical innovations contribute to energy and resource efficient connectivity?	11:00 - 12:30
Lunch Break (on your own)				12:30 - 14:00
Hybrid solutions for very high speed PON – the best (or worst) of coherent and IMDD worlds?	Telecom fiber as a geophysical sensor for earthquake, tsunami and microseismic monitoring	Confluence at the edge: rethinking networks for 6G and beyond	Can fast narrow channels keep rising without limit or will slow and wide become the winner?	14:00 - 15:30
Afternoon Coffee break				15:30 - 16:00
Hybrid solutions for very high speed PON – the best (or worst) of coherent and IMDD worlds?	Telecom fiber as a geophysical sensor for earthquake, tsunami and microseismic monitoring	Confluence at the edge: rethinking networks for 6G and beyond	Can fast narrow channels keep rising without limit or will slow and wide become the winner?	16:00 - 17:30
Get-together at FYCMA				18:00 - 20:00

Programme at a Glance

Monday, 21 September

	A1 Auditorium 1	A2 Auditorium 2	E1 Exhibition room 1	C1.1 Conference room 1.1	C1.4 Conference room 1.4
	GROUND FLOOR				
9:00 - 9:30	**Morning coffee**				
9:30 - 12:00	Opening and plenaries (in person)	Opening and plenaries (live stream)			
12:00 - 14:00	**Lunch Break (on your own)**				
14:00 - 15:30	Photonic-driven architectures for access networks and AI clusters (SC 07)	Hollow-core fibre fabrication and deployment (SC 01)	Lasers and sources (SC 02)	Integrated quantum photonics (i) (SC 11)	Optical non-terrestrian networks (SC 06)
15:30 - 16:45	**Afternoon Coffee Break (15:30 - 16:00) & Poster session in Multipurpose Poster area PV-P. See page 64 for detailed programme**				
16:45 - 18:15	Distributed optical sensing: from physics to network deployment (SC 08)	Hollow-core fibre design (SC 01)	Resonators, TFLT and integrated routing devices (SC 02)	Integrated quantum photonics (ii) (SC 12)	Packaging and dense integration (SC 03)
19:30 - 21:30	**Welcome reception at Cruise Terminal - bus transfer available**				

C2.1 Conference room 2.1	C2.2 Conference room 2.2	E2 Exhibition room 2	PV-R Multipurpose room	
TOP FLOOR		GROUND FLOOR		
Morning coffee				9:00 - 9:30
				9:30 - 12:00
Lunch Break (on your own)				12:00 - 14:00
DSP for high spectral efficiency and SDM (SC 04)	Submarine and unrepeatered systems (SC 05)	New approaches for linear and nonlinear functionalities (SC 12)	Winning interconnects for AI: scale-up & scale-out technology paths Symposium	14:00 - 15:30
Afternoon Coffee Break (15:30 - 16:00) & Poster session in Multipurpose Poster area PV-P. See page 64 for detailed programme				15:30 - 16:45
ML and nonlinearity mitigation (SC 04)	Very high speed PON (SC 07)	Control and optimization of optical network systems (SC 10)	Winning interconnects for AI: scale-up & scale-out technology paths Symposium	16:45 - 18:15
Welcome reception at Cruise Terminal - bus transfer available				19:30 - 21:30

Programme at a Glance

Tuesday, 22 September

	A1 Auditorium 1	A2 Auditorium 2	E1 Exhibition room 1	C1.1 Conference room 1.1	C1.4 Conference room 1.4
	GROUND FLOOR				
8:30 - 9:00	**Morning Coffee**				
9:00 - 10:30	From high-Q resonators to frequency comb generation (SC 12)	Hollow core fibers in optical networks (SC 06)	Advanced enabling technologies for free-space optical and optical wireless communications (SC 09)	Optical amplification	Optical switches and demultiplexers (SC 03)
10:30 - 11:00	**Coffee break**				
11:00 - 12:30	**Exhibition only time (Pavilion 1 and 2) & Demo zone (Pavilion 1, Area 1065). See page 100 for detailed programme**				
12:30 - 14:00	**Lunch Break (on your own)**				
14:00 - 15:00	AI and advanced processing for optical communication systems (SC 04)	Light propagation and manipulation from short to long distance (SC 12)	Microwave photonics and sensing (SC 08)	Integrated modulators (SC 03)	Digital twin and autonomous network intelligence (SC 10)
15:00 - 15:30					
15:30 - 16:00	**Afternoon Coffee break**				
16:00 - 16:45	Access network evolution (SC 07)	Optical networks for AI datacenters and workloads (SC 10)		Long-range QKD and fields trials (SC 11)	Mode division multiplexing (SC 02)
16:45 - 17:30					
17:30 - 19:30			Hack your research! Tools and tricks for today's telecommunications techies		

C2.1 Conference room 2.1	C2.2 Conference room 2.2	E2 Exhibition room 2	PV-R Multipurpose room	
TOP FLOOR		GROUND FLOOR		
Morning Coffee				**8:30 - 9:00**
AI-driven control and monitoring in optical access networks (SC 10)	Short reach interconnects (SC 05)	Microwave photonics and radio over fiber (SC 08)	Optical fiber sensing and its aplications (SC 04)	**9:00 - 10:30**
Coffee break				**10:30 - 11:00**
Exhibition only time (Pavilion 1 and 2) & Demo zone (Pavilion 1, Area 1065). See page 100 for detailed programme				**11:00 - 12:30**
Lunch Break (on your own)				**12:30 - 14:00**
AI for 6G and 6G for AI Symposium	Turbulence-resilient underwater optical wireless links (SC 09)	Long-haul HCF systems (SC 05)	Quantum state transmission and manipulation (SC 11)	**14:00 - 15:00**
				15:00 - 15:30
Afternoon Coffee break				**15:30 - 16:00**
AI for 6G and 6G for AI Symposium	Optical sensing in telecommunications networks (SC 04)	Impairments monitoring in optical networks (SC 06)		**16:00 - 16:45**
				16:45 - 17:30
		European photonic integration forum (EPIF)		**17:30 - 19:30**

Programme at a Glance

Wednesday, 23 September

	A1 Auditorium 1	A2 Auditorium 2	E1 Exhibition room 1	C1.1 Conference room 1.1	C1.4 Conference room 1.4
	GROUND FLOOR				
8:30 - 9:00	**Morning Coffee**				
9:00 - 10:00	SDM systems (SC 05)	Optical computing (SC 03)	Advanced integrated modulators and transmitters (SC 02)	THz transmission and sensing (SC 08)	Multicore and multimode fibres, devices and characterisation (SC 01)
10:00 - 10:30					
10:30 - 11:00	**Coffee break**				
11:00 - 12:15	Advancements on optical fiber transmission (SC 06)	SiP Based Modulators (SC 02)	LLM-driven control and automation in optical networks (SC 10)	Ultra-wideband systems (SC 05)	Advanced distributed fiber sensing (SC 08)
12:15 - 12:30					
12:30 - 14:00	**Lunch at your own & WIP-BEAM: Women in Photonics-Bridging Excellence and Advancement through Mentorship at Conference Room 1.4**				
14:00 - 15:00	Switching architectures in optical networks (SC 06)	Integration of magneto-optics (SC 03)	On-chip light emission and detection (SC 12)	Signal processing for high-speed IMDD (SC 04)	Innovations in high capacity, short reach links (SC 07)
15:00 - 15:15					
15:15 - 15:30					
15:30 - 17:00	**Afternoon Coffee Break (15:30 - 16:00) &Poster session in Multipurpose Poster area PV-P. See page 136 for detailed programme**				

C2.1 Conference room 2.1	C2.2 Conference room 2.2	E2 Exhibition room 2	PV-R Multipurpose room	
TOP FLOOR		GROUND FLOOR		
Morning Coffee				**8:30 - 9:00**
ITU-T ION-2030: Architectures and standards of optical networks for the AI era Symposium	DSP-based optical network monitoring (SC 04)	Digital signal processing & equalization for PON (SC 07)	Quantum networks (SC 11)	**9:00 - 10:00**
				10:00 - 10:30
Coffee break				**10:30 - 11:00**
ITU-T ION-2030: Architectures and standards of optical networks for the AI era Symposium	Optical processing (SC 03)	SDM transmission (SC 01)	Advanced signal processing and real-time implementations (SC 04)	**11:00 - 12:15**
				12:15 - 12:30
Lunch at your own & WIP-BEAM: Women in Photonics-Bridging Excellence and Advancement through Mentorship at Conference Room 1.4				**12:30 - 14:00**
Integrated optical sensing and communications systems (SC 09)	Subsea fiber sensing and advanced interrogation techniques (SC 08)	HCF systems (SC 05)	Hollow-core fibre characterisation and standardisation (SC 01)	**14:00 - 15:00**
				15:00 - 15:15
				15:15 - 15:30
Afternoon Coffee Break (15:30 - 16:00) &Poster session in Multipurpose Poster area PV-P. See page 136 for detailed programme				**15:30 - 17:00**

Programme at a Glance

Wednesday, 23 September

	A1 Auditorium 1	A2 Auditorium 2	E1 Exhibition room 1	C1.1 Conference room 1.1	C1.4 Conference room 1.4
	GROUND FLOOR				
17:00 - 18:15	Network operation and fault management in optical networks (SC 10)	Optical transmitters and transceivers (SC 03)	Integrated sensing and communication (SC 08)	Optical wireless technologies for next-generation networks systems (SC 09)	PON sensing, monitoring & energy efficiency (SC 07)
18:15 - 18:30					
19:30 - 22:30	**Conference dinner at Finca Nadales - bus transfer available**				

C2.1 Conference room 2.1	C2.2 Conference room 2.2	E2 Exhibition room 2	PV-R Multipurpose room	
TOP FLOOR		GROUND FLOOR		
Quantum devices (SC 11)	Advance phase and timing recovery (SC 04)	Coupled core MCF systems (SC 05)	VCSELs (SC 02)	**17:00 - 18:15**
				18:15 - 18:30
Conference dinner at Finca Nadales - bus transfer available				**19:30 - 22:30**

Programme at a Glance

Thursday, 24 September

	A1 Auditorium 1	A2 Auditorium 2	E1 Exhibition room 1	C1.1 Conference room 1.1	C1.4 Conference room 1.4
	GROUND FLOOR				
8:30 - 9:00	**Morning Coffee**				
9:00 - 10:15	Novel modulators (SC 02)	Turbulence mitigation in free-space optical communications (SC 09)	Photodiodes (SC 02)	Advanced photonic integration (SC 03)	Sub-THz transmission and photonic sensing techniques (SC 08)
10:15 - 10:30					
10:30 - 11:00	**Coffee break**				
11:00 - 12:00	Security of optical communication systems (SC 11)	SoP sensing and aplications (SC 08)	End-to-end optical communications systems for space: demonstration and validation (SC 09)	Advances in coherent PON (SC 07)	Receivers and photodetectors (SC 03)
12:00 - 12:15					
12:15 - 12:30					
12:30 - 14:00	**Lunch Break (on your own)**				
14:00 - 15:30	Postdeadline papers	Postdeadline papers	Postdeadline papers	Postdeadline papers	Postdeadline papers
15:45 - 16:15	Closing	Closing			

C2.1 Conference room 2.1	C2.2 Conference room 2.2	E2 Exhibition room 2	PV-R Multipurpose room	
TOP FLOOR		GROUND FLOOR		
Morning Coffee				**8:30 - 9:00**
Programmable photonics: architectures, control and applications Symposium	Ai-training in optical networks (SC 06)	Coherent systems (SC 05)		**9:00 - 10:15**
				10:15 - 10:30
Coffee break				**10:30 - 11:00**
Programmable photonics: architectures, control and applications Symposium	Enabling fibre based devices and handling (SC 01)	Faster-than-nyquist, equalization and coding (SC 04)		**11:00 - 12:00**
				12:00 - 12:15
				12:15 - 12:30
Lunch Break (on your own)				**12:30 - 14:00**
Postdeadline papers	Postdeadline papers	Postdeadline papers		**14:00 - 15:30**
				15:45 - 16:15

A1 Auditorium 1	A2 Auditorium 2	E1 Exhibition room 1	C1.1 Conference room 1.1	C1.4 Conference room 1.4
08:00–20:00 Registration				
08:30–09:00 Morning coffee				

09:00 - 10:30 Session 1/2

Light sources for next-generation optical communication systems for AI datacenters Workshop

Organizers:
Despoina Petousi *(Adtran Networks SE, Germany)*
Abdul Rahim *(PhotonDelta)*
Wei Shi *(Canada Research Chair in Silicon Photonics)*
Wilfried Maineult *(Coherent)*
Abstract:
The integration of lasers remains a significant challenge in the most scalable PICs such as Si, SiN, TFLN. In most cases, these platforms need external lasers, as on-chip lasers have yet to match the performance of discrete counterparts. Yet, as additional functionalities on the light sources are required for different applications, their integration onto PICs could be a driver for wide market adoption and cost reduction. This workshop brings a pool of experts who will discuss on one part their application needs and on the other part how different laser architectures and underlying integration technologies could meet their requirements.

09:00 - 10:30 Session 1/2

How can we overcome the power wall across optical communication systems – from AI clusters to submarine networks? Workshop

Organizers:
Shu Namiki *(The National Institute of Advanced Industrial Science and Technology (AIST, Japan)*
Peter Winzer *(Ciena Corporation)*
Jean-Christophe Antona *(Alcatel Submarine Networks)*
Abstract:
This workshop aims to share emerging objectives driven by the power limitations of future optical communication systems—from AI clusters to submarine networks—and to discuss potential technological breakthroughs.

09:00 - 10:30 Session 1/2

From idea to product: how to speed up innovation in integrated photonics? Workshop

Organizers:
Oded Raz *(TU/e, The Netherlands)*
Wim Bogaerts *(UGent, Belgium)*
Antonio Teixeira *(Universidade de Aveiro, Portugal)*
Abstract:
Integrated photonics is approaching a critical inflection point where the main barrier to large-scale adoption is no longer device performance, but workflow maturity. In contrast to microelectronics — where highly developed modeling, standardized PDKs, and tightly integrated design-to-packaging flows enable first-time-right silicon — photonics still lacks the predictive accuracy, tool integration, and accessibility needed for rapid prototyping and fast iteration. This workshop will explore how to mature photonic workflows toward microelectronics-like streamlining, with a focus on multi-physics modeling, electronic–photonic co-design, scalable packaging, and the emerging role of programmable photonics as a path to faster validation, reconfigurability, and system-level optimization.

09:00 - 10:30 Session 1/2

Optical in-building networks - more than higher speed: quality of experience, centralized coordination and decentralized AI Workshop

Organizers:
Volker Jungnickel *(Fraunhofer Heinrich Hertz Institute (HHI)*
Christian Bluemm *(Huawei Technologies Duesseldorf GmbH)*
Philippe Chanclou *(Orange)*
The combination of fiber-to-the-room (FTTR) with Wi-Fi is an enabler for high-performance wireless indoor access in households and industries. We will discuss recent developments of next-generation optical in-building networks with a focus on the vast range of often overlooked benefits beyond higher data rates.
Abstract:
The workshop addresses the increasingly critical in-building network segment, where over 80% of all data traffic is consumed and generated. It focuses on quality of experience, reliability, low latency, and the growing needs of AI and non-AI services across homes, enterprises, and dense indoor venues. Fiber-to-the-Room (FTTR) and Fiber-to-the-Machine (FTTM) are key enablers for high-performance, energy-efficient indoor networks. The discussion also covers coordination of Wi-Fi, millimeter-wave, and LiFi technologies, as well as centralized control for better mobility, resource management, and interference handling.
Participants will gain practical insight into technical, economic, and environmental aspects of in-building networks, including deployment challenges, future trends, and real-world case studies.

C2.1 Conference room 2.1	C2.2 Conference room 2.2	E2 Exhibition room 2	PV-R Multipurpose room	PV-P Multipurpose poster area
08:00–20:00 Registration				
08:30–09:00 Morning coffee				
09:00 - 10:30 Session 1/2	**09:00 - 10:30 Session 1/2**	**09:00 - 10:30 Session 1/2**	**09:00 - 10:30 Session 1/2**	
Atmospheric turbulence mitigation for high-rate, coherent ground-to-space optical links: final hurdles to commercialization Workshop **Organizers:** Anaëlle Maho *(TAS)* Mustafa Cardakli *(Amazon)* Morio Toyoshima *(NICT)* Christian Fuchs *(DLR)* Yan Li *(BUPT)* **Abstract:** Free-space optical (FSO) communications are emerging as a key technology for next-generation satellite systems, enabling high-capacity, low-latency links beyond legacy RF systems. However, atmospheric turbulence severely limits optical communication links, in particular ground-to-space uplinks, requiring advanced mitigation techniques spanning system design, adaptive optics, diversity, coding, and coherent digital processing. This workshop brings together solution providers and end users to address application requirements, review state-of-the-art mitigation strategies, and define a technology roadmap for reliable, 100+ Gbps optical space–ground networks.	**Quantum repeaters - recent progress and open challenges** Workshop **Organizers:** Wolfgang Tittel *(University of Geneva, Switzerland)* Adam Kinos *(Lund University)* Andreas Reiserer *(Technical University of Munich)* **Abstract:** Quantum communication, and more precisely quantum key distribution *(QKD)*, has started revolutionizing secure communication over optical networks. But despite rapid progress, quantum communication remains fundamentally limited in point-to-point range due to photon loss. This workshop aims at gathering some of the world-leading actors in the rapidly evolving field of quantum repeaters, which promise overcoming this limitation.	**Can Global and Federated Optical Testbeds Facilitate AI-Native Networks and Telecom Data Spaces?** Workshop **Organizers:** Behnam Shariati, *(Fraunhofer HHI)* Marco Ruffini, *(Trinity College Dublin)* Yusuke Hirota, *(NICT)* Achim Autenrieth, *(Adtran)* **Abstract:** AI-native automation and digital-twin technologies for optical networks depend on access to diverse, high-quality, and trustworthy telemetry. However, today's data remains siloed across vendors, operators, and research testbeds, limiting reproducibility and slowing progress toward interoperable AI-driven network control. Emerging concepts such as data spaces, sovereign data sharing, and federated learning offer a path to unlock collaboration without centralizing sensitive operational data. This workshop explores whether global or federated optical testbeds can serve as the backbone of a telco data-space ecosystem, enabling reliable AI models, cross-domain digital twins, and scalable simulation capabilities. Moreover, it aims to identify reference architectures, interoperability requirements, and governance models that could enable a federated, AI-ready optical testbed ecosystem. Session 1: Data Sharing Use-cases and Applications for Telco and Beyond	**Scaling sustainable AI data centers and green access networks: how can optical innovations contribute to energy and resource efficient connectivity?** Workshop **Organizers:** Salvatore Spadaro *(Organizer, Universitat Politècnica de Catalunya)* Paola Parolari *(Organizer, Politecnico di Milano)* Michela Svaluto Moreolo *(Organizer, Centre Tecnològic de Telecomunicacions de Catalunya)* Jeremy Potet *(Organizer, Orange)* **Abstract:** AI-driven workloads and growing access-network demands are rapidly increasing energy consumption and stressing the scalability of today's network infrastructures. This workshop examines how deployable optical and photonic solutions—such as high-capacity AI interconnects, energy-efficient coherent access technologies, low-power DSP, and coordinated network-compute management—can reduce operational costs while meeting performance and sustainability targets. Bringing together experts from academia, industry, and operators, the workshop will define key technological pathways toward sustainable AI data centers and access networks.	

A1 Auditorium 1

Speakers:
09:00-09:12
Scott Wilkinson *(Cignalai)*
09:12-09:24
Mark Filer *(Oracle)*
09:24-09:36
Zhang Shiyong *(Huawei)*
09:36-09:48
Haisheng Rong *(Amd)*
09:48-10:00
Keren Bergman *(Columbia University)*
10:00-10:30
Roundtable discussion

A2 Auditorium 2

Speakers:
09:00-09:15
Ai data center networking – power savings opportunities and challenges.
Dreu Alduino *(Meta)*
09:15-09:30
Power efficient scale up in AI, does copper still do the job?. Sara Zebian *(Openai)*
09:30-09:45
How can Slow & Wide Interconnects bring key benefits for scale-up networks?.
Ashkan Seyedi *(ams OSRAM)*
09:45-10:00
High-speed I/O in AI clusters.
Karl Muth *(Broadcom)*
10:00-10:15
Pluggables forever: power efficient ultra-dense XPO.
Sunil Priyadarshi *(Arista)*
10:15-10:30
ASICs over Dielectrics for Scale-Up - Is it optical or electrical?.
David Welch *(AttoTude)*

E1 Exhibition room 1

Speakers:
09:00-09:20
The challenge: how to translate a photonic chip idea into a product... fast. Antonio Teixeira *(PICadvanced)*
09:20-09:35
The European Chip Design Platform, and the role of MPW in the photonic innovation cycle.
Romano Hoofman *(Imec – IC.link)*
09:35-09:50
ST Microelectronics silicon photonics platform.
Corrado Sciancalepore *(ST Microelectronics)*
09:50-10:05
Rapid foundry-based photonic chip prototyping.
Ramsey Selim *(Cornerstone)*
10:05-10:20
The role of packaging in photonic product development.
William Henry *(Tyndall)*
*10:20-10:3*0
Poll: what are the main *(perceived)* obstacles to rapid photonic innovation. Oded Raz *(TU/eindhoven)*

C1.1 Conference room 1.1

Speakers:
09:00-09:05
Opening words
09:05-09:25
Can optics fix the indoor challenge?.
Andreas Gladisch *(Deutsche Telekom)*
09:25-09:45
Considerations on Deployment and Technology Development of FTTR.
Li Junwei *(China Mobile)*
09:45-10:05
ITU-T Q3/15 technologies for FTTR.
Marcos Martinez *(Maxlinear)*
10:05-10:25
Optimized Optical In-building Networks for future IoT, AI and Wireless Needs.
Ronald Heron *(NOKIA)*
10:25-10:40
Panel discussion with first four speakers — focus: fixed

C1.4 Conference room 1.4

10:30–11:00 Coffee Break

C2.1 Conference room 2.1

Speakers:
09:00-09:13
Diversity-based fade mitigation for coherent ground-space optical links. Jonst, Abraham *(Fraunhofer HHI)*
09:13-09:26
Atmospheric turbulence mitigation for high-rate, ultra-low-latency coherent ground-to-space optical links: final hurdles to commercialization. Reeves, Andrew *(Durham Univ)*
09:26-09:39
Impact and mitigation of atmospheric turbulence in satellite-ground laser links. Professor Wu Jian *(Beijing university of Posts and Telecommunication)*
09:39-09:52
Adaptive coherent dsp and turbulence mitigation techniques for robust high-capacity ground-to-space optical links. Guiomar, Fernando *(Aveiro)*
09:52-10:05
From primary mirror to fiber core – the optical antenna and its relay architecture. Goy, Matthias *(fraunhofer-iof)*
10:05-10:18
Building the Next Generation of Adaptive Optics Systems: a Robust and Scalable Solution for High-Throughput Free-Space Optical Communication. Laidlaw, Douglas *(DLR-KN)*
1*0:18-10:38*
Panel discussion

C2.2 Conference room 2.2

Speakers:
09:00-09:15
Welcome and introduction. Adam Kinos *(lund technical university, se)*
09:15-09:40
Towards quantum repeaters based on trapped ions integrated into optical cavities. Ben Lanyon *(University of Innsbruck, AT)*
09:40-10:05
Quantum networks using rare-earth ion-based solid-state qubits. Sophie Hermans *(Delft Technical University, NL)*
10:05-10:30
Implementation and applications of telecom quantum networks based on heralded quantum memories in diamond. Mihir Bhaskar *(Ionq, us)*

E2 Exhibition room 2

Speakers:
09:00-09:12
Riccarco Nicolicchia, *(Telefonica Spain)* TC DATA - The Train to Open Data Infrastructures
09:13-09:24
Andreas Gladisch, *(Deutsche Telekom)* TBD
09:25-09:36
Yvan Pointourier, *(Huawei)* Use Cases for AI-native Optical Networks Design and Management
09:37-09:48
Flavio Cirillo, *(NEC Lab)* Beyond Data Sharing: Enabling AI-Native Network Digital Twins through Data Spaces
09:49-10:00
TBD, *(TBD)*
10:00-10:30
Panel Discussion *(All)*

PV-R Multipurpose room

Speakers:
09:00-09:15
Workshop Opening
09:15-09:30
Operator perspective on network infrastructure and roadmap towards scalability and sustainability. J. Pedro Fernandez *(Telefónica)*,
09:30-09:45
Optical access networks & energy-saving. F. Saliou *(Orange Research)*
09:45-10:00
Next generation PON architectures and systems for sustainable connected intelligence. R. Bonk *(Nokia)*
10:00-10:15
The Need for environmental sustainability assessment of ICT technologies and services. L. Katsuo Oxenløwe *(DTU)*
10:15-10:30
Photonic integrated switching solutions for energy-efficient high-capacity interconnects networks. N. Calabretta *(TU/e)*

PV-P Multipurpose poster area

10:30–11:00 Coffee Break

A1 Auditorium 1

11:00 - 12:30 Session 2/2

Light sources for next-generation optical communication systems for AI datacenters (continued)

Speakers:
11:00 11:10
Lukas chrostowski *(university of british columbia)*
11:10 11:20
Alan Liu *(Quintessen)*
11:20 11:30
Rui Santos *(Photon Bridge)*
11:30 11:40
Yoshiho Maeda *(NTT)*
11:40 11:50
Victor Torres Company *(Chalmers University of Technology)*
11:50 12:00
Claire besancon *(iii-v lab)*
12:00 12:30
Roundtable discussion

A2 Auditorium 2

11:00 - 12:30 Session 2/2

How can we overcome the power wall across optical communication systems – from AI clusters to submarine networks? (continued)

Speakers:
11:00 11:15
Power efficient scale-across. Matt Newlan *(Google US)*
11:15 11:30
Breaking the Power Wall with Multi-Rail Photonics and Optical Interconnect Innovation. Bilal Riaz *(Ciena)*
11:30 11:45
Pushing Optical Network Efficiency to the Limit for the AI Era: From QoT Margins to Goodput-Aware Operation. Kiyo Ishii *(AIST)*
11:45 12:00
Power efficient submarine pluggable transceivers. John van Weerdenburg *(Nokia)*
12:00 12:15
Power efficient multi-petabit/s submarine cables. Fatih Yaman *(NEC America)*
12:15 12:30
Can hollow core fibers improve the power efficiency in submarine systems?. Alexi Carbo *(Alcatel Subnarine Networks)*

E1 Exhibition room 1

11:00 - 12:30 Session 2/2

From idea to product: how to speed up innovation in integrated photonics? (continued)

Speakers:
11:00 11:15
Bringing photonic and electronic design together. Xu Wang *(Cadence)*
11:15 11:30
Photonic circuit design for manufacturing and yield. Pierre Wahl *(Luceda Photonics)*
11:30 11:45
Programmable Photonics for photonic system prototyping. Wim Bogaerts *(Ghent University - imec)*
11:45 12:00
Brightboards – a path to rapid prototyping. Katarzyna Lawniczhuk *(Bright Photonics)*
12:00 12:30
Panel Session *(moderated by Wim Bogaerts)*

C1.1 Conference room 1.1

11:00 - 12:30 Session 2/2

Optical in-building networks - more than higher speed: quality of experience, centralized coordination and decentralized AI (continued)

Speakers:
11:00 11:20
AI-Native modems for Wi-Fi 9. Jim Lansford *(DeepSig)*
11:20 11:40
Intelligent FTTR and mmWave integration for premium quality smart homes application. Eric Wang Xiang *(Huawei)*
11:40 12:00
Functional Split to Improve Throughput and Latency of Wi-Fi in Fiber-to-the-Room Networks. Anselm *(Fraunhofer HHI)*
12:00 12:20
Toward Multi-AP Joint Scheduling in Next-Generation Wi-Fi. Boris Bellalta *(UPF)*
12:20 12:30
Panel discussion with second four speakers — Focus: Wi-Fi

C1.4 Conference room 1.4

12:30–14:00 Lunch Break (on your own)

C2.1 Conference room 2.1

11:00 - 12:30 Session 2/2

Atmospheric turbulence mitigation for high-rate, coherent ground-to-space optical links: final hurdles to commercialization (continued)

Speakers:
11:00 11:13
Space Laser Communications Through the Atmosphere: NICT's Experience in Japan. Carrasco-Casado, Alberto *(NICT)*
11:13 11:26
Australian National University laser communication program: an overview of laser propagation and correction through atmospheric turbulence. Bennet, Francis *(ANU)*
11:26 11:39
Performance of link-layer and physical-layer atmospheric mitigation approaches for free-space optical communications. Robinson, Bryan. *(MIT LL)*
11:39 11:52
Towards Robust High Capacity LEO Coherent Optical Links: Recent Results of LEO DTL Links with Adaptive Optics and Atmospheric Channel Characterization. Lanz, Thierry *(OGS Technologies)*
11:52 12:05
Towards Robust High Capacity LEO Coherent Optical Links: combining Adaptive Optics, Transmit diversity and Digital Signal Processing. Thomas, Alain. *(SAFRAN)*

C2.2 Conference room 2.2

11:00 - 12:30 Session 2/2

Quantum repeaters - recent progress and open challenges (continued)

Speakers:
11:00 11:25
TBA. Julien Laurat *(Sorbonne University, FR)*
11:25 11:50
Bell tests and quantum communication based on a metropolitan-scale multiplexed quantum repeater (XingHan 2.0). Zong-Quan Zhou *(University of Science and Technology of China, CN)*
11:50 12:30
Panel discussion. Led by Wolfgang Tittel *(University of Geneva, CH)*

E2 Exhibition room 2

11:00 - 12:30 Session 2/2

Can Global and Federated Optical Testbeds Facilitate AI-Native Networks and Telecom Data Spaces? (continued)

Speakers:
11:00 11:12
Camille Delezoide, *(NOKIA)*
Bell Labs Open Datasets, Data Sharing, and their Impact for Optical Networking Research
11:13 11:24
Agastya Raj, *(Trinity College Dublin)* Bridging Testbed Telemetry and Digital Twins: Lessons from Large-Scale Optical Network Experimentation
11:25 11:36
Angela Mitrovska, *(Fraunhofer HHI)*
From Data Sharing to Federated Operations: The Expanding Role of Telco Data Spaces
11:37 11:48
Yuki Yoshida, *(NICT)* Powering AI via Testbeds: Establishing Sustainable and Sovereign Data Pipelines
11:49 11:00
Pouria Khodashenas, *(i2Cat)*
From Testbeds to Data Spaces: Enabling AI-Native Networks through ETSI OOP SDG
12:00 12:30
Panel Discussion, *(All)*

PV-R Multipurpose room

11:00 - 12:30 Session 2/2

Scaling sustainable AI data centers and green access networks: how can optical innovations contribute to energy and resource efficient connectivity? (continued)

Speakers:
11:00 11:15
Photonics-enabled technologies for AI factories. P. Bakopoulos *(NVIDIA)*
11:15 11:30
Photonic Switching and Computing in Future AI and Data Systems. B. Yoo *(UCDavis)*
11:30 11:45
Scalable Photonic Integration for energy-efficient scale-up AI networking. A. Gonzalez *(IPRONICS)*
11:45 12:30
Panel *(All speakers)*

PV-P Multipurpose poster area

12:30–14:00 Lunch Break (on your own)

A1 Auditorium 1

14:00 - 15:30 Session 1/2

Meeting diverse AI connectivity needs: architectural choices for next-generation pluggable transceivers Workshop

Organizers:
Andrea Carnio *(NOKIA)*
Adonis Bogris *(University of West Attica, Greece)*
Mads Lønstrup Nielsen *(NVIDIA)*
Abstract:
As hyperscalers deploy AI infrastructure at unprecedented scale, they require optical connectivity across a broad spectrum of applications, from intra-data-center GPU fabrics and optical circuit switches to inter-DC links, metro networks, and long-haul interconnects. Each application imposes distinct requirements on bandwidth, reach, latency, power consumption, and cost, driving the need for a diverse portfolio of specialized pluggable transceivers. This workshop brings together market analysts, hyperscalers, silicon vendors, and optical module designers, alongside academic researchers exploring novel photonic signal processing solutions, to examine the challenges and design trade-offs shaping next-generation pluggables from 800G through 1.6T to 3.2T and beyond.

A2 Auditorium 2

14:00 - 15:30 Session 1/2

Could 100s-km long unrepeatered HCF links redefine the economics design of terrestrial and submarine optical networks? Workshop

Organizers:
Jeremie Renaudier *(NOKIA)*
Ruben S. Luis *(National Institute of Information and Communications Technology (NICT, Japan)*
Georg Rademacher *(University of Stuttgart, Germany)*
Ben Puttnam *(Microsoft Azure)*
Abstract:
Hollow-core fibers *(HCFs)* promise a step change in optical communications by enabling unrepeatered transmission beyond the limits of silica-core fiber. This workshop examines the technical breakthroughs required to reach ~1000 km unrepeatered links and evaluates the potential impact on terrestrial and submarine network architectures. Participants will gain insights from leading experts across fiber design, amplifiers, systems, and DSP innovations.

E1 Exhibition room 1

14:00 - 15:30 Session 1/2

Will the AI workload require an end-to-end-optimized network infrastructure? Workshop

Organizers:
Yvan Pointurier *(HUAWEI)*
Raul Muñoz *(Centre Tecnològic de Telecomunicacions de Catalunya (CTTC)*
Shuangyi Yan *(University of Bristol)*
Abstract:
The rapid growth of AI-driven applications demands a high-performance, scalable, and flexible infrastructure spanning all network segments: data center interconnection, (intra-)data center networks, and data center access. How will those 3 segments architecturally and operationally evolve, and possibly converge, to satisfy the new requirements incurred by AI workloads?

C1.1 Conference room 1.1

14:00 - 15:30 Session 1/2

How will we manage the heterogeneous optical communication networks of the future? Workshop

Organizers:
Tom Bradley *(Eindhoven University of Technology)*
Natalie Wheeler *(University of Southampton)*
Abstract:
For decades, single-mode fibre *(SMF)* has been the backbone of global optical communication networks. Emerging technologies — including hollow-core fibre, free-space optical links, and space-division multiplexing *(SDM)* — are now reshaping this landscape. This workshop will explore how these technologies can be deployed, how they will coexist with legacy SMF infrastructure, and the technical, economic, and standardisation challenges involved in building unified heterogeneous networks.
The session will examine questions such as: • How can new fibre and free-space technologies be integrated into existing network topologies?
• Which deployment scenarios (long-haul, metro, access, data-centre interconnects) are likely to adopt them first?
What challenges arise in interoperability, cost, scalability, and network management?

C1.4 Conference room 1.4

C2.1 Conference room 2.1

14:00 - 15:30 Session 1/2

Hybrid Solutions for very High Speed PON – the best (or worst) of Coherent and IMDD worlds Workshop

Organizers:
Oskars Ozolinš *(Riga Technical University, Latvia)*
Steinar Bjørnstad *(Tampnet, Norway)*
Guy Torfs *(Ghent University, Belgium)*

Abstract:
Telecom fiber networks are emerging as large-scale sensors enabling detection of earthquakes, deep-ocean tsunamis and microseismic activity. This workshop brings together photonics engineers and geoscientists to examine the suitability of distributed acoustic and polarization-based sensing for early warning, event localization and industrial monitoring applications such as carbon capture and storage. The session will critically assess the realistic capabilities and limitations of using existing telecom infrastructure for seismic monitoring.

C2.2 Conference room 2.2

14:00 - 15:30 Session 1/2

Telecom fiber as a geophysical sensor for earthquake, tsunami and microseismic monitoring Workshop

Organizers:
Oskars Ozoliņš *(Organizer)*,
Riga Technical University
Steinar Bjørnstad *(Organizer)*,
Tampnet AS
Guy Torfs *(Organizer)*

Abstract:
Telecom fiber networks are emerging as large-scale sensors enabling detection of earthquakes, deep-ocean tsunamis and microseismic activity. This workshop brings together photonics engineers and geoscientists to examine the suitability of distributed acoustic and polarization-based sensing for early warning, event localization and industrial monitoring applications such as carbon capture and storage. The session will critically assess the realistic capabilities and limitations of using existing telecom infrastructure for seismic monitoring.

E2 Exhibition room 2

14:00 - 15:30 Session 1/2

Confluence at the edge: rethinking networks for 6G and beyond Workshop

Organizers:
Paolo Monti *(Chalmers University of Technology, Sweden)*
Aleksandra Kaszubowska *(Trinity College Dublin, Ireland)*
Marco Ruffini *(Trinity College Dublin, Ireland)*

Abstract:
The evolution toward 6G demands more than incremental improvements — it requires rethinking how radio, optical, and data systems work together at the network edge. This workshop introduces the concept of confluent networks, where heterogeneous signals integrate natively end-to-end to meet the ultra-high data rates, low latency, and resilience requirements of tomorrow's applications. Through a mix of academic and industry perspectives, we critically examine the technologies, architectures, and open challenges that will define the path from today's converged networks to true confluence.

PV-R Multipurpose room

14:00 - 15:30 Session 1/2

Can fast narrow channels keep rising without limit or will slow and wide become the winner? Workshop

Organizers:
Eric Bernier *(Leader Advanced Photonics, Huawei Technologies Canada)*
Peter Winzer *(VP Systems Architecture, Ciena)*
Tony Chan Carusone *(Senior VP Technology, Qualcomm)*
Marianna Pantouvaki *(Principal Researcher, Microsoft)*

Abstract
As both compute engines and AI models scale, data movement requirements surge, forcing an increase in I/O density. The industry now faces a fundamental choice between pushing ever faster lane rates or scaling through wider parallel interfaces, each bringing distinct limits in power, packaging, cost, and optical engine capability. This workshop will bring together system, module, and device experts to examine these trade-offs and explore which direction can best support the next generation of AI interconnect.

PV-P Multipurpose poster area

A1 Auditorium 1

Speakers:
14:00
How AI Will Shape the Connectivity Hardware Market in the Coming Years?. Daryl Inniss *(LightCounting)*
14:15
AI Scale-Up Networks: Requirements for Reliable, High-Bandwidth-Density Interconnects. Binbin Guan *(OpenAI)*
14:30
Photonic interconnects for modern AI superclusters. Mark Filer *(Oracle)*
14:45
Optical switching solutions for data center networks in the AI era. Georgios Zervas *(Oriole Networks)*
15:00
The Path for Co-Packaged Optics in the AI Ecosystem: Unlocking Advantages Over Pluggable Transceivers for Next-Generation Connectivity. Dan Kuchta *(NVIDIA)*
15:15
All Panelists. Reversed Round Table & Audience Q&A *(Session 2 speakers are invited to ask questions to Session 1 speakers, followed by open audience questions)*

A2 Auditorium 2

Speakers:
Sesion 1: Technology Enablers for 100s-km Unrepeatered HCF Links
14:00
Design of HCFs for long unrepeated links
Li Peng *(YOFC)*
14:10
Design of HCFs for long unrepeated links. Yingying Wang *(Linfiber)*
14:20
Characterizaton of Long Fibers
Nicolas Fontaine *(Nokia Bell Labs (NJ)*
14:30
EDFAs for long unrepeatered links
Lutz Rapp *(Adtran)*
14:40
Reaching high power with BDFAs
Vitaly Mikhailov *(OFS)*
14:50
Energy efficiency of new amplifier
Ronit Sohanpal *(University College London)*
15:00
Panel Discussion

E1 Exhibition room 1

Speakers:
14:00-14:18
ITU-T vision on 2030 optical networks. Glenn Parsons *(Ericsson)*
14:18-14:36
AI-Driven Traffic Evolution in the Optical Backbone: OVHcloud's Fibre Constrained Architecture. Sina Fazel *(OVH)*
14:30-14:54
End-to-End Optimized Optical Networks for AI Infrastructure: An Operator Perspective. Yuyang Liu. *(China Telecom)*
14:54-15:12
Rings: Collapsing the DCN/DCI Boundary to Scale AI Regions. Giuseppe Rizzelli. *(Meta)*
15:12-15:30
BT Optical Networks for AI. Russell Davey *(BT)*

C1.1 Conference room 1.1

Speakers:
Greg Jasion *(UoS)*
Zimu Zhu *(Relativity Networks)*
Chigo Okonkwo *(TU/e)*
Robert Keys *(Ciena)*
Nourdin Kaai *(Aircision)*
Devin Brinkley *(Taara)*
Oleg Sinkin *(Nokia)*
Ali Mefleh *(KPN)*

C1.4 Conference room 1.4

15:30–16:00 Afternoon Coffee break

C2.1 Conference room 2.1

Speakers:
14:00-14:10
Introduction.
14:10-14:20
Shan Wey *(Verizon)* – The Three Ws of VHSP: Why?, What?, and When?
14:20-14:30
Claudio Rodrigues *(Altice Labs)* – Hybrid Solutions for VHSP: A Practical Engineering Perspective
14:30-14:40
Kenneth Jackson *(Sumitomo Electric)* – Leveraging Data-Center Optical Sources for VHSP PON: Opportunities for Coherent-Lite and Hybrid Architectures
14:40-14:50
Noriaki Kaneda *(Coherent)* – Can VHSP hybrid solutions benefit from developments in the coherent pluggable eco-system?
14:50-15:00
Sebastian Randel *(KIT)* – Challenges and Possibilities of Hybrid Coherent PONs
15:00-15:10
Jose Galan *(MaxLinear)* – DSP considerations for coherent, IMDD and hybrid approaches in VHSP systems
15:10-15:30
Panel session

C2.2 Conference room 2.2

Speakers:
14:00-14:05
Chair's introduction
14:05-14:17
Opening a New Window on Earth Dynamics: Microhertz Polarization Sensing with Submarine Cables. Antonio Mecozzi *(University of L'Aquila, Italy)*
14:17-14:29
From Sensing to Services: Telecom Networks as Multi-Scale Monitoring Infrastructures. Andrè Herrero *(Istituto Nazionale di Geofisica e Vulcanologia, INGV, Italy)*
14:29-14:41
Telecom Fibers as Geophysical Sensors: Hype, Reality, and Missing Links. Mikael Mazur *(Nokia Bell Labs, USA)*
14:41-14:53
Pushing the limits for DAS – from earthquake sensing to detection of silent whales. Martin Landrø *(Norwegian University of Science and Technology (NTNU)*, Norway)
14:53-15:05
Sensing earthquakes, ships and other things using submarine cables. Ezra Ip *(NEC Laboratories America, Inc., USA)*
15:05-15:30
Panel discussion

E2 Exhibition room 2

Speakers:
14:00-14:12
Introduction from the chairs - Confluence in the 6G scenario
14:12-14:24
Latency constraint services. Sandip Das *(Nokia)*
14:24-14:36
UK 6G program: what we tried, what worked. Dimitra Simeonidou *(University of Bristol)*
14:36-14:48
Control Plane for on-demand mesh networks. Merim Džaferagic *(Trinity College)*
14:48-15:00
Agentic AI as an emerging capacity driver. Achim Autenrieth *(Adtran)*
15:00-15:30
Panel

PV-R Multipurpose room

Speakers:
14:00
Opening remarks *(Eric Bernier and Peter Winzer)*
14:06
Roy Rubenstein *(LightCounting)*
14:18
Sunil Priyadarshi *(Arista)*
14:30
Letizia Giuliano *(Qualcomm)*
14:42
Bilal Riaz *(Ciena)*
14:54
Wen Zheng *(Huawei)*
15:06
Lenin Patra *(Marvell)*
15:18
Chris Cole *(Applied Materials)*

PV-P Multipurpose poster area

15:30–16:00 Afternoon Coffee break

A1 Auditorium 1

16:00 - 17:30 Session 2/2

Meeting diverse AI connectivity needs: architectural choices for next-generation pluggable transceivers (continued)

Speakers:
16:00
Next-generation DSP trends for the AI ecosystem. Lenin Patra *(Marvell)*
16:15
Future role of coherent technology for data-centers applications. Kim Roberts *(Ciena)*
16:30
Breaking Into PAM4: how to differentiate in a competitive PAM4 DSP market? Timo Pfau *(Acacia)*
16:45
Evolution of Coherent DSP to Meet the Evolving Needs of the AI Supercycle. Bilal Syed *(Nokia)*
17:00
Can Photonic Signal Processing Simplify DSP?: Breaking the Fiber Dispersion Barrier in IM/DD. Yuki Yoshida *(NICT)*
17:15
All Panelists. Reversed Round Table & Audience Q&A *(Session 1 speakers are invited to ask questions to Session 2 speakers, followed by open audience questions)*

A2 Auditorium 2

16:00 - 17:30 Session 2/2

Could 100s-km long unrepeatered HCF links redefine the economics design of terrestrial and submarine optical networks? (continued)

Speakers:
16:00
Splicing and monitoring techniques Radan Slavik *(ORC - University of Southampton)*
16:12
Performance limits of HCF links Haik Mardoyan *(Nokia Bell Labs)*
16:24
In-field systems deployment using HCF. Dong Wang *(China Mobile Research Institute)*
16:36
Long Haul transmission opportunities Alexis Carbo Meseguer *(Alcatel Submarine Networks (ASN)*
16:48
System requirements for long unrepeated links
Yang Hong *(Microsoft Azure Fiber)*
17:00
Panel Discussion

E1 Exhibition room 1

16:00 - 17:30 Session 2/2

Will the AI workload require an end-to-end-optimized network infrastructure? (continued)

Speakers:
16:00-16:18
Towards AI-Native Infrastructure with Optical Network Digital Twins. Hideki Nishizawa *(NTT)*
16:18-16:36
How to build efficient optical networks for AI using domain intelligence?. Annalisa Morea *(Nokia)*
16:36-16:54
Integrated Computing-Network Design for AI-DC. Hongchen Yu *(Huawei)*
16:54-17:12
Building the Optical Networks AI Actually Wants.Robert Keys *(Ciena)*
17:12-17:30
The Interconnected Edge: Networking strategies for Telco AI Cloud. Ricard Vilalta *(CTTC)*

C1.1 Conference room 1.1

16:00 - 17:30 Session 2/2

How will we manage the heterogeneous optical communication networks of the future? (continued)

Speakers:
16:00-16:05
Workshop introduction *(2nd half)*
16:05-16:57
Next Four Speakers *(FSO+SMF)*
16:57-17:12
Panel Q&A with Audience
17:12-17:24
Round 2 weakest “communication” link
17:24-17:29
Concluding Remarks & Thanks

C1.4 Conference room 1.4

18:00 - 20:00 Get-together at FYCMA

C2.1 Conference room 2.1

16:00 - 17:30 Session 2/2

Hybrid Solutions for very High Speed PON – the best (or worst) of Coherent and IMDD worlds (continued)

Speakers:
16:00-16:05
Introduction
16:05-16:15
Philippe Chanclou *(Orange)* - An operator's perspective on the needs and approaches for VHSP
16:15-16:25
Vincent Houtsma *(Nokia)* – Can VHSP be still fully IM-DD based?
16:25-16:35
Giuseppe Rizzelli *(PoliTo)* – Digital Chromatic Dispersion Pre-Compensation for VHSP
16:35-16:45
Ryo Koma *(NTT)* – Single-Sideband Solutions for CD Penalty Mitigation in the Era of VHSP and 50G-TWDM PONs
16:45-16:55
Giuseppe Talli *(Huawei)* – Pushing Direct Detection: Limits and Workarounds for VHSP
16:55-17:05
Martin Kuipers *(Adtran)* – 200G PON: The next territory for coherent technology

C2.2 Conference room 2.2

16:00 - 17:30 Session 2/2

Telecom fiber as a geophysical sensor for earthquake, tsunami and microseismic monitoring (continued)

Speakers:
16:00-16:05
Chair's introduction
16:05-16:17
Multi-tech fiber sensing testbed exploiting FTTH network in Campi Flegrei. Emanuele Virgillito *(Politecnico di Torino, Italy)*
16:17-16:29
Adoption of DAS for full-resolution geophysical monitoring. Jan Kristooer Brenne *(Alcatel Submarine Networks, Norway)*
16:29-16:41
A system design perspective on distributed acoustic sensing for geophysical events: trade-offs and limits. Rajiv Boddeda *(Nokia Bell Labs, France)*
16:41-16:53
Digital Signal Processing for Extracting Weak Vibration Signatures in Telecom-Fiber Distributed Acoustic Sensing, Yaxi YAN. *(Hong Kong Polytechnic University, Hong Kong)*
16:53-17:05
Sensing with Light: How to Architect Networks That See and Communicate?. Aleksandra Kaszubowska *(Trinity College Dublin, Ireland)*
17:05-17:30
Panel discussion

E2 Exhibition room 2

16:00 - 17:30 Session 2/2

Confluence at the edge: rethinking networks for 6G and beyond (continued)

Speakers:
16:00-16:12
Plasmonic technologies for THz communication. Jasmin Smajic *(ETH)*
16:12-16:24
Radio/Optical Wireless. Iman Tavakkolnia *(Cambridge University)*
16:24-16:36
Data plane for confluent communication. Dan Kilper *(Trinity College)*
16:36-16:48
Transceivers for metro-scale applications. Annina Moser *(Marvel)*
16:48-17:00
IOWN perspective on optical spectrum and network digital twins. Toru Mano *(NTT)*
17:00-17:30
Panel

PV-R Multipurpose room

16:00 - 17:30 Session 2/2

Can fast narrow channels keep rising without limit or will slow and wide become the winner? (continued)

Speakers:
16:00
Opening remarks.
Tony Chan *(Carusone and Marianna Pantouvaki)*
16:06
Binbin Guan *(OpenAI)*
16:18
Matt Sysak *(Lumentum)*
16:30
Chris Kocot *(Coherent)*
16:42
Christian Reimer (HyperLight)
16:54
Darius Bunandar *(LightMatter)*
17:06
Mohsen Asad *(Credo)*
17:18
Vivek Raghunathan *(Xscape Photonics)*

PV-P Multipurpose poster area

18:00 - 20:00 Get-together at FYCMA

A1 Auditorium 1	A2 Auditorium 2	E1 Exhibition room 1	C1.1 Conference room 1.1	C1.4 Conference room 1.4

08:00–18:30 Registration

09:00–09:30 Morning coffee

09:30 - 12:00

Mo12-A - Opening and plenaries (in person)

09:30-10:00
Mo12-A1 Opening
Robert Halir (Chair, Universidad de Málaga)
Ivana Gasulla *(Chair, Universitat Politècnica de València)*
José Capmany *(Chair, Universitat Politècnica de València)*
Íñigo Molina *(Chair, Universidad de Málaga)*

10:00 - 10:30
Mo12-A3 AI cluster communications
Peter Winzer *(Vice President of Systems Architecture at Ciena)*

10:30 - 11:00
Mo12-A4 integrated photonics at the heart of a scalable AI revolution
Patrick Vandenameele *(CEO at IMEC)*

11:00 - 11:30
Mo12-A5 Scaling AI From Optical Innovation to NPO and CPO Solutions
Jiangwei Man *(Director of Advanced Optoelectronics Laboratory at Huawei)*

11:30 - 12:00
Mo12-A6 Photonics for Quantum Computing
Mark Thompson *(Co-Founder and CTO at PsiQuantum)*

09:30 - 12:00

Mo12-B - Opening and plenaries (live stream)

09:30-10:00
Mo12-B1 Opening
Robert Halir *(Chair, Universidad de Málaga)*
Ivana Gasulla *(Chair, Universitat Politècnica de València)*
José Capmany *(Chair, Universitat Politècnica de València)*
Íñigo Molina *(Chair, Universidad de Málaga)*

10:00 - 10:30
Mo12-B3 AI cluster communications
Peter Winzer *(Vice President of Systems Architecture at Ciena)*

10:30 - 11:00
Mo12-B4 Integrated photonics at the heart of a scalable AI revolution
Patrick Vandenameele *(CEO at IMEC)*

11:00 - 11:30
Mo12-B5 Scaling AI From Optical Innovation to NPO and CPO Solutions
Jiangwei Man *(Director of Advanced Optoelectronics Laboratory at Huawei)*

11:30 - 12:00
Mo12-B6 Photonics for Quantum Computing
Mark Thompson *(Co-Founder and CTO at PsiQuantum)*

12:00 - 14:00 Lunch Break (on your own)

C2.1 Conference room 2.1	C2.2 Conference room 2.2	E2 Exhibition room 2	PV-R Multipurpose room	PV-P Multipurpose poster area
08:00–18:30 Registration				
09:00–09:30 Morning coffee				
12:00 - 14:00 Lunch Break (on your own)				

A1 Auditorium 1

14:00 - 15:30

Mo3-A - Photonic-driven architectures for access networks and AI clusters

SC 07: Optical networks for access, mobile X-haul, in-building, and intra-datacentre interconnects
Salvatore Spadaro *(Chair, Technical University of Catalonia (UPC)*
Oded Raz *(Chair)*

14:00
Mo3-A1 The role of programmable photonics in ai data centers
Daniel Pérez Invited

A2 Auditorium 2

14:00 - 15:30

Mo3-B - Hollow-core fibre fabrication and deployment

SC 01: Novel fibres, fibre devices and amplifiers
Tom Bradley *(Chair)*
Leslie Rusch *(Chair)*

14:00
Mo3-B1/1426 - Breaking the Loss Barrier: Hollow-Core Fibers from Physical Limits to Mass
Yingying Wang *(Jinan University)*
Tutorial
This tutorial reviews anti-resonant hollow-core fibers, from structure evolutions and loss reduction to manufacturable long-draw production, and discuss application-oriented trade-offs from intra-data-center links to long-haul networks.

E1 Exhibition room 1

14:00 - 15:30

Mo3-C - Lasers and sources

SC 02: Discrete photonic devices and technologies
Selina Farwell *(Chair)*

14:00
Mo3-C1/113 - Semiconductor Optical Amplifier for WDM and High-Power Applications
Stanislav Rocas *(Innolume GmbH)*
Two different types of quantum-dot O-band semiconductor optical amplifiers are demonstrated using a single epitaxial structure. By varying the device length, both low-noise WDM amplification and near watt-class output power are achieved, enabling linear and high-power operation within a single technology.

14:15
Mo3-C2/492 - High Power ASE Source Module with Innovative Architecture
You Wu *(Optical Communication Technologies Lab, Huawei Technologies France)*
We propose a 50nm and 70mW white source module with innovative design based on a single Semiconductor Optical Amplifier (SOA) with an optical circulator. By combining it with a high power SOA amplifier, we obtain 430 mW in-fiber power.

C1.1 Conference room 1.1

14:00 - 15:30

Mo3-D - Integrated quantum photonics (i)

SC 11: Quantum communications, physical layer security, and optical quantum technologies
Takeshi Umeki *(Chair)*

14:00
Mo3-D1/1043 - Practical Real-time CV-QKD with a Chip-scale Receiver
Igor Servello *(KEEQuant GmbH)*
Scalable hardware and real-time operation are key requirements for field-deployable QKD. We demonstrate an automated CV-QKD system featuring a miniaturized receiver, built on chip-scale telecom laser and integrated coherent receiver. This system enables real-time key generation over 26 km and 52 km links.

14:15
Mo3-D2/377 - High-Speed Squeezed-State CV-QKD Over 10 km Fiber With a CMOS-Compatible Electronic-Photonic Integrated Receiver
Sarah Bastiaens *(Ghent University)*
The bandwidth limitations of squeezed-state CV-QKD are addressed by implementing a photonic–electronic integrated receiver with a CMOS transimpedance amplifier and a broadband single-pass squeezer. A 8.45 Mbit/s asymptotic key rate is achieved over 10 km with 500 MBaud signaling rate, demonstrating scalable high-speed squeezed-state CV-QKD.

C1.4 Conference room 1.4

14:00 - 15:30

Mo3-E - Optical non-terrestrian networks

SC 06: Architecture, modelling and performance of optical networks
Carmen Mas Machuca *(Chair)*
University of the Bundeswehr Munich
Fatima Gunning *(Chair)*

14:00
Mo3-E1/317 - Demonstration of WDM, QoT-Aware Rate Adaptation and Add/Drop Operation in Inter-satellite All-optical Networks
Shoichiro Oda *(NICT)*
Using a seven-node inter-satellite all-optical network (ISAON) testbed driven by Starlink TLE data, we demonstrate WDM, QoT-aware rate adaptation, and WXC add/drop under realistic time-varying inter-satellite loss emulation. Under HPA-limited power, four-channel WDM reaches 800 Gb/s. WDM-capable QoT estimation enables upgrades with ≤1.4 dB error.

14:15
Mo3-E1/322 - Adaptive Lightpath-Correlation Refinement for Efficient QoT-Aware Routing in Transparent Satellite Optical Networks
Katsuaki Higashimori *(NTT Inc.)*
We propose a method for efficiently routing lightpaths by adaptively switching their QoT and objective policies in transparent satellite WDM networks under stringent and time-varying transmission conditions. The method demonstrates equivalent network performance while dramatically reducing more than 70% power and 98% computation time.

C2.1 Conference room 2.1

14:00 - 15:30

Mo3-F - DSP for high spectral efficiency and SDM

SC 04: Signal processing for optical communication and sensing
Sjoerd Van Der Heide *(Chair)*
Andrea Carnio *(Chair)*

14:00
Mo3-F1/81 - Turbo Equalization with Duobinary Precoding for High-speed Bandwidth-limited IM/DD Transmission Systems
Tianyuan Kong *(Huawei Technologies Duesseldorf GmbH, Munich Research Center)*
We propose turbo equalization with duobinary-BCJR detection to mitigate error floors and boost performance of weak inner codes in bandwidth-limited channels. Simulations and experiments demonstrate significant SNR gains and error floor elimination using duobinary precoding. Analytical limits confirm advantages for high-speed optical links.

14:15
Mo3-F2/638 - Reduced-Complexity Partial MIMO Equalization for Real-Time GPU-based 10-Mode Transmission over 26 km GI-FMF
Ruby Bravo Ospina *(Nokia Bell Labs)*
We investigate partial MIMO equalization in real-time 10-mode transmission over 26 km of FMF and demonstrate that the technique successfully tracks channel dynamics over time, enabling flexible performance-complexity reduction trade-offs in MG-selective FMF transmission.

C2.2 Conference room 2.2

14:00 - 15:30

Mo3-G - Submarine and unrepeatered systems

SC 05: Optical transmission systems
René-Jean Essiambre *(Chair)*
Adolfo Cartaxo *(Chair)*
Instituto de Telecomunicações

14:00
Mo3-G1 Technologies and challenges for beyond petabit submarine cable
Pascal Pecci *(Invited, META)* Invited

E2 Exhibition room 2

14:00 - 15:30

Mo3-H - New approaches for linear and nonlinear functionalities

SC 12: CLEO® Special Session on Emerging Trends in Optics and Photonics
Jens H. Schmid *(Chair)*
National Research Council Canada
Laurent Vivien *(Chair)*

14:00
Mo3-H1/1159 - Frequency Comb Generation in Single-Mode Silicon Microresonators at 1550 nm in Normal Dispersion Regime
Abdou Shetewy *(TU Dresden)*
We demonstrate frequency comb generation in a single-mode silicon microring resonator under normal dispersion at 1550 nm. Using a dual-pump configuration (2.5 mW and 27 µW) and an 11 V bias, seven comb lines spanning 3.74 THz are observed, indicating stable and coherent oscillation.

14:15
Mo3-H2/736 - Large-aperture Optical Antenna with Vertical Emission in Silicon-on-Insulator
Elio Godoy Lorite *(University of Malaga)*
Vertically emitting optical antennas with large mode-fields diameters are key for free space optics and atomic spectroscopy, but have not been yet reported in silicon-on-insulator. We present a novel vertically radiating antenna with a mode-field diameter of 200µm by 320µm with measured 48% efficiency.

PV-R Multipurpose room

14:00 - 15:30

Mo3-I - Winning interconnects for AI: scale-up scale-out technology paths Symposium

Daniel Kuchta *(Organizer, Nvidia Corp)*
Lidia Galdino *(Organizer, Corning,UK)*
Constance Chang-Hasnain *(Organizer, Berxel Photonics, USA)*
Julie Raulin *(Organizer, Adtran, Germany)*
Paul Gunning *(Organizer, BT Group, UK)*
AI/ML growth is driving a surge in interconnect bandwidth as models and datasets scale and workloads become increasingly token-centric—reshaping system design. Modern systems have converged on a two-tier hierarchy: scale-up fabrics that tightly couple XPU, memory, and switching into a coherent “virtual XPU,” and scale-out networks that connect many scale-up fabrics across the data centre.
Session 1:
- Ryan Yu, TeraHop - "Open Optical Solutions for AI Scale Up"
- Peter Ossieur, IMEC - "Closing the final centimeter: < 1pJ/bit connectivity through heterogeneously integrated Silicon Photonics and advanced 3D assembly techniques"
- Peter O'Brien, Tyndall National Institute - "Co-Packaging on Glass Substrates: Design, Materials, Processes, Equipment, and Scaling"
- Sylvie Menezo, Scintil - "Single-chip DWDM external DFB laser source with integrated wavelength monitoring and locking for scalable interconnects"
- Chris Wu, Corning - "Fiber Bundle Connector Solutions for VCSEL-Based Optical Scale-Up Interconnects"
- William Fegadolli, Nokia - "Optics and host co-optimization towards the AI Supercycle"

PV-P Multipurpose poster area

A1 Auditorium 1

14:30
Mo3-A2/1350 - Demonstration of Ultra-high Link Budget, Low Cost/ Latency Distributed AI Scale-across Network enabled by C-band 3.2-Tb/s/lane IM-DD Transmission over 20-km AR-HCF
Jingchuan Wang *(The Hong Kong Polytechnic University)*
We demonstrate a C-band 32λ × 50-GBaud PAM4 transmission over 20-km HCF. We achieve a record link budget over 50-dB, showing that HCF-enabled IM-DD technology is strong candidate for AI scale-across scenarios requiring low-latency, low-cost, and zero packet loss.

14:45
Mo3-A3/1153 - Is DSP-free Pluggable Optical Module More Suitable for Optical Circuit Switching?
Han Wang *(KDDI Research, Inc.)*
This paper presents the first comprehensive analysis of an LPO + OCS GPU network, from the optical to the application layer, including the impact of OCS reconfiguration. Stable 72-hour LLM pre-training was successfully demonstrated on this architecture.

A2 Auditorium 2

E1 Exhibition room 1

14:30
Mo3-C3/1429 - Rare-earth ion doped on-chip amplifiers in the Al2O3 platform
Sonia Garcia Blanco *(University Of Twente / Aluvia Photonics)* Invited
Reactive sputtering of rare-earth-ion-doped Al_2O_3 enables scalable on-chip optical amplification across multiple wavelength bands. Monolithic integration with passive photonic platforms, combined with low nonlinearities and high-power handling, supports applications in telecommunications, datacom, sensing, and quantum photonics. Recent progress using erbium, thulium, and neodymium is reviewed.

C1.1 Conference room 1.1

14:30
Mo3-D3/739 - Time-Bin BB84 QKD System Using Indium Phosphide and Silicon Nitride Photonic Integrated Circuits
Denis Fatkhiev *(Eindhoven University of Technology)*
We demonstrate a dual-chip InP-SiN photonic QKD system with on-chip pulse generation and reconfigurable decoding, implementing time-bin BB84 with finite-key security against coherent attacks. The system sustains a QBER below 4% and delivers secret keys at kbps rates over 150–250 km of fiber.

14:45
Mo3-D4/435 - Silicon-Native QKD Transmitter for Bidirectional Quantum/Classical Co-Existence in High-Speed PON
Florian Honz *(AIT Austrian Institute of Technology)*
We prove secure-key generation over passive optical network plants for co-existing C- / O-band quantum/ classical channels utilizing an all-silicon QKD transmitter, involving a 2×16 power split while being able to tolerate bidirectional classical launch levels up to 0 dBm.

C1.4 Conference room 1.4

14:30
Mo3-E3/387 - Intelligent Empowerment of Optical-Computation Synergy: Signal Processing and Resource Management for Multi-Band Optical Networks
Rentao Gu *(Beijing University of Posts and Telecommunications)* Invited
This paper presents an AI-driven control architecture for optical-computation synergy in AI data center interconnection. Multi-band optical networks provide interconnect support, while AI enhances signal processing and resource management, further strengthening support for computing. We review recent advances and outline future integrated multi-agent control.

C2.1 Conference room 2.1

14:30
Mo3-F3/631 - Non-Data-Aided SDM MIMO Equalization for Randomly-Coupled Multi-Core Fibers with a Tap-Correlation Avoidance CMA
Pamir Oezsuna *(Fraunhofer HHI)*
We propose the tap-correlation avoidance (TCA-)CMA, a low-complexity, non-data-aided MIMO equalizer for RC-MCFs, preventing singularities by penalizing tap-weight correlations. Simulations using 32 GBd 16-QAM signals show singularity-free convergence up to 600 ps total delay spread for 3-, 4-core fibers and 300 ps for 7-core fiber.

14:45
Mo3-F4/983 - Simple Direct Estimation of Link SMD and MDL for MIMO-DSP Design in Ultra-Wideband Coupled-Core Fiber Transmission
Akira Kawai *(NTT, Inc.)*
We propose a simple optical setup for estimating SMD and MDL in coupled-core fibers over a 150-nm bandwidth without full MIMO-DSP characterization. The method is validated by measurements on 4- and 12-core fibers and by C+L-band WDM MIMO transmission over a field-installed 12-core link.

C2.2 Conference room 2.2

14:30
Mo3-G2/167 - Algorithmically-Optimized Real-Time 18 Tb/s Throughput over a 16,608 km Trans-Pacific Subsea Link
Marc Stephens *(Ciena Corp)*
We report 18 Tb/s throughput across a 16,608 km trans-Pacific subsea link using an algorithmically-optimized channel plan, for a record 298.9 Pb/s·km. Bidirectional SNR margins were 0.18–0.75 dB for all 28 channels. Additionally, an 800 Gb/s (173 GBd) signal reached 4.57 bits/s/Hz spectral efficiency.

14:45
Mo3-G4/594 - Few-Mode Fibre for Noise Transfer Mitigation in Co-Raman Amplified Unrepeatered Transmission
Alexis Busson *(Alcatel Submarine Networks)*
We present a real-time Unrepeatered experiment using a short section of Few-Mode Fibre at the transmitter side to mitigate non-linear degradation due to Co-Raman amplification. We demonstrate an improvement up to 0.4 dB of Q factor margin compared to classical fibre with large effective area.

E2 Exhibition room 2

14:30
Mo3-H3/1485 - Sputtered AlN buffer layer for low loss crystalline AlN on sapphire integrated photonics
Camille-Sophie Brès Invited
To fully exploit the broad transparency window of crystalline AlN through nonlinear optics, both dispersion engineering and low optical losses are required. We present thick regrown AlN waveguides enabling three-octave supercontinuum generation and show how a sputtered AlN buffer suppresses void-induced scattering, establishing a pathway toward low-loss visible-to-mid-infrared integrated photonics.

PV-R Multipurpose room

14:30 Continuation of:

Mo3-I - Winning interconnects for AI: scale-up scale-out technology paths Symposium

See page 53.

PV-P Multipurpose poster area

A1 Auditorium 1

15:00
Mo3-A4/1306 - Dynamic RU-DU Reconfiguration in 6G Access Networks Using Fast Controlled Photonic Switches with 400G ZR+ Optics
Assad Bahari *(Eindhoven University of Technology)*
We demonstrate a novel 6G access network for dynamic RU-DU reconfiguration combining fast-controlled SOA-based photonics with 400G ZR+ optics. Cross-layer coordination achieves 206 µs end-to-end reconfiguration latency, with scalable performance across multiple nodes and 3.8 dB penalty at pre-FEC 10^{-2} BER.

15:15
Mo3-A5/555 - Large-Scale Deployment of LPO in AI Clusters
Chunxiao Wang *(Alibaba Cloud Beijing, Technology Co., Ltd)*
We present the large-scale deployment of 400G DR4 LPO modules in AI clusters, reporting statistical data on system conditions, link performance, and reliability from over 25.8 million device-hours of field operation, proving the long-term reliability of LPO technology.

A2 Auditorium 2

15:00
Mo3-B2/366 - Rate of Water Ingress into Hollow-Core Fibre by Capillary Action
Samuel Agah *(Optoelectronics Research Centre, University of Southampton)*
We investigate water ingress into a double-nested antiresonant nodeless fibre by capillary action, using two independent methods. We find that different parts of the fibre fill at different rates and that ingress is 2-4 times slower than into a cylindrical capillary of identical core diameter.

15:15
Mo3-B3/1136 - Dynamic Response of Antiresonant Hollow-Core Fibre Drawing to Pressure Perturbations
Greg Jasion *(Optoelectronics Research Centre, University of Southampton)*
A transient thermo-viscous model for drawing antiresonant hollow-core fibre is presented and experimentally validated. Core and capillary pressure perturbations drive distinct geometric responses, with inter-capillary gap showing the largest sensitivity. Low-frequency disturbances induce the strongest modulation, providing guidance for stable pressure control during fabrication.

E1 Exhibition room 1

15:00
Mo3-C4/430 - Compact Widely Tunable InP Laser with 10 kHz Linewidth
Maximilian Kähler *(Fraunhofer Heinrich Hertz Institute)*
We demonstrate a monolithic InP laser foundry-fabricated on a multi-project wafer that employs two passive parallel ring resonators, targeting coherent interconnects. It achieves 10 kHz intrinsic linewidth, 46 nm tuning range, >35 dB SMSR and 6 mW on-chip output power within a 0.8 mm² footprint.

15:15
Mo3-C5/1023 - Over 400-mW O-band Monolithic MOPA Laser Array Based on REC Technology for CPO/OIO
Zhenxing Sun *(Nanjing University)*
We propose and demonstrate a MOPA array with precise wavelength spacing based on the REC technique. The MOPA laser array achieves an output power exceeding 400 mW when operating at 50°C, providing an excellent high-power light source solution for CPO/OIO technologies.

C1.1 Conference room 1.1

15:00
Mo3-D5/1412 - Thin-film lithium niobate for quantum photonics: perspectives and challenges
Yunhong Ding *(DTU Electro, Technical University of Denmark)* Invited
Thin-film lithium niobate (TFLN) photonics has recently emerged as an appealing platform for quantum photonics thanks to its low-loss characteristics, large electro-optic and nonlinear coefficients, and broad transparency window. Here, we discuss the latest developments, promising directions, and challenges for future TFLN quantum photonics research.

C1.4 Conference room 1.4

15:00
Mo3-E4/818 - Experimental Data-driven Forward and Inverse SOA WDM Gain and SNR Modelling using Gaussian Process Regression
Alan Yuan *(University of Cambridge)*
We experimentally demonstrate data-driven Gaussian process regression for SOA modelling in a worst-case WDM system, with 0.1dB gain and 0.23dB SNR mean absolute error. Inverse modelling is demonstrated for estimating the required SOA injection current, temperature, and input channel powers to achieve channel-specific SNR targets.

15:30 - 16:00 Afternoon Coffee Break

C2.1 Conference room 2.1

15:00
Mo3-F5/50 - Advances in High-Spectral-Efficiency Formats: Modulation and Coding
Hussam Batshon *(Nokia Bell Labs)*
Invited
Probabilistic amplitude shaping, increasingly adopted in coherent systems, relies on bit-metric decoding that introduces residual demapping loss. This paper shows that single parity-check coded probabilistic shaping reduces this loss via iterative demapping, achieving up to 0.9 dB SNR gain experimentally confirmed in long-haul WDM transmission.

C2.2 Conference room 2.2

15:00
Mo3-G5/507 - Impact of RIN Transfer and Pump-Induced XPM on Coherent Transmission with Forward-Pumped-Raman Amplification
Kosuke Kimura *(NTT Inc.)*
We propose a numerical framework for estimating the impact of pump-to-signal RIN transfer and pump-induced XPM on QoT under forward-Raman pumping. Numerical estimates show reasonable agreement with experiments in single-channel and WDM configurations. The results indicate that pump-induced XPM is more significant than RIN transfer

15:15
Mo3-G6/309 - Real-time 52.8 Tb/s (26.4Tb/s/core) Unrepeatered Transmission over 303.4km of Uncoupled 2-core MCF
BENYUAN ZHU *(Lightera Labs)*
We demonstrate real-time unrepeatered transmission of 52.8 Tb/s over 303.4 km uncoupled 2-core MCF using commercial pluggable modules and ultra-low loss SCUBA2X fibre (0.147 dB/km). We achieve 26.4 Tb/s per core (33×800Gb/s/core) and show no measurable inter-core crosstalk penalty in both unidirectional and bidirectional operations.

E2 Exhibition room 2

15:00
Mo3-H4/1423 - Harnessing Nonlinear and Optomechanical Phenomena in Silicon Nanostructures
Carlos Alonso Ramos *(C2N, CNRS)*
Invited
Subwavelength silicon nanostructures enable precise control of light and optomechanical interactions in integrated devices. We review our recent advances in mid-infrared silicon photonics and the optimization of Brillouin interactions in non-suspended optomechanical cavities.

PV-R Multipurpose room

15:00 Continuation of:

Mo3-I - Winning interconnects for AI: scale-up scale-out technology paths Symposium

See page 53.

PV-P Multipurpose poster area

15:30 - 16:00 Afternoon Coffee Break

Posters sessions
15:30 - 16:45
(See page 64)

A1 Auditorium 1

16:45 - 18:15

Distributed optical sensing: from physics to network deployment

SC 08: Sensing and microwave photonics
Sonia Martín López *(Chair, Consejo Superior de Investigadores Científicas)*
María del Rosario Fernández-Ruíz *(Chair)*

16:45
Mo5-A1/1402 - Distributed Optical Fibre Sensing: Where Elegant Physics Gives Rise to Smart Systems
Luc Thévenaz *(EPFL Ecole Poytechnique Fédérale de Lausanne)* Tutorial
Distributed optical fibre sensing exploits Rayleigh, Brillouin and Raman scattering in silica fibres to measure physical quantities such as temperature and strain with spatial resolution. Each scattering mechanism offers distinct advantages and trade-offs. Operating principles, performance limits, and future prospects, notably hollow-core fibres, are reviewed.

A2 Auditorium 2

16:45 - 18:15

Mo5-B - Hollow-core fibre design

SC 01: Novel fibres, fibre devices and amplifiers
Leslie Rusch *(Chair)*
Tom Bradley *(Chair)*

16:45
Mo5-B1/1427 - Hollow Core Fibres: From Visionary Concept to Multi Problem Solution
Francesco Poletti *(Optoelectronics Research Centre, University of Southampton)* Invited
Hollow-core fibres have evolved from early photonic bandgap concepts to modern antireso-nant nested designs, overcoming loss, bandwidth, and scalability challenges. Here we briefly trace this progress, highlighting recent DNANF advances achieving sub-silica loss, long spans, and multi-band operation.

E1 Exhibition room 1

16:45 - 18:15

Mo5-C - Resonators, TFLT and integrated routing devices

SC 02: Discrete photonic devices and technologies
Yuriko Maegami *(Chair)*

16:45
Mo5-C1/839 - Ultrafast Resonance-Tracking Thin-Film Lithium Tantalate Resonator: Enabling Colorless Self-Coherent Reception
Haojie Zhu *(Westlake University)*
We demonstrate a high-Q thin-film lithium tantalate (TFLT) microring resonator featuring a fast adaptive resonance-tracking speed with a convergence time below 1.3 μs. The ultrafast-tracking TFLT resonator enables colorless carrier-extracted self-coherent reception, achieving 375-Gbps transmission over 50-km SSMF using an uncooled DFB laser.

17:00
Mo5-C2/549 - Low-Noise Agile FMCW Source via Self-Injection Locking of a DFB Laser to a Micro-Transfer-Printed TFLT-on-Si_3N_4 Cavity
Jinwei Su *(Shanghai Jiao Tong University)*
We demonstrate a low-noise, frequency-agile FMCW source by self-injection-locking a DFB laser to a micro-transfer-printed TFLT-on-Si_3N_4 cavity, achieving a 100 Hz linewidth and highly linear frequency sweeps from 1 kHz to 10 MHz.

C1.1 Conference room 1.1

16:45 - 18:15

Mo5-D - Integrated quantum photonics (II)

SC 12: CLEO® Special Session on Emerging Trends in Optics and Photonics
Carlos Alonso Ramos *(Chair, C2N, CNRS)*
Laurent Vivien *(Chair)*

16:45
Mo5-D1 Photonic integrated circuits on soi and sin for quantum communications and quantum computing
Segolene Olivier *(CEA Leti)* Invited

C1.4 Conference room 1.4

16:45 - 18:15

Mo5-E - Packaging and dense integration

SC 03: Photonic integrated circuits, assemblies and packaging
Sylvie Menezo *(Chair)*
Nobuhiko Nishiyama *(Chair)*

16:45
Mo5-E1/1121 - Ultra-broadband, Ultra-Dense 2D-Array Optical I/O Interface. Enabled by 3D Nanoprinting
Huiyu Huang *(University of Cambridge)*
We demonstrate a 3D-nanoprinted high-efficiency, ultra-dense 2D-array optical I/O interface for photonic packaging, integrating 16 channels within 160×120μm². Experiments show stable 1–2dB channel losses, with rigorous simulations indicating a potential reduction to 0.4dB.

17:00
Mo5-E2/848 - Laser-Induced Forward Transfer of Photonic Integrated Circuits
Nick de Louw *(TNO/PITC)*
We present laser-induced forward transfer (LIFT) as a novel die-to-wafer assembly approach for photonic integrated circuits (PICs). Placement accuracies approaching 500 nm (3σ) are achieved, alongside efficient electro-optical coupling, underscoring LIFT's promise for high-throughput, high-precision PIC integration.

C2.1 Conference room 2.1

16:45 - 18:15

Mo5-F - ML and nonlinearity mitigation

SC 04: Signal processing for optical communication and sensing
Fernando Guiomar *(Chair)*
Adonis Bogris *(Chair)*

16:45
Mo5-F1/755 - Unsupervised-Domain-Adaptation Enhanced Learned Subband-based Perturbation Nonlinear Compensation for Optical Transmission Systems
Xuan Tang *(South China University of Technology)*
We propose a learned subband-based perturbation-aided nonlinear compensation method, enhanced by unsupervised domain adaptation using polarization- and phase-agnostic power moments. Experiments of PS-64QAM signals over 1200 km demonstrate that this method is robust to parameter mismatch and can adapt to channel variations quickly and blindly.

17:00
Mo5-F2/1337 - A Realistic Implementation of Fast Convergence Hypernetwork-based DSP for Coherent Data Centre Links
Samuel Lennard *(University College London)*
We experimentally demonstrate a hypernetwork-based algorithm to generate the weights of an adaptive equalizer in 30-GBaud DP-16-QAM coherent transmission. It achieves better performance than conventional algorithms, providing purely feed-forward coherent DSP and locking to unseen channels with comparable computational complexity but without feedback paths.

C2.2 Conference room 2.2

16:45 - 18:15

Mo5-G - Very high speed PON

SC 07: Optical networks for access, mobile X-haul, in-building, and intra-datacentre interconnects
Rene Bonk *(Chair, Nokia)*
Derek Nesset *(Chair, Huawei)*

16:45
Mo5-G1/336 - Low-Complexity VSB Generation and Chirp Management for VHSP Downstream Links Supporting GPON Coexistence
Christoph Füllner *(Nokia Bell Labs)*
We propose a novel hybrid PON concept at 100 Gb/s combining vestigial sideband (VSB) generation with an easy-to-implement transmitter chirp management to enable GPON coexistence of VHSP. We show that dispersion levels from 0 to 125 ps/nm can be covered.

17:00
Mo5-G2/198 - On the Extinction Ratio penalty and Sensitivity of next-generation 120 Gb/s upstream IM solutions for Very High-Speed PONs
Vincent Houtsma *(Nokia, Bell Labs)*
The sensitivity and impact of extinction ratio on proposed IM upstream solutions for next generation 100-120 Gb/s VHSP is investigated.

E2 Exhibition room 2

16:45 - 18:15

Mo5-H - Control and optimization of optical network systems

SC 10: Control and management of optical networks
Joao Pedro *(Chair)*
Shuangyi Yan *(Chair)*

16:45
Mo5-H1/471 - Physical-Model-Based Optical Line System Transmission Optimization Integrating Probing Transceivers
Giacomo Borraccini *(NEC Laboratories America)*
An automated methodology for optical line systems integrating probing transceivers to initialize a system-level digital twin is described. Physical model parameters are inferred from scratch by combining end-to-end spectrum measurements, pre-FEC BER and optical amplifier telemetry, enabling near-optimal configuration, model alignment, and precise QoT tuning.

17:00
Mo5-H2/1295 - Importance Sampling for Deterministic Uncertainty when Estimating QoT in Autonomous Optical Networks
Camille Delezoide
We investigate importance sampling to significantly improve computational efficiency when assessing the probability of lightpath failure in complex scenarios. Results pave the way towards risk-informed decision-making in self-driven optical networks.

PV-R Multipurpose room

16:45 - 18:15

MO4-I - Winning interconnects for AI: scale-up scale-out technology paths Symposium

Session 2:
- Manish Mehta, Broadcom - "Scaling Optical Interconnects for AI: Manufacturing Pathways to Massive CPO-Enabled Clusters"
- Fotini Karinou, Microsoft Azure - "AI Scale-up and GP Compute Use Cases for Optical Interconnects"
- Claudia Hössbacher, Marvell - "Silicon Photonics at Every Layer: Optical Interconnect Solutions for Scale-Up and Scale-Out"
- Jean Philippe Fricker, Cerebras - *(Title: TBC)*
- Ling Liao, Nvidia - "Optical solutions for scale-up and scale-out connectivity"
- Andy Bechtolsheim, Arista - *(Title: TBC)*

PV-P Multipurpose poster area

A1 Auditorium 1

A2 Auditorium 2

17:15
Mo5-B2/1138 - A Unified Framework for Understanding Confinement Loss, and Engineering Bandwidth, and Modal-Dependent Loss in Hollow-Core Fibers
Federico Melli *(Università di Parma)*
Exploiting a unified framework linking mode-coupling and tube-tunneling losses in Hollow-Core Inhibited-Coupling Fibers, we show how tube shape and position govern transmission bandwidth and anisotropic leakage, revealing Mode-Dependent loss in HC-IC fibers as a controllable outcome of geometric and azimuthal design choices

17:30
Mo5-B3/973 - Ultra-high Mode Purity and SMF-matched O-Band Hybrid Antiresonant Hollow Core Fiber for Intra Data Center Connection
Zihan Dong *(Yangtze Optical Fiber and Cable Joint Stock Limited Company)*
We report the first demonstration of an O-band hybrid antiresonant hollow core fiber with ~6000 dB/km LP_{11} mode loss and 14/240 µm core/coating diameters. Meanwhile, this fiber delivers macrobending loss comparable to G.657.A2, rendering it well suited for high-density IDC interconnections.

E1 Exhibition room 1

17:15
Mo5-C3 Thin film lithium tantalate photonic integrated circuits for next generation high speed communications and lasers.
Tobias Kippenberg *(EPFL)* Invited

C1.1 Conference room 1.1

17:15
Mo5-D2/312 - Quantum and Classical Photonics for Advanced Smart Applications
Roberto Morandotti *(INRS Canada)*
Invited
We report fiber-based and integrated photonic platforms that use time and frequency control to address scalable quantum communication and classical information processing. Through high-dimensional entanglement, ultrafast time-bin encoding, reservoir computing, spectral machine learning, and microcomb optimization, we demonstrate scalable telecom-compatible architectures for next-generation smart applications.

C1.4 Conference room 1.4

17:15
Mo5-E3/500 - Fully Interconnected Die-to-Wafer Hybrid Copper Bonding Process for Opto-Electrical Routing Platforms
Da In Song *(SAMSUNG Electronics)*
We demonstrate simultaneous opto-electrical interconnection on a die-to-wafer hybrid bonding system. CMP erosion is 100 A even with pattern density mismatch between optic and electric layers. Measured evanescent coupler loss is 0.32 dB at 1310 nm and measured electrical resistance is 0.30 Ω.

17:30
Mo5-E4/1086 - Ultra-High-Resolution Silicon Photonic Beamformer via Path-Reversal Optical True-Time Delay
Senyu Zhang *(Huazhong University of Science and Technology, HUST)*
We demonstrate a silicon photonic beamformer employing a path-reversal optical true-time delay mechanism, increasing squint-free pointing angles in switched M-bit architectures from 2^M to 2^{M+1}-1 without additional delay stages. Our 5-bit chip achieves 63 angles over 35 GHz with <0.5 ps delay error.

C2.1 Conference room 2.1

17:15
Mo5-F3/1366 - Sequential Neural Probabilistic Amplitude Shaping: Learning the Channel's Language
Mohammad Taha Askari *(University of British Columbia)*
We present the first neural probabilistic amplitude shaping that outperforms existing methods while accounting for all implementation losses, using a block-less, easily implementable sequential autoregressive encoder compatible with arithmetic distribution matching, yielding reduced rate loss and higher achievable information rates.

17:30
Mo5-F4/180 - DPD-KAN: Kolmogorov-Arnold Networks for Low Complexity Digital Predistortion in 5G Analog Radio-over-Fiber Systems
Rana Ahmad Bilal Khalid *(Aston University)*
We demonstrate the first KAN-based DPD model for 5G analog RoF fronthaul link, achieving a 24.2% lower EVM than multi-layer perceptron and 29.6% lower than Volterra-based GMP at equivalent Bit Operations. To attain an EVM below 2%, KAN requires ≈52% fewer BOPs than a perceptron.

C2.2 Conference room 2.2

17:15
Mo5-G3/613 - Investigation of MPI and DGD Tolerance in Digitally CD Pre-Compensated PAM-2 for Very High Speed PON Systems
Hanane Kharbich *(Politecnico di Torino)*
Digital Chromatic Dispersion Compensation (DCPC) has been investigated through both experiments and simulations to assess its resilience to multipath interference and differential group delay. The results show a performance similar to conventional PAM-2, with MPI-induced penalty below 1 dB for interference values under 15 dB.

17:30
Mo5-G4/1095 - 200 Gb/s PolMux Link with 32 dB optical power budget, 28GHz electrical bandwidth and LO reuse for VHS-PONs
Ignacio Garcés Gregorio
In this work we experimentally demonstrate a 25km long, 200Gb/s PolMux multiCAP downstream link for Very-High Speed PONs, using a narrow 28GHz electrical bandwidth and obtaining an optical power budget of 32dB while reusing the LO at the receiver as the upstream source.

E2 Exhibition room 2

17:15
Mo5-H3/754 - Experimental Demonstration of Optical Network Partitioning and Parallel Configuration for Autonomous Power Re-Equalization
Chenyu Sun *(Sorbonne Université)*
We propose and experimentally demonstrate a digital twin–based optical network partitioning strategy on a 7-OMS mesh optical network testbed. By leveraging parallel closed-loop control across subnets, the proposed approach reduces power re-equalization time by over 80%.

17:30
Mo5-H4/980 - Hybrid FXC-WXC Networks with Selective Wavelength Conversion: Dynamic Path Control and Experimental Demonstration
Ryota Hosokawa *(Nagoya University)*
We propose a hybrid FXC-WXC architecture with selective wavelength conversion for low-loss and flexible optical networks. Network simulations show reduced blocking and improved OSNR under dynamic control, while transmission experiments demonstrate lower BER and longer reach than WXC-only networks, supporting ZR+ deployment in metro/core networks.

PV-R Multipurpose room

17:15 Continuation of:

MO4-I - Winning interconnects for AI: scale-up scale-out technology paths Symposium

See page 59.

PV-P Multipurpose poster area

A1 Auditorium 1

17:45
Mo5-A2/455 - Rayleigh Fingerprint-Based DAS over a 688-km Repeatered Link with Co-Propagating 15-Tb/s WDM Transmission
Daniele Orsuti *(University of Padova)*
We report the first demonstration of distributed acoustic sensing based on cross-correlation of the fiber's Rayleigh fingerprint over >600 km using 500-MHz bandwidth pulses. The link includes 90 km of field fiber for seismic monitoring.

18:00
Mo5-A3/122 - Performance of L-band DAS on Live Traffic Fiber Compared to C-band DAS Over Dark Fiber
Jan Kristoffer Brenne *(Alcatel Submarine Networks Norway AS)*
We present field-trial results with L-band DAS deployed in coexistence with C-band DWDM channels carrying live production traffic. We monitored the quality of DAS and optical communication channels during the test and uncompromised performance was achieved for both compared to sensing on dedicated dark fiber.

A2 Auditorium 2

17:45
Mo5-B4/862 - Active Antiresonant Hollow-Core Fibres Enabled by Internal Semiconductor Quantum-Dot Coatings
Alexander Heidt
We demonstrate an active antiresonant hollow-core fibre with optical gain provided by thin internal semiconductor quantum-dot coatings. In a side-pumped all-fibre cavity, it shows 625-nm laser emission while preserving air-core guidance and eliminating the need for liquid or gas-based gain media.

E1 Exhibition room 1

17:45
Mo5-C4/1334 - Reconfigurable Optical Routing Using Microring Resonators with Interferometric Arms
Hilmi Othman *(University of Southampton)*
We demonstrate energy-efficient, resonance-stable, reconfigurable optical power routing in a microring resonator with interferometrically controlled coupling.
The device achieves up to 20 dB power extinction ratio and error-free 80 Gb/s transmission, establishing a compact building block for scalable reconfigurable silicon photonic interconnects.

18:00
Mo5-C5/803 - A 500 Gbps PAM4 Silicon Microdisk Modulator With a 3.2 THz FSR and >110 GHz Bandwidth
Houyou Lai *(Xi'an Institute of Optics and Precision Mechanics, CAS)*
We demonstrate a microdisk modulator with an ultra-high bandwidth exceeding 110 GHz at a 6 dB IL detuning and a FSR of 3.2 THz. Clear PAM4 eye diagrams at 448 and 500 Gbps are obtained, with TDECQ values of 1.41 dB and 2.46 dB, respectively.

C1.1 Conference room 1.1

17:45
Mo5-D3/72 - III-V nanostructures for lasers and quantum emitters
Hark Hoe Tan *(The Australian National University)* Invited
Selective area epitaxy is used to grow III-V semiconductor nanostructures – ranging from nanowires to nanosheets to microrings. The nanostructures are then used for various light emitting applications.

C1.4 Conference room 1.4

17:45
Mo5-E5/127 - Double-Layer Metasurface-based Interface for Dense PIC-to-MCF Polarization-Multiplexed Coupling
Yusuke Tsubai
Efficient and compact edge-coupling interface between SiN photonic integrated circuit (PIC) and multicore fiber (MCF) is demonstrated using a double-layer metasurface device. The PIC-to-MCF coupling losses below 1.4 dB (numerically) and 4.9 dB (experimentally) with polarization-multiplexing functionality are obtained for all eight channels.

18:00
Mo5-E6/1197 - Hybrid Photonic Integrated O-band PLC with SiN SSC and SOA
Array Switches for Lossless Wavelength Selective Switching
Amare Kindu Tesfa *(Eindhoven University of Technology)*
We demonstrate O-band lossless wavelength-selective switch using hybrid photonic-integrated U-shaped InP-SOA arrays and silica PLC AWGs with integrated SiN spot-size converters. Results show efficient coupling 1.5dB/facet, 12dB net-gain and WDM 100G/λ PAM4 switching with >46dB on-off ratio and 0.52dB power penalties at KP4.

19:30–21:30 Welcome reception at Cruise Terminal

C2.1 Conference room 2.1

17:45
Mo5-F5/1042 - 168-GBd PCS-324QAM Signal Transmission with 2.1-Tb/s Net Bitrate Using Sample-Domain Volterra Nonlinear Pre-distortion
Masanori Nakamura *(Network Innovation Laboratories, NTT, Inc.)*
We demonstrate 168-GBd PCS-324QAM signal generation and transmission using sample-domain Volterra nonlinear pre-distortion applied to the oversampled high-PAPR waveform. Our approach provides a 0.7-dB peak-SNR gain over a symbol-domain Volterra filter and achieves net bitrates of 2.18 Tb/s back-to-back and 2.10 Tb/s after 80-km transmission.

18:00
Mo5-F6/867 - Physics-Aware Contribution-Guided Pruning for Low-Complexity Sparse Volterra Equalization in 100-Gb/s IM/DD PAM4 Links
Govind Yadav *(Institute of Communications Engineering, National Tsing Hua University)*
We experimentally demonstrate a novel physics-aware, contribution-guided pruned Volterra equalization framework for distortion mitigation in a 100-Gb/s PAM4 IM/DD link over 4.2-km SMF, achieving ~92% complexity reduction versus full VE and ~36.5% reduction relative to baseline MP-VE, while delivering superior performance at the KP4-FEC limit.

C2.2 Conference room 2.2

17:45
Mo5-G5/1394 - Research Directions on Hybrid PON for Very High Speed PON
Ivan Cano *(Huawei Technologies Duesseldorf GmbH)* Invited
Two systems are proposed for VHSP that aim to centralize the complexity at the OLT while having simple DD at the ONU-Rx: DCPC and SSB. An evaluation of both systems in terms of their CD tolerance is provided as well as motivations for further research.

E2 Exhibition room 2

17:45
Mo5-H5/371 - LOME: A Low-latency Optimal Ports Matching Engine for Optical Circuit Switches
Yangmiao Yu *(Institute of Computing Technology, Chinese Academy of Sciences)*
We propose a hardware-accelerated, low-latency,optimal ports matching engine for optical circuit switches to accommodate mouse flows.It reduces port-matching latency to hundreds of nanoseconds,an improvement by multiple orders of magnitude compared to CPU baselines,and reduces mouse flow latency by a factor of 19 on the demo.

18:00
Mo5-H6/195 - Selective Deployment of Bidirectional Hollow-Core Fibers in Hybrid SMF/HCF Optical Networks
Mëmëdhe Ibrahimi *(Politecnico di Milano)*
We investigate selectively deploying bidirectional transmission in hybrid Hollow-Core Fiber (HCF) networks. Upgrading 50% of links to bidirectional HCF yields at least a 40% throughput increase compared to unidirectional SMF and captures 85% of the power consumption reduction of a full unidirectional HCF network upgrade.

PV-R Multipurpose room

17:45 Continuation of:

MO4-I - Winning interconnects for AI: scale-up scale-out technology paths Symposium

See page 59.

PV-P Multipurpose poster area

19:30–21:30 Welcome reception at Cruise Terminal

Poster Session in PV-P (Multipurpose poster area)

15:30 – 16:45

Mo4-P-1/43 - Simultaneous Rotational Alignment of Multi-Core Fiber Ribbons for Scalable Interconnection. (SC01)
Katsuyoshi Sakaime *(National Institute of Information and Communications Technology (NICT))*
We propose a simultaneous rotational alignment method for multi-core fibre ribbons, enabling scalable interconnection with reduced assembly time. Multiple fibres are aligned and selectively fixed during collective rotation using a dedicated jig. We experimentally demonstrate an average rotational misalignment of 0.83°.

Mo4-P-2/166 - Two-Pump Distributed Parametric Amplification of 25x 32Gbaud 16-QAM Channels over 25 km SSMF with ~20dB Gain (SC01)
Munira B. Mostafa
We demonstrate distributed fiber optic parametric amplification of 25x 16-QAM 32Gbaud channels over 25 km of G.652.D in the O-band with GMI-estimated throughput of 3.148Tbps and on/off gain of ~20dB by employing two ~125mW pumps.

Mo4-P-3/176 - Generation and Modulation of Second-order Nonlinearity in the Microfibre (SC01)
Yuxin Ma *(Northwestern Polytechnical University)*
We demonstrate optical fibre schemes assisted with low-dimensional materials to implement second-order nonlinear processes. The functionalized fibre devices have achieved tunable and broadband second harmonic and sum-frequency generation under low peak-power CW lasers, facilitating applications in nonlinear fibre optics.

Mo4-P-4/272 - Enhanced Radiation Hardness of High-Hydroxyl Fluorine-Doped Silica Optical Fibers (SC01)
Youngwoong Kim *(Korea Atomic Energy Research Insititute)*
We developed high-hydroxyl (OH) fluorine-doped silica optical fibers and evaluated their radiation response at 1550 nm under γ-ray irradiation. The developed fiber exhibits significantly reduced radiation-induced attenuation and improved saturation behavior compared with conventional radiation-hardened fibers, demonstrating synergistic benefits of combined fluorine and OH incorporation.

Mo4-P-5/304 - Virtual Draw of Arbitrary Geometry Hollow Core Fibres, a 3D Finite Element Approach (SC01)
Mohammadreza Najafigamasaei
A novel 3D finite-element Computational Fluid Design tool is developed to study the fabrication of anti-resonant hollow-core fibres from preforms with arbitrary geometries. To showcase its unique capabilities, we study the draw of elliptical tubes and of hollow-core fibres with elliptical capillaries.

Mo4-P-6/306 - Discrete-Raman-Amplification in the U+X-Band (1610-1690nm) Utilizing Twin EDFA ASE Peaks (1535nm and 1565nm) for Forward Pumping with Reduced Noise Generation (SC01)
Youichi Akasaka *(1Finity Americas Inc.)*
U+X band discrete Raman amplification covering 1610nm to 1690nm is demonstrated using twin peaks of C-band EDFA ASE at 1535nm and 1565nm, made by 4m EDF and 13m EDF, respectively. Forward pumping with incoherent ASE achieved a 1dB Lower noise compared to backward pumping.

Mo4-P-7/355 - Refractive-index profile dependence of an LPFG-based mode scrambler for broadband and low-loss MDL compensation (SC01)
Taro Iwaya *(NTT, Inc.)*
A dual-step-index (DSI) core reduces the insertion loss increase associated with mode-coupling efficiency for LPFG-type 2-LP mode scramblers. An LPFG-based mode-scrambler utilizing DSI-core fibre was numerically and experimentally demonstrated, achieving <0.5 dB insertion loss and broadband mode-dependent-loss compensation over the C+L band.

Mo4-P-8/361 - High-Density Cable Employing 160 µm Reduced-Cladding 4-Core Multi-Core Fibre for Data Centre Applications (SC01)
Hiroki Takehana *(Fujikura)*
A high-density 288-fibre cable was fabricated employing reduced-cladding 100/160 µm, 4-core, multi-core fibres (MCFs) for intra-/inter-data centre links (lengths <10 km). The cable suppressed the microbending loss and maintained practical crosstalk and temperature stability levels, demonstrating the feasibility of reduced-cladding MCF cabling for practical deployment.

Mo4-P-9/505 - Core-Pitch Conversion Technique for Randomly Coupled Multi-Core Fibre Links by Cladding Mode Coupling
Kazuhiro Kikuchi *(NTT, Inc. Access Network Service Systems Labpratories)* **(SC01)**
We propose a core-pitch conversion technique using only a simple spliced-taper structure of randomly coupled multi-core fibres (RC-MCF). We demonstrate up to 20-µm core-pitch conversion with loss below 0.9 dB and low mode-dependent loss, which can connect RC-MCF transmission line and smaller-core-pitch amplifier.

Mo4-P-10/670 - Novel Photonic Lantern with Higher Order Radial Mode Suppression (SC01)
Jin Wei *(The University of Sydney)*
We present the design and fabrication of a novel 6-core photonic lantern to suppress the LP02 mode, by omitting its central core. The device was characterised by off-axis digital holography achieving an average 27.41 dB suppression (versus 32 dB simulated) with -0.19 dB throughput loss.

Mo4-P-11/769 - Machine Learning in Hollow Core Fiber Design (SC01)
Leslie A. Rusch
We generate numerous high-performance designs using neural networks predicting confinement loss in nested anti-resonant nodeless fibers. These designs provide meaningful statistics to identify a high-fidelity figure of merit, aiding future complex designs with multiple metrics.

Mo4-P-12/54 - Monolithically Integrated 2 × 226 Gbps Dual-Wavelength EML with a Passive MZI-based Optical Multiplexer (SC02)
Kenichi Terao *(Mitsubishi Electric)*
We developed dual-wavelength integrated EMLs with a passive Mach-Zehnder optical multiplexer requiring no phase-tuning electrodes. The emission wavelengths are spaced for CWDM, and each supports 226 Gbps operation (113-Gbaud PAM4). Measured insertion losses were 1.8 dB at 1311 nm and 4.3 dB at 1331 nm.

Poster Session in PV-P (Multipurpose poster area)

Mo4-P-13/64 - Demonstration of Higher-Order Tensor Contraction via Optical Nonlinear Wave Mixing (SC02)
Wing Ko *(University of Southern California)*
We demonstrate direct optical higher-order tensor contraction using nonlinear wave mixing in a periodically poled lithium niobate waveguide. The system performs the contraction of three order-3 tensors over three pairs of indices at 5 GHz with ~4-bit precision.

Mo4-P-14/93 - E-band InP-on-Si Tunable Laser via Micro-Transfer Printing (SC02)
Dongbo Wang *(Ghent University)*
We demonstrate a widely tunable E-band InP-on-Si laser heterogeneously integrated using micro-transfer printing. The laser achieves a tuning range of 41 nm (1398–1439 nm), with a side-mode suppression ratio above 45 dB and 3 mW output power in the silicon waveguide.

Mo4-P-15/115 - O-band InP Mach-Zehnder Modulator for 400 Gb/s per Lane in a Generic Pure-Play Foundry (SC02)
David Barcons *(SMART Photonics B.V.)*
To address increasing datacenter requirements of 400 Gb/s per lane we present an InP Mach-Zehnder modulator with measured electro-optic bandwidth above 67 GHz and Vπ of 2.6-3.4 V for an interaction length of just 0.8 mm. Our physics-based model predicts operation beyond 110 GHz.

Mo4-P-16/129 - Low-Loss Subwavelength Grating-Based Waveguide Crossings in Silicon Nitride at 1550 nm (SC02)
Polyxeni Kolka *(Optoelectronics Research Centre, University of Southampton)*
We design, fabricate, and characterise subwavelength grating waveguide crossings in SiN for 1550 nm operation. Using cascaded structures, we measure state-of-the-art 0.052 dB/crossing loss with <−47 dB crosstalk. These results enable dense, low-loss routing for telecom PICs, surpassing prior SiN crossings.

Mo4-P-17/300 - Single-Drive Flat-Top Near-Visible Electro-Optic Frequency Comb Generation in Lithium Tantalate (SC02)
Fei Huang *(Zhejiang University)*
We demonstrate a single-drive flat-top electro-optic comb generator at 798 nm in thin-film lithium tantalate. The device generates 49 comb lines, with a 5 dB bandwidth comprising 25 lines at an 18 GHz microwave drive.

Mo4-P-18/329 - Hybrid Integrated Tunable Laser with SiN Ring Resonators for Wide Wavelength Tuning and Locking (SC02)
Jong-Hoi KIim *(Electronics and Telecommunications Research Institute (ETRI))*
We demonstrate a hybrid integrated tunable external cavity laser utilizing SiN micro-ring resonators for tuning and locking of wavelengths, achieving a tuning range of 82 nm, an output power exceeding 16 dBm, and a SMSR over 56 dB.

Mo4-P-19/333 - A 500 Gbps Ultra-Compact Silicon Photonic Mach-Zehnder Modulator with >110 GHz Bandwidth (SC02)
Qian Liu *(University of Chinese Academy of Sciences)*
We demonstrate a 500 Gbps silicon modulator with a length of 300 μm, integrating chirped phase-shifted grating and electro-optic frequency-domain equalization. The device achieves a tuning efficiency of 66 pm/V and an electro-optic bandwidth exceeding 110 GHz.

Mo4-P-20/348 - Silicon Photonics Mode-Selective 3-dB Power Splitters (SC02)
Sora Izumisawa *(Graduate School of Information Science and Technology, Hokkaido University)*
Silicon mode-selective 3-dB power splitters based on multimode interference are experimentally demonstrated. They selectively split the TE0 or TE1 mode, allowing the other to pass. Furthermore, AI-based layout correction improves the power imbalance by up to 2.63 dB.

Mo4-P-21/420 - High-bandwidth and High-efficiency MOS Mach-Zehnder Modulator based on InGaAsP Membrane/ Si Waveguide with Capacitively-loaded Travelling-wave Electrodes (SC02)
Naotaka Kasuya *(Sumitomo Electric Industries, Ltd.)*
We demonstrate InGaAsP/Si MOS Mach–Zehnder (MZ) modulators with capacitively-loaded travelling-wave electrodes. With a reduced RC constant, VpL-bandwidth trade-off is significantly improved, achieving bandwidth exceeding 60 GHz with VpL ~ 0.5 Vcm, representing the highest reported bandwidth for MOS MZ modulators on Si photonics platforms.

Mo4-P-22/424 - 80 GHz C+L Band Germanium Photodetector via Microheater (SC02)
Bingyan Zhang *(Harbin Institute of Technology (Shenzhen)*
A germanium photodetector integrated with microheater is demonstrated for operation in C+L band. The detector has a measured dark current of 30 nA and responsivity of 0.76 A/W at 1625 nm. The bandwidth is 80 GHz supporting 96 Gbps NRZ signalling at 1600 nm.

Mo4-P-23/426 - Broadband Vernier-Programmable Thin-Film Lithium Niobate Triple-Ring Electro-Optic Modulator for High-Speed Optical Interconnects (SC02)
Tiancheng Yu
We demonstrate a broadband Vernier-programmable triple-ring lithium niobate electro-optic modulator that overcomes single-ring high-frequency efficiency roll-off through supermode coupling. DC bias enables 19.4-GHz tuning of the peak RF operating frequency. The extracted response indicates a sideband-to-carrier ratio from -1.4 to -2.7 dB over this range.

Mo4-P-24/431 - A 112 Gbps and Direct-drive Silicon Microdisk Modulator (SC02)
Jian Li
We present a silicon microdisk modulator with 30 GHz electro-optic bandwidth and 0.57 V·cm modulation efficiency. For the first time, the silicon microdisk modulator can be directly driven with 0.8 Vpp swing for 112 Gbps four-level pulse amplitude modulation

Mo4-P-25/94 - Wafer-scale process-decoupled spectral stabilization in SiN CWDM (de)multiplexer (SC03)
Yung-Jr Hung *(National Sun Yat-sen University)*
We demonstrate wafer-scale process decoupling and spectral stabilization in SiN CWDM photonics using sensitivity-engineered cascaded MZIs. Independent extraction of linewidth and thickness variations enables a Δλ/Δw-compensated design achieving -1.92 ± 0.95 nm wavelength shift with <2 dB insertion loss across a 12-inch wafer.

Mo4-P-26/216 - High-Power Multi-Wavelength Hybrid Integrated Laser Array for Co-Packaged Optics (SC03)
Lei Liu *(POET Technologies)*
A four-channel L-band hybrid laser array is demonstrated using an InP gain-chip array integrated on a CMOS-compatible optical interposer. Single-mode operation with >50 dB SMSR and 400 GHz spacing is achieved without active wavelength tuning. Each channel delivers over 20 dBm at 50 °C.

Mo4-P-27/264 - C+L Band Tunable External Cavity Laser Array Integrated using Photonic Wire Bonding (SC03)
Youssef Saghiran
We report on an 8-channel external cavity-based TLS integrated using PWB between a RSOA array and a SiN circuit array. We demonstrate a wide tunability over C+L band, output power>16 dBm, SMSR>60 dB and intrinsic linewidth <10KHz.

Poster Session in PV-P (Multipurpose poster area)

Mo4-P-28/335 - Multi-mode Microring Spectrometer without Photodetector (SC03)
Yuchen Yin *(Shanghai Jiao Tong University)*
We demonstrate a multi-mode microring resonator spectrometer assisted with two-photon absorption, achieving a 40 pm resolution across 50 nm bandwidth and record-high channel-number-to-footprint ratio of 2.8 × 10^6 mm^{-2}. Without any external photodetector, this fully integrated spectrometer demonstrates excellent capability in on-chip optical sensing applications.

Mo4-P-29/378 - High-Density High-Throughput WDM Optical Transmitter Based on Lithium-niobate-on-insulator Platform (SC03)
Cheng Zeng *(Huazhong University of Science and Technology)*
We propose an ultra-compact Bragg microcavity modulator on LNOI platform, with a length of ~100μm, a measured 3-dB electro-optic bandwidth >110GHz and a modulation efficiency of ~6.6pm/V. It supports high-speed transmission of 140Gbit/s OOK and 180Gbit/s PAM4, enabling a 720Gbit/s four-channel transmitter.

Mo4-P-30/416 - A 3.2 Tbps 2.5D Integrated Silicon Photonic Transmitter for Co-packaged Optics (SC03)
Shuxiao Wang *(Shanghai Institute of Microsystem and Information Technology)*
We demonstrate a 3.2 Tbps 2.5D integrated silicon photonic transmitter supporting a date transmission of 200 Gbps PAM4 modulation per channel. Full-link operation is experimentally validated, achieving 4.01 pj/bit energy efficiency at a total power consumption of 12.83W, highlighting its potential for co-packaged optics.

Mo4-P-31/423 - O-, E- and S-band Silicon Photonics Wavelength Cross-Connect Switch with Waveguide Bragg Gratings (SC03)
Kazuhiro Ikeda *(National Institute of Advanced Industrial Science and Technology)*
We demonstrate an extended multiband operation over 300 nm using an improved wavelength cross-connect switch circuit in 2x2 and 32-ch scale, fully exploiting the potential available wavelength range of wavelength-selective couplers with waveguide sidewall gratings.

Mo4-P-32/470 - An All-Silicon Coherent Optical Receiver Beyond 100 GBd Using a Traveling-Wave SiGe BiCMOS TIA (SC03)
Jakob Declercq *(Ghent University - imec)*
We demonstrate a coherent optical receiver integrating a silicon-photonic front-end with a 55-nm SiGe BiCMOS traveling-wave TIA. The receiver achieves 44-GHz bandwidth and supports single-polarization QPSK up to 140 GBd and 16-QAM up to 112 GBd.

Mo4-P-33/532 - Integrated Diffractive Slab Photonic Processor for Real-Time RF Spectrum Sensing and Matched Filtering (SC03)
Shen ZIchao *(National Key Laboratory of Microwave Imaging Aerospace Information Research Institute Chinese Academy of Sciences Beijing 100190, China)*
We demonstrate a silicon-nitride diffractive slab photonic processor for real-time RF spectrum sensing and matched filtering. A 24-point, 9.12-GHz one-shot processor achieves 380-MHz resolution and 3-ns-scale response, while frequency stitching improves matched-filtering resolution to 47.5~MHz and yields >20-dB sidelobe suppression in pulse compression.

Mo4-P-34/592 - Highly Efficient Broadband Thin-Film Lithium Niobate MZM for 1μm Optical Communications (SC03)
Alessandro Aimone *(Nokia Bell Labs)*
We demonstrate the first compact 1μm TFLN modulator with Vpi = 4.2 V (VpiL = 1.1 V*cm) and electro-optical bandwidth > 110 GHz. We successfully demonstrate data modulation up to 145 GHz electro-optic bandwidth by upconverting a 20 GBd signal combined with single-ended heterodyne detection.

Mo4-P-35/656 - 212.5 Gbps SerDes-Driven Optical Engines Based on SiPh and TFLN Platforms (SC03)
Wei Chu *(Shanghai Optoelectronics Science and Technology Innovation Center)*
We demonstrate a 212.5 Gbps SerDes-based LRO interconnect to compare SiPh and TFLN engines. We employ EIC-PIC analog peaking to overcome SiPh bandwidth limits. Conversely, while a SerDes direct-drive architecture improves TFLN's energy efficiency, it restricts signal integrity. This paper highlights these trade-offs.

Mo4-P-36/682 - Agile Wavelength-Switchable Self-Injection-Locked Narrow Linewidth DBR Laser for Coherent Wavelength Routing (SC03)
Fang Wei *(Shanghai Optoelectronics Science and Technology Innovation Center)*
We propose a hybrid self-injection-locked DBR laser with a Si_3N_4 micro-ring external cavity for coherent wavelength routing. Enabled by optical feedback over C-band ITU channels, it achieves 89 ns switching, stable wavelength locking, and a 2.5 kHz linewidth for high-speed optical switching.

Mo4-P-37/694 - A 4-λ × 32-Gb/s Silicon Micro-Ring-Resonator-Based DWDM Receiver with On-Chip Temperature Controller (SC03)
Jae-Ho Lee *(Yonsei University)*
We demonstrate a 4-λ x 32-Gb/s silicon MRR-based DWDM receiver with an on-chip temperature controller, automatically aligning and locking each MRR resonance wavelength to its target wavelength. Its operation is confirmed by electronic-photonic co-simulation using the Cadence design environment and experimentally verified under thermal stress.

Mo4-P-38/31 - Machine Learning-Assisted Digital Predistortion for Mask Margin Recovery in EML Transmitters (SC04)
Cengizhan Kaya *(Technical University of Munich)*
We demonstrate that machine learning-assisted digital predistortion effectively recovers eye-mask margin in EML transmitters biased in nonlinear region. Experimental results at 25GBd show a 13% margin improvement over the first order hold interpolation, while filter- and lookup-table-based approximations achieve comparable performance.

Mo4-P-39/41 - A Novel Low-Complexity Clock Recovery for Non-Integer Oversampling Coherent Optical Transmission (SC04)
Yukun Zhang *(Chongqing University Of Posts And Telecommunications)*
Non-integer oversampling technique has been widely adopted in high-speed coherent optical transmission. We propose a novel low-complexity clock recovery algorithm for recovering the clock of non-integer oversampled signals. Compared to conventional methods, the novel clock recovery algorithm reduces the number of real multiplications by 93%.

Poster Session in PV-P (Multipurpose poster area)

Mo4-P-40/46 - Enabling High-Reliability Link Monitoring in In-Vehicle PONs via Correlation OTDR (SC04)
Wu Liu *(China Information Communication Technologies Group Corporation)*
We propose an in-vehicle PON monitoring scheme based on correlation OTDR. By incorporating in-band communication, the scheme achieves centimeter-level spatial resolution while enabling the detection of nanosecond-level outages and sub-0.2 dB power fluctuations.

Mo4-P-41/142 - Real-Time FPGA Implementation and Verification of OSA-Aided SBC-BCH FEC for 100G Coherent Optical Access Network (SC04)
In-Ki Hwang *(ETRI)*
We present the first real-time FPGA implementation of an OSA-aided SBC-BCH FEC for 100G coherent optical networks. Featuring a 7.6μs round-trip latency, it achieves a 2.5×10^{-10} post-FEC BER at 8.6×10^{-3} pre-FEC BER, confirming stable operation with a PTBC-based coherent DSP.

Mo4-P-42/143 - In-Service Transceiver Calibration for Digital Subcarrier Signals with Synthesising IQ Imbalance via (SC04) Offloaded Multi-layer Filters
Masaki Sato *(NEC Corporation)*
We proposed Tx/Rx-IQ imbalance calibration for digital-subcarrier signals using synthesised responses from multi-layer filters. In 1,200-km WDM transmission of 128-GBd 8-DSC PM-PCS-64QAM, Q-penalties within 0.1 dB under 2.5-ps Tx-IQ skew, 3-ps Rx-IQ skew, 2.5-dB Tx-IQ peaking error, and 63-GHz Rx-IQ imbalanced bandwidth limitation were demonstrated.

Mo4-P-43/150 - High-Fidelity Fiber Longitudinal Power Monitoring via Spatially-Decoupled Sparse Regularization (SC04)
Yan Zuo *(State Key Laboratory of Optical Communication Technologies and Networks, China Information Communication Technologies Group Corporation)*
We experimentally demonstrate a non-uniform sparse regularization approach for longitudinal power monitoring. Leveraging spatial decoupling, this method accurately recovers all power discontinuities, including EDFA gains and anomalies. Using limited measurements, it achieves 1-km localization accuracy and an RMSE reduction of 0.41–0.6 dB.

Mo4-P-44/236 - 128 Gb/s CAP-16 Transmission Over 100 m OM4 MMF Using Low-Complexity ABCD Linearization of a Directly Modulated VCSEL (SC04)
Yee Hui Low *(University of Cambridge)*
We demonstrate 128-Gb/s (32-Gbaud) CAP-16 transmission over 100-m OM4 MMF using a low-cost commercial 21-GHz VCSEL and low-complexity ABCD linearization. The method successfully mitigates the VCSEL non-linearity, achieving a ~2x EVM reduction vs conventional FFE. FFE-only implementation fails to support this data rate.

Mo4-P-45/239 - Online Low-Power Time-Varying IQ skew Estimation Scheme for Ultra-High-Speed Coherent Receivers (SC04)
Chengbo Li *(ZTE corporation)*
We propose to use an online low-power side-path DSP to estimate the IQ skew of ultra-high-speed coherent receivers. Its effectiveness is experimentally verified in a 90 GBaud transmission experiment, with an estimation error of less than 1% of the symbol period.

Mo4-P-46/247 - HCF Gas Line Absorption Mitigation: On the Interplay between Pre-emphasis and SOA Nonlinear Compensation (SC04)
Trung Hien Nguyen *(Huawei Technologies France, Optical Communication Technology Lab.)*
We experimentally and numerically investigate the interplay between GLA-dip emphasis (GE) and SOA-booster nonlinear compensation in 140 GBaud PCS-64QAM transmission system. Results show that the interplay causes 0.3 dB SNR penalty and the partial-GE is more favorable, providing 0.5 dB SNR gain at 7-dB dip.

Mo4-P-47/256 - Experimental Demonstration of Polar Coded Many-to-one Mapping based Truncated PS-PAM8 with 37-dB power budget (SC04)
Junwei Li *(Department of Fundamental Network Technology)*
In this paper, a polar coded truncated probabilistic shaped PAM-8 (PTPS-PAM8) operating at 200-Gb/s/lane is proposed and experimentally investigated using the intensity-modulation and coherent-detection structure. Adopting the PTPS-PAM8, a 2-dB ROP sensitivity improvement is obtained over the uniformly-distributed polar-coded PAM8 after 20-km transmission.

Mo4-P-48/360 - On LLR Calculations for Soft-decision Decoding in Next-generation IM-DD Systems with Laser RIN (SC04)
Felipe Villenas Cortez *(Eindhoven University of Technology)*
We propose a low-complexity LLR approximation for SD decoding in IM-DD systems with relative intensity noise. Our approximation results in no BER performance penalty for a concatenated KP4+Hamming FEC scheme, and outperforms mismatched AWGN-based LLRs.

Mo4-P-49/412 - Quantum-Well Comb DWDM Transmission via Residual Carrier-Based Phase Recovery and EEPN Mitigation (SC04)
Yueying Niu *(Institute of Semiconductors, Chinese Academy of Sciences)*
We experimentally demonstrate 8λ×70-GBd 16QAM DWDM transmission over 1280-km SSMF using quantum-well mode-locked laser combs. We employ residual comb line-based phase tracking to address the 9.0-MHz and 54.6-MHz comb linewidths, achieving >6-dB Q^2-factor improvement at BTB and 3.6-dB additional gain from EEPN after 1280-km transmission.

Mo4-P-50/427 - Complexity Reduction of SD-FEC by Bayes-Based Simple-Soft-Output MLSE in Coherent Transmission with Chase Decoder (SC04)
Shuto Yamamoto *(NTT, Inc.)*
We evaluate the applicability of Bayes-based simple-soft-output MLSE to coherent transmission systems with LR-FEC and turbo product codes. Experimental results show that the proposed scheme reduces the number of test patterns and the number of iterations in Chase decoding by approximately 50% and 25%, respectively.

Mo4-P-51/496 - 224 Gbaud On-Off Keying Optical Link Using O-Band Vertical P–N Junction Ring Resonator Modulator (SC04)
Dan Li *(KTH Royal Institute of Technology)*
An O-band vertical p–n junction ring resonator modulator-based IM/DD link is demonstrated using bi-LSTM equalization. We achieve 224 Gbaud OOK and 140 Gbaud PAM4 over 1 km single-mode fiber with BER below the 6.25% overhead HD-FEC threshold.

Poster Session in PV-P (Multipurpose poster area)

Mo4-P-52/533 - Joint Transmitter-Receiver Design for High-Baud-Rate IM/DD Transmission with Low-Resolution DAC over 20-km Hollow-Core Fiber (SC04)
Zixian Wei *(The Hong Kong Polytechnic University)*
We propose a joint transmitter-side VF-DRE and receiver-side NWF and MLSE scheme for high-baud-rate IM/DD transmission with low-resolution DAC. 140-GBaud OOK with 2-bit DAC and 100-GBaud PAM4 with 3-bit DAC are experimentally demonstrated over 20-km hollow-core fiber.

Mo4-P-53/534 - Robust Pilot-Tone-Based Timing Recovery Scheme for Coherent Digital Subcarrier Multiplexing Systems (SC04)
Yanfu Yang
A robust, high-precision, and fast-converging frequency-domain pilot-aided timing recovery scheme for DSCM systems is proposed. By dividing two pilot tones, the scheme achieves FO/PN immunity. Experiments show strong robustness to roll-off and SFO, ensuring stable operation up to 280-ppm SFO.

Mo4-P-54/564 - Low-Complexity FO-Tolerant Frame Synchronisation Using an Amplitude-Weighted Timing Metric and QAM-Based Training Sequence for Low-SNR Coherent Optical Inter-Satellite Links (SC04)
Shoma Tateno *(NEC Corporation)*
We propose a high-sensitivity, low-complexity FO-tolerant frame synchronisation scheme for low-SNR coherent optical inter-satellite links based on an amplitude-modulated training sequence and a multiplication-free amplitude-weighted timing metric, reducing the required overhead length by 37.5% and the computational complexity by 36.3% compared to conventional schemes.

Mo4-P-55/569 - Self-Adaptive Silicon Photonic Equalizer for Polarization-Insensitive and Multi-Wavelength 200-Gbps O-Band Interconnects (SC04)
Guofeng Yan *(Wuhan National Laboratory for Optoelectronics and School of Optical and Electronic Information)*
We demonstrate a self-adaptive silicon photonic equalizer for polarization-insensitive, multi-wavelength division O-band transmission. The equalizer simultaneously equalizes 2x50-Gbaud PAM4 signals transmitted in a WDM system, improving the received sensitivity about 4 dB.

Mo4-P-56/584 - High spatial resolution and large strain measurement in long-distance OFDR (SC04)
Yaxi YAN *(The HK Polytechnic University)*
We present a distance-domain gating method that simultaneously achieves long sensing distance, high spatial resolution and wide strain measurement range. Strain range of 8000με is achieved over a 54m fiber with a 1.9mm spatial resolution.

Mo4-P-57/35 - Nonlinear Distortion of Semiconductor Optical Amplifiers as a Source of Equalization Enhanced Phase Noise (SC05)
Chuandong Li *(Huawei Technologies Canada)*
We demonstrate the interaction between nonlinear phase distortion induced by semiconductor optical amplifiers (SOA) and digital equalization via both simulations and experiments. Properties of the resulting equalization enhanced phase noise (EEPN) are also compared with the well-studied EEPN caused by laser phase noise.

Mo4-P-58/42 - 375 km, Unrepeatered Transmission Using a Erbium-Doped, Tellurite Fiber Based, 69 nm bandwidth, ROPA (SC05)
Julian Schneck *(Institute of electrical and optical communications)*
We use a 69 nm bandwidth ROPA based on an erbium-doped tellurite glass fiber, combined with bidirectional distributed Raman amplification, to transmit 333 x 24.5 Gbaud channels over 375 km with a minimum span loss of 56 dB, achieving a total throughput of 40.9 Tb/s.

Mo4-P-59/168 - Impact of Kerr Nonlinearity within High Power Optical Amplifiers on HCF Transmission (SC05)
Olga Vassilieva *(1Finity Americas, Inc)*
We quantify Kerr nonlinearity generated within C-band high-power EDFAs for long HCF links. We show that EDFA doped-fiber nonlinearity is the main contributor to system impairments, limiting allowable output power to below 32 dBm when the EDF length exceeds 10 m.

Mo4-P-60/321 - Characterization of Various Impairments in Coherent Optical Transmitters Using Spectrum Analyser Only (SC05)
Jingnan Li *(Fujitsu Research Development Center Co., Ltd.)*
Using probability-maintained multi-notch sequences and equally spaced multi-tone signals, various impairments in EDFA-embedded coherent transmitters including nonlinear distortion, additive electrical noise, and ASE noise are decoupled via spectrum-analyser-based measurements. The system's error vector magnitude is predicted with 0.4-dB accuracy based on the measured noise-to-signal ratio.

Mo4-P-61/324 - Cycle-Slip Resilient High-Precision Transmitter IQ Skew Estimation for Ultra-High Baud-Rate Digital Subcarrier Multiplexing Transmission (SC05)
Huanyu Le *(Guangdong University of Technology)*
We propose a cycle-slip resilient high-precision transmitter IQ skew estimation scheme based on a designated training sequence. The 120-GBaud DP-16QAM digital subcarrier multiplexing (DSM) experimental transmission verifies its effective suppression of phase-extraction cycle slips, improving IQ skew estimation accuracy from 0.3 ps to below 0.1 ps.

Mo4-P-62/398 - In-Service Inter-Segment Skew Calibration Using a Built-in Low-Speed Coherent Detection Monitor (SC05)
Tong Ye *(Fujitsu Research Development Center Co. Ltd.)*
We propose a power-efficient in-service skew calibration method for the transmitters with segmented modulators, utilizing a modulated local oscillator and low-speed coherent detection monitor. Experimental results demonstrate an accurate skew calibration with a maximum error within ±0.025 UI over a ±0.2 UI skew range.

Mo4-P-63/495 - On the Optimum Energy-per-bit Launch Power in Coherent Hollow-core Fibre Transmission Systems (SC05)
Ronit Sohanpal
We investigate the optimum energy per bit in hollow-core-fibre transmission systems. We show that a 1000 km C-band link can achieve a 41.5% reduction in total power consumption when operating at the minimum energy-per-bit launch power with only 2.2% throughput penalty.

Poster Session in PV-P (Multipurpose poster area)

Mo4-P-64/522 - Driverless Net 3.2 Tbps (8×448 Gbps) PAM4 Transmission at 500m Using a Chirped Differential MZM DR8 PIC on TFLN (SC05)
Charles St-Arnault *(McGill University)*
We report a novel ultra-compact chirped differential electrode layout on TFLN reducing VπL by 1.33x on a DR8 PIC enabling driverless 3.2 Tbps (8×448 Gbps) PAM4 with compliant TDECQ under the HD-FEC.

Mo4-P-65/530 - Link Diagnosis Enabled by Longitudinal Noise Monitoring (SC05)
Junho Chang *(Huawei Technologies Canada)*
We show that a longitudinal noise monitoring scheme utilizing coherent receiver DSP comprehensively monitors link health. By experimentally demonstrating dynamic SNR monitoring during channel-drop transients and the localization of abnormal noise increases, we establish an effective, spatially resolved diagnostic tool.

Mo4-P-66/576 - Longitudinal Power Monitoring in S+C+L Transmission with Forward and Backward Distributed Raman Amplification (SC05)
Runa Kaneko *(NTT Network Innovation Laboratories)*
We demonstrate longitudinal power monitoring in S+C+L transmission with bidirectional distributed Raman amplification (DRA) for the first time. Measurements over five 80-km spans spatially resolve the effects of DRA and inter-channel stimulated Raman scattering (ISRS) on power evolution, revealing spatial features inaccessible to end-to-end monitoring.

Mo4-P-67/673 - KZ-Based Spectral Modeling of Nonlinear Interference with Data-Driven PSD Estimation (SC05)
Saber Rahbarfam (University of Toronto)
Accurate modeling of nonlinear interference in optical fiber systems is investigated using Kolmogorov–Zakharov modeling and learning-based PSD estimation. KZ outperforms GN in accuracy and effective complexity. A linear regression model maps spectra to NLI PSD, enabling improved performance prediction in practical systems.

Mo4-P-68/762 - Real-Time MDM Transmission Trial Using 800G OTN Transceivers over Field-Deployed FMF (SC05)
Chengbin Long *(Peking University)*
Through effective suppression of modal crosstalk including adopting bidirectional transmission and only selecting LP_{01} and LP_{02} modes as active channels, we demonstrate real-time MDM-WDM transmission over 80-km field-deployed FMF using commercial 800G DP-16QAM OTN transceivers.

Mo4-P-69/772 - Power Consumption Analysis of Terrestrial Systems with the Same Fiber Capacity (SC05)
John Downie *(Corning Incorporated)*
We analyze the relative power consumption of terrestrial long-haul systems constructed with different fiber types and optimized span lengths producing the same cable capacity. Advanced fibers with C-band amplifiers have the lowest power consumption and carbon footprint, saving up to 40% over conventional fiber.

Mo4-P-70/91 - Hollow-Core and Standard Single-Mode Fiber Hybrid Optical Networks: A Multi-Topology Investigation of Protection Switching (SC06)
Zhiping Jiang
We study cross-fiber protection switching in hybrid hollow-core and single-mode networks. At 50% deployment, CD steps reach 4,000-22,000 ps/nm with 1.6-3.1 dB penalties, causing 38-59% modulation downgrades. CO_2-absorption degrades 9-26 of 64 L-band channels. Higher HCF fractions generally reduce all impairments across six network topologies.

Mo4-P-71/213 - SRS-Immune Fiber Attenuation Monitoring via Full-Band Power Aggregation in C+L Band Systems (SC06)
Chuxuan Yu *(Tencent)*
We propose a full-band power aggregation method for real-time fiber attenuation monitoring in C+L band systems to overcome stimulated Raman scattering (SRS) interference in single-channel monitoring. Validation on 237 production spans reduces the false alarm rate from 24.9% to 0% at a 3.5dB attenuation variation.

Mo4-P-72/219 - Time-Error-Constrained Bidirectional Provisioning for Synchronization Services in Dynamic Elastic Optical Networks (SC06)
Yixin Wang *(BUPT)*
Bidirectional slot mismatch in dynamic EONs induces chromatic-dispersion time errors that can invalidate synchronization services. We derive a path-dependent reverse-slot admissibility bound for bidirectional provisioning. On COST239, it lowers blocking versus timing-unaware and strict same-slot baselines while keeping admitted synchronization services within a 3-ns budget.

Mo4-P-73/246 - Inter-Port Crosstalk Reduction in Single Multi-Input-Port WSS-Based ROADM Architectures Using Interleaved Port Allocation (SC06)
Masahiko Jinno *(Keio University)*
We analyse joint-switching-induced inter-port crosstalk (XT) in single multi-input-port WSS-based ROADM architectures. We propose an interleaved port allocation scheme that suppresses XT without additional hardware and validate it experimentally, demonstrating considerable XT reduction while preserving the simplicity and cost advantages of the single-WSS architecture.

Mo4-P-74/302 - Benchmarking of Switching Technologies under Various Traffic Distributions in Pan-European and US WDM Core Networks (SC06)
Thierry Zami *(Alcatel Submarine Network)*
We review the conditions of network topology and traffic distribution under which pure fiber switching can accommodate a total capacity close to wavelength switching for a North American and a Pan-European WDM networks

Mo4-P-75/307 - Impact of Statistical LCoS-induced PDL in WDM Networks Equipped with Multirail Amplifiers and 800ZR+ Interfaces (SC06)
Nicola Rossi *(Alcatel Submarine Networks)*
This study quantifies the benefit on both the OSNR penalty and the network capacity of accounting realistically statistical PDL insertions vs. fixed reasonable worst-case values in the context of modern optical networks equipped with multirail amplifiers featuring integrated spectral equalizers

Poster Session in PV-P (Multipurpose poster area)

Mo4-P-76/556 - SMART Optical Network Integrating PTMP Sensing, 10×1-Tb/s Metro Superchannel, and Fixed-Mobile Access (SC06)
Yixiao Zhu *(Shanghai Jiao Tong University)*
We present SMART (Sensing-Metro-Access-RoF-Transport) optical network integrating, for the first time, point-to-multipoint multi-event forward sensing with sub-28-m resolution, 10×1-Tb/s metro superchannel, co-wavelength access of super-rated 200G coherent PON with 35-dB power budget (ITU-T E2-class) and 1.05-Tb/s CPRI-equivalent rate 16384-QAM RoF.

Mo4-P-77/629 - CATS: Constraint-Aware Topology Scheduling Mechanism for Efficient LLM Training in O/E Hybrid Switching Networks (SC06)
Liang Gao *(BUPT)*
We propose Constraint-Aware Topology Scheduling (CATS) mechanism to overcome the indiscriminate scheduling exclusively based on traffic volume in O/E hybrid networks. CATS strategically offloads the constraint-induced traffic to the contention-free, zero-jitter optical paths, accelerating LLM training average time by 0.49%–9.16% and boosting TFLOPS by 0.61%–9.12%

Mo4-P-78/86 - Distributed LLM Training over Passive Optical Networks: Performance Impact of Dynamic Bandwidth Allocation (SC07)
Xiaonan Xu *(Nokia Bell Labs)*
We implement data-parallel LLM training on a two-node 25GS-PON testbed and evaluate AllReduce performance under varying delay tolerance and bandwidth configurations. Results show that higher delay tolerance increases communication latency, demonstrating that properly configured PONs can feasibly support small- and medium-scale distributed training workloads.

Mo4-P-79/154 - Mixed DD and Coherent Receivers for VHSP using Digital CD Pre-Compensated PAM-2 (SC07)
Dario Pilori *(Politecnico di Torino)*
In the ongoing research towards next-generation Very High Speed PON, we propose and experimentally investigate the combination of Digital Chromatic Dispersion Pre-Compensation (DCPC) PAM-2 transmission with coexisting mixed receivers: DD for PON up to 20km and coherent detection for extended reach up to 40+km.

Mo4-P-80/182 - An Integrated 150 Gb/s NRZ Heterodyne Detection RX Supporting 20km SMF with Simple FFE for VHSP PON (SC07)
Gertjan Coudyzer
An integrated NRZ modulation heterodyne detection RX is demonstrated for VHSP PON. Analog signal processing for chromatic dispersion suppression and demodulation is implemented. 150Gb/s NRZ is detected with -22(B2B)/-16dBm(20km SMF) OMA at 1320/1295nm, using 0.5 dBm LO and 7/11-tap FFE.

Mo4-P-81/200 - Receiver-Informed Transmitter for 200Gbps C-Band Direct-Detection PON With FFE-Free ONU (SC07)
Safiya Dabwan
We introduce and numerically demonstrate receiver-informed transmitter *(RITX)* waveform design for 200 Gb/s PAM-4 C-band direct-detection PON. Using 50 GHz optoelectronics, RITX achieves N1/E1 loss classes with FFE-Free ONU, enabling 40 km reach and 48.1%/66.7% network-wide complexity savings at 1:64/1:128 splits.

Mo4-P-82/276 - Passive Optical Networks Systems with Co-Propagating Distributed Acoustic Sensing (SC07)
Jeremy Potet *(Orange Research)*
We study the impact of distributed acoustic sensing on PONs. We show that wavelength isolation is required, and how Raman scattering can impact the downstream G-PON. We also provide guiding rules to mitigate DAS impact on PONs.

Mo4-P-83/280 - Wi-Fi Transmission Over In-building FTTR Networks Using Sigma-Delta Modulation (SC07)
Sophie Thiele
Sigma-delta, unlike analog radio over fiber, enables robust Wi-Fi FTTR transmission with standard SFP+ modules not optimized for linear drive. Furthermore, a 27.5% reduction in required optical bandwidth is achieved for a 160 MHz 256-QAM signal by reducing the oversampling rate through amplitude clipping.

Mo4-P-84/346 - Multipath Interference Mitigation Based on Low-Complexity Adaptive High-Pass Filtering in Data Centre IM/DD Systems with OCS (SC07)
Ning Deng
We propose a low-complexity MPI mitigation scheme using adaptive high-pass filtering for data centre IM/DD systems. Experimental results demonstrate 4 dB improvement in SIR tolerance and 3.5 dB receiver sensitivity gain at HD-FEC threshold for a 56.88 Gbps PAM-4 signal in an OCS-integrated IM/DD link.

Mo4-P-85/397 - First Demonstration of Novel Combo-ONUs for Cost-Effective Evolution from XGS-PON to 50G-PON (SC07)
Frank Effenberger *(Futurewei)*
We demonstrate the first 50G/XGS Combo-ONU deployment for PON evolution. It integrates XGS-PON and 50G-PON links. The business modeling and field trial results demonstrate reduced migration cost, operational flexibility, and enhanced system features for operators.

Mo4-P-86/486 - Experimental Evaluation of PAM2-SSB and PAM2-SSB+DCPC for a 2×100Gb/s/λ Very High Speed PON Downstream (SC07)
Lorenzo Andrenacci *(Huawei Technologies Düsseldorf GmbH)*
We experimentally demonstrate a digitally-generated PAM2-SSB modulation with direct-detection receiver. The results show that, even with limited DSP complexity, the CD tolerance can be enhanced to ensure coexistence with previous PON technologies while still supporting Class N1 power-budget. Further improvement is obtained by adding DCPC.

Mo4-P-87/513 - 400 Gbit/s IM/DD PON with >30 dB Power Budget Enabled by Quantum-Dot SOA Amplified Remote Node (SC07)
Ahmed Galib Reza *(Dublin City University)*
We demonstrate 4×100 Gbit/s NRZ-OOK transmissions with 200 GHz channel spacing for next-generation 400G PON. By employing an InAs/GaAs quantum-dot SOA-amplified remote node, we achieve an optical power budget beyond N1 class after 20 km at the HD-LDPC BER limit, using a T-spaced FFE.

Poster Session in PV-P (Multipurpose poster area)

Mo4-P-88/36 - Environmental Sensing on XGS-PON OLT Using Upstream Burst Window Alignment (SC08)
Borja Vidal *(Universitat Politecnica de Valencia)*
We demonstrate PON integrated sensing and communication (ISAC) for fiber ambient temperature estimation and continuous monitoring. Using operational XGS-PON we measure change in fiber RTT at OLT using burst-mode upstream alignment. Experimental results in a climatic chamber show 0.63°C temperature RMS error over 4-km-long fiber.

Mo4-P-89/77 - Low-Tech SOP Sensing over FTTH for Seismic Monitoring in Campi Flegrei: Benchmarking Against Interferometry and Φ-OTDR (SC08)
Emanuele Virgillito *(Politecnico di Torino)*
We demonstrate, for the first time, PBS-based low-tech SOP sensing for seamless seismic monitoring using in-service FTTH infrastructure in the highly seismic area of Campi Flegrei. The approach detects earthquakes down to magnitude 1.9 and is positively benchmarked against consolidated interferometric phase and Φ-OTDR techniques.

Mo4-P-90/137 - 252 Gbit/s, Polarization-multiplexed 128 QAM Fully Coherent Transmission over 10 km SMF and 40 m Wirelessly at 125 GHz (SC08)
Tomoki Joichi *(Tohoku University)*
We report a 252-Gbit/s polarization-division-multiplexed (PDM) fully coherent transmission in the 125 GHz band. By employing frequency-domain-equalization that compensates for both imperfect frequency responses and IQ imbalance, PDM 18 Gbaud 128 QAM signals are successfully transmitted over a 10 km SMF and 40 m wirelessly.

Mo4-P-91/174 - Cost-Effective 50-km DAS Using a 200-kHz-Linewidth ECL with FDM Dual-Pulse Phase Noise Compensation (SC08)
Jingchi Cheng *(Xidian University)*
We demonstrate a cost-effective 50-km DAS resilient to phase noise and fading. Leveraging a frequency-division-multiplexed dual-pulse delay-beat scheme, we achieve a strain sensitivity of 234 pε/√Hz using a 200-kHz-linewidth ECL, and the performance using a 10-kHz-linewidth ECL is comparable to that of a 100-Hz-linewidth NLL.

Mo4-P-92/319 - Detection, Localization and Tracking of Underwater Acoustic Sources via A Passive Fiber Optic Hydrophone Array (SC08)
Sarper Ozharar *(NEC Laboratories America)*
A fiber optic hydrophone array comprising four passive fiber mandrels, interrogated by a distributed acoustic sensing system was deployed in a lake for field testing. Several stationary and moving underwater acoustic sources were localized, continuously tracked, and their acoustic signals were enhanced by beamforming techniques.

Mo4-P-93/373 - Comparison of Sigma-Delta-Over-Fiber and Analog Radio-Over-Fiber mm-wave Links With Optical Up-Conversion (SC08)
Frida Olofsson *(Chalmers University of Technology)*
Radio-over-fiber with central frequency up-conversion is promising for phase-coherent D-MIMO transmission, but extension to mm-wave requires impractically high sampling rates. We employ optical up-conversion to relax this constraint and compare ARoF and SDoF, showing SDoF performs better below 300 MBd.

Mo4-P-94/376 - Breaking the Manual Alignment Barrier: First Demonstration of an Automatically Aligned Kilometer-Scale 100-Gb/s Photonic THz Wireless Link in 300-GHz Band (SC08)
Minkyu Sung *(Electronics and Telecommunications Research Institute)*
We demonstrate the first automatically aligned km-scale 100-Gb/s photonic THz wireless link under realistic rooftop-to-rooftop deployment conditions. Sensor-assisted coarse acquisition and power feedback fine alignment achieve 25-GBaud 16-QAM transmission over a 1.1-km line-of-sight path at 300 GHz with a BER of 1.5×10^{-2}.

Mo4-P-95/517 - Low-Penalty Joint Communication and Acoustic Sensing using P43 Polyphase Code (SC08)
Vishal Chandraprakash Rai *(Adtran Networks SE)*
Polyphase coding is investigated for distributed acoustic sensing in joint communication-sensing systems. A P43 code is evaluated using CC-OTDR and compared to linear frequency-modulated probes. Experiments demonstrate an additional 17.4 dB crosstalk suppression, while inducing only a 0.09 dB OSNR penalty on co-propagating DP-16QAM signals.

Mo4-P-96/541 - Joint High-Speed Communications, Safety Power Delivery and Temperature Sensing over Multicore Fibers (SC08)
Javier Barco Alvarez *(Universidad Carlos III De Madrid)*
We report the first measurement of temperature variations induced by PoF using FBGs. Tests on a 7-core MCF with 25.67 Gbps 5G-NR ARoF and 25 Gbps NRZ transmission, delivering 360 mW at 2km, show that 2W PoF increases core temperature by 16 ±1 ºC.

Mo4-P-97/608 - Field Trial of Distributed Acoustic Fiber and 6G Radio Sensing Fusion for Enhanced Localization Accuracy in an Industrial Environment (SC08)
Michael Straub *(Nokia Bell Labs)*
We propose, analyse, and experimentally verify the effectiveness of combining radio and optical sensing for enhanced localization accuracy. First use cases to jointly sense within an industrial environment were demonstrated and analysed during a Field Trial at the research campus of Arena2026 in Stuttgart, Germany.

Mo4-P-98/612 - RF Interference Suppression with Synthesis of Field-Programmable Microwave Photonic Filters Based on Hexagonal Meshes (SC08)
Qiuzhuo Deng *(Zhejiang University)*
We demonstrate the synthesis of a field-programmable microwave photonic filter (MPF) on a 5×5 hexagonal mesh for RF interference suppression. Strong anti-interference ability of the synthesized integrated MPF architecture is validated with a 4 Gbps QPSK RF signal, achieving an EVM improvement of >40%.

Mo4-P-99/733 - External Modulation of an RF Signal Enhanced by Mutual Optical Injection Locking (SC08)
Leonardo Rama
We demonstrate a novel external modulation scheme that increases the modulation efficiency for RF signals. It uses an EAM placed between two mutually injection-locked DFB lasers. Driving the EAM at the relaxation frequency of DFB lasers provides a modulation gain of 14 dB.

Poster Session in PV-P (Multipurpose poster area)

Mo4-P-100/800 - Field Demonstrations of Operational Strain Modal Analysis of a Historic Suspension Bridge Using Installed Telecom Fibres (SC08)
Bo Fan
We demonstrate operational strain modal analysis of the Menai suspension bridge using installed telecom fibre and distributed acoustic sensing. Using enhanced frequency-domain decomposition, we extract key structural health indicators, including natural frequencies, mode shapes, and damping ratios, providing a cost-effective, continuous, and robust SHM solution.

Mo4-P-101/825 - A New Optical Fiber-Based Sensor for Concentrated Solar Flux Monitoring in Concentrated Solar Power Plants (SC08)
Alejandro Carballar *(E.T.S. Ingeniería - Universidad de Sevilla)*
This paper presents the proof of concept of a novel optical fiber-based sensor to measure concentrated solar flux up to 1 MW/m^2 in Concentrated Solar Power (CSP) applications. The proposal constitutes an efficient, passive, robust and low-maintenance alternative to traditional radiometers.

Mo4-P-102/74 - A Field Demonstration of Cross Lake Free Space Optical Communication for 10GPON Backhaul (SC09)
Buzheng Wei *(China Unicom)*
This paper demonstrates a field trial in PON network utilizing a custom-designed FSO system cross an 1.3km lake environment. Operating at C-band without OA and FEC, the system achieves consecutive 6 hours of error-free 10Gbps transmission, validating FSO as an alternative solution for operator backhaul.

Mo4-P-103/102 - Geometric-Configuration Modulation: A Novel Free-Space Optical Communication Paradigm for D/r_0 ~ 5 Turbulence Resistance (SC09)
Yu-Ming Bai *(Tsinghua University)*
We propose Geometric-Configuration Modulation (GM), a novel AO-free FSO paradigm utilizing multi-source geometric configuration encoding and active correlative decoding. GM demonstrates exceptional resistance to strong atmospheric turbulence (D/r_0~5.0) over a 1.2 m link in preliminary experiments.

Mo4-P-104/233 - Experimental Demonstration of Dual-Polarization PAM3 for Visible-Light Underwater Optical Wireless Communication (SC09)
Masanori Hanawa *(University of Yamanashi)*
We experimentally demonstrate dual-polarization PAM3 as a 3 bit/s/Hz IM/DD scheme for visible-light underwater optical wireless communication. Polarization-axis mismatch between transmitter and receiver deformed square-like constellation maps into rhombic ones, causing BER floor; affine compensation was effective for $\rho \leq 20°$ but not at 30°.

Mo4-P-105/396 - High Sensitivity and High Speed SiPM Array Based Optical Wireless Receiver (SC09)
Jingyu Hou *(University of Cambridge)*
1×2 SiPM receiver arrays are experimentally demonstrated in high-speed optical wireless links. 9.5 Gbps transmission is achieved using a 2× 10010 SiPM array, while the required irradiance at 8 Gbps is reduced by 6.25× compared to a single 10010 SiPM receiver.

Mo4-P-106/408 - Enhancing Turbulence Resilience in Free-Space Optical Communications Using Germanium-Silicon Photodiode Array Interfaced with Multi-Core Fiber via Vertical Grating Couplers (SC09)
Yuan-Zeng Lin
We demonstrate a free-space-optical-communication (FSOC) with enhanced atmospheric-turbulence resilience using germanium-silicon (GeSi) photodiode-array interfaced with multi-core-fiber (MCF) via vertical-grating-couplers (VGC). Experimental results show the proposed scheme significantly improves FSOC performance under different turbulence conditions.

Mo4-P-107/453 - A Novel Integrated Multi-Gb/s Optical Wireless Communication and Sub-μm Particle Sensing System for IoT Applications (SC09)
Tiankuo Jiao *(University of Cambridge)*
A proof-of-concept optical wireless integrated sensing and communication (OW-ISAC) system is proposed, demonstrating 0.5–10 μm particulate matter (PM) detection and 7.3 Gb/s optical wireless communication (OWC) at hard decision forward error correction (HD-FEC) bit error ratio (BER), using a single laser diode (LD).

Mo4-P-108/560 - Optical Hotspot for Adaptive Pencil-/Wide-Beam Formation for Fiber-Wireless Connectivity with Integrated User Localization (SC09)
Florian Honz *(AIT Austrian Institute of Technology)*
We propose an optical hotspot for adaptive pencil-/wide-beam formation, enabling user localization and the establishment of an optical fiber-wireless connection by means of tunable optics. We confirm stable optical wireless operation over a free-space link reach of 107 m.

Mo4-P-109/741 - Compact VCSEL–Metasurface OAM Transmitter with SIMO. Processing for Optical Wireless Interconnects (SC09)
Rizwana Ahmad *(University of Cambridge)*
Optical wireless interconnects require compact transmitters and robust detection. We demonstrate a VCSEL–metasurface OAM link with SIMO processing for short-reach interconnects. At the FEC threshold, ZF achieves 3.84 Gbps (no turbulence) and 1.96 Gbps ($D/r_0 = 0.2$), outperforming MRC, confirming interference-limited operation under considered receiver.

Mo4-P-110/159 - AI-Driven Detection and Localization of Optical Filtering Soft Failures via Digital Twin (SC10)
Andrea Rosso (Politecnico di Torino)
We propose a digital twin-assisted neural network for detecting, localizing, and characterizing soft failures in optical filters. Leveraging optical channel monitor and transceiver metrics, the method achieves high accuracy enabling scalable monitoring in complex optical networks.

Mo4-P-111/501 - Experimental Demonstration of Compilation-oriented AI Agent for Autonomous PON Slice Provisioning (SC10)
Chansung Park *(Electronics and Telecommunications Research Institute)*
We demonstrate a compilation-oriented AI agent for autonomous PON slicing. By aggregating multi-source evidence into a shared specification, the AI agent enables model-agnostic improvements in provisioning reliability and token efficiency. Experiments on a 25G PON testbed demonstrate consistent dual-slice provisioning performance across multiple LLMs.

Poster Session in PV-P (Multipurpose poster area)

Mo4-P-112/587 - Wavelength and Polarization Diversity OTDR for Highly Accurate Fiber Faults Identification (SC10)
Hongcheng Wu *(Tsinghua Shenzhen International Graduate School, Tsinghua University)*
We experimentally demonstrate a wavelength- and polarization-diversity OTDR for fiber faults identification in data-center networks. Our system accurately distinguishes fiber faults beyond conventional OTDR capabilities. Six critical fault types are emulated, and the proposed OTDR architecture, aided by ML, demonstrates over 99% faults identification accuracy.

Mo4-P-113/645 - Bridging the 6G Gap: Scaling Sustainable ROADM-Based. IP-over-WDM via DSCM-Enabled Point-to-Multipoint Designs (SC10)
David Larrabeiti *(Universidad Carlos III de Madrid)*
This study compares transponder-based, Point-to-Point, and DSCM-based Point-to-Multipoint(PtMP) access-metro architectures. Findings demonstrate that PtMP IPoWDM significantly optimizes efficiency across diverse geotypes, slashing CAPEX by 92.0% and power by 99.2% compared totraditional benchmarks over a ten-year horizon.

Mo4-P-114/692 - Demonstration of Full-network Level Digital Twin for QoT Estimation in Field-deployed ROADM Networks (SC10)
Anxu Zhang *(State Key Laboratory of Optical Fiber and Cable Manufacture Technology, China Telecom Research Institute)*
We propose and demonstrate a full-network level digital twin framework for QoT estimation in China Telecom's field-deployed ROADM networks, achieving mean aboslute errors of 0.53 dBm power and 0.68 dB OSNR for 95% test samples across all frequencies and loading rates.

Mo4-P-115/695 - Max-Flow-Based OCS Reconfiguration Scheduling for Full-Stack Distributed LLM Training Acceleration in Optical AIDC (SC10)
Dianxuan Fu *(Shanghai Jiao Tong University)*
We propose a max-flow-based OCS reconfiguration scheduling framework on our full-stack scale-out AIDC platform to accelerate LLM training. The proposed method reduces iteration time by up to 65.58% and improves All-Gather flow completion time by up to 15.36× under heuristically pruned GPU grouping.

Mo4-P-116/771 - Integrated Sensing and Communication for Real-Time Detection and Localization in Live Production Metro Networks (SC10)
Gulmina Malik *(Politecnico di Torino)*
We present an integrated SOP-based sensing framework for real-time detection and localization of fiber disturbances in a 31 km live production metro network. The ML classifier achieved 96.2% accuracy, while bidirectional measurements enabled median localization errors below 23 m, supporting controller-assisted alarms and maintenance operations.

Mo4-P-117/97 - Highly Indistinguishable Dual-Channel Integrated Microring Single-Photon Source (SC11)
Baojie Hou *(Zhejiang University)*
Here, we propose a highly indistinguishable dual-channel integrated microring single-photon source based on bidirectional pumping. It achieves spectral purities of 96.13% and 96.96% in the two directions, respectively, alongside a 95.89% two-photon interference visibility.

Mo4-P-118/99 - Throttling Protocol for Quantum Links (SC11)
Ludovic Noirie *(Nokia Bell Labs)*
We propose a new throttling mechanism for quantum link control in entanglement-based quantum networks. Using Markov chain modeling, we demonstrate Bell pair delivery stabilization, enabling an easier consumption by the upper layers of the quantum network protocol stack.

Mo4-P-119/289 - Performance Statistics and Joint Optimization of CV-QKD and Classical Traffic in Dynamically Allocated Optical Networks (SC11)
Lucas Alves Zischler (University of L'Aquila)
We analyze the performance of classical and quantum CV-QKD systems, operating under dynamic classical traffic, assessing how classical signal statistics affects QKD performances. Furthermore, for channel-dynamics compensation, we introduce a novel gradient-descent-based approach for real-time optimization of quantum and classical throughput.

Mo4-P-120/363 - Seamless Integration of Practical Quantum Key Distribution in Future Passive Optical Networks via Adaptive Scheduling (SC11)
Alessandro Gagliano *(Politecnico di Milano)*
We investigate upstream DV-QKD in future passive optical networks under the finite-key regime, demonstrating that adaptive scheduling enables interference-reduced quantum-transmission windows and improves secret key rate, reach and scalability, especially in coexistence with XG-PON systems.

Mo4-P-121/434 - Performance Comparison of QKD Key Relaying Strategies Across Diverse Network Topologies (SC11)
María Álvarez Roa *(Eindhoven University of Technology)*
By evaluating across diverse network topologies, we provide a comparison of on-demand relaying and key flooding strategies for QKD using the key request success rate metric. Results show that key flooding outperforms on-demand relaying in sparse, low-connectivity networks, while on-demand relaying benefits from higher connectivity.

Mo4-P-122/491 - Quantum Time Synchronization in Star Networks (SC11)
Brian Rollick *(CableLabs)*
We demonstrate scalable multi-user clock synchronization using time-correlated photon pairs generated via spontaneous parametric downconversion in a star network. Pairwise offsets are extracted from second-order correlations, while triangle closure provides a consistency metric. Measurements show sub-200 ps agreement, with Kalman tracking of offset and skew.

Mo4-P-123/520 - Joint Spectral Characterization of a Bright, Tunable, Continuous Wave Photon-Pair Source at Telecom Wavelengths (SC11)
Stijn Scheijen *(Technische Universiteit Eindhoven)*
We demonstrate a tunable fiber-coupled photon-pair source spanning λ = 1490 – 1630 nm with high internal spectral brightness *(*~4.6·107 pairs/s/mW/nm). Using pulse carving, we measure the joint spectral intensity and achieve tunable spectral correlations via narrow-band filtering, enabling correlation control for quantum networking applications.

Poster Session in PV-P (Multipurpose poster area)

Mo4-P-125/596 - Optical Fuses and Isolation using 1D Grating Couplers against QKD Trojan Horse Attacks (SC11)
Zoe Davidson *(BT)*
The security of chip-based quantum key distribution (QKD) systems must be secured against high-power laser attacks. We test 1D grating coupler optical fuses as passive countermeasures. We find a heating-induced limit in back-reflections in addition to the damage threshold and discuss implications for QKD.

Mo4-P-126/599 - Adaptive Noise-Resistant Threshold Estimation for Quantum. Zero-Knowledge Authentication (SC11)
Livia Giacomin *(Politecnico di Milano)*
As quantum communications advance, user authentication becomes essential. This work studies a quantum identity authentication protocol under realistic noise, deriving a suitable threshold for Quantum Bit Error Rate verification and proposing an adaptive strategy that improves robustness and addresses information leakage across repeated authentication attempts.

Mo4-P-127/601 - Fully Automated Software-Defined Switched Quantum Key Distribution Network Enhanced with PUF Authentication (SC11)
Nikolaos Makris *(National Kapodistrian University of Athens)*
We demonstrate a fully automated 4-node switched-QKD network using PUF-based authentication orchestrated by a central SDN controller, enabling scalable and dynamic operation.

Mo4-P-128/658 - Secure 100-Gbit/s Real-time Spatially Multiplexed Quantum Random Number Generation Based on Vacuum Fluctuations (SC11)
Ken Tanizawa *(Tamagawa University)*
We demonstrate high-speed unpredictable random number generation using a single laser diode and parallel homodyne detectors. A spatially multiplexed setup with eight channels mitigates the trade-off between security and generation rate and achieves real-time 100-Gbit/s operation with a low security parameter of 5×10^{-30}.

Mo4-P-129/188 - Frequency-Domain Locking of a Pulsed Microring Single-Photon Source via Low-Frequency Pump Transmission Extraction (SC12: CLEO®)
Baojie Hou *(Zhejiang University)*
Here, we report frequency-domain locking of a pulsed microring single-photon source by extracting the transmission spectrum derivative via low-frequency modulation. The generated zero-crossing error signal effectively compensates for resonance drift, enabling long-term, highly stable system operation.

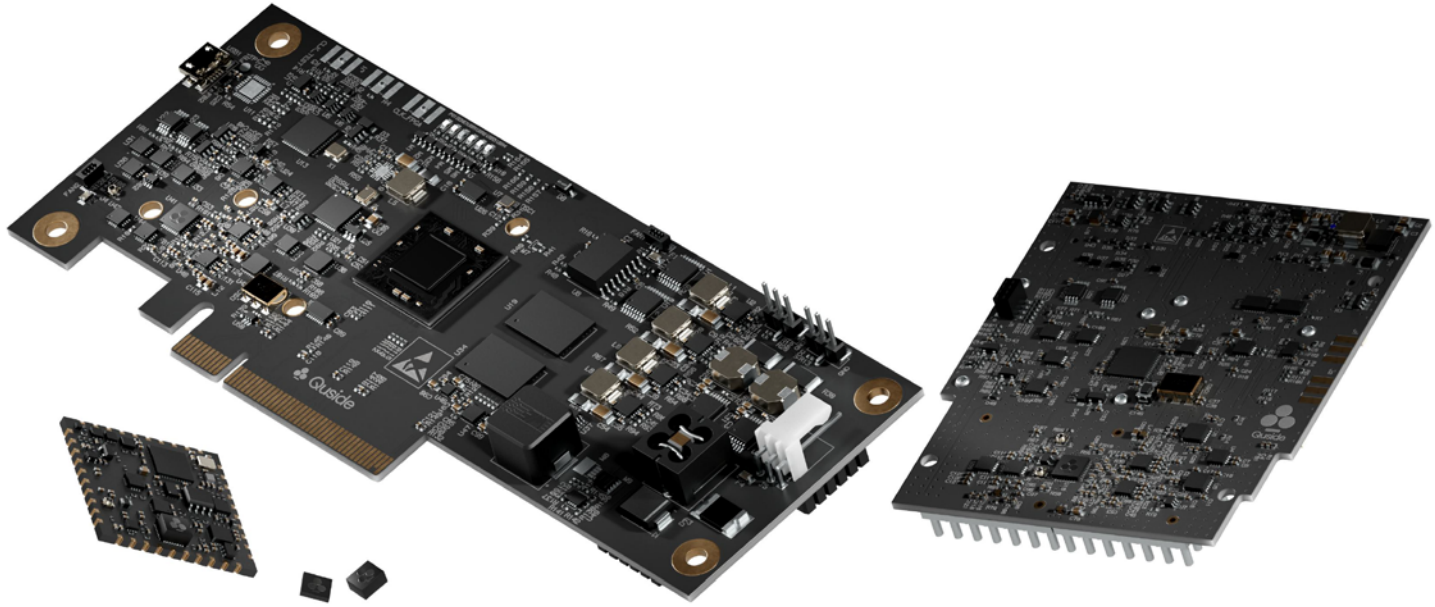
Mo4-P-130/399 - Practical Design of High-Density Bend Waveguide Array for Co-Packaged Fan-Out Routing (SC12: CLEO®)
Masaki Matsumoto *(Shinko Electric Industries Co., Ltd.)*
An optimised bend array under limited NA constraints reduces the minimum radius of curvature by 21% at 0.3 dB/turn and achieves −36 dB crosstalk (L/S= 2.5/40µm), enabling dense FO routing of 576 channels within a 15.0 mm length without major changes to existing package designs.

Mo4-P-131/740 - Lens-free on-chip vibrometer with millimetre working distance (SC12: CLEO®)
Manuel Jesús Montilla-Gallardo *(University of Málaga)*
On-chip vibration sensors usually rely on bulk optics to deliver the sensing beam to the moving target, thereby limiting integration. We show that large optical antennas enable target distances of ~5mm while achieving measurement resolutions of 12nm, without using any bulk optics.

Mo4-P-132/790 - High-Extinction-Ratio Integrated Polarizer Based on a Subwavelength Grating Bent Waveguide (SC12: CLEO®)
Hachim Lahbib *(Centre de Nanosciences et de Nanotechnologies, CNRS, Université Paris-Saclay)*
Silicon photonic devices show markedly different behaviors for TE and TM polarized modes, making polarization management critical. We experimentally demonstrate a TE-pass polarizer based on subwavelength-waveguide cut-off engineering and bend-assisted filtering, experimentally achieving an extinction ratio of 28 dB and insertion losses of −0.22 dB.

Mo4-P-133/858 - Software-reconfigurable wavelength-tunable dual optical frequency comb based on externally-injected gain-switched lasers (SC12: CLEO®)
Minghao Wei *(Dublin City University)*
We demonstrate a software-reconfigurable wavelength-tunable dual optical frequency comb based on externally injected gain-switched lasers, achieving >30 nm contiguous tunability with minimum step of 2 pm. The system operates without wavelength-dependent re-optimisation while maintaining consistent DOFC performance across the tuning range, enabling broadband sensing

Mo4-P-134/906 - Efficient Fiber-Chip Optical Coupling in Silicon Nitride Photonics Using Amorphous Silicon Grating Overlays (SC12: CLEO®)
Daniel Benedikovic *(University of Zilina)*
We demonstrate α-Si/Si3N4 surface grating couplers with -1.6 dB experimental coupling loss. Inverse-designed multi-band couplers show −2 dB loss at O- and C-band wavelengths with -30 dB crosstalk. This enables compact and scalable fibre-chip interfaces for high-capacity optical communication and advanced photonic integrated circuits.



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A1 Auditorium 1	A2 Auditorium 2	E1 Exhibition room 1	C1.1 Conference room 1.1	C1.4 Conference room 1.4
08:00–18:30 Registration				
08:30–09:00 Morning Coffee				
09:00 - 10:30	**09:00 - 10:30**	**09:00 - 10:30**	**09:00 - 10:30**	**09:00 - 10:30**
Tu1-A - From high-Q resonators to frequency comb generation	**Tu1-B - Hollow core fibers in optical networks**	**Tu1-C - Advanced enabling technologies for free-space optical and optical wireless communications**	**Tu1-D - Optical amplification**	**Tu1-E - Optical switches and demultiplexers**
SC 12: CLEO® Special Session on Emerging Trends in Optics and Photonics Laurent Vivien *(Chair)* Camille-Sophie Brès *(Chair)*	**SC 06: Architecture, modelling and performance of optical networks** Carmen Vázquez *(Chair)* Fatima Gunning *(Chair)*	**SC 09: Free-space optics and optical wireless technologies** Beatriz Ortega Tamarit *(Chair)* Amalia Miliou *(Chair)*	**SC 01: Novel fibres, fibre devices and amplifiers** Lutz Rapp *(Chair)* Marco Santagiustina *(Chair)*	**SC 03: Photonic integrated circuits, assemblies and packaging** Keijiro Suzuki *(Chair)* Nobuhiko Nishiyama *(Chair)*
09:00 **Tu1-A1/1415 - High-Q Integrated Photonics** Kerry Vahala *(California Institute of Technology)* **Tutorial** We review recent progress in chip-integrated high-Q resonators and discuss their applications to frequency microcombs, second-harmonic generation, and spontaneous parametric down-conversion, along with recent system-level demonstrations of high-performance microwave signal sources.	**09:00** **Tu1-B1/548 - On the Practical Impacts of Inter-Modal-Interference (IMI) in Hollow-Core Fibers for High-Speed Data Center Interconnects** Yan He *(The Hong Kong Polytechnic University)* We measured IMI-induced SNR after different HCF transmission with different transponders and frequency and found that SNR can be worse than theoretical value. A delivered OSNR model validated by 1.6T/λ transmission experiments identify -54dB/km as a practical IMI threshold, providing guidance on HCF-based DCI standardization/ optimization.	**09:00** **Tu1-C1/1147 - Sweep-Free Coherent Tracking Using a Multi-Tone Local Oscillator with a 100-MHz-Bandwidth Quadrant Photodetector** Takashi Kan *(KDDI Research, Inc.)* With narrowband detectors, coherent beam tracking is challenging under signal–local oscillator frequency offset uncertainty, given reliance on frequency sweeping or wideband reception. We demonstrate frequency-offset-tolerant error signal generation and closed-loop beam tracking under realistic disturbances using a multi-tone local oscillator.	**09:00** **Tu1-D1/225 - High-gain and Low-noise Integrated Fiber Amplifier with Seamless 102 nm Bandwidth Across the Extended C+L Band** Huang Xin *(YOFC)* We report a hybrid EBDF/BDF fiber amplifier that achieves integrated amplification with a seamless 102 nm spectral bandwidth in the extended C+L band for the first time. The amplifier exhibits a gain of 26.7 dB and a noise figure of 4.6 dB.	**09:00** **Tu1-E1/251 - 200 Gbps Coherent Optical Switching Enabled by an Integrated Si_3N_4-TFLN Laser** Yilin Wu *(Tsinghua University)* We achieve 200 Gbps coherent optical switching with a switching latency of 80 ns and bit error ratios of below 1×10^{-4}. It is enabled by a tri-material Integrated Si_3N_4-TFLN Laser unifying an intrinsic linewidth of 181 Hz and below-15-ns electro-optic wavelength switching.

C2.1 Conference room 2.1	C2.2 Conference room 2.2	E2 Exhibition room 2	PV-R Multipurpose room	PV-P Multipurpose poster area

08:00–18:30 Registration

08:30–09:00 Morning Coffee

C2.1 Conference room 2.1

09:00 - 10:30

Tu1-F - AI-driven control and monitoring in optical access networks

SC 10: Control and management of optical networks
Nguyen-Cac Tran *(Chair)*
Yvan Pointurier *(Chair)*

09:00
Tu1-F1/1330 - Digital Twin, Agent and Artificial Intelligence Towards ION-2030
Italo Busi *(Huawei)* Invited
This paper explores trends in Artificial Intelligence, Network Digital Twin, and Agents aimed at enhancing the operations of optical networks. Following the ITU-T ION-2030 vision, it also addresses the standardization gaps that remain.

C2.2 Conference room 2.2

09:00 - 10:30

Tu1-G - Short reach interconnects

SC 05: Optical transmission systems
Tomoyuki Kato *(Chair)*
Chiara Lasagni *(Chair)*
1Finity Inc.

09:00
Tu1-G1/1414 - Scalable, High-Capacity Optical Transmission for AI Data Centre Networks
Yuta Wakayama *(KDDI Research)*
Invited
This paper reviews ultrawideband optical transmission technologies for scalable AI data centre networks and presents an optical-gateway-based scale-across architecture. Exploiting O-band expansion, WDM/SDM aggregation, and RDMA-over-WDM, the approach enables capacity scaling beyond single-facility limits whilst reducing fibre deployment.

E2 Exhibition room 2

09:00 - 10:30

Tu1-H - Microwave photonics and radio over fiber

SC 08: Sensing and microwave photonics
Guy Torfs *(Chair)*
Keisuke Kasai *(Chair)*

09:00
Tu1-H1/1275 - Reconfigurable Microwave Photonic Demultiplexer Using Integrated CROW and Lattice Filters
Luis Gonzalez Guerrero *(Universidad Carlos III de Madrid)*
We demonstrate an integrated microwave photonic demultiplexer using cascaded CROW and lattice filters, enabling tunable bandwidth (125–500 MHz) and strong channel suppression. Experimental demultiplexing of 16-QAM signals at 23 GHz is demonstrated, confirming reconfigurable filtering for flexible satellite payloads.

PV-R Multipurpose room

09:00 - 10:30

Tu1-I - Optical fiber sensing and its aplications

SC 04: Signal processing for optical communication and sensing
Elie Awwad *(Chair, Télécom Paris)*
Bernhard Spinnler *(Chair)*

09:00
Tu1-I1/1296 - End-to-End Modelling of Earthquake-Induced Polarisation Perturbations in Submarine Optical Fibres
Rick M. Butler
We present an end-to-end model of earthquake-perturbed signal propagation in submarine fibres. Ground displacements are converted to fibre strain via ocean pressure, and injected into a split-step model. Our model shows good qualitative alignment with measurements from the Curie cable during the 2020 Oaxaca earthquake.

A1 Auditorium 1

A2 Auditorium 2

09:15
Tu1-B2/1314 - MIMO Channel Memory Requirements for Randomly-Coupled Multicore Fiber Networks
Besma Kalla *(Eindhoven University of Technology)*
We evaluate the impact of network nodes on MIMO memory requirements in a C+L-band randomly-coupled multicore fiber network. While point-to-point transmission requires less than 1 ns of memory, constraining network operation to this length results in throughput penalties of 50–75% due to path delay misalignment.

09:30
Tu1-B3/1400 - New opportunities in optical networks enabled by hollow-core fibres
Periklis Petropoulos *(Optoelectronics Research Centre, University of Southampton)* Invited
Hollow-core fibres enable performance and applications that are challenging to achieve in conventional solid-core fibre systems. Here we review demonstrations in intensity modulation direct-detection transmission and simultaneous power-and-data delivery that offer opportunities for newservices and enhanced performance in optical communication networks.

E1 Exhibition room 1

09:15
Tu1-C2/475 - Diversity Gain of 2-D PD Array in a 13.3°/s High-mobility FSO System with 13-ms Handover Latency
Yuki Yoshida *(NICT)*
We investigate the impact of 2-D PD array-based diversity reception in realistic mobile FSO scenarios, including terminal mobility and handovers. By eliminating tracking jitter-induced outages through diversity combining, the arrayed receiver achieved zero tracking-induced interruption under a 13.3°/s terminal velocity and 13-ms handover latency.

09:30
Tu1-C3/439 - Increasing the Alignment Tolerance in Long-Reach FSO Links by using a Photodiode Matrix
Ton Koonen *(Eindhoven University of Technology)*
A matrix of 2D-interconnected PDs enables a broadband FSO receiver with large effective aperture and wide field-of-view. Without needing adaptive optics, it offers superior link robustness over single-PD and MMF-coupled FSO receivers, and compact receiver solution. Alignment tolerances increase >3x and scale with matrix size.

C1.1 Conference room 1.1

09:15
Tu1-D2/598 - High-Gain Sub-3 dB Noise Figure Chip-Based Phase Sensitive Preamplifier with Pulsed Pumping
Junda Chen *(Chalmers University Of Technology)*
We demonstrate a sub-3dB “black box” noise figure, Si_3N_4 waveguide-based phase-sensitive preamplifier receiver using pulsed pump. A 37 dB gain yields a sensitivity of -59 dBm at BER=10^{-3} for a 2 Gb/s QPSK signal, with an estimated 0.5 dB on-chip noise figure.

09:30
Tu1-D3/1411 - Optical Amplification in the S-band and Beyond: From Materials and Mechanisms to Practical Deployment
Aleksandr Donodin *(Aston University)*
Invited
We review recent advances in S-band optical amplifiers for communication systems, comparing doped-fibre, Raman, parametric, and semiconductor approaches. Gain mechanisms, performance, and efficiency are analysed, highlighting key trade-offs and emerging solutions for scalable, energy-efficient transmission within and beyond the S-band.

C1.4 Conference room 1.4

09:15
Tu1-E2/451 - Low-loss Silicon Photonic MEMS Switch Array Based on 2.5D Torus Topology
Jiayue Zhu *(Zhejiang University)*
A scheme for scalable low-loss silicon photonic switch arrays using micro-electro-mechanical systems (MEMS) switches and a novel 2.5D Torus topology is proposed and demonstrated, which exhibits one of the lowest insertion losses among widely used wide-sense and strictly non-blocking topologies.

09:30
Tu1-E3 breaking the AI networking and memory wall with a wide-and-slow architecture and microleds
Paolo Costa *(Microsoft)* Invited

C2.1 Conference room 2.1

C2.2 Conference room 2.2

E2 Exhibition room 2

09:15
Tu1-H2/609 - Photonic Millimeter-wave Parallel Chaos Source Enabling Multi-Channel Secure Communication and Sensing
Qiuzhuo Deng *(Zhejiang University)*
We experimentally demonstrate a 2×5 Gbps photonic mmWave secure communication and an interference-free MISO sensing with a single receiver, empowered by a parallel chaos source with 40 channels and up to 94.5 GHz bandwidth per channel, overcoming hardware bottlenecks in future multi-functional mmWave networks.

09:30
Tu1-H3/896 - A Monolithic Analog Radio-over-Fiber Uplink Transmitter with –100.8 to –98.3 dBm Effective Isotropic Sensitivity for mm-Wave Communications
Jiacong Ke *(the university of british columbia)*
We present a monolithic analog radio-over-fiber uplink transmitter co-integrating LNAs, driver, and MZM on a CMOS SOI process. The transmitter achieves 26.1-dB gain, 8.2-dB noise figure, and –100.8-dBm EIS, enabling DPD-free 1.1% and 2.25% EVM of 16-QAM and 32-QAM, respectively, meeting 3GPP requirements.

PV-R Multipurpose room

09:15
Tu1-I2/944 - Polarization Noise Anisotropy-Aware Technique for Enhanced Earthquake Detection Using Coherent Subsea Transponders
Mohammad Mohammad Hosseini *(Nokia)*
Polarization noise anisotropy, in coherent subsea transponders, limits the reliability of earthquake detection. We analyze lab- and field-deployed transponders using a tensor-based eigenvalue decomposition technique that dynamically aligns seismic signals with the eigenvectors, enhancing detection sensitivity up to 16 dB improvement in SNR.

09:30
Tu1-I3/1140 - Path-Integrated Polarization Rotation Signatures in Subsea Networks: Cable Geometry Effects in 2023 Turkey Earthquakes
Mohammad Mohammad Hosseini *(Nokia)*
We analyze polarization data streamed from a commercial coherent transponder, used in MedNautilus link, during 2023 Turkey earthquakes. We show how earthquake features and cable geometry fundamentally govern the optical polarization response, taking the first steps for detailed interpretation in designing fiber-based seismic sensing systems.

PV-P Multipurpose poster area

09:30
Tu1-F2/744 - A Deterministic Bandwidth-Mapper Scheme in Upstream TDM-PON for Time-Sensitive Industrial AI Applications
Sandip Das *(Nokia Bell Labs)*
This paper proposes a real-time, scalable deterministic bandwidth-mapper *(BWmapper)* for upstream TDM-PON, capable of supporting a large number of Time-Sensitive Industrial-AI flows with diverse latency and jitter requirements alongside best-effort traffic. Validated through simulation and experiments, the scheme demonstrates low computational complexity and high efficiency.

09:30
Tu1-G2/1101 - 24-l Coherent Optical Communications Using Passive Coherence Cloning of Dark-Soliton Microcombs for Homodyne Detection
Huanfa Peng *(Karlsruhe Institute of Technology)*
We report on the first demonstration of coherent multi-wavelength transmission using passive coherence cloning of Kerr microcombs. Our scheme leverages a coherence-cloned replica of the transmitter comb as a multi-wavelength local oscillator for homodyne reception of 24 16QAM and 32QAM channels with reduced digital-signal-processing effort.

A1 Auditorium 1

10:00
Tu1-A2 flattop soliton microcombs for low power optical data links
Scott Papp *(National Institute of Standards and Technology)* Invited

A2 Auditorium 2

10:00
Tu1-B4/977 - Physics-Driven Transfer Learning Approach for OSNR Prediction in Hollow-Core Fiber-Based Data Center Interconnect Networks
Jiahui Xu *(State Key Laboratory of Information Photonics and Optical Communications, Beijing University of Posts and Telecommunications)*
This paper proposes a physics-driven transfer learning approach for Hollow-Core Fiber (HCF) OSNR prediction. Utilizing a theoretical analytical model for pre-training, it achieves robust predictions with minimal experimental samples, eliminating 17 dB cliffs, reaching 0.388 dB RMSE and 0.6 dB 95% error bounds.

E1 Exhibition room 1

09:45
Tu1-C4/68 - Cost-Effective 448-Gbps Indoor Optical Wireless Access Via Dual-Polarization Carrier-Extracted Direct Detection
Haojie Zhu *(Westlake University)*
We propose a dual-polarization carrier-extracted direct detection without polarization tracking because of the polarization stability in free-space environment. The system achieves a 448-Gbps transmission data rate in 9-meter indoor free-space link without expensive local oscillators while meeting the eye-safety standard.

10:00
Tu1-C5/260 - Free-Space Optical Communication using Photonic-Crystal Sur-face-Emitting Lasers
Shota Ishimura *(KDDI Research, Inc.)*
Invited
Photonic-crystal surface-emitting lasers (PCSELs) offer a compelling route to compact free-space optical (FSO) transmitters by combining watt-class single-mode output, narrow divergence, and direct modulation on a single chip. This invited paper reviews recent progress from initial lens-free demonstrations to >10-Gbit/s, and coherent PCSEL-based links.

C1.1 Conference room 1.1

10:00
Tu1-D4/330 - Energy Harvesting over Optical Communication Networks Using Discarded Light from a Gain-Flattening Filter
Masaki Wada *(NTT, Inc.)* Invited
We demonstrate electrical-domain energy harvesting over optical communication networks and show for the first time that more than 10 mW of electrical power per core can be extracted from discarded optical power at a gain-flattening filter in a four-core erbium-doped fibre amplifier.

C1.4 Conference room 1.4

10:00
Tu1-E4/626 - An 8×8 Optical Circuit Switch in Thin-Film Lithium Tantalate
Dennis Maes *(OneTouch Technology)*
We demonstrate the first 8×8 electro-optic optical circuit switch (OCS) on thin-film lithium tantalate (TFLT). The photonic integrated circuit comprises twelve 2×2 switches and achieves 4 ns switching, sub-1-µW static power consumption, and 0.5 dB output power stability over 1 hour without active feedback.

C2.1 Conference room 2.1

09:45
Tu1-F3/139 - Dynamic PON Monitoring System Based on Time-Frequency Encoded Optical Pulses
Ruisi Wang *(School of Optical and Electronic Information, Huazhong University of Science and Technology)*
We propose a novel PON monitoring method using time–frequency encoded optical pulse sequences and cross-correlation analysis for real-time fault localization and port detection in dynamic port switching scenarios. Experimental results show that the proposed method achieves sub-meter localization accuracy and 100% port identification accuracy.

10:00
Tu1-F4/860 - Passive GPON Monitoring for Network Load Forecasting Using BWMap Information
Lucas Ingles Loggia
We present a vendor and element management system-agnostic solution for passive upstream bandwidth monitoring in GPON. We demonstrate its usage in a commercial platform for forecasting the network congestion state and providing services profiling, enabling SLA verification and identification of low-congestion windows.

C2.2 Conference room 2.2

09:45
Tu1-G3/1083 - Regular Perturbation on the Group-Velocity Dispersion Parameter for Dual-Polarization Short-Reach Systems.
Dario Cellini *(Scuola Superiore Sant'Anna)*
The Manakov equation governs the propagation of signals in dual-polarization systems. Its solution is usually approximated by regular perturbation on the nonlinear Kerr parameter. In this paper, we propose a novel regular perturbation on the group-velocity dispersion parameter for the Manakov equation.

10:00
Tu1-G4/400 - Water Vapor Robustness of Hollow-Core Fiber for O-Band Short Reach Interconnects.
Yuan Gao *(Yangtze Optical Fiber and Cable Joint Stock Limited Company)*
This work presents the first experimental investigation of water vapor's impact on O-band hollow-core fibres. Results show that HCFs are robust to water vapor: even after prolonged high-humidity exposure, attenuation at the O-band operating wavelengths remains virtually unaffected, confirming their reliability for O-band short-reach interconnects.

E2 Exhibition room 2

09:45
Tu1-H4/526 - Integrated Photonic RF Receiver with Frequency Downconversion in a Packaged InP PIC for Satellite Payloads
Metodi Belchovski *(Eindhoven University of Technology)*
We demonstrate an integrated photonic RF front-end for satellite payloads using a packaged InP PIC, combining optical LO distribution with Ka- to C-band microwave downconversion, supporting 1×128 antenna elements, achieving 24 dB conversion loss, 53 dB noise figure, and <15% EVM across modulation formats.

10:00
Tu1-H5/47 - Processing THz Signals with GHz Electronics
Thomas Schneider *(THz-Photonics, TU-Braunschweig)* Invited
We present the fundamentals and latest findings on the generation, processing and reception of THz-bandwidth signals using low-bandwidth electronics and orthogonal base functions for communication and the acceleration of photonic signal processing.

PV-R Multipurpose room

09:45
Tu1-I4/1322 - Towards SOP-based Real-Time Earthquake Detection: Limitations and Opportunities
Wesley Melo
We statistically analyze real SOP data using a physics-informed seismic event-labelling model and show that 95% of the 798 seismic events have SNR below 1.64dB, independent of distance. We demonstrate a real-time low-cost pipeline extensible to 20Hz Jones sampling, while highlighting limitations and research opportunities.

10:00
Tu1-I5/87 - Passive Distributed Acoustic Sensing for Borehole Seismic Velocity Profiling: A 3 km Geothermal Well Field Trial
Philip Ji *(NEC Laboratories America, Inc.)*
We demonstrate passive borehole velocity profiling using coherent DAS on a 3 km geothermal well. Deconvolution interferometry with phase-weighted stacking recovers velocities from ambient micro-vibrations without active sources, achieving <80 m/s mean absolute error at 0.5–1 km depth against a calibration shot ground truth.

PV-P Multipurpose poster area

A1 Auditorium 1	A2 Auditorium 2	E1 Exhibition room 1	C1.1 Conference room 1.1	C1.4 Conference room 1.4
				10:15 **Tu1-E5/395 - Static and Dynamic Ring Assignment in a Clock-Forwarded DWDM Optical Link** Angad Rekhi *(NVIDIA Corporation)* We present heater sweep-based in-situ minimum-power assignment of microrings to lasers during clock-forwarded optical link initialization (“static ring assignment”). We also show rotation of microring-to-laser assignment during live link operation (“dynamic ring assignment”).

10:30 – 11:00 Coffee Break

11:00 – 12:30 Exhibition only time (Pavilions 1 and 2)

12:30 – 14:00 Lunch Break (on your own)

C2.1 Conference room 2.1

10:15
Tu1-F5/478 - Demonstration of Optical Access Network Failure Management for RAN Control toward Rapid Recovery
Megumi Asada *(NTT, Inc.)*
We propose RAN control based on failure notifications from the optical access network to shorten failure recovery time for high reliability services. Experiments show that the interruption time can be reduced by 66.9% compared with the conventional method.

C2.2 Conference room 2.2

10:15
Tu1-G5/811 - 172 Tb/s GMI, O-band Coherent Transmission with OSNR Optimization.
Aleksandr Donodin *(Aston University)*
We report a record GMI-estimated transmission of 172.87 Tb/s over 25 km of G.652.D in the O-band, achieved using 633 × 24.5 GBaud DP-64QAM and DP-128QAM channels, with optimized launched signal and Raman pump powers.

E2 Exhibition room 2

PV-R Multipurpose room

10:15
Tu1-I6/961 - Real-time Tracking and Localization of Rapid Instantaneous SOP Fluctuations for 100G Coherent System over FPGA
Yu Tang *(China Unicom Research Institute)*
We demonstrate a two-step AEQ cooperating a loopback configuration to track and locate rapid instantaneous state of polarization in a 100G 16QAM coherent optical system based on FPGA. The localization error is within 115 m at 5 MHz.

PV-P Multipurpose poster area

10:30 – 11:00 Coffee Break

11:00 – 12:30 Exhibition only time (Pavilions 1 and 2)

Demo zone
(Pavilion 1, Area 1065)
11:00 - 12:30
(See page 100)

12:30 – 14:00 Lunch Break (on your own)

A1 Auditorium 1

14:00 - 15:30

Tu3-A - AI and advanced processing for optical communication systems

SC 04: Signal processing for optical communication and sensing.
Adonis Bogris *(Chair)*
Fernando Guiomar *(Chair)*

14:00 - 15:00
Tu3-A1 Communication engineering in the age of AI
Darko Zibar *(Technical University of Denmark)* Tutorial

A2 Auditorium 2

14:00 - 15:30

Tu3-B - Light propagation and manipulation from short to long distance

SC 12: CLEO® Special Session on Emerging Trends in Optics and Photonics
Pavel Cheben *(Chair)*
Daniel Benedikovic *(Chair, University of Zilina)*

14:00 - 14:30
Tu3-B1/1403 - Metamaterial Integrated Photonics for Light Coupling, Beam Steering and Spectral Filtering
Jens H. Schmid *(National Research Council Canada)* Invited
In this paper we provide an overview of recent developments in metamaterial integrated optics including efficient grating couplers on silicon nitride, optical antennas and phased arrays, as well as polarization-independent Bragg filters.

E1 Exhibition room 1

14:00 - 15:00

Tu3-C - Microwave photonics and sensing

SC 08: Sensing and microwave photonics.
Miguel Drummond *(Chair)*
Guy Torfs *(Chair)*

14:00
Tu3-C1/1142 - 280-Gbps Rx-DSP-Free Coherent Analog-RoF Fronthaul Enabled by Hybrid Optical-Electrical Frequency Combs
Yiming Wen *(Huazhong University of Science and Technology)*
We demonstrate an Rx-DSP-free coherent A-RoF fronthaul using hybrid optical-electrical frequency combs to enable self-heterodyne detection and pre-equalization, mitigating laser phase noise and transmitter impairments. 5 channels of 14-GBaud 16-QAM signals with 22-GHz carrier frequency are successfully transmitted over a 10-km fiber link.

14:15
Tu3-C2/926 - Acoustic Imaging for 2D Tracking of Surface Vessels Using Distributed Acoustic Sensing on Submarine Optical Fibres
Marcelo Soto *(Universidad Tecnica Federico Santa Maria)*
This paper presents a beamforming-based method using fibre-optic distributed acoustic sensing to map acoustic energy in two dimensions around submarine telecom fibres. The method enables near-field 2D localisation via beamforming and tracking through Kalman filtering of moving marine vessels, including regions without direct fibre deployment.

C1.1 Conference room 1.1

14:00 - 15:30

Tu3-D - Integrated modulators

SC 03: Photonic integrated circuits, assemblies and packaging
Marianna Pantouvaki *(Chair)*
Sylvie Menezo *(Chair)*

14:00
Tu3-D1/696 - 400-Gb/s PAM4 Operation of an InP-on-Si Membrane EA Modulator Sub-Assembly with 1.0-V Differential Swing Voltage
Kensho Nishizaki *(Furukawa Electric Co., Ltd.)*
We demonstrate a 400-Gb/s PAM4 operation of a differential drive membrane electro-absorption modulator (EAM) sub-assembly with 1.0-V differential amplitude. 3-dB electro-optic bandwidth of >110 GHz is realized owing to a low capacitance 150-µm-long EAM flip-chip-bonded ceramic substrate as well as an integrated 80-ohm differential termination.

14:15
Tu3-D2/218 - Flip-chip Integrated Differential Drive EML with Dual Modulator Structure with AC-coupling for 226 Gb/s
Kei Masuyama *(Mitsubishi Electric Corporation)*
We report a flip-chip-mounted EML with a dual-EAM structure on an interposer, together with differential termination and an AC-coupling capacitor. The device exhibits >60 GHz 3-dB electro-optic bandwidth and 226 Gb/s back-to-back operation at 113-GBaud PAM4 with 2.8-dB TDECQ.

C1.4 Conference room 1.4

14:00 - 15:30

Tu3-E - Digital twin and autonomous network intelligence

SC 10: Control and management of optical networks.
Raul Muñoz *(Chair)*
Behnam Shariati *(Chair)*

14:00
Tu3-E1/1015 - A Robust Scalable Markov Chain Monte Carlo Approach for a Probabilistic Digital Twin of Optical Networks
Davide Rinaldi *(Nokia Bell Labs)*
We propose a method of refining the optical network parameters joint probability distribution, leveraging live measurements and integrating a differentiable reimplementation of GNPy into a Bayesian inference framework. We illustrate the benefits of our approach in terms of robustness and quality of the predicted distributions.

14:15
Tu3-E2/1044 - Experimental Demonstration of Autonomous Class Aware Optimization via Digital Twin Aided Optical Network Agent
Marc Lawson *(Scuola Superiore Sant'Anna)*
We demonstrate a Digital Twin-aided multi-agent LLM for autonomous class-aware optical network management on a network testbed. The system detects soft failures and autonomously adapts modulation format per service class requirements, ensuring marginless channel quality with minimal human intervention.

C2.1 Conference room 2.1

14:00 - 15.30

Tu3-F - AI for 6G and 6G for AI
Symposium

Stefan Dahlfort *(Organizer)*
Oskars Ozoliņš *(Organizer, Riga Technical University)*
Philippe Chanclou *(Organizer, Orange)*

The use of AI in society is exploding and quickly changing how businesses and public functions operate. It's speculated that Generative AI could drive a 10x traffic growth in 6G mobile networks. This workshop will outline the background of such predictions.

Session 1:
- Operator section – Moderator: Philippe Chanclou, Orange, France 14:00 - 14:45
- Stefan Melin, "Towards 6G: Intelligent Optical Networks and Autonomous Transport Architectures" Telia Company, Sweden
- Dr. Hirofumi Sasaki, "Photonics-Assisted RF Beamforming and Management for 6G and Beyond", NTT, Japan
- Lieven Levrau, "Coevolution of RAN and Optical Transport", IOWN, Nokia, Belgium
- Panel Operators: 14:45 - 15:00
- Vendor section – Moderator: Stefan Dahlfort, MOPA, Ericsson, Sweden 15:00-15:30
- Angelo Centonza, 3GPP RAN3 Vice Chairman, Ericsson, Spain
- François Fredricx, MOPA Technical Committee Co-chair, Nokia, Belgium

C2.2 Conference room 2.2

14:00 - 15:30

Tu3-G - Turbulence-resilient underwater optical wireless links

SC 09: Free-space optics and optical wireless technologies.
Eduward Tangdiongga *(Chair)*
Anaëlle Maho *(Chair)*

14:00
Tu3-G1 Optical wireless communications - progress and challenges
Ampalavanapillai Nirmalathas *(University of Melbourne)* Invited

E2 Exhibition room 2

14:00 - 15:30

Tu3-H - Long-haul HCF systems

SC 05: Optical transmission systems
Jeremie Renaudier *(Chair)*
Adolfo Cartaxo *(Chair, Instituto de Telecomunicações)*

14:00
Tu3-H1/1018 - Hollow-Core Fibre Transmission Systems: From Metro to Long-Haul Applications
Yang Hong *(Microsoft Azure Fiber)*
Invited
We review recent advances in high-capacity optical transmission that exploit the unique beneficial properties of hollow-core fibres (HCFs). Single-span metro, multi-span long-distance, and long-haul transmission scenarios are discussed, together with opportunities and challenges towards future HCF-based transmission systems.

PV-R Multipurpose room

14:00 - 15:30

Tu3-I - Quantum state transmission and manipulation

SC 11: Quantum communications, physical layer security, and optical quantum technologies.
Konrad Banaszek *(Chair)*

14:00
Tu3-I1/593 - Air-to-Ground Transmission of Time-Encoded Qubits with Single-Mode Fiber Coupling for Terrestrial Network Compatibility.
Adam Widomski *(Fraunhofer-Institute for Telecommunication, Heinrich-Hertz-Institut, HHI)*
We present a demonstration of time-encoded quantum bit transmission over an air-to-ground link between a mobile airborne transmitter and an optical ground station. Our results pave the way to wards constructing secure and flexible hybrid Quantum Key Distribution links beyond currently available fiber-optic topologies.

14:15
Tu3-I2/830 - Quantum Readout based on Silicon Photonic Integrated Circuits for Enhanced Authentication Security.
Charis Mesaritakis *(University of West Attica)*
In this work, we present a quantum-driven physical unclonable function based on a silicon nitride photonic integrated chip, offering enhanced authentication security against eavesdropping. The maximally mixed state property conceals the hardware fingerprint, while a cloning probability as low as 10^-14 provides secure authentication.

PV-P Multipurpose poster area

A1 Auditorium 1

A2 Auditorium 2

14:30
Tu3-B2/1397 - Hollow Core Photonic Crystal Fibre: Perfect Light Pipe?
Philip St. John Russell *(Hangzhou Institute of Optics and Fine Mechanics)*
Tutorial
In the tutorial I plan to briefly review the history of hollow-core PCF, explore its many applications, and outline how “glancing incidence optics” has revolutionised hollow-core fibre design.

E1 Exhibition room 1

14:30
Tu3-C3/719 - Optical path difference measurements using symmetric dual-comb interferometry
Alonso Romero Barrueco *(Universidad de Alcalá)*
We present a common-path dual-comb technique for long-distance fiber ranging, addressing coherence and ambiguity limitations. Spectral phase retrieval combined with multi-Nyquist-zone pro-cessing enables measurements up to 102 km with 5.6 mm resolution.

14:45
Tu3-C4/991 - Quantitative Evaluation of Localised Fibre Loss in Multicore Fibre Systems Using Coherent OTDR
Kosuke Komatsu *(KDDI Research, Inc.)*
We quantitatively evaluate localised fibre loss in two-core fibre systems using coherent OTDR. Better than ±1-dB agreement with power meter measurements is confirmed for two distinct configurations, with and without high-loss loopbacks. Operational advantages and disadvantages of each configuration are also clarified.

C1.1 Conference room 1.1

14:30
Tu3-D3/275 - A Mach–Zehnder Modulator Exceeding 110 GHz in a 300 mm Silicon Photonic Platform towards 400 Gbps/lane Transmission
Haiwen Cai *(Shanghai Optoelectronics Science and Technology Innovation Center)*
A 420 Gbps PAM-8 Mach-Zehnder modulator with a compact footprint of 500 µm is demonstrated in a 300 mm silicon photonic platform, achieving an insertion loss of 5.6 dB, an electro-optic bandwidth exceeding 110 GHz, and a modulation efficiency of 0.49 V∗cm around 1310 nm.

14:45
Tu3-D4/238 - Energy-Efficient Optical Chiplet Link with Heterogeneously Integrated Membrane EA-DFB Laser Achieving 1.55 pJ/bit at 64-Gbit/s PAM-4
Suguru Yamaoka *(NTT Inc.)*
We demonstrate a transmitter chiplet integrating a low-capacitance InGaAsP electro-absorption modulator and a membrane InGaAsP laser on a Si platform, co-integrated with an electronic IC through flip-chip bonding. Together with a Ge receiver chiplet, a 1.55-pJ/bit optical link at 64-Gbit/s PAM-4 is achieved.

C1.4 Conference room 1.4

14:30
Tu3-E3/1431 - ROADM and AI: a Perfect Symbiosis for Autonomous Optical Networks
Annalisa Morea *(Nokia)* Invited
This article examines how AI is reshaping optical transport networks by driving architectural innovations to meet surging data center interconnect demands, while simultaneously enabling intelligent, agentic network automation frameworks that optimize operations, reduce costs, and deliver measurable business outcomes.

C2.1 Conference room 2.1

14:30 Continuation of:

Tu3-F - AI for 6G and 6G for AI
Symposium

See page 85.

C2.2 Conference room 2.2

14:30
Tu3-G2/655 - Blind Turbulence Mitigation Based on Ultra-Low-Latency Energy-Efficient Photonic Computing Processor: A Field Trial for Real-Time Underwater Links with 6D-AUV
Geyang Wang *(The Chinese University of Hong Kong)*
We demonstrate a CSI-free blind turbulence-whitening equalizer (BTWE) using a novel compact modulation-and-weighting microring resonator-based photonic computing processor. Through 6D-AUV underwater field trials, photonic BTWE achieved orders-of-magnitude lower latency and energy consumption compared to advanced DSP with ~50% data-rate enhancement, successfully mitigating turbulence-induced power fluctuations.

14:45
Tu3-G3/562 - Turbulence-Resilient Self-Aligned Bidirectional Optical Wireless Using Optical Phase Conjugation
Zhaoming Wang *(University of Oxford)*
We demonstrate a bi-directional OWC link in which an optical phase-conjugate uplink provides automatic alignment and turbulence compensation, enabling a reverse high-speed downlink that achieves a 10.1-Gb/s peak throughput while sustaining Gb/s-class transmission over an optical power equivalent distance of 80 m.

E2 Exhibition room 2

14:30
Tu3-H2/1233 - Impact of Gas Line Absorption in Long-Haul transmission of 134 GBd Signals in C-Band over Low Loss and Low IMI HCF
Rajiv Boddeda *(Nokia Bell Labs)*
We report on the C-band WDM transmission of 134-GBd channels using DP-16QAM and DP-64QAM over long-haul distances. Using a recirculating loop comprising of a single span made of 266-km of GTA-ST-HCF, we show the impact of gas line absorption on SC and MC modulation schemes.

14:45
Tu3-H3/1181 - On the Impact of Gas-Line Absorption in Long-Haul C+L-Band Hollow-Core Fibre Transmission
Zelin Gan *(University College London)*
We numerically investigate gas-line absorption in hollow-core fibre C+L-band transmission. Results show limited C-band but severe L-band performance degradation. Ideal suppression enables a 1.5× higher L-band throughput, reaching 59.1 Tb/s over 1000~km, while reducing repeater number by up to 3.3×.

PV-R Multipurpose room

14:30
Tu3-I3/1424 - Quantum Advantage with Continuous Variable Systems.
Ulrik Andersen *(Technical University of Denmark)* Invited
In this talk, I will present our efforts to leverage CV optical quantum systems for achieving quantum advantage in learning, communication, and computation. Highlights include demonstrations of massive quantum advantage in quantum learning, progress toward quantum computational advantage, and recent advances in practical CVQKD.

PV-P Multipurpose poster area

A1 Auditorium 1	A2 Auditorium 2	E1 Exhibition room 1	C1.1 Conference room 1.1	C1.4 Conference room 1.4
15:00 **Tu3-A2/332 - 24×432-Gbps/λ All-Optical Equalization for DSP-Free Optical Interconnects** Benshan Wang *(The Chinese University of Hong Kong)* We demonstrate an integrated all-optical signal processor (OSP), enabling WDM transmission of 24-channels at 432-Gbps/λ over 2-km SMF across the whole C-band. The OSP simultaneously equalizes fiber-dispersion and transceiver-bandwidth-limit with 50-mW power and 75-ps latency, offering a disruptive solution for energy-efficient and low-latency optical interconnects.			**15:00** **Tu3-D5/527 Zero-Post-Processing Micro-Transfer-Printed Heterogeneous Si/TFLN Mach-Zehnder Modulators with >67-GHz Bandwidth** Toshiya Murai, *(National Institute of Advanced Industrial Science and Technology (AIST))* We micro-transfer-print fully pre-fabricated thin-film lithium niobate modulators, incorporating RF CPW electrodes and SiO2 cladding, onto a silicon platform using a Mo sacrificial layer. Eliminating post-printing fabrication, the 3-mm-long device achieves a 3-dB bandwidth exceeding 67 GHz, enabling scalable integration.	**15:00** **Tu3-E4/844 - Collaborative Measurement-Driven Digital Twin with Data Extrapolation for DRL-assisted Optical Networks.** Yiran Teng *(University of Bristol)* We present a measurement-driven digital twin framework that integrates multiple lab-based emulations with AI-based extrapolation, offering a practical approach to data-driven digital twin construction. Using 5% measured data, it achieves below 0.05 dB error and enables DRL-based spectrum allocation with 0.4 dB Q-factor improvement.
15:15 **Tu3-A3/58 - 220-GBd optical coherent waveform generation using temporal unitary transforms** Callum Deakin *(Nokia Bell Labs)* We use temporal unitary transforms to generate 16-QAM up to 220 GBd using only 50-GHz electrical bandwidth. The technique is theoretically lossless and can generate arbitrary optical waveforms beyond the bandwidth of the constituent modulators.			**15:15** **Tu3-D6/931 - A 150-GBaud PAM2, 120-GBaud PAM4 Monolithic Transmitter Integrating a Silicon-Photonic Mach–Zehnder Modulator and a CMOS Driver** Jiaqin Fang *(Department of Electrical Computer Engineering, The University of British Columbia)* We demonstrate a monolithically integrated optical transmitter consisting of a 46-GHz silicon photonic Mach-Zehnder modulator and a CMOS-SOI driver with on-chip continuous-time linear equalization. The measured E/O bandwidth is 70 GHz, with BERs below HD-FEC at 240-Gb/s PAM4 and 150-Gb/s PAM2.	**15:15** **Tu3-E5/791 - Experimental Demonstration of a Digital-Twin-Based Risk Map for Proactive Management of Fiber Flapping in a Mesh Network.** Chenyu Sun *(Sorbonne Université)* We experimentally demonstrate a digital-twin-based framework simulates “what-if” fiber flapping and power dips across a mesh optical network, generates risk maps, and recommends proactive adjustments of inline amplifier gain or booster launch power profile to pre-compensate potential degradations, enhancing end-to-end SNR margin and network resilience.

15:30 - 16:00 Afternoon Coffee Break

C2.1 Conference room 2.1

15:00 Continuation of:

Tu3-F - AI for 6G and 6G for AI
Symposium

See page 85.

C2.2 Conference room 2.2

15:00
Tu3-G4/674 - Downlink-Assisted Uplink Beam Steering in an Asymmetric Underwater Optical Attocell for Turbulence-Resilient Links
Takahiro Kodama *(Kagawa University)*
An asymmetric underwater optical attocell is proposed to mitigate the coverage-efficiency trade-off in underwater wireless optical communication. Downlink diffusive beams enable extended cell formation, while uplink beam steering exploits positional information. Experiments demonstrate turbulence-resilient coverage and stable communication throughout the attocell for mobile nodes.

15:15
Tu3-G5/1251 - Underwater WDM-VLC Systems Enabled by Ultrafast Perovskite Superlattice and SiPMs Receiver Array
Zengyi Xu *(Fudan University)*
We proposed an underwater WDM-VLC system, combining a multi-wavelength laser transmitter and a large area receiver with ultrafast fluorescent antenna (FA) and SiPM array. The system achieves 117.6 Gbps*mm2capacity-area product in the 1.2 m tap water channel.

E2 Exhibition room 2

15:00
Tu3-H4/1001 - Demonstration of Full C-band 400G ZR Transmission over 3-Span 427.97-km Hollow-Core Fibre
Yang Hong *(Microsoft Azure Fiber)*
We experimentally demonstrate 400G ZR transmission over record reach thanks to the ultra-low nonlinearity and low-and-flat chromatic dispersion of hollow-core fibre (HCF). Using 34.5-dBm launch powers, real-time full C-band 400G ZR transmission over 3 spans with a maximum 427.97-km reach is demonstrated.

15:15
Tu3-H5/1287 - Fundamental Quantum Limits of Power-Constrained Multi-Span Fiber-Optic Transmission: HCF vs Conventional Fibers
Karol Lukanowski *(University of Warsaw)*
We explore fundamental quantum limits on the system capacity of multi-span HCF and standard silica-based fiber links in the power-constrained regime, comparing phase-sensitive and phase-insensitive amplifiers and Shannon vs Gordon-Holevo capacity.

PV-R Multipurpose room

15:00
Tu3-I4/1333 - Measurement-Based Quantum Kernel Method for Data Classification on a Reprogrammable Silicon Photonic Device.
Veronika Raschendorfer *(Denmark's Technical University - Electro)*
We demonstrate a measurement-based quantum kernel estimation protocol on a reprogrammable silicon photonic chip. Using path-encoded four-qubit graph states, we achieve 90% classification accuracy. This provides a scalable, noise-resilient framework for quantum machine learning

15:15
Tu3-I5/1115 - Experimental Quantification of Layered Error Suppression in Fiber-Interconnected Quantum Data Centers.
Seyed Navid Elyasi *(University of Bristol)*
We perform experiments to quantify error suppression in fiber-connected superconducting QPUs using combined error mitigation techniques, demonstrating over 20% improvement in operational fidelity across interconnected quantum processing units under realistic noise conditions.

PV-P Multipurpose poster area

15:30 - 16:00 Afternoon Coffee Break

A1 Auditorium 1

16:00 - 17:30

Tu4-A - Access network evolution

SC 07: Optical networks for access, mobile X-haul, in-building, and intra-datacentre interconnects.
Rene Bonk *(Chair, Nokia)*
Paola Parolari *(Chair, Politecnico di Milano)*

16:00
Tu4-A1/211 - Optical Access Network Evolution and Transformation Enabled by AI
Xuming Wu *(Huawei Technologies France)* Invited
Artificial intelligence has emerged as a key enabler to address challenges such as capacity demand, dynamic resource allocation, and intelligent management through data-drive optimiza tion and adaptive control in Optical Access Network. This paper reviews major aspects and dis cusses future directions for AI-driven OAN.

A2 Auditorium 2

16:00 - 17:30

Tu4-B - Optical networks for AI datacenters and workloads

SC 10: Control and management of optical networks.
Yvan Pointurier *(Chair)*
Nguyen-Cac Tran *(Chair)*

16:00
Tu4-B1/1162 - Dynamic Optical Pluggable Allocation and LLM-aware Job Scheduling for Distributed AI training in Regional Multi-Cluster Data Centers
Varsha Lohani *(Centre Tecnològic de Telecomunicacions de Catalunya (CTTC)*
We propose an LLM-aware dynamic optical pluggable allocation for regional multi-cluster data centers, jointly optimizing DCI capacity and job queuing to support heterogeneous distributed AI training workloads, improving utilization, blocking probability, and training efficiency significantly.

16:15
Tu4-B2/209 - Energy-Efficient Machine Learning-Assisted Load Balancing for Fully Virtualized Access Networks on Multi-Node GPU Servers.
Takahiro Suzuki
We propose energy-efficient machine learning-assisted load balancing for fully-virtualized OLTs. The nonlinear change in computational load is estimated using a decision tree. Experiments on multi-node GPU servers show a 62% improvement in inference error and power savings of 95% to 98%.

E1 Exhibition room 1

C1.1 Conference room 1.1

16:00 - 17:30

Tu4-D - Long-range QKD and fields trials

SC 11: Quantum communications, physical layer security, and optical quantum technologies.
Annachiara Pagano *(Chair)*

16:00
Tu4-D1 Practical quantum communications in deployed optical telecom networks.
Mirko Pittaluga *(Wavephotonics LTD)*
Invited

C1.4 Conference room 1.4

16:00 - 16:45

Tu4-E - Mode division multiplexing

SC 02: Discrete photonic devices and technologies.
Eric Bernier *(Chair)*
Despoina Petousi *(Chair)*

16:00
Tu4-E1/620 - 20-Mode Spatial and Polarization Multiplexer using Vertically Stacked Three-Layer Dielectric Metasurfaces.
Takahiro Suganuma Mr *(The University of Tokyo)*
A spatial and polarization multiplexer based on compact stacked metasurfaces is experimentally demonstrated. Using three metasurface layers with 800-μm-diameter aperture, we achieve simultaneous conversion of 20 input beams to the desired Hermite–Gaussian modes at 1550 nm, demonstrating a scalable optical interface for space-division-multiplexed systems.

16:15
Tu4-E2/402 - Inversely Designed Ultrasmall Scrambling-Type Mode Multiplexer Based on Mosaic Structure.
Shizunari Aomori *(Graduate School of Science and Engineering, Hosei University)*
We propose and experimentally demonstrate first scrambling-type mode multiplexers based on mosaic structure. Two- and three-mode multiplexers with an ultrasmall footprint of <10 μm^2 are successfully demonstrated with the help of inverse design method based on gradient-based and machine learning techniques.

C2.1 Conference room 2.1

16:00 -17:30:

Tu4-F - AI for 6G and 6G for AI
Symposium

Stefan Dahlfort *(Organizer)*
Oskars Ozoliņš *(Organizer, Riga Technical University)*
Philippe Chanclou *(Organizer, Orange)*
The use of AI in society is exploding and quickly changing how businesses and public functions operate. It's speculated that Generative AI could drive a 10x traffic growth in 6G mobile networks. This workshop will outline the background of such predictions.

Session 2:
- Fabio Cavaliere, Ericsson, Italy
- Raza Khan. "How can optical solutions and components for 6G match the needs of AI?", Semtech, Canada
- Academia section – Moderator: Oskars Ozolins, RTU, Latvia 16:30-17:45
- Roberto Gaudino, "Next-generation optical access networks and their possible impact on AI", Politecnico di Torino, Italy
- Carlos Natalino Da Silva "6G transport networks for an agentic future: synergies and opportunities", Chalmers, Sweden
- Patryk Urban "Resiliency of fiber-optic access network in the 6G and AI era", West Pomeranian University of Technology in Szczecin, Poland
- Christina Lim "AI-Native Radio-over-Fiber Receivers for 6G", University of Melbourne, Australia
- Panel Vendors and Academia 17:15-17:30

C2.2 Conference room 2.2

16:00 - 17:30

Tu4-G - Optical sensing in telecommunications networks

SC 04: Signal processing for optical communication and sensing.
Fatih Yaman *(Chair)*
Elie Awwad *(Chair)* Télécom Paris

16:00
Tu4-G1/308 - Enhancing Telecommunications Network Availability through Infrastructure Protection with High-Spatial-Resolution Sensing.
André Sandmann *(Adtran Networks SE)* Invited
A framework for increasing optical fiber network availability by integrating high-spatial-resolution distributed fiber sensing in data transmission systems is presented. Coexistence with parallel data channels on a separate wavelength, mitigation of nonlinear signal interaction impacts, applications and challenges are investigated.

E2 Exhibition room 2

16:00 - 17:30

Tu4-H - Impairments monitoring in optical networks

SC 06: Architecture, modelling and performance of optical networks.
Camille Delezoide *(Chair)*
Vittorio Curri *(Chair)*

16:00
Tu4-H1/511 - Estimation of Nonlinear Intra- and Inter-Channel Impairments in Optical Fiber Transmission.
Joana Girard-Jollet *(Nokia Bell Labs)*
We propose a neural network to estimate the relative contributions of intra- and inter-channel nonlinear impairments in fiber optic transmission from received-signal power spectral densities. Trained and tested on experimental data, the model achieves 1% RMSE across varying launch powers, symbol rates, and transmission distances.

16:15
Tu4-H2/572 - First Distributed PDL Monitoring on Coherent DSP Chip in Pluggable Transceiver.
Minami Takahashi *(NTT, Inc.)*
We demonstrate the first experimental localization and quantification of distributed PDL, fully implemented on a coherent DSP in a 118-GBd OSFP transceiver. Over a WDM link, on-chip digital-SOP-optimized polarization-resolved power profiles identify multiple PDL elements solely from ZR+ traffic signals, with <1.0-dB estimation error.

PV-R Multipurpose room

PV-P Multipurpose poster area

A1 Auditorium 1

16:30
Tu4-A2/467 - 25 Years of PON standardization Tracking the Evolution of Technology and its Market
Frank Effenberger *(Futurewei)* Tutorial
Passive optical networks have a long history of standardization that has tracked both the progress of the technology and the development of the broadband market. The goal is to find a good cost-performance trade-off. This paper reviews the major themes of this work.

A2 Auditorium 2

16:30
Tu4-B3/1433 - The Role of Optics in Next-Generation Multi-Gigawatt Datacenters.
Bodhisattwa Gangopadhyay *(META)*
Invited
Multi-gigawatt AI datacenters demand optical interconnects scaling from intra-cluster fabrics to inter-building backbone rings under strict power, latency, and reliability constraints. We present the deployed optical architecture spanning disaggregated AI fabrics and metro-ring backbones, covering 2×400G FR4-LITE optics, 800GZR coherent modules, and optical protection switching.

E1 Exhibition room 1

C1.1 Conference room 1.1

16:30
Tu4-D2/1157 - Field Trial of Commercial 1295-nm O-Band DV-QKD under Coexistence with Classical Channels in a High-Capacity ROADM-based Metropolitan Production Fiber Network.
José Manuel Rivas-Moscoso *(Telefónica CDO)*
We report field deployment of a 1295.56 nm O-band DV-QKD system coexisting with high-capacity C-band traffic in a metropolitan link. Measurements under varying channel allocations and powers show robust coexistence, improved tolerance over 1310 nm operation, and no degradation in classical C-band performance or capacity.

16:45
Tu4-D3/617 - Field Demonstration of QKD–Classical Coexistence with Real-Time Encryption over Multi-Core Fiber.
Ibrahim Mohamed Ramadan *(Università degli Studi dell'Aquila, Department of Physical and Chemical Sciences)*
We report the first field trial of quantum key distribution coexisting with classical signals over a fielddeployed multi-core fiber link, achieving 106.7 Tb/s classical transmission alongside real-time networklayer encryption at 132 Gb/s, with 63 µs latency overhead and key-refresh time interval of 15 seconds.

C1.4 Conference room 1.4

16:30
Tu4-E3/438 - Ultrasmall 8-Channel Wavelength/Mode Hybrid Multiplexer with Mosaic Structures for Beyond-Tbit/s Optical Ethernet.
Yusuke Sawada *(Sumitomo Electric Industries, Ltd.)*
We demonstrate ultrasmall wavelength/mode hybrid multiplexers for the C- and O-bands. Integrating mosaic structures designed using machine learning enables ultrasmall footprint of 50 × 50 µm^2 while maintaining low loss property. To the best of our knowledge, these devices are the smallest for 8-channel multiplexers.

C2.1 Conference room 2.1

16:30 Continuation of:

Tu4-F - AI for 6G and 6G for AI
Symposium

See page 91

C2.2 Conference room 2.2

16:30
Tu4-G2/523 - Generalised Bidirectional ODN Characterisation with Unknown Number of Loss Events for Coherent PONs.
Chenxi Tan *(University of Cambridge)*
We propose a generalised bidirectional DSP-based framework using adaptive Gaussian process regression and Bayesian information criterion for precise and efficient ODN characterisation in coherent PONs with unknown loss events. Experiments demonstrate accurate dual-loss localisation and quantification, with maximum mean errors of 0.26km and 0.17dB.

16:45
Tu4-G3/1381 - Multipoint Vibration Localization in Forward Coherent ISAC Enabled by Blind Source Separation.
Bowen Yin *(School of Optical and Electronic Information, Huazhong University of Science and Technology)*
We demonstrate multipoint vibration localization in forward ISAC by extracting perturbations directly from the communication signal phase. Leveraging blind source separation, three concurrent vibrations are blindly localized over a 63-km link with meter-level accuracy, alongside penalty-free 30-GBaud 16-QAM transmission.

E2 Exhibition room 2

16:30
Tu4-H3/1224 - First Implementation of NLI Estimation on Coherent DSP Enabled by On-Chip Longitudinal Power Monitoring.
Takeo Sasai *(NTT)* Invited
We report the first implementation of NLI estimation on a real-time coherent DSP, enabled by on-chip longitudinal power monitoring inside an OSFP. We demonstrate NLI estimation over a 450-km link using only standard 400ZR+ traffic, achieving a 0.62-dB maximum absolute error in generalized OSNR.

PV-R Multipurpose room

PV-P Multipurpose poster area

A1 Auditorium 1

A2 Auditorium 2

17:00
Tu4-b4 optical networks for ai: the challenge and optimization for llm training and inference across datacenters.
Jiawei Zhang *(Beijing University of Posts and Telecommunications)*
Invited

E1 Exhibition room 1

C1.1 Conference room 1.1

17:00
Tu4-D4/722 - Field Trials of Restoration-Capable Quantum Key Distribution Networks with Optical Routers.
Xiao Duan *(KDDI Research, Inc.)*
We demonstrate physical-layer failure detection and automated recovery in quantum key distribution ne works utilising commercial prepare-and-measure BB84 and polarisation entanglement-based BBM92 systems integrated with self-developed all-transparent optical routers over a field-deployed network testbed.

17:15
Tu4-D5/949 - Demonstration of a Dynamic SD-KMS with Batch-Based Multipath Routing in a Field-Deployed QKD Network.
Konstantinos Tsimvrakidis *(National and Kapodistrian University of Athens)*
We present a dynamic Software-Defined Key Management System (SD-KMS), integrated with a custom batch-based Linear Programming (LP) routing engine, to optimize dynamic key provision-ing in Quantum Key Distribution (QKD) networks. The SD-KMS is experimentally validated across diverse operational scenarios in a field-deployed QKD network.

C1.4 Conference room 1.4

C2.1 Conference room 2.1

17:00 Continuation of:

Tu4-F - AI for 6G and 6G for AI
Symposium

See page 91

C2.2 Conference room 2.2

17:00
Tu4-G4/358 - Flexible DAS Implementation over a Self-Homodyne Optical Link.
Junda Chen *(Chalmers University Of Technology)*
We demonstrate a flexible ISAC architecture over a 25-km polarization-division-multiplexed self-homodyne link using a shared continuous frequency-swept carrier, achieving 160-Gbps 16QAM transmission with negligible communication penalty and 30-kHz vibration recovery. High-sampling-rate DAS is realized via continuous-wave sub-band multiplexing, increasing sampling rate 45× without spectral overhead.

17:15
Tu4-G5/95 - Hybrid Phase and Polarization Sensing Using OIF DSP Frame Pilot Symbols and Training Sequences in Integrated Receivers.
Hao Zhou *(Beijing University of Posts and Telecommunications)*
A hybrid feedforward phase and polarization sensing architecture is proposed for integrated coherent receivers with 100-kHz ECLs, directly utilizing OIF-defined DSP frame pilot symbols and training sequences. By adaptively selecting modalities based on frequency-dependent sensing SNR, we achieve sub-Hz-to-10-MHz vibration detection for fiber-ISAC optical networks.

E2 Exhibition room 2

17:00
Tu4-H4/1091 - Near-Symbol-Rate Linear Least-Square Longitudinal Power Monitoring.
Junho Chang *(Huawei Technologies Canada)*
We characterize the dependency of the spatial response function on the waveform sampling rate used for LPM. By proposing an optimized near-symbol-rate approach, we achieve mean absolute error of the estimated profile comparable to 2-SpS processing with lower sampling requirements, supporting more resource-efficient real-time monitoring.

17:15
Tu4-H5/512 - Generalizable PDL Regression via Transfer Learning in Optical Links.
Lina Shi *(Nokia Bell Labs France)*
Abstract: We demonstrate transfer learning for PDL regression by adapting a simulation-trained model to experimental data under unseen operating conditions. Across different symbol rates, launch powers, and modulation formats, it consistently outperforms a source-only baseline, demonstrating robust cross-domain generalization with few target samples.

PV-R Multipurpose room

PV-P Multipurpose poster area

A1 Auditorium 1	A2 Auditorium 2	E1 Exhibition room 1	C1.1 Conference room 1.1	C1.4 Conference room 1.4

C2.1 Conference room 2.1	C2.2 Conference room 2.2	E2 Exhibition room 2	PV-R Multipurpose room	PV-P Multipurpose poster area
		17:30-19:30		
		European photonic integration forum (EPIF)		
		The European Photonic Integration Forum is organized every year at ECOC by ePIXfab and JePPIX, and is this year again supported by PhotonDelta. In the 2026 edition, EPIF focuses on the pathways to European scaling of the photonics ecosystem: from public funding to venture capital. **Keynote speakers:** Claudia Hoessbacher *(Polariton)* will tell the exceptional story of Polariton, going from an academic spin-off setting world-record modulator speeds to a successful acquisition by Marvell in 2025. Ewit Roos *(PhotonVentures)* will give insights in the investment strategies in Europe, and how new pathways to venture capital can enable photonic start-ups and scale-ups in the European ecosystem/ Each of the keynotes will be accompanied by a one-on-one interview diving deeper into the topic, followed by an interactive panel discussion session. The event will be closed by a networking drink.		

A1 Auditorium 1	A2 Auditorium 2	E1 Exhibition room 1	C1.1 Conference room 1.1	C1.4 Conference room 1.4
		17:45 - 19:30 **Hack your research! Tools and tricks for today's telecommunications techies.** Join us at Hack Your Research for an exciting event featuring interactive demos of the most powerful tools and techniques used by expert researchers and professionals to simplify all aspects of optical communication research. Whether you are a student or a highly experienced researcher, everyone is welcome! Come and learn from the trial-and-error experiences of others, connect with peers and experts and engage in stimulating discussions, all while enjoying light food and drinks in a relaxed and fun environment. **Organizers:** **Besma Kalla** *(Eindhoven University of Technology)* **Giammarco Di Sciullo** *(Università degli Studi dell'Aquila, Italy)* **Vincent van Vliet** *(Eindhoven University of Technology, the Netherlands)* **Rekha Yadav** *(University College London, United Kingdom)* **Amol Delmade** *(Pilot Photonics, Ireland)* **Advisory Committee:** **Nicolas Fontaine** *(Nokia Bell Labs, USA)* **Binbin Guan,** *(Microsoft, USA)* **Roland Ryf,** *(Nokia Bell Labs, USA)* **Jochen Schroeder,** *(Chalmers University of Technology, Sweden)* **Marco Eppenberger,** *(PsiQuantum, USA)* **Menno van den Hout, Eindhoven University of Technology, the Netherlands**		

C2.1 Conference room 2.1 | C2.2 Conference room 2.2 | E2 Exhibition room 2 | PV-R Multipurpose room | PV-P Multipurpose poster area

Demo zone Schedule

11:00 - 12:30

Exhibition - Pavilion 1 - Area 1065

Tu2-Ex1/1440 TwinLight: A Multi-Timescale Physical-Layer-Aware T-API-Compliant Optical Domain Controller Digital Twin
Carlos Natalino. (*Chalmers University of Technology)*
We demonstrate TwinLight, an open-source optical-network digital twin acting as an optical domain controller. Its T-API REST and telemetry streaming interfaces use a physical-layer engine comprising a GNPy steady-state QoT baseline and four analytical transients.

Tu2-Ex2/1475 Comparative Demonstration of Coherent-Pluggable Control Architectures for Disaggregated IPoWDM Networks
Hussein Zaid. (*Fraunhofer Heinrich-Hertz-Institute)*
We demonstrate three IPoWDM coherent-pluggable workflows: hierarchical IP-controller-only management, EDCC-governed dual-controller access with hierarchical SDN coordination, and direct optical-controller access without hierarchical controller, validating responsibilities, access control, and policy enforcement on a live multi-vendor testbed.

Tu2-Ex3/1454 MPC-Enabled Agentic AI for Autonomous IPoDWDM Network Lifecycle Automation
Chunmin Xia. (*Adtran Networks SE)*
This demo presents an MCP-enabled agentic AI architecture for autonomous control of vendor-agnostic IPoDWDM networks. We demonstrate live end-to-end lifecycle multi-layer automation and closed-loop control using GNPy and telemetry, validated on a real testbed.

Tu2-Ex4/1444 Inter-Satellite All-Optical Networks (ISAON): Hands-on Demonstration of Orbit-Aware Routing Design and WDM Ground-Emulator Control
Anthony Brasi. (*National Institute of Information and Communications Technology (NICT))*
We developed a software prototype for inter-satellite all-optical network operation, demonstrating GUI-based visualisation of orbit-aware routing and live WDM ground-emulator control to monitor 100/200/300 Gbps transmission performance on the path corresponding to Barcelona–Mumbai.

Tu2-Ex5/1457 Demonstration of a Quantum-Safe Network Service Including Quantum Key Distribution, Software-Define Networking and Telco Edge Cloud Integration
Elisa Redolfi. (*FiberCop S.p.A).*
This demonstration presents a quantum-safe network service integrating QKD, SDN, and Telco Edge Cloud technologies, enabling secure key distribution, real-time monitoring, and industrial application protection, demonstrating scalability, interoperability, and deployment feasibility in realistic telecom environments.

Tu2-Ex6/1484 GsOQDC: A GUI-Driven Interactive Framework for End-to-End Simulation of Optical Quantum Data Centers
Seyed Navid Elyasi. (*University of Bristol*).
We present GsOQDC, an open-source graphical framework integrating optical-network design, distributed quantum-circuit compilation, scheduling, and DES-based remote-gate simulation, enabling end-to-end cross-layer evaluation of entanglement-resource dynamics and system-level performance in Optical Quantum Data Centers

Tu2-Ex7/1466 Demonstration of Digital Twin Development and Validation Workflows in Heterogeneous Multi-Party Environments using OTDS
Hassan Akbari. (*Fraunhofer HHI)*
We demonstrate a Digital Twin (DT) data space enabling policy-governed exchange of Internet Engineering Task Force (IETF)-defined DT components across organizations. The demo showcases interoperable and real-time cross-organizational DT workflows using heterogeneous optical network environments.

Tu2-Ex8/1450 AI-Enabled Autonomous Service Migration for Proactive SLA Assurance in Optical Access and Transport Networks
Hesam Rahimi. (*Huawei Technologies)*
We demonstrate a fully autonomous Network-as-a-Service platform where an AI-assisted orchestrator proactively migrates the services between best-effort and deterministic performance across end-to-end F5G-Advanced access and transport segments to ensure SLA compliance for real-time immersive applications.

Demo zone Schedule

Tu2-Ex9/1461 Failure Detection and Recovery of IP Virtual Network Slice using P2MP DSCM Pluggable Transceivers for Xhaul Networks Controlled by Multi-layer SDN Control Framework
Waleed Akbar. (*CTTC)*
This demonstration showcases autonomous failure detection and recovery for Xhaul IP virtual network slices over P2MP DSCM pluggable, where optical controller detects failure, while the multi-layer SDN framework coordinates the slice migration to backup path.

Tu2-Ex10/1468 OpticalClaw: An Interactive Agentic Digital Twin for Optical Communication System Design and Optimization
TianChi Zhong. (*Peking University)*
OpticalClaw is a remote interactive agent for optical-link design. It embeds a high-fidelity waveform-level digital twin, enabling natural-language link construction, simulation, result analysis, and iterative parameter optimization in a closed loop.

Tu2-Ex11/1455 Demonstration of a Telemetry-Assisted QoS-Aware Scheduler over SOA-Based Time-Slotted Optical Metro-Access Networks
Sadegh Ghasrizadeh. *(Universitat Politècnica de Catalunya, Barcelona Tech – UPC).*
We demonstrate a telemetry-assisted QoS-aware scheduler controlling an SOA-based time-slotted optical metro-access network. Cyclic plans consider real-time telemetry measuring the state of the queues in the access nodes and the priority of 6G traffic flows.

Tu2-Ex12/1449 Demonstration of Joint Communication, Sensing & Monitoring with Unified Management on a 4-Core Multi-Core Fiber
Tom Jürgensen. *(Kiel University (CAU))*
We experimentally demonstrate a 4-core multi-core fiber SDM system, enabling simultaneous bidirectional coherent transmission, IM/DD transmission, integrated longitudinal power monitoring, distributed acoustic sensing, and unified control-plane operation across communication, monitoring, and sensing functions.

Tu2-Ex13/1438 ML-Aided Transponder-Native SOP Sensing for Proactive Restoration in Live Metro Data Center Xchange
Renato Ambrosone. *(Politecnico Di Torino)*
We demonstrate transponder-native SOP sensing over a live metro DCX spectrum service. Coherent transponder telemetry feeds a Kafka-based ML pipeline that classifies fiber disturbances and triggers real ROADM restoration without external polarimeters.

Tu2-Ex14/1447 Autonomous Link Restoration and Capacity Management in Open Optical Networks for Connected Mobility Services
Luca Vettori. *(Centre Tecnològic de Telecomunicacions de Catalunya (CTTC))*
This demonstration integrates sensing with programmable packet-optical infrastructure. We showcase autonomous capacity upgrades and network restoration to maintain high-performance connectivity for demanding mobility applications when using real-world data from a sensorized vehicle platform prototype.

Tu2-Ex15/1482 Telemetry-Driven Scale-Across over On-Demand Optical Slices in Federated Data Centres
Aristotelis Kretsis.
We demonstrate telemetry-driven scale-across of distributed workloads over on-demand optical slices between geo-distributed data centres on a disaggregated multi-vendor testbed. Analytics anticipate SLA pressure across compute- and network-bound phases and trigger QoT-validated slice adaptation.

Tu2-Ex16/1476 Experimental Demonstration of AI in Performance Optimization of Short-Reach Optical Interconnects
Ramin Solaimani. *(CNIT - National Inter-University Consortium for Telecommunications)*
We demonstrate a unified platform that compares AI-assisted optimization strategies for short-reach IM/DD interconnects (transmitter pre-distortion, neural-network and look-up-table receivers, and end-to-end learning) through live simulations and remotely operated laboratory experiments with real-time performance visualization.

Demo zone Schedule

Tu2-Ex17/1442 Preventing Data Hallucinations in Agentic AI for Optical Network Troubleshooting
Jeremias Dötterl. *(Adtran GmbH)*
An agentic AI system for automated troubleshooting in optical communication networks is demonstrated that integrates data references into the agent architecture to prevent data hallucinations, improving the interpretability and trustworthiness of root-cause identification and reasoning.

Tu2-Ex18/1473 Nanoseconds Reconfigurable Optical Switching Platform Based on REC-DFB Laser Arrays and AWGR
Dongxu Zhang. *(Beijing Philinks Technology Co., Ltd.)*
We demonstrate a nanosecond reconfigurable optical switching platform combining REC-DFB laser arrays, AWGR routing, FPGA-based scheduling, and visualized traffic steering to show destination-dependent wavelength selection and dynamic optical path reconfiguration in a four-node prototype.

Tu2-Ex19/1446 Exploiting Observability in Optical Networks for AI-driven Real-time Soft Failure Detection and Continual Learning
Andrea Sgambelluri. *(Scuola Superiore Sant'Anna)*
We propose an observability-enabled AI framework using telemetry for degradation management. The proposed autoencoder-based solution detects anomalies, localizes the soft-failures, automates re-action, and supports continual learning, for automatic model retraining while the network is evolving.

Tu2-Ex20/1480 LLM-Orchestrated Optical-Fibre ISAC Platform for Sensing-Event Monitoring and Selective Network Response
Peiyun Ge. *(University of Bristol)*
We propose an LLM-driven integrated communication-and-sensing system for automated QoT monitoring, sensing-event interpretation, vibration localization, and adaptive network response. Our use case demonstrates real-time vibration-event classification and localization for proactive link-risk assessment.

Tu2-Ex21/1459 240 Gbit/s Coherent PON Demo with Simplified ONU Design Using Uncalibrated Lasers and Coexistence with Legacy PONs
Md Mosaddek Hossain Adib. *(Nokia Bell Labs)*
We demonstrate in-service alignment of a wavelength-uncalibrated LO laser in a proof-of-concept coherent PON setup, enabling a 240 Gbit/s downstream link. Coexistence with legacy PON validates a potential migration path toward future high-capacity access networks.

Tu2-Ex22/1456 Modular & Hybrid Physical-Digital Twin for Optical-Mobile Networking
Valentin Brienza. *(Universidad de la República)*
We demonstrate a modular optical-mobile testbed combining commercial G-PON equipment, an OMNeT++/INET optical DWDM network simulator, and open-source 5G/O-RAN components. Its interchangeable physical, simulated, and emulated segments support researcher-defined fixed-mobile convergence experiments.


ECOC 2026

A1 Auditorium 1	A2 Auditorium 2	E1 Exhibition room 1	C1.1 Conference room 1.1	C1.4 Conference room 1.4
08:00–18:30 Registration				
08:30–09:00 Morning Coffee				
09:00 - 10:30	**09:00 - 10:30**	**09:00 - 10:30**	**09:00 - 10:30**	**09:00 - 10:00**
We1-A - SDM systems	**We1-B - Optical computing**	**We1-C - Advanced integrated modulators and transmitters**	**We1-D - THz transmission and sensing**	**We1-E - Multicore and multimode fibres, devices and characterisation**
SC 05: Optical transmission systems. Georg Rademacher *(Chair)* Kouki Shibahara *(Chair)*	**SC 03: Photonic integrated circuits, assemblies and packaging.** Francesco Da Ros *(Chair)* Claudio Porzi *(Chair)*	**SC 02: Discrete photonic devices and technologies.** Aleksandra Kaszubowska-Anandarajah *(Chair)* Wilfried Maineult *(Chair)*	**SC 08: Sensing and microwave photonics.** Sebastian Randel *(Chair)* Oskars Ozoliņš *(Chair, Riga Technical University)*	**SC 01: Novel fibres, fibre devices and amplifiers.** Kazuhide Nakajima *(Chair)* Alexander Heidt *(Chair)*
09:00 **We1-A1 High capacity SDM transmission.** Ruben Luis *(National Institute of Information and Communications Technology)* Tutorial	**09:00** **We1-B1/33 - Microring Resonators as Neuromorphic Primitives for Optical Computing: Spiking Networks, Complex Perceptrons, and Pho-tonic Preprocessing.** Lorenzo Pavesi *(Nanoscience Laboratory, Department of Physics, University of Trento)* Invited Silicon microring resonators are versatile neuromorphic primitives. We present three applications: all-optical spiking networks for sparse signalling, complex photonic perceptrons for link equalization, and reservoir arrays for sensor pre-processing. These architectures leverage nonlinear dynamics and non-fading memory to enable low-latency, high-speed optical computing solutions.	**09:00** **We1-C1/227 - Over 110 GHz Bandwidth Differential Drive EML with Flip Chip Bonding Technique for 400G/lane Applications.** Kyohei Maekawa *(Sumitomo Electric Device Innovations, Inc.)* A wideband differential drive EML using face-up mounting and flip chip bonding is reported. 3 dB bandwidth exceeds 110 GHz, with simulation indicating 123 GHz. It achieved 3.63 dB extinction ratio and 2.43 dB TDECQ at 180 Gbd PAM4 with 1.5 Vpp differential drive.	**09:00** **We1-D1/73 - Field Trial of 300-GHz THz Signal Transmission over Deployed PBG-HCF Using an Amplifier-Free, Full-Optically Powered RAU for Ultra-Compact, Low-Latency Seamless Links.** Pham Dat *(NICT)* We report the first field trial of THz signal transmission over a deployed PBG-HCF link using an amplifier-free, locally power-free RAU. A 50-Gb/s signal was successfully transmitted over 1 km of deployed PBG-HCF and a 120-m, 300-GHz wireless link with full optical powering.	**09:00** **We1-E1/170 - Statistical Characterization of Spatial and Polarization Mode Coupling in Field-Deployed Coupled-core Multi-core Fibers.** Manish Raj *(Chalmers University of Technology)* We experimentally investigate spatial and polarization mode coupling dynamics in field-deployed coupled-core multi-core fibers in both time and frequency domains. We observe that the fiber exhibits similar isotropic probability density functions in both domains, with spatial modes decorrelating faster in time than polarization modes.

C2.1 Conference room 2.1	C2.2 Conference room 2.2	E2 Exhibition room 2	PV-R Multipurpose room	PV-P Multipurpose poster area
08:00–18:30 Registration				
08:30–09:00 Morning Coffee				
09:00 - 10:30	**09:00 - 10:30**	**09:00 - 10:30**	**09:00 - 10:30**	
We1-F - ITU-T ION-2030: Architectures and standards of optical networks for the AI era. Symposium Raul Muñoz *(Organizer)* Xiang Liu *(Organizer)* Glenn Parsons *(Organizer)* AI workloads, IMT-2030 *(6G)* transport and hyperscale data-centre optics are converging, forcing networks toward 800G/1.6T interfaces, microsecond-level synchronization, deterministic latency, and stringent energy budgets. Session I *(Mobile and Broadband Optical Access in the AI era)* • Opening of the ITU-T ION-2030 symposium, Raul Muñoz *(CTTC)* and Xiang Liu *(Huawei)* • Introduction of the ITU-T ION-2030 framework, Glenn Parsons *(Chair of ITU-T SG15, Ericsson)* • Optics for radio access towards 6G: challenges and opportunities, Fabio Cavaliere, Ericsson, Italy • Status and evolution of optical access broadband, Philippe Chanclou, Orange, France • Fiber sensing and mobile fronthaul in metro/access optical networks, Antionio Napoli, Nokia, Germany. • AI-oriented broadband and home networks in the era of ION-2030, Liang Zhang, Huawei Technologies, China. • Distributed fiber optic sensing *(DFOS)* industry standards and practical use cases, Jun Shan Wey, Verizon, USA. • Broadband Access networks in an IA world, Marcos Martinez, Maxlinear, Spain. • Panel discussion *(All)*	**We1-G - DSP-based optical network monitoring** **SC 04: Signal processing for optical communication and sensing.** Fatih Yaman *(Chair)* Elie Awwad *(Chair, Télécom Paris)* **09:00** **We1-G1/156 - Tens-Meter-Level Least Squares Longitudinal Power Monitoring:A Truncated Singular Value Decomposition Method.** Yichao Wang *(Beijing University of Posts and Telecommunications)* A tens-meter-level single-channel least-squares longitudinal power monitoring scheme is proposed. By incorporating the truncated singular value decomposition method assisted by a window function, the proposed scheme achieves estimation step sizes at 50 m and 75 m in the 80-GBaud simulated and experimental systems, respectively.	**We1-H - Digital signal processing equalization for PON** **SC 07: Optical networks for access, mobile X-haul, in-building, and intra-datacentre interconnects.** Oded Raz *(Chair)* Changyuan Yu *(Chair)* **09:00** **We1-H1/544 - Equalization and FEC Evaluation Beyond D/E2 Class 50G-PON.** Luiz Anet Neto *(IMT Atlantique)* We experimentally assess different equalization schemes allowing optical power budgets beyond 41 dB post-LDPC(17280,14592) decoding in 50G-PON. We also investigate decoder performances in terms of the number of needed iterations on average and assess the accuracy of pre-FEC threshold estimations when compared to post-FEC measurements.	**SC 11: Quantum communications, physical layer security, and optical quantum technologies.** Zong-Quan Zhou *(Chair, University of Science and Technology of China)* **09:00** **We1-I1/1149 - Long-Distance Entanglement Distribution Between Integrated Silicon Photonic Chips.** Damien Roux *(Technical University of Denmark (DTU)* Phase decoherence prevents long-distance path-encoded entanglement distribution. We report chip-to-chip entanglement-based QKD between silicon photonic chips over an 80-km multicore fiber link. Stabilized via a phase-locked loop, we achieve an 85.7% Bell state fidelity and 2.03 bits/s secure key rate.	

A1 Auditorium 1	A2 Auditorium 2	E1 Exhibition room 1	C1.1 Conference room 1.1	C1.4 Conference room 1.4
		09:15 **We1-C2/421 - Low-polarization-dependent Membrane InP-based Electro-absorption Modulator on Si Photonics Platform.** Tatsurou Hiraki *(NTT, Inc.)* We demonstrate a low-polarization-dependent membrane InP electro-absorption modulator on Si photonic circuits. The device exhibits a polarization-dependent insertion loss below 1 dB. PAM4 operation at 256 and 300 Gbps is demonstrated for TE, TM, and mixed polarization, with extinction ratios of 3.0-3.4 and 3.2-3.7 dB.	**09:15** **We1-D2/1017 - On-chip Antenna-Integrated Photonic THz Transmitter for Multi-Band 280-Gbit/s Superchannel Wireless Transmission.** Yinjun Liu *(Fudan University)* We demonstrate a compact antenna-integrated MUTC-PD THz transmitter enabling multi-band wireless transmission across the W- and D-bands. Simultaneous 36/34-Gbaud 16-QAM superchannel signals achieve a total line rate of 280 Gbit/s after 10-km SSMF delivery and 1-m wireless transmission, validating high-capacity broadband photonic THz operation.	**09:15** **We1-E2/743 - Detecting Longitudinal Variations of Spatial Mode Dispersion in Coupled-Core Multicore Fibers via Four-Wave Mixing.** Chiara Lasagni We propose a method for spatially-resolved estimation of the spatial mode dispersion (SMD) coefficient in coupled-core multicore fibers, exploiting the dependence of four-wave mixing on the local SMD. Results from simulations and measurements confirm the ability of the method to detect anomalous longitudinal SMD variations.
	09:30 **We1-B2/1196 - 20 GHz In-situ Optical Backpropagation for Training AWGR-based Hyperdimensional Photonic Tensor Cores.** Odysseas Asimopoulos We demonstrate in-situ optical backpropagation and train a hyperdimensional AWGR-based photonic tensor core, performing both forward and backward MVM operations at 20 GHz and presenting inference accuracies of 93.5% and 81.6% for the Wine and Moons datasets, respectively.	**09:30** **We1-C3/171 - Reconfigurable Integrated Photonics for Massively Scaling AI Systems.** Keren Bergman *(Columbia University)* Invited High-performance systems are limited by the energy and bandwidth of data movement, with off-chip links lagging on-chip communication by orders of magnitude. Integrated silicon photonics ena-bles ultra-broadband, low-power DWDM links, supporting petabit/s chip escape and reconfigurable ar-chitectures that unify connectivity and accelerate distributed AI/ML workloads.	**09:30** **We1-D4/565 - Dual chirps for photonic THz hyperspectral imaging with high spectral resolution and scan rate.** Xing Fang *(Zhejiang University)* We propose and experimentally demonstrate a photonic terahertz imaging system based on dual chirped signals, resolving 250-270GHz spectrum within 40 µs with a resolution of 31.25 MHz and leading ultrafast pixel rates for THz hyperspectral imaging.	**09:30** **We1-E3/285 - Experimental Observation of Modal-Dispersion-Induced FWM Efficiency Increase and Non-linearity Coefficient Characterization in Deployed Coupled-Core Multi-Core Fibers.** Lucas Alves Zischler *(University of L'Aquila)* We experimentally observe enhanced four-wave mixing efficiency induced by spatial-mode dispersion at large channel spacing in a field-deployed coupled-core 4-core fiber, consistent with the theory. We characterize the MCF effective non-linearity coefficient, demonstrating a 4.26-fold reduction against a co-deployed single-mode fiber.

C2.1 Conference room 2.1

09:15 Continuation of:

We1-F - ITU-T ION-2030: Architectures and standards of optical networks for the AI era. Symposium

See page 105.

C2.2 Conference room 2.2

09:15
We1-G2/293 - Practical Implementation of Power Profile estimation with Reduced complexity and Pre-FEC data.
Yingjie Jiang *(State Key Laboratory of Information Photonics and Optical Communications, School of Information and Communication Engineering, Beijing University of Posts and Telecommunications)*
We demonstrate practical power profile estimation with preserved fidelity using symbol-rate data and fewer step size numbers to reduce complexity, and pre-FEC data to remove the need for ideal transmitted data, validated in an 80-GBaud DP-16QAM 5-span experiment.

09:30
We1-G3/883 - Highly Sensitive and Phase-Noise-Tolerant Multipath Interference Localization in IM/DD Systems by Block-based SNC.
Shen Wang *(Key Laboratory of Optical Fibre Sensing and Communications, University of Electronic Science and Technology of China)*
We propose and experimentally demonstrate a phase-noise-tolerant block-based SNC (BSNC) method for MPI localization. This method detects MPI even at a 40-dB SIR, achieving a 14-dB sensitivity improvement. The estimation exhibits a positive correlation with MPI intensity to enable reliable in-service early fault warning.

E2 Exhibition room 2

09:15
We1-H2/101 - Dual Line Coherent Detection.
Nelson Castro *(Aston Institute of Photonic Technologies, Aston University)*
We experimentally demonstrate dual-line coherent detection using an optical frequency comb local oscillator, enabling large frequency offset tolerance with minimal additional signal processing. The proposed method achieves 200 GHz offset tolerance for 400 Gbit/s signals with low penalty, supporting uncooled, low-cost coherent transceivers.

09:30
We1-H3/169 - An Exploratory Study of RS Decoding and Equalization in 50G-PON.
Luiz Anet Neto *(IMT Atlantique)*
We investigate whether XGS -PON RS(248,216) FEC combined with stronger equalization can support 50G-PON optical power budgets with reduced ONU complexity. Experimental results show that MLSE+RS achieves performance equivalent to aFFE+HI-LDPC, while DFE+RS operates within 0.6 dB over 25 km without iterative decoding.

PV-R Multipurpose room

09:15
We1-I2/1353 - Quantum Teleportation of Weak Coherent Polarization States on a Metropolitan Fiber Network in Coexistence With Classical Traffic.
Zofia Borowska *(Deutsche Telekom AG)*
We demonstrate polarization-encoded quantum teleportation on Deutsche Telekom's metropolitan fiber testbed using commercial devices over a 30 km deployed-fiber loop. An average fidelity of 91.4±3.1% is achieved over 30 km, and 91.3±2.6% while co-propagating live classical traffic, confirming compatibility with existing telecom infrastructure.

09:30
We1-I3/797 - Field Trial of a Four-User Entanglement Distribution Network for QKD over Deployed Metropolitan Fiber Using a Commercial Photon Source.
Sarah Sommermeier *(Fraunhofer Heinrich-Hertz-Institute, HHI)*
We demonstrate simultaneous BBM92 quantum key distribution between user pairs in a four-user network over 13.8 km deployed fiber. Using a single commercial entanglement source, wavelength-division multiplexing and White Rabbit synchronization, we achieve 2–2.5 % QBER and 40–54 bit/s secret-key rates.

PV-P Multipurpose poster area

A1 Auditorium 1

A2 Auditorium 2

09:45
We1-B3/141 - Photonic 5D Convolutional Tensor Core Using Time-Wavelength-Space Multiplexing.
Wenjia Zhang *(Shanghai Jiao Tong University)*
We present the first five-dimensional photonic convolutional tensor core integrating a 2×2×2×4 MRR weighting bank for high-accuracy edge extraction and classification. It achieves a computational density of 179.65 TOPS/mm_2, which is 5 times higher than existing photonic programmable accelerators.

10:00
We1-B4/1369 - High-Fidelity Generative Image Reconstruction using a Digital Optical Multiplier.
Pierre Nay
We demonstrate generative image reconstruction via digital optical transposed convolution operating at 5 Gbit/s. The system reconstructs 28×28 images from feature maps with a MSE of 3.42×10−5 against ground truth. Comparison with an analog simulation shows greater robustness against noise accumulation.

E1 Exhibition room 1

10:00
We1-C4/269 - Demonstration of 310 Gb/s PAM4 Operation for a Dual-modulator Differential Electro-Absorption Integrated Laser Diode on an AC-terminated Sub-mount.
Asami Uchiyama *(Mitsubishi Electric Corporation)*
We demonstrate 155 Gbaud PAM4 (310 Gb/s) operation of a dual-modulator differential EML with AC termination, achieving a clear optical eye with measured TDECQ of 2.1 dB. A small-footprint AC termination using a single capacitor experimentally showed an 80 GHz bandwidth comparable to DC-terminated designs.

C1.1 Conference room 1.1

09:45
We1-D5/385 - Integrated Antenna-Coupled Photonic Terahertz Spectrum Analyzer with Hz-Level Accuracy on Thin-Film Lithium Niobate.
Aleksei Gaier *(EPFL)*
We demonstrate an antenna-coupled thin-film lithium niobate photonic spectrum analyzer for wide-span 80–400 GHz spectral analysis with sub-MHz resolution. Optical frequency referencing, together with comb-referenced sampling, enables Hz-accurate frequency readout, establishing an integrated platform for precise characterization of wireless terahertz and millimeter-wave signals.

C1.4 Conference room 1.4

09:45
We1-E4/819 - Long-Range Birefringence Characterization in a Field-Deployed Uncoupled-Core Fiber.
Loreto Valentina Romero Ponce *(Department of Information Engineering, University of Padova)*
Distributed birefringence measurements are presented for a field-deployed 4-core uncoupled-core fiber. Using polarization-sensitive OFDR with section-wise compensation, we achieve kilometer-scale birefringence characterization and observe strong inter-core correlation of the local birefringence vector over the full reconstructed distance. Bidirectional probing at the midsection corroborates measurement reliability.

10:00
We1-A2/105 - 10.33 Pb/s GMI Data-Rate S+C+L Transmission over a Standard-250 µm Coating Diameter, 6-Mode, 7-Core Fiber.
Stefano Gaiani
We achieve 10.33 Pb/s (GMI-estimated) or 9.72 Pb/s (FEC-decoded) data-rate by transmitting 775, polarization-multiplexed, 256-QAM channels across S+C+L-bands (19.25 THz bandwidth) over a 26.6 km, standard-coating, 6-mode, 7-core fiber with a cladding diameter of 171 µm, which is the lowest reported to date.

C2.1 Conference room 2.1

09:45 Continuation of:

We1-F - ITU-T ION-2030: Architectures and standards of optical networks for the AI era. Symposium

See page 105.

C2.2 Conference room 2.2

09:45
We1-G4/405 - Localization of Heterogeneous Fiber Type Using Inverse Scattering Transform.
Ryosuke Takagi *(The University of Osaka)*
We demonstrate the first inverse scattering transform-based method for localizing heterogeneous fiber spans in optical links. Experimental and simulation results show accurate NZ-DSF span identification with dispersion parameter estimation error below 1 ps/nm/km.

10:00
We1-G5/67 - Digital Signal Processing for Longitudinal Power Monitoring and Nonlinear Interference Estimation.
Dario Pilori *(Politecnico di Torino)* Invited
Longitudinal Power Monitoring (LPM) enables DSP-based receiver-side reconstruction of the optical power evolution. This paper reviews recent LPM techniques and implementations, and demonstrates its use for nonlinear interference estimation and span-wise power optimization, enabling accurate, model-light, and scalable performance monitoring in real-world optical networks.

E2 Exhibition room 2

09:45
We1-H4/133 - DSP-Based Mitigation of Extreme DC Leakage for 100G/200G Coherent PON.
Haipeng Zhang *(CableLabs)*
We analyze DC leakage in coherent TDM-PON burst transmitters and demonstrate three mitigations: a frequency-domain adaptive notch, an IF-based transmitter with digital band-pass filter, and an IF plus Rx EO-edge prefilter. Experiments at 30-GBd DP-QPSK/16QAM show leakage tolerance improved from −47.1 dBm to −5.1 dBm.

10:00
We1-H5/345 - Integrated Hybrid 50G DD and 200G Coherent PON with a Shared OLT based on 67-GHz TFLN MZM and Bias Optimization.
Yimin Hu *(Shanghai Jiao Tong University)*
We propose and experimentally demonstrate a hybrid DD-Coherent PON, leveraging single ultra-wideband TFLN MZM-based OLT and frequency-division multiplexing. The trade-off between bias voltage and signal power ratio are optimized. The architecture simultaneously supports 50-Gb/s OOK and 200-Gb/s 16-QAM signals at DD and coherent ONUs, respectively.

PV-R Multipurpose room

09:45
We1-I4/1315 - Single-Copy Entanglement Distillation via Hyperentanglement for Raman-Resilient Quantum Networks.
Domenico Ribezzo *(Dipartimento di Fisica e Astronomia, Università degli Studi di Firenze)*
We demonstrate a practical single-copy distillation protocol for hyperentangled states to enhance QKD resilience against Raman noise in shared fibers. By exploiting frequency-domain correlations, we achieve a 4~dB increase in maximum classical launch power tolerance during co-existence with genuine, co-propagating telecom traffic.

10:00
We1-I5/1432 - A Quantum Internet Based on Solid-State Quantum Nodes.
Samuele Grandi *(Arq Quantum Technologies)* Invited
We present ARQ's approach to a deployable quantum internet: rack-compatible quantum repeaters based on solid-state rare-earth memories interfaced with telecom-band entanglement sources. We discuss how native multidimensional multiplexing in this architecture enables high-rate memory-memory entanglement distribution.

PV-P Multipurpose poster area

A1 Auditorium 1	A2 Auditorium 2	E1 Exhibition room 1	C1.1 Conference room 1.1	C1.4 Conference room 1.4
10:15 **We1-A3/279 - A Simplified Model for Linear Mode Coupling in Multimode Fibers with Experimental Assessment.** Paolo Carniello *(Technical University of Munich)* We propose a novel surrogate model for linear coupling in graded-index multimode fibers that is computationally more efficient than existing models, and can be tuned through a single measurable parameter. The model is benchmarked numerically and experimentally on a 90-polarization-mode fiber.	**10:15** **We1-B5/152 - Noise analysis in optical computing systems based on analog bits.** Raúl López March *(Universitat Politècnica de València)* We analyse noise in optical computing systems based on analog bits (anbits) by mapping photocurrent perturbations at the receiver onto the Generalized Bloch Sphere. Our results enable the design of noise-tolerant, high-density anbit constellations in scalable photonic processors for artificial intelligence and machine learning applications.	**10:15** **We1-C5/197 - Demonstration of an Optical I/Q Modulator Using Surface-Normal Electroabsorption Modulators.** Haoshuo Chen *(Nokia)* We experimentally demonstrate a broadband optical I/Q modulator based on compact surface-normal electroabsorption modulators (SNEAMs). The device exhibits a wide operating wavelength range, reduced footprint, and temperature insensitivity, making it well suited for high-density integration and a promising candidate for co-packaged optics applications.		

10:30–11:00 Coffee Break

C2.1 Conference room 2.1	C2.2 Conference room 2.2	E2 Exhibition room 2	PV-R Multipurpose room	PV-P Multipurpose poster area
10:15 Continuation of: **We1-F - ITU-T ION-2030: Architectures and standards of optical networks for the AI era.** Symposium See page 105.		**10:15** **We1-H6/315 - Demonstration of 50-Gbps SSB DCPC Transmission for Over-40-km-Reach and 1:512-Split PON Using Remotely Pumped BiDi-EDFA and Distributed Raman Amplification.** Ryo Koma *(NTT, Inc.)* We propose a long-reach, high-splitting-ratio PON using bidirectional remotely pumped EDFA and Raman amplification. Upstream and downstream 50-Gb/s transmission experiments in L- and C-bands confirm feasibility of over 40–60 km reach and split ratios of up to 1:512.		

10:30–11:00 Coffee Break

A1 Auditorium 1

11:00 - 12:30

We2-A - Advancements on optical fiber transmission

SC 06: Architecture, modelling and performance of optical networks.
Takehiro Tsuritani *(Chair)*
Carmen Mas Machuca *(Chair, University of the Bundeswehr Munich)*

11:00
We2-A1/390 - Optical fibre communications and network innovations: the past 60 years and what the future holds.
Russell Davey *(BT)* Tutorial
This tutorial reviews the history and vital role of optical fibre communications from a BT perspective and speculates what the future may hold.

A2 Auditorium 2

11:00 - 12:30

We2-B - SiP Based Modulators

SC 02: Discrete photonic devices and technologies.
Eric Bernier *(Chair)*
Yuriko Maegami *(Chair)*

11:00
We2-B1 Pushing terabits: 800g and 1.6t silicon photonic transmitters at scale.
Erman Timurdogan *(Lumentum)*
Invited

E1 Exhibition room 1

11:00 - 12:30

We2-C - LLM-driven control and automation in optical networks

SC 10: Control and management of optical networks.
Behnam Shariati *(Chair)*
Raul Muñoz *(Chair)*

11:00
We2-C1/939 - Token-Efficient and Output-Reliable LLM Agent for Link Fault Diagnosis via Skill-Augmented and SOP-Constrained Design.
Shengnan Li *(Beijing University of Posts and Telecommunications)*
We propose a skill-augmented and SOP-constrained LLM Agent for optical link fault diagnosis. By organizing diagnostic capabilities into reusable skills with progressive disclosure, the Agent reduces token usage by 86% and achieves 100% RCA accuracy on a commercial-equipment testbed, while ensuring deterministic operation.

C1.1 Conference room 1.1

11:00 - 12:30

We2-D - Ultra-wideband systems

SC 05: Optical transmission systems.
Chiara Lasagni *(Chair)*
Mingming Tan *(Chair, Aston University)*

11:00
We2-D1/443 - 423.7 + 426.5 Tb/s GMI Bi-Directional HCF Transmission.
Jiaqian Yang *(University College London (UCL)*
We demonstrate OESCL-band same-wavelength bi-directional transmission over 60 km HCF with 42.5 THz bandwidth, achieving GMIs comparable with the highest unidirectional SMF data-rates in both directions, with an aggregate of 423.7 + 426.5 Tb/s.

C1.4 Conference room 1.4

11:00 - 12:30

We2-E - Advanced distributed fiber sensing

SC 08: Sensing and microwave photonics.
Sonia Martín López *(Chair, Consejo Superior de Investigadores Científicas)*
María del Rosario Fernández-Ruíz *(Chair)*

11:00
We2-E1/1037 - Towards Six-Decade Dynamic Range for Distributed Strain Sensing Using Coherent Microwave-Frequency OTDR.
Yan Ren *(Universidad de Alcalá)*
A coherent microwave-frequency OTDR scheme is demonstrated. By simultaneously extracting radio frequency and optical frequency signals through coherent detection, it supports distributed strain sensing from sub-nanostrain to hundreds of microstrain levels, offering a promising approach for saturation-free wide-range sensing in earthquake early warning applications.

C2.1 Conference room 2.1

11:00-12:30

We2-F - ITU-T ION-2030: Architectures and standards of optical networks for the AI era. Symposium

AI workloads, IMT-2030 *(6G)* transport and hyperscale data-centre optics are converging, forcing networks toward 800G/1.6T interfaces, microsecond-level synchronization, deterministic latency, and stringent energy budgets.

Session II *(AI Datacenters and AI-ready optical networks)*

- Framework and Requirements for AI deployment in Telco Transport Networks, Juan Pedro Fernández Palacios, Telefónica, Spain
- TBD, Chengliang Zhang, China Telecom, China
- Sustainable Optical Transport Architectures for AI: The F5G Advanced Perspective, Olivier Ferveur, Post Technologies, Luxembourg.
- Silicon photonics Optical switches for next gen AI datacenters, Daniel Pérez-López, Ipronics, Spain
- Optical interconnects for scaleup architectures and the standardization efforts, Fotini Karinou, Microsoft, UK.
- The current state of AI in Broadband today, and its role in the future, Martin Creaner, World Broadband Association
- Panel discussion *(All)*
- Closing of the ITU-T ION-2030 symposium, Raul Muñoz *(CTTC)*, Xiang Liu *(Huawei)* and Glenn Parsons *(Chair of ITU-T SG15, Ericsson)*.

C2.2 Conference room 2.2

11:00 - 12:30

We2-G - Optical processing

SC 03: Photonic integrated circuits, assemblies and packaging.
Wenjia Zhang *(Chair, Shanghai Jiao Tong University)*
Francesco Da Ros *(Chair)*

11:00
We2-G1/297 - Microring-Based Programmable Temporal Kernels for Ultrafast Photonic Neural Networks.
Shaojie Liu *(The Chinese University of Hong Kong)*
We propose a temporal convolution paradigm for photonic neural networks beyond static weighting. A single microring resonator performs programmable multi-tap convolution at 128 Gbaud, achieving 5.12 TOPS computing throughput. We demonstrate a multiplexed system enabling hardware-efficient and high-dimensional computing with 48 TOPS/mm^2.

E2 Exhibition room 2

11:00 - 12:15

We2-H - SDM transmission

SC 01: Novel fibres, fibre devices and amplifiers.
Patrice Mégret *(Chair)*
Peter Ingo Borel *(Chair)*

11:00
We2-H1/1419 - Space Division Multiplexing for Ultra-High Capacity Optical Communications.
Chigo Okonkwo *(Eindhoven University of Technology)* Invited
We review progress in space-division multiplexing towards recent records in standard-cladding 19-core randomly coupled multi-core fibres, including 1.7 Pb/s and 568.8 Tb/s over 5,166 km, addressing the yearly increase in capacity demands from AI and hyperscale datacenter interconnects.

PV-R Multipurpose room

11:00 - 12:30

We2-I - Advanced signal processing and real-time implementations

SC 04: Signal processing for optical communication and sensing.
Hae Young Rha *(Chair)*
Manabu Arikawa *(Chair)*

11:00
We2-I1/52 - Real-Time 100G Burst-Mode Coherent Receiver with Convergence-Free DSP.
Tao Zeng *(State Key Laboratory of Optical Communication Technologies and Networks, China Information and Communication Technology Group Corporation)*
We demonstrate a real-time 100G burst-mode coherent receiver with convergence-free DSP eliminating burst-start convergence. Fast impairments are resolved feedforward, while slow effects use pre-initialized channel states with adaptive refinement. Immediate acquisition is achieved under ±100 ppm asynchronous operation, with −30 dBm sensitivity without optical amplification.

PV-P Multipurpose poster area

A1 Auditorium 1

A2 Auditorium 2

E1 Exhibition room 1

11:15
We2-C2/1339 - A T-API-Compliant ReAct Agentic Loop for Optical Networks: Generic vs. Domain-Specific Tool Abstractions.
Morteza Ahmadian *(Chalmers University of Technology)*
Optical networks need intent-driven, closed-loop agentic management, a key enabler for higher autonomy levels. We present the first T-API-compliant reasoning and act (ReAct) loop. We show that domain-specific composite tools achieve 90% oracle-validated correctness with threefold token savings compared to generic tools.

11:30
We2-C3/1409 - LLMs and Optical Networks: A Symbiotic Relationship.
Massimo Tornatore *(Politecnico di Milano)* Invited
This paper explores the emerging symbiosis between LLMs and optical networks. LLMs require geo-distributed training, which demands advanced optical transport capabilities that require new technical enablers, as WAN-aware CCL algorithms, ZR+ pluggables, and Hollow-Core Fibers. Conversely, LLMs also enable new forms of autonomous network management.

C1.1 Conference room 1.1

11:15
We2-D2/968 - 75.6-Tbps (700 Gbps x 108 ch.) L+U-band Transmission over Multi-span Field-deployed DSF Link Enabled by PPLN-based OPA/EDFA Hybrid Repeater.
Megumi Hoshi *(Network Innovation Laboratories, NTT, Inc.)*
We demonstrated 75.6-Tbps L+U-band WDM transmission over 2×70.4-km field-deployed DSF using a hybrid repeater of EDFAs and waveband converting optical parametric amplifiers with PPLN waveguides. The gain stability of our hybrid repeater and signal quality in the L- and U-band was validated over an hour.

11:30
We2-D3/497 - S+C+L-band WDM Transmission Under Realistic Telco Transport Network Conditions.
Erwan Pincemin *(Orange SA)*
We report here a S+C+L-band WDM transmission over 4x100-km SSMF carrying 50-Tbps overall on 12-THz bandwidth with Raman-assisted mitigation of inter-band Raman crosstalk under realistic telco transport network conditions including the use of industrial coherent transponders.

C1.4 Conference room 1.4

11:15
We2-E2/703 - Distributed Single-Shot Birefringence Measurement with Sub-Meter Resolution Using Dual-Polarization TEΦOTDR.
Julia Mateu-Comas *(Universidad de Alcalá)*
We demonstrate a single-shot, fully distributed technique for linear birefringence measurement of single-mode optical fibers based on dual-polarization TE-ΦOTDR. The method retrieves the local birefringence magnitude from local spectral shifts, achieving sub-meter spatial resolution. We also prove its capacity for sensing transverse loads.

11:30
We2-E3/721 - Distributed and dynamic strain sensing in a hollow-core anti-resonant fiber.
Pedro Vidal Moreno *(University of Alcala)*
Distributed acoustic sensing is limited by strain–temperature cross-sensitivity in standard fibers. We demonstrate distributed sensing in hollow-core fiber using mode walk-off interferometry, enabling spatial mapping and dynamic strain sensing without Rayleigh scattering. Results show localized perturbation detection over hundreds of meters.

C2.1 Conference room 2.1

11:15 Continuation of:

We2-F - ITU-T ION-2030: Architectures and standards of optical networks for the AI era. Symposium

See page 113.

C2.2 Conference room 2.2

11:15
We2-G2/84 - Experimental Demonstration of Few-Sample Energy-Aware Hardware-in-the-Loop Training of Photonic Neural Networks.
Guangwei Cong *(AIST, Japan)*
We propose and experimentally demonstrate an energy-aware augmented simultaneous perturbation stochastic approximation (SPSA) algorithm and few-sample in-situ training of photonic neural networks (PNNs), reducing power consumption by ~20–57% and improving both time and power efficiency in training by 10-30x while maintaining >95% classification accuracy.

11:30
We2-G3/71 - Heterogeneous Photonic Integration for High-Performance Communication and Computing.
Liangjun Lu *(Shanghai Jiao Tong University)* Invited
In this talk, I will review our recent work on heterogeneously integrated photonic devices via micro-transfer printing for high-performance communication and computing, achieving a 110-GHz modulator and a −45-dB crosstalk optical switch by synergistically combining silicon nitride with thin-film lithium tantalate/niobate.

E2 Exhibition room 2

11:30
We2-H2/148 - Impact of Separated/Coupled Core Amplification on MDL and SMD Characteristics in Coupled Multi-core Fibre Link.
Taiji Sakamoto *(NTT Inc.)*
We quantitatively clarify that coupled-core multi-core fibre amplifiers simultaneously achieve low mode-dependent loss (MDL) and low spatial-mode dispersion (SMD) over the C-band, while separated-core amplification poses severer requirements regarding the property variations between single-mode amplifiers to lower MDL and SMD even with independent gain control.

PV-R Multipurpose room

11:15
We2-I2/380 - Low-Complexity FPGA Implementation of Rate-Adaptive Hierarchical Distribution Matcher.
Zulin Liu *(Beijing University Of Posts and Telecommunications)*
We propose a modified hierarchical distribution matching architecture that enables flexible transmission rate adjustment with low complexity and fine rate granularity in a rate-adaptive probabilistic shaping system, achieving real-time line rate adjustment from 96 Gb/s to 179.2 Gb/s on a single FPGA.

11:30
We2-I3/476 - Parallel DSP Architecture with Pilot Aggregation for Real-Time MIMO Equalization Enabling Fast Polarization Tracking.
Syoma Miura *(Graduate School of Engineering Science, The University of Osaka)*
We propose a parallel DSP architecture for MIMO equalization where pilot samples are aggregated into a single parallel channel, enabling fast polarization tracking. FPGA-based evaluation shows that the proposed method significantly reduces circuit resources while achieving delay below 6 ns, demonstrating suitability for real-time implementation.

PV-P Multipurpose poster area

A1 Auditorium 1

A2 Auditorium 2

11:45
We2-B3/1289 - Beyond 110 GHz Silicon-Organic Hybrid Modulator.
Wim Bogaerts
First-time demonstration of 3dB bandwidth larger than 110GHz for a vertical silicon organic hybrid electro-optical (EO) modulator without back gating. For the same Pockels coefficient, the new configuration shows a two times reduced compared to classical SOH devices.

12:00
We2-B4/163 - Post-Fabrication Laser-Trimmed Microring Modulator Operating Beyond 100 Gbaud.
Erwan Weckenmann *(Universite Laval)*
We demonstrate the first laser-trimmed silicon microring modulator validated under high-speed data transmission beyond 100 Gbaud. Post-fabrication trimming enables a permanent 376 GHz resonance shift without compromising modulation efficiency or electro-optic bandwidth. Bit-error-rate measurement confirms no performance penalty induced by trimming.

E1 Exhibition room 1

12:00
We2-C4/731 - Agentic AI for IPoDWDM Network Lifecycle Automation: An MCP-Enabled Architecture.
Chunmin Xia *(Adtran Networks SE)*
We present a distributed, vendor-agnostic multi-MCP architecture for SDN-based automation and autonomous control of multi-vendor, multi-layer IPoDWDM networks. The framework enables E2E service lifecycle automation, closed-loop cross-layer control using GNPy model and optical telemetry, and is experimentally validated on a IPoDWDM testbed.

C1.1 Conference room 1.1

11:45
We2-D4/1325 - Time-Domain Two-Pulse Collisions Nonlinear Interference Noise Model for Ultra-Wideband Links.
Marco Santagiustina
We extend the time-domain model of two-pulse collisions nonlinear interference noise to ultra-wideband single-mode links. We identify key length scales, derive a classification of collision regimes, and explain similarities and differences with Gaussian noise models, especially under low dispersion and low differential group delay.

12:00
We2-D5/988 - Enabling Technologies for Long-Haul Ultra-Wideband Transmission Utilizing Extremely Long Wavelengths.
Shimpei Shimizu *(NTT, Inc.)* Invited
We introduce our work on extending the WDM bandwidth to longer wavelengths in the U- and X-bands and its key technologies for long-haul transmission, including the ISRS design and an ultra-wideband inline repeater using high-efficiency parametric waveband conversion with periodically poled lithium niobate (PPLN) waveguides.

C1.4 Conference room 1.4

11:45
We2-E4/185 - Phase Noise Suppression in Distributed Acoustic Sensing Using a Hollow-Core-Fiber-Assisted Interferometer.
Jiazhen Ji *(Shanghai Jiao Tong University)*
The performance of distributed acoustic sensing degrades significantly when the interrogator is subject to phase-noise induced by environmental perturbations. We propose a hollow-core-fiber delay interferometer for environmentally robust phase-noise compensation, achieving a 46% improvement in strain resolution at 50 km sensing range under environmental perturbations.

12:00
We2-E5/123 - Distributed measurement of hollow core optical fibres.
Radan Slavik *(University of Southampton)* Invited
We review the brief history of distributed measurement techniques for characterization of anti resonant hollow-core fibres, highlighting the associated challenges and solutions, which often differ from those in single-mode optical fibre measurements.

C2.1 Conference room 2.1

11:45 Continuation of:

We2-F - ITU-T ION-2030: Architectures and standards of optical networks for the AI era. Symposium

See page 113.

C2.2 Conference room 2.2

12:00
We2-G4/816 - Experimental Demonstration of Flexible, Multi-Wavelength All-Optical Equalization using a Receiver-Side Integrated Photonic Reservoir.
Sarah Masaad *(Ugent - imec)*
As IM/DD links scale, equalization across multiple wavelength channels becomes increasingly demanding. Here, we demonstrate an integrated photonic reservoir for adaptable, multi-wavelength equalization using TDM-assisted training. Results on 14–28 Gbaud/λ, 20–70km and up to four wavelengths show up to four orders BER improvement over DSP.

E2 Exhibition room 2

11:45
We2-H3/1012 - Characterization of Mode-Dependent Gain in Distributed-Raman-Amplified 90-km Multi-mode Fiber with Remote Digital Holography.
Divya Shaji *(University of L'Aquila)*
Using optical injection-locking-based remote digital holography, we investigate the impact of distributed Raman amplification (DRA) on the mode-dependent gain (MDG) of a 90-km, three-mode graded-index multi-mode fiber. Observed MDG trends are further supported by the corresponding mode-differential-gain due to DRA in an emulated transmission system.

12:00
We2-H4/1326 - Demonstration of Dispersion-Diversity Signal Processing Using a 19-Core Heterogeneous Multicore Fiber.
Sergi García Cortijo *(Universitat Politècnica de València)*
We demonstrate a 19-core heterogeneous multicore fiber operating as a tunable sampled true-time delay line for dispersion-diversity signal processing. Three distinct preforms, scaled to implement the 19 cores, enable quasi-linear chromatic dispersion increments across the channels. Experimental results confirm controlled differential delay and reconfigurable filtering.

PV-R Multipurpose room

11:45
We2-I4/117 - AI-core Enabled Real-time 2.0-Tbit/s Coherent Transceiver Operating at 234 Gbaud.
Xuefeng Tang *(Huawei Technologies Canada)*
We demonstrate a real-time coherent transceiver operating at a baud rate of 234 Gbaud. The transceiver incorporates advanced ASIC-implemented DSP algorithms and an integrated AI core, delivering sufficient performance margin to support transmission over a 60-km SSMF link.

12:00
We2-I5/258 - Completely Optical-Filterless Comb-Based Transmitter with a Relaxed Clock Rate for Multi-Tbps Single-Carrier Transmission.
Hiroshi Yamazaki *(NTT, Inc.)*
We demonstrate a transmitter architecture that optically extends signal bandwidth without any filtering of the comb lines. A digital spectral weaver with half the conventional frequency-division spacing halves the clock rate required for comb generation. Up to 2.9-Tbps single-carrier transmission is achieved with 320-GBaud signaling.

PV-P Multipurpose poster area

A1 Auditorium 1

12:15
We2-A3/718 - Field Trial of Digital Subcarrier Multiplexing-based P2MP over 170 km for Distributed Data Center Network Interconnect.
Chenxiao Zhang *(KDDI Research, Inc.)*
We demonstrate a DSCM-based P2MP optical interconnect architecture through a ~170-km metro field trial. Full C-band transmission, long-term stability, coexistence with legacy services, asymmetric link tolerance, and dynamic re-grouping capabilities are experimentally validated.

A2 Auditorium 2

12:15
We2-B5/1163 - 200 GBaud PAM-4 Silicon Photonic Traveling-Wave Mach-Zehnder Modulator for 400G/lane IM/DD Links.
Simone Cammarata *(imec)*
A silicon photonic Mach–Zehnder modulator supporting 400 Gb/s per lane with 200 GBaud PAM-4 modulation format is demonstrated, featuring carrier-dispersion phase shifters and differential push-pull electrodes with ground shielding to suppress parasitic RF mode excitation.

E1 Exhibition room 1

12:15
We2-C5/1025 - Hybrid Active-Online Learning Framework for Label-Efficient Concept Drift Adaptation in Optical Network Failure Detection.
Yousuf Moiz Ali *(Aston University)*
We propose a hybrid active-online learning framework for label-efficient concept drift adaptation in optical network failure detection. Using margin-based selective labeling, our method achieves near- ceiling accuracy and AUC scores while querying only 3.4% of streaming samples, with negligible latency overhead compared to static inference.

C1.1 Conference room 1.1

C1.4 Conference room 1.4

12:30–14:00 Lunch at your own

12:30 - 14:00
Women in photonics: "WIP-BEAM: Women in Photonics-Bridging Excellence and Advancement through Mentorship".
Organizers:
Carmen Mas Machuca *(University of the Bundeswehr Munich)*
Anjali Sharma *(University of the Bundeswehr Munich)*
Panelists:
Lena Wosinska *(Chalmers University of Technology)*
Olga Vassilieva *(1Finity Americas, Inc)*
Anna Tzanakaki *(National and Kapodistrian University of Athens, Greece)*

C2.1 Conference room 2.1

12:15 Continuation of:

We2-F - ITU-T ION-2030: Architectures and standards of optical networks for the AI era. Symposium

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C2.2 Conference room 2.2

12:15
We2-G5/1257 - Compact Single Chip SiGe BiCMOS Optical Phased Array for Energy Efficient, Fast Beam Steering.
Saeed Arsanjani *(Technical University of Berlin and Silicon Austria Labs GmbH)*
A compact, energy efficient SiGe BiCMOS optical phased array (OPA) implemented on an electro-photonic integrated circuit (EPIC) platform is presented. The 1×32 array achieves a 51.2°×15.7° beam steering range, a reduced per-channel electrical power consumption of 2.5mW /π, and a fast 2.6μs beam configuration time.

E2 Exhibition room 2

PV-R Multipurpose room

12:15
We2-I6/1020 - First-Ever Burst-Capable Adaptive Optical Signal Processor for Next-Generation PON Upstream Links.
Giannis Kanakis
We experimentally demonstrate the first optical signal processor compatible with burst-mode upstream reception in Passive Optical Networks. The processor integrated in Indium Phosphide enables nanosecond-scale reconfiguration, performs equalization and noise suppression, and may potentially reduce complexity and power consumption of US digital signal processing.

PV-P Multipurpose poster area

12:30–14:00 Lunch at your own

A1 Auditorium 1

14:00 - 15:30

We3-A - Switching architectures in optical networks

SC 06: Architecture, modelling and performance of optical networks.
Vittorio Curri *(Chair)*
Camille Delezoide *(Chair)*

14:00
We3-A1/1407 - Automated Performance Optimization for Data Center Exchange over Open Optical Networks: Challenges and Future Perspectives.
Toru Mano *(NTT, inc.)* Invited
This paper addresses data center exchange optimization over open optical networks under physical-layer uncertainty. A 300-km field experiment showed that a digital-twin framework combining physical models, digital longitudinal monitoring, and optical line system calibration can characterize unknown resources, optimize settings, and enable rapid optical-path provisioning.

A2 Auditorium 2

14:00 - 15:00

We3-B - Integration of magne-to-optics

SC 03: Photonic integrated circuits, assemblies and packaging.
Claudio Porzi *(Chair)*
António Teixeira *(Chair)*

14:00
We3-B1/1421 - Nonreciprocal integrated magneto-optics: from optical isolators to new applications in communications, sensing, and computing.
Paolo Pintus *(University of Cagliari)*
Tutorial
Magneto-optic materials exhibit the nonreciprocal capability to control the amplitude, phase, and polarization of light with an external magnetic field. In this tutorial, I will highlight recent progress in their integration and explore emerging applications across communications, sensing, and next-generation computing paradigms.

E1 Exhibition room 1

14:00 - 15:30

We3-C - On-chip light emission and detection

SC 12: CLEO® Special Session on Emerging Trends in Optics and Photonics.
Daniel Benedikovic *(Chair, University of Zilina)*
Carlos Alonso Ramos *(Chair, C2N, CNRS)*

14:00
We3-C1 Coherent and silicon photonics: a marriage for the long and short haul.
Chris Doerr *(Aloe Semiconductor)*
Invited

C1.1 Conference room 1.1

14:00 - 15:30

We3-D - Signal processing for high-speed IMDD

SC 04: Signal processing for optical communication and sensing.
Manabu Arikawa *(Chair)*
Hae Young Rha *(Chair)*

14:00
We3-D1/1343 - PAM12 Modulation Coding Options Enabling High-Speed IM/DD Transmission in Bandwidth-Limited Systems.
Suttikarn Wantee *(University of Southampton)*
We investigate two-dimensional bit-mapping for PAM12 transmission, identifying a valid solution for Gray coding. We experimentally demonstrate its performance in a 203 Gbit/s PAM12 transmission over 2-km single-mode fibre, showing the feasibility of high-order PAM for reduced electrical bandwidth utilisation and improved spectral efficiency.

C1.4 Conference room 1.4

14:00 - 15:15

We3-E - Innovations in high capacity, short reach links

SC 07: Optical networks for access, mobile X-haul, in-building, and intra-datacentre interconnects.
Michela Svaluto Moreolo (Chair)
Oded Raz (Chair)

14:00
We3-E1 #1329 Demonstration and Study of Silicon-Photonics-Based 720-Gbps Dual-polarization IMDD.
Chris Doerr.
A 720-Gbps dual-polarization *(DP)* IMDD system including a 180-GBd PAM4 transmitter and a Stokes polarization demultiplexer is demonstrated. Employed PICs are comprised entirely of silicon-photonics. Demultiplexed eye diagrams are presented for homodyne and heterodyne schemes.

C2.1 Conference room 2.1

14:00 - 15:15

We3-F - Integrated optical sensing and communications systems

SC 09: Free-space optics and optical wireless technologies.
Amalia Miliou *(Chair)*
Volker Jungnickel *(Chair)*

14:00
We3-F1/90 - Experimental Demonstration of a Mid-IR Free Space Link for Simultaneous Gas Sensing and Adaptive Communication.
Wing Ko *(University of Southern California)*
We demonstrate an OFDM-based mid-IR free-space link at ~3.3 μm for simultaneous multi-gas sensing and coherent communication. We show sensing results with <15% error in gas concentration, and the sensing-informed adaptive loading enables ~60-Gbit/s OFDM transmission.

C2.2 Conference room 2.2

14:00 - 15:30

We3-G - Subsea fiber sensing and advanced interrogation techniques

SC 08: Sensing and microwave photonics.
Steinar Bjørnstad *(Chair, Tampnet AS)*
Ming-Fang Huang *(Chair)*

14:00
We3-G1/1204 - Long-Term Measurements from a North-Atlantic Deep-Ocean Observatory on Dual Telecom Cables.
Mikael Mazur *(Nokia Bell Labs)*
We report one year of continuous data from the IRIS cable and six months from a trans-Atlantic cable. Using per-span interferometry, this >150-sensor deep-ocean observatory successfully captured concurrent seismic signals, Spring-Neap ocean tides, deep-sea turbulence, and long-term drift.

E2 Exhibition room 2

14:00 - 15:15

We3-H - HCF systems

SC 05: Optical transmission systems.
Junjie Li *(Chair)*
Fan Yu *(Chair, HUAWEI)*

14:00
We3-H1/828 - 202-km Single-Span 200-GBd C-Band IM/DD Transmission over Hollow-Core Fibre Using a SiN Integrated Recurrent Optical Spectrum Slicer.
Periklis Petropoulos *(Optoelectronics Research Centre, University of Southampton)*
We report single-wavelength (145-GBd PAM4 and 200-GBd OOK) and WDM (20×160-GBd OOK) IM/DD transmission over a 202-km single-span hollow-core fibre with 34.5-dBm launch power, enabled by a silicon nitride optical pre-processor, achieving a record 646.4 Tb/s·km capacity-distance product.

PV-R Multipurpose room

14:00 - 15:30

We3-I - Hollow-core fibre characterisation and standardisation

SC 01: Novel fibres, fibre devices and amplifiers.
Marco Santagiustina *(Chair)*
Alexander Heidt *(Chair)*

14:00
We3-I1 Rayleigh speckle backscatter measurements of hollow core fiber
Nicolas Fontaine *(Nokia Bell Labs)*
Invited

PV-P Multipurpose poster area

A1 Auditorium 1

14:30
We3-A2/1356 - Evaluating Hyperconnected Optical Core Networks Under Future Traffic Requirements.
Mirko Zitkovich *(Universität der Bundeswehr München)*
As optical core networks are expected to evolve toward hyperconnected topologies, understanding their trade-offs becomes critical. This work evaluates traffic redistribution, fiber deployment, and quality of transmission, showing that hyperconnectivity relieves resource pressure with relatively low signal penalties but increases transponder requirements.

A2 Auditorium 2

E1 Exhibition room 1

14:30
We3-C2/#1500 The development of avalanche photodetectors for silicon photonics.
Andrew Knights *(McMaster University)*
Invited
Avalanche Photodetection provides an efficient means to maintain a link budget for a photonic system. For silicon photonics there exist multiple device geometries, which are summarised here. We show that in the case of defect mediated detection, elevated temperature operation leads to improved performance.

C1.1 Conference room 1.1

14:15
We3-D2/418 - Resonant Plasmonic Optical DAC for Low-Power IM/DD Links.
David Moor *(ETH Zurich Institute of Electromagnetic Fields (IEF))*
We experimentally demonstrate low-power intensity-modulated links utilizing optical digital-to-analog converters (DACs) based on resonantly enhanced plasmonic devices. By enabling amplitude multiplexing in the optical domain, this approach supports transmission with reduced processing com-plexity, achieving rates up to 336 Gb/s/POL/λ.

14:30
We3-D3/579 - Photonic-Electronic Arbitrary-Waveform Generation Enabling 276 GBd Electrical and 260 GBd Optical PAM4 Signaling.
Daniel Drayss *(Karlsruhe Institute of Technology (KIT)*
We demonstrate 276 GBd electrical PAM4 signaling using a photonic–electronic arbitrary-waveform generator (PE-AWG). We validate the concept in optical signaling experiments with thin-film lithium-niobate Mach-Zehnder modulators, achieving PAM4 symbol rates up to 236 GBd in the O-band and 260 GBd in the C-band.

C1.4 Conference room 1.4

14:15
We3-E2/877 - Single-SMF Bidirectional Up-to-180GBd 400Gb/s IM-DD Links Utilizing Optoelectronic equalization (OE-EQ) with Direction-, Wavelength- and Baudrate-shared Simple Optics.
Paikun Zhu *(National Institute of Information and Communications Technology)*
We demonstrate record single-SMF bidirectional IM-DD transmissions of 180GBd/lane 50km, 320Gb/s/lane 30km and 400Gb/s 20km in C-band with standard PAM formats. It is enabled by a bidirectional OE-EQ technique with shared low-complexity optics supporting both directions, different wavelengths baud-rates.

14:30
We3-E3/1404 - Accelerating the Terabit Breakthrough: Defining the Future of Ultra-High-Speed Ethernet.
John D'Ambrosia *(Futurewei, U.S. Subsidiary of Huawei)* Invited
Ethernet is accelerating to meet the extreme scale-up and scale-out demands of AI back-end fabrics. IEEE 802.3dj's 200 Gb/s–1.6 Tb/s solutions are already reshaping architectures, and the IEEE 802.3 Working Group is assessing requirements beyond 200 Gb/s to power the next wave of AI systems.

C2.1 Conference room 2.1

14:15
We3-F2/941 - Integrated Mid-Infrared Ranging and Free-Space Communication using a Low-Threshold Directed-Modulated QCL.
Zhidong Lyu *(Zhejiang University)*
We report the first system-level MWIR FSO integrated sensing and communication (ISAC) demonstration at 4.52 μm, combining a low-lasing-threshold directly modulated QCL with an uncooled UTC-PD, achieving 4.28 Gb/s data transmission with ~4.0 cm ranging resolution.

14:30
We3-F3/178 - Hz-to-kHz Range Vibration Sensing in a 2.53 Tb/s FSO System.
Keisuke Matsuda *(Mitsubishi Electric Corporation)*
Detection of 4 Hz to 2 kHz vibration of a transmitter was demonstrated using forward-transmitted communication signal by measuring the Doppler frequency shift. In an anomaly detection scenario of a tower, abnormal vibration reproduced from field data was detected while transmitting a 2.53 Tb/s capacity.

C2.2 Conference room 2.2

14:15
We3-G2/543 - Sea-Scan: High-Accuracy, ML-based Dark Vessel Detection and Localisation via Weakly Supervised DAS Monitoring.
Tian Tian *(ADAPT Centre, School of Computer Science and Statistics, Trinity College Dublin)*
We present an ML-based vessel detection and localization system, trained with weak supervision from imperfect AIS labels, that achieves a 97.8% detection rate at 1.98% false-trigger rate, successfully identifies dark-vessel events from unlabeled data.

14:30
We3-G3/1185 - SOP Sensing in Hollow-Core Fiber: Forward Sensing using COTS Transponder and Localization with Coherent OTDR.
Adrish Sahu Sahu *(Nokia Bell Labs)*
We experimentally investigate and compare distributed state-of-polarization sensing in support-tube hollow-core and standard single-mode fiber. Despite significantly weaker Rayleigh backscattering and reduced polarization sensitivity in hollow-core fiber, polarization perturbations remain observable and spatially localizable, demonstrating the feasibility of SOP-based distributed sensing in hollow-core fiber.

E2 Exhibition room 2

14:15
We3-H2/1249 - Unrepeatered Transmission of 2x43.2 Tb/s Bidirectional Real Time data over 266 km leveraging Low Loss GTA-ST Hollow Core Fiber with a Single Booster Amplifier.
Haik Mardoyan *(NOKIA BELL LABS)*
We report real-time unrepeatered bidirectional transmission of 2×36 channels at 1.2-Tb/s, achieving a full-duplex total throughput of 86.4-Tb/s on a single fiber over 266-km, enabled by a newly designed low-loss Gap-Tube-Assisted Support-Tube hollow-core fiber and a single high-power booster doped-fiber amplifier.

14:30
We3-H3/863 - 15 THz Long-Haul O-band Transmission over Hollow Core Fibre Supported by Wideband Bismuth-Doped Fibre Amplifiers.
Romulo Aparecido de Paula Junior *(University College London)*
We demonstrate long-haul, wideband O-band transmission enabled by hollow-core fibre and wideband bismuth-doped fibre amplification. A 60 km recirculating loop enables record single-amplifier-type system throughputs of 95.7, 61.1, and 31.1 Tb/s over 360, 1080, and 3000 km, respectively, across bandwidths of up to 15.3 THz.

PV-R Multipurpose room

14:30
We3-I2/1089 - Distributed Measurement of Magnitude and Orientation of the Local Birefringence Vector in a 5-Tube NANF.
Silvia Zampato *(University of Padova)*
Invited
We present the first complete measurement of the local birefringence vector in a 5-tube NANF. Measurements performed from both sides of a fiber wound on two coils of different diameters show excellent self-consistency and good agreement with numerical simulations.

PV-P Multipurpose poster area

A1 Auditorium 1

14:45
We3-A3/637 - Optimizing 800G IPoWDM Architectures through Optical Bypass, Thin Transponders and Proprietary Channel Modulation.
Annalisa Morea *(Nokia)*
This work highlights the value of IPoWDM architectures with optical bypass, describing when Thin Transponders as regenerators and 800G ZR+ optical pluggable proprietary mode significantly improve energy efficiency—30% average—while optimizing interface deployment and maximizing traffic across core WDM networks.

15:00
We3-A4/918 - Network-Level Impact of EDFA Gain Fluctuations under Dynamic RWA in High-Symbol-Rate WDM Networks.
Taisei Sekizuka *(Nagoya University)*
We investigate EDFA gain fluctuations under dynamic RWA through network simulations, experimental characterisation, and transmission evaluation in high-symbol-rate WDM networks. Results reveal increased intra-link fibre utilisation variation, gain-profile distortion, and accumulated Q-factor degradation, highlighting EDFA gain fluctuations as a non-negligible impairment in such optical networks.

A2 Auditorium 2

E1 Exhibition room 1

15:00
We3-C3/1396 - Recent progress on III-V on Si photonic transmitters.
Joan Ramirez Ramirez *(Nokia Bell Labs / III-V Lab)* Invited
We demonstrate InP-based high-speed EML-SOA transmitters integrated on silicon photonics using a single heterostructure based on AlGaInAs multi-quantum wells. Devices show a fiber-coupled modulated output power of 2 dBm, a static extinction ratio over 25 dB and a BER below the HD-FEC at 58 Gbps.

C1.1 Conference room 1.1

14:45
We3-D4/#382 Peak Amplitude Constrained Linear Pre-Equalization Design Method for Intensity Modulation and Direct Detection Systems
Wouter Lanneer *(Nokia Bell Labs)*
We propose a novel design method for linear transmit-side pre-equalization in IM/DD systems that takes DAC peak amplitude constraints directly into account. Experimental 100G PON results demonstrate a loss budget improvement of 4.3 dB for PAM2 compared to conventional methods while utilizing fewer filter taps.

15:00
We3-D5/323 - Direct Detection with High Electrical Spectral Efficiency.
Yikai Su *(Shanghai Jiao Tong University)* Invited
Carrier assisted direct detection receiver can reconstruct the optical field of a complex-valued double-sideband signal, thus achieving a high electrical spectral efficiency comparable to that of a coherent homodyne receiver, while eliminating the need for a costly local oscillator laser.

C1.4 Conference room 1.4

15:00
We3-E4/245 - 2.4 Tb/s OCS-based Intra-to-Inter Datacentre IM/DD Links Over 54-km MCF Using Sub-pJ/bit Membrane DML Arrays.
Nikolaos Panteleimon Diamantopoulos *(NTT, Inc.)*
We demonstrate a high-bandwidth, low-latency, OCS-based WDM+SDM O-band IM/DD link for AI datacentre scale-across networking, spanning SR-to-ER distances without OEO conversion. Net 2.4 Tb/s is achieved over a heterogeneous 54-km MCF link using sub-pJ/bit membrane DML arrays, extending energy-efficient intra-datacentre DML transmitters to metro-DCI reach.

C2.1 Conference room 2.1

14:45
We3-F4/1108 - A Silicon Photonic Integrated Quasi-Monostatic Focal-Plane-Array FMCW LiDAR.
Guillaume Croes *(imec)*
We present a solid-state quasi-monostatic FMCW LiDAR realized on a 200-mm silicon photonics platform, integrating a 32 ×16 focal-plane-array transceiver that enables 20 m ranging and imaging of real-world targets with only 200 µW optical emission per pixel.

15:00
We3-F5/232 - 158° Wide-FoV Photomultiplier-Assisted Reception for Bent-Pipe Visible-Light Communication.
Bernhard Schrenk *(AIT Austrian Institute of Technology)*
A silicon photomultiplier is explored as spatial-diversity receiver. Its wide field-of-view enables end-to-end VLC links between end-points that do not share a direct line-of-sight connection. Towards that, LiDAR point-cloud transmission is shown around an obstructing building.

C2.2 Conference room 2.2

14:45
We3-G4/1124 - Characterization of a 10.9-km Hollow-Core Fiber with 920-um Resolution Using a 10-kHz-Linewidth Tunable Laser Source.
Xun Guan *(Tsinghua University Shenzhen International Graduate School)*
Based on the noise model of optical frequency-domain reflectometry (OFDR), our analysis indicates that lower reflection relaxes the linewidth requirement of the tunable laser source (TLS). We experimentally characterize a 10.9-km hollow-core fiber (HCF) with 920-um resolution using a 10-kHz-linewidth TLS.

15:00
We3-G5/794 - Sensitivity Comparison of Microwave-Frequency and Optical Fibre Interferometry Based on State-of-the-Art Components.
Georgios Karydis *(Department of Informatics and Computer Engineering, University of West Attica)*
We compare the sensitivity of fibre interferometers to vibrations using microwave oscillators and state-of-the-art lasers over distances up to 70 km. High spectral purity lasers outperform only above 10 Hz, highlighting microwave advantages at low frequencies and the potential of hybrid microwave–optical interferometry systems.

E2 Exhibition room 2

14:45
We3-H4/135 - Net 12-Tb/s (30λ×400-Gb/s/λ) IM/DD DWDM Transmission Over 3.2-km Ultra-low Chromatic Dispersion DNANF Covering Full Super C-Band.
Shouchuan Ma *(Pengcheng Laboratory, Tsinghua University)*
For the first time, a net 12-Tb/s IM/DD transmission experiment using 30 160-GBaud PAM8 is carried out over a 3.2-km hollow-core double-nested anti-resonant nodeless fibre with ultra-low chromatic dispersion of less than 1.5ps/nm/km in the entire super C-band.

15:00
We3-H5/498 - Full C-Band Net 8.4 Tb/s (40λ×112Gb/s/×2dir.) Real-Time DWDM IM/DD Transmission over 22 km AR-HCF.
Yunhong Liu *(Pengcheng Laboratory)*
We demonstrate the first real-time DWDM IM/DD transmission over 22km anti-resonate hollow-core fiber loaded by 40λ 100G optical modules at C-band, achieving net capacity of 8.4Tb/s via dual-direction with BERs all below the 7 % HD-FEC threshold of 3.8×10^{-3}.

PV-R Multipurpose room

15:00
We3-I3/1398 - Field Deployment Practice, Key Challenges, and Standardization Outlook of Hollow-Core Fibers and Transmission Systems.
Dong Wang *(China Mobile Research Institute)* Invited
This paper summarizes field deployment practices and long-term stability of hollow-core fibres (HCFs) in real operating environments. It analyses key challenges like gas absorptions and current progress of solutions, and prospects future standardization of HCF and transmission systems.

PV-P Multipurpose poster area

A1 Auditorium 1	A2 Auditorium 2	E1 Exhibition room 1	C1.1 Conference room 1.1	C1.4 Conference room 1.4
15:15 **We3-A5/1056 - Network-Wide Deployment of Pluggable Transceivers with Selective Wavelength Routing and Path-Splitting Regeneration.** Shunya Shimoi *(Nagoya University)* We propose an architecture for regional and core networks that combines low-loss optical bypass at FXCs with regeneration at selected WXCs, enabling end-to-end connectivity using only ZR+ pluggable transceivers even with their limited transmission reach. Simulations show lower transceiver cost with modest fibre penalty.				

15:30–16:00 Afternoon coffee

C2.1 Conference room 2.1	C2.2 Conference room 2.2	E2 Exhibition room 2	PV-R Multipurpose room	PV-P Multipurpose poster area
	15:15 **We3-G6/764 - Multiple FBG Thermometry using a Dual-Comb Interrogator.** Clara Quevedo-Galán *(CEMDATIC - Universidad Politécnica de Madrid)* Fiber Bragg grating sensing benefits from dual-comb interrogation, enabling faster measurements and enhanced resolution. We demonstrate quasi-distributed dual-comb thermometry based on gain-switched multimode lasers. The approach enables the sequential interrogation of multiple FBGs, expanding the spectral coverage of the sensor and achieving 30 mK precision.			
15:30–16:00 Afternoon coffee				
				Posters sessions Schedule **15:30 - 17:00** **(See page 136)**

A1 Auditorium 1

17:00 - 18:30

We5-A - Network operation and fault management in optical networks

SC 10: Control and management of optical networks.
Shuangyi Yan *(Chair)*
Joao Pedro *(Chair)*

17:00
We5-A1/1416 - SDN Agents for IPoWDM Routers and Coherent Pluggables.
Andrea Sgambelluri *(Scuola Superiore Sant'Anna)* Tutorial
This tutorial presents an overview of the IPoWDM technology and devices, coherent pluggable transceivers and recent studies on SDN agents enabling the deep control of those devices, exposing standard NETCONF/YANG APIs, while envisioning the next future towards agentic paradigm.

A2 Auditorium 2

17:00 - 18:30

We5-B - Optical transmitters and transceivers

SC 03: Photonic integrated circuits, assemblies and packaging.
Chin-Hui *(Janet)* Chen *(Chair)*
Lian Qin *(Chair)*

17:00
We5-B1/1430 - Progress of High-speed VCSELs and VCSEL-based Co-Packaging for Short Reach Communications.
Daniel Kuchta *(Nvidia Corp.)* Invited
This talk will cover the state of art of VCSELs used for short reach data communications and VCSEL-based packaging solutions of co-packaged transceivers for scale-up applications.

E1 Exhibition room 1

17:00 - 18:30

We5-C - Integrated sensing and communication

SC 08: Sensing and microwave photonics.
María del Rosario Fernández-Ruíz *(Chair)*
Sonia Martín López *(Chair, Consejo Superior de Investigadores Científicas)*

17:00
We5-C1/822 - Experimental Assessment of CP-DAS+DWDM Co- and Counter-propagation in C+L Bands.
Hugo Martins *(Instituto de Óptica CSIC (IO-CSIC)*
An in-depth experimental characterization of the compatibility between C+L band DWDM coherent transmission and chirped-pulse DAS is performed under realistic conditions, showcasing strong impairments to the telecom signals in co-propagating configurations, but robust performance in counter-propagation, with DAS performance largely unaffected in both cases.

C1.1 Conference room 1.1

17:00 - 18:15

We5-D - Optical wireless technologies for next-generation networks systems

SC 09: Free-space optics and optical wireless technologies.
Volker Jungnickel *(Chair)*
Beatriz Ortega Tamarit *(Chair)*

17:00
We5-D1/1090 - In-Orbit Demonstration of Dual-ITLA Silicon Photonics Coherent Optical Module Supporting 100/200 Gbps Communications.
Quan Li *(Shanghai Optoelectronics Science and Technology Innovation Center)* Invited
We demonstrate the in-orbit validation of a dual-ITLA silicon photonics coherent optical module for LEO inter-satellite laser communication. In-orbit loopback test at 492 km LEO confirms the key performances at both 100 Gbps and 200 Gbps PM-QPSK modes.

C1.4 Conference room 1.4

17:00 - 18:15

We5-E - PON sensing, monitoring energy efficiency

SC 07: Optical networks for access, mobile X-haul, in-building, and intra-datacentre interconnects.
Paola Parolari *(Chair, Politecnico di Milano)*
Salvatore Spadaro *(Chair, Technical University of Catalonia, UPC)*

17:00
We5-E1/294 - Sensing in PON – techniques and applications.
Jochen Maes *(Nokia Bell Labs)*
Invited
We provide an overview of use cases and methodologies for sensing in passive optical networks. With its point-to-multipoint nature, we address the potential to resolve events between drop fibers, and the preference for low-cost central-side solutions.

C2.1 Conference room 2.1

17:00 - 18:30

We5-F - Quantum devices

SC 11: Quantum communications, physical layer security, and optical quantum technologies.
Yunhong Ding *(Chair, DTU Electro, Technical University of Denmark)*

17:00
We5-F1/746 - Contextuality-based Integrated Semi-Device-Independent Quantum Random Number Generator.
Maddalena Genzini Genzini *(Technical University of Denmark)*
We demonstrate an integrated semi-device-independent quantum random number generator based on contextuality. By implementing a KCBS inequality test on a programmable photonic circuit, we certify genuine randomness and achieve an extractable rate of 0.077 bits per round, enabling scalable, chip-based certified QRNGs.

C2.2 Conference room 2.2

17:00 - 18:30

We5-G - Advance phase and timing recovery

SC 04: Signal processing for optical communication and sensing.
Andrea Carnio *(Chair)*
Sjoerd Van Der Heide *(Chair)*

17:00
We5-G1/846 - Mitigation of Error Bursts after Pilot-Aided Carrier Phase Recovery.
Han Cui *(Chalmers University of Technology)*
We propose two phase estimation error (PEE)-aware schemes for bursty phase noise channels: one based on average PEE and one capturing bursty PEE statistics. Simulations show that both outperform the conventional scheme, with the latter performing best under strong burst conditions.

E2 Exhibition room 2

17:00 - 18:30

We5-H - Coupled core MCF systems

SC 05: Optical transmission systems.
Adolfo Cartaxo *(Chair, Instituto de Telecomunicações)*
Mingming Tan *(Chair, Aston University)*

17:00
We5-H1/664 - 1.17-Pbps C + Extended-L Band 68-km Transmission over Field-Installed 12-Coupled-Core Fibre Cable.
Kohki Shibahara *(NTT Inc.)*
We demonstrate 10.2-THz-bandwidth 12-coupled-core-fibre multiband transmission over a field-installed cable, achieving a record 1.17-Pbps net capacity (12 SDM × 68 WDM × 1.43 Tbps/λ/SDM). Real-time FPGA-based MIMO-DSP prototype also confirms stable BER performance for 1-GBd QPSK with C+extended-L band spatially-coupled channel copropagation.

PV-R Multipurpose room

17:00 - 18:30

We5-I - VCSELs

SC 02: Discrete photonic devices and technologies.
Selina Farwell *(Chair)*
Eric Bernier *(Chair)*

17:00
We5-I1/504 - 2.3 Tbit/s Backside-Emitting 1060 nm VCSEL Array on Silicon Interposer for CPO Applications.
Marc Ganzhorn *(Coherent)*
Communication inside AI datacenters requires highest bandwidth-densities and energy-efficiency. We demonstrate a 2x9 VCSEL array at 128 Gbit/s PAM-4 (2.3 Tbit/s) with 160 µm pitch. We further show 32 Gbit/s NRZ operation up to 125° C without DSP and no power degradation at 125° C.

PV-P Multipurpose poster area

17:15
We5-C2/85 - Field Trial of SDN-controlled Point-to-MultiPoint Sensing of Weak Urban Events in 50G HS-PON.
Margarita Fylaktaki *(Aristotle University of Thessaloniki)*
The first field-trial of Point-to-MultiPoint sensing in field-deployed 50G HS-PONs is demonstrated exploiting real-time SDN-allocation of its wavelength-tunable sensing-channels and wavelet-transform-based DSP-techniques for detection of weak non-stationary urban events beyond the limits of conventional Fourier-transform spectrograms.

17:30
We5-B2/290 - 19.1-THz Tunable Wideband TFLN/SiPh Hybrid Integrated 800G CFP2 Transceiver for AIDC Scale-Across Clusters.
Baoluo Yan *(ZTE Corporation)*
We demonstrate a CFP2 coherent transceiver with hybrid TFLN/SiPh COSA and ultra-wideband SOA, enabling 800G PS-16QAM across 19.1-THz S+C+L bands. Achieving 0-dBm output, >35-dB Tx OSNR, and 74.8% fiber saving, it addresses AIDC scale-across cluster demands.

17:30
We5-C3/806 - Advancing Forward-Transmission Fibre Sensing for Precise Event Localisation.
Jian Fang *(NEC Laboratories America)*
Invited
We review recent progress in forward-transmission fibre sensing from a practical perspective, revisit the fundamental challenges in the localisation performance, and discuss possible approaches to improve event localisation accuracy.

17:30
We5-D2/615 - Hybrid Free-space-optics and Millimetre-wave D-band Trans-mitter enabled by Optically Harmonically Locked Lasers.
Zichuan Zhou *(University College London)*
We demonstrated hybrid free-space optics (FSO) and D-band (110-170GHz) millimetre wave transmitter enabled by a single phase-locked laser pair, simultaneously enabling ultra-low RF phase noise and optical linewidth for communications. Based on this, we further study combined capacity with beam angle misalignment using >100Gb/s signalling.

17:30
We5-E2/392 - Burst-Mode Polarization Sensing and ODN Monitoring for Aerial Fiber Using a Commercial 25G PON.
Vincent Houtsma *(Nokia, Bell Labs)*
We report on a low-cost polarization sensing element located at OLT side of a commercial 25G PON system to enable ODN monitoring. Sensing is performed in burst-mode on upstream PON wavelength. Field results using aerial fiber are reported as well.

C2.1 Conference room 2.1

17:15
We5-F2/468 - High-Speed Quantum Random Number Generator Using Flip-Chip Bonded Laser.
Axl Bomhals *(IDLab, Ghent University - imec)*
We present an advancement in quantum random number generator integration by using a fully integrated vacuum fluctuation-based noise source containing a flip-chip bonded laser and low-noise TIA to produce secure random numbers in real-time at rates up to 87.46 Gbit/s.

17:30
We5-F3/1413 - Engineering Deterministic Quantum Light Sources at Telecom Wavelengths.
Elizaveta Semenova *(Technical University of Denmark)* Invited
Deterministic telecom quantum light sources are limited by stochastic emitter properties and placement. We present paths to address these issues: near-critical InAs/InP quantum dot (QD) epitaxy, Stark tuning, deterministic cavity fabrication, and site-controlled epitaxy,- enabling QD device fabrication with improved yield, tunability, and single-photon purity.

C2.2 Conference room 2.2

17:15
We5-G2/709 - Phase-Recovery-Free 6bit/4D Coherent Transmission Using Subcarrier-Joint Modulation for Large-Linewidth Lasers.
Tianhong Zhang *(Peking University)*
We propose a subcarrier-joint modulation scheme and experimentally demonstrate, to the best of our knowledge, the first high-order coherent transmission without phase recovery in a large-linewidth system. Robust 80-km operation and strong linewidth tolerance are verified under 100-kHz and 1-MHz lasers.

17:30
We5-G3/370 - Baud-Rate Timing Recovery with 1UI DGD Tolerance for Dual Polarization Coherent Systems.
Xiaofei Su *(FRDC)*
A baud-rate timing recovery to mitigate the impact of polarization mode dispersion is proposed and validated by simulations and experiments. It does not rely on successful PMD compensation and carrier phase recovery and achieves 1 UI DGD tolerance, enhancing robustness in baud-rate coherent systems.

E2 Exhibition room 2

17:15
We5-H2/810 - Real-Time Dual-Polarization IM-DD Transmission over Coupled-Core 4-Core Fiber Using All-Optical MIMO and FPGA Transceivers.
Stefano Grillanda *(Nokia Bell Labs)*
We perform the first real-time dual-polarization IM-DD transmission over 5 km of randomly-coupled 4-core fiber using a silicon photonic all-optical MIMO chip and a real-time DSP engine, made by hard-silicon transceivers inside an FPGA. We show real-time demultiplexing and tracking of 10 Gb/s NRZ-OOK channels.

17:30
We5-H3/666 - Power-Safe Inter-Core Split-Pumping for C+L-Band Distributed Raman Amplified Transmission Using Randomly Coupled 12-Core Fiber.
Kouki Taguchi *(Network innovation Laboratories, NTT inc.)*
We propose an inter-core split-pumping scheme for power-safe operation in distributed Raman-amplified transmission over randomly coupled multicore fibers. A ≥5-dB distributed gain *(up to 8.3 dB)* in a 51-km 12-core fiber over the 10.2-THz C+L-band is demonstrated with 800 mW launched into each SMF section.

PV-R Multipurpose room

17:15
We5-I2/1223 - 62-GHz Bandwidth 1060-nm Metal-Aperture VCSELs Enabling 256-Gbps PAM4 and Modal-Dispersion-Free SMF/MMF Links.
Fumio Koyama *(Institute of Science Tokyo)*
We report record 62-GHz bandwidth in 1060-nm metal-aperture coupled-cavity VCSELs with highly-strained QWs and optimized damping. These devices enable 256-Gbps PAM4 back-to-back and 200-Gbps over 1-km SMF. Additionally, SMF-mode-filtered 500-m MMF (OM4) links exhibit >50-GHz link bandwidth with ±4-μm VCSEL-coupling tolerance, ensuring modal-dispersion-free MMF transmission.

17:30
We5-I3/1221 - Low-Threshold Single-Frequency Intra-Cavity VCSELs for Scalable Cryogenic Computing.
Behzad Namvar *(Tampere University)*
VCSELs suitable for cryogenic optical interconnects to superconducting processors are demonstrated. An intra-cavity design was used to minimize Joule losses and ensure high thermal dissipation. Single-mode operation with SMSR > 45 dB and 130 μA threshold is demonstrated at 5 K.

PV-P Multipurpose poster area

A1 Auditorium 1

A2 Auditorium 2

17:45
We5-B3/44 - Industry's First 12.8T 8×DR8 High-Density Liquid-Cooled 64-Channel Pluggable XPO Optical Module for Scale-Up.
Sunil Priyadarshi *(Arista Networks)*
This work presents a 12.8T liquid-cooled pluggable optical module addressing bandwidth and thermal challenges in AI data centers. The XPO architecture enables high-density silicon photonics integration. Measurements demonstrate 212 Gbps PAM4 performance, ~188 W power consumption, and improved thermal efficiency.

18:00
We5-B4/437 - Advanced Industrial Silicon Photonics Platform on 300mm wafer for Optical Interconnect and Beyond.
Frederic Boeuf *(STMicroelectronics)*
Invited
We review the development of 300mm wafer Silicon Photonics platform for 200Gbps/lane and its extension towards Co-Packaged-Optics (CPO) through the addition of 110GHz GeSi electro-absorption modulator (EAM), 70GHz Micro-Ring Modulators (MRM) and Through Silicon Via (TSV). Investigations on integration of III-V materials is also discussed.

E1 Exhibition room 1

18:00
We5-C4/753 - Large-Scale Integrated Sensing and Communication over Bidirectional 200-Gb/s Coherent PON with 256 ONUs.
Qi Wu *(The Hong Kong Polytechnic University)*
We experimentally demonstrate a large-scale PON that integrates distributed optical fiber sensing with bidirectional single-wavelength 200-Gb/s transmission. The system achieves 37-dB optical power budgets, 25-m localization accuracy, and supports up to 256 ONUs with distinguishable multi-point simultaneous vibrations.

C1.1 Conference room 1.1

17:45
We5-D3/1392 - Optical Satellite Communication Systems – A Canadian Perspective.
Steve Hranilovic *(McMaster University)*
Invited
Optical satellite communications is maturing globally, yet Canada faces unique challenges including high-latitude orbital constraints, persistent cloud cover, and connectivity for remote northern communities. This paper surveys recent Canadian research at McMaster University highlighting advances in coherent receivers, mid-infrared links, silicon photonics, and adaptive optics.

C1.4 Conference room 1.4

17:45
We5-E3/389 - Experimental Demonstration of Simultaneous SOP Sensing on All Active ONUs in Upstream GPON.
Saverio Pellegrini *(Dipartimento di Elettronica e Telecomunicazioni, Politecnico di Torino)*
We experimentally investigate SOP-based sensing in upstream GPON using a single OLT-side polarimeter, focusing on sampling rate, synchronization, averaging strategies, and resulting SOP angular deviation. We show coarse localization capabilities, discriminating whether vibrations occurred on the feeder or in each distribution fiber.

18:00
We5-A2/1311 - Experimental Multimodal Dataset and Benchmark for Soft-Fault Classification in Coherent Optical Transmission Systems.
Zhiming Sun *(Peking University)*
We present a multimodal experimental dataset for soft-fault classification in coherent optical transmission systems. It contains 3463 receiver captures, 34 structured features, and four tensor modalities. Extra Trees achieves 0.9356 macro-F1 on the four-class benchmark, with WSS showing the clearest separation.

18:00
We5-E4/125 - Experimental Evaluation of Energy Saving in XGS-PON ONU.
Philippe Chanclou *(Orange)*
This paper experimentally evaluates XGS-PON ONU doze mode, demonstrating up to 1 Watt energy savings while preserving service continuity. It analyzes how low-power and aware intervals affect consumption, and shows practical bandwidth–energy trade-offs for 128 shared ONUs and supporting greener broadband network operation.

C2.1 Conference room 2.1

C2.2 Conference room 2.2

17:45
We5-G4/51 - Receiver-Side Compensation of TI-DAC Offset Mismatch in Optical Transceivers.
Meng Qiu *(Huawei Technologies Canada Co., Ltd.)*
We propose a calibration and compensation technique, performed in receiver digital signal processing, to mitigate effects of offset mismatch in digital-to-analog converters (DAC) with time-interleaving (TI). It enables on-demand re-calibration during system operation thanks to its post-processing nature, and achieves effective compensation with low complexity.

E2 Exhibition room 2

17:45
We5-H4/874 - Unrepeatered 312.5 km Transmission Over a Randomly-Coupled Multicore Fiber With Bidirectional Raman Amplification.
Ruben Luis *(National Institute of Information and Communications Technology)*
We demonstrate a 39.9 nm, C-band, 312.5 km, 160.8 Tb/s transmission on a 4-core, randomly-coupled, multicore fiber. The link uses bidirectional Raman amplification with conventional and incoherent pumps shared over all cores through random coupling in the fiber.

PV-R Multipurpose room

17:45
We5-I4/433 - 1060 nm back-emitting VCSEL modulated at 106 Gbps PAM4 transmission over 100 m OM3 MMF for NPO Applications.
Constance Chang-Hasnain *(Berxel Photonics, USA)*
We demonstrate 1060 nm back-emitting VCSELs with 37 GHz bandwidth, −149.5 dB/Hz RIN, and transmits 50 Gbps NRZ and 106 Gbps PAM4 over 100 m OM3 fiber. Accelerated aging predicts >1000-year lifetime under normal operation, promising for low-cost optical interconnects.

PV-P Multipurpose poster area

18:00
We5-F4/1377 - Ultra-Compact and High-Bandwidth Silicon Photonic Chip for Fully Integrated CV-QKD Systems.
Taijie Li *(zhejiang university)*
We demonstrate a fully integrated CV-QKD chip system including a laser chip, a transimpedance amplifier chip, and silicon photonic chips, which features a compact micro-ring IQ modulator and a high-speed homodyne detector operating up to >16 GHz frequency.

18:00
We5-I5/394 - Performance, Reliability and Manufacturability of 1060nm VCSEL Arrays for AI Data Center Scale-Up.
Matthew Glenn Peters *(Lumentum)*
Invited
Lumentum's 1060nm multi-mode VCSEL arrays will enable scalable parallel optical interconnects for high-speed links with excellent power efficiency, thermal performance, and reliability making them well suited for both scale-up bandwidth density and scale-out reach in next-generation data center architectures.

A1 Auditorium 1	A2 Auditorium 2	E1 Exhibition room 1	C1.1 Conference room 1.1	C1.4 Conference room 1.4
18:15 **We5-A3/812 - Fault Prediction and Localization in Optical Networks Based on Incremental Tensor Network-GRU.** Yuxuan Gao *(Beijing University of Posts and Telecommunications)* An iTenGRU model is proposed for fault prediction and localization,achieving 91% prediction and 96% localization accuracy in the testbed.When retraining less than 1% of parameters on unseen faults, >93% prediction and 96% localization accuracy with respect to full retraining are still achieved.		**18:15** **We5-C5/422 - Over-80-km Transmission of Image-Derived Semantic Data via a Distributed Fiber-Optic Acoustic Sensing Link.** Wataru Kohno *(NEC Corporation)* We demonstrate underwater acoustic transmission of image-derived semantic messages using an over-80-km distributed fiber-optic acoustic sensing link with chirp-coded pulse interrogation, Raman amplification, and fiber-optic hydrophones. At 50~bps with Raman amplification, 100 scene-graph messages *(21,193 bits)* are delivered without observed errors (BER upper bound $4.72\ times10^{-5}$.		

19:30–22:30 Conference dinner at Finca Nadales - bus transfer available

C2.1 Conference room 2.1	C2.2 Conference room 2.2	E2 Exhibition room 2	PV-R Multipurpose room	PV-P Multipurpose poster area
18:15 **We5-F5/681 - Towards Scalable Quantum Clock Synchronization Networks Using InGaAs Single Photon Avalanche Detectors and High-Brightness Integrated Entanglement Photon Pair Sources.** Kostas Sozos *(University of West Attica, Department of Informatics and Computer Engineering)* We experimentally showcase the potential of ps-level precision quantum clock synchronization based on silicon nitride microring resonators as sources of entangled photons. We also propose a quantum clock synchronisation architecture that improves scalability requiring only one single-photon avalanche detector per user at the server side.	**18:15** **We5-G5/255 - Modeling and Mitigation of Equalization-Enhanced Phase Noise.** Benedikt Geiger *(Karlsruhe Institute of Technology)* Invited Equalization-enhanced phase noise *(EEPN)* emerges as a key performance limitation in high symbol-rate coherent transmission systems. In this paper, we highlight recent advances in modeling EEPN and show that the temporal Gaussian noise model reproduces the characteristic burst-like SNR degradation, enabling efficient system simulation.			

19:30–22:30 Conference dinner at Finca Nadales - bus transfer available

Poster Session in PV-P (Multipurpose poster area)

15:30 – 17:00

We4-P1/845 - Multimode Multicore Fiber with 19 Cores for Short Reach Data Center Interconnects (SC01)
Ming-Jun Li *(Corning Incorporated)*
A multimode multicore fiber with 19 cores was designed and fabricated for short reach datacenter applications using VCSEL or micro-LED arrays. Fiber characteristics such as core refractive index profile, core position accuracy, attenuation, crosstalk are reported.

We4-P2/902 - 200 km SSMF Transmission of C+L-Band 800 Gbps Signals Using Bidirectional Distributed Raman Amplification with High Power Incoherent Forward Pumping (SC01)
Daichi Ogata *(Furukawa Electric Co., Ltd.)*
We demonstrate 201.6km standard SMF single-span transmission of C+L-band 60 channel 100 GBd DP-16QAM signals employing bidirectional distributed Raman amplification. Amplified incoherent forward pumps suppress relative intensity noise transfer to the signals, while forward and backward Raman pumps each operate with sub-1 W power.

We4-P3/911 - Ultra-Large Mode Area All-Solid Antiresonant Fiber with Effective Single Mode Guidance (SC01)
Charu Goel *(Temasek Laboratories, Nanyang Technological University)*
We demonstrate effectively single-mode guidance in an all-solid antiresonant fiber with an ultra-large mode area exceeding 3000 μm2. The fiber offers strong broadband suppression of higher-order modes over a short propagation length of 1 m, enabling scalable design for high-power lasers.

We4-P4/930 - Experimental Demonstration of 34 OAM Modes Reaching the Third Radial Order in a Weakly Guiding Three-Layer Ring-Core Fiber (SC01)
Quanhao Niu *(Huazhong University of Science and Technology)*
We design and fabricate a three-layer weakly guiding ring-core fiber capable of supporting the third-order radial OAM modes, with a total of 34 OAM modes. Experimental characterization shows superior performance of the fabricated fiber with low loss and low crosstalk.

We4-P5/966 - Increased Gain per Unit Length in O-band Bismuth Doped Amplifiers with Trench Assisted Fibre (SC01)
Daniel Elson *(KDDI Research, Inc.)*
Trench assisted bismuth doped fibre (TA-BDF) is used for O-band amplification. TA-BDF is compared to standard BDF, higher gain per meter and lower noise figure are demonstrated for both forward and backwards pumping configurations. RIN transfer of both doped fibres are compared to SMF.

We4-P6/982 - Characterization of Resonance-Induced PDL in ST-HCF via Mueller Matrix Method and Coherent Transmission (SC01)
Xinyu Hao *(Huazhong University of Science and Technology)*
PDL in HCFs is mainly induced by asymmetric cladding-resonance-interference leakage mismatch. By analysing the Mueller matrix characterization of a 150-km ST-HCF, 2.54-dB PDL peak is identified @192.2 THz. In transmission experiments, the Q-factor penalty between X/Y polarisations reveal highly correlations with this resonance-induced effect.

We4-P7/1024 - Three-wavelengths fiber optical parametric oscillator tunable from 1296 to 1916 nm (SC01)
Mariia Bastamova *(Aston University)*
We demonstrate a continuous-wave pumped fiber optical parametric oscillator tunable over the 1296-1916 nm range with output powers of 10-25 dBm. Three waves (signal, idler and residual pump) are available at the output and can be used simultaneously.

We4-P8/1092 - Pluggable-Transceiver-Compatible 4-Core Multi-Core Fibre Cable for High-Density intra-data-centre Interconnects (SC01)
Daiki Soma *(KDDI Research, Inc.)*
We propose a pluggable-transceiver-compatible aggregated multi-core fibre cable for intra-data-centre optical wiring. By aggregating standard-cladding four-core fibres, the proposed design supports 2×400G-DR4 links while reducing cable cross-sectional area and weight by more than 86%. Error-free transmission using commercial pluggable transceivers is confirmed at 1310 nm.

We4-P9/1104 - Inter-core Spontaneous Raman Scattering in a 39-core 3-mode/1-mode Heterogeneous Multi-core Fiber System (SC01)
Hideaki Furukawa *(NICT)*
We systematically characterize the forward/backward inter-core spontaneous Raman scattering of a 39-core 3-mode/1-mode heterogenous multi-core fiber system. Low forward direction crosstalk is expected for most three-mode cores distant from the 1-mode core, indicating high potential of the system for use in classical-quantum coexisting transmission.

We4-P10/1123 - Parallel Photonic RF Memory Enabled by Hollow-Core Fiber (SC01)
Kai Xu *(Huazhong University of Science and Technology)*
We report the first parallel photonic RF memory and its application in radar jamming, enabled by recirculation in an HCF with minimal nonlinearity and latency. The storage capacity reaches record-breaking 1100 loops (serial) and 800 loops (parallel), featuring 24-GHz bandwidth and 33% improved delay resolution.

We4-P11/1193 - Single-Ended Crosstalk Measurement in Field-Deployed Multi-Core Fiber Using Commercial OTDR (SC01)
Deepa Venkitesh *(Indian Institute of Technology, Madras)*
We demonstrate a single-ended method for measuring inter-core crosstalk in multi-core fibers using a single-channel commercial OTDR. The method is validated by comparing with power meter measurements, through simulations and field testbed experiments.

We4-P12/531 - High Δ Single-Mode Polymer Waveguides with Athermal Mode-Field Diameter for Co-Packaged Optics (SC02)
Taiki Yamagishi *(Keio University)*
We demonstrate athermal polymer waveguides suitable for co-packaged optics. We measure the temperature dependence of core-cladding index difference using 3D-OWFM on circular cores in polymer waveguides and identify a core/cladding combination with $|d\Delta n/dT| = 10^{-6}$ / °C, enabling a stable mode-field diameter up to 100 °C.

Poster Session in PV-P (Multipurpose poster area)

We4-P13/582 - Low-Power Consumption and Stable Broadband Optical Frequency Comb Generation in X-Cut Lithium Tantalate (SC02)
Xin Wang *(Shanghai Jiao Tong University)*
We demonstrate controllable switching between Raman and Kerr frequency combs via dispersion and coupling engineering in X-cut lithium tantalate. The Kerr comb exhibits low power consumption, over 450 nm spectral span and hour-scale stable operation without dual-pump excitation or complex thermal control.

We4-P14/589 - Mid-Infrared Optical Parametric Amplification in a Quasi-Phase-Matched Silicon Nitride Waveguide with a Broad Bandwidth of 130 nm (SC02)
Shaoxing Wang *(Shanghai Jiao Tong University)*
A 2.5-m-long Si_3N_4 waveguide (4.74 × 4.31 mm^2) featuring sign-alternated dispersion for quasi-phase-matched optical parametric amplifier is demonstrated. It achieves 2-dB/m low attenuation and 130-nm amplification bandwidth, offering robust fabrication tolerance and promising potential for efficient continuous-wave broadband amplification in the mid-infrared regime.

We4-P15/661 - Four-Port Oblique-Coupled Ge-on-Si Photodetector with Improved Bandwidth Retention at High Photocurrent (SC02)
Chao Zhang *(The University of Tokyo)*
We demonstrate four-port oblique-coupled Ge-on-Si photodetector enabling high photocurrent and bandwidth. The device achieves a record-high responsivity–bandwidth product, with 1.04 A/W responsivity and 64.4 mA photocurrent, and maintains 15-5 GHz bandwidth up to 35 mA, improving the trade-off between high-current operation, bandwidth, and responsivity.

We4-P16/699 - Metasurface-based Transmissive 2×2 Polarization Beam Splitter/Combiner for Circular and Linear Polarizations (SC02)
Abdulaziz Elfiqi *(KDDI Research Inc.)*
Transmissive 2-input 2-output polarization beam splitter/combiner based on ultrathin metasurface is demonstrated. Efficient polarization splitting is achieved experimentally for all port combinations over a ~60 nm wavelength range, with the maximum polarization extinction exceeding 17 dB for both linear and circular polarization bases.

We4-P17/795 - Tuneable RF Signal Generation Through Integrated Self-Injection-Locked Gain-Switched Combs (SC02)
Diego Domínguez Castillejo *(Tyndall National Institute)*
High frequency tuneable gain-switched combs are demonstrated through a monolithically integrated multi-section laser. Photon-photon resonance extends modulation bandwidth beyond 43.5 GHz, enabling comb generation up to 30 GHz without external injection. Downconverted microwave tones exhibit resolution-limited linewidths below 50 Hz.

We4-P18/831 - Spiking Photonic Nodes based on Two Section InP Semiconductor Lasers on Silicon (SC02)
Charis Mesaritakis *(University of West Attica)*
Spiking behaviour of two-section InP quantum-well lasers fabricated on a Silicon-on-Insulator platform is experimentally validated. Dynamic regimes, including integrate-and-fire and resonate-and-fire are achieved through bias variation. Impact of cavity length and absorber ratio are evaluated, providing design guidelines for scalable active neuromorphic photonic integrated circuits.

We4-P19/916 - First Statistical 2,000-hour Reliability and Reflow Compatibility Results of Silicon-Ferroelectric Nematic Glass (Si-FNG) Electro-Optic Modulators (SC02)
Li-Yuan Chiang *(Polaris Electro-Optics)*
We report the first industry-standard (Telcordia) reliability and reflow compatibility assessment of hybrid-integrated Si-FNG modulators. With 167 devices, we demonstrate robust parametric stability and failure-free life over 2,000-hour HTS, 2,000-hour uBDH, 200-cycle TC, and 4-cycle Solder Reflow stresses.

We4-P20/924 - Inverse-Designed Silicon Six-Mode Multiplexer for 1.6T/λ Mode-Division Multiplexing Interconnect with AI-Enhanced Reception (SC02)
Aolong Sun *(Fudan University)*
We demonstrate a silicon-photonic mode-division multiplexing interconnect employing an inverse-designed six-mode multiplexer with insertion loss below 1.9 dB and crosstalk below −14.6 dB at 1550 nm. A 1.62 Tb/s/λ capacity is realized by transmitting 90-GBaud PAM-8 signals over six modes using a temporal convolutional network.

We4-P21/1067 - Frequency Response Engineering of EO-Equalized Thin-Film Lithium Niobate Modulator Using Capacitive-Loaded Traveling-Wave Electrodes with Two Distinct Periods (SC02)
Yuya Yamaguchi *(National Institute of Information and Communications Technology)*
We demonstrate a thin-film lithium niobate modulator with engineered frequency response using an electro-optic equalizer based on capacitive-loaded traveling-wave electrodes with two distinct loading periods. The device achieves a 1 dB bandwidth exceeding 110 GHz with a half-wave voltage of 2.2 V.

We4-P22/1079 - High-Baud-Rate Data Transmission Through a Non-Volatile Sb2Se3 Phase-Change Switch on Silicon Nitride (SC02)
Iñigo Lopez-Mulet *(Nanophotonics Technology Center, Technical University of Valencia)*
We experimentally evaluate high-baud-rate transmission through a non-volatile Sb_2Se_3 phase-change optical switch on silicon nitride, supporting up to 200-GBd OOK, 135-GBd PAM4, and 80-GBd PAM8. An up to 2 dB penalty is observed with no phase-state-dependent degradation, confirming compatibility with high-speed, reconfigurable photonic interconnects.

We4-P23/1187 - Compact Slow-Light-Enhanced TFLN Modulator for CWDM4 (SC02)
Ruiqing He *(Zhejiang University)*
We present a compact slow-light-enhanced TFLN transmitter for CWDM4, enabling an aggregate line rate of 800 Gbps. The device exhibits a reduced modulation length of 2 mm and a modulation efficiency of 1.22 V·cm. In addition, low-loss CWDM operation is provided by integrated cascaded Bragg-grating filters.

We4-P24/1344 - Co-fabrication of Graphene Modulators and Detectors on Silicon-on-insulator (SC02)
Petros Symeon *(University of Cambridge)*
We report co-fabrication of high-speed graphene modulators and photodetectors on silicon on insulator by optimising modulator and photodetector designs under CMOS-BEOL constraints. The resulting platform balances extinction ratio, responsivity and bandwidth, establishing a practical route towards integrated >67GHz SLG optoelectronic transmit/receive systems.

Poster Session in PV-P (Multipurpose poster area)

We4-P25/1393 - A 240 Gb/s O-band Silicon Micro-ring Modulator with 3 THz FSR and 110 GHz bandwidth (SC02)
Shuang Zheng *(Huazhong University Of Science And Technology)*
A 4-μm-radius O-band silicon micro-ring modulator featuring a 3-THz FSR and >110-GHz EO bandwidth is demonstrated. Offering a finesse of 50, it supports 160-Gb/s NRZ and 240-Gb/s PAM4 below the SD-FEC limit, enabling >16-channel high-density WDM.

We4-P26/710 - Workload-Aware Passively Biased Short-Electrode MZI for Efficient Vector-Matrix Multiplication in Neural Networks (SC03)
Shi Zhao *(National University of Singapore (NUS))*
Exploiting the skewed distribution of neural-network weights, we report a passively biased MZI that reduces phase tuning from π to ~0.16π for efficient VMM. Measured devices validate design targets with good reproducibility, enabling 5.3× footprint reduction, 0.11 pJ/OP and 1079 TOPS/(W·cm²) at 0.1% accuracy drop.

We4-P27/756 - Dual-Pump Pulsed Degenerate Optical Parametric Oscillation in a Silicon Nitride Microresonator with Anomalous Dispersion (SC03)
Kambiz Jamshidi *(TU Dresden)*
We experimentally demonstrate modulated degenerate optical parametric oscillation in an anomalous-dispersion silicon nitride microresonator using an optimized dual-pump scheme, achieving pulsed operations up to 30 MHz with 5.34 dBm optical power and an 18 dB signal-to-noise ratio, establishing its potential for coherent Ising machines.

We4-P28/833 - Integrated Photonic Physical Unclonable Function based on Multi-Resonant Structures in a Hexagonal-Reconfigurable Mesh (SC03)
Nikolaos Tzekas
we propose a physical unclonable function based on a silicon reconfigurable mesh programmed to implement multi-resonant structures. By harnessing manufacturing imperfections as a stochastic source, each device produces unique spectral fingerprints. When combined with a Gabor fuzzy-extractor a probability of cloning of 10^{-16} is achieved.

We4-P29/837 - Nanosecond Silicon Photonic BiDi Splitter-Switch for Point-to-Multipoint Networks (SC03)
Brian Stern
We demonstrate a 1×8 silicon photonic splitter-switch enabling independent switching for upstream and downstream directions in an access network. Nanosecond-scale switching is shown with 1.1 dB loss per Mach-Zehnder stage, showing feasible scaling to higher port count and enabling higher power budgets than with splitters.

We4-P30/868 - Reconfigurable On-Chip Spectrometer with Adaptive Spectral Resolution (SC03)
Huiyu Huang *(University of Cambridge)*
In this paper, we present a reconfigurable on-chip spectrometer based on a cascaded Mach–Zehnder interferometer network with programmable optical path differences (0–180 μm). It enables adaptive spectral acquisition across multiple resolution scales within a single device, establishing a new paradigm for reconfigurable on-chip spectroscopy.

We4-P31/891 - Experimental Demonstration of Sub-10 kHz Linewidth Tunable DFB Laser Array Based on Self-Injected Feedback (SC03)
Zhenxing Sun *(Nanjing University)*
We demonstrate a high-power, narrow-linewidth REC-DFB laser array using SCOW and self-injection feedback. Integrated with PLCs via photonic wire bonding (PWB), the array achieves >100mW power, 12.8nm tuning range, and SMSR >50dB. The Lorentzian linewidth is compressed to 7kHz.

We4-P32/903 - A 1.2 Vpp Driver-free Differential Ge Eelectro-absorption Modulator Enabling 150 Gbps NRZ and 360 Gbps PAM-8 modulation (SC03)
Haiwen Cai *(Shanghai Optoelectronics Science and Technology Innovation Center)*
A differential Ge Franz-Keldysh EAM with 2.78 dB insertion loss operates at 1.2 Vpp without a driver. It achieves 150 Gbps NRZ and 360 Gbps PAM-8. The ultra-low swing enables direct CMOS driving for future LPO/CPO links.

We4-P33/913 - PAM4 448 Gb/s per Lane InP MZM-SOA Array PIC for Next-Generation CPO Applications (SC03)
Anna Tatarczak *(Coherent)*
We demonstrate a monolithic 1310 nm InP Mach–Zehnder modulator and semiconductor optical amplifier array operating at 448 Gb/s per lane with an external laser. After 500 m transmission, a BER of 1.1×10^{-3} is achieved with 25-tap FFE, supporting InP for next-generation co-packaged optics.

We4-P34/1050 - On-Chip Pulse Amplification and Compression Using Silicon Nitride Photonic Integrated Circuits (SC03)
Jie Wang *(University of Hong Kong)*
We demonstrate on-chip pulse amplification and compression using a silicon-nitride-based erbium-doped waveguide amplifier and a chirped spiral Bragg grating. Our work achieves >50-fold amplification and 32-fold pulse compression, paving the way toward fully integrated high-power ultrashort pulse sources for diverse applications.

We4-P35/1051 - C-band Compact Hybrid-Integrated Multi-port Multi-wavelength Laser Source for DWDM Communication in Optical I/O (SC03)
Wentao Sun
A C-band compact MP-MWL for optical I/O has been presented. The source architecture comprises an 8-wavelength high-power DFB laser array based on the REC technique, hybrid-integrated with a Si3N4 8×8 MMI via the PWB technique.

We4-P36/1186 - Compact Waveguide-Integrated Graphene Photodetector with >110-GHz Bandwidth for 240-Gbit/s PAM-4 Reception (SC03)
Hejie Peng *(Huazhong University of Science and Technology)*
We experimentally demonstrate a compact waveguide-integrated graphene photodetector based on a geometry-optimized plasmonic slot waveguide. With an 80 nm slot, 53 nm electrodes, and a 10 μm interaction region, the device exhibits >110 GHz bandwidth and clear 240 Gbit/s PAM-4 reception for ultrafast optical interconnects.

Poster Session in PV-P (Multipurpose poster area)

We4-P37/1278 - Fully integrated CWDM Optical Engine with III-V/Si DFB Laser Arrays and Silicon Mach-Zehnder Modulators
Zheng Yong *(SCINTIL Photonics)* **(SC03)**
We report on an O band 4-CWDM transmitter consisting of a single Silicon chip comprising heterogeneous DFB lasers, Si MZMs and monitoring Ge-PDs. The Tx chip is wire bonded to a 56 Gbaud PAM4 commercial driver. 64Gbaud PAM4 eye diagrams are reported.

We4-P38/1349 - High-Connectivity, Low-Latency Optical Perceptron Enabled by Time-Multiplexing and All-Optical Nonlinearity (SC03)
Hao Sun *(Institut National de la Recherche Scientifique, Centre Énergie Matériaux Télécommunication (INRS-EMT))*
We experimentally demonstrate an end-to-end optical single-layer perceptron (SLP). This computing engine combines stable optical temporal interference with all-optical nonlinearity, enabling 8,100 connections and low latency of ~670 ns. The optical SLP successfully recognizes 90 distinct binary patterns with an accuracy of 100%.

We4-P39/591 - Accelerating Convergence of Longitudinal Power Profile Estimation based on Adaptive Tikhonov regularization (SC04)
Junjiang Xiang *(School of Information Engineering, Guangdong Provincial Key Laboratory of Information Photonics Technology, and Key Laboratory of Photonic Technology for Integrated Sensing and Communication, Ministry of Education of China, Guangdong University of Technology, Guangzhou, 510006, China)*
We propose adaptive Tikhonov regularization for accelerating convergence of longitudinal power profile estimation. Only single-shot execution can secure an estimation error of 0.13dB over the anomaly loss range of 0.74~3.4dB, when the 120Gbaud DP-QPSK signals with 14dBm launch power are transmitted over 3×50km G.654.E fiber.

We4-P40/651 - Improved Chase–Pyndiah Decoding for Product Codes with Scaled Messages (SC04)
Laurent Schmalen
We propose an enhanced Chase–Pyndiah decoder that scales extrinsic messages based on decoder confidence of the component decoder, achieving a 0.1 dB gain over the original with negligible complexity increase.

We4-P41/683 - Subcarrier Channel Polarization-Based Low-Complexity FEC for 16-QAM SDM Digital Subcarrier Multiplexing System (SC04)
Hao Shi *(Pengcheng Laboratory)*
We experimentally demonstrate the first subcarrier channel polarization low-complexity FEC encoded 1.92Tb/s 16-QAM-DSCM signal transmission over a 50-km four-core fiber, achieving a 4.2-dB OSNR gain and 80% decoding-complexity reduction at the KP4-FEC threshold compared to conventional FEC scheme.

We4-P42/686 - Simulation-to-Experiment Transfer Learning for Nonlinear Equalization in Long-Haul Raman-Amplified Coherent Systems (SC04)
Georgios Moustakas *(University of West Attica)*
This paper employs transfer learning to train a machine learning equalizer for Raman-amplified systems using limited experimental data. Pre-training on simulated synthetic data allows the model to achieve performance comparable to, or exceeding, optimized digital back propagation, effectively mitigating nonlinear impairments over long-haul distances.

We4-P43/708 - Optimized Spatio-temporal Spike Encoding for Low-power Spiking Neural Network Equalizers in IM/DD Systems (SC04)
Shuangxu Li *(Huawei Technologies Duesseldorf GmbH)*
A convolutional neural network spike encoder paired with a spiking neural network equalizer is proposed for an IM/DD link. It achieves a 1.7 dB gain over a linear equalizer while reducing spike activity by 80%, offering a low-complexity, low-power solution for neuromorphic hardware.

We4-P44/779 - Pilot Symbol-Aided Timing Error Correction for Equalization-Enhanced Phase Noise and Clock Timing Jitter Compensation (SC04)
Ahmed Medra
We propose a novel pilot symbol-aided timing error correction algorithm designed to mitigate impairments from equalization-enhanced phase noise (EEPN) and clock timing jitter. The proposed architecture employs a hybrid feedback loop for analog-to-digital converter (ADC) clock refinement and a feed-forward path for digital timing correction.

We4-P45/832 - Joint Probabilistic and Geometric Constellation Shaping for Complexity-Constrained Direct Detection Optical Systems (SC04)
Rodrigo Fischer *(Karlsruhe Institute of Technology)*
We evaluate joint probabilistic and geometric constellation shaping via reinforcement learning for complexity-constrained joint equalization and demodulation of direct detection optical signals. We demonstrate the proposed technique in a simulated 56 GBd, 2.2 km C-band direct-detection system, demonstrating its effectiveness for complexity-constrained receivers.

We4-P46/899 - Order-Dependent Characterisation and Cutdown of Volterra Kernels in NL-MLSE for Net 400-Gb/s O-Band PAM-6 IM-DD (SC04)
Hiroki Taniguchi *(NTT, Inc.)*
Volterra NL-MLSE kernels of 1st and 2nd/3rd order play distinct roles: 1st-order tracks CD while 2nd/3rd-order capture CD-invariant device nonlinearity. This decoupling enables independent channel modelling. Cutdown to 15 kernels (73%) preserves −6 to +8 ps/nm CD tolerance at 182 GBd PAM-6 without BER penalty.

We4-P47/942 - Semantic Holographic-Type Co-frequency Co-time Full duplex Communication Over a 100 km Single-span Hollow Core Fiber (SC04)
Anxu Zhang *(China Telecom Research Institute, State Key Laboratory of Optical Fiber and Cable Manufacture Technology)*
We demonstrate the first semantic holographic-type co-frequency co-time full duplex (HT-CCFD) communication system over 100 km hollow-core fiber. The semantic scheme achieves 73.3 dB PSNR, outperforming 16QAM and QPSK by 5 dB and 8 dB, respectively, while maintaining reliable transmission at low received optical power.

We4-P48/970 - Pruning-Assisted Model Adaptation for Real-Time Neural Network Equalization in Photonic-Aided Wireless Transmission (SC04)
Sheng Hu *(Fudan University)*
We propose an updatable real-time neural-network equalizer using iterative magnitude pruning and transfer fine-tuning, validated in a 300 m, 3.75 Gbaud DMT-64QAM experiment. Compared with the best dense network, it cuts complexity by 89% with nearly unchanged performance under a 2 m channel offset.

Poster Session in PV-P (Multipurpose poster area)

We4-P49/996 - Polarization-Multiplexed Coexistence of 100 Gb/s MultiCAP Transmission and DD-COTDR Distributed Sensing (SC04)
Natalia Herguedas *(Universidad de Zaragoza)*
We demonstrate co-propagation 100 Gb/s MultiCAP communication and DD-COTDR sensing over 25km of SMF-Using orthogonal polarization multiplexing and spectral guard band tailoring, interference is mitigated. A trade-off between sensing SNR and BER is identified, enabling operation below the FEC threshold under practical coexistence conditions

We4-P50/1052 - A Closed-Form Solution for Fiber Anomaly Detection in C+L-Band Systems Based on Stimulated Raman Scattering (SC04)
Zihao Cui *(Beijing University of Posts and Telecommunications)*
We propose an SRS-based closed-form method for fiber anomaly localization in C+L-band systems. A PSO-based refinement enhances robustness under dynamic conditions. Experiments demonstrate 1.5 km average localization error with low complexity and rapid calculation.

We4-P51/1053 - Dual-Polarization Optical Coherent Transmitters IQ Impairment In-service Monitoring Using a Single Low-Bandwidth PD (SC04)
Xiuquan Cui
We propose an enhanced Wiener-Hammerstein model-based framework to monitor dual polarization optical coherent transmitter IQ impairments via a single low-bandwidth photodetector. Experimental results demonstrate an IQ skew estimation error of 0.3ps(2.3ps) for the RLS(LMS) algorithm,with RLS achieving an order-of-magnitude faster convergence than LMS.

We4-P52/1062 - Blind dispersion slope estimation for high-symbol-rate coherent systems (SC04)
Juan Moreno Morrone *(Fraunhofer Heinrich Hertz Institute)*
We propose a two-stage scanning method for chromatic dispersion estimation in high symbol-rate coherent systems, including accumulated dispersion slope. The performance is evaluated by simulations at a symbol rate of 240 GBd and experimental emulation of up to 70.8 ps/nm2 dispersion slope at 160 GBd.

We4-P53/1182 - Field-Trial Validation of EKF Embedded Real-Valued MIMO Equalization for Transmitter Impairment Mitigation (SC04)
Yingyu Chen *(Sun Yat-sen University)*
We experimentally validate a real-valued MIMO equalizer embedding EKF phase estimator for transmitter impairment mitigation over a 70-km submarine multicore fiber link. The proposed method maintains Q-penalties below 0.5-dB under 10-ps IQ skew and 2.5-dB gain imbalance with improved frequency offset tolerance up to 50-MHz.

We4-P54/1194 - Split-Sideband Digital Subcarrier Multiplexing for IQ-Impairment Compensation without Inter-Subcarrier MIMO (SC04)
Takuma Kuno *(Nagoya University)*
We propose a split-sideband DSCM architecture that eliminates the need for a high-dimensional inter-subcarrier joint MIMO equaliser. Experiments with two 50-Gbaud DP-16-QAM subcarriers, corresponding to an aggregate symbol rate of 100 Gbaud, show performance comparable to that of inter-subcarrier MIMO while using a lower-dimensional equaliser.

We4-P55/1239 - High-Precision SOP-based Event Localization Using Coherent WDM Polarisation Localisation (CWPL) Technique (SC04)
Rafael Vieira *(Aston University)*
Source localization of SOP transients via CWPL is demonstrated for the first time. By exploiting the correlation between error standard deviation and $\Delta\lambda$, we selectively average measurements from 12 channels, achieving a standard error of the mean of 930 m over a 10000 km link.

We4-P56/1244 - Joint Subcarrier Phase Recovery for Nonlinearity Mitigation (SC04)
Marco Secondini *(Scuola Superiore Sant'Anna)*
We propose a low-complexity phase recovery scheme that simultaneously mitigates laser phase noise and fiber nonlinearity across several subcarriers. In a long single-span link with Raman amplification, the scheme achieves 0.9 dB gain with 99 real multiplications per complex symbol.

We4-P57/1285 - Accurate Multi-perturbation Localization in Optical Fibers with Polarization-based Forward Sensing (SC04)
Rick M. Butler
We present a method to accurately localize multiple perturbations from fiber outputs. We cross-correlate received polarizations between two wavelengths, apply peak detection, and interpolate peaks to boost accuracy. We localize five simultaneous perturbations in a 10 GSa/s numerical fiber model with 3.5 m median error.

We4-P58/1310 - Frequency Domain Timing Recovery for Baud-rate Sampled Coherent Receivers (SC04)
Serge Afouda *(Huawei Technologies France)*
We propose a generalized roll-off factor independent timing error detector (TED) cost function suitable for frequency-domain DSP working at 1-sample/symbol (1-sps). We numerically and experimentally investigate the effectiveness of proposed TED, an alternative to conventional Godard-TED, in 123.6-Gbaud DP-16QAM transmission systems with only 1-sps Rx-DSP.

We4-P59/1331 - Feedforward and Iterative Phase Noise Compensation for Channels with Chromatic Dispersion (SC04)
Alex Jäger *(Technical University of Munich)*
Equalization-enhanced phase noise is avoided by applying phase noise compensation (PNC) before chromatic dispersion compensation. Feedforward and iterative PNC algorithms based on expectation propagation are proposed. Both achieve information rates close to channels without phase noise for 100 GBaud 64-QAM and 10,000 km of fiber.

We4-P60/781 - Error-Propagation-Aware Transmitter Compliance Metric for Next-generation Optical Interconnects with MLSE Receivers (SC05)
Yongxin Sun *(Shanghai Jiao Tong University)*
We propose an error-propagation-aware MLSE TDECQ based on an analytical Zig-zag model for next-generation optical interconnects. Experimental results in 112-Gb/s PAM-4 systems demonstrate near-unity correlation (slope=1.024, R2=0.994) with actual receiver sensitivity across diverse impairments, ensuring reliable transmitter compliance testing.

Poster Session in PV-P (Multipurpose poster area)

We4-P61/808 - O-band 3.2 Tb/s Kerr Microcomb Coherent Transmission for Short-Reach DCI Links (SC05)
Robert Emmerich *(Fraunhofer HHI)*
We report the first demonstration of an O-band Kerr comb laser in coherent transmission, achieving 3.2 Tb/s aggregate rate (GMI) over 25 km using eight comb lines from a single source.

We4-P62/852 - One Terahertz Full-Field Digital Back-Propagation over 3000 km (SC05)
Eric Sillekens *(UCL (University College London))*
We implement full-field digital back-propagation with a 1-THz receiver using 20 synchronous frequency-adjacent coherent receivers with digital stitching and a frequency-comb local oscillator. Relative to electronic dispersion compensation, per-channel DBP and full-field DBP achieve throughput gains of 2.2% and 5.4%, respectively.

We4-P63/866 - Evaluating the Viability of Long-haul O-Band Transmission over G.654.C Fibre (SC05)
Romulo Aparecido de Paula Junior *(University College London)*
We demonstrate the first long-haul, 15.9 THz, WDM O-band transmission using G.654.E-compliant fibre, achieving 55.5 Tb/s (GMI) over 704 km despite its high cutoff wavelength. Ultra-low fibre loss enables a single lumped amplification scheme to achieve an information rate highly competitive with state-of-the-art single-band systems.

We4-P64/887 - Experimental Evaluation of Optical-Analog-Optical Wavelength Converter Penalty Metric for Quality of Transmission Estimation (SC05)
J. Kenji Clark *(NEC Corp.)*
Noise added by an optical-analog-optical wavelength converter is shown to have a gaussian-like distribution, represented by a signal-to-noise ratio (SNR) of wavelength conversion. Using this metric, SNR estimation with 0.8 dB accuracy of a
300 Gbps signal transmitted 400 km and wavelength converted is demonstrated.

We4-P65/933 - Open-Loop Calibration of Frequency-Dependent Sub-DAC Mismatch in Time-Interleaved DACs (SC05)
Chenjin Li *(University of Electronic Science and Technology of China)*
We propose an open-loop calibration algorithm for time-interleaved DACs by decomposing mismatches into frequency-independent components and frequency-dependent residuals. Experiments on a 92 GSa/s device with four sub-DACs show that post-compensation suppresses interleaving spurs to the noise floor. A pre-compensated PAM-16 achieves a 44% BER reduction.

We4-P66/1039 - Experimental Investigation of U-band Transmission over 20 km of Anti-Resonant Hollow-Core Fiber Using Bismuth doped Fiber Amplifier (SC05)
Carina Castineiras Carrero *(NOKIA Bell Labs)*
U-band transmission over 20 km hollow-core fiber (HCF) is experimentally investigated to assess its potential for high-capacity transmission systems. Using Bismuth doped Fiber Amplifier, we show the transmission of 16-QAM and 64-QAM signals.

We4-P67/1214 - Experimental Study of Burst Error Induced by Relative Intensity Noise in Raman Amplified Repeaterless Systems (SC05)
Abir Hraghi *(Huawei Technologies France - Paris Research Center - Optical Communication Technology Lab)*
We experimentally investigate the burst-error penalty caused by RIN-transfer noise in forward-Raman-amplified transmission systems, observing 0.6 dB larger SNR fluctuations when having 10 dB Raman gain. Our modelling results confirm that RIN-transfer burst penalty should be accounted for when estimating the performance of forward Raman.

We4-P68/1220 - Breaking the Complexity Barrier of Volterra Equalization via End-to-End Sparse Compression and Recovery in 106-Gb/s PAM4 IM/DD Links (SC05)
Govind Yadav *(Institute of Communications Engineering, National Tsing Hua University)*
We propose and experimentally validate a novel SLQF-VE for nonlinear distortion compensation in 106-Gb/s PAM4 IM/DD over 6-km SMF. It achieves ~90% complexity reduction at KP4-FEC and ~97% at HD-FEC at −4 dBm ROP, outperforming baseline and sparse VEs, with quantization-aware fine-tuning enabling low-precision operation.

We4-P69/1261 - EEPN-Aware Phase-Gradient MIMO Equalization for Robust Short-Reach Coherent Transmission (SC05)
Fan Zhang *(Peking University)*
We propose EEPN-aware phase-gradient MIMO *(PG-MIMO)*, which augments conventional 2-sps MIMO with a phase-gradient-modulated branch to model phase-memory-induced perturbations. In 80-GBaud, 80-km DP-16QAM transmission, PG-MIMO reduces BER by 46.6% and improves Q2 by 0.71 dB.

We4-P70/1269 - GPU-Accelerated Optimisation of Symmetric Bidirectional Ultrawideband Coherent Transmission Under Launch Power Constraints (SC05)
Mindaugas Jarmolovicius *(University College London)*
We optimise bidirectional OESCL-band coherent transmission under total fibre power constraints using a GPU-accelerated boundary-value Raman solver and launch-power optimisation. While no gain is observed without power constraints, for a 18-dBm limit 3-span transmission reversing the O-band direction increases aggregate capacity by up to 24.5%.

We4-P71/1320 - On the Nonlinear Impairments Induced by High-Power Doped Fiber Amplifiers in HCF Transmission Systemss (SC05)
Leonardo Sorensen Braga *(Nokia Bell Labs)*
We numerically demonstrate that the nonlinearities in high-power EDFAs induced by signal signal interactions in WDM systems are not negligible and may become a limiting factor in future HCF systems and may be captured by the existing EGN models.

We4-P72/956 - DRL-Based Joint RSA and Reconfiguration Using Integrated Graph-Based GNN and State-Adaptive Reward (SC06)
Takafumi Tanaka *(NTT)*
We propose a novel multi-agent DRL framework for joint RSA and optical path reconfiguration, featuring a GNN with a unified graph schema and a state-adaptive reward. Simulations demonstrate over 40% blocking probability reduction compared to conventional approaches, validating the importance of joint planning.

Poster Session in PV-P (Multipurpose poster area)

We4-P73/1002 - A Novel Minimum Latency Transport Framework by Satellite-Terrestrial Cross-Physical-Layer Hybrid Transmission (SC06)
Yuto Kaida *(Tokyo Denki University)*
We propose a two-level minimum latency framework for Starlink-like LEO transport: OTN-like hit-less switching suppresses handover-related latency penalty, while hybrid multi-path FEC with Systematic-on-LEO and CRC early completion enables low-latency loss recovery, with larger gains under smaller path-delay gaps or higher loss.

We4-P74/1061 - AI-EON for Self-Adaptive Multi-Task Computing Power Access and Its Field Trial (SC06)
Jiang Sun *(China Mobile Research Institute)*
A scale-across AI-powered elastic optical network is proposed for self-adaptive multi-task computing power access, and is validated in a field 640 km 3,000-GPU dual-node training with 2% efficiency degradation using 800G OTN and 272×272-port OCS.

We4-P75/1122 - Securing 5G/6G Networks Applying Moving Target Defense over Elastic Optical Networks (SC06)
Anna Tzanakaki *(National and Kapodistrian University of Athens, Greece)*
This work proposes a Moving Target Defense framework using Live Virtual Machine Migration over Elastic Optical Networks to enhance 6G security. Optimized migrations and Markov-based evaluation demonstrate reduced attack success and improved network resilience.

We4-P76/1183 - Maximum Achievable Burst Size in All-Optical Satellite Networks (SC06)
Sleman Mouammar *(Technische Universität Braunschweig)*
We analyze the maximum burst size achievable in all-optical satellite networks across different constellations. With a 100 Gbps uplink capacity, a WDM-based optical burst switching network supports burst sizes of up to 500 MB in high-altitude LEO constellations and 600 MB in low-altitude LEO constellations.

We4-P77/1198 - Experimental Demonstration of Fabric Resilience Using a 4 × 4 Dual-Microring Optical Switch for AI Data Centers (SC06)
Bin Zhang *(Zhejiang University)*
We demonstrate an optically connected network architecture with fault recovery for building ML training clusters, enabled by a nonblocking optical switch based on dual-microring resonators. We present experiments on our HPC/ML testbed leveraging the optical programmable network to automatically failover from hardware or software failures.

We4-P78/1217 - Data-Efficient Few-Shot Modeling of EDFA Gain for QoT Estimation Using Machine Learning (SC06)
Abdelrahmane Moawad *(Fraunhofer - HHI)*
We compare few-shot EDFA gain modeling using transfer learning and physics-informed gaussian process regression, enabling data-efficient cross-vendor adaptation under extreme scarcity and achieving sub-0.1 dB mean absolute error for gain prediction.

We4-P79/1271 - Experimental Investigation of Optical Fiber Amplifier Based All-Optical Relays for Inter-Satellite Optical Networks (SC06)
Satoshi Shinada *(National Institute of Information and Communications Technology)*
The transmission performance of all-optical relays employing watt-class optical fiber amplifiers was experimentally investigated. Although the large link losses assumed for inter-satellite optical links cause significant OSNR degradation, all-optical relaying of WDM signals over distances exceeding 10,000 km is shown to be feasible.

We4-P80/1363 - A Comparative Study on Linear and Nonlinear SNR Estimation Using Neural Networks (SC06)
Vinod Bajaj *(Nokia Bell-Labs)*
We compare spectral correlation-based features against well-explored amplitude noise covariance and phase noise correlation-based features for linear and nonlinear SNR estimation using neural networks. Simulation results indicate errors reduced by > 30% when spectral correlation-based features are included.

We4-P81/529 - 50 Gbps 25km SSMF Quasi-Coherent Transmission for C-band Optical Access, Mobile Fronthaul and Edge AI Networks (SC07)
Natalia Herguedas *(Universidad de Zaragoza)*
Quasi-coherent reception of 50/53.125 Gbps C-band multiCAP/PAM4 signals after 25/10 km SSMF transmission. The PAM4 signal was received error free after real-time FEC decoding. The QC-receiver is implemented in a Silicon Photonics PIC. Applications include mobile fronthaul, edge AI, SMPTE ST2110 video and access networks.

We4-P82/570 - Synchronization Reliability Analysis and Real-Time Verification for Burst-Mode 200G Coherent PON (SC07)
Xiaoshuo Jia *(China Mobile Research Institute)*
A real-time burst-mode synchronization emulator is demonstrated using 10 FPGAs for 200G coherent PON upstream, executing 1e15 trials. A theoretical model for reliability evaluation is proposed and validated. Results confirm high synchronization reliability could be achieved over 20-km fibre with specially designed preambles.

We4-P83/628 - Field Trial of a 50G HS-PON architecture supporting 1×16 All-Photonic Gateway and Time Sensitive Network Traffic (SC07)
Margarita Fylaktaki *(Aristotle University of Thessaloniki)*
The first field trial of a Next Generation Central Office featuring a 1×16 all-photonic gateway comprising a C-/O-band glass diplexer-array and MEMS-based optical switch is reported, flexibly provisioning multiple traffic-classes of a 50G HS-PON and 10G C-band high-precision Time-Sensitive Network traffic at 1.6 km-long drop-fibers.

We4-P84/669 - Flexible Coherent PON using LUT-Based Channel-Adaptive Modulation (SC07)
Jie Li *(State Key Laboratory of optical communication technology and network, China Information Communication Technologies Group Corporation)*
We propose a LUT-based GS-FCLS-PON scheme and experimentally demonstrate it in a TFDM system with flexible rates ranging from 100 Gb/s to 600 Gb/s. Both the sensitivity and dynamic range are improved using the proposed scheme.

Poster Session in PV-P (Multipurpose poster area)

We4-P85/724 - Impact of Burst Traffic in Upstream Converged Coherent Metro-Access Networks (SC07)
Safana Al Zoubi *(Politecnico di Torino)*
For future all-optical metro-access networks using PON upstream burst mode transmission, we experimentally investigate on the resulting EDFAs gain transient and its impact on the "regular" DWDM coherent metro wavelengths, focusing specifically on typical 125 microsecond frame time-constants and evaluating the post-FEC OSNR penalty.

We4-P86/726 - Traffic-Aware Dynamic Spectral Allocation in AWGR-Based AI Datacenter Scale-Out Fabrics (SC07)
Miroslaw Klinkowski *(National Institute of Telecommunications)*
We evaluate dynamic spectral subcarrier (SC) allocation in arrayed-waveguide grating router (AWGR)-based AI datacenter (AI-DC) fabrics under realistic traffic characteristics. Gains over static allocation arise with temporal misalignments, while near-synchronous incast limits benefits. Performance depends on control responsiveness and spectral resource dimensioning.

We4-P87/757 - When LLM Meets PON: Distributed Edge Inference Framework and Scheduling over TDM-PON (SC07)
Jiawei Zhang *(Beijing University of Posts and Telecommunications)*
We propose a distributed edge inference framework for LLMs over TDM-PON, with a joint computation-communication scheduling scheme eliminating the DBA polling cycles via delay budgeting and phase-aware bandwidth reservation. The performance is evaluated by time per output token and jitter under edge inference workloads.

We4-P88/765 - Dual-Channel 60 GBaud PON System Signal Equalization Using Micro-Ring Resonators-Based Reservoir Computing (SC07)
Mohammad Seifi Laleh *(Kiel University)*
Based on simulations, a silicon photonic reservoir computer using cascaded add-drop micro-ring resonators successfully performs joint signal equalization and dual-channel demultiplexing for 60-GBd PAM-4 PONs. This integrated processor is cost-effective, improves BER and extends transmission reach over conventional DSP-based FFE.

We4-P89/814 - Experimental Assessments of O-band 32x32x8λWavelength Cross-connect Switch at 100Gbpsλ for Data Center Networks (SC07)
Boyang Zheng *(Eindhoven University of Technology)*
We experimentally demonstrate an O-band 32×32×8λ WCS architecture for optical interconnections. By exploiting SOA switch/amplification with transmitter optimization and receiver-side sparse Volterra equalization, OSNR and nonlinear impairments are mitigated. Results show 6dB fiber-to-fiber loss, cross-talk -35dB, total system power penalty 4.3dB, and 6.5dB link-budget.

We4-P90/958 - 240-Gb/s Bipolar Dual-Polarization IM Coherent PON with 10-ns Preamble and 38-dB Power Budget Using 9-MHz DFB Laser (SC07)
Dangui Huang *(State Key Laboratory of Photonics and Communications, Shanghai Jiao Tong University)*
We demonstrate bipolar dual-polarization intensity-modulation coherent PON leveraging sensitivity gain over unipolar modulation while mitigating frequency offset and phase noise with 9-MHz DFB laser. We use 10-ns short preamble to recover 240-Gb/s signal over 20-km SSMF at 38-dB power budget, supporting flexible rates of 120~300-Gb/s.

We4-P91/1008 - Low-Complexity Hierarchical Polar Quantization for CPRI-Based Radio-over-Fibre Systems (SC07)
Hongliang Li
We propose a low-complexity, memory-efficient optimized polar quantization scheme with cross-ring continuous mapping for RoF systems. A 117 Gb/s/λ signal is transmitted over 40-km S-SMF, achieving ~8-dB SNR gain compared with conventional square-domain quantization under equivalent fronthaul capacity.

We4-P92/840 - Early-Warning Fiber Event Classification Operating over Commercial Single- and Dual-polarization Sources Using Stokes-Parameter Features and Lightweight Machine Learning (SC08)
Devika Dass *(Trinity College Dublin)*
We present an SOP-based scheme for early-warning classification of 4-physical fiber-events (twisting/vibration/bending/tapping) over 20km field-fiber. Using a polarimeter monitoring different sources: single-polarized (SP)-unmodulated, SP-modulated, and dual-polarized (DP)-modulated sources, we achieve classification accuracies of 99.7%, 100%, and 94.5%, respectively, without requiring a dedicated sensing wavelength.

We4-P93/841 - Cross-Modal Contrastive Learning Between Coherent Telemetry and Distributed Brillouin Sensing for Fiber Perturbation Analysis (SC08)
Petr Munster
We propose a contrastive learning (CL) framework for sensing of otherwise non explicitly represented environmental perturbations from coherent receivers' telemetry data. Through alignment with Brillouin sensing data in latent space as ground truth, ~96% CL accuracy in temperature-bin retrieval from telemetry data is experimentally demonstrated.

We4-P94/871 - A Widely Tunable ASE-Driven Optoelectronic Oscillator (SC08)
Zhuoran Wang *(McGill University)*
We experimentally demonstrated a single-mode ASE-driven optoelectronic oscillator tunable up to 25 GHz. Single-mode oscillation is enabled by cascaded zero-dispersion loops, while wide tunability is achieved through balanced photodetection for baseband suppression and chirp-like slicing for mitigating filter amplitude degradation induced by third-order dispersion.

We4-P95/888 - Ultra-low Phase Noise 58-GHz Optoelectronic Oscillator Driven by a Narrow-Linewidth Quantum Dot DFB Laser (SC08)
Atsushi Matsumoto *(National Institute of Information and Communications Technology (NICT))*
We demonstrate a 58.2 GHz optoelectronic oscillator using a narrow-linewidth quantum-dot DFB (QD-DFB) laser. Compared to a conventional MQW-DFB laser, the QD-DFB significantly reduces phase noise to -102.5 dBc/Hz at 10 kHz offset, achieving a 19 dB improvement with a 100 m fiber loop.

We4-P96/917 - A Hardware-Efficient FMCW-Based Point-to-Multipoint Forward Sensing Scheme Compatible with Existing PON Infrastructures (SC08)
Yi Zou
We propose a hardware-efficient FMCW-based P2MP sensing scheme seamlessly compatible with existing PON infrastructures. By introducing only passive components, namely an MZI and an ODL, at each ONU, we achieve simultaneous and unambiguous interrogation of all branches with a localization accuracy better than 10 m.

Poster Session in PV-P (Multipurpose poster area)

We4-P97/1030 - Hybridization of sensing technologies to detect fibre distribution cabinets and environmental variations in a terrestrial fibre link to improve deployed fibre localization (SC08)
Tjorven Hilbert
In this work, we used multi-modal sensing and monitoring approaches to find reference points within a communication fibre network. These points were identified by their spectral signature in the range of 1-15 Hz and their Brillouin frequency shift variations in the range of 5-30 MHz.

We4-P98/1032 - Fully Distributed Fiber-Optic Sensing Enabled by Kalman Filtering (SC08)
Juan Marin Mosquera *(Technical University of Denmark)*
Signal fading creates points along the fiber where phase cannot be extracted, so they are conventionally discarded. Instead, we propose a Kalman-based solution for φ-OTDR full-fiber monitoring. Experiments demonstrate phase and temperature estimation with approximately 15 times better spatial density than if removing these points.

We4-P99/1088 - High-Bandwidth Branch-Ambiguity-Free Probing for Single-Wavelength DAS in PON (SC08)
Geyang Wang *(The Chinese University of Hong Kong)*
We propose and validate new probing sequences achieving the bandwidth-branch-distance bound of a single-wavelength DAS over PON. Results show up to 300% improvement in acoustic bandwidth or 100% improvement in sensing distance compared to state-of-the-art schemes, resolving simultaneously branch ambiguity in event detection over drop-fibers.

We4-P100/1113 - Monolithic Silicon Photonic Processor for Reconfigurable Radar Jamming with Asymmetric False-Target Clusters (SC08)
Senyu Zhang *(Huazhong University of Science and Technology (HUST))*
We demonstrate a 2.5 × 5.5 mm² monolithic silicon photonic processor for reconfigurable radar jamming with >20 GHz bandwidth. A gated-modulation scheme generates asymmetric false-target clusters with tunable centroid offsets from −0.55 to +0.6 μs, enabling reconfigurable asymmetric deceptive jamming.

We4-P101/1207 - Compact Hybrid-Integrated 8-Port Optical Heterodyne Source for Wideband Gap-Free Terahertz Generation via Photonic Wire Bonding (SC08)
Wentao Sun
We demonstrate a compact hybrid-integrated 8-port optical heterodyne source for wideband THz generation via photonic wire bonding. Gap-free continuous beat frequency tuning from 0.08 to 0.83THz is achieved with high output power (>70mW) and narrow linewidth (~165kHz).

We4-P102/1222 - Distributed Sensing on a 110-kV Overhead-Line Maintenance Operation on an Operational Optical Ground Wire (SC08)
Konstantinos Alexoudis *(Adtran Networks SE)*
We demonstrate dual-modal distributed sensing on an operational 110-kV OPGW during crane maintenance. DAS resolves meter-scale lifting events and matches impulsive events to phone audio, while DTSS quantifies post-reclamping residual strain up to ~398 με, enabling maintenance verificationand asset monitoring in transmission grids.

We4-P103/1225 - Pre-Delayed Laser Modulation for Remote Radio Beam Steering (SC08)
Rodrigo Otoniel Méndez Canú *(Universitat Politècnica de Catalunya - BarcelonaTech)*
We demonstrate remote radio beam steering up to 11º over a 10 km fiber fronthaul and a 2 m free-space link at 7.5 GHz, using four pre-delayed, individually modulated DFB lasers whose wavelengths are mapped to the horn antennas of a phased array.

We4-P104/1357 - Silicon-based Microwave Photonics Notch Filter for Millimeter-Wave Frequency Bands (SC08)
Claudio Porzi
A microwave photonic notch filter based on on-chip modified Michelson interferometer in silicon on insulator technology is presented. The filter features a large rejection ratio exceeding 40 dB, positive RF gain, and unprecedented continuous tuning range over nearly 60 GHz, only limited by available equipment.

We4-P105/1358 - Interpretable and Data-Efficient Fiber Disturbance Classification from SOP Dynamics Using Semantic Knowledge and Adaptive Retrieval (SC08)
Khouloud Abdelli *(Nokia Bell Labs)*
We present a data-efficient framework for fiber disturbance classification from state-of-polarization (SOP) measurements. Physically grounded semantic descriptors enable interpretable zero-shot inference, while adaptive retrieval resolves class ambiguity. Experiments on a 2600-km WDM system achieve 95% accuracy, outperforming supervised methods in robustness.

We4-P106/777 - Experimental Investigation of System Outage in Spatial Diversity FSO Links Using Data-Aided and Non-Data-Aided DSP (SC09)
Abraham Johst *(Fraunhofer Institute for Telecommunications, Heinrich-Hertz-Institut, HHI)*
We experimentally investigate the suitability of data-aided and non-data-aided DSP for spatial diversity FSO reception with digital combining. Measurements over a 3.2-km, 32-GBd free-space link are used to emulate variable diversity order and quantify the impact of low-SNR receiver branches on the system outage probability.

We4-P107/857 - Real-Time Event-Based Optical Camera Communication at 80 kbit/s over a 320 m Outdoor Link with 120° Field-of-View (SC09)
Francesco Nardo *(Airbus Space and Defense GmbH)*
We demonstrate an event-based optical camera communication system using a 120° field-of-view sensor. In daylight, three transmitting nodes achieve an aggregate 240 kbit/s, with individual links reaching 106 kbit/s at 1m and 80 kbit/s at 320m. Our results, establish a new baseline for event-OCC.

We4-P108/859 - 10 Gb/s Fiber-Coupled and 2 Meter Free-Space Optical Link using an APD array and an Imaging Receiver (SC09)
Atiyeh Pouralizadeh Gelehpordesari *(Fraunhofer HHI)*
We demonstrate in a fiber-coupled setup using a manufactured silicon APD-array with a peak data rate of 10Gb/s. In a VCSEL-based free-space optical link, the APD array acts as an imaging receiver, achieving 5.6-7Gb/s over wireless distances to 2 meters while preserving full angular diversity.

Poster Session in PV-P (Multipurpose poster area)

We4-P109/912 - Mitigating Outages in a 4.6-km FSO Link via Mode-Diverse Reception: An Experimentally Validated Digital Twin Approach (SC09)
Jonas Krimmer *(Karlsruhe Institute of Technology)*
Terrestrial coherent FSO requires mitigating turbulence-induced coupling losses. We experimentally validate a "Digital Twin" channel model against fading statistics from a 4.6-km link. Combining long-term scintillometer data with mode-diverse receiver simulations, we demonstrate that a 6-mode receiver reduces turbulence-induced outage probabilities to 2.02e-5.

We4-P110/1064 - Fully Monolithic Pseudo-Random Phase Modulated Coherent LiDAR Transceiver (SC09)
Pablo López-Querol *(Universidad Politécnica de Madrid)*
A fully monolithic coherent LiDAR transceiver is demonstrated on a generic indium phosphide platform. The photonic integrated circuit combines a narrow-linewidth laser, a phase modulator, and a 120° hybrid coherent receiver. Ranging capability is validated through in-fibre distance measurements over 500 m.

We4-P111/1066 - Channel-Predictive and Content-Aware Satellite-to-Ground Semantic Optical Communication System (SC09)
Wei Zhang *(State Key Laboratory of Information Photonics and Optical Communications, Beijing University of Posts and Telecommunications)*
We proposed a channel-predictive, content-aware semantic optical communication system for satellite-to-ground links. The framework enables adaptive transmission under dynamic atmospheric turbulence, achieving both strong noise resilience and high-fidelity image transmission. Experiments demonstrate a 3 dB receiver sensitivity improvement.

We4-P112/1094 - Analysis of Nonlinear Distortions in High Power EDFAs for Coherent Optical Satellite Communications (SC09)
Ricardo Cotrim *(Instituto de Telecomunicações, Department of Electrical and Computer Engineering, University of Coimbra)*
Scaling ground-to-satellite free-space optical links to tens of watts introduces Kerr-nonlinearities that limit system capacity. We analyze the interplay between EDFA and patch-cord nonlinearities, showing that a multi-section EDFA structure effectively mitigates amplifier-induced impairments, while patch-cord nonlinearities emerge as the dominant limitation for longer links.

We4-P113/1105 - Digital Twin-Driven Space Risk-Aware Intelligent Routing for LEO-Satellite Optical Networks (SC09)
Lei Shi *(Zhengzhou University)*
We propose risk-aware routing for LEO optical networks via asynchronous digital twin feedback, modeling multi-stage debris clouds and sun outage risks from synchronized observations. A reinforcement learning agent modulates link costs for routing optimization, improving service success rate by 30.42% over baselines.

We4-P114/1362 - FMCW LiDAR Demonstrator using an Integrated Silicon Photonics IQ Modulator and Dynamic Target Emulation (SC09)
Gijs van Elzakker *(IMEC The Netherlands)*
An integrated silicon photonics IQ modulator is used in an FMCW LiDAR demonstrator. With a tunable coupler to connect I and Q branches, we show the importance of sideband suppression for the detection of dynamic targets, which are emulated using an acousto-optic modulator.

We4-P115/938 - Two-Stage Rollback-Aware Recovery for Cross-Datacenter Training under Failure-Induced Optical-Link Capacity Degradation (SC10)
Zheng Yang *(Beijing University of Posts and Telecommunications)*
Bandwidth degradation caused by failures disrupts cross-datacenter training. We propose a two-stage recovery strategy using minimum sustainable bandwidth to preserve rollback-aware training value. At 40% residual capacity, it preserves over 2x the value of rigid-priority protection and cuts weighted slowdown by 25% versus equal sharing.

We4-P116/1081 - Energy-Efficient FSO Reconfiguration under User Mobility in Hybrid Fiber-IAB Backhaul (SC10)
Piotr Lechowicz *(Chalmers University of Technology)*
User mobility creates stochastic, time-varying backhaul demand that static capacity provisioning cannot match. We propose a closed-loop, load-aware hysteresis controller for hybrid fiber-IAB-FSO backhaul and show that energy drops faster than coverage: 8% to 44% energy savings cost only 0.9% to 6.7% coverage.

We4-P117/1172 - A Physics-Guided Learning Framework for Compound Soft-Failure Identification from Single-Failure Training Data (SC10)
Yun Wang *(the School of Optical and Electronic Information, Huazhong University of Science and Technology)*
We propose a physics-guided learning framework for compound soft-failure identification in optical communication links using only single-failure training data, achieving 92.8% accuracy and strong generalization to unseen failure combinations through physical spectrum synthesis and decision fusion.

We4-P118/1279 - Descriptor-Conditioned Multi-Agent Small Language Models for On-Premises Optical Network Control (SC10)
Takahito Tanimura *(Hitachi Ltd.)*
Secure optical network control requires local processing, but locally deployable SLMs remain limited in capability. We propose text-defined SLM teams sharing a backbone and diversified by deterministic Text-to-LoRA parameter modulation. In fiber launch-power control, the proposed method achieves higher GOSNR than single-agent and prompt-only baselines.

We4-P119/662 - Demonstration of Novel Key-Rate and Trust Aware Routing Scheme for Maximum QKD Link Utilization in Integrated Quantum-Communication Network (SC11)
Xinyu Chen *(China Mobile Research Insititute)*
We propose a key-rate and trust aware routing scheme maximizing QKD link utilization in integrated quantum-communication networks. Demonstrated for the first time via simulation and experiment, 8.61% utilization improvement, stable key pools, and trusted relays are achieved, overcoming barriers to scalable QKD under limited resources.

We4-P121/798 - Dynamic tracking-enabled indoor free-space BBM92 access for mobile quantum users (SC11)
Shan Jiang
We demonstrate a tracking-assisted indoor free-space optical entanglement distribution system for mobile quantum access. Over 3.4-10.1m FSO links, QBER remains below 10.58% with SKR up to 208 bps under ambient light. Results confirm stable end-to-end entanglement delivery under mobility and alignment variations.

Poster Session in PV-P (Multipurpose poster area)

We4-P122/1026 - A Practical Countermeasure Against Attacks Exploiting Detection Efficiency Mismatch in High-Speed Quantum Key Distribution (SC11)
Ben Taylor
We demonstrate a practical countermeasure against quantum hacking strategies on quantum key distribution (QKD) systems exploiting detection efficiency mismatch, where the receiver's detectors do not exhibit identical responses to incoming photons. This countermeasure enables almost complete recovery of the GHz-clocked system's ideal secret key rate.

We4-P123/1084 - Optimizing Resource Allocation and Scheduling in Quantum Networks (SC11)
Oumayma Bouchmal *(Delft University of Technology)*
We propose a scheduling framework for resource allocation in quantum networks to maximize served demands. Evaluating ILP, EDF, and simulated annealing across 200 scenarios shows ILP achieves offline optimality, EDF enables fast real-time operation, while simulated annealing offers negligible performance benefit at higher computational cost.

We4-P124/1099 - Optimization of CV-QKD Under Practical Constraints (SC11)
Konrad Banaszek
Using reinforcement learning, we optimize for practical hardware constraints, including limited FIR filter taps at the transmitter and receiver, mean photon number and finite DAC/ADC resolution. Under these realistic conditions, the proposed approach achieves significant performance improvements.

We4-P125/1118 - Experimental Demonstration of C-Band DWDM Multi-Classical Multi-QKD Coexistence with Pretrained Rapid QBER Evaluation (SC11)
Qianhui Guo *(Beijing University of Posts and Telecommunications)*
We experimentally demonstrated a 20-km DWDM system comprising 4-QKD-channels coexisting with 6-classical-channels, investigated the heterogeneous impairments experienced by different QKD users under multi-channel combinations, and proposed a pretrained rapid QBER estimator to adaptive QKD parameters optimisation, increasing the total DV-QKD SKR by 28.25% to 127.64-kbps.

We4-P126/1130 - Fiber-Coupled Negative Feedback Avalanche Diode Module for Single-Photon Detection in the Optical O-Band (SC11)
Muhammed Fatih Akal *(Fraunhofer Heinrich Hertz Institute)*
We present a fiber-coupled negative feedback avalanche diode (NFAD) module, characterized in free-running mode with active hold-off circuitry, demonstrating a dark count rate below 100 Hz for 20% single-photon detection efficiency at 1301 nm and 233 K.

We4-P127/1191 - Key-Aware Shared Wavelength Management for Coexisting Quantum and Classical Optical Networks (SC11)
Wenjie Huang
We propose a key-aware shared wavelength management (KA-SWM) algorithm for CV-QKD and classical service coexistence over SDN-enabled WDM networks. A dual-threshold mechanism dynamically expands and recycles quantum channels based on real-time key pool status, achieving up to 79.62% relative improvement in service success probability.

We4-P128/1268 - Passive Polarization-Insensitive QKD Receiver Module in a Standard CFP2 Form Factor (SC11)
Chun Ju Youn
We report the first passive polarization-insensitive QKD receiver implemented in a CFP2 module through hybrid QPIC integration. The proposed self-compensating configuration removes active polarization control while enabling high integration density, offering a scalable route toward compact and commercial quantum communication systems.

We4-P129/1040 - Characterization of Coherence From Spontaneous to Stimulated Four-Wave Mixing in Si3N4 Microresonators (SC12: CLEO®)
Francesca Fama *(Istituto Nazionale di Ricerca Metrologica (INRiM))*
We experimentally characterize spectral coherence in four-wave mixing using high-Q silicon nitride microresonators. Employing time-correlation and phase-sensitive techniques, we follow the expected extension of the coherence time from cavity- to pump-limited regimes, providing a method for characterizing tunable quantum sources, useful for quantum communication.

We4-P130/1055 - Octave-spanning Supercontinuum Generation with Optimized Ultralong-Ultrafast Fiber Lasers (SC12: CLEO®)
Laura Hernández-Martín *(Instituto de Óptica Daza de Valdés (CSIC))*
Pulsed supercontinuum generation centered at 1550 nm with a-30 dB bandwidth in excess of 1000 nm is generated from optimized ultralong ultrafast ring fibre sources with intra-cavity polarization and gain control, using commercially available HNLF.

We4-P131/1167 - Silicon Nitride Microring Resonator for Broadband Near-Infrared to Telecom Wavelength Conversion (SC12: CLEO®)
Chandan Upadhyay
A silicon nitride pulley microring resonator is designed for broadband 780-to-1550 nm frequency conversion via four-wave mixing Bragg-scattering. Measured loaded Q-factors of 0.52×10^6 (780 nm) and 0.48×10^6 (1550 nm) yield a simulated on-chip conversion efficiency of -4.6 dB at 50 mW pump powerseach.

We4-P132/1219 - Measuring Nanometer-Scale Process Variation in Lithography Using Image-Based Anomaly Detection (SC12: CLEO®)
Yanick Douven *(Nobleo Technology)*
This work evaluates image-based anomaly detection as a fast, low-cost method to estimate nanometer-scale lithography variation from optical microscope images. A reference-trained model is applied to parameter-sweep structures and validated with SEM, showing that process-induced fill-factor-shifts, corresponding to 20 nm can be detected and quantified.

We4-P133/1250 - A Fourier Neural Operator Surrogate Model for 3D Diffusion in Photonic Glass Core Substrates (SC12: CLEO®)
Dennis Choy *(Technische Universität Berlin)*
Three-dimensional diffusion simulation in glass core substrates is computationally expensive. We present a Fourier Neural Operator surrogate that maps 2D masks to 3D diffusion fields. On heldout data, it achieves 0.0236 normalized RMSE with 140 ms inference, enabling rapid design-space exploration.

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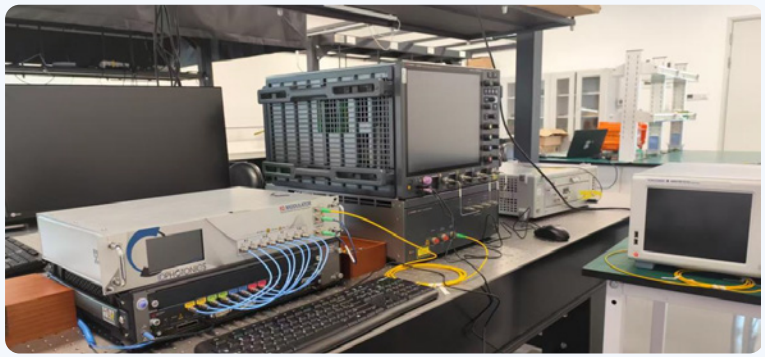

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08:00–12:30 Registration				
08:30–09:00 Morning Coffee				
09:00 - 10:30	**09:00 - 10:30**	**09:00 - 10:30**	**09:00 - 10:15**	**09:00 - 10:15**
Th1-A - Novel modulators	**Th1-B - Turbulence mitigation in free-space optical communications**	**Th1-C - Photodiodes**	**Th1-D - Advanced photonic integration**	**Th1-E - Sub-THz transmission and photonic sensing techniques**
SC 02: Discrete photonic devices and technologies. Wilfried Maineult *(Chair)* Yuriko Maegami *(Chair)*	**SC 09: Free-space optics and optical wireless technologies.** Hidenori Takahashi *(Chair)* Eduward Tangdiongga *(Chair)*	**SC 02: Discrete photonic devices and technologies.** Despoina Petousi *(Chair)* Selina Farwell *(Chair)*	**SC 03: Photonic integrated circuits, assemblies and packaging.** António Teixeira *(Chair)* Jose Manuel Luque Gonzalez *(Chair, University of Málaga)*	**SC 08: Sensing and microwave photonics.** Oskars Ozoliņš *(Chair, Riga Technical University)* Sebastian Randel *(Chair)*
09:00 **Th1-A1/409 - Silicon Slow-Light-Based Modulators and High-Efficiency Optical Transmitters.** Toshihiko Baba *(Yokohama National University)* **Tutorial** We present CMOS-compatible silicon Mach-Zehnder modulators in which slow-light phase shifters enable a small footprint suitable for dense integration, high-speed at 200 Gb/s and beyond, and low bit-energy consumption below 100 fJ/bit. Such modulators also enable reduced transmitter power consumption through an open-collector configuration.	**09:00** **Th1-B1/1428 - Coherent Free-Space Optical Communications in Atmospheric Turbulence: Principles, Limits, and Emerging Strategies.** Aniceto Belmonte. **Tutorial** Coherent free-space optical communication is fundamentally limited by atmospheric turbulence. This tutorial presents a unified statistical modal framework for analyzing performance limits and reviewing mitigation strategies, highlighting statistically matched transmission modes that enable robust and scalable link design without instantaneous wavefront correction.	**09:00** **Th1-C1/201 - Record Gain-Bandwidth Product Si-Ge Avalanche Photodiode Enabling an 8x300 Gbps DWDM Receiver.** Chao Cheng *(University of Chinese Academy of Sciences)* We demonstrate a Si-Ge avalanche photodiode with a record 9460 GHz gain-bandwidth product via inductive peaking, achieving a 55 GHz bandwidth and a peak gain of 172. Integrated with dual-ring filters on an SOI platform, it enables an 8×300 Gbps PAM4 DWDM receiver.	**09:00** **Th1-D1/979 - Silicon Photonic CWDM Filter with Compact Footprint, Low Loss, Flat-Top Transmission and High Yield.** Qingzhong Deng *(imec)* A novel silicon photonic CWDM filter design is proposed and experimentally demonstrated. The design has achieved flat-top transmission across all dies on a wafer, with a device footprint of 48×25μm², an insertion loss of 0.24±0.18dB, and a channel central wavelength standard deviation of 0.77nm.	**09:00** **Th1-E1/585 - 400-Gbit/s Net Transmission Over a 56-m Single-Carrier and Single-Aperture Dual-Polarization Sub-THz Link.** Joel Dittmer *(Institute of Photonics and Quantum Electronics (IPQ))*, Karlsruhe Institute of Technology *(KIT)* We demonstrate a single-carrier and dual-polarization wireless point-to-point transmission at 287 GHz over 56 m with a net data rate of 400 Gbit/s using a single aperture. We employ a novel mHEMT receiver and PCS-16-QAM at 64 GBd, compliant with IEEE 802.15.3d.

C2.1 Conference room 2.1	C2.2 Conference room 2.2	E2 Exhibition room 2	PV-R Multipurpose room	PV-P Multipurpose poster area

08:00–12:30 Registration

08:30–09:00 Morning Coffee

09:00 - 10:30

Th1-F - Programmable photonics: architectures, control and applications. Symposium

Wim Bogaerts *(Organizer)*
Ioanis Tomkos *(Organizer)*
Programmable Integrated Photonics *(PIP)* represents a paradigm shift from application-specific PICs to reconfigurable optical subsystems integrating hardware, electronics, and control algorithms.

Part 1. Chair: Ioannis Tomkos
- Wim Bogaerts *(Ghent University, Belgium)*. "Introduction: The state of Programmable Photonics"
- Darius Bunandar *(co-Founder and Chief Scientist of Lightmatter)*. "Photonics for AI Information Processing: Interconnect and Memory Bandwidth Before Computation"
- Keren Bergman *(Columbia University, US)*. "Programmable photonics for AI clusters"
- Daniel Perez *(iPronics, Spain)*. "Programmable photonics for Optical Switching"
- Bhavin Shastri *(Queens University, Canada)*. "Programmable photonic Ising machine for combinatorics and optimization problems"
- Francesco Da Ros *(Danmark University of Technology, Denmark)*. "Physics-Informed Machine Learning to model and compensate thermal crosstalk"
- Panel session *(30 mins)*.

09:00 - 10:30

Th1-G - Ai-training in optical networks.

SC 06: Architecture, modelling and performance of optical networks.
Paolo Monti *(Chair, Chalmers University of Technology)*
Takehiro Tsuritani *(Chair)*

09:00
Th1-G1/878 - Modeling the Impact of Fiber Latency on Compute-Communication Overlap in Geo-Distributed Multi-Datacenter AI Training.
Ioannis Papavasileiou *(Corning Inc)*
We use discrete-event simulation to quantify the impact of fiber latency on the efficacy of geo-distributed AI model training with data parallelism. We conclude that the optimum distances between two AI clusters is 10-100km, over which hollow-core fiber enables 25% higher compute-communication overlap.

09:00 - 10:30

Th1-H - Coherent systems

SC 05: Optical transmission systems.
David Millar *(Chair)*
Tomoyuki Kato *(Chair, 1Finity Inc.)*

09:00
Th1-H1/1401 - High Capacity Coherent Systems: EEPN Characterization, System Impact and Mitigation Options.
Fred Buchali *(Nokia)* Invited
Equalization-enhanced phase noise (EEPN) is a critical impairment in high-symbol-rate coherent optical systems. This paper analyses EEPN characteristics, system-level effects, and mitigation options. The dominant role of EEPN-induced timing jitter is demonstrated, and implications for pluggable transceivers across DCI, metro, and long-haul applications are discussed.

A1 Auditorium 1	A2 Auditorium 2	E1 Exhibition room 1	C1.1 Conference room 1.1	C1.4 Conference room 1.4
		09:15 **Th1-C2/561 - 100-GHz and >0.5-A/W Balanced Photodiodes with Interference-Enhanced Absorption in O- and C-Bands.** Yuki Yamada *(NTT)* We demonstrate vertical-illumination InGaAs/InP balanced photodiodes (PDs) using interference-enhanced absorption for high-speed coherent detection. O-band- and C-band-optimized PDs achieve 100 GHz bandwidth, 0.52 A/W responsivity, 0.06 nA dark current, <0.1 dB polarization-dependent loss (PDL), and <-35 dB common-mode rejection ratio (CMRR).	**09:15** **Th1-D2/1307 - Dual Self-Injection Locking for Hybrid-Integrated Laser Linewidth Reduction and Stabilization.** Jamal Mohammad Khani *(UBC)* Short on-chip external cavities improve laser stability but offer limited linewidth reduction, while long reflections narrow linewidth. We combine phase- and amplitude-controlled short and long cavities in a zero-process-change silicon-on-insulator circuit to simultaneously reduce linewidth and enhance stability against reflections in a hybrid-integrated DFB laser.	**09:15** **Th1-E2/1332 - In-band Noise Mitigation of Broadband Chirped Signals Based on Joint Time-Frequency Photonic Processing.** Hao Sun *(Institut National de la Recherche Scientifique, Centre Énergie Matériaux Télécommunication (INRS-EMT)* We demonstrate a real-time microwave photonic approach for in-band noise mitigation using time–frequency domain processing. In the experiment, chirped signals with up to 23-GHz bandwidth are recovered under strong optical noise, achieving up to ~9 dB SNR improvements for high-speed applications.
		09:30 **Th1-C3/110 - Bias-free operational 200 GHz bandwidth photodetector toward 800 Gbps/ lane communication.** Toshimasa Umezawa *(National Institute of Information and Communications Technology (NICT)* We proposed a bias-free operational 200-GHz photodetector assuming an integrated photoreceiver with a transimpedance amplifier toward the next-generation 800-Gbps per lane optical transceiver. The device performance of its high-baud-rate signal detection are discussed.	**09:30** **Th1-D3/1277 - Field demonstration of an unshielded InP photonic integrated circuit (PIC) onboard a PocketQube picosatellite payload.** José Manuel Delgado Mendinueta *(Carlos III University of Madrid)* We developed a picosatellite payload with a PIC consisting of a laser and a photodiode, mounted with no metallic shielding. Experimental field results demonstrate a success in the mission after more than one year orbiting the earth, showing no degradation due to ionizing radiation.	**09:30** **Th1-E3/1288 - Demonstration of Photonic Chip-based Ultra-high-resolution Dual-band Microwave Imaging of Non-cooperative Targets.** Weichao Ma *(Aerospace Information Research Institute, Chinese Academy of Sciences)* To break electronic bandwidth bottleneck limited frequency band and resolution, and architectural constraints from generic discrete components, a photonic transceiver chip for radar is presented. It enables concurrent dual-band ultra-high-resolution imaging, demonstrating the first photonic chip-based microwave imaging of non-cooperative targets in realistic environment.

C2.1 Conference room 2.1

09:15 Continuation of:

Th1-F - Programmable photonics: architectures, control and applications. Symposium

See page 149.

C2.2 Conference room 2.2

09:15
Th1-G2/237 - Accurate and Dynamic Network Topology Representation based on Functional Block-based Disaggregation for a Common Reference of Network Digital Twins.
Kiyo Ishii
We develop a data platform integrating component-level topology and port-based reservations using a relational database for optical network digital twins. Field-testbed experiments evaluate the execution times of digital- and physical-space update operations, demonstrating timely and consistent synchronization and its role as a real-time common reference.

09:30
Th1-G3/936 - Agent-to-Agent Protocol Enhanced Multi-Agent Coordination for Autonomous Service Provisioning in Agentic Optical Networks.
Zihao Cui *(Beijing University of Posts and Telecommunications)*
The A2A protocol is implemented into a multi-agent system for autonomous service provisioning in optical networks. The test results demonstrate reliable end-to-end execution across heterogeneous agents, with 100% routing accuracy and low overhead, supporting interoperable and scalable optical network O&M.

E2 Exhibition room 2

09:30
Th1-H2/563 - Reach Extension of WDM DP-16QAM Signals Based on Decision-Feedforward Digital Backpropagation.
Takashi Inoue *(National Institute of Advanced Industrial Science and Technology (AIST)*
We experimentally demonstrate an improved decision-feedforward digital backpropagation (DFF-DBP) to mitigate self- and cross-phase modulation in long-distance WDM systems without using neighboring-channel amplitudes. DFF-DBP with optimized design parameters extends the transmission reach of a 21-channel, 64-Gbaud DP-16QAM system from 2140 km to 2634 km.

PV-R Multipurpose room

PV-P Multipurpose poster area

A1 Auditorium 1

A2 Auditorium 2

E1 Exhibition room 1

09:45
Th1-C4/602 - 100 GHz Ge/Si Avalanche Photodiodes Enabling Net 400 Gbps Data Reception at a Low Voltage of 5 V.
Amir Shahin *(Ugent - Imec)*
We present Ge/Si avalanche photodiodes operating at low voltages (<6.5 V) achieving BWs of 100 GHz and 50 GHz at 1.8 A/W and 3.7 A/W responsivity levels across the O- and C-bands, enabling net 400 Gbps PAM-4 data link demonstration below the FEC threshold.

10:00
Th1-C5/266 - High Performance Waveguide GeSi Avalanche Photodiode Fully-integrated on a 220nm Silicon Photonics Platform.
Jiliang Wu *(SiFotonics Technologies Co., Ltd)*
We demonstrate a 100Gbps Ge/Si waveguide APD integrated with low loss SiN edge couplers and other components on a 220nm SOI platform, achieving ultra-low dark currents and record sensitivity. Our results offer a high-density integration path for APDs in high-link budget and low-power dissipation scenarios.

C1.1 Conference room 1.1

09:45
Th1-D4/578 - Monolithically Integrated Quad-Line Comb Generation in Thin-Film $LiNbO_3$ enabling 3.2 Tb/s Superchannel Transmission.
Fabian Chowanek *(Fraunhofer Institute for Telecommunications, Heinrich-Hertz-Institut HHI., Einsteinufer 37)*
We realize a 3.2 Tb/s superchannel (4x800 Gb/s/λ) at 1550 nm by using monolithic integrated quad-carrier generation. The fabricated TFLN device exhibits 36% on-chip conversion efficiency and 32 dB suppression of interjacent sidelines. Employing 81.1 GBd DP-64QAM, the BER after 100.8 km remains below 2E-2.

10:00
Th1-D5/1276 - Low loss Digitally Tunable Dispersion Controller Using Ridge Waveguides.
Ruitao Ma *(Zhejiang University)*
We demonstrate a low-loss digitally tunable dispersion controller based on rib waveguides on a silicon-on-insulator (SOI) platform. The device achieves a digital dispersion tuning range of −251.87 to +262.33 ps/nm over the 1544–1553.2 nm wavelength band.

C1.4 Conference room 1.4

09:45
Th1-E4/770 - Pulsed Interferometry Towards Real Time PON Monitoring with Feeder and Drop Fibres Discrimination.
Marco Fasano *(Politecnico Di Milano)*
We present a non-invasive interferometric method for simultaneous and unambiguous monitoring of PON drop fibres. Drop fibre discrimination is demonstrated with a 30 km feeder fibre deployed in Athens, even with 1:32 splitting ratio and 52 dB budget losses.

10:00
Th1-E5/652 - Gain-switched DOFC for real-time interrogation of FBGs.
Minghao Wei *(Dublin City University)*
We demonstrate a real-time fibre Bragg grating interrogation system using externally injected gain-switched dual optical frequency comb and embedded receiver. The system achieves interrogation rates up to 1 kHz, while a minimum Bragg wavelength tracking uncertainty of 64.9 fm is obtained at reduced measurement rate.

10:00
Th1-A2/849 - Epitaxial PLZT Mach–Zehnder Modulators with Low Vπ?L, Low Loss, and High-Speed Operation.
Keiichi Nashimoto *(EpiPhotonics Corp)*
Epitaxial PLZT Mach–Zehnder modulators achieve Vπ·L of 0.21 V·cm with propagation loss of 0.8–0.9 dB/cm. Small-signal measurements show ~25 GHz bandwidth, extendable beyond 40 GHz. The devices also support high optical power operation up to 30 dBm.

10:00
Th1-B2/221 - Turbulence-Resilient MMF-MCF Interface for FSO-to-Fibre SDM Transmission via Adaptive Wavefront Shaping.
Xuchen Hua *(Huazhong University of Science and Technology (HUST)*
We demonstrate an interface between free-space OAM-multiplexed link and multi-core fibre link using an MMF-MCF coupling structure with wavefront shaping. We achieve SDM transmission of two 32-GBaud-QPSK channels under turbulence (D/r_0 ~14), with channel crosstalk reduced by 12.6 dB compared to conventional mode demultiplexing approach.

C2.1 Conference room 2.1

09:45 Continuation of:

Th1-F - Programmable photonics: architectures, control and applications. Symposium

See page 149.

C2.2 Conference room 2.2

09:45
Th1-G4/69 - Anything over Dense Wavelength Division Multiplexing with Programmable Data Planes and Software Defined Networking.
Cristian Bermudez Serna *(Universität der Bundeswehr München)*
This work proposes using Programmable Data Plane (PDP) switches with Digital Coherent Optical (DCO) pluggables to enable Anything over Dense Wavelength Division Multiplexing (XoDWDM) Open Line Systems (OLSs) with Software-Defined Networking (SDN) control plane. Feasibility is verified in a testbed using hardware PDP switches.

10:00
Th1-G5/165 - Trade-Offs of AI-based Optical Performance Monitoring and Sensing Techniques.
Lena Wosinska *(Chalmers University of Technology)* Invited
Modern optical networks leverage AI/ML for performance monitoring and fiber sensing across Phi-OTDR/DAS and SOP technologies. We present a unified data-rate framework, showing that monitoring precision choices impact the generated data volumes over nine orders of magnitude, and analyze AI/ML processing trade-offs across these configurations.

E2 Exhibition room 2

09:45
Th1-H3/1241 - Post-FEC Performance Prediction Using Distribution Transform Functions Under Non-Stationary Conditions.
Chuandong Li *(Huawei Technologies Canada)*
Static pre-FEC thresholds fail to guarantee requirements under non-stationary conditions. We propose a transform function leveraging pre-FEC distributions for accurate post-FEC estimation, simplifying to specific distribution moments at high SNR. Experimental validation confirms superior accuracy, preventing significant link margin monitoring errors in dynamic fiber environments.

10:00
Th1-H4/119 - Demonstration of PDM-16QAM Transmission Robust to Fast SOP Variations Using Real-Time 2×2 MIMO Equalization on a GPU.
Manabu Arikawa *(NEC Corporation)*
We demonstrated 5-Gbaud PDM-16QAM transmission using GPU-based real-time DSP with 2×2 MIMO equalization tailored for parallel processing. The pre-FEC BER remained stable below 10^{-4} for over one hour after 240-km SMF transmission, and degradation was small under fast SOP variations up to 10 krad/s.

PV-R Multipurpose room

PV-P Multipurpose poster area

A1 Auditorium 1	A2 Auditorium 2	E1 Exhibition room 1	C1.1 Conference room 1.1	C1.4 Conference room 1.4
	10:15 **Th1-B3/1035 - Reducing Turbulence-Induced Outages in a Deployed Terrestrial Free-Space Optical Communication Link via Interleaving.** Kadir Gumus *(Eindhoven University of Technology)* We present an experimental study of data interleaving for terrestrial free-space optical communication over a 4.6 km urban testbed. Results demonstrate a two-order-of-magnitude reduction in outage probability. A dependency between measured turbulence strength, interleaver length, and achievable data rate is revealed, enabling robust system design.	**10:15** **Th1-C6/1125 - Heterogeneous Integration of Low Loss Si_3N_4 Waveguides and High-Speed Si-Ge Photodiodes.** Martin Peyrou *(CEA)* We demonstrate a Ge photodiode heterogeneously integrated on a low-loss Si_3N_4 200mm platform, achieving a 3dB bandwidth beyond 50GHz at 1550nm. This approach enables high-speed photodetection while leveraging low-loss waveguides, compatible with Kerr frequency comb generation, paving the way for highly scalable DWDM transceivers.		

10:30 - 11:00 Coffee Breack

C2.1 Conference room 2.1	C2.2 Conference room 2.2	E2 Exhibition room 2	PV-R Multipurpose room	PV-P Multipurpose poster area
10:15 Continuation of: **Th1-F - Programmable photonics: architectures, control and applications.** Symposium **See page 149.**		**10:15** **Th1-H5/884 - Optical-Analog-Optical Wavelength Converter for Multi-Domain Optical Direct-Connect Boundaries: 100G/400G Multi-FEC Characterization and Network Demonstration.** Hiroki Mori *(NTT, inc.)* We experimentally evaluate an Optical-Analog-Optical wavelength converter as a boundary node for multi-domain optical direct-connect networks. 100G/400G multi-FEC and multi-vendor measurements indicate OSNR penalty variations correlate more strongly with transceiver-dependent characteristics than with FEC scheme. Multi-domain network demonstration confirms measurable margin and frequency-offset detection capability.		

10:30 - 11:00 Coffee Breack

A1 Auditorium 1

11:00 - 12:30

Th2-A - Security of optical communication systems

SC 11: Quantum communications, physical layer security, and optical quantum technologies.
Zoe Davidson *(Chair, BT)*

11:00
Th2-A1/1405 - Quantum Physical Unclonable Functions: Foundations and Applications.
Mina Doosti *(University of Edinburgh, Quantum Software Lab)* Tutorial
Quantum Physical Unclonable Functions extend the no-cloning principle from states to transformations, enabling hardware-rooted security for quantum networks. This tutorial introduces foundations, security notions, impossibility and positive results, and applications to authentication, identification, hybrid PUFs, and practical quantum communication infrastructures, with implementation considerations and outlook.

A2 Auditorium 2

11:00 - 12:30

Th2-B - SoP sensing and aplications

SC 08: Sensing and microwave photonics.
Ming-Fang Huang *(Chair)*
Steinar Bjørnstad *(Chair, Tampnet AS)*

11:00
Th2-B1/1364 - Fully Unsupervised Detection of Physical Contacts on Subsea Cables via State-of-Polarization Monitoring.
Agastya Raj *(Trinity College Dublin)*
We present a fully unsupervised Fast-Slow DSVDD detector for continuous State-of-Polarization monitoring on a deployed subsea cable. Trained without event labels, it ranks all five confirmed trawler contacts within the top 13 of 122,174 recordings and surfaces additional corroborated cable-contact events.

E1 Exhibition room 1

11:00 - 12:30

Th2-C - End-to-end optical communications systems for space: demonstration and validation

SC 09: Free-space optics and optical wireless technologies.
Anaëlle Maho *(Chair)*
Hidenori Takahashi *(Chair)*

11:00
Th2-C1/252 - Satellite to Ground FSO Communication Links enhanced by Mode Diversity Reception and Adaptive Optics.
Jian Wu *(Beijing University of Posts and Telecommunications)* Invited
We experimentally demonstrate a joint adaptive optics and mode diversity reception (AO+MDR) scheme for GEO satellite-to-ground laser communication. A 1 Gbit/s BPSK link achieves 4.0 dB power gain and improves the probability of BER $<1 \times 10^{-3}$ from 54.2% to 88.8%, confirming synergistic compensation.

C1.1 Conference room 1.1

11:00 - 12:15

Th2-D - Advances in coherent PON

SC 07: Optical networks for access, mobile X-haul, in-building, and intra-datacentre interconnects.
Derek Nesset *(Chair, Huawei)*
Rene Bonk *(Chair, Nokia)*

11:00
Th2-D1/1263 - 960/480/240/120 Gbit/s Single-Carrier Super-Rated Hybrid Coherent Upstream Burst-Mode PON.
Kovendhan Vijayan *(Nokia Bell Labs)*
We propose and experimentally verify a hybrid coherent architecture for an upstream TDMA PON, in which multiple ONU transmitter types can be supported by a single OLT receiver. We demonstrate more than 40-dB loss budget for 480-Gbit/s using 120-GBd DP-QAM4 in upstream burst-mode reception.

C1.4 Conference room 1.4

11:00 - 12:15

Th2-E - Receivers and photodetectors

SC 03: Photonic integrated circuits, assemblies and packaging.
Jose Manuel Luque Gonzalez *(Chair, University of Málaga)*
Marianna Pantouvaki *(Chair)*

11:00
Th2-E1/1286 - A 4-λ x 64 Gb/s Polarization-diverse Silicon Photonic DWDM Receiver using low-PDL 2D Grating Couplers.
Nandish Mehta *(NVIDIA)*
We demonstrate a 4-λx64 Gb/s silicon-photonic polarization-diverse receiver using a low-PDL 2D grating coupler. Co-optimized grating geometry and fiber coupling angle yield <+/-0.2-dB PDL across a 300-mm wafer. Stable eye-diagrams and BER measured under fast 2000-rad/s SOP scrambling confirm fully passive reception independent of polarization.

C2.1 Conference room 2.1

11:00 - 12:00

Th2-F - Programmable photonics: architectures, control and applications. Symposium

Programmable Integrated Photonics *(PIP)* represents a paradigm shift from application-specific PICs to reconfigurable optical subsystems integrating hardware, electronics, and control algorithms.

Part 2. Chair: Wim Bogaerts

- David Marpaung *(University of Twente, Netherlands)*. "Programmable Microwave Photonics"
- Shuang Zheng *(Huazhong University of Science and Technology, China)* . "WDM-enabled Programmable Silicon Photonic Meshes for Parallel Optical Signal Processing"
- Andrea Melloni *(Politecnico di Milano, Italy)*. "Control and calibration of programmable photonic integrated circuits"
- Ioannis Tomkos *(University of Patras, Greece)*. "Programmable Photonics for AI Interconnect Transceivers"
- Panel session *(30 mins)*.

C2.2 Conference room 2.2

11:00 - 12:00

Th2-G - Enabling fibre based devices and handling

SC 01: Novel fibres, fibre devices and amplifiers.
Peter Ingo Borel *(Chair)*
Patrice Mégret *(Chair)*

11:00
Th2-G1/870 - In-Fibre Optical Logic Gate Utilizing Laser-Inscribed Multi-Mode Interference within Multi-Core Fibre.
Kiyoshi Kamimura *(NTT Corporation)*
We propose the in-fibre logic gate based on laser-inscribed multi-mode interference (MMI) within multi-core fibre to realize core switching by optical phase for the first time. The MMI-based logic gate is experimentally demonstrated, and we show its applicability to 2x4 optical logic circuits.

E2 Exhibition room 2

11:00 - 12:30

Th2-H - Faster-than-nyquist, equalization and coding

SC 04: Signal processing for optical communication and sensing.
Jianming Tang *(Chair)*
Bernhard Spinnler *(Chair)*

11:00
Th2-H1 Maximum Coverage Chase Decoder for Optical Interconnects.
Alessandro Cardinale *(EPFL)*
We propose a low-complexity Chase decoder for optical interconnects that formulates test pattern selection as a generalized maximum coverage problem. For concatenated RS-BCH and oFEC codes, our decoder achieves the standard Chase decoding performance with 25% and 61.3% fewer test patterns, respectively.

PV-R Multipurpose room

PV-P Multipurpose poster area

11:15
Th2-B2/882 - On SOP Vibration Sensitivity in Hollow Core Fibers and the Impact of Multipath Interference.
Zhiping Jiang
A recent study reported two-order-of-magnitude higher SOP vibration sensitivity in hollow-core fibers (HCF). We demonstrate that multipath interference might greatly skew these measurements when using narrow-linewidth lasers. Utilizing a proposed robust characterization method, we show that HCF SOP sensitivity is actually comparable to solid-core fibers.

11:15
Th2-D2/821 - Experimental Burst-Mode Reception of LDPC Forward-Error-Corrected 256Gbps Coherent PON with 24 dB Dynamic Range using a Static-Gain TIA.
Jad Sarkis *(Huawei Heisenberg Research Center)*
We demonstrate post-FEC error-free upstream burst-mode transmission of 256 Gbps DP QPSK over 20 km in the C-band. The proposed receiver scheme with commercial ICR and static-gain TIA supports 24 dB of dynamic range (DR) exceeding the typical 20 dB ITU-T requirement for PON systems.

11:15
Th2-E2/630 - Neural Inverse Design of Electrodes Enables Uni-Traveling-Carrier Photodiodes with 220 GHz Bandwidth and 2.7 dBm Output Power at 170 GHz.
Jianwei Chen *(Southeast University (China)*
We demonstrate neural inverse-designed uni-traveling-carrier photodiodes achieving a 220 GHz bandwidth and 2.7 dBm output power at 170 GHz. By tailoring the inductive-capacitive resonance of the on-chip electrodes to compensate for intrinsic RC roll-off, this approach simultaneously enhances bandwidth and output power without heterogeneous integration.

11:30
Th2-B3/1060 - State-of-Polarisation (SoP) Monitoring of Wind-Induced Resonance Oscillations on Power Lines.
Alvaro Doval *(Tampnet AS)*
Aeolian vibrations cause fatigue damage to power-line infrastructure. We monitor SoP on a live OPGW link over seven months, correlating with wind-speed data. Discrete resonance tones below 25 Hz occur at wind speeds up to 7 m/s, demonstrating SoP sensing for proactive structural condition monitoring.

11:30
Th2-C2/1165 - Real-Hardware Demonstration of a 1.25 Gb/s Free-Space Optical Inter-Satellite Link on 6U CubeSat Engineering Models with Simultaneous Closed-Loop PAT.
Amna Riaz *(Northumbria University)*
Real-Hardware Demonstration of a 1.25 Gb/s Free-Space Optical Inter-Satellite Link on 6U CubeSat Engineering Models with Simultaneous Closed-Loop PAT.

11:30
Th2-D3/680 - Low-Complexity FPGA Implementation of Channel Estimation and Equalization for 100G Real-Time Upstream Burst-Mode Detection in Coherent PON.
Renle Zheng *(Fudan University)*
We experimentally demonstrate low-complexity FPGA-based channel estimation and equalization for 100-Gb/s real-time upstream burst-mode detection in coherent PON. Reduced-parallelism one-tap SOP-aided MMSE decreases FPGA resource consumption by 35.8% versus full 128-parallel processing, with only 1-dB dynamic-range penalty and a 45.7-dB power budget.

11:30
Th2-E3/783 - Highly Reliable CMP-Free Ge-on-Si Waveguide Photodiodes for Data Center Optical Interconnects.
Solomon Musibau *(imec)*
We demonstrate reliable CMP-free Ge-on-Si photodiodes, validated through extensive accelerated aging, showing stable dark current. The device exhibits 0.89 A/W responsivity, 65.3 GHz bandwidth, and sub-10 nA dark current, enabling simplified silicon photonics integration for optical interconnects in AI data centers with strict reliability requirements.

C2.1 Conference room 2.1

11:15 Continuation of:

Th2-F - Programmable photonics: architectures, control and applications. Symposium

See page 157.

C2.2 Conference room 2.2

11:15
Th2-G2/725 - 8 × 40-channel Gang Connector Using Snap-Beam Connectors in Co-packaged Optics.
Yuki Fujimaki *(Furukawa Electric Co., Ltd.)*
A low-loss 8 × 40-channel gang connector using Snap-Beam connectors has been developed, enabling high-density simultaneous connection in Co-packaged Optics. Low insertion loss ≤ 0.7 dB and return loss ≥ 36 dB were verified for fibre-to-fibre connections.

11:30
Th2-G3/829 - Efficient, Ultra-flat and Low-noise Parametric Comb Generation using Hybrid Nonlinear Fibre System and Chirped-pulse Nonlinear Loop Mirror.
Yijia Cai *(University College London)*
We address efficiency, spectral flatness and noise-scaling problems in cavity-less frequency comb generation using a hybrid fibre system combining soliton and wave-breaking nonlinearities. We propose chirped-pulse nonlinear loop mirror to efficiently shape pulse and spectra, achieving 3-dB flatness across C-band and sub-3-kHz linewidth over 80nm.

E2 Exhibition room 2

11:15
Th2-H2/690 - Robust Real-Time DSP for a Hybrid Fiber and Photonic-Assisted Sub-THz Wireless Communication.
Filipp Gostner
We demonstrate a real-time photonic-assisted sub-THz link. Across 10km SSMF and a 1.4m wireless link, the coherent 16-QAM system achieves 6.83Gbit/s. Our fast-acquisition DSP performs real-time, non-data-aided timing recovery, channel equalization, and phase recovery on an FPGA, operating under ±100ppm clock offset and intermitted data.

11:30
Th2-H3/989 - Impact of Non-Uniform Constellations on MLSE Demodulation Performance for PCS-16QAM under Bandwidth Limitation.
Yukinobu Nakajima *(Network Innovation Laboratories, NTT, Inc.)*
We investigated the impact of the prior probability term in MLSE branch metrics and demonstrated a GMI improvement of up to 9% over the case without MLSE by optimizing the prior probability term weight through transmission experiments using PCS-16QAM signals under severe bandwidth limitation.

PV-R Multipurpose room

PV-P Multipurpose poster area

A1 Auditorium 1

A2 Auditorium 2

11:45
Th2-B4/537 - Per-Span Microwave Frequency Fiber Interferometry in Subsea Cables for Scalable Deep-Ocean Geophysical Monitoring.
Adonis Bogris
We demonstrate low-cost microwave frequency fibre interferometry for per-span monitoring of a 1,770 km operational subsea cable connecting Ireland and Iceland. Over four months, this approach successfully resolved tidal variations, storms, and teleseismic earthquakes, highlighting its potential for large-scale, cost-effective ocean monitoring.

12:00
Th2-B5/40 - The Mediterranean as an Earth-Scale Geophysical Sensor: Polarization Sensing on Subsea Fiber Infrastructure.
Antonio Mecozzi *(University of L'Aquila)* Invited
We demonstrate that commercial coherent submarine telecommunication links can operate as ultra-low-frequency environmental sensors by monitoring polarization telemetry from DSP receivers. Multiple Mediterranean cables detected both Rayleigh waves and Earth-scale precursor anomalies preceding the 29 July 2025 M_w 8.8 Kamchatka earthquake at ~9000 km distances.

E1 Exhibition room 1

11:45
Th2-C3/834 - Design and Validation of Low Penalty High-Power (>50W) Optical Amplifier for Satellite Communications using Commercial Coherent Transceiver.
Rajiv Boddeda *(Nokia Bell Labs)*
A high-power optical amplifier for ground-to-satellite optical links was developed using polarization beam combination to alleviate nonlinear effects. We demonstrate net 100-Gb/s transmission with commercial coherent transceivers and experimentally characterize the resulting penalty from the nonlinear distortions.

12:00
Th2-C4/432 - Wavelength-Polarization Domain Synthetic Aperture Combining of Noncoherent Multi-beams for Turbulence-Resilient Satellite-to-Ground Laser Downlinks.
Fang Dong *(Fudan University)*
We propose a wavelength-polarization domain synthetic aperture combining scheme for turbulence-resilient satellite-to-ground downlinks based on VCM-FSM-enabled noncoherent multibeam transmission. This architecture supports all-weather uninterrupted communication under atmospheric turbulence and demonstrates 2.24 Tbit/s transmission over a 3000 km FSO equivalent link.

C1.1 Conference room 1.1

11:45
Th2-D4/557 - First Field Trial of Coherent TDM-PON Up to 300 Gb/s.
Yixiao Zhu *(Shanghai Jiao Tong University)*
We report the first field trial demonstration of coherent TDM-PON over 57-km deployed urban fiber (~34-dB loss), achieving flexible rates up to 300 Gb/s and fast-convergence DSP with a 30-ns preamble. The power budgets are 42/39 dB for 200-/300-Gb/s data rates.

12:00
Th2-D5/1252 - Impact of Rayleigh backscattering on next-generation bidirectional 200 Gb/s FDMA coherent PON.
Juan Lautaro Moreno Morrone *(Fraunhofer Heinrich Hertz Institute)*
We experimentally evaluate the impact of Rayleigh backscattering in the upstream in a single-wavelength 200 Gb/s DP-QPSK FDMA coherent PON between two ONUs and an OLT. Simulations show a trade-off between downstream and upstream transmit powers and identify an operational region enabling simultaneous bidirectional transmission.

C1.4 Conference room 1.4

11:45
Th2-E4/758 - On-Chip Real-Time Polarization Demultiplexing using an Adaptive MZI Photonic Mesh.
Seyedmohammad Seyedinnavadeh *(Politecnico di Milano)*
We demonstrate on-chip real-time demultiplexing of two 25 Gbps signals with orthogonal, randomly scrambled polarizations. The photonic circuit consists of a polarization-insensitive 4x2 reconfigurable MZI mesh that also compensates phase drifts of the input signals and is adaptively configured through monolithically integrated electronic multiplexers.

12:00
Th2-E5/632 - A High Sensitivity 200 Gbps PAM4 Receiver with Flip Chip Integrated Si-Ge Avalanche Photodiode and CMOS Transimpedance Amplifier.
Chao Cheng *(University of Chinese Academy of Sciences)*
This paper reports a high-sensitivity optical receiver based on flip-chip integrated Si–Ge avalanche photodiode and CMOS transimpedance amplifier. Clear eye diagrams are achieved at 100 Gbps NRZ and 200 Gbps PAM4, with sensitivities of -26.1 dBm and -20 dBm, respectively.

C2.1 Conference room 2.1

11:45 Continuation of:

Th2-F - Programmable photonics: architectures, control and applications. Symposium

See page 157.

C2.2 Conference room 2.2

11:45
Th2-G4/193 - Highly Efficient and Ultra-Low Loss AR-HCF Fusion Splicing with Rapid Rotational Alignment.
Cong Zhang *(Guangdong University of Technology)*
We propose a discrete-sampling gradient detection algorithm for rapid rotational alignment in anti-resonant hollow-core fiber (AR-HCF) fusion splicing, in order to resolve directional ambiguity, compress the angular search space, and achieve an 0.042 dB average splicing loss with a splicing time less than 55 seconds.

E2 Exhibition room 2

11:45
Th2-H4/985 - Low-Complexity FPGA-Based PR-9QAM Detection for Photonics-Aided 306-GHz FTN Wireless System.
Yikai Wang *(Southeast University)*
This paper employs PR coding for FTN transmission, yielding a PR-9QAM signal and motivating low-complexity CMMA and carrier recovery design. The algorithms are implemented on an FPGA platform and validated in a photonics-aided 306 GHz link with error-free 30 Gbps over 3 m.

12:00
Th2-H5/1190 - 30.2-km D-Band Photonics-Assisted Wireless Reception Enabled by FPGA-Based Equalizer-Guided SFO Compensation.
Sheng Hu *(Fudan University)*
An FPGA-deployed receiver is demonstrated for a 30.2-km photonics-assisted D-band wireless link with equalizer-guided SFO estimation and Farrow-based compensation. Using experimentally captured waveform data loaded into on-board RAM, the FPGA receiver successfully achieves 16-Gbaud QPSK transmission below the 20% SD-FEC threshold.

PV-R Multipurpose room

PV-P Multipurpose poster area

A1 Auditorium 1	A2 Auditorium 2	E1 Exhibition room 1	C1.1 Conference room 1.1	C1.4 Conference room 1.4
12:15 **Th2-A3/640 - Breaking AES at 50 km: Long-Range Optical Side-Channel Attack over Fiber.** Victor Gerenton *(SAMOVAR, Télécom SudParis - Institut Polytechnique de Paris)* Passive optical networks rely on AES-128 for traffic confidentiality. We demonstrate that AES-induced power fluctuations on microcontrollers can modulate a co-powered laser and propagate through 50 km of fiber. This enables key recovery using 1500 optical traces, making this the first long-range optical side-channel attack.				
12:30 - 14:00 Lunch at your own				
14:00-15:30 Postdeadline papers	**14:00-15:30 Postdeadline papers**	**14:00-15:30 Postdeadline papers**	**14:00-15:30 Postdeadline papers**	**14:00-15:30 Postdeadline papers**
15:45-16:15 Closing	**15:45-16:15 Closing**			

C2.1 Conference room 2.1

12:15 Continuation of:

Th2-F - Programmable photonics: architectures, control and applications. Symposium

See page 157.

C2.2 Conference room 2.2

E2 Exhibition room 2

12:15
Th2-H6/1013 - Demonstration of 169-Gbaud Faster-Than-Nyquist PAM4 Transmission Using Adaptation-Free THP-FFDNN Under 37.9-GHz 3-dB Bandwidth Limitation.
Yuan Wei *(Fudan University)*
We propose a THP-FFDNN framework for faster-than-Nyquist PAM4 transmission, which eliminates adaptive updating while requiring only 408 parameters. The proposed scheme is compatible with GPU-based DSP implementation and achieves 169 Gbaud PAM4 under 37.9-GHz 3-dB bandwidth limitation, supporting the lowest spectral compression ratio of 62.5%

PV-R Multipurpose room

12:30 - 14:00 Lunch at your own

14:00-15:30 Postdeadline papers

14:00-15:30 Postdeadline papers

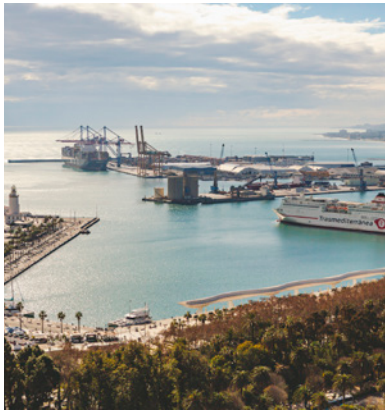
14:00-15:30 Postdeadline papers

Social Events

Get-together at FYCMA

20 September
18:00 - 20:00

On 20 September, all ECOC 2026 participants are invited to a get-together event at the conference venue, FYCMA. It is a great way to connect with other delegates before the conference starts.



Welcome Reception at Cruise Terminal

21 September
19:30 - 21:30

Join us at the welcome reception at Cruise Terminal where we celebrate the beginning of ECOC2026. Meet old and new colleagues while enjoying a sea view in a unique venue, an exceptional waterfront space with a Mediterranean essence.

An Unforgettable Evening in an 18th-Century Historic Palace!

23 September
19:30 - 22:30

The conference dinner is the perfect opportunity to network and build lasting connections with colleagues from around the world in a truly magical setting. We will gather at Finca Nadales, a stunning 19th-century historic gem nestled in a lush natural oasis. The evening kicks off with a dynamic networking cocktail featuring refreshing drinks and iconic Spanish starters. This will be followed by an exceptional banquet: a seated two-course dinner concluded by a spectacular dessert.

Get ready for a night of inspiration, extraordinary connections, and exquisite cuisine!

Buses shuttles schedule:

18:45 FYCMA - Málaga Town Hall - Finca Nadales

19:00 FYCMA - Finca Nadales

23:00 Finca Nadales - Málaga Town Hall

(Bus timetables are subject to change due to scheduling reasons; please check the timetables published in the web site the day before)

FYLA Networks

Contact

Long Range Laser Communications

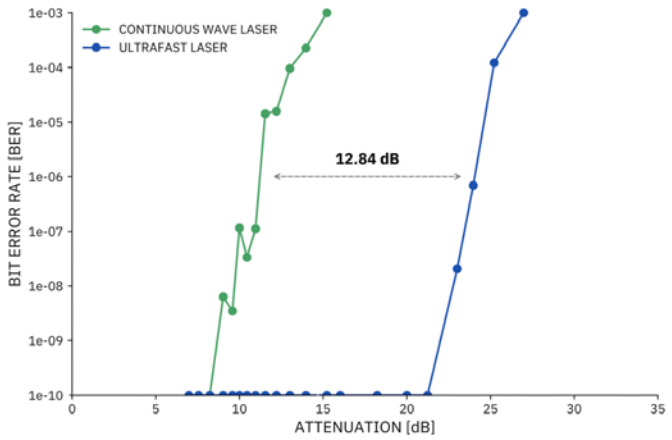
Energy-efficient free-space optics links optimized for tactical environments

Contact delivers high-capacity, full-duplex communication with low average transmission power, enabling fast deployment without the need for spectrum licenses. Its inherently secure and uninterceptable technology is also immune to jamming, ensuring reliable, high-performance connectivity even in demanding environments.

TECHNICAL SPECIFICATIONS

Source type:	Ultrafast laser
Central Wavelength:	1.5 µm, narrow linewidth
Average Optical Output Power:	< 1 W
Link Distance:	> 20 Km
Transmission Data Rate:	1.25 / 2.5* / 10 Gbit/s*
Modulation:	Amplitude - OOK
Optical Power per Bit:	> 350 W
Optical Aperture:	4 cm
Electrical Power Consumption:	200 W per terminal
Energy consumed per bit:	< 350 pJ/bit

*2.5 / 10 Gbit/s under development.



Performance comparison between continuous-wave laser vs. ultrafast laser under equal conditions.

Currently under development. Launch of commercial version by Q4 2027. Demo units available now.

More info at fyla.com

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Notes

Notes

53rd European Conference on Optical Communication

October 10 - 14, 2027 - Milan (Italy)

Topics

SC 1: Novel fibres, fibre devices and amplifiers
SC 2: Discrete photonic devices and technologies
SC 3: Photonic integrated circuits, assemblies and packaging
SC 4: Signal processing for optical communication
SC 5: Optical transmission systems
SC 6: Architecture, modelling and performance of optical networks
SC 7: Optical networks and systems for optical access and xHaul mobile transport networks
SC 8: Sensing and microwave photonics
SC 9: Free-space optics and optical wireless technologies
SC 10: Control and management of optical networks
SC 11: Quantum communications, physical layer security and optical quantum technologies
SC12: Photonic interconnects, heterogeneous integration, and integrated subsystems for data centers and AI

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