

ACP 2026

The Asia Communications and Photonics Conference

HOSTS

Westlake University | Zhejiang University

CO-ORGANIZERS

Progress in Optoelectronics and Communications (POC) | LUSTER

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The Chinese Institute of Electronics

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Welcome to the Asia Communications and Photonics Conference

It is our great pleasure to welcome you to the Asia Communications and Photonics Conference (ACP) and share the latest advances in communication and photonics science, technology, and innovations from leading companies, universities, and research institutions around the world. ACP is the largest conference in the Asia-Pacific region dedicated to optical communications, photonics, and related technologies. Established in 2001, ACP has been held annually and is jointly sponsored by the IEEE Photonics Society, Optica, SPIE, Chinese Optical Society (COS), China Institute of Communications (CIC), and China Instrument and Control Society (CIE).

The ACP technical conference offers a comprehensive program including plenary, tutorial, invited, and contributed talks delivered by leading international academic and industry researchers. This year, the conference revolves around four main tracks: D-Track, N-Track, T-Track and NP-Track, covering optoelectronic devices, optical networks, optical transmission, and non-telecom photonics. With its broad and high-quality technical program, ACP provides an ideal venue to explore emerging research directions and engage with top researchers driving these advances. Nearly 800 papers are scheduled, including over 100 invited and 16 tutorial presentations by many of the world's most prominent experts. The poster session will be held from 15:30 to 17:30 on November 3, providing an excellent opportunity to meet the authors and discuss technical topics in depth. We sincerely thank all contributors and authors for making ACP a truly outstanding global event.

The Plenary Session on the morning of November 2 will feature three distinguished speakers, including Professor Sir David Payne from University of Southampton on "Re-Imagining the Global Internet: 'Nothing' is better than silica fiber," Dr. Dennis Cai from Alibaba Cloud on "Network Architecture Evolution for the Agentic AI Era," and Dr. Glenn Parsons from Ericsson on "The Optical Foundation of the AI and 6G Era: Connecting Compute, Communications, and Intelligence", providing a unique opportunity to hear cutting-edge advances and insights from leading experts in optical communication and photonics.

We also host a rich lineup of exciting activities, including workshops, industry forum, Industry Horizon program, academic forum, student event and short course. Workshop and industry forum are free of charge for all conference registrants. We sincerely thank the organizers and speakers for their contributions to an excellent program.

Best Top-Score Paper Award, Best Student Paper Award, and Best Paper Award in Industry Innovation will be presented to the winners at the banquet on Tuesday, November 3. Best Top-Score Paper Award represents an exciting new initiative. The top 5% of submissions will be designated as Top-Score Papers, and be invited to publish extended versions in the *Progress in Optoelectronics and Communications (POC)*.

In addition to the technical program, the conference will feature an impressive range of exhibitions from relevant industries, publishers, and professional organizations.

As the host city of ACP 2026, Hangzhou, the capital city of Zhejiang Province, is famed as "Paradise on Earth". It is home to three UNESCO World Heritage Sites: West Lake, the Grand Canal and the Archaeological Site of Liangzhu. With a recorded history of over 2,200 years, this ancient capital perfectly combines poetic natural landscapes with booming digital and photonic industries. West Lake's Three Ponds Mirroring the Moon, printed on China's one-yuan banknote, is the city's most recognizable attraction. The city also enjoys a reputation as the home of silk and fine Longjing tea.

Organizing a conference of this scale is a tremendous task, and success would be impossible without the dedicated efforts of many supporters and volunteers. We are deeply grateful to the entire Technical Program Committee and Subcommittee Chairs, who have worked persistently throughout the year to invite speakers, solicit and review papers, and organize technical sessions, resulting in an excellent technical program. We also thank the staff and volunteers of Westlake University and Zhejiang University, professional societies such as the IEEE Photonics Society, Optica, SPIE, COS, CIC, and CIE, together with Learning Conference and BRIGHTEN CORE for organizing and sponsoring this outstanding event.

Sincerely,

ACP 2026 General Chairs



William Shieh

Westlake University,
China



Daoxin Dai

Zhejiang University/
China Jiliang University,
China



Yikai Su

Shanghai Jiao Tong
University, China

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Lena Wosinska
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General Chairs



William Shieh
Westlake University,
China



Daoxin Dai
Zhejiang University/
China Jiliang University,
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Yikai Su
Shanghai Jiao Tong
University, China

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Xinliang Zhang, Huazhong University of Science and Technology, China, COS

Gangxiang Shen, Soochow University, China

Subcommittee

D-Track: Devices

D1: Advanced Packaging, Interfacing, and System Integration

Linjie Zhou, Shanghai Jiao Tong University, China *subcommittee chair*

Nicolas K. Fontaine, Nokia Bell Labs, United States
Xianshu Luo, IME, Singapore
Guangwei Cong, AIST, Japan
Stanley Cheung, North Carolina State University, United States
Jiawei Wang, Harbin Institute of Technology (Shenzhen), China
Wei Chu, Zhangjiang Laboratory, China
Shaoliang Yu, Zhejiang Laboratory, China
Jiangbing Du, Shanghai Jiao Tong University, China
Huashun Wen, Nankai University, China
Shanshan Yu, Lightelligence, China
Fengman Liu, Institute of Microelectronics of Chinese Academy of Sciences, China
Andrew Poon, The Hong Kong University of Science and Technology, Hong Kong, China

D2: Integrated Photonic Circuits and Heterogeneous Platforms

Hongtao Lin, Zhejiang University, China *subcommittee chair*
Jianjun Zhang, Institute of Physics, Chinese Academy of Sciences, China
Zhaohui Li, Sun Yat-sen University, China
Bart Kuyken, Ghent University, Belgium
Jiangwei Man, HISILICON, China
Alberto Montanaro, CNIT, Italy
Jingyi Tian, Westlake University, China
Nan Qi, Institute of Semiconductor, Chinese Academy of Sciences, China
Yonghui Tian, Lanzhou University, China
Xuhan Guo, Shanghai Jiao Tong University, China
Fang Wang, Shanghai Institute of Technical Physics of the Chinese Academy of Sciences, China

D3: Active Optoelectronic Devices

Xingjun Wang, Peking University, China *subcommittee chair*
Haowen Shu, Peking University, China
Hiroyuki Tsuda, Keio University, Japan
Tiantian Li, Xi'an University of Posts and Telecommunications, China
Daquan Yang, Beijing University of Posts and Telecommunications, China
Xiaobei Zhang, Shanghai University, China
Ping Zhao, Sichuan University, China
Hui Cong, Institute of Semiconductors, Chinese Academy of Sciences, China
Baile Chen, ShanghaiTech University, China
Bin Zhang, Sun Yat-sen University, China

D4: Passive Photonic Components Across Domains

Wenfu Zhang, Xi'an Institute of Optics and Precision Mechanics of Chinese Academy of Sciences, China *subcommittee chair*
Lin Sun, Soochow University, China
Yating Wan, KAUST, Saudi Arabia
Ting Wang, Institute of Physics CAS, China
Xiaojun Xie, Southwest Jiaotong University, China
Ke Xu, Harbin Institute of Technology, Shenzhen, China
Minhao Pu, Technical University of Denmark, Denmark
Juejun Hu, Massachusetts Institute of Technology, United States
Cheng Wang, City University of Hong Kong, Hong Kong, China
Hao Hu, Technical University of Denmark, Denmark
Yu Zhang, Huazhong University of Science and Technology, China
Xiaoxiao Xue, Tsinghua University, China

N-Track: Networks

N1: Network, System and Service Innovations

Shanguo Huang, Beijing University of Posts and Telecommunications, China *subcommittee chair*
Xiaoping Zheng, Tsinghua University, China
Zhangyuan Chen, Peking University, China
Yi Dong, Beijing Institute of Technology, China

Bingli Guo, Beijing University of Posts and Telecommunications, China
Avishek Nag, University College Dublin, Ireland
Lei Guo, Northeastern University, China
Ran Gao, Beijing Institute of Technology, China
Yongli Zhao, Beijing University of Posts and Telecommunications, China
Rui Wang, University of Bristol, United Kingdom
Sabidur Rahman, ATT, United States

N2: Photonics for Data Center and Computing Systems

Weisheng Hu, Shanghai Jiao Tong University, China *subcommittee chair*
Xiao Lin, Fuzhou University, China
Wei Wang, Beijing University of Posts and Telecommunications, China
Yuxin Xu, Zhejiang University of Technology, China
Yuyang Liu, China Telecom Research Institute, China
Liangjun Lu, Shanghai Jiao Tong University, China
Meng Xiang, Guangdong University of Technology, China
Massimo Tornatore, Politecnico di Milano, Italy
Zuqing Zhu, University of Science and Technology of China, China
Huaxi Gu, Xidian University, China
Pham Tien Dat, National Institute of Information and Communications Technology (NICT), Japan

N3: Optical Network Architectures, Control and Management

Gangxiang Shen, Soochow University, China *subcommittee chair*
Qunbi Zhuge, Shanghai Jiao Tong University, China
Jiawei Zhang, Beijing University of Posts and Telecommunications, China
Yongcheng Li, Soochow University, China
Yvan Pointurier, Huawei Technologies, France
Xiaoliang Chen, University of Science and Technology of China, China
Kari Clark, University College London, United Kingdom
Hiroshi HASEGAWA, Nagoya University, Japan
Francesco Musumeci, Politecnico di Milano, Italy
Wenda Ni, ByteDance Networking, United States

N4: Optical Access and Last-Mile Networks

Shikui Shen, China Unicom Research Institute, China *subcommittee chair*
Hanhyub LEE, ETRI, Korea
Jim Zou, Adtran Networks, United States
Dezhi Zhang, China Telecom, China
Yan Zeng, Huawei Technologies, China
Junwen Zhang, Fudan University, China
Zhensheng Jia, CableLabs, United States
Elaine Wong, The University of Melbourne, Australia
Rene Bonk, Nokia Bell Labs, United States
Jun Li, Soochow University, China
Luca Valcarengi, Scuola Superiore Sant'Anna, Italy

N5: Industry Perspectives and Network-Centric Technology Evolution

Frank Chang, Source Photonics, United States *subcommittee chair*
Chongjin Xie, PhotonicX AI, Singapore
Xiang Liu, Huawei, China
Di Liang, University of Michigan, United States
Gordon Ning Liu, Soochow University, China
Anbin Wang, Alibaba, China
Scott Xin Yin, IMEC, Belgium
Scott Wilkinson, Signal AI, United States
Xiang Zhou, Google, United States
Min Sun, Tencent, China
Xue Wang, Bytedance, China

T-Track: Transmission

T1: Short-Reach Transmission Systems for Data-Center, Access, and Mobile Networks

Kangping Zhong, The Hong Kong Polytechnic University, Hong Kong, China *subcommittee chair*

Yanni Ou, Beijing University of Posts and Telecommunications, China

Jiahao Huo, University of Science and Technology Beijing, China

Tianwai Bo, Beijing Institute of Technology, China

Xiang Li, China University of Geosciences, China

Brandon Buscaino, CIENA, United States

Gabriele Di Rosa, Adtran, Germany

Paikun Zhu, NICT, Japan

Ming Luo, China Information and Communication Technologies Group Corporation, China

Chi-Wai Chow, NYCU, Taiwan, China

Xingyu Zhou, Huawei, China

T2: Optical Transmission Systems

Fan Zhang, Peking University, China *subcommittee chair*

Johannes Karl Fischer, Fraunhofer HHI, Germany

Xian Zhou, University of Science and Technology Beijing, China

Fan Li, Sun Yat-sen University, China

Yixiao Zhu, Shanghai Jiao Tong University, China

Bin Chen, Hefei University of Technology, China

Danshi Wang, Beijing University of Posts and Telecommunications, China

Fan Yu, Huawei Optical Product Line Planning Department, China

Guowei Lu, Kyushu University, Japan

Haoshuo Chen, Nokia Bell Labs, United States

Takeshi Hoshida, Fujitsu Ltd, Japan

Yan He, The Hong Kong Polytechnic University, Hong Kong, China

T3: Subsystems and Digital Signal Processing for Optical Communications

Vivian Xi Chen, Nokia Bell Labs, United States *subcommittee chair*

Haïk Mardoyan, Nokia Bell Labs, France

Anxu Zhang, China Telecom Research Institute, China

Deepa Venkitesh, IIT Madras, India

Zhenning Tao, Fujitsu, China

Besma Kalla, Eindhoven University of Technology, Netherlands

Zhaopeng Xu, Pengcheng Laboratory, China

Ji Zhou, Beijing Institute of Technology, Zhuhai, China

Stephan Pachnicke, Christian-Albrechts-University of Kiel, Germany

Pandelis Diamantopoulos, NTT, Japan

Xingyuan Xu, Beijing University of Posts and Telecommunications, China

Yi Yu, The Hong Kong Polytech University JinJiang Technology and Innovation Research Institute, China

T4: Free-Space Transmission and Communication Systems

Xiaodan Pang, Zhejiang University, China *subcommittee chair*

Xiong Deng, Southwest Jiaotong University, China

Oskars Ozolins, Riga Technical University, Latvia

Chen Chen, Chongqing University, China

Haifeng Yao, Beijing Institute of Technology, China

Ming Che, Kyushu University, Japan

Liam Barry, Dublin City University, Ireland

Sebastian Randel, Karlsruhe Institute of Technology, Germany

Hoon Kim, KAIST, Korea

Jian Zhao, South China University of Technology, China

Gil Fernandes, Instituto de Telecomunicacoes, Portugal

NP-Track: Non-telecom Photonics**NP1: Fiber-Based and Free-Space Sensing**

Li Pei, Beijing Jiaotong University, China *subcommittee chair*
Liang Zhang, Shanghai University, China
Kwang Yong Song, Chung-Ang University, Korea
Zinan Wang, University of Electronic Science and Technology of China, China
Yongkang Dong, Harbin Institute of Technology, China
Zheng Zheng, Beihang University, China
Lei Wei, Nanyang Technological University, Singapore
Ruohui Wang, Northwest University, China
Tuan Guo, Jinan University, China
Qizhen Sun, Huazhong University of Science and Technology, China
Bin Yin, Ocean University of China, China

NP2: Microwave Photonic Devices and Systems

Xiangchuan Wang, Nanjing University of Aeronautics and Astronautics, China *subcommittee chair*
Fei Xu, Nanjing University, China
Xihua Zou, Southwest Jiaotong University, China
Zhangyuan Chen, Peking University, China
Yi Dong, Beijing Institute of Technology, China
Jiejun Zhang, Jinan University, China
Mable Fok, University of Georgia, United States
Paolo Ghelfi, Scuola Superiore Sant' Anna & CNIT, Italy
Ziqian Zhang, The University of Sydney, Australia
Zejie Yu, Zhejiang University, China
Fangzheng Zhang, Nanjing University of Aeronautics and Astronautics, China
Wenhao Wang, Westlake University, China

NP3: Quantum Devices, Systems, Networking and Computing

Xifeng Ren, University of Science and Technology of China, China *subcommittee chair*
Shuang Wang, University of Science and Technology of China, China
Xiaosong Ma, Nanjing University, China
Biheng Liu, University of Science and Technology of China, China
Xiaolong Su, Shanxi University, China
Wei Zhang, Tsinghua University, China
Xuewen Chen, Huazhong University of Science and Technology, China
Hualei Yin, Renmin University of China, China
Lai Zhou, Beijing Academy of Quantum Information Sciences, China
Kejin Wei, Guangxi University, China
Shengshuai Liu, East China Normal University, China
Qiang Zhou, University of Electronic Science and Technology of China, China
Chao Wang, Singapore Institute of Technology, Singapore
Xinhao Li, Westlake University, China

NP4: Materials, Nanofabrication, and Characterization Techniques

Jianrong Qiu, Zhejiang University, China *subcommittee chair*
Yuan Gong, University of Electronic Science and Technology of China, China
Xinyu Fan, Shanghai Jiao Tong University, China
Liaoyong Wen, Westlake University, China
Kaixuan Chen, South China Normal University, China
Mable Fok, University of Georgia, United States
Dezhi Tan, Zhejiang University, China
Jiyeon Choi, Korea Institute of Machinery & Materials/University of Science and Technology, Korea
Jun He, Shenzhen University, China
Yuechen Jia, Shandong University, China

Sponsors

General Information

Conference Venue

Conference Venue: Hangzhou International Expo Center

Address: 353 Benjing Ave, Qianjiang Century City, Xiaoshan District, Hangzhou

Located in Qianjiang Century City on the south bank of Qiantang River, Hangzhou International Expo Center (HIEC) covers a total floor area of 850,000 square meters. The venue is in a modern simplistic style and also reflects the unique vibe of regions south of the Yangtze River. In September 2016, Hangzhou International Expo Center was unveiled as the main venue of the G20 Hangzhou Summit. In September 2023, Hangzhou International Expo Center, as the Hangzhou Asian (Para) Games Main Media Centre, the venue for the Asian Games squash competition, and the catering service provider for the Main Media Centre, once again drew global attention.

Registration

Location: Lobby at Conference Area, Hangzhou International Expo Center

08:00–20:30 Sunday, 1 November

08:00–18:30 Monday, 2 November

08:30–18:30 Tuesday, 3 November

08:30–16:00 Wednesday, 4 November

Onsite Speaker Preparation

Tutorial/Invited/Oral: 60/30/15 minutes, including Q & A.

Presenters are required to be in the session room at least 30 minutes prior to their scheduled talk to upload and check their slides. No shows of the oral presentation will be recorded and these papers will not be published. If you attend the conference but do not present your talk at the scheduled time, your attendance will be deemed invalid and the paper will not be published.

Onsite Poster Preparation

There is no fixed template for Poster. Presenters can make it according to their needs. Presenters should put up their poster before the poster session starts. Each board has a Control ID on it, please note whether it is your own Control ID. Presenters are also required to be standing by their poster during poster session to answer questions and further discuss their work with attendees.

During poster session, staff will record no-show posters and these papers will not be published. Posters put up after the end of the poster session will be counted as invalid posters, and papers will not be published either.

Poster Board Size: 1m (Length) * 2.235m (Height)

Recommended Poster Size: 1.2m (Height) * 0.8m (Width)

Poster Session: 15:30–17:30, Tuesday, 3 November

Location: Corridor on Level 2, Hangzhou International Expo Center

Note: Poster presenters are responsible to remove their posters, and the conference staff will not collect the posters left at the end of the poster session.

Demo Zone

Time: 15:30–17:30, Tuesday, 3 November

Location: Corridor on Level 2, Hangzhou International Expo Center

Best Paper Award in Industry Innovation

Any non-invited speaker, who is the first author as well as the presenting author of a paper submitted will be eligible for this award. Three papers focusing on industry and technology will be selected by the ACP 2026 Committee. Certificates and Awards will be presented to the winners at the conference banquet and award ceremony. The nominates of this award are marked Industry Innovation Nomination in this program.

Best Student Paper Award

Best Student Paper Award Competition Session: 13:30–15:30, Sunday, 1 November

Location: VIP Room 1–2, 1F

Any full-time university student, who is the first author as well as presenter of a paper submitted with choosing presentation type of “Best Student Paper Award” will be eligible for this award. Three winners will be selected by the ACP 2026 Committee. Certificates and Awards will be presented to the winners at the conference banquet and award ceremony.

Best Top-Score Paper Award

Best Top-Score Paper Award Competition Session: 08:30–17:30, Sunday, 1 November

Location: Conference Room 207, 2F & VIP Room 2-2, 2F

The top 5% of submissions will be designated as Top-Score Papers. First authors of these papers will be officially recognized as Top-Score Papers in the conference database, and be invited to publish extended versions in the *Progress in Optoelectronics and Communications*. Four winners will be selected by the ACP 2026 Committee. Certificates and Awards will be presented to the winners at the conference banquet and award ceremony.

Exhibition

The ACP 2026 Exhibition is open to all attendees.

Tea Breaks

10:00–10:30 Sunday, 1 November

15:00–15:30 Sunday, 1 November

10:00–10:30 Monday, 2 November

15:30–16:00 Monday, 2 November

10:00–10:30 Tuesday, 3 November

15:30–16:00 Tuesday, 3 November

10:00–10:30 Wednesday, 4 November

15:30–16:00 Wednesday, 4 November

Lunches

Location: Press Conference Room, 2F

12:00–13:30 Monday, 2 November

12:00–13:30 Tuesday, 3 November

12:00–13:30 Wednesday, 4 November

Dinner

Location: Press Conference Room, 2F

17:30–20:30 Sunday, 1 November

17:30–20:30 Tuesday, 3 November

Welcome Reception

Location: No.3 Bridge, 2F 三号桥

18:30–20:30 Monday, 2 November

Banquet and Award Ceremony

Best Top-Score Paper Award, Best Student Paper Award, and Best Paper Award in Industry Innovation will be presented at the banquet. The banquet is NOT INCLUDED in the registration fee for students, but is included for all other regular registration types. The ticket is provided within the badge.

Location: Multi-function Hall, 1F

Time: 18:30–20:30, Tuesday, 3 November

Note

Volunteers and staff will wear yellow slings. If you have any questions, you can contact them or come to the conference registration table for help.

Program at a glance

	November 1 Sunday	November 2 Monday	November 3 Tuesday	November 4 Wednesday
Registration Lobby at Conference Area, 1F	08:00-20:30	08:00-18:30	08:30-18:30	08:30-16:00
Workshop 1F & 2F	08:30-17:45			
Industry Forum Conference Room 101, 1F	09:00-17:50			
Industry Horizon program Conference Room 205, 2F	09:30-17:00	13:30-17:00	08:30-17:00	
Opening Ceremony Multi-function Hall, 1F		08:30-08:45		
Plenary Session Multi-function Hall, 1F		08:50-12:10		
Technical Session 1F & 2F		13:30-18:00	08:30-15:30	08:30-17:30
Poster Session & Demo Zone 2F			15:30-17:30	
Best Top-Score Paper Award Competition Session Conference Room 207, 2F & VIP Room 2-2, 2F	08:30-17:30			
Best Student Paper Award Competition Session VIP Room 1-2, 1F	13:30-15:30			
Post-deadline Paper Session Conference Room 102B, 1F				13:30-15:30
Exhibition 1F & 2F	09:00-18:00	09:00-18:00	09:00-18:00	09:00-18:00
Student Event TBD		12:00-13:30		
Academic Forum Conference Room 102C, 1F	08:00-12:00			
Fiber Short Course Conference Room 102B, 1F	10:00-12:00			
Welcome Reception No.3 Bridge, 2F 三号桥		18:30-20:30		
Banquet & Award Ceremony Multi-function Hall, 1F			18:30-20:30	

Conference Map-1F

November 1

Conference Room 103A

Workshop: Fit-for-Purpose or Falling Behind? Rethinking Optical Network Design for the Scale-Across Era

Conference Room 103B

Workshop: Free-Space Optical Communications for Terrestrial, Aerial and Space Networks: Which Frequency Bands for Which Scenarios?

Conference Room 103C

Workshop: Key components and signal processing for high-speed and real-time optical transmission systems

Conference Room 102A

Workshop: Advanced opto-electronic and optical fiber packaging

Workshop: Silicon and Heterogeneously Integrated Photonics Towards Sub-pJ/bit, Multi-Tbps Optical I/O and Next-Generation AI Clusters

Conference Room 102B

Workshop: Path to Very High Speed PON: Requirements, Components, and Solutions
Special Event: Fiber Short Course

Conference Room 102C

Workshop: POC Workshop on Trends in Optoelectronics and Communications

Special Event: Academic Forum for Postgraduates in Optical Communications 2026

Multi-function Hall A

Workshop: Programmable photonics and applications

Multi-function Hall B

Workshop: Optical Satellite Networking and In-Orbit Computing: Towards Integrated Space Communication and Computing

Multi-function Hall C

Workshop: Photonic Systems for AIDC: From Optical Fabrics to Computing and System Co-Design

Conference Room 101

Industry Forum: All-Optical Network in the Intelligent Era

VIP Room 1-2

Best Student Paper Award Competition Session

November 2

Conference Room 103A

D1: Advanced Packaging, Interfacing, and System Integration

Conference Room 103B

D2: Integrated Photonic Circuits and Heterogeneous Platforms

Conference Room 103C

D3: Active Optoelectronic Devices

Conference Room 102A

D4: Passive Photonic Components Across Domains

Conference Room 102B

N1: Network, System and Service Innovations

Conference Room 102C

N3: Optical Network Architectures, Control and Management

Multi-function Hall A

T1: Short-Reach Transmission Systems for Data-Center, Access, and Mobile Networks

Multi-function Hall B

T2: Optical Transmission Systems

Multi-function Hall C

T4: Free-Space Transmission and Communication Systems

Conference Room 101

NP4: Materials, Nanofabrication, and Characterization Techniques

November 3

Conference Room 103A

D1: Advanced Packaging, Interfacing, and System Integration

N2: Photonics for Data Center and Computing Systems

Conference Room 103B

D2: Integrated Photonic Circuits and Heterogeneous Platforms

NP4: Materials, Nanofabrication, and Characterization Techniques

Conference Room 103C

D3: Active Optoelectronic Devices

N4: Optical Access and Last-Mile Networks

Conference Room 102A

D4: Passive Photonic Components Across Domains

Conference Room 102B

N1: Network, System and Service Innovations

N3: Optical Network Architectures, Control and Management (Parallel Session)

Conference Room 102C

N3: Optical Network Architectures, Control and Management

Multi-function Hall A

T1: Short-Reach Transmission Systems for Data-Center, Access, and Mobile Networks

Multi-function Hall B

T2: Optical Transmission Systems

T3: Subsystems and Digital Signal Processing for Optical Communications

Multi-function Hall C

T4: Free-Space Transmission and Communication Systems

Conference Room 101

NP4: Materials, Nanofabrication, and Characterization Techniques

NP2: Microwave Photonic Devices and Systems

November 4

Conference Room 103A

N2: Photonics for Data Center and Computing Systems

Conference Room 103B

D2: Integrated Photonic Circuits and Heterogeneous Platforms

Conference Room 103C

D3: Active Optoelectronic Devices

Conference Room 102A

D4: Passive Photonic Components Across Domains

Conference Room 102B

N1: Network, System and Service Innovations

Post-deadline Paper Session

Conference Room 102C

N4: Optical Access and Last-Mile Networks

Multi-function Hall A

T2: Optical Transmission Systems

Multi-function Hall B

T3: Subsystems and Digital Signal Processing for Optical Communications

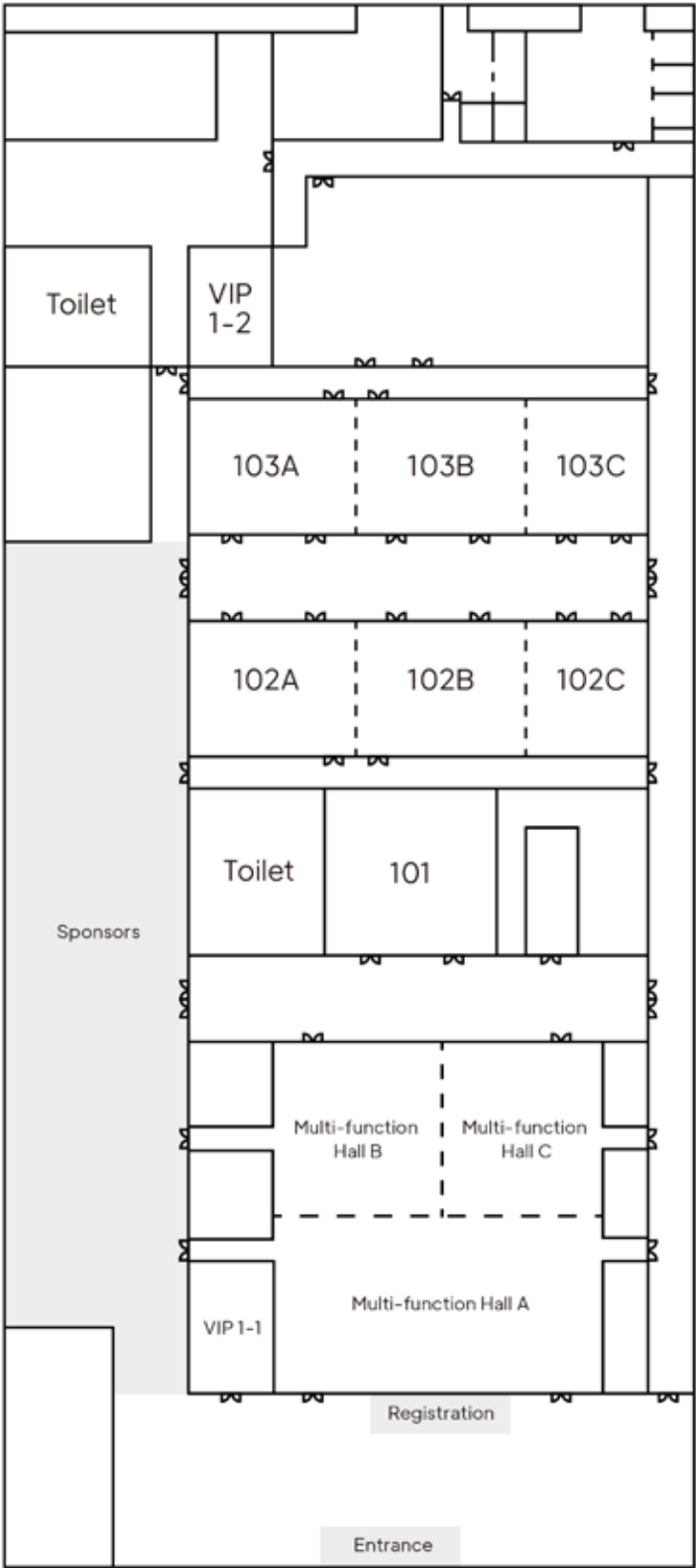
Multi-function Hall C

T4: Free-Space Transmission and Communication Systems

T3: Subsystems and Digital Signal Processing for Optical Communications (Parallel Session)

Conference Room 101

NP2: Microwave Photonic Devices and Systems



Conference Map-2F

November 1

Conference Room 205

Industry Horizon program: Market update and outlook on optical PON access and wireless fronthall & last-mile transport

Industry Horizon program: Industry debate: OCS or not OCS?

Conference Room 206

Workshop: Next Generation AI Optical Interconnects

Conference Room 207

Best Top-Score Paper Award Competition Session (D-Track & T-Track)

VIP Room 2-2

Best Top-Score Paper Award Competition Session (N-Track & NP-Track)

November 2

Conference Room 205

Industry Horizon program: Realistic check of AI interconnect scaling solutions for post 1.6T era

Conference Room 206

NP1: Fiber-Based and Free-Space Sensing

Conference Room 207

NP3: Quantum Devices, Systems, Networking and Computing

November 3

Conference Room 205

Industry Horizon program (special symposium): ION-2030 for AI Data Centers: From Scale-Up to Scale-Out, Scale-Across, and Distributed Intelligence

Industry Horizon program: Exploring Slow & wide approach using uLEDs and uVCSEL for AI scale up networks

Conference Room 206

NP1: Fiber-Based and Free-Space Sensing

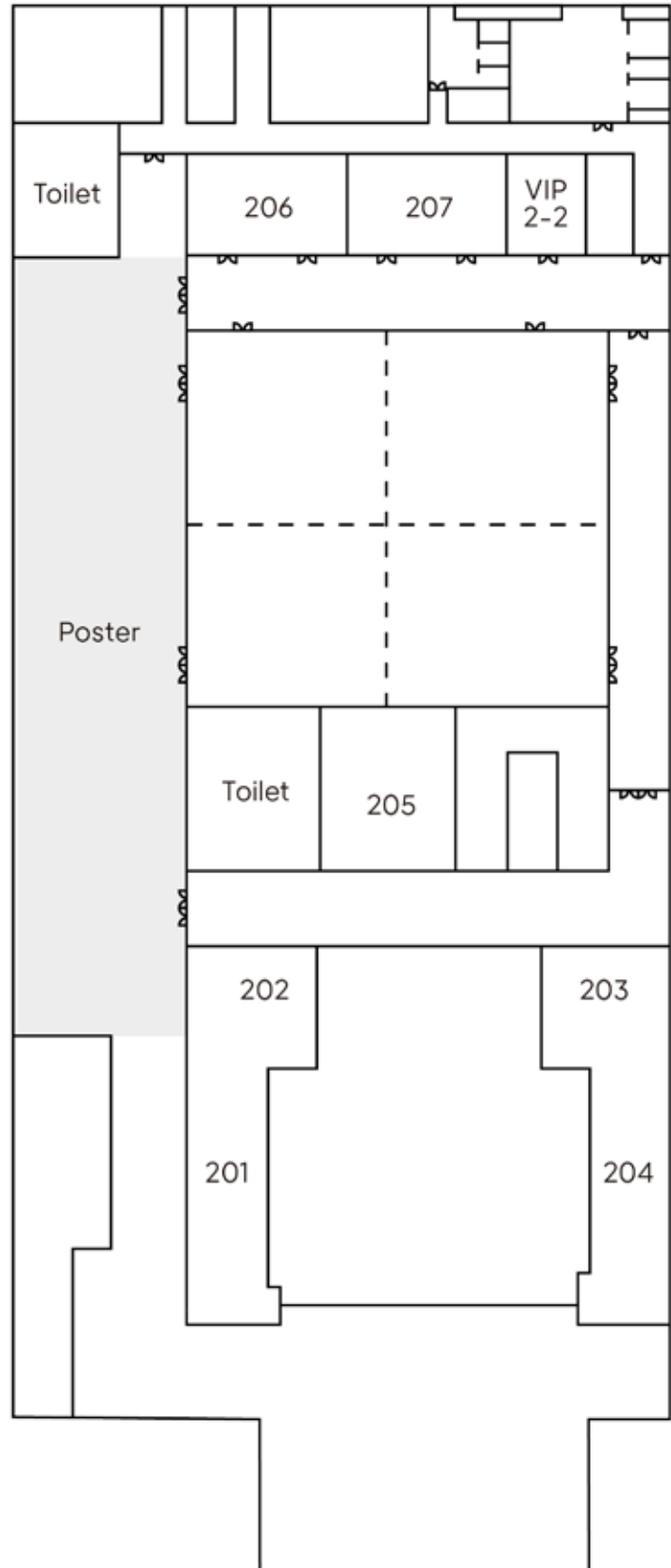
Conference Room 207

NP3: Quantum Devices, Systems, Networking and Computing

November 4

Conference Room 206

NP1: Fiber-Based and Free-Space Sensing



Workshop & Industry Forum

Workshop														
November 1 · Sunday														
	Conference Room 103A, 1F	Conference Room 103B, 1F	Conference Room 103C, 1F	Conference Room 102A, 1F	Conference Room 102B, 1F	Conference Room 102C, 1F	Multi-function Hall A, 1F	Multi-function Hall B, 1F	Multi-function Hall C, 1F	Conference Room 101, 1F	VIP Room 1-2, 1F	VIP Room 2-2, 2F	Conference Room 206, 2F	Conference Room 207, 2F
08:30-12:00	/	/	/	Advanced opto-electronic and optical fiber packaging (08:30-11:30)	Fiber Short Course (10:00-12:00)	Academic Forum for Postgraduates in Optical Communications 2026 (08:00-12:00)	Programmable photonics and applications	/	/	All-Optical Network in the Intelligent Era (09:00-12:00)	/	Best Top-Score Paper Award Competition Session-NP-Track (08:30-11:30)	/	Best Top-Score Paper Award Competition Session-D-Track
12:00-13:30	Lunch Break													
13:30-17:30	Fit-for-Purpose or Falling Behind? Rethinking Optical Network Design for the Scale-Across Era	Free-Space Optical Communications for Terrestrial, Aerial and Space Networks: Which Frequency Bands for Which Scenarios? (13:30-16:40)	Key components and signal processing for high-speed optical transmission systems (13:30-16:15)	Silicon and Heterogeneous Integrated Photonics Towards Sub-p/bit, Multi-Tbps Optical I/O and Next-Generation AI Clusters (13:30-17:45)	Path to Very High Speed PON: Requirements, Components, and Solutions (13:30-17:15)	POC Workshop on Trends in Optoelectronics and Communications (14:00-17:30)	Programmable photonics and applications	Optical Satellite and In-Orbit Computing: Towards Integrated Space Communication and Computing	Photonic Systems for AIDC: From Optical Fabrics to Computing and System Co-Design	All-Optical Network in the Intelligent Era (14:00-17:50)	Best Student Paper Award Competition Session (13:30-15:30)	Best Top-Score Paper Award Competition Session-N-Track (13:30-15:30)	Next Generation AI Optical Interconnects (13:30-17:15)	Best Top-Score Paper Award Competition Session-T-Track

Industry Horizon Program

Industry Horizon Program		
November 1	Market update and outlook on optical PON access and wireless fronthall & last-mile transport (09:30-12:00) Industry debate: OCS or not OCS? (13:30-17:00)	Conference Room 205, 2F
November 2	Realistic check of AI interconnect scaling solutions for post 1.6T era (13:30-17:00)	
November 3	ION-2030 for AI Data Centers: From Scale-Up to Scale-Out, Scale-Across, and Distributed Intelligence (Special Symposium) (08:30-12:00) Exploring Slow & wide approach using uLEDs and uVCSEL for AI scale up networks (13:30-17:00)	

Workshop

Fit-for-Purpose or Falling Behind? Rethinking Optical Network Design for the Scale-Across Era

Description:

Scale-Across — interconnecting geographically distributed GPU clusters into a unified AI computing fabric — is no longer a future scenario. Unlike Scale-Up and Scale-Out, Scale-Across imposes a fundamentally different and more demanding set of requirements on optical networks. Yet the optical networking community has not reached consensus on whether existing architectures, technologies, and design philosophies are adequate to meet this moment. This workshop brings together hyperscale AI operators, optical system and component vendors, and academic researchers to confront a direct question: is the optical network being designed for Scale-Across, or is it falling behind?

The following topics are proposed as the scope of this workshop.

Topic 1 | What Does Scale-Across Really Demand from Optical Networks?

Scale-Across spans a wide distance continuum — from sub-kilometer intra-campus links, to metropolitan-scale connections of 10–80km, and wide-area interconnects exceeding 100km — and across this entire range, the demand for high bandwidth is certain, but many other dimensions remain open for debate: how critical is deterministic latency for AI training workloads, and is jitter truly a problem that needs to be solved at the optical network layer, or can it be absorbed by upper-layer protocols and AI frameworks? How should client-side port rates evolve — 800G or 1.6T, single-port or multi-port aggregation, and on what timeline? RDMA is the dominant communication protocol for AI clusters — what is its relationship with the optical transport network, does the optical layer need to be aware of RDMA traffic characteristics, or can the two remain completely decoupled?

Topic 2 | Multi-Rail and Petabit Capacity: How Should Optical Network Architecture Evolve?

The push toward petabit-scale capacity is a certain direction for Scale-Across optical networks, but the path to get there is filled with open questions: is Multi-Rail an indispensable architectural choice, or an unproven concept yet to be validated at scale — what problem does it actually solve, and what additional cost and complexity does it introduce? As the electrical layer continues to evolve with ever-higher forwarding capacity, what will the next-generation transponder look like, and what level of chassis integration density is achievable? In point-to-point Scale-Across scenarios, is the wavelength flexibility provided by WSS still necessary, or is a fixed-grid architecture sufficient? Can C+L band expansion meet future capacity demands, or does reaching true petabit-scale require the introduction of the S band or even spatial division multiplexing?

Topic 3 | Protection for Scale-Across: Is What We Have Enough, or Does It Need to Be Redefined?

Protection and resilience are unavoidable topics for Scale-Across optical networks, but the answers are far from settled: what does traditional 50ms optical-layer protection switching actually mean for an AI training job — does it truly constitute a problem, or do upper-layer systems have the ability to tolerate it? Does Scale-Across require entirely new protection schemes beyond existing 1+1 and shared mesh approaches, or is optimization of current mechanisms sufficient? Should the optical transport layer and the data communications layer jointly coordinate protection decisions, or is it more robust to keep them operating independently? At what granularity should protection be defined — fiber, wavelength, cable, or flow level? Is lossless switchover technically feasible, and if so, can it deliver meaningful business value for AI workloads — and at what cost?

Topic 4 | Autonomous Management: Does a Scale-Across Optical Network Really Need It?

Autonomous management is frequently cited as essential, but its necessity and feasibility remain open questions: for an optical network purpose-built for Scale-Across, is autonomous management a nice-to-have or an operational prerequisite? If building a greenfield network from scratch with no legacy constraints, does that make autonomous management easier to achieve — and where do the real barriers lie, in technology or in organizational process? What northbound interface capabilities does the equipment need to expose, and are existing interface standards already sufficient? Across the spectrum from alarm reporting and assisted recommendation to fully closed-loop autonomy, what level of automation is trustworthy and deployable today? What telemetry sampling granularity and real-time performance are required, and can current optical network equipment support this natively, or does it demand additional infrastructure investment?

Time: Sunday, 1 November 2026 | 1:30 p.m. – 5:30 p.m.

Venue: Conference Room 103A, 1F

Organizers:

Fan Zhang, Peking University

Liang Dou, Alibaba

Agenda:

13:30-13:45 **Opening**

13:45-14:00 **Cheng Chen**, Baidu

Title: Optical Transport Evolution for Distributed AI: Making Heterogeneous AI Compute Usable

14:00-14:15 **Minggong Chen**, Tencent

Title: Scale-Across: A Paradigm Shift in Optical Networking

14:15-14:30 **Shuo Wang**, Alibaba

Title: Scale-Across Era: Evolving Optical Transport for Distributed Compute Clusters

14:30-14:45 **Jiang Li**, Huawei

Title: Rearchitecting Optical Networks for Scale Across

14:45-15:00 **Yufeng Yuan**, Coherent

Title: Optical Network Evolution in the Scale-Across Era: Pluggable or Highly Integrated

15:00-15:30 **Coffee Break**

15:30-15:45 **Li Xiao**, Accelink

Title: Bulk-Capacity Expressway: Scaling Across via Fiber Trunks

15:45-16:00 **Qunbi Zhuge**, Shanghai Jiao Tong University

Title: Service-Aware, High-Capacity, and Intelligent Optical Networks for Scale-Across Scenarios

16:00-16:15 **Danshi Wang**, Beijing University of Posts and Telecommunications

Title: Agentic AI for Scale-Across Optical Networks

16:15-16:30 **Xiang Cai**, Peking University

Title: Coherent-Lite Systems for Scale-Across Optical Networks

16:30-17:30 **Panel Discussion**

Free-Space Optical Communications for Terrestrial, Aerial and Space Networks: Which Frequency Bands for Which Scenarios?

Description:

Free-space optical (FSO) communications are attracting increasing interest for terrestrial, aerial and space networks. However, the optimal technical solution depends strongly on the target scenario. A terrestrial FSO link across an urban area, a ground-to-HAP/UAV link, an optical feeder link to a satellite, and an inter-satellite link all face different constraints in terms of propagation distance, atmospheric loss, turbulence, cloud blockage, pointing accuracy, terminal size, optical power, eye safety, receiver sensitivity and operational availability. Therefore, the choice of spectral band is not straightforward and should be discussed in a scenario-driven manner.

This 2-hour workshop will focus on the practical question: which wavelength or frequency bands should be used for different FSO application scenarios? The discussion will cover near-infrared (NIR) bands such as 850 nm, 1064 nm and 1550 nm, which benefit from mature telecom and space optical communication technologies; visible and ultraviolet (UV) bands for short-range, underwater, non-line-of-sight or specialized links; mid-infrared (MIR) bands for potential operation in favorable atmospheric windows and challenging weather or turbulence conditions; and THz bands as a complementary option between RF and optical systems. Rather than seeking a single "best" band, the workshop aims to build a clear mapping between application scenario, spectral window, device maturity, propagation characteristics and deployment feasibility.

The workshop will include invited talks of 10–15 minutes each, followed by a 20–30 minutes panel discussion. The invited speakers will represent academia, industry and standardization/ecosystem stakeholders. Academic speakers will address atmospheric propagation, channel modelling, modulation formats and emerging device technologies. Industrial speakers will discuss terminal design, acquisition and tracking, component availability, reliability, cost and field deployment experience. Standardization speakers will cover interoperability, eye safety, availability metrics, regulatory aspects and integration with future 6G and non-terrestrial network architectures.

The workshop will conclude with a panel discussion, addressing whether future FSO systems will mainly rely on mature near-infrared technologies, move toward MIR/LWIR and THz solutions in selected scenarios, or evolve into adaptive multi-band hybrid RF/THz/FSO architectures. The expected outcome is a concise technology roadmap connecting FSO scenarios with suitable spectral bands, modulation choices, atmospheric mitigation methods and deployment requirements.

Time: Sunday, 1 November 2026 | 1:30 p.m. – 4:40 p.m.
Venue: Conference Room 103B, 1F

Organizers:

Xiaodan Pang, Zhejiang University

Haifeng Yao, Beijing Institute of Technology

Yuzhe Lin, The Institute of Semiconductors (IOS), CAS

Agenda:

Part I: Mid-IR and THz devices and links.

Presider: **Yuzhe Lin**, The Institute of Semiconductors (IOS), CAS

13:30-13:40 **Huibin Zhou**, Huazhong University of Science and Technology, China

Title: Recent Advances in Mid-infrared Free Space Optical Communications

13:40-13:50 **Zhidong Lyu**, Zhejiang University, China

Title: Exploring mid-infrared for free-space optical communications

13:50-14:00 **Junqi Liu**, Ocean University of China

Title: Quantum Cascade Lasers for Mid-Infrared Free-Space Optical Communications

14:00-14:10 **Baile Chen**, ShanghaiTech University, China

Title: From AI Optical Interconnects to THz Wireless and MWIR Free-Space Communications

14:10-14:20 **Hua Li**, Shanghai Institute of Microsystem and Information Technology, CAS, China

Title: TBD

14:20-14:30 **Ming Che**, Kyushu University, Japan

Title: Photonics-Enabled Terahertz Antenna Arrays: Toward High-EIRP and Agile-Beam Wireless Communications

14:30-15:00 **Panel Discussion I: Which scenarios benefit from mid-IR and THz?**

15:00-15:30 **Coffee Break**

Part II: FSO, VLC and UV systems and scenarios.

President: **Haifeng Yao**, Beijing Institute of Technology

15:30-15:40 **Buzheng Wei**, China Unicom, China

Title: Recent progress of FSOC standards

15:40-15:50 **Zhenming Yu**, Beijing University of Posts and Telecommunications, China

Title: TBD

15:50-16:00 **Zhouyi Hu**, Beijing Jiaotong University, China

Title: Towards Wireless Intra-Data Center Networks: Millimeter Waves or Free-Space Optics?

16:00-16:10 **Zixian Wei**, Hong Kong Polytechnic University, Hong Kong, China

Title: TBD

16:10-16:20 **Chao Shen**, Fudan University, China

Title: Optical Wireless Communication in the UV and Visible Regime: Technology and Applications

16:20-16:50 **Panel Discussion II: Choosing bands for terrestrial, aerial and space networks**

Key components and signal processing for high-speed and real-time optical transmission systems

Description:

This workshop focuses on key components and signal processing for high-speed and real-time optical transmission systems, covering the full chain from key devices, signal generation and reception, intelligent algorithms and system verification. The scope includes, but is not limited to, the following topics:

High-speed ADC/DAC technologies and modules
High-speed signal processing chip based on ASIC,
Analog real-time signal processing,
Real-time signal processing and applications (Satellite, sensing and GPU)

Time: Sunday, 1 November 2026 | 1:30 p.m. – 4:15 p.m.
Venue: Conference Room 103C, 1F

Organizers:

Jing Zhang, University of Electronic Science and Technology of China
Qi Yang, Huazhong University of Science and Technology
Fan Zhang, Peking University
Jianming Tang, Bangor University

Agenda:

President: **Qi Yang**, Huazhong University of Science and Technology

- 13:30-13:45 **Junwen Zhang**, Fudan University
 Title: Real-time FPGA-based DSP and Coherent Reception for High-speed Short-Reach Optical Connection and Access
- 13:45-14:00 **Danshi Wang**, Beijing University of Posts and Telecommunications
 Title: A Topology-Scalable Foundation Model for QoT Estimation in Large-Scale Multi-Band Optical Networks
- 14:00-14:15 **Zhenming Yu**, Beijing University of Posts and Telecommunications
 Title: Integration of Communication and Computational Imaging
- 14:15-14:30 **Bin Chen**, Hefei University of Technology
 Title: GPU-Based DSP for Real-Time Optical Communication: Can It Meet the Requirements
- 14:30-14:45 **Yan Li**, Beijing University of Posts and Telecommunications
 Title: Signal processing for satellite-ground laser communications
- 14:45-15:15 **Coffee Break**

President: **Jing Zhang**, University of Electronic Science and Technology of China

- 15:15-15:30 **Fan Li**, Sun Yat-sen University
 Title: Multi-Scale Optical Interconnects for AI Compute Clusters
- 15:30-15:45 **Xianglei Dong**, Chengdu Sino Microelectronics Technology Co., Ltd.
 Title: Application of Domestic Ultra-High-Speed ADCs and DACs in oDSP"
- 15:45-16:00 **Bingtian Ye**, East China Normal University
 Title: A 1.11pJ/b 224Gb/s XSR Receiver with Slice-Based CTLE and PI-Based Clock Generator in 12nm CMOS
- 16:00-16:15 **Tao Zeng**, CICT
 Title: Real-Time FPGA DSP for Burst-Mode Coherent Reception, Ultrafast Polarization Tracking, and Distributed Fiber Sensing

Advanced opto–electronic and optical fiber packaging

Description:

OE packages for CPO, NPO, XPO, OIO, OCI, OCS and so on; Advanced 2.5D/3D packaging of PIC and EIC; Advanced optical fiber packaging and fiber assembly unit; Optical interposer and bridge; Micro and meta lens and packaging devices by silicon, silica, and so on;

Time: Sunday, 1 November 2026 | 08:30 a.m. – 11:30 a.m.
Venue: Conference Room 102A, 1F

Organizers:

Jiangbing Du, Shanghai Jiao Tong University
Xingjun Wang, Peking University
Wei Chu, Zhangjiang Laboratory
Yang Cheng, JCET Group Co., Ltd.
Shaoliang Yu, Zhejiang Lab
Linjie Zhou, Shanghai Jiao Tong University

Agenda:

President: **Jiangbing Du**, Shanghai Jiao Tong University

08:30-08:45 **Ting Lei**, Shenzhen Photonics Valley Technology

Title: Glass-based 3D Waveguides: A New Path for AI Optical Interconnection

08:45-09:00 **Li Geng**, HM Microelectronics Integration Technology Co., Ltd

Title: CPO : Advanced Packaging Processes and Industrialization from Sample to Mass Production

09:00-09:15 **Erse Jia**, Zhangjiang Laboratory

Title: High-speed modulators and opto–electronic Co-Packaging Based on Advanced Silicon Photonics Platform

09:15-09:30 **Anjin Liu**, Institute of Semiconductors, Chinese Academy of Sciences

Title: VCSELs for optical interconnects in hybrid computing systems

09:30-09:45 **Pengfei Tian**, Fudan University

Title: Ultra-low-power high-speed micro-LED optical interconnects

09:45-10:00 **Xueyan Zheng**, Westlake Institute for Optoelectronics, Westlake University

Title: Optoelectronic Co-Packaging: Empowering AI

10:00-10:30 **Coffee Break**

President: **Ting Lei**, Shenzhen University

10:30-10:45 **Guangyong Chu**, Yuechun Shi, Yongjiang Laboratory

Title: Dynamic Simulation and Design of DFB semiconductor Lasers Using Transmission-Line Model

10:45-11:00 **Yuyao Guo**, Shanghai Jiao Tong University

Title: Multimaterial Photonic Packaging-Enabled Tunable Low-Noise Lasers and Their Applications

11:00-11:15 **Bin Zhang**, Zhejiang University

Title: Co-Design of High-Bandwidth Silicon Photonics Integration, Packaging, and Optical Interconnect Systems for Next-Generation AI Data Centers

11:15-11:30 **Zhimin Yu**, Peking University

Title: Interlayer-Free InP-on-SOI Bonding for III-V/Si Photonic Integration

Photonic Systems for AIDC: From Optical Fabrics to Computing and System Co-Design

Description:

The explosive scaling of large foundation models is pushing AIDC infrastructure beyond the limits of current statically-interconnected electrical network architectures. To support the future AIDC's scale-up, scale-out, and scale-across scenarios, photonics is moving toward xPU-facing optical interconnects, optical switching fabrics, and even optical computing acceleration. Emerging technologies such as high-density optical interfaces, next-generation interconnect architectures, OCS, programmable photonic fabrics, and photonic computing bring both tremendous opportunities and challenges as they step up on the central stage of AIDC.

This workshop focuses on key turning points and unresolved debates in AIDC photonic systems. It is organized in two sessions. The first session will explore how optical interconnects and switching fabrics can reshape AI infrastructure; and the second one will examine whether photonics can move toward computing and workload-aware system co-design. The workshop aims to bring together experts from photonics, AI systems, computing architecture, DC networking, and industry deployment to discuss technical feasibility, architectural trade-offs, commercialization challenges, and open ecosystems.

The key questions to address in session 1:

- GPU-facing optical interfaces and interconnect architectures: Beyond traditional paradigms, which emerging optical interface solutions and interconnect standards can best meet the power, cost, reliability, serviceability, and deployment requirements of future AI clusters?
- OCS and all-optical native AI infrastructure: Can OCS evolve from successful technical demonstrations into practical hyperscale deployment? What switching technologies (e.g., 3D MEMS, LCoS, silicon photonics), control mechanisms, and engineering solutions are needed for scale-up, scale-out, and scale-across AI infrastructures?
- Workload and traffic adaptation for optical fabrics: How should OCS and optically switched fabrics support large-model training and inference workflows? How can optical networks balance long-lived, high-bandwidth AI flows with short-packet, bursty interactive services?

The key questions to address in session 2:

- Interconnects vs. computing: Will photonics mainly serve as a high-performance data movement technology, or can optical computing approaches, such as photonic matrix-vector multiplication engines, realistically outperform or complement electronic AI accelerators?
- Software-hardware co-design: How can AI workloads, algorithms, photonic devices, optical switching fabrics, and system software be co-designed? Should AI algorithms adapt to photonic constraints, or should photonic systems evolve to fit existing computing paradigms?
- Open ecosystem, standards, and commercialization: What role should open software interfaces, orchestration frameworks, benchmarks, and standardization play in accelerating the adoption of photonic systems in AI data centers? How can the industry move from technical validation to scalable commercial deployment? Will ecosystem fragmentation or proprietary electronic alternatives (e.g., NVLink) delay the large-scale adoption of optical fabrics?

The panel aims to bring together speakers from optical networking, AI systems, photonic computing, hyperscale data centers, and standardization communities to discuss whether optical interconnects, optical switching, and optical computing will converge into a unified AI infrastructure, or evolve as competing technology paths.

Time: Sunday, 1 November 2026 | 13:30–17:30

Venue: Multi-function Hall C, 1F

Organizers:

Yuyang Liu, China Telecom **Chair**

Xiao Lin, Fuzhou University **Co-Chair**

Massimo Tornatore, Politecnico di Milano **Co-Chair**

Wei Wang, Beijing University of Posts and Telecommunications **Co-Chair**

Agenda:

President: **Xiao Lin**, Fuzhou University

13:30-13:35 **Opening Remarks & Speaker Introductions**

13:35-13:55 **Yuyang Liu**, China Telecom Research Institute

Title: Optical Networks for AI Data Centers: Standardization Perspectives and Operator Practices

13:55-14:15 **Chongjin Xie**, PhotonicX AI

Title: High density NPO and CPO for scale-up optical interconnects

- 14:15-14:35 **Weiqliang Sun**, SJTU
Title: Bridging the Time-Scale Barrier: Atomic Optical-Digital Reconfiguration in AI Clusters via the AAOP Pattern
- 14:35-14:55 **Pan Cao**, HISILICON
Title: NPO: A Pragmatic Path to Future AI Scaling
- 14:55-15:15 **Nan Qi**, Institute of Semiconductor, CAS
Title: Codesign of Electronic and Photonic Circuits for Integrated high-BW and WDM Transceivers
- 15:15-15:40 **Coffee Break**
- President: **Yuyang Liu**, China Telecom Research Institute
- 15:40-16:00 **Xuwei Xue**, BUPT, Philinks Tech
Title: Summary and Prospect of Optical-Switched AI Computing Centers
- 16:00-16:20 **Qiming Cao**, ZTE Corporation
Title: Routing in Reconfigurable Optical Circuit-Switched Networks for AI Computing
- 16:20-16:40 **Sisi Tan**, Huawei
Title: Emerging Optical Networking Technologies for AI Infrastructure
- 16:40-17:00 **Raul Muñoz**, CTTC
Title: From GPUs to Multi-Rail: How RDMA Shapes the Optical Network for Scale-Across AI
- 17:00-17:30 **Panel Discussion**

Silicon and Heterogeneously Integrated Photonics Towards Sub-pJ/bit, Multi-Tbps Optical I/O and Next-Generation AI Clusters

Description:

As AI/ML compute clusters scale toward hundreds of thousands of accelerators, inter-chip communication bandwidth is experiencing unprecedented exponential growth, pushing traditional copper-based electrical interconnects and conventional digital signal processing (DSP)-heavy optical transceivers to their physical limits in energy consumption, thermal dissipation, and edge density. To break through the looming "power wall" and "bandwidth density bottleneck," the optical communications industry is accelerating its paradigm shift from linear-drive pluggable optics (LPO) toward co-packaged optics (CPO) and near-chip, die-level Optical I/O. This workshop focuses on revolutionary architectural and device-level breakthroughs across material platforms, native on-chip sources, high-speed modulation, and zero-power static tuning, aiming to achieve multi-Tbps per waveguide physical-layer optical interconnects under a strict sub-1 pJ/bit energy budget. The technical scope mainly encompasses: high-yield integration of quantum-dot lasers and microcombs on standard silicon photonics foundries to eliminate external laser coupling losses; sub-volt, ultra-high-bandwidth thin-film lithium niobate (TFLN) modulators based on rings and photonic crystal nanobeam cavities to enable DSP-less host ASIC/SerDes direct drive; and monolithic back-end-of-line non-volatile phase-change material (PCM) integration for post-fabrication phase correction and static power elimination. By cascading active high-efficiency devices with passive multi-dimensional multiplexing, this symposium will bridge pioneering micro-and-nanophotonics physics with commercial foundry mass-productibility, mapping out the definitive energy-efficient, high-throughput all-optical networking infrastructure.

Time: Sunday, 1 November 2026 | 1:30 p.m. – 5:45 p.m.

Venue: Conference Room 102A, 1F

Organizers:

Jiawei Wang, Harbin Institute of Technology (Shenzhen)

Yu Li, Shanghai Jiao Tong University

Zhanshi Yao, Huawei Technologies Co., Ltd.

Kaiyi Wu, Harbin Institute of Technology

Agenda:

President: **Jiawei Wang**, Harbin Institute of Technology (Shenzhen)

13:30-14:00 **Jianfeng Wang**, Huawei Technologies Co., Ltd

Title: Requirements for Heterogeneous Integration in Optical Communications in the AI Era

14:00-14:30 **Kelaiti Xiao**, Shanghai Institute of Microsystem and Information Technology Chinese Academy of Sciences

Title: Advanced packaging technologies used in Co-packaged Optic

14:30-15:00 **Zekun Niu**, Shanghai Jiao Tong University

Title: Agentic PIC Design and Simulation Acceleration

15:00-15:30 **Shiyang Zhu**, Shenzhen Polytechnic University

Title: Hybrid Integration of Standard Silicon Photonics Process and Various Backend Process

15:30-15:45 **Coffee Break**

President: **Yu Li**, Shanghai Jiao Tong University

15:45-16:15 **Yu Zhang**, Huazhong University of Science and Technology

Title: Towards Sub-pJ/bit Optical I/O using Advanced Packaging and Heterogeneous Integrated Photonic Devices

16:15-16:45 **Shikui Shen**, China Unicom Research Institute

Title: Recent advances in Optical Frequency Combs and applications in optical communications

16:45-17:15 **Junyin Zhang**, École Polytechnique Fédérale de Lausanne

Title: Recent Advances in Thin-Film Lithium Tantalate Integrated Photonics

17:15-17:45 **Xiaomeng Zhao**, Shanghai Novel Si Integration Technology Co., Ltd

Title: Fabrication and Integration Technologies for Monocrystal Thin-Film Lithium Niobate

Path to Very High Speed PON: Requirements, Components, and Solutions

Description:

The passive optical network has been the workhorse of broadband access for four decades, evolving from A/B-PON through G-PON, XG(S)-PON, and now 50G-PON. With 50G-PON being standardized in ITU-T G.9804, the industry is paying attention to Very High Speed PON (VHSP). The first VHSP Supplement, ITU-T G Suppl. 88, was agreed by ITU-T in October 2025, describing potential system requirements and candidate technologies for PON systems above 50 Gbit/s per wavelength, including general architecture, system requirements, and candidate VHSP technologies. ITU-T is continuing to evaluate candidate technologies for next-generation PON systems, with Q2/15 actively updating modulation formats and single-wavelength transceiver configurations for VHSP. This provides the background and starting point for the workshop.

However, the path from 50G-PON to VHSP is far from settled, and the central open question is technology path selection. The workshop will examine these open issues through several intertwined dimensions: VHSP requirements and standardization status; rate targets such as 100 Gb/s and 200 Gb/s, and technology choices among IM-DD, coherent detection, and hybrid alternatives; and wavelength plans including O-band, E-band, and C-band, together with coexistence scenarios with GPON, XGS-PON, and 50G-PON. The discussion will span requirements, standardization, component maturity, and system architecture without presupposing specific technical conclusions.

This workshop will bring together proponents of hybrid, IMDD-only, and coherent-only solutions to create a lively and technically substantive debate. Rather than surveying broad trends, the discussion will focus on the critical decisions (i.e., requirements, standardization, component readiness, and architecture) that will shape VHSP over the next 2–3 years. Through invited talks and panel discussions, the workshop aims to foster dialogue among different technology paths and provide a platform for exchange across VHSP research, standardization, and industrial deployment.

Time: Sunday, 1 November 2026 | 1:30 p.m. – 5:15 p.m.

Venue: Conference Room 102B, 1F

Organizers:

Yixiao Zhu, Shanghai Jiao Tong University

Shikui Shen, China Unicom

Luyao Huang, China Telecom Research Institute

Zhaopeng Xu, Pengcheng Laboratory

Agenda:

Part I

13:30–13:45 **Yanzhao Lu**, Huawei

13:45–14:00 **Yanni Ou**, Beijing University of Posts and Telecommunications

14:00–14:15 **Junwen Zhang**, Fudan University

14:15–14:30 **Jinlong Wei**, Pengcheng Laboratory

14:30–14:45 **Guoqiang Li**, ZTE

Part II

15:15–15:30 **Xiang Li**, China University of Geosciences

15:30–15:45 **Bin Chen**, Hefei University of Technology

15:45–16:00 **Dayu Shi**, Westlake Univeserity

16:00–16:15 **Ning Wang**, China Mobile Research Institute

16:15–16:30 **Dezhi Zhang**, China Telecom Research Institute

Part III

16:45–17:15 **Panel Discussion**

Next Generation AI Optical Interconnects

Description:

AI datacenters are growing at an unprecedented pace and photonics will play a key role in scaling to ever higher computational powers. This workshop will provide a comprehensive technical deep dive into how innovative photonics solutions can increase performance, energy-efficiency and scalability. The first part of the workshop will take a deep look into the evolution of standards for AI-datacenter networks, novel integrated photonic concepts for transceivers and switches as well as next generation pluggable transceivers. In the second part a comprehensive technical deep dive into the Optical Compute Interconnect (OCI) Multi-Source Agreement (MSA), the emerging open standard designed to break the copper barrier in AI scale-up architectures will be given and implementation pathways will be explored.

Time: Sunday, 1 November 2026 | 1:30 p.m. – 5.15 p.m.

Venue: Conference Room 206, 2F

Organizers:

Stephan Pachnicke, Kiel University, Germany

Vivian Chen, Nokia Bell Labs, USA

Ting Wang, Shanghai Jiao Tong University, China

Agenda:

Session 1: Intra-Datacenter Communications and the Role of Photonics in Future AI Datacenter Networks– President: Stephan Pachnicke

13:30-13:45 **Xiang Liu**, Huawei

Title: Overview of Optical Standardization on FPO/XPO/NPO/OCS for AI-Datacenter Networks

13:45-14:00 **Son Thai Le**, Ciena

Title: Silicon-Photonics Optics Engines for AI Datacenters

14:00-14:15 **Jose Capmany**, iPRONICS / UPV

Title: The Role of Programmable Photonics for Future AI Datacenters

14:15-14:30 **Jim Zou**, Adtran

Title: Pluggable Optics for the Evolving Needs of the AI Supercycle

14:30-14:45 **Dmitrii Briantsev**, Trinity College Dublin

Title: Future AI Fabrics: What Role will Optics Play?

14:45-15:00 **Magnus Fischer**, Kiel University

Title: Will Electrical or Optical BiDi Systems Reshape Future Scale-Up Networks?

15:00-15:30 **Coffee Break**

Session 2: OCI Standards and Implementation Pathways – President: Ting Wang

15:30-15:45 **Nan Qi**, LuxSilicon

Title: TBA

15:45-16:00 **Liangjun Lu**, Photonic Nexus

Title: Heterogeneous Photonic Integrated Circuits for High-Performance Communication

16:00-16:15 **Zhiyuan Li**, Huawei

Title: TBA

16:15-16:30 **Shujie Pan**, HS Photonics

Title: III-V QD comb for next generation CPO/OIO

16:30-16:45 **Xinlun Cai**, Niobate

Title: TBA

16:45-17:15 **Panel Discussion**

Programmable photonics and applications

Description:

As integrated photonic technology matures, programmable photonic circuits are ushering in a new era of flexibility and versatility. Such programmability stems from precisely tunable photonic building blocks, such as thermo-optic and electro-optic phase shifters. Leveraging multiple optical degrees of freedom to enable parallel processing, these structures reshape optical amplitude and phase responses in situ to synthesize arbitrary spectral functions, eliminating the need for hardware re-fabrication. This workshop brings together leading researchers to discuss the state-of-the-art in programmable photonics and its applications, including optical switching for high-density networking in next-generation AI-driven data centers and optical computing architectures that leverage light for ultra-fast matrix operations, neuromorphic processing and physics-inspired computing. Furthermore, we will explore the potential of programmable photonics for on-chip signal processing and optical sensing. This workshop offers an unparalleled opportunity to connect, share breakthroughs, and shape the future of programmable photonics.

Time: Sunday, 1 November 2026

Venue: Multi-function Hall A, 1F

Organizers:

Daoxin Dai, Zhejiang University & China Jiliang University

Yikai Su, Shanghai Jiao Tong University

Hon-Ki Tsang, Chinese University of Hong Kong

Siyuan Yu, Sun Yat-sen University

Speakers:

TBD

Optical Satellite Networking and In-Orbit Computing: Towards Integrated Space Communication and Computing

Description:

The rapid deployment of large-scale satellite constellations, together with advances in laser communications and spaceborne computing, is transforming satellite systems from traditional communication platforms into highly connected and computing-enabled space infrastructures. High-capacity optical inter-satellite links can provide hundreds of gigabits per second or even terabit-class connectivity, while emerging in-orbit computing platforms enable data processing, storage, AI inference, and service execution directly in space.

The convergence of optical networking and in-orbit computing also introduces new technical challenges. Satellite mobility leads to highly dynamic topologies, intermittent connectivity, and time-varying link conditions, making routing, traffic engineering, resource allocation, resilience, and network control fundamentally different from terrestrial networks. Meanwhile, in-orbit computing is constrained by limited power, processing capacity, storage, and thermal resources. Efficient coordination of communication, computing, and storage resources is therefore essential.

This workshop aims to bring together researchers, engineers, satellite operators, equipment vendors, cloud and computing providers, and standardization communities to discuss recent advances and future directions in optical satellite networking and in-orbit computing. Particular attention will be given to the integration of high-speed optical connectivity, dynamic networking, distributed computing, artificial intelligence, and autonomous network operation. Topics of interest include optical inter-satellite and satellite-to-ground networking; optical transport architectures for satellite constellations; dynamic routing and traffic engineering; resilient and survivable networking; in-orbit computing architectures; distributed AI inference and edge computing in space; computing-aware routing; AI-assisted network management; experimental platforms and in-orbit demonstrations; and emerging standards and applications.

Time: Sunday, 1 November 2026 | 1:50 p.m. – 5:30 p.m.

Venue: Multi-function Hall B, 1F

Organizers:

Yongli Zhao, Beijing University of Posts and Telecommunications

Kangning Li, China Satellite Network Group Co., Ltd.

Yunbo Li, China Mobile Research Institute

Yuping Wu, Huawei Technologies Co., Ltd.

Agenda:

Session I

President: **Yongli Zhao**

13:50-14:00 **Opening Remarks**

14:00-14:20 **Fang Li**, CAICT

Title: Collaborative promotion of satellite optical communication technology standards and industrial scale development

14:20-14:40 **Buzheng Wei**, China Unicom

Title: Thoughts on Wireless Optical Communication in Ground and Low-Altitude Multi-Scenario Applications

14:40-15:00 **Xiao Ma**, BUPT

Title: Tiansuan Constellation: Research and Practice on Satellite Computing

15:00-15:20 **Jiang Tang**, Huawei

Title: Technological Trends and Challenges of Space Optical Network for the AI Era

Session II

President: **Yuping Wu**

15:40-16:00 **Yunbo Li**, China Mobile

Title: Towards Standard-Compatible Adaptive Framing for LEO Inter-Satellite Laser Links: An Exploratory Study of Ephemeris-Embedded OTN

16:00-16:20 **Kanglian Zhao**, Nanjing University

Title: Resilient Optical Feeder Link Networking for LEO Constellations

16:20-16:40 **Wenbo Yu**, ZTE

Title: Prospect of Broadband Satellite Laser Communication Technology

16:40-17:00 **Changzheng Zhou**, Blue Star Optics

Title: Development Status and Future Prospects of Optical Inter-Satellite Links in LEO Satellite Constellations

17:00-17:30 **Panel Discussion, President: Yunbo Li**

POC Workshop on Trends in Optoelectronics and Communications

Description:

Progress in Optoelectronics and Communications (POC) covers cutting-edge research and innovations across the entire ecosystem of light-based telecommunications. This includes optoelectronic devices (lasers, modulators, detectors, PICs), transmission technologies (advanced modulation, DSP, fiber/wireless integration), and network architectures (core/metro/access networks, 5G/6G fronthaul, data center interconnects). The journal emphasizes high-speed systems (terabit-class), coherent optics, SDN/NFV control, and emerging paradigms like quantum communications, integrated sensing-communication (ISAC), and AI-optimized networks. It addresses challenges in capacity, latency, energy efficiency, and scalability—from component design to field deployment—enabling next generation secure, ultra-low latency global connectivity.

Time: Sunday, 1 November 2026 | 2:00 p.m. – 5:30 p.m.

Venue: Conference Room 102C, 1F

Organizers:

POC Journal

Wuhan Research Institute of Post & Telecommunications Co., Ltd (WRI)

Chinese Optical Society (COS)

Westlake University

State Key Laboratory of Optical Communication Technologies and Networks (OCTN)

Chair:

William Shieh, Westlake University

Agenda:

President: **William Shieh**, Westlake University

14:00-14:20 **Lianshan Yan**, Southwest Jiaotong University, China

Title: Photonic integration of sensing and communication

14:20-14:40 **Jinshi Xu**, University of Science and Technology of China, China

Title: Identifying Single Oxygen-vacancy centers in 4H-SiC

14:40-15:00 **Jian Wang**, Huazhong University of Science and Technology, China

Title: Tailoring Light with Photonic Integrated Devices and Its Applications

15:00-15:20 **Xiaonan Xu and Haoshuo Chen**, Nokia Bell Labs, USA

Title: Adaptive AI over Optical Networks

15:20-15:40 **Coffee Break**

15:40-16:00 **Isidora Teofilovic and Francesco Da Ros**, Technical University of Denmark (DTU), Denmark

Title: Physics-informed data-driven modeling of thermal crosstalk in interferometer meshes

16:00-16:20 **Lena Wosinska**, Chalmers University of Technology, Sweden

Title: Evolution of Optical Solutions to Support Fixed and Mobile Broadband Access Networks

16:20-17:30 **POC Editor Meeting**

Industry Forum

All-Optical Network in the Intelligent Era

Description:

In the AI Era, optical networks need to be upgraded to ION-2030, this includes AIDC, AI-OTN and AI-FAN solutions, which support to build all-optical networks and realize the vision of "Network for AI", while introducing AI capabilities into devices to implement "AI for Network".

Session1: AIDC

Session1: AIDC

Session 1 of this industry forum explores AI-driven data centers (AI-DCs), the cornerstone of next-generation intelligent applications amid rapid advances in AI and digital transformation. It provides a global platform for in-depth discussion between academia and industry, focusing on cutting-edge trends and practical challenges in the AI-DC domain. OCS enables flexible, efficient optical-layer scheduling, while hollow-core fibers – with their ultra-low latency and nonlinear suppression – are pushing the boundaries of transmission. These topics will be explored in this session.

Time: November 1, 2026 | 9:00 a.m. – 12:00 p.m.

Venue: Conference Room 101, 1F

Organizers:

Hongchen Yu, Huawei Technologies Co., Ltd

Xuwei Xue, Beijing University of Posts and Telecommunications

Agenda:

09:00-09:10 **Opening**

09:10-09:30 **Dong Wang**, China Mobile Research Institute

Title: Evolution and Outlook of Intelligent Computing and Optical Network Technologies in the AI Era

09:30-09:50 **Xuhuang Ma**, Kuaishou

Title: Optical Interconnect Technology: Applications and Prospects in Intelligent Computing Networks

09:50-10:10 **Dejiang Zhang**, Huawei Technologies Co., Ltd

Title: AIDC Optical Network Technology Evolution Trend

10:10-10:30 **Coffee Break**

10:30-10:50 **Jiawei Zhang**, Beijing University of Posts and Telecommunications

Title: Optical Networks for AI: the Challenge and Optimization for LLM Training across Datacenters

10:50-11:10 **Dongxu Zhang**, Beijing Philinks Tech Co., Ltd.

Title: All-Optical Switching Technologies for AI Computing Clusters

11:10-11:30 **Yu Li**, Shanghai Jiao Tong University

Title: Ge-on-Si Photodetectors for NPO and CPO: Receiver Requirements and Device Design

11:30-12:00 **Panel**

Session2: AI-FAN

Looking toward ION-2030, we will accelerate the large-scale commercial deployment of 50G PON for 10-gigabit broadband, explore key architectures and technologies enabling end-edge-cloud collaboration and compute-network integration, and innovatively evolve AI-FAN to build the next-generation access network foundation, which will empower operators to transition from bandwidth-centric operations to token-centric operations, jointly opening up new opportunities in optical access.

Time: 1 November 2026 | 2:00 p.m. – 5:50 p.m.

Venue: Conference Room 101, 1F

Organizers:

Enyu Zhou, Huawei Technologies Co., Ltd

Borui Li, Huawei Technologies Co., Ltd

Agenda:

Opening

14:00-14:15 **Zhicheng Ye**, Huawei Technologies Co., Ltd

14:15-14:35 **Dezhi Zhang**, China Telecom Research Institute

Title: Evolution of Next-Generation Intelligent Optical Access Networks

14:35-14:55 **Yan Shao**, China unicom Research Institute

Title: Discussion on the Evolution of Optical Access Network Technology in the AI+ Era

14:55-15:15 **Ning Wang**, China Mobile Research Institute

Title: Technical progress on AI integrated optical broadband networks

15:15-15:35 **Zongzhao Zheng**, Huawei Technologies Co., Ltd

Title: AI-FAN: Building Optical Access Solutions for the AI Era, Inspiring Unlimited Innovation Opportunities

15:35-16:00 **Coffee Break**

16:00-16:20 **Dajian Liu**, Zhejiang University

Title: Advances in Silicon Photonics for Passive Optical Networks

16:20-16:40 **Junwen Zhang**, Fudan University

Title: TBD

16:40-17:00 **Richeng Jin**, Zhejiang University

Title: Privacy-preserving distributed computation with device-edge collaboration

17:00-17:20 **Ji Zhou**, Beijing Institute of Technology (Zhuhai)

Title: High-speed home optical access network based on plastic optical fibers

17:20-17:50 **Panel**

Industry Horizon program

Description:

Generally speaking, Industry Horizon encompasses current trends, forecasts, and challenges across various industrial sectors, influenced by economic conditions, technological advancements, and geopolitical factors. To be more specific, with the wider impact of AI on networking and service provider infrastructure, this program is tailored to provide valuable insights into the innovations, opportunities, and challenges shaping the future of global connectivity, compute and networking for our industry.

The 2026 Industry Horizon program target a full day series of panel discussions highlighting the latest application topics and business issues in the field of optical communications. Presentations and panel sessions feature esteemed guest speakers from industry, academic and the investment community.

We will explore and share insights into emerging technologies, standards, and manufacturing / deployment challenges, alongside look into the future direction of optical solutions and examine how the industry is scaling to meet growing AI demands, with topics such like scale-up, scale-out and scale across architectures, CPO/NPO/XPO, uLED, silicon photonics & TFLN, photonics packaging, laser innovation, and the evolution beyond 1.6T connectivity etc.

ACP 2026 Industry Horizon program

Market update and outlook on optical PON access and wireless fronthall & last-mile transport

Session Description:

Passive Optical Networking (PON) continues to evolve rapidly, with operators around the world transitioning from GPON to XGS-PON while evaluating 25G, 50G, and other next-generation technologies. Besides, PON expands into the Data Center: PON is breaking out of purely residential broadband. Hyperscalers, colocation facilities, and enterprise campuses are increasingly deploying Passive Optical LAN (POL) solutions for secure, low-latency out-of-band infrastructure management and network architecture. Data center spending on PON equipment is projected to grow at a 52% CAGR through 2030.

Currently PON access and wireless fronthaul markets are entering a strong growth phase in 2026, driven by FTTH expansion, 5G transport demand, and next-gen optical technologies, with global PON equipment valued at ~USD 38.7 B in 2026 and projected to reach USD 61.5 B by 2031. 5G Fronthaul and Backhaul transport market is valued at \$7.44 billion and is on a steep multi-year trajectory to reach over \$34 billion by 2030, mirroring the transition to 5G Advanced and Cloud RAN architectures.

This industrial session provides an industry reality check on current PON, wireless FH & last-mile transport deployments, upgrade strategies, and emerging applications, as well as the key technical and operational challenges operators are facing. Industry experts will share insights on adoption trends, coexistence approaches, real-world use cases, and the roadmap toward multi-gig services and future access architectures.

Keywords: FTTH, PON, wireless fronthaul, last-mile transport

Time: Sunday, 1 November 2026 | 9:30 a.m. – 12:00 p.m.

Location: Conference Room 205, 2F

Organisers:

Hua Zhang, Ligent

Scott Xin Yin, IMEC

Speakers:

Na Wu, ICCSZ

Jim Zou, Adtran Networks

Meng Gao, Huawei

Zhong Shao, ZTE

Dezhi Zhang, China Telecom

Ning Wang, China Mobile

Hua Zhang, Ligent

Frank Chang, Source Photonics

Industry debate: OCS or not OCS?

Session Description:

As AI clusters scale to tens of thousands of accelerators, conventional electrical packet switching faces bandwidth, power, latency, and reconfiguration limits. Optical Circuit Switching (OCS) builds reconfigurable light paths with minimal O-E-O conversion, enabling software-defined topology, protocol/rate transparency, lower latency, and lower power.

At OFC 2026, Google reported multi-generation OCS with TPU pods while NVIDIA outlined OCS possible for scale-up, scale-out, and cross-site AI fabrics. OCS target to complement (not replace), electrical cuicirt switches: it suits predictable training/elephant flows, spine reconfiguration, fault isolation, and cross-campus scheduling, while random low-latency traffic still needs packet switches. Open issues remain – SDN/control-plane integration, TCO validation, millisecond switching speed, insertion loss, and vendor interoperability.

This forum debates when OCS is mandatory, when hybrid electrical-optical designs win, and how standards, MEMS, piezoelectric ceramic, liquid-crystal, and silicon-photonics roadmaps and operator use case studies can de-risk industrial adoption.

Keywords: OCS, MEMS, Switches, Data Center Interconnect

Time: Sunday, 1 November 2026 | 1:30 p.m. – 5:00 p.m.
Location: Conference Room 205, 2F

Organisers:

Frank Chang, Source Photonics

Hua Zhang, Luster Lighttech

Xiang Zhou, Google

Speakers:

1H Session Moderator: **Frank Chang**

Mark Lutkowitz, FibeReality LLC, USA

Bo Xiong, Zhejiang University, China

Ning Deng, Great Bay University, China

William Chen, OneTouch, Belgium

Hua Zhang, Luster(H+S Polatis)

2H Session Moderator: **Hua Zhang**

Fanmiao Kong, Huawei, China

Guangpeng Ma, Lumentum, China

José Capmany, iPronics, Spain

Chonghuai Ma, Bopu Semiconductor, China

Jun Wei, NexPhoton, China

Realistic check of AI interconnect scaling solutions for post 1.6T era

Session Description:

With AI DC build out for 2026, rapid deployment of 800G is happening with close to 100M ports annually, while 1.6T is emerging soon as clear roadmap to reach prime time in next 2-3 years. The next era of networking is here for post 1.6Tb/s. In order to sustain the AI and cloud-driven bandwidth surge, the industry enters into another crossroad again with many MSA solutions available, similar to the last situation with transition to 100Gb/s for 10 year ago. From industry perspective, while CPO is commonly considered as a long-term enabler, many other solutions like NPO, CPX, XPO, 300/400G per lane, high-order modulation & Coherent lite are proposed. In this session, we will provide an overview of various development status/readiness, and discuss these high capacity/high density optical solutions per use cases for how to meet AI scaling requirements in supporting AI scale up, scale out and scale across.

More specially, the next revolution in AI computing clusters has been driven by scale up (for vertical scaling) as bottleneck to enhance single-node performance such like "Super nodes". As we race toward 1.6T and beyond, it pushes network infrastructure to its fundamental limits of physical electrical interconnects, so a new paradigm is emerging for post 1.6T solutions: a fundamental shift in how industry design network hardware beyond pluggable optics transceivers.

The workshop will focus on hyperscale end user case studies, design/package challenges, implementation & commercialization. Looking beyond today's SuperPods, the path toward increasingly large and tightly connected "Hyper Pods," become prevailing with optics enabling next level of system scale and integration. The workshop will bring together hyperscalers, CSP end users, switch integrators, and technology innovative vendors to exchange technology and market intelligence and help align future products, roadmaps, and supply chains around the next generation of AI computing.

Keywords: Scale up, 1.6T, optical transceivers, Switches, Data Center Interconnect

Time: Monday, 2 November 2026 | 1:30 p.m. – 5:00 p.m.

Location: Conference Room 205, 2F

Organisers:

Scott Wilkinson, Signal AI

Frank Chang, Source Photonics

Guangcan Mi, Huawei

Speakers:

Mark Lutkowitz, fiReReality, LLC, USA

Eric Berner, Huawei, Canada

Chongjin Xie, PhotonicX AI, Singapore

Minqing Zuo, China Mobile, China

Anbin Wang, Alibaba, China

Die Wan, Baidu, China

Youxi Lin, Huawei DC, China

Samuel Liu, Lumilens, USA

Bruce Chow, Coherent, USA

Bilal Riaz, Ciena, USA

Xiang Liu, Huawei, Hong Kong, China

ACP 2026 Special Symposium

(within the Industry Horizon Program)

ION-2030 for AI Data Centers: From Scale-Up to Scale-Out, Scale-Across, and Distributed Intelligence

Session Description:

The International Telecommunication Union (ITU) has established a new strategic framework, International Optical Networks Towards 2030 and Beyond (ION-2030), to guide the evolution of global optical connectivity in the era of artificial intelligence (AI). ION-2030 presents a strategic vision for how optical networks should evolve to meet the emerging requirements of AI, data centers, broadband access, home networking, and IMT-2030/6G mobile networks. The framework emphasizes the mutual empowerment of AI and optical networking, positioning them as complementary drivers of the next wave of digital transformation and ubiquitous intelligence.

This Special Symposium will bring together experts at ACP 2026 to present and discuss advances in ION-2030 technologies and architectures for AI data centers, with particular emphasis on the following four dimensions:

- Scale-up: Ultra-high-bandwidth and ultra-low-latency connectivity among accelerators, memory, storage, and network interfaces within AI supernodes;
- Scale-out: Scalable interconnection among racks, pods, and accelerator clusters within a data center or campus;
- Scale-across: Deterministic, high-capacity connectivity among geographically distributed AI data centers operating as a unified computing infrastructure; and
- Distributed intelligence: Coordinated AI inference, training, data processing, and resource orchestration across centralized, regional, edge, enterprise, and user-premises computing facilities with a supporting optical network fabric.

Optical technologies will play a critical role across all four dimensions, and the ION-2030 Special Symposium will address key topics including:

- Co-packaged optics (CPO), near-packaged optics (NPO), eXtra-dense pluggable optics (XPO), linear pluggable optics (LPO), and high-density interconnects;
- Optical circuit switching (OCS) for AI supernodes, scale-out fabrics, and multi-data-center connectivity;
- 400G, 800G, 1.6T, Beyond-1-Terabit OTN, flexible-grid, full-spectrum transponder (FST), and multi-rail transmission;
- Deterministic latency, low jitter, lossless or near-lossless transport, and telecom-grade protection and restoration;
- Distributed training, collaborative inference, agentic AI, embodied AI, and edge intelligence;
- AI-ready data-center access, metro computing networks, and one-hop connectivity to edge and regional AI data centers;
- Energy-efficient architectures, sustainability, resilience, security, data sovereignty, and assured service-level agreements; and
- Standards, deployment experience, technology roadmaps, and emerging business opportunities.

The symposium will bring together experts from network and cloud operators, AI data-center providers, equipment and component manufacturers, standards organizations, universities, and research institutes. Through invited presentations and forward-looking discussions, participants will examine how advances across devices, systems, networks, computing architectures, and intelligent control can be brought together to build scalable, sustainable, secure and resilient AI infrastructure.

We warmly invite the ACP community and professionals across the AI, data-center, and optical-networking ecosystems to join this timely discussion and help shape the evolution of ION-2030 for AI data centers - from scale-up and scale-out to scale-across and truly distributed intelligence.

Time: Tuesday, 3 November 2026 | 8:30 a.m.–12:00 p.m.

Location: Conference Room 205, 2F

Moderators:

Shikui Shen, China Unicom, China

Xiang Liu, Hong Kong Research Center of Huawei, Hong Kong, China

Agenda:**Session 1: 8:30 a.m.–10:00 a.m.**

1. **Glenn Parsons**, Ericsson, Canada (ITU-T SG15 Chair)
"ITU-T SG15's Vision and Work Programs for the AI Era"
 2. **Raul Muñoz**, Centre Tecnològic de Telecomunicacions de Catalunya (CTTC), Spain
"ION-2030 for Distributed AI Training and Inference"
 3. **Nicola Calabretta**, Eindhoven University of Technology, Netherlands
"Optical Circuit Switching (OCS) for Energy-Efficient AI Data Centers"
 4. **Yuyang Liu**, China Telecom, China
"Metro Optical Networks Rearchitected as Computing Power Interconnect for Edge-AI"
 5. **Mingqing Zuo**, China Mobile, China
"An Operator's Perspective on the Evolution towards AI-OTN"
 6. **Gabriele di Rosa**, Adtran Networks SE, Germany
"Optical Technologies for 1.6Tb/s Coherent Pluggable Modules"
- Panel Discussion and Q&A of Session 1**

Coffee break: 10:00 a.m.–10:30 a.m.**Session 2: 10:30 a.m.–12:00 p.m.**

7. **Frank Chang**, Source Photonics, USA
"1.6Tb/s Optical Modules for AI Data Center Scale-Out"
 8. **Son T. Le**, Ciena Corporation, United States
"Optical Technologies for AI Data Center Scale-Up"
 9. **Qin Chen**, Alibaba, China
"CPO and NPO for Hyper-Scale AI Data Centers"
 10. **Sidong Fu**, Tencent, China
"NPO and XPO for AI Data Centers"
 11. **Sisi Tan**, Huawei, China
"Full-Spectrum Transponder Innovations for AI Data Center Scale-Across"
- Panel Discussion and Q&A of Session 2**

Presented By:

Exploring Slow & wide approach using uLEDs and uVCSEL for AI scale up networks

Session Description:

Optical I/O (OIO) interconnect technology aims to address power and bandwidth bottlenecks in AI computing clusters for Chip-to-Chip (C2C) and Device-to-Device (D2D) scenarios through a “high-parallelism, low-single-channel-rate” architecture. Regarding transmitter selection, Mode-Refractive Modulators (MRMs) are the mainstream solution in OCI-MSA due to their miniaturization, CMOS compatibility, and support for high-speed single-channel and WDM expansion.

However, since MRMs require independent DFB lasers, direct modulation schemes using MicroLEDs (uLEDs) and MicroVCSELs (uVCSELs) offer potential for further cost and power reduction. uLEDs exhibit superior thermal stability but suffer from low single-channel bandwidth (1–4 Gbps) and complex coupling processes, necessitating breakthroughs in single-channel rates or the design of low-power Gearboxes to adapt to switch interfaces. In contrast, uVCSELs provide higher bandwidth, yet the yield of high-density arrays and the maturity of Fiber Array Units (FAUs) remain to be validated.

To achieve extreme low power consumption, OIO technology must evolve toward a Serdes-less and Gearbox-less form, facing challenges in architecture compatibility, performance, packaging/coupling processes, and multi-channel reliability. This requires restructuring the switch architecture, including supporting I/O Die direct drive for low-speed parallel channels, adjusting Small IO bandwidth (4G–64G), and adopting control-data separation scheme. Furthermore, when using low-cost light sources, receiver performance must be enhanced via high-sensitivity Photodiodes (PDs) and low-noise CMOS TIAs. As parallelism increases, novel packaging solutions like 2.5D TMV and 3D TSV must be developed to integrate high-density optoelectronic devices with chips, while precise coupling with various fiber types remains an engineering challenge. Finally, thermal risks must be addressed, and redundancy designs implemented to mitigate reliability risks arising from engineering fluctuations.

Keywords: Switch, OIO, MRM, uLED, uVCSEL, Data Center Interconnect

Time: Tuesday, 3 November 2026 | 1:30 p.m. – 5:00 p.m.
Location: Conference Room 205, 2F

Organisers:

Ye Yao, Huawei Hisilicon

Gordon Ning Liu, Soochow University

Frank Chang, Source Photonics

Speakers:

Mark Lutkowitz, fibeReality, LLC, USA

Bao Yun, Alibaba, China

Zhenhao Li, CEO of Beijing Sparkle Opto Tech Co, China

Haijiang Yu, HG Genuine, China

Yeyu Tong, The Hong Kong University of Science and Technology, Hong Kong, China

Haining Yang, Southeast University, China

Tao Tao, Nanjing University, China

Special Event

Academic Forum for Postgraduates in Optical Communications 2026

Session Description:

The Academic Forum for Postgraduates in Optical Communications 2026 is jointly hosted by Study on Optical Communications, Progress in Optoelectronics and Communications (POC), and the State Key Laboratory of Optical Communication Technologies and Networks (OCTN). It aims to continuously identify and nurture young researchers with academic potential and innovative vitality, and to build a high-level, diversified academic exchange platform for master's and doctoral students across China in optical communications and related interdisciplinary fields. Focusing on the frontiers and adhering to fairness and impartiality, the Forum is committed to promoting interdisciplinary and inter-institutional exchange and to identifying and cultivating emerging young academic talent.

Time: Sunday, 1 November 2026 | 08:00 a.m. – 12:00 p.m.

Venue: Conference Room 102C, 1F

Organisers:

Study on Optical Communications Journal

Progress in Optoelectronics and Communications Journal

State Key Laboratory of Optical Communication Technologies and Networks (OCTN)

Sponsors:

Hubei Provincial Institute of Communications (HBIC)

Peng Cheng Laboratory

FiberHome

Accelink

National Optoelectronics Innovation Center (NOEIC)

CICT Mobile

Wuhan Ligong Guangke (WUTOS)

Learning Conference

Chair:

Hanbing Li, State Key Laboratory of Optical Communication Technologies and Networks (OCTN)

Agenda:

Presider: **Songnian Fu**

08:00–08:10 **Opening**

08:10–10:40 **Doctoral Students (10 students)**

10:40–10:50 **Coffee Break**

10:50–11:50 **Master's Students (4 students)**

11:50–12:00 **Announce Results**

Fiber Short Course

Fiber Connectivity Technologies for AI Data Centers and HPC Systems

Course Description:

The rapid growth of AI clusters is driving unprecedented demands for bandwidth, density, power efficiency, and scalability in optical interconnect systems. Emerging architectures such as co-packaged optics (CPO), near-package optics (NPO), optical circuit switching (OCS), and advanced fiber shuffle solutions are reshaping the design of next-generation AI data centers.

This short course provides an industry-oriented overview of optical connectivity technologies enabling AI infrastructure, covering optical fibers, fiber management architectures, high-density connectors, fiber assemblies, optical test methodologies, and future technology trends. Participants will gain insights into key technical challenges, manufacturing considerations, and innovation opportunities across the optical interconnect ecosystem.

Ideal for engineers, researchers, students, and industry professionals involved in AI networking, photonics, optical communications, and data center infrastructure.

Time: Sunday, 1 November 2026 | 10:00 a.m. – 12:00 p.m.

Venue: Conference Room 102B, 1F

Module 1: Fiber Technologies for AI Infrastructure

Single-Mode Fiber (SMF)

Multimode Fiber (MMF)

Multicore Fiber (MCF)

Hollow Core Fiber (HCF)

Specialty Fibers for Photonics Applications

Module 2: AI Data Center Optical Interconnects

AI Data Center Network Architecture

Optical Interconnect Technologies for AI Data Centers

Student Event – Young Scientists Networking Lunch

Description:

Join us for an interactive networking lunch bringing together early-career researchers and students with experienced scientists from around the world. This session offers a unique opportunity to exchange ideas, explore shared research interests, gain insights into scientific careers, and build international connections in a welcoming and informal setting. Connect, get inspired, and expand your scientific network!

Time: Monday, 2 November 2026 | 12:00 p.m. – 1:30 p.m.

Venue: TBD

Organizers:

Nicolas Fontaine, Bell Labs US

Haoshuo Chen, Bell Labs US

Xiaonon Xu, Bell Labs, US

Bin Chen, Hefei University of Technology, China

Georg Rademacher, University of Stuttgart, Germany

Opening Ceremony & Plenary Session

08:30–12:10 · November 2 · Monday	
08:30–08:45	Opening Ceremony Presider: William Shieh , Westlake University, China Welcome Speech Prof. Min Qiu , Westlake University, China
08:45–08:50	Group Photo
08:50–09:50 · Plenary Session I · Multi-function Hall 1F Presider: William Shieh , Westlake University, China	
08:50–09:50	Re-Imagining the Global Internet: “Nothing” is better than silica fibre David Payne University of Southampton, United Kingdom
09:50–10:10	Coffee Break
10:10–12:10 · Plenary Session II · Multi-function Hall 1F Presider: Yikai Su , Shanghai Jiao Tong University, China	
10:10–11:10	The Optical Foundation of the AI and 6G Era: Connecting Compute, Communications, and Intelligence Glenn Parsons Ericsson, Canada
11:10–12:10	Network Architecture Evolution for the Agentic AI Era Dennis Cai Alibaba Cloud, United States

**Prof Sir David N Payne**

University of Southampton, United Kingdom

Title: Re-Imagining the Global Internet: “Nothing” is better than silica fibre**Abstract:**

Conventional optical fibres have guided light through solid glass cores for more than half a century. Since their invention in the 1960s, they have become the foundation of global communications, with close to half a billion kilometres installed every year. Today, we stand at the threshold of the next major transformation: the arrival of ultra-low-loss hollow-core fibre (HCF).

By replacing glass with air as the transmission medium, and using a meticulously engineered geometrical structure in the cladding to confine the light, hollow-core fibres retain all the strengths of traditional fibres while removing the fundamental limitations imposed by solid glass. The performance gains are profound: latency reduced by around 30%, nonlinearity suppressed by more than a factor of a thousand, and the prospect of losses as low as 0.03 dB/km — low enough to support repeaterless transoceanic links. When manufactured at scale and integrated into commercial cable systems, these fibres promise a step-change in global data capacity and a dramatic reduction in cost-per-bit. In short, they offer the opportunity to reshape the communications landscape once again.

A fibre with an “air core” also brings exceptional environmental stability, opening new possibilities in precision sensing, inertial navigation, timing distribution, and high-frequency financial trading. And because the cladding behaves as a more than just a lower index material, we gain unprecedented geometric freedom: the ability to design dispersion profiles, loss windows, and operating regimes that simply do not exist in nature.

This talk will highlight the remarkable opportunities unlocked by these radical fibre architectures — from next-generation global networks to advanced sensing platforms — and outline why hollow-core technology represents one of the most significant advances in fibre optics since the original invention of the solid-core fibre.

Biography:

Prof D. N. Payne is an internationally distinguished research pioneer in photonics, having been in the field for over 50 years. Optical fibre technology is one of the greatest scientific successes of the last three decades and Payne’s contributions are acknowledged as seminal in many areas. Optical fibres underpin the internet, provide new laser capability and environmental sensing, and drive growth to the benefit of all nations.

Payne’s work spans many diverse areas of photonics, from telecommunications and optical sensors to nanophotonics and optical materials. As others have noted, with his colleagues he has made many of the key technical achievements in almost every area of optical fibre technologies and his work has had a direct impact on worldwide telecommunications, as well as nearly all fields of optical R&D. As a result, he is the most highly honoured UK scientist in photonics.

David’s pioneering work in fibre fabrication in the 70’s resulted in almost all the special fibres in use today. He led the team that in 1985 first announced the silica fibre laser and the Erbium-Doped Optical Amplifier (EDFA), the device that fuelled an explosive growth in the internet through its ability to transmit and amplify vast amounts of data. The EDFA is widely regarded as being one of the foremost and most significant developments in modern telecommunications.

David is widely regarded as a charismatic and influential speaker, with extensive international experience. He is known throughout the world and is much in demand as a Plenary Speaker for his insight in a diverse range of scientific topics.

He has published over 650 Conference and Journal papers and been awarded the top American, European and Japanese prizes in photonics, a rare achievement.

As well as the UK Rank Prize for Optics and the prestigious US Tyndall Award, he is a Franklin Laureate (USA), an Eduard Rhein Laureate (Europe) and a Millennium Prize Laureate. He is also an original member of the Highly Cited Researchers (USA) where he is honoured as one of the most referenced, influential researchers in the field and a Thomson REUTERS Citation Laureate.

In 2013, he was Knighted for services to photonics in the Queen's New Year's Honours and in 2018 with his colleagues won the Queen's Anniversary Prize that celebrates excellence, innovation and public benefit in work carried out by UK universities.

**Dr. Dennis Cai**

Alibaba Cloud, United States

Title: Network Architecture Evolution for the Agentic AI Era**Abstract:**

As large models shift from training to inference-centric architectures, AI infrastructure undergoes a fundamental transformation. The rise of Agentic AI demands efficient, predictable token production at scale—imposing unprecedented requirements on optical interconnects, the backbone of AI computing networks. This keynote traces the evolution of Alibaba Cloud's AI network architecture across three dimensions: Scale-out (HPN and TPN), Scale-up (UPN), and Scale-across (eCore). We examine the optical interconnect technology stack enabling these architectures: 800G/1.6T Pluggable Optics, 3.2T/6.4T NPO, and the path toward future terabit solutions. The discussion spans switch silicon photonic integration, high-radix architectures, and advanced packaging technologies that together define next-generation AI-optimized interconnects. Join us to explore how emerging AI workloads are reshaping optical network design—and what this means for the future of AI infrastructure at scale.

Biography:

Dennis Cai is the Vice President of Product & Engineering and the Head of Network R&D at Alibaba Cloud Intelligence Group. He is a prominent figure in the field of cloud infrastructure, specifically known for his leadership in developing high-performance networking solutions that power some of the world's largest AI and cloud ecosystems.

Professional Profile

As a key architect of Alibaba Cloud's physical and software-defined networks, Dennis Cai oversees the evolution of network infrastructure across several domains:

- Data Center Networking: Designing predictable, low-latency architectures (such as the HPN - High Performance Network) specifically optimized for Large Language Model (LLM) training.
- Edge & Backbone: Driving the strategy for metro, backbone, and edge networks to support global cloud distribution.
- Infrastructure Innovation: Leading research into RDMA (Remote Direct Memory Access), advanced congestion control, and SDN 3.0, which utilizes programmable hardware to create "predictable" network services.



Dr. Glenn Parsons

Ericsson, Canada

Title: The Optical Foundation of the AI and 6G Era: Connecting Compute, Communications, and Intelligence

Abstract:

The convergence of artificial intelligence, cloud computing, and next-generation communications is reshaping how networks are designed, built, and operated. Emerging applications are driving unprecedented demands for bandwidth, latency, synchronization, resilience, and energy efficiency, while increasingly distributing intelligence across data centers, networks, and edge environments.

Optical networking is becoming a foundational infrastructure layer for this transformation, enabling the efficient movement of data between compute resources, users, devices, and services at global scale. From data center interconnects to metro, transport, access, and mobile networks, optical technologies provide the performance and scalability needed to support the growing integration of computing and communications.

This keynote explores the evolving role of optical networks in an era where compute, communications, and intelligence are becoming deeply interconnected. It examines emerging architectural trends, operational challenges, and opportunities for collaboration across industry, academia, and standards communities to build the open, interoperable, and sustainable infrastructure that will underpin the next decade of innovation.

Biography:

Glenn Parsons is an internationally known expert in networking, including mobile transport and Ethernet. He is a standards advisor with Ericsson Canada, where he coordinates standards strategy and policy for Ericsson, including network architecture for 5G radio transport networks. Previously, he has held positions in development, product management and standards architecture in the ICT industry. Over the past number of years, he has held several management and editor positions in various standards activities, including IETF, IEEE, and ITU-T. He has been an active participant in the IEEE-SA Board of Governors, Standards Board, and its Committees since 2004. He is currently involved with mobile transport standardization in IEEE and ITU-T and is the chair of IEEE 802.1. In addition to being the founding Editor-in-Chief for IEEE Communications Standards Magazine, he was previously a Senior Technical Editor for IEEE Communications Magazine. He graduated in 1992 with a B.Eng. degree in electrical engineering from Memorial University of Newfoundland.

November 2 · Monday												
	D1 Conference Room 103A, 1F	D2 Conference Room 103B, 1F	D3 Conference Room 103C, 1F	D4 Conference Room 102A, 1F	N1 Conference Room 102B, 1F	N3 Conference Room 102C, 1F	T1 Conference Room Multi-function Hall A, 1F	T2 Conference Room Multi-function Hall B, 1F	T4 Conference Room Multi-function Hall C, 1F	NP4 Conference Room 101, 1F	NP1 Conference Room 206, 2F	NP3 Conference Room 207, 2F
13:30-15:30	CPO and Optical Interconnects President: Lei Ting, Shenzhen University, China	Heterogeneous integration of lasers (I) President: Zihao Wang, Institute of Physics, Chinese Academy of Science, China	Heterogeneous Integration and Integrated Photonics President: Yu Han, Sun Yat-sen University, China	Passive Photonic Components Across Domains (I) President: Victor Torres Compagny, Chalmers University of Technology, Sweden	AI Native Optical Network and Emerging Fiber Systems President: Yuan Cao, Nanjing University of Posts and Telecommunications, China	AI Agents and Autonomous Optical Network Control President: Ning Deng, Great Bay University, China	FSO and Wireless Access President: Jiahao Huo, University of Science and Technology Beijing, China	High-Speed Coherent Transmission and DSP President: Fan Zhang, Peking University, China	Free-space Integrated Sensing and Communications President: Xiong Deng, Southwestern Jiao Tong University, China	Materials, Nanofabrication, and Characterization Techniques (1) President: Yuanlin Zheng, Shanghai Jiao Tong University, China	DAS and Nano-sensing #1 President: Li Pei, Beijing Jiaotong University, China	Integrated Photonics for Quantum Communications President: Xiaomin Hu, University of Science and Technology of China, China
15:30-16:00	Coffee Break											
16:00-17:30	Optical Coupling and Packaging President: Shao-liang Yu, Zhejiang Lab, China	Heterogeneous integration of lasers (II) President: Yating Wan, King Abdullah University of Science and Technology, Saudi Arabia	Integrated Lasers and Photonic Devices President: Siyuan Yu, Sun Yat-sen University, China	Passive Photonic Components Across Domains (2) President: Yong Liu, Technical University of Denmark, Denmark	Quantum Optical Networks and Performance Monitoring President: Bingli Guo, Beijing University of Posts and Telecommunications, China	Optical Data Centers and Distributed AI Training President: Yongcheng Li, Soochow University, China	Advanced Coding Technology President: Tianwai Bo, Beijing Institute of Technology, China	Space-Division Multiplexing and Multicore Amplification President: Fan Yu, Huawei Optical Product Line Planning Department, China	Optical Wireless Receivers, Visible Light Communications and Positioning President: Oskars Ozolins, Riga Technical University, Latvia	Materials, Nanofabrication, and Characterization Techniques (2) President: Qiming Zhang, University of Shanghai for Science and Technology, China	DAS and Nano-sensing #2 President: TBD	High-dimensional quantum entanglement President: Yanxiao Gong, Nanjing University, China
18:00-20:00	Welcome Reception (outdoor)											

November 3 · Tuesday												
	D1 Conference Room103A, 1F	D2 Conference Room 103B, 1F	D3 Conference Room103C, 1F	D4 Conference Room102A, 1F	N1 Conference Room 102B,1F	N3 Conference Room 102C, 1F	T1 Conference Room Multi-function Hall A, 1F	T2 Conference Room Multi-function Hall B, 1F	T4 Conference Room Multi-function Hall C, 1F	NP4 Conference Room 101, 1F	NP1 Conference Room 206, 2F	NP3 Conference Room 207, 2F
08:30-10:00	Optical Beam Manipulation President: Jiawei Wang, Harbin Institute of Technology (Shenzhen) , China	Heterogeneous Integration for Quantum Photonics President: Xingchen Ji, Shanghai Jiao Tong University, China	Photodetectors and Infrared Optoelectronics President: Lianping Hou, University of Glasgow, United Kingdom	/	Optical Wireless Communication Networks President: Wei Wang, Beijing University of Posts and Telecommunications, China	Optical Network Sensing, Monitoring and Resilience President: Yvan Pointurier, Huawei Technologies, France	Impairments Mitigation President: Kangping Zhong, The Hong Kong Polytechnic University, Hong Kong, China	Integrated Optical Fiber Sensing and Communication President: Xian Zhou, University of Science and Technology Beijing, China	Beam Steering and Alignment for Mobile Optical Links President: Ming Che, Kyushu University, Japan	Materials, Nanofabrication, and Characterization Techniques (3) President: Wei Xin, Northeast Normal University, China	Hollow-Core Fibers and Optical Imaging-based Sensor President: Ting Feng, Northeastern University, China	Quantum memory President: Jianwei Tang, Huazhong University of Science and Technology, China
10:00-10:30	Coffee Break											
10:30-12:00	Emerging Materials for Photonic Integration President: Hao Hu, Technical University of Denmark, Denmark	Integrated Photonic Circuits for Optical Field Manipulation President: TBD	Photodetectors and Novel Materials President: Michael Sumetsky, Aston University, United Kingdom	/	Space Optical Transport Networks President: Tingwei Wu, Chongqing University of Posts and Telecommunications, China	Digital Twins and Physical-Layer Optimization President: Danshi Wang, Beijing University of Posts and Telecommunications, China	High-Speed PON President: Ming Luo, China Information and Communications Technologies Group Corporation, China	Optical Frequency Combs and Advanced Optical Transmission President: Yixiao Zhu, Shanghai Jiao Tong University, China	Advanced Signal Processing for Optical Transmission President: Jian Zhao, South China University of Technology, China	Materials, Nanofabrication, and Characterization Techniques (4) President: Jian Xu, East China Normal University, China	Advanced Reflectometry Techniques for Distributed Multi-Parameter Sensing President: Zheng Zheng, Beihang University, China	Quantum Light Source President: Fanglei Wang, University of Science and Technology of China, China
12:00-13:30	Lunch Break											
13:30-15:30	N2 Conference Room103A, 1F	NP4 Conference Room 103B, 1F	N4 Conference Room103C, 1F	D4 Conference Room 102A, 1F	N3 (Parallel) Conference Room 102B,1F	N3 Conference Room 102C, 1F	T1 Conference Room Multi-function Hall A, 1F	T3 Conference Room Multi-function Hall B, 1F	T4 Conference Room Multi-function Hall C, 1F	NP2 Conference Room 101, 1F	NP1 Conference Room 206, 2F	NP3 Conference Room 207, 2F
	Optical Interconnect and Integration President: Meng Xiang, Guangdong University of Technology, China	Materials, Nanofabrication, and Characterization Techniques (5) President: Shikai Deng, Shanghai Institute of Microsystem and Information Technology, China	Optical sensing and communication in access networks President: Shikui Shen, China Unicom, China	Passive Photonic Components Across Domains (3) President: TBD	Optical Access and Satellite Networks President: Jiawei Zhang, Beijing University of Posts and Telecommunications, China	Intelligent Optical Network Technologies and Quantum Networking President: Xiaoliang Chen, University of Science and Technology of China, China	Optoelectronics Devices for Short Reach President: Xiang Li, China University of Geosciences, China	Novel Fibers and Space-Division Multiplexing: Transmission, DSP and Sensing President: Anxu Zhang, China Telecom Research Institute, China	Structured Light and Turbulence-Resilient Optical Communications President: Huibin Zhou, Huazhong University of Science and Technology, China	Microwave Photonic Devices and Systems (1) President: Xiangchuan Wang, Nanjing University of Aeronautics and Astronautics, China	Integrated Sensing and Communication in Optical Fiber Networks President: TBD	Quantum Communication over Fiber Channels President: Xiang Cheng, Huazhong University of Science and Technology, China
15:30-17:30	Coffee Break											
18:30-20:30	Poster Session & Demo Zone, 2F											
Banquet & Award Ceremony · Multi-function Hall, 1F												

November 4 · Wednesday											
	N2 Conference Room 103A, 1F	D2 Conference Room 103B, 1F	D3 Conference Room 103C, 1F	D4 Conference Room 102A, 1F	N1 Conference Room 102B, 1F	N4 Conference Room 102C, 1F	T2 Conference Room Multi-function Hall A, 1F	T3 Conference Room Multi-function Hall B, 1F	T4 Conference Room Multi-function Hall C, 1F	NP2 Conference Room 101, 1F	NP1 Conference Room 206, 2F
08:30-10:00	Optical Switch for AI Infra Presenter: Wei Wang, Beijing University of Posts and Telecommuni- cations, China	Heterogeneous Integration of Electro-Optic Modulator Presenter: Hong- tao Lin, Zhejiang University, China	Lasers and Non- linear Photonics Presenter: Ting Wang, Shanghai Jiao Tong Univer- sity, China	Passive Photonic Components Across Domains (4) Presenter: Qiancheng Zhao, Southern Univer- sity of Science and Technology, China	Semantic and DCI Optical Networks Presenter: Nan Hua, Tsinghua Univer- sity, China	Key technologies for VHSP (1) Presenter: Hanhyub LEE, ETRI, Korea	Optical Intercon- nects Presenter: Yan He, The Hong Kong Polytechnic University, Hong Kong, China	AI and Machine Learning for Optical Commu- nications Presenter: Yi Yu, The Hong Kong Poly- tech University Jinjiang Technolo- gy and Innovation Research Institute, China	Mid-Infrared Free-Space Optical Commu- nications Presenter: Haifeng Yao, Beijing Insti- tute of Technolo- gy, China	Microwave Pho- tonic Devices and Systems (2) Presenter: Yiwai Xie, Zhejiang Univer- sity, China	Biophotonics and Optical Fiber Sensors for Healthcare Presenter: Nicolas Joly, Max Planck Institute for the Science of Light, Germany
	Coffee Break										
10:00-10:30	Photonic AI Com- puting Presenter: Liangjun Lu, Shanghai Jiao Tong University, China	Heterogeneous Integration of Novel Materials Presenter: Hong- tao Lin, Zhejiang University, China	Optical Com- munications and Modulation Presenter: Chao Zhao, Institute of Semiconductors, CAS, China	Passive Photonic Components Across Domains (5) Presenter: Hao Hu, Technical Univer- sity of Denmark, Denmark	AI-assisted Opti- cal Network Presenter: TBD	Key technologies for VHSP (2) Presenter: Jim Zou, Adtran Networks, United States	Transceiver Impairments and Nonlinear Equal- ization Presenter: Bin Chen, Hefei University of Technology, China	Transceiver Impairment Characterization, Calibration and Compensation Presenter: Zhaop- eng Xu, Peng- cheng Laboratory, China	Satellite Optical Links: Standards, Turbulence and Adaptive Sched- uling Presenter: Chen Chen, Chongqing University, China	Microwave Pho- tonic Devices and Systems (3) Presenter: Wei Wei, Beijing Institute of Technology, China	Advanced De- modulation and Signal Processing for Fiber-Optic Sensing Presenter: Liang Zhang, Shanghai University, China
12:00-13:30	Lunch Break										
	N2 Conference Room 103A, 1F	D2 Conference Room 103B, 1F	D3 Conference Room 103C, 1F	D4 Conference Room 102A, 1F	PDP Session Conference Room 102B, 1F	N4 Conference Room 102C, 1F	T2 Conference Room Multi-function Hall A, 1F	T3 Conference Room Multi-function Hall B, 1F	T3 (Parallel) Conference Room Multi-function Hall C, 1F	NP2 Conference Room 101, 1F	
13:30-15:30	Optical AI Ar- chitecture and Network Presenter: Xiao Lin, Fuzhou University, China	Integrated Silicon Nitride Photonic Circuits Presdier: Jingyi Tian, Westlake University, China	High-Speed Opti- cal Interconnects Presenter: Yunhong Ding, Technical Uni- versity of Denmark, Denmark	Passive Photon- ic Components Across Domains (6) Presenter: TBD	Post-deadline Paper Session Presenter: Liu Liu, Zhejiang Univer- sity, China & Lan Li, Westlake University, China	AI and access net- work Presenter: Dezhi Zhang, China Tele- com, China	Hollow-Core Fiber Systems and Per- formance Monitor- ing Presenter: Fei Liu, University of Science and Technology Beijing, China	Short Reach Inter- connects - Equal- ization, Coding, and Monitoring Presenter: Stephan Pachnicke, Chris- tian-Albrechts-Uni- versity of Kiel, Germany	Coherent Optics for Access and Da- tacenter Networks Presenter: Zhenming Tao, Fujitsu, China	Microwave Pho- tonic Devices and Systems (4) Presenter: Zejie Yu, Zhejiang University, China	
15:30-16:00	Coffee Break										
16:00-17:30	Photonics for AI and Computing Presenter: Yuxin Xu, Zhejiang Univer- sity of Technology, China	/	Integrated Pho- tonics Applications and Devices Presenter: Ken Mishi- na, The University of Osaka, Japan	Passive Photon- ic Components Across Domains (7) Presenter: Isidora Teofilovic, Technical University of Den- mark, Denmark	/	New applications of access networks Presenter: Junwen Zhang, Fudan Uni- versity, China	AI-Enabled Networks and Advanced Commu- nication Techniques Presenter: Dan- shi Wang, Beijing University of Posts and Telecommuni- cations, China	Co-Packaged Op- tics and Advanced Coherent Trans- ceiver DSP Presenter: Zhaop- eng Xu, Pengcheng Laboratory, China	Ultra-Wideband and Multi-Core Fiber Transmission and Performance Monitoring Presenter: Besma Kalla, Eindhoven University of Tech- nology, Netherlands	Microwave Pho- tonic Devices and Systems (5) Presenter: Qifan Yang, Peking University, China	

D1: Advanced Packaging, Interfacing, and System Integration

Conference Room 103A, 1F

13:15-15:30 · November 2, 2026 · Monday

CPO and Optical Interconnects

Presider: Lei Ting, Shenzhen University, China

13:15-13:45 · ACP2026-0708-3 **Invited**

1.6Tbps optical engine for co-packaged optics systems

Bigeng Chen¹

1.Zhejiang Lab, China

A 1.6Tbps optical engine is designed and implemented for co-packaged optics (CPO) systems. The optical engine is assembled using a 2D packaging structure, where the silicon photonic chip and drivers/TIAs are flip-chip bonded onto a package substrate.

13:45-14:15 · ACP2026-0817-1 **Invited**

Ultra-High-Density Silicon Photonic Interconnects for AI Computing Clusters

Binhao Wang^{1,2*}

1.Xi'an Institute of Optics and Precision Mechanics, Chinese Academy of Sciences, China; 2.Beijing Lingxi Photonix Technology Co., Ltd., China

This talk discusses the key technology drivers and emerging trends in optical interconnects for AI infrastructure, highlighting recent advances in silicon microring-modulator-based interconnects and their potential to enable scalable, energy-efficient CPO systems.

14:15-14:45 · ACP2026-0904-2 **Invited**

Advanced optical interconnection for I/O in AI Compute Infrastructure

Yuan Li¹

1.Zhangjiang Laboratory, China

This talk presents advanced optical-interconnect solutions at Zhangjiang Laboratory for AI-infrastructure I/O, including 90-GHz MRMs, dual-mode scalable, PCIe-compatible low-latency architectures, O/C-band DWDM transmitters and an quantum-dot-comb-based O-band transmitter.

14:45-15:15 · ACP2026-0629-14 **Invited**

AI-Driven Multidimensional Silicon Photonics Devices and Intelligent Photonic Processors

Yeyu Tong¹

1.Hong Kong University of Science and Technology (Guangzhou), China

This report presents our latest findings on silicon photonic devices and circuits, including photonic engines with microring modulators, multidimensional chip-fiber coupling interfaces, and applications in programmable structured light generation, manipulation, and high-capacity inter-chip interconnects.

15:15-15:30 · ACP2026-0624-2 **Industry Innovation Nomination**

Ultra-Low-Loss Fusion Splicing of Anti-Resonant Hollow-Core Fiber Enabled by Dual-Beam CO₂ Laser Processing

Haojie Chen¹, Hao Zhang¹, Ningbo Duan¹, Jinlin Dong², Xiaoyu Chen³, Yunyao Wei³, Yu Qin⁴, Yichun Shen⁵, Limin Xiao⁴, Ye Chen^{1*}, Fei Xu^{3,6*}

1.MIT Key Laboratory of Aerospace Information Materials and Physics, College of Physics, Nanjing University of Aeronautics and Astronautics, China; 2.School of Physics, Nanjing University, China; 3.National Laboratory of Solid-State Microstructures and College of Engineering and Applied Sciences, Nanjing University, China; 4.Advanced Fiber Devices and Systems Group, Key Laboratory of Micro and Nano Photonic Structures (MoE), Key Laboratory for Information Science of Electromagnetic Waves (MoE), Shanghai Engineering Research Center of Ultra-Precision Optical Manufacturing, College of Future Information Technology, Fudan University, China; 5.Zhongtian Technology Advanced Materials Co., Ltd., China; 6.Shenzhen Research Institute of Nanjing University, Nanjing University, China

Dual-beam CO₂ laser splicing of anti-resonant hollow-core fibres achieves record-low 0.01 dB insertion loss and 263.1 gf mechanical strength, overcoming arc-splicing thermal limits to enable scalable hollow-core fibre integration in optical networks.

15:30-16:00 Coffee Break

16:00–17:45 · November 2, 2026 · Monday

Optical Coupling and Packaging

Presider: Shaoliang Yu, Zhejiang Lab, China

16:00–16:30 · ACP2026-0715-74 **Invited****Advanced Waveguide Grating Couplers for high bandwidth–density applications****Hon Ki Tsang^{1*}**, Xuotong Zhou¹¹.The Chinese University of Hong Kong, Hong Kong, China

Waveguide grating couplers offer higher bandwidth density than edge couplers for high-capacity interconnects. We review recent developments in volume production ready designs that attain sub-decibel coupling losses, 1 dB bandwidths 200 nm, and low back reflections.

16:30–17:00 · ACP2026-0820-1 **Invited****Glass-based 3D waveguides for high-density optical packaging****Ting Lei¹**¹.Shenzhen University, China

We develop the glass based 3D waveguides using the laser direct writing technology for optical packaging and interconnecting in data centers, including the multi-core fiber fan-in fan-out and high density optical waveguides coupling devices.

17:00–17:15 · ACP2026-0701-211

Sub-dB Polymer-to-Silicon Photonic Adiabatic Coupler Enabled by a SiN Interlayer**Toon De Baere^{1*}**, Jef Van Asch², Lucas Van Severen¹, Imene Jadli², Joris Van Campenhout², Peter Ossieur¹, Jeroen Missinne¹, Geert Van Steenberghe¹¹.UGent, Belgium; ².imec, Belgium

We demonstrate a polymer-to-silicon photonic waveguide adiabatic coupler through a SiN interlayer, including opening of the back-end-of-line for SiN access, achieving coupling losses below 1 dB in the O-band and 1.5 dB in the C-band.

17:15–17:30 · ACP2026-0701-46

Low-Divergence Tri-Tip Inverse-Taper Silicon End-Fire Emitter for Broadband Free-Space Emission**Yicheng Wang¹**, Tianqi Song¹, Jing Wang^{1*}¹.Southern University of Science and Technology, China

We report a tri-tip silicon end-fire emitter enabling low-divergence broadband free-space emission. At 1550 nm, TE and TM divergences measure 9.3 by 13.7 degrees and 11.2 by 15.6 degrees, with 0.41 dB and 0.57 dB losses.

17:30–17:45 · ACP2026-0701-48

Silicon Polarization Controller with Integrated End-Fire Emitter for Tunable Linearly Polarized Output**Yicheng Wang¹**, Ningyu Zhang¹, Jing Wang^{1*}¹.Southern University of Science and Technology, China

We report a thermo-optic silicon polarization controller with an integrated end-fire emitter. At 1550 nm, it achieves 2.4/1.5 dB losses, 25.5/28.2 dB extinction ratios, 22.5 mW power, and validates four representative free-space linear-polarization beam profiles.

08:30–10:00 · November 3, 2026 · Tuesday

Optical Beam Manipulation

Presider: Jiawei Wang, Harbin Institute of Technology (Shenzhen), China

08:30–09:00 · ACP2026-0701-29 **Invited****Integrated optical phased array for optical wireless communications****Hao Hu¹**¹.Technical University of Denmark, Denmark

I will present our recent advances in integrated optical phased array, which enable fast beam steering, tracking, and adaptive control for robust optical links by replacing bulky mechanical pointing systems.

09:00–09:30 · ACP2026-0911-2 **Invited****Versatile functionalities of on-chip metasurfaces****Ke Xu¹**¹.Harbin Institute of Technology (Shenzhen), China

Current integrated optical chips are primarily based on single-mode or few-mode waveguides, with functional devices such as beam splitters, couplers, and phase shifters having been constructed. However, for slab waveguides far from the guided-mode cutoff con-

dition, on-chip beam manipulation remains challenging. To address this, drawing inspiration from the wavefront manipulation mechanisms and applications of free-space optical metasurfaces, the concept of metasurfaces has been extended to the on-chip domain. We focus on the working principles and implementation methods of on-chip metasurfaces, which enable the manipulation of light propagation characteristics in slab waveguides through phase-gradient metasurfaces. Furthermore, we explore the applications of such on-chip metasurfaces in the field of information photonics: 1) miniature spectrometers; 2) optical encryption systems; 3) image processing units; and 4) Fourier optics operators.

09:30-09:45 · ACP2026-0715-120

Metasurface Photonic-crystal Multivariate Optical Elements with Integrated Metalenses

Pengjiu Zhao¹, Jiangbing Du^{1*}, Zuyuan He¹

1.Shanghai Jiao Tong University, China

We present a single-slab metasurface photonic-crystal MOE with integrated metalenses for input and output coupling. This monolithic architecture performs optical spectral encoding while eliminating external optics and relaxing alignment tolerances.

09:45-10:00 · ACP2026-0715-33

Optical Path Scaling via Multimode Recirculation

Xiyue Lyu¹, Yaotian Zhao^{2*}, Wei Chu²

1.Fudan University, China; 2.Zhangjiang laboratory, China

We propose a nonresonant silicon waveguide that extends effective propagation via sequential multimode recirculation, achieving 2.65- and 3.07-fold group-delay enhancements in three- and five-mode configurations, respectively.

10:00-10:30 Coffee Break

10:30-12:15 · November 3, 2026 · Tuesday

Emerging Materials for Photonic Integration

Presider: Hao Hu, Technical University of Denmark, Denmark

10:30-11:00 · ACP2026-0828-3 **Invited**

Hybrid-Integrated TFLN-Based Coherent Optical Sub-Assembly Enabling 128Gbaud DP-16QAM 800Gps/λ Transmission

Keqi Cao^{*}, Xiaonan Chen^{1,2}, Yu Liu^{1*}

1.Institute of Semiconductor, Chinese Academy of Sciences, China; 2.University of Chinese Academy of Sciences, China

We experimentally demonstrate a coherent optical subassembly based on thin-film lithium niobate with hybrid integration, featuring a 3-dB bandwidth over 75 GHz and enabling 128-Gbaud DP-16QAM transmission for 800-Gbps/λ applications.

11:00-11:30 · ACP2026-0901-6 **Invited**

Ferroelectric optical memristors

Yang Zhang^{1*}, Yiyang Wen¹

1.Nankai University, China

This PMN-PT optical memristor relies on ferroelectric domain rearrangement to achieve deterministic non-volatile multilevel optical-phase modulation, featuring fast switching, low energy consumption and long-term state retention.

11:30-12:00 · ACP2026-0831-6 **Invited**

Wafer level heterogeneous co-packaging optoelectronics for ultrabroadband microsystems

Liang Zhou^{*}

1.Shanghai Jiao Tong University, China

Modern communication, sensing, and computing systems are increasingly marked by relentless growth in data throughput and bandwidth. Delivering this trend in an efficient fashion has driven the fusion of photonics for broadband operation and low-loss transmission with electronics for powerful signal processing, leading to the growth of optoelectronic microsystems. However, conventional interfaces and packaging schemes between photonic and electronic chips impose loss, bandwidth, and footprint penalties, particularly severe at millimetre-wave and terahertz frequencies. Here we demonstrate a co-packaged optoelectronics (CPO) platform that densely integrates complementary metal-oxide-semiconductor (CMOS), gallium nitride (GaN) and indium phosphide (InP) electronic chips together with a thin-film lithium niobate (TFLN) modulator.

12:00-12:15 · ACP2026-0702-1

Fabrication-Friendly PZT First-Order Bragg Topological Slow-Light Waveguide for Compact Electro-Optic Phase Modulation

Jing He¹, Wei Dou¹, Zhe Sun², Ye Zheng², Kanzhong Yao², Jun Tan³, Chao Liu³, Kunpeng Zhai^{1*}, Huashun Wen^{1*}

1.Nankai University, China; 2.Institute of Artificial Intelligence (TeleAI), China Telecom, China;

3.HiStarlink (Wuxi) Aerospace Technology Co., Ltd, China

A continuous PZT rib waveguide with SSH-like Bragg width modulation enables compact slow-light electro-optic tuning, achieving 681.8 nm/RIU sensitivity, 103.7 pm/V estimated tuning, low $V_{\pi L}$, and mitigated RF-bandwidth penalty for PZT microwave photonic modulators.

D2: Integrated Photonic Circuits and Heterogeneous Platforms

Conference Room 103B, 1F

13:30–15:30 · November 2, 2026 · Monday

Heterogeneous integration of lasers (I)

Presider: Zihao Wang, Institute of Physics, Chinese Academy of Science, China

13:30–14:30 · ACP2026-0625-11 **Tutorial**

Integrated Silicon Photonics with Quantum Dot On-Chip Lasers

Yating Wan^{1*}

1. King Abdullah University of Science and Technology, Saudi Arabia

Silicon photonics needs efficient on-chip light sources to scale AI, computing, sensing, and communications. I will present heterogeneous quantum-dot lasers on silicon, highlighting low thresholds, narrow linewidths, stability, and applications in PUC and Lidar.

14:30–14:45 · ACP2026-0630-114

Self-Injection-Locked Laser Based on a CMOS-Compatible Compact Spiral Resonator

Wei Chen¹, Chenlei Li¹, Yueyang Zhang¹, Cunyu Shi¹, Tao Shu¹, Daoxin Dai^{1,2*}

1. Zhejiang University, China; 2. China Jiliang University, China

We demonstrate a hybrid-integrated self-injection-locked laser using a compact silicon nitride spiral resonator fabricated in a standard CMOS-compatible process. The device achieves a 96.3 GHz mode-hop-free tuning range and a Lorentzian linewidth of 47.7 Hz.

14:45–15:00 · ACP2026-0701-132

A Self-Injection-Locked Laser with Synchronous Electro-Optic Tuning for FMCW Ranging

Xiao Wu¹, Xiaoying Guo², Xinhang Li², Zhenwu Mo¹, Yang He¹, Cheng Zeng¹, Yuyao Guo², Linjie Zhou², Jinsong Xia¹

1. Wuhan National Laboratory for Optoelectronics and School of Optical and Electronic Information, Huazhong University of Science and Technology, China; 2. State Key Laboratory of Photonics and Communications, Shanghai Key Lab of Navigation and Location Services, Department of Electronic Engineering, Shanghai Jiao Tong University, China

By using synchronous tuning, we demonstrate a hybrid-integrated self-injection-locked laser on a thin-film lithium tantalate on insulator (LTOI) platform that achieves a 4.8-GHz FMCW chirp at 100 kHz while maintaining an 390-Hz Lorentzian linewidth.

15:00–15:15 · ACP2026-0625-4

Laser cavity-soliton microcombs generation in normal-dispersion silicon nitride microresonators

Yingge Tao^{1,2}, Lei Wang², Houling Ji², Zhaonian Wang², Ke Xu^{1,2,3*}, Chunyang Ma^{2*}

1. Department of Integrated Circuits, Harbin Institute of Technology, Shenzhen, China; 2. Pengcheng Laboratory, China; 3. Guangdong Provincial Key Laboratory of Semiconductor Optoelectronic Materials and Intelligent Photonic Systems, Harbin Institute of Technology, China

A CMOS-compatible normal-dispersion silicon nitride microring laser cavity-soliton microcomb with 150 GHz FSR is demonstrated. It achieves stable mode-locking at only 8.3 mW pump power with 58% conversion efficiency. Single and dual FSR soliton states are switchable.

15:15–15:30 · ACP2026-0701-85 **Industry Innovation Nomination**

Mode-Hop-Free Electro-Optic Synchronous Tuning in an Integrated Vernier Laser

Zhenwu Mo¹, Xiao Wu¹, Yang He¹, Cheng Zeng¹, Jinsong Xia^{1*}

1. Wuhan National Laboratory for Optoelectronics and School of Optical and Electronic Information, Huazhong University of Science and Technology, China

We demonstrate a hybrid integrated Vernier laser on lithium tantalate on insulator with electro-optic synchronous tuning, achieving a 34.2 GHz chirp bandwidth at 1 MHz chirp rate with under 1% root-mean-square nonlinearity without predistortion.

15:30–16:00 Coffee Break

16:00–18:00 · November 2, 2026 · Monday

Heterogeneous integration of lasers (II)

Presider: Yating Wan, King Abdullah University of Science and Technology, Saudi Arabia

16:00–16:30 · ACP2026-0902-1 **Invited****Recent Advances in Quantum Dot Lasers for Optical I/O****Zihao Wang¹***1. Institute of Physics, Chinese Academy of Science, China*

Recent advances in quantum dot DFB and comb lasers with 100, 200, and 400 GHz mode spacings are presented, highlighting their performance advantages for optical I/O applications.

16:30–17:00 · ACP2026-0902-3 **Invited****Integrated Photonics based on Lithium Tantalate-on-Insulator****Jinsong Xia^{1*}***1. Huazhong University of Science and Technology, China*

Lithium Tantalate-on-Insulator is a new platform for high-performance modulators and integrated photonics. We will report new progress in Lithium Tantalate-on-Insulator photonics, including optical coupling, phase tuning, hybrid-integrated modulator, and integrated chips.

17:00–17:15 · ACP2026-0715-45

Heterogeneously Integrated III-V-on-Silicon Directly Modulated DFB Laser on a Standard 220 nm Silicon Photonics Platform**Yu Qiao¹**, Xian Zhang², Caiqiang Gu¹, Bing Wang^{1,2*}, Ruijun Wang^{1,2*}, Siyuan Yu^{1,2}*1. Sun Yat-sen University, China; 2. Guangzhou Innovation Center of Optoelectronics and Microelectronics, China*

We demonstrate a directly modulated III-V-on-silicon distributed feedback laser on a standard 220 nm platform. It achieves 7.4 mW on-chip single-facet output power, 54.2 dB side-mode suppression, 9.46 GHz bandwidth, and a 10 GBaud eye.

17:15–17:30 · ACP2026-0714-13

GaSb-TFLN hybrid integrated laser based on cascaded micro-ring resonators in the 2 μm waveband**Songjian Lin¹**, Zhengqi Geng², Zhichuan Niu², Chengao Yang², Ruijun Wang^{1*}, Siyuan Yu¹*1. Sun Yat-sen University, China; 2. University of Chinese Academy of Sciences, China*

We present a GaSb-TFLN hybrid integrated laser operating in the 2-μm band. This laser achieves an output power of 3.6 mW, a side-mode suppression ratio of 60 dB, and a 33 nm tuning range.

17:30–17:45 · ACP2026-0701-181

Photonic Wire Bonding-Enabled Hybrid-Integrated Tunable Optical Transmitter for NG-PON2**Wentao Sun¹**, Zhenxing Sun^{1*}, Rulei Xiao¹, Xiangfei Chen¹*1. Nanjing University, China*

A hybrid-integrated tunable transmitter combining a REC-based DFB laser array and TFLNMZM delivers 25 Gb/s NRZ operation. PWB provides low-loss laser-modulator-fiber interconnection, and clear open eye diagrams are obtained after back-to-back and 10 km SMF transmission.

17:45–18:00 · ACP2026-0701-119

Low-loss Wafer-scale 3D Polymer Photonic Inline Monitoring Chip for 7-core Fiber Transmission**Zexu Liu¹**, Tao Chen¹, Zhenming Ding¹, Yuhao Fang¹, Zeyu Deng¹, Haojie Zhu¹, Weiqi Lu¹, Jiwei Xie¹, Xue Cheng¹, Shijie Ke¹, William Shieh^{1*}*1. Westlake University, China*

We demonstrate a wafer-scale 3D polymer inline monitor for 7-core-fiber links, featuring per-core spectral access without spatial demultiplexing, insertion loss of 2.1–4.0 dB, and transmission of 240-Gb/s per core without measurable BER penalty.

08:30–10:00 · November 3, 2026 · Tuesday

Heterogeneous integration for Quantum Photonics

Presider: Xingchen Ji, Shanghai Jiao Tong University, China

08:30–09:00 · ACP2026-0828-2 **Invited****Integrated Photonics for Quantum Secure Applications****Marco Avesani^{1,2*}***1. University of Padova, Italy; 2. ThinkQuantum, Italy*

Integrated photonics is transforming quantum-secure technologies by enabling compact, stable, and scalable platforms. We present experimental results on photonic integration for quantum key distribution and quantum random-number generation.

09:00–09:30 · ACP2026-0715-160 **Invited****Integrated High Performance Single Photon Emitters in Nanogap/WSe₂ Heterostructures****Hongbing Cai¹***1. University of Science and Technology of China, China*

Two-dimensional (2D) semiconductors single photon emitters (SPEs) have great potential in various light quantum technologies owing to their perfect collection efficiency. However, so far, various 2D-semiconductors SPEs are difficult to simultaneously fulfil a combination of high brightness, high stability, and excellent monochromaticity, due to challenges in single-frequency emitting, high intensity, and emitting stability. Here we present a feasible strategy that based on a controllable wrinkling technique, realizes simultaneously high brightness, high stability and excellent monochromaticity in a monolayer WSe₂ nano-bulge SPE array with a designable and controllable local uniform large strain gradient. The SPEs exhibit exceptional performance in the SPE generation probability up to about 70% and possess high single-frequency brightness and excellent emitting stability. What's more, we show that nonradiative decay in 2D WSe₂ quantum emitters can be electrically suppressed through charge depletion by utilizing dual gate configurations under a large electric field. In this condition, for site-controlled SPEs in WSe₂ coupled to gold nanogaps, the SPE transition quantum efficiency after gating is increased to $76.4 \pm 14.6\%$ on average, with some SPEs reaching near-unity (more than 90%) quantum efficiency. Our innovative method represents a powerful generation and modulation method of SPEs in two-dimensional materials.

09:30–09:45 · ACP2026-0715-133

Nonlinear Frequency Conversion in a 4H-SiC Microring Resonator for Integrated Nonlinear and Quantum Light Sources**Jiantao Wang¹**, Ng Ching Ting¹, Emer Kelleher-Smith¹, Andrew W. Poon^{1*}*1. The Hong Kong University of Science and Technology, Hong Kong, China*

4H silicon carbide is a promising platform for integrated nonlinear and quantum photonics because of its second- and third-order optical nonlinearities. In this work, we design and fabricate a silicon carbide microring resonator with modal phase-matching between telecom band and near-visible modes. We observe cavity-enhanced second-harmonic generation at ~ 775 nm wavelengths with an efficiency of $\sim 22\%/W$ pumping at ~ 1550 nm wavelength. Upon dual-wavelength pumping around ~ 1550 nm wavelength, we demonstrate sum-frequency generation together with two second-harmonic signals. We also observe four-wave-mixing-like sidebands in the telecom band, with generated idlers appearing at the microring resonances. These results demonstrate multiple cavity-enhanced second- and third-order frequency conversions in a single silicon carbide microring resonator and establish a basis for integrated quantum light sources.

09:45–10:00 · ACP2026-0701-137

Waveguide integrated superconducting single-photon detectors with near-unity detection efficiency**Ilya Stepanov^{1*}**, Evgeniy Sergeev^{1,2}, Oksana Shmonina¹, Aleksey Kramarenko¹, Kirill Buzaverov^{1,2}, Sergey Avdeev^{1,2}, Aleksandr Baburin^{1,2}, Ilya Ryzhikov¹, Ilya Rodionov^{1,2}*1. Bauman Moscow State Technical University, Russia; 2. Dukhov Research Institute of Automatics (VNIIA), Russia*

We demonstrate a technology for fabricating SNSPDs monolithically on a SiN photonic platform. Detectors have demonstrated absorption efficiencies of up to 99.8% and saturated intrinsic detection efficiency at 1550nm wavelength, ensuring near-unity detection efficiency.

10:00–10:30 Coffee Break

10:30–12:00 · November 3, 2026 · Tuesday

Integrated Photonic Circuits for Optical Field Manipulation

Presider: TBD

10:30–11:00 · ACP2026-0908-6 **Invited****Integrated Visible-Light Photonic Circuits for Nonlinear and Free-Space Optics****Giovanni Pruiti¹**, Marc Sorel^{1*}*1. University of Glasgow, United States*

We report on visible-light photonic integrated circuits built on loss-optimised silicon nitride and alumina waveguides. Demonstrations span on-chip wavefront sensing for free-space optics, and concurrent supercontinuum and second-harmonic generation via lithium niobate heterogeneous integration.

11:00–11:30 · ACP2026-0911-3 **Invited****Supercontinuum Generation in Integrated Waveguide Platforms and Their Applications****Xingchen Ji¹***1. Shanghai Jiao Tong University, China*

Supercontinuum generation (SCG) in integrated waveguide platforms has emerged as a transformative technology for realizing broadband on-chip light sources, characterized by its compactness, stability, and energy efficiency. This report reviews our recent progress in SCG, with a specific focus on the performance and design of gallium phosphide and silicon nitride photonic platforms.

11:30–11:45 · ACP2026–0715–142

Integrated Photonic Wiener Operator with a Silicon Metalens 4F Processor**Chen Wu**^{1,2}, Wenjia Zhang^{1,2*}, Zuyuan He^{1,2}*1.State Key Laboratory of Photonics and Communications, Shanghai Jiao Tong University, China*

We demonstrate the first Integrated Photonic Wiener operator in a waveguide-coupled on-chip 4F processor. Paired silicon metalenses and a Fourier-plane metasurface implement complex spatial-frequency filtering, showing excellent agreement ($R^2=0.969$) with scalar predictions.

11:45–12:00 · ACP2026–0715–58

Integrated Multiport Optical Vortex Beam Emitters**Liheng Yi**¹, Hanwen Liu¹, Shuang Zheng^{1*}, Tiange Wu¹, Kaisheng Peng^{2*}, Minming Zhang^{1*}*1.Huazhong University of Science and Technology, China;2.Wuhan Tri-light Technology Co., Ltd., China*

Silicon multiport vortex emitters use waveguide crossings and fork gratings to form OAM beam arrays. Port choice and phase coding set beam position, enabling two-axis steering, spatial multiplexing, and links from chips to free space.

08:30–09:30 · November 4, 2026 · Wednesday

Heterogeneous integration of Electro-Optic Modulator

Presider: Hongtao Lin, Zhejiang University, China

08:30–08:45 · ACP2026–0701–21

Heterogeneously Integrated Slow-Light SiN-TFLN Michelson Interferometer Modulator with Inverse-Designed Reflectors**Wensheng Huang**¹, Yuxin Hao¹, Zhengquan Jiang¹, Ningyu Zhang¹, Tianqi Song¹, Yan Cai², Jing Wang^{1*}*1.Southern University of Science and Technology, China;2.Shanghai Institute of Microsystem and Information Technology, Chinese Academy of Sciences, China*

We numerically investigate a heterogeneously integrated slow-light SiN-TFLN Michelson modulator with inverse-designed reflectors. Modeled on an MPW platform, the 0.3-mm-long device exhibits a simulated 0.55 V·cm half-wave voltage-length product and 50 GHz bandwidth.

08:45–09:00 · ACP2026–0706–2

A PZT Enabled LAN WDM Transmitter with Post Trimming and Efficient Pockels Modulation**Cunyu Shi**¹, Chenlei Li¹, Tao Shu¹, Wei Chen¹, Yueyang Zhang¹, Feng Qiu², Daoxin Dai^{1*}*1.Zhejiang University, China;2.Hangzhou Institute for Advanced Study, University of Chinese Academy of Sciences, China*

We present a PZT-based LAN-WDM transmitter combining nonvolatile calibration and volatile Pockels modulation. Twelve channels show average 15.7 dB crosstalk suppression and 1.87 nm 0.5-dB flat-top bandwidth, with simulations indicating 100 Gbps per channel transmission.

09:00–09:15 · ACP2026–0715–85

Wafer-Scale Manufacturable Single-Drive Ultrahigh Extinction Ratio Electro-Optic Switch**Zhile Wu**¹, Zhengyuan Bao¹, Changying Song¹, Zeyuan Xie¹, Daoxin Dai¹, Zejie Yu^{1*}*1.Zhejiang University, China*

We demonstrate a wafer-scale manufacturable single-drive electro-optic switch with nearly 60 dB extinction ratio, 1.5 dB insertion loss, and 2.92 ns switch time across the entire C band on a thin-film lithium tantalate platform.

09:15–09:30 · ACP2026–0715–172

High-Extinction-Ratio Thin-Film Lithium-Niobate Electro-Optic Modulator Enabled by Nonvolatile Sb₂Se₃ Programming**Jiahuan Chen**¹, Ming Zhang^{1*}, Daoxin Dai¹*1.Zhejiang University, China*

High-extinction-ratio electro-optic modulators are essential for photonic systems requiring strong optical suppression, high dynamic range, and precise optical control. However, the extinction ratio of conventional Mach-Zehnder modulators is highly sensitive to fabrication-induced phase, loss, and power-splitting imbalances. These imperfections are typically compensated using thermo-optic or electrically controlled tuning elements, which require continuous heating power or sustained electrical bias to maintain the calibrated state. Here, we propose and experimentally demonstrate a nonvolatile Sb₂Se₃-assisted thin-film lithium-niobate electro-optic modulator based on a cascaded Mach-Zehnder architecture. A tapered Sb₂Se₃ phase-change-material (PCM) section is integrated on the Mach-Zehnder interferometer. By adjusting the nonvolatile state of Sb₂Se₃, fabrication-induced imbalance is compensated, enabling balanced of the subsequent traveling-wave Mach-Zehnder modulator. Once programmed, the calibrated state is retained without continuous thermal or electrical tuning. The fabricated device achieves a maximum extinction ratio of 46.5 dB and the electro-optic bandwidth of the modulator exceeds 60 GHz. The demonstrated electro-optic modulator holds significant potential for stable, broadband, and high-extinction-ratio modulators.

10:00–10:30 Coffee Break

10:30–12:00 · November 4, 2026 · Wednesday
Heterogeneous integration of Novel Materials
 Presider: Hongtao Lin, Zhejiang University, China

10:30–11:00 · ACP2026–0617–1 **Invited**

Programmable Photonic Integrated Circuits Enabled by Phase-Change Materials

Yuru Li¹

1. South China Normal University, China

Driven by the demands of artificial intelligence, this presentation highlights phase-change materials with nonvolatile and low-power operation, and reviews recent advances in programmable metasurfaces, on-chip optical routing, and programmable photonic devices.

11:00–11:30 · ACP2026–0714–31 **Invited**

Advances in integrated magneto-optics: beyond optical isolators

Shuyuan Liu^{1*}, Zhifeng Tu^{1,2}, Bingzhou Hong¹, Lei Bi³, Wei Chu^{1*}

1. Zhangjiang Laboratory, China; 2. Fudan University, China; 3. University of Electronic Science and Technology of China, China

Beyond isolators, integrated magneto-optical devices leverage nonreciprocity, nonvolatility, high-speed switching, and endurance to unlock novel system architectures for next-generation optical switching and computing.

11:30–11:45 · ACP2026–0715–206

Integrated Magneto-Optical Circulators for Parallel FMCW LiDAR and Imaging Applications

Zixuan Wei¹, Wu Di¹, Zhenyuan Ren¹, Tianchi Zhang¹, Jun Qin¹, Bi Lei^{1*}

1. University of Electronic Science and Technology of China, China

We demonstrate a thermally tuned four-channel integrated magneto-optical circulator array operating at 1550 nm and validate one channel in FMCW ranging, highlighting its potential for scalable parallel transmit-receive sensing.

11:45–12:00 · ACP2026–0626–14

Heterogeneous structure of Carbon Nanotubes and Silicon Nanobeam Cavity for Efficient Emission Coupling

Zijun Xiao¹, Weiwei Zhang², Carlos Ramos¹, Arianna Filoramo³, Nicolas Dubreuil⁴, Laurent Vivien^{1*}

1. Paris Saclay University, France; 2. Songshan Lake Materials Laboratory, Dongguan, China; 3. CEA, France; 4. LP2N, France

We demonstrate significant photoluminescence enhancement from semiconducting single-walled carbon nanotubes integrated into a silicon air-mode photonic crystal nanobeam cavity. Precise control over the spatial localization and alignment of the nanotubes is achieved through a dielectrophoresis-based fabrication process. Furthermore, our optimized photonic crystal cavity design achieves strong light-matter coupling and a low mode volume $V=0.18(\lambda/n)^3$, which lead to the Purcell factor ($FP=15000(\lambda/n)^3$), paving a way towards s-SWCNTs based integrated laser.

13:30–16:00 · November 4, 2026 · Wednesday
Integrated Silicon Nitride Photonic Circuits
 Presider: Jingyi Tian, Westlake University, China

13:30–14:00 · ACP2026–0911–4 **Invited**

TBD

Xuechao Yu¹

1. Suzhou Institute of Nano-tech and Nano-bionics, Chinese Academy of Sciences, China

TBD

14:00–14:30 · ACP2026–0819–1 **Invited**

The co-designed electro-optical (E/O) chips for the interconnects in AI Infrastructure

Jingbo Shi¹

1. Beijing University of Posts and Telecommunications, China

Silicon photonics (SiPh) are being employed as an advanced platform, enabling low cost and high yield interconnects in AI Infrastructure. Here we report several recent progresses of co-designed photonic circuits (PICs) and electrical chiplets (EICs).

14:30–14:45 · ACP2026–0714–38

Deterministic Switching of Bright Soliton and Dark Pulse Microcombs within a Single-Ring Microresonator

Houling Ji^{1,2}, Yingge Tao^{1,3}, Zhaonian Wang¹, Yanhua Shen^{1,3}, Quanxin Na¹, Qijie Xie¹, Lei Wang¹, Chunyang Ma^{1*}, Perry Ping Shum^{2*}

1. Pengcheng Laboratory, China; 2. Southern University of Science and Technology, China; 3. Harbin Institute of Technology, China

Here, we demonstrate a heater-free, fully passive structurally engineered approach to achieve on-demand switching between bright soliton and dark pulse microcombs within a single-ring microresonator on the complementary metal oxide-semiconductor-compatible, 300-nm-thick silicon nitride platform.

14:45-15:00 · ACP2026-0701-174

Ultralow-threshold near- to mid-infrared supercontinuum generation in nanophotonic suspended aluminum gallium arsenide waveguides**Luyao Fan**¹, Guangzi Feng², Xiyue Zhang², Qiankun Li³, Xueying Sun³, Bing Xiong¹, Zhibiao Hao¹, Jian Wang¹, Lai Wang¹, Yanjun Han¹, Hongtao Li¹, Lin Gan¹, Jiyuan Zheng¹, Yi Luo¹, Long Zhang², Yuchen Wang^{2*}, Hairun Guo^{3*}, Changzheng Sun^{1*}*1.Tsinghua University, China;2.Shanghai Institute of Optics and Fine Mechanics, Chinese Academy of Sciences, China;3.Shanghai University, China*

Suspended aluminum gallium arsenide (AlGaAs) waveguides are tailored for ultralow-threshold near- to mid-infrared supercontinuum generation. An octave-spanning supercontinuum from 1280 to 2620 nm is generated at an on-chip pulse energy of only 20.3 pJ.

15:00-15:15 · ACP2026-0701-209

Experimental Demonstration of Thermo-Optic- and Carrier-Induced Optical Limit Cycles in Silicon Microring Resonators with Lateral Diodes**Menglong He**¹, Weizhong Zhang¹, Abdou Shetewy¹, Kambiz Jamshidi¹*1.TU Dresden, Germany*

Silicon microring resonators with lateral p-i-n junctions are promising integrated photonic devices for nonlinear-optical applications because of their CMOS compatibility and strong optical nonlinearities. The interplay between thermo-optic and free-carrier effects can lead to nonlinear bifurcations and complex dynamical states, including optical limit cycles. Such dynamics are relevant to neuromorphic photonics, including photonic spiking neural networks and reservoir computing. Here, we experimentally demonstrate controllable optical limit cycles in a silicon-on-insulator microring resonator by varying the applied bias voltage and laser detuning, which modifies the intracavity power. At selected biases of 0 V, 1 V, and 5 V, under a fixed continuous-wave input power of approximately 6 dBm, we observe three dynamical regimes: self-pulsation at 24 kHz, self-pulsing oscillation at 80 MHz, and thermo-free-carrier oscillation at 2.4 GHz.

15:15-15:30 · ACP2026-0701-25

Polarization-Insensitive Si/SiN Thermo-Optic Switch with Power Tolerance Exceeding 335 mW**Ningyu Zhang**¹, Tianqi Song¹, Jing Wang^{1*}*1.Southern University of Science and Technology, China*

We demonstrate a polarization-insensitive thermo-optic switch using Si/SiN hybrid phase shifters. The device features a low switching power of 32.7 mW, an extinction ratio over 15 dB, and a high-power tolerance exceeding 335 mW.

15:30-15:45 · ACP2026-0628-11

An Ultra-Low-Loss Dual-Layer (150/800-nm) Silicon Nitride Photonic Platform**Zhonghan Wu**¹, Haiyan Jia¹, Xin Xu¹, Jiarui Zhang¹, Zhangjun Huang¹, Zhichao Ye¹*1.Hangzhou Qoretek Co., Ltd., China*A monolithic dual-layer silicon nitride platform combines a 150-nm layer ($Q \sim 1.15 \times 10^8$, 0.26 dB/m) and an 800-nm layer (2.08 dB/m), linked by a ~12 m-dB interlayer coupler with wafer-scale uniformity.

15:45-16:00 · ACP2026-0701-28

Inverse-Designed Dual-Polarization Silicon Nitride Waveguide Crossing**Yuhang Hu**¹, Ningyu Zhang¹, Tianqi Song¹, Jing Wang^{1*}*1.Southern University of Science and Technology, China*We present an adjoint-optimized dual-polarization silicon nitride waveguide crossing. The $16.15 \times 16.15 \mu\text{m}^2$ device achieves low insertion losses (0.25 dB/0.35 dB) and peak crosstalk suppressions (-55 dB/-46 dB) for TE₀/TM₀ modes, respectively.

D3: Active Optoelectronic Devices

Conference Room 103C, 1F

13:30–15:30 · November 2, 2026 · Monday

Heterogeneous Integration and Integrated Photonics

Presider: Yu Han, Sun Yat-sen University, China

13:30–14:30 · ACP2026-0901-2 **Tutorial**

Heterogeneous integration of active optoelectronic components on photonic integration platforms

Siyuan Yu¹

1. Sun Yat-sen University, China

This tutorial will discuss the technological approaches and commercial perspectives of heterogeneous integration of active optoelectronic components such as modulators, detectors and lasers on photonic integration platforms including silicon and thin-film lithium niobate (TFLN) PICs.

14:30–15:00 · ACP2026-0622-2 **Invited**

Heterogeneously Integrated Thin-Film Lithium Niobate Modulators on Silicon Photonics platform

Yan Cai^{1*}

1. SIMT, China

Thin-film lithium niobate (TFLN) photonic integrated circuits (PICs) have demonstrated excellent electro-optic (EO) performance for high-speed optical communications. However, monolithic TFLN PICs still face challenges in passive components compactness, photodetection, and large-scale photonic integration. In this talk, we will present our recent progress on heterogeneously integrated TFLN EO modulators on the Silicon Photonics Platform and their applications for optical interconnect, coherent communication and optic gyroscope.

15:00–15:15 · ACP2026-0627-3

High-dimensional Mid-Infrared Computational Nanocrystal Photodetector

Yifan Chen¹, Tianhua Feng², Zhengyong Liu¹, Jingshun Pan³, Mingjie Li⁴, Zhaohui Li^{1*}

1. Sun Yat-sen University, China; 2. Jinan University, China; 3. South China Normal University, China; 4. The Hong Kong Polytechnic University, Hong Kong, China

We report a high-dimensional uncooled midinfrared photodetector based on ZnO/Sn-PbSe/PbS nanocrystal PIN heterojunctions. The device enables spectral and polarization reconstruction, achieving a superior spectral resolution of 3.24 nm and a polarization angular resolution of 2°.

15:15–15:30 · ACP2026-0629-30

High-Speed 1310-nm Modified Uni-Traveling-Carrier Photodetector with Diluted Waveguide Spot-Size Converter

Qifan Wang¹, Linze Li¹, Dingran Gu¹, Baile Chen^{1*}

1. ShanghaiTech University, China

We demonstrate a 1310-nm MUTC-PD with a diluted waveguide spot-size converter, achieving 157-GHz bandwidth, 0.46-A/W responsivity, and 0.15-dB PDL.

15:30–16:00 Coffee Break

16:00–17:15 · November 2, 2026 · Monday

Integrated Lasers and Photonic Devices

Presider: Siyuan Yu, Sun Yat-sen University, China

16:00–16:30 · ACP2026-0629-15 **Invited**

Monolithic integration of III-V lasers on SOI using selective lateral heteroepitaxy

Yu Han^{1*}

1. Sun Yat-sen University, China

We demonstrate the selective lateral heteroepitaxy of InP membranes and buried QWs on (001) SOI wafers as well as the monolithic integration of III-V micro-cavity lasers and photodetectors on SOI.

16:30–16:45 · ACP2026-0701-38

Ge–Si Photodetector with Large Bandwidth and High Saturation Based on Hyperparameter OptimizationJian Wang¹, Zijie Wang¹, Siyu Chen¹, Guanyu Chen^{1*}*1. Chongqing University, China*

Hyperparameter-optimized Ge–Si photodetectors are demonstrated for high-speed, high-power optical links. Joint optimization of dual Ge absorption, extended doping, and inductive peaking enables 0.94 A/W responsivity, 33.9 mA saturation current, and 44.3 GHz bandwidth under –3V.

16:45–17:00 · ACP2026-0701-151

A Room–Temperature Waveguide–Integrated Germanium–on–SOI Defect–mediated Photodetector for Mid–Infrared SensingTianhui Hu^{1*}, Lauren Reid¹, Milos Nedeljkovic¹, Goran Mashanovich¹*1. University of Southampton, United Kingdom*

A waveguide–integrated defect–mediated photodetector based on Germanium–on–SOI is demonstrated at the methane absorption wavelength $\lambda = 3.3 \mu\text{m}$, with 0.34 mA/W responsivity with no bias voltage. The photodetectors are monolithically fabricated and operate at room temperature.

17:00–17:15 · ACP2026-0701-163

A Waveguide–Integrated Graphene–Colloidal–Quantum–Dots–Graphene Heterostructure Photodetector operating at 2 μm Leyi Hu^{1,2}, Hengtai Xiang^{1,2}, Jing Liu^{3,4}, Yujie Liu^{3,4}, Yiding Zheng^{1,2}, Junhuan Li^{1,2}, Liang Gao^{3,4}, Jingshu Guo^{1,2*}, Jiang Tang^{3,4}, Daoxin Dai^{1,2}

1. State Key Laboratory of Extreme Photonics and Instrumentation, China; 2. College of optical Science and Engineering, Zhejiang University, China; 3. Wuhan National Laboratory for Optoelectronics and School of Optical and Electronic Information, China; 4. Huazhong University of Science and Technology, China

We report a waveguide–integrated graphene–colloidal quantum dot–graphene (Gr–CQD–Gr) heterostructure photodetector designed for 2 μm short–wave–infrared detection. The device achieves a responsivity of 33 A/W, a dark current of 14 nA, and a noise–equivalent power of 0.4 pW/Hz^{1/2}.

08:30–10:00 · November 3, 2026 · Tuesday

Photodetectors and Infrared Optoelectronics

Presider: Lianping Hou, University of Glasgow, United Kingdom

08:30–09:00 · ACP2026-0626-21 **Invited****Continuous Free Spectral Range Tuning in Optical Microresonators**Michael Sumetsky¹*1. Aston University, United Kingdom*

High–Q SNAP (Surface Nanoscale Axial Photonics) microresonators enable continuous free spectral range tuning via bending, translation, and rotation of intersecting and side–coupling optical fibers. Experimental results show excellent agreement with theoretical predictions.

09:00–09:30 · ACP2026-0831-5 **Invited****Developments of Si–photonics based on group IV materials: from epitaxy to infrared optoelectronic devices**Chi Xu^{1,2}, Hui Cong^{1,2}, Chao Zhao^{1,2}, Chunlai Xue^{1,2}

1. Institute of Semiconductors, Chinese Academy of Sciences, China; 2. College of Material Science and Optoelectronic Technology, University of Chinese Academy of Sciences, China

In this talk, we report our recent progress in CVD–based epitaxy of group–IV materials, including intrinsic/doped Ge and GeSn, as well as group–IV optoelectronic devices such as high–speed IR photodetectors and focal plane arrays.

09:30–09:45 · ACP2026-0715-149

PIN Diode–Integrated Silicon Microring Resonators for Reconstructive Optical Spectrum AnalyzersHo Ming Ku¹, Ching Chi Kwan¹, Jiantao Wang¹, Chengyi Fan¹, Chin Cheung Kam¹, Hong Yuen Wong¹, Andrew W. Poon^{1*}*1. HKUST, China*

Datacenters and artificial–intelligence infrastructures rely on wavelength–division–multiplexed optical interconnects in the O–band near 1310 nm. There is a need for compact, distributed optical spectrum monitoring. We are in the progress of developing a reconstructive optical spectrum analyzer based on thermally tunable silicon microring resonator arrays integrated with an on–ring PIN junction. The micro–ring provides wavelength–selective resonant enhancement, while the PIN diode directly reads out the spectrally filtered optical signal as photocurrent. The wavelength–dependent photocurrent measured at multiple tuning states is used to construct a calibration matrix, from which an unknown input spectrum is recovered through non–negative least–squares reconstruction. In a preliminary measurement, the device produced an on–resonance current of approximately 0.1 μA at an optical input power of 7 dBm measured at 1295 nm under a PIN reversed bias of 5V. The completed experiments will quantify a reconstruction bandwidth of 2.5 nm, a spectral resolution of 0.3 nm, and a wavelength error of 0.2 nm of a single peak near 1295 nm.

09:45–10:00 · ACP2026–0715–25

High-Saturation Ge–Si Traveling-Wave Photodetector with Inductive-LoadJian Wang¹, Zijie Wang¹, **Guanyu Chen^{1*}***1. Chongqing University, China*

We demonstrate an eight-cell germanium–silicon traveling-wave photodetector with and without an on-chip inductor. At –5 V, it achieves 0.96 A/W responsivity, 180.66 mA 1-dB compression photocurrent, and 11–12 GHz 3-dB bandwidth for compact micro-wave–photonic applications.

10:00–10:30 Coffee Break

10:30–12:00 · November 3, 2026 · Tuesday

Photodetectors and Novel Materials

Presider: Michael Sumetsky, Aston University, United Kingdom

10:30–11:00 · ACP2026–0615–1 **Invited****Monolithic Dual-Wavelength DFB Lasers for THz/MMW Signal Generation****Lianping Hou^{1*}***1. University of Glasgow, United Kingdom*

This talk reviews monolithic dual-wavelength DFB lasers for THz/MMW generation, highlighting advanced grating technologies, self-detected THz generation, and optical injection locking achieving ~1 Hz RF linewidth, enabling compact, low-cost, and highly coherent photonic sources.

11:00–11:15 · ACP2026–0701–2

Continuous Spatial Harmonic Engineering of Slow-Light TFLN Waveguides for Fabrication-Tolerant Velocity Matching**Yingfei Wan¹**, Jifang Qiu¹, Yaqi Feng¹, Meican He¹, Jian Wu¹*1. Beijing University of Posts and Telecommunications, China*

Continuous spatial harmonic engineering is proposed for slow-light thin-film lithium niobate waveguides. A band-limited second-harmonic boundary suppresses lithography-induced distortion, reduces group-index drift, and maintains an estimated velocity-mismatch-limited 3-dB bandwidth above 100 GHz under 15-nm blur.

11:15–11:30 · ACP2026–0701–133

Ultra-Compact High-Power 60-μm-Pitch SOA Arrays with Shared Electrodes for Simultaneous Current Injection**Ying Liu¹**, Jianxin Wu¹, Ruijun Wang^{1*}, Siyuan Yu¹, Yang Ke²*1. Sun Yat-sen University, China*

We demonstrate 4- and 8-channel C-band SOA arrays with 60-μm pitch and shared electrodes for simultaneous injection. Peak per-channel output exceeds 18 and 16 dBm, with 0.5-dB variation. Total output exceeds 24, 25 dBm.

11:30–11:45 · ACP2026–0701–43

4 Channel Directly Modulated DFB Laser Array for 400Gb/s DR4 optical communications**Kai Kang^{1,2}**, Longfei Zhang^{1,2}, Daibing Zhou^{1,2}, Song Liang^{1,2*}

1. State Key Laboratory of Optoelectronic Materials and Devices, Institute of Semiconductors, Chinese Academy of Sciences, China; 2. Center of Materials Science and Optoelectronics Engineering, University of Chinese Academy of Sciences, China

A 4-channel directly modulated InGaAlAs/InP MQW DFB laser array has been fabricated. The lasers of the array have larger than 27 GHz modulation bandwidths. Clearly opened 100 Gb/s PAM4 eye diagrams can be obtained for both back-to-back and after 5 km of fiber transmission.

11:45–12:00 · ACP2026–0713–9

Performance Uniformity Enhancement of III–V/Si₃N₄ Hybrid Laser Based on Broadband Bent Directional Couplers**Xinrong Jiang¹**, Yihao Fan¹, Yifan Xia¹, Bohan Chu¹, Yuyao Guo^{1,2*}, Yu Li^{1,2}, Liangjun Lu^{1,2}, Jianping Chen^{1,2}, Linjie Zhou^{1,2}

1. State Key Laboratory of Photonics and Communications, Department of Electronic Engineering, Shanghai Jiao Tong University, China; 2. SJTU-Pinghu Institute of Intelligent Optoelectronics, China

We present a III–V/Si₃N₄ external-cavity laser employing broadband bent directional couplers to enhance performance consistency. The laser exhibits a uniform ~3-GHz FMCW bandwidth over a wide tuning range of 1470–1590 nm.

08:30–09:45 · November 4, 2026 · Wednesday

Lasers and Nonlinear Photonics

Presider: Ting Wang, Shanghai Jiao Tong University, China

08:30–09:00 · ACP2026-0823-1 **Invited****Machine Learning-Assisted Smart Epitaxy of III–V Quantum Dots and Devices****Chao Zhao**^{*}*1. Institute of Semiconductors, CAS, China*

In this study, we propose a machine learning-assisted smart epitaxy method for III–V quantum dots that enables precise, dynamic adjustment of growth conditions, improving the optical and electrical characteristics of the devices.

09:00–09:15 · ACP2026-0701-26

L-band composite soliton rains in an NPR mode-locked erbium-doped fiber laser**Danyang Wang**¹, Dongfang Jia^{*}, Enfan Zhou¹, Yi Liu¹, Chunfeng Ge¹, Zhaoying Wang¹, Tianxin Yang¹*1. College of Precision Instrument and Optoelectronics Engineering, Tianjin University, China*

We report on an L-band composite soliton rain. Spectral slicing reveals its condensed state forms square-wave pulses, drifting state arises from conventional solitons and enhanced Kelly sidebands. And 2nd–4th harmonic soliton rains are also achieved.

09:15–09:30 · ACP2026-0701-169

Tunable electro-opto-mechanical oscillator based on Brillouin scattering in optical fibers**Haoran Xie**¹, Yichun Li¹, Fufei Pang¹, Liang Zhang^{1*}, Soto Marcelo A.²*1. Shanghai University, China; 2. Universidad Técnica Federico Santa María, Chile*

A tunable electro-opto-mechanical oscillator based on Brillouin scattering is proposed and demonstrated. With help of tunability of backward stimulated Brillouin scattering, $R_{0,2}$ to $R_{0,19}$ ratio frequency signals can be selectively excited.

09:30–09:45 · ACP2026-0629-31

Back-illuminated MUTC-PD with 0.9 A/W Responsivity and 67 GHz Bandwidth**Xiaosong Ma**¹, **Dingran Gu**¹, Linze Li¹, Baile Chen¹*1. ShanghaiTech University, China;*

This work, we demonstrate a back-illuminated InGaAs/InP MUTC-PD optimized for 1310-nm operation. Benefiting from a scaled device diameter and a SiO₂-spacer-assisted interference-enhanced absorption structure [4], the device achieves 0.91 A/W responsivity at 1310 nm, 0.85 A/W at 1550 nm, and measurement-limited 3-dB bandwidth exceeding 67 GHz for 12-μm.

10:00–10:30 Coffee Break

10:30–12:00 · November 4, 2026 · Wednesday

Optical Communications and Modulation

Presider: Presider: Chao Zhao, Institute of Semiconductors, CAS, China

10:30–11:00 · ACP2026-0818-4 **Invited****Femtojoule Optical Kerr Switching with Milliwatt–Peak–Power in Silicon–Organic Hybrid Nanocavity****Jing Xu**^{*}, Yizheng Chen¹*1. Huazhong University of Science and Technology, China*

We experimentally demonstrate a silicon-organic hybrid Kerr switch compatible with high-duty-cycle 40-Gbit/s signals, achieving error-free switching with 7.5-mW peak power and 63-fJ/bit energy through tight field confinement and high-nonlinearity polymer integration for ultrafast photonic processing.

11:00–11:30 · ACP2026-0818-7 **Invited****QD Comb Laser Driven Optical Interconnects****Ting Wang**^{*}*1. Shanghai Jiao Tong University, China*

AI has boosted significant demand of high-performance computing (HPC). Existing electrical I/O is limiting the overall transmission bandwidth and latency of HPC, optical I/O appears to be excellent candidate of data links for next generation HPC. Here, we demonstrated optical interconnections with ultra-low power consumption via quantum dot comb laser integrated silicon photonic chip.

11:30–11:45 · ACP2026–0623–10

Integrated Optical Receiver for Terahertz Wireless Communication Over 100 GBaudYunhao Zhang¹, **Linshan Yang¹**, Yijun Guo¹, Yu Sun², Luyu Wang³, Tianyu Long³, Peng Yan¹, Jun Qin², Baile Chen³, Lei Wang^{4*}, Haowen Shu^{1*}, Xingjun Wang^{1*}*1.Peking University, China;2.Beijing Information Science and Technology University, China;3.ShanghaiTech University, China;4.Peng Cheng Laboratory, China*

We demonstrate full-link-bandwidth all-optical receiving for terahertz wireless communication. Leveraging an ultrabroadband (S21200 GHz) receiver, we achieve a record-high single-channel wireless transmission of 120 Gbaud QPSK over a 4 m distance at 180 GHz carrier frequency.

11:45–12:00 · ACP2026–0701–45

A Silicon Mach-Zehnder Modulator with Time-Frequency Equalization Achieving a Bandwidth Exceeding 67 GHz**Yanxiang Lu¹**, Erse Jia^{2*}, Weixiang Hu², Haibin Zhao¹, Haiwen Cai², Fenghe Yang^{2*}, Chu Wei^{2*}*1.Fudan University, China;2.Zhangjiang Laboratory, China*

An O-band silicon MZM with integrated on-chip time-frequency equalization and a differential-drive SS electrode achieves a bandwidth exceeding 67 GHz and supports 300 Gb/s PAM-8 transmission.

12:00–13:30 Lunch

13:30–15:15 · November 4, 2026 · Wednesday

High-Speed Optical Interconnects

Presider: Yunhong Ding, Technical University of Denmark, Denmark

13:30–14:00 · ACP2026–0825–1 **Invited****Optical Multilevel Eigenvalue Modulation for Nonlinear Fiber-Optic Transmission****Ken Mishina^{1*}***1.The University of Osaka, Japan*

This talk reviews advances in optical multilevel eigenvalue modulation based on the nonlinear Fourier transform, and presents our recent work on constellation design, neural-network demodulation, and long-haul transmission toward practical nonlinear-spectrum-based optical communication systems.

14:00–14:15 · ACP2026–0701–47

Impedance-Equalized Silicon MZM with 78 GHz Extrapolated Bandwidth for DSP-Free 224 Gb/s Transmission**Yanxiang Lu¹**, Erse Jia^{2*}, Haiwen Cai², Haibin Zhao¹, Fenghe Yang^{2*}, Wei Chu^{2*}*1.Fudan University, China;2.Zhangjiang Laboratory, China*

An impedance-equalized MZM is designed and fabricated in a 200-mm silicon photonic platform, achieving a high efficiency of 1.3 V-cm, an extrapolated bandwidth of 78 GHz, and a transmission rate of 224 Gb/s without DSP.

14:15–14:30 · ACP2026–0712–3

144 Gbps Traveling-Wave-Electrode EML Based on Identical Epitaxial Layer Scheme for Data Center Interconnects**Zhaozhuo Wang¹**, Changzheng Sun^{1*}, Bing Xiong¹, Jian Wang¹, Zhibiao Hao¹, Lai Wang¹, Yanjun Han¹, Hongtao Li¹, Lin Gan¹, Yi Luo¹*1.Tsinghua University, China*

A traveling-wave electrode electroabsorption modulated laser (TWE-EML) based on an identical-epitaxial-layer (IEL) structure is proposed for data center interconnects. Clear eye-opening at 72 GBaud PAM4 is demonstrated after 10 km SSMF transmission.

14:30–14:45 · ACP2026–0715–26

A Gain-Controllable Broadband Transimpedance Amplifier for over 100-GBaud PAM4 Receivers**Yuming Zhao¹**, Xin Zhang¹, Linsheng Zhong^{2,3}, Sunningchang Zhang¹, Chengxuan Ye¹, Shenmao Zhang¹, Xiaoxiao Dai^{1*}, Qi Yang¹, Deming Liu¹*1.Huazhong University of Science and Technology, China;2.Research Institution of Generic Technology for Integrated Circuit, China;3.Trustservice Technology Co.,LTD, China*

We present a gain-controllable broadband TIA for over 100-GBaud PAM4 optical receivers. It achieves 24.75-dB gain, 33.87 GHz 3-dB and 53.96 GHz 10-dB bandwidths, 2.02 mV output noise, and 19.15-dB tuning range, enabling robust high-dynamic-range optical interconnects.

14:45–15:00 · ACP2026–0714–41

A CSV-to-BGA Vertical Transition Design on an LTCC Substrate for High-Speed 2.5D CPO Interconnects**Chi Zhang¹**, Jiabin Zheng¹, Jianyu Shi¹, Jie Shi¹, Shuo Jiang¹, Jun Qin^{1*}*1.Key Laboratory of Information and Communication Systems, Ministry of Information Industry, Beijing Information Science and Technology University, China*

We propose a differential CSV-to-BGA vertical transition on an LTCC substrate for 2.5D CPO. The design achieves 70 GHz bandwidth, Sdd11 below -15 dB, and a 173.0 mV eye height at 224 Gbps PAM4.

15:00-15:15 · ACP2026-0715-103

High-Gain Mid Wavelength Infrared UTC-HPT with Gradient Doped InGaAsGaAsSb T2SLMing Liu^{1,2}, **Mingxin Yao**¹, Ya Su¹, Zichong Ma¹, Yaqi Zhao¹, Hongyue Hao^{3*}, Xiaoning Guan^{1*}, Pengfei Lu¹*1.School of Integrated Circuits, Beijing University of Posts and Telecommunications, China; 2.China Electronics Technology Group Co., Ltd., China; 3.Institute of Semiconductors, Chinese Academy of Sciences, China*

This paper proposes an n-p-n uni-traveling-carrier heterojunction phototransistor (UTC-HPT) for mid-wavelength infrared detection based on a type-II superlattice composed of InGaAs and GaAsSb. The device consists of a gradient-doped InAlAs emitter, a gradient-doped InGaAs/GaAsSb type-II superlattice base, step-graded InGaAlAs transition layers, an InAlAs collector, and an InAlAs subcollector. At 150 K, the spectral responsivity, dark and illuminated collector current-voltage characteristics, responsivity, and small-signal current-gain cutoff frequency are analyzed and compared across four structures with different emitter and base doping profiles. In the two-terminal mode at an incident wavelength of 3.752 micrometers and a collector voltage of 2 volts, the proposed device achieves a responsivity of 233.80 amperes per watt and a dark-current density of approximately 0.0132 ampere per square centimeter. Assuming unity photoelectric conversion efficiency, the lower-bound optical gain estimated from the responsivity is 77.3. In the three-terminal mode at a collector voltage of 2 volts and a base voltage of 0.35 volts, the small-signal current-gain cutoff frequency reaches 67.65 gigahertz. These results indicate that the dual-gradient doping scheme for the emitter and base provides the best overall performance, enhancing photocurrent amplification while maintaining a high three-terminal small-signal current-gain cutoff frequency.

15:30-16:00 Coffee Break

16:00-17:15 · November 4, 2026 · Wednesday

Integrated Photonics Applications and Devices

Presider: Ken Mishina, The University of Osaka, Japan

16:00-16:30 · ACP2026-0708-2 **Invited****Reconfigurable integrated photonic circuit for quantum entanglement generation, manipulation and purification**Yonghe Yu¹, Leif K. Oxenløwe¹, **Yunhong Ding**^{1,2*}*1.Department of Electrical and Photonics Engineering (DTU Electro), Technical University of Denmark, Denmark; 2.SiPhotonIC ApS, Denmark*

Quantum entanglement is one of the key resources for future quantum computing and communication technologies. Here, we present our latest results on quantum entanglement generation, manipulation and purification based on integrated photonic circuits.

16:30-16:45 · ACP2026-0701-203

Coated near 8.5 μm quantum cascade laser frequency combs for mid-infrared free-space heterodyne links**Xinkai Liu**^{1,2}, Yuzhe Lin¹, Feng Xu^{1,2}, Haohang Cheng^{1,2}, Mingshuo Ren^{1,3}, Wanhua Zheng^{1,2,4*}*1.Laboratory of Solid-State Optoelectronics Information Technology, Institute of Semiconductors, Chinese Academy of Sciences, China; 2.College of Materials Science and Opto-Electronic Technology, University of Chinese Academy of Sciences, China; 3.School of Electronic, Electrical and Communication Engineering, University of Chinese Academy of Sciences, China; 4.College of Future Technology, University of Chinese Academy of Sciences, China*

We demonstrate coated near-8.5 μm quantum cascade laser frequency combs with low dispersion, broad multimode emission, sub-kHz RF beatnotes, and matched repetition-frequency offsets, establishing device-level readiness for future mid-infrared free-space dual-comb heterodyne links.

16:45-17:00 · ACP2026-0630-74

Integrated Lithium Niobate Acousto-optic Frequency Comb**Xinyan Fu**¹, Daoxin Dai¹, Zejie Yu^{1*}*1.State Key Laboratory of Extreme Photonics and Instrumentation, Zhejiang Key Laboratory of Optoelectronic Information Technology, College of Optical Science and Engineering Zhejiang University, China*

We demonstrate an acousto-optic frequency comb on a non-suspended TFLN platform, generating high-order sidebands up to the 25th order and realizing an 11-line flat-top comb via a cascaded electro-optic modulator.

17:00-17:15 · ACP2026-0630-80

A high-speed on-chip graphene bolometer with the folded waveguide structure**Junhuan Li**¹, Tiannan Han², Yiding Zheng¹, Zhekai Zhu¹, Leyi Hu¹, Laipeng Ma², Jingshu Guo^{1*}, Wencai Ren², Daoxin Dai¹*1.State Key Laboratory of Extreme Photonics and Instrumentation, College of Optical Science and Engineering, Zhejiang University, China; 2.Shenyang National Laboratory for Material Science, Institute of Metal Research, Chinese Academy of Sciences, China*

A waveguide-integrated graphene bolometer with folded waveguide is demonstrated, with responsivity of 0.29 A/W and noise-equivalent power of 75.1 pW/Hz^{0.5}. It achieved a cutoff bandwidth exceeding 67 GHz and reception of 80 Gbps NRZ signals.

D4: Passive Photonic Components Across Domains

Conference Room 102A, 1F

13:30–15:30 · November 2, 2026 · Monday

Passive Photonic Components Across Domains (1)

Presider: Victor Torres Company, Chalmers University of Technology, Sweden

13:30–14:30 · ACP2026-0911-5 **Tutorial**

TBD

Daoxin Dai¹

1. Zhejiang University, China

TBD

14:30–15:00 · ACP2026-0701-91 **Invited**

Integrated Optical Phased Arrays for Next-Generation Solid-State Beam Steering

Yong Liu^{1*}, Zhenli Dong¹, Hao Hu¹

1. Technical University of Denmark, Denmark

Integrated optical phased arrays enable solid-state beam steering for LiDAR, free-space optical communications. This talk reviews major architectures, compares performance tradeoffs, and discusses future directions toward practical, wide-field-of-view, low-loss, high-efficiency, scalable, manufacturable optical phased array.

15:00–15:15 · ACP2026-0630-15

Dispersion-Enhanced Metalens via Synergistic Modulation of Broadband Phase and Group Delay

Ruixin Lu^{1*}

1. Xi'an University of Posts and Telecommunications, China

To boost semiconductor inspection speed, we propose a metalens as the core dispersive element in a miniaturized spectral confocal system. Simulations show it achieves 38.3- μm axial dispersion over 480–650 nm while maintaining focus quality.

15:15–15:30 · ACP2026-0714-34

Dispersion-Compensating Metasurface for Optical Communication

Feng Liu¹, Lei Liu¹, Zhicheng Jin¹, Puzhen Yuan¹, Weiqi Lu¹, Mingke Jin¹, Heming Wang¹, Jingyi Tian¹, William Shieh^{1*}

1. Westlake University, China

We propose and fabricate the first dispersion-compensating metasurface (DCMS) for optical fiber communication. With the DCMS, we successfully demonstrate 50-Gbaud PAM-4 IMDD transmission over 2-km SSMF, recovering near-B2B transmission performance and improving the receiver sensitivity by 1.3 dB.

15:30–16:00 Coffee Break

16:00–17:45 · November 2, 2026 · Monday

Passive Photonic Components Across Domains (2)

Presider: Yong Liu, Technical University of Denmark, Denmark

16:00–16:30 · ACP2026-0911-10 **Invited**

Heterogeneous/Hybrid Silicon Photonics for Next-Generation Information Technologies

Lin Chang¹

1. Peking University, China

Silicon photonics technology, owing to its tremendous advantages in large-scale integration, is widely regarded as a key technology for future data communications, precision measurement, quantum information, and other fields. However, current mainstream silicon photonic platforms, limited by the properties of silicon materials, suffer from significant limitations in device performance and diversity, greatly restricting their applications. This presentation will introduce our team's work on heterogeneous integration in silicon photonics, in which multiple material systems have been integrated on a silicon photonic platform through various integration approaches. The presentation will showcase the integration of ultra-narrow-linewidth lasers and optical frequency combs, as well as applications of heterogeneous integration in microwave photonics.

16:30-16:45 · ACP2026-0701-22

Ultra-Compact Silicon Reflective Arrayed Waveguide Gratings Enabled by Inverse Design**Mengxi Cui¹**, Tianqi Song¹, Jing Wang^{1*}*1.Southern University of Science and Technology, China*

This work demonstrates the first silicon reflective arrayed waveguide gratings (AWGs) using inverse-designed reflectors. The 1.6-nm and 3.2-nm devices exhibit around -15 dB crosstalk, while the 0.8 nm AWG achieves -8.4 dB, validating WDM functionality.

16:45-17:00 · ACP2026-0630-25

Compact, Low-Loss Grabowski Hybrid Bend in Silicon Nitride Photonic Waveguides for O-Band**Changxing Yang¹**, Jinglei Qin², Qian Wang², Lei Zhang^{1*}*1.Beijing University of Posts and Telecommunications, China; 2.Beijing Yandong Microelectronics Co., Ltd., China*

We demonstrate a compact and low-loss Grabowski hybrid waveguide bend operating in the O-band on a 300 nm thick silicon nitride (Si₃N₄) photonic platform. For an effective bend radius of 30 μm at a wavelength of 1310 nm, wafer-level measurements yield an ultra-low bending loss of 3.06 ± 0.50 mdB per 90° bend.

17:00-17:15 · ACP2026-0629-10

Multidimensional Topological Control of Vortex Beams Enabled by Rotationally Stacked Triple-Fork Gratings**Duanduan Wu^{1*}**, Lu Liu¹, Jiayang Yuan¹*1.Ningbo University, China*

A femtosecond-written chalcogenide-glass rotationally stacked triple-fork grating exploits structural symmetry for 5D vortex control (three charges, two angles). C3/C6-breaking converts scanning into classification, programming petal patterns and networks for mid-infrared structured light.

17:15-17:30 · ACP2026-0715-8

Reflection-Matrix-Guided Hybrid Inverse Design of Low-Index-Contrast Multimode Reflectors**Yuxin Hao¹**, Yicheng Wang¹, Wensheng Huang¹, Tianqi Song¹, Ningyu Zhang¹, Jing Wang^{1*}*1.Southern University of Science and Technology, China*

We propose a hybrid inverse design framework guided by a reflection matrix for compact multimode reflectors. Validated on silicon nitride and lithium niobate platforms, the approach enhances reflection, suppresses crosstalk, and mitigates fabrication spectral shifts.

17:30-17:45 · ACP2026-0715-88

High Extinction Ratio 2 × 2 Silicon MZI Switch Using a Chamfered MMI Coupler**Ting Liu¹**, Tongxin Yang¹, Xinkuo Yu¹, Conghao Zhuang¹, Haotian Zhu¹, Yayun Xu¹, Lei Zhang², Hengying Xu^{1*}, Chenglin Bai^{1*}*1.Liaocheng University, China; 2.Beijing University of Posts and Telecommunications, China*

We propose straight-cut chamfered 2×2 MMI splitter to suppress scattering & phase errors. It achieves <0.2 dB excess loss/splitting imbalance over C-band, enabling MZI switch with 45 dB ER at 1550 nm.

13:30-15:45 · November 3, 2026 · Tuesday

Passive Photonic Components Across Domains (3)

Presider: TBD

13:30-14:30 · ACP2026-0911-6 **Tutorial****Ultralow-loss silicon nitride integrated photonics: advances and applications****Victor Torres Company¹***1.Chalmers University of Technology, Sweden*

I will give an overview of recent advances in silicon nitride waveguides with losses below the decibel per meter, and enabling applications in efficient microcombs, parametric oscillators and lasers.

14:30-15:00 · ACP2026-0911-8 **Invited****TBD****Junqiu Liu¹***1.Shenzhen International Quantum Research Institute, China*

TBD

15:00-15:30 · ACP2026-0908-9 **Invited****Meter-Scale Chirped Bragg Gratings Based on Ultra-Low-Loss Silicon Nitride****Chao Xiang^{1*}***1.The University of Hong Kong, Hong Kong, China*

We demonstrate meter-long chirped spiral Bragg gratings on an ultra-low-loss silicon nitride platform. The device provides a 10-nanosecond group delay and high-fidelity on-chip electro-optic comb pulse compression.

15:30–15:45 · ACP2026–0630–57

Symmetric Passive Silicon Nitride Photonic Integrated Circuit with High Polarization Extinction Ratio Optimized for Interferometric Fiber Optic Gyroscope**Quang Huy Phan**¹, The Khai Chu¹, Thi Vien Tran¹, Nguyen Hung Tran¹, Huu Vinh Nguyen^{1*}*1. Viettel Semiconductor Center, Vietnam*

This work presents a compact, fully symmetric SiN PIC core for high-performance IFOGs, integrating two TE-pass polarizers and MMI couplers, achieving 8.52 dB maximum IL, PER 38.2 dB at 1550 nm, and broadband signal purity.

15:45–17:30 Coffee Break & Poster Session

08:30–09:30 · November 4, 2026 · Wednesday

Passive Photonic Components Across Domains (4)

Presider: Qiancheng Zhao, Southern University of Science and Technology, China

08:30–09:00 · ACP2026–0908–2 **Invited****Recent advances in programmable photonics****Jose Capmany**^{1*}*1. Valencia Polytechnic University, Spain*

This talk will review the recent advances in programmable photonics including non-uniform and low power consumption waveguide meshes, parallel WDM architectures and novel applications in physics and computing.

09:00–09:15 · ACP2026–0715–179

Broadband and Compact Silicon Mode Exchanger Enabling Simultaneous Even- and Odd-Mode-Pair Swapping**Jiacheng Li**¹, Ming Zhang^{1*}, Daoxin Dai¹*1. Zhejiang University, China*

We propose a compact silicon metasurface-assisted mode exchanger swapping TE₀TE₂, TE₁TE₃. Optimized via PSO and 3D-FDTD, it achieves low loss and crosstalk, verified by simulations and experiments for multimode circuits.

09:15–09:30 · ACP2026–0630–108

Compact Mode Multiplexer/Demultiplexer Based on Folded Multi-Plane Light Conversion**Zhanhong Wen**¹, Zhibing Liu^{2*}, Yan Li^{1*}, Zhaohui Li^{1*}*1. Sun Yat-sen University, China; 2. Hefei University of Technology, China*

We propose a compact folded MPLC mode MUX/DEMUX. A mirror doubles effective modulation stages; dual-pass adjoint optimization achieves 1.26 dB loss and -22 dB crosstalk with halved physical planes.

10:00–10:30 Coffee Break

10:30–12:00 · November 4, 2026 · Wednesday

Passive Photonic Components Across Domains (5)

Presider: Hao Hu, Technical University of Denmark, Denmark

10:30–11:00 · ACP2026–0625–8 **Invited****Tantalum Pentoxide Third-order Nonlinear Integrated Photonics****Qiancheng Zhao**^{1*}*1. Southern University of Science and Technology, China*

Tantalum pentoxide has strong mode confinement, large Kerr nonlinearity and Brillouin gain, and excellent robustness against temperature or power fluctuations, which renders it well-suited for third-order nonlinear integrated photonic circuits and applications.

11:00–11:30 · ACP2026–0911–9 **Invited****Integrated Cavity Optomechanical Ultrasonic Sensors****Beibei Li**¹*1. Institute of Physics, Chinese Academy of Sciences, China*

We demonstrate wafer-scale fabrication of integrated cavity optomechanical ultrasonic sensors with optical Q factors reaching 10⁷ and nanopascal-level sensitivity (nPa/√Hz), alongside a compact FPGA-based measurement system enabling both underwater ultrasonic imaging and photoacoustic gas sensing.

11:30–11:45 · ACP2026–0715–51

Wavelength-Insensitive Microrings with Artificial Gauge Field Couplers in the O-Band**Zhaonian Wang¹**, Houling Ji¹, Yingge Tao¹, Yanhua Shen¹, Quanxin Na¹, Qijie Xie¹, Chunyang Ma^{1*}, Lei Wang^{1*}¹.Pengcheng Laboratory, China

Wavelength-insensitive microrings enabled by artificial gauge field are achieved on a 300-nm thick SiN platform. The AGF coupler and microring realize a stable 10% coupling coefficient and maintain extinction ratios above 5.6 dB across the O-band.

11:45–12:00 · ACP2026–0629–11

Polymer-Loaded LNOI Long-Period Waveguide Grating with Tunable Wavelength and Contrast for Reconfigurable Optical Filtering**Jiayao Deng¹**¹.University of Electronic Science and Technology of China, China

We propose and experimentally demonstrate a tunable polymer-loaded long-period waveguide grating on lithium niobate on insulator platform, which requires no etching of the lithium niobate layer. The fabricated device achieves a high rejection contrast of 26.2 dB and a narrow 3-dB bandwidth of 26.46 nm at 1566.8 nm. Through electro-optic (EO) and thermo-optic (TO) control, it offers efficient EO wavelength tuning of 0.38 nm/V, contrast modulation of 0.74 dB/V, and TO tuning of 0.6 nm/°C. The combination of straightforward fabrication and robust reconfigurability makes this grating a promising building block for integrated photonic signal processing.

13:30–15:30 · November 4, 2026 · Wednesday

Passive Photonic Components Across Domains (6)

Presider: TBD

13:30–14:00 · ACP2026–0701–83 **Invited****Physics-informed data-driven modeling of thermal crosstalk in interferometer meshes****Isidora Teofilovic¹**, Darko Zibar¹, Francesco Da Ros¹¹.Technical University of Denmark, Denmark

Interferometer meshes enable optical matrix-vector multiplication, but thermal crosstalk limits scalability. Purely data-driven models achieve good accuracy yet generalize poorly across devices. By embedding thermal-diffusion physics, physics-informed data-driven models enhance generalizability while ensuring physical plausibility.

14:00–14:15 · ACP2026–0701–55

3D-Printing-Assisted Fiber Arrangement Optimization for Low-Loss Six-Mode-Group Selective Photonic Lanterns**Xiaokang Zhong¹**, Cong Zhang^{1*}, Yuwen Qin¹, Songnian Fu¹¹.Guangdong University of Technology, China

To overcome structural randomness in photonic lantern (PL) fabrication, we demonstrate a 3D-printing-assisted fiber arrangement method for six mode PL fabrication, achieving mode selective excitation of LP₀₁, LP₁₁, LP₂₁ and LP₀₂ with insertion loss less than 0.8 dB (1.7~2.0 dB for LP₀₂) over the C-band.

14:15–14:30 · ACP2026–0715–21

Mechanism and Fabrication of Helical Fiber Gratings in Strongly-Coupled Four-Core Fibers**Jiaming Chen¹**, Jiajing Tu^{2*}¹.Dept. of Electronic Engineering, Jinan University, China; ².Dept. of Electronic Engineering, School of Inf. Science and Technology, Jinan University, China

We investigate the mechanism and fabrication of helical fiber gratings based on strongly-coupled four-core fiber (SC-FCF). This work aims to simultaneously generate multiple orders of orbital angular momentum (OAM) modes in the cladding through an SC-FCF helical grating. In the theoretical simulation, angular momentum matching conditions are applied to determine the cladding modes that can be coupled from the core supermodes, and phase matching conditions are employed to reveal the quantitative relationship between the twist rate and the target high-order OAM modes. In the experiment, the sixth- and seventh-order OAM modes are simultaneously generated in the SC-FCF helical grating using the electric arc discharge method. Finally, the generated OAM mode orders are successfully verified by off-axis digital holography.

14:30–14:45 · ACP2026–0715–42

Femtosecond-laser-inscribed active tilted fiber gratings as monolithic gain polarizers for compact ultrafast fiber lasers**Kyriacos Kalli^{1*}**¹.Cyprus University of Technology, Cyprus

We present multifunctional active fiber gratings fabricated by femtosecond laser inscription, integrating optical amplification and polarization-selective filtering within erbium-doped fiber. The monolithic architecture enables nonlinear polarization rotation mode locking without discrete polarizers, reducing cavity complexity while improving robustness, integration, and scalability for ultrafast fiber laser systems.

14:45–15:00 · ACP2026-0701-148

Ultra-Low Loss Few-Mode Nested Elliptical Tube Hollow-Core Anti-Resonant Fiber**Wenzhe Chang¹**, Lipeng Feng¹, Anxu Zhang¹, Xishuo Wang¹, Xiaoli Huo¹*1. China Telecom Research Institute, China*

We propose a nested elliptical-tube few-mode HC-ARF supporting six modes. At 1550 nm, the fundamental mode loss is 1.36×10^{-4} dB/km, highest-order mode loss is 9.51×10^{-3} dB/km, the bending loss is < 0.1 dB/km at 3 cm.

15:00–15:15 · ACP2026-0715-13

CNN-Assisted Real-Time Alignment Monitoring of Hollow-Core Fiber and Single Mode Fiber**Eryang Liu¹**, Lei Zhang^{2,3}, Zhaohui Li^{4,5}, Jiajing Tu^{1*}

1. Department of Electronic Engineering, Jinan University, China; 2. State Key Laboratory of Optical Fiber and Cable Manufacture Technology, China; 3. Yangtze Optical Fiber and Cable Joint Stock Limited Company, China; 4. School of Electronics and Information Technology and Guangdong Provincial Key Laboratory of Optoelectronic Information Processing Chips and Systems, China; 5. Sun Yat-sen University, China

We propose a neural-network-assisted monitoring method that performs real-time mode decomposition from the near-field intensity image at the HCF output using a multi-task learning network (MTL-SCU). The LP₀₁ purity serves as a quantitative alignment metric. Experiments on 15~m and 2~km HCFs validate the method: in the short fiber, purity is highly sensitive to misalignment, making it suitable for laser delivery applications; in the long fiber, purity should be combined with power monitoring. The approach achieves millisecond-level prediction and raises LP₀₁ purity above 0.99.

15:15–15:30 · ACP2026-0715-38

Strongly enhanced circular dichroism near anti-crossing in chiral single-ring PCF**Xinyang Liu^{1*}**, Sibnath Dey¹, Xinglin Zeng¹, Ruochen Yin¹, Xin Jiang¹, Philip Russell¹*1. Shanghai Institute of Optics and Fine Mechanics and Hangzhou Institute of Optics and Fine Mechanics, China*

We report experimental results on strongly enhanced circular dichroism (CD) in helically twisted single-ring photonic crystal fibre close to an anti-crossing wavelength. The CD is confirmed to change sign for opposite twists.

15:30–16:00 Coffee Break

16:00–17:00 · November 4, 2026 · Wednesday

Passive Photonic Components Across Domains (7)

Presider: Isidora Teofilovic, Technical University of Denmark, Denmark

16:00–16:15 · ACP2026-0715-139

Multichannel Mode Converter Using Amplitude-Sampled Tapered LPFG in Few-Mode Fiber**Yi Luo¹**, Siyu Chen¹, Xiaolong Fan¹, Li-Ao Zuo¹, Chengbo Mou¹, Yunqi Liu^{1*}*1. Shanghai University, China*

We propose a tapered amplitude-sampled LPFG in FMF. Rectangular sampling enables multi-resonance, achieving 17 LP₀₁–LP₂₁ conversion channels at 10% duty cycle as compact all-fiber multiplexers for high-capacity communications.

16:15–16:30 · ACP2026-0629-3

Switching wave linear-wave interaction in a pulsed-driven fibre Fabry-Pérot resonator**Shengbo Xu^{1,2}**, Stuart Murdoch^{1,2}, Yiqing Xu^{1,2*}*1. University of Auckland, New Zealand; 2. The Dodd-Walls Centre for Photonic and Quantum Technologies, New Zealand*

We present a study of switching-wave linear-wave interaction in a normal-dispersion resonator under pulsed driving. The phase-matching frequency of the generated idler wave can be determined using the phase-matching equation, including temporal desynchronization.

16:30–16:45 · ACP2026-0715-84

On-Chip Thermal Mapping of Battery Hotspots Using A Quasi-Distributed Photonic Approach**Haomin Wang¹**, Yingchun Wu¹, Kangjian Bao¹, Zongxi Li¹, Xu Yang¹, Yuting Ye¹, Zequn Chen¹, Wei Zhang², Hongtao Lin³, Lan Li^{1*}

1. Zhejiang Key Laboratory of 3D Micro/Nano Fabrication and Characterization, Department of Electronic and Information Engineering, School of Engineering Westlake University, China; 2. Faculty of Electrical Engineering and Computer Science Ningbo University, China; 3. College of Information Science and Electronic Engineering Zhejiang University, China

An integrated photonic chip with quasi-distributed temperature sensing is validated under simulated battery thermal conditions, resolving thermal gradients and hotspots to address the need for high-resolution operando monitoring in high-energy-density Li-ion batteries under fast charge-discharge.

16:45-17:00 · ACP2026-0715-128

Fabrication-Tolerant Narrow-Waveguide Directional Couplers on a 400-nm-Thick Silicon Nitride Platform**Haoran Shi¹**, Yiyun Shen², Junqi Yao¹, Xucheng Zhang¹, Yu He¹, Guohua Huang², Qianqian Wang², Xiabo Chen², Yikai Su^{1*}*1.Shanghai Jiao Tong University, China; 2.Hangzhou Brighten Core Optoelectronics Co., Ltd., China*

Narrow-waveguide silicon nitride directional couplers with small gaps show reduced fabrication sensitivity and good simulation-measurement agreement, verified by modal analysis, FDTD simulations, and experiments.

NI: Network, System and Service Innovations

Conference Room 102B, 1F

13:30–17:30 · November 2, 2026 · Monday

AI Native Optical Network and Emerging Fiber Systems

Presider: Yuan Cao, Nanjing University of Posts and Telecommunications, China

13:30–14:30 · ACP2026-0817-3 **Tutorial**

AI Native Functionality in Optical Networks

Daniel Kilper¹

1. Trinity College Dublin, Ireland

This tutorial will examine recent research on using AI in the control and operation of optical networks and consider the challenges in moving to a fully AI native approach.

14:30–15:00 · ACP2026-0713-10 **Invited**

Standardization Progress of Hollow-core Fiber and Its System Applications in ITU-T: From Technical Debates to GSTR.hcf

Dawei Ge^{1*}, Dong Wang¹, Dechao Zhang¹, Chao Han², Jing Li³, Fang Li²

1. China Mobile Research Institute, China; 2. China Academy of Information and Communications Technology, China; 3. Yangtze Optical Fibre and Cable Joint Stock Limited Company, China

This paper reviews the current standardization progress of hollow-core fiber (HCF) in ITU-T SG15, analyzing key technical debates on categorization, properties, application-driven variants, interoperability, and the path to the GSTR.hcf technical report.

15:00–15:15 · ACP2026-0701-225

Continual Event Recognition for Autonomous Optical Network Monitoring

Khoulood Abdelli^{*}

1. Nokia Bell Labs, Germany

Autonomous optical networks require monitoring systems that adapt to evolving disturbances without retraining. We propose a continual SOP event recognition framework combining open-set detection, prototype registration, and compositional reasoning, achieving 99.82% accuracy and continual adaptation.

15:15–15:30 · ACP2026-0622-6

Non-invasive Identification of Hollow-Core Fiber Type and Propagation Direction via Evanescent-Field Analysis

Yuqian Zhang¹, Dechao Zhang¹, Dawei Ge^{1*}, Dong Wang¹, Mingqing Zuo¹, Han Li^{1*}

1. Department of Fundamental Network Technology, China Mobile Research Institute, China

We propose a low-complexity, non-invasive evanescent-field detection scheme for hollow-core fibers, enabling identification of leaky-field intensity, nested structures, and propagation direction. Results reveal strong dependence on fiber structure and propagation modes, supporting characterization and sensing.

15:30–16:00 Coffee Break

16:00–17:30 · November 2, 2026 · Monday

Quantum Optical Networks and Performance Monitoring

Presider: Bingli Guo, Beijing University of Posts and Telecommunications, China

16:00–16:30 · ACP2026-0624-8 **Invited**

Large-Scale Quantum Key Distribution Networking: Toward Space-Ground Integration

Yuan Cao^{*}

1. Nanjing University of Posts and Telecommunications, China

This talk presents recent research on large-scale quantum key distribution (QKD) networking, including satellite-based QKD networking and multi-protocol QKD networking, and discusses future trends toward space-ground integrated QKD networks.

16:30–17:00 · ACP2026-0908-8 **Invited**

Emulating Quantum Data Centers: From Distributed Circuits to Fiber-Interconnect Noise

Rui Lin^{*}

1. Chalmers University of Technology, Sweden

We will introduce quantum data centers and distributed quantum computing, then a practical emulation framework for evaluating remote gates, distributed algorithms, and fiber-interconnect noise on real quantum hardware, connecting network impairments with application-level performance.

17:00-17:15 · ACP2026-0715-71 **Industry Innovation Nomination****Online Scheduling of Path-Coupled Key for Heterogeneous Services in Optical Satellite Networks**Ruikang Ni¹, Wei Wang¹, Liyazhou Hu², Lian Meng³, Yongli Zhao^{1*}, Jie Zhang¹*1. Beijing University of Posts and Telecommunication, China; 2. Shenzhen Polytechnic University, China; 3. Beijing University of Technology, China*

Physical-layer key generation supplies link-local keys but suffers intermittent, path-coupled availability. We propose an SLA-aware online scheduler integrating credit allocation, reservation, and virtual queues, reducing security-sensitive PLKG-support miss rates from 94.2% to 50.3% in simulation.

17:15-17:30 · ACP2026-0715-59

Optical Power Monitoring Integrated with Wavelength Selective Switch Enabled by Nonuniform Beam Splitting and Low-Crosstalk Hologram DesignXinghua Wang^{1,2}, Suresh Chejarla^{2,3}, Tonghui Ji², Ning Deng^{2*}, Fan Li¹, Yuyao Wang²*1. Sun Yat-Sen University, China; 2. Great Bay University, China; 3. Shenzhen International Graduate School, Tsinghua University, China*

This paper presents a simple and integrated optical power monitor based on a novel small-portion power-splitting method for wavelength selective switches (WSSs). A redistributed iterative Fourier transform algorithm (R-IFTA) is proposed and experimentally demonstrated to achieve efficient power splitting with low crosstalk in a 1×20 WSS setup.

08:30-10:00 · November 3, 2026 · Tuesday

Optical Wireless Communication Networks

Presider: Wei Wang, Beijing University of Posts and Telecommunications, China

08:30-09:30 · ACP2026-0625-1 **Tutorial****High-performance receivers for optical wireless communication**Ton Koonen¹*1. Institute for Photonic Integration, Eindhoven University of Technology, Netherlands*

High-speed receivers capturing optical beams are vital in high-capacity optical wireless communication systems. Concepts for large aperture, wide Field-of-View, high energy efficiency and bandwidth are discussed, for various short-reach indoor and medium-to-long reach outdoor applications.

09:30-09:45 · ACP2026-0715-72

Weather-Adaptive Routing for Latency-sensitive Service in Satellite Networks with RF/Laser LinksZijian Cui¹, Wei Wang¹, Chenwei Zhang¹, Xin Li¹, Yongli Zhao^{1*}, Jie Zhang¹*1. Beijing University of Posts and Telecommunications, China*

Weather-induced degradation of hybrid RF/FSO satellite-to-ground links can cause congestion when latency-sensitive (LS) and non-latency-sensitive (NLS) services compete for limited downlink resources. The proposed WA-RA prioritizes low-delay routing for LS services and redirects NLS traffic to feeder satellites with higher residual capacity.

09:45-10:00 · ACP2026-0715-110

LSTM-Enhanced MADDPG for Congestion-Aware Routing in Hybrid FSO/RF LEO Satellite NetworksLi Xu¹, Chengyue Lou¹, Tingwei Wu^{1*}, Ruijie Zhu², Hui Yang², Lei Guo¹*1. Chongqing University of Posts and Telecommunications, China; 2. Beijing University of Posts and Telecommunications, China*

This paper proposes an LSTM-MADDPG routing framework for hybrid FSO/RF LEO satellite networks, using a temporal encoder to exploit traffic history. Results show 24.1% higher delivery and 21.6% lower delay over MADDPG under medium load.

10:00-10:30 Coffee Break

10:30-12:15 · November 3, 2026 · Tuesday

Space Optical Transport Networks

Presider: Tingwei Wu, Chongqing University of Posts and Telecommunications, China

10:30-11:00 · ACP2026-0904-7 **Invited****Challenges and Opportunities for Building a Space Optical Transport Backbone in Dynamic Satellite Networks**Wei Wang¹, Yongli Zhao¹, Jie Zhang¹*1. Beijing University of Posts and Telecommunications, China*

Space optical transport networks are envisioned as a key infrastructure for future global broadband and space-ground integrated services. This talk discusses dynamic topology abstraction, predictive routing, resilient optical resource orchestration, and auto-

mous control. An emulation platform demonstrates the feasibility of the proposed architecture and significant gains in service continuity and resource utilization.

11:00–11:30 · ACP2026-0904-3 **Invited**

Hybrid Free-Space Optical and Microwave Transmission: Fused Architecture and Enhanced Phase-Noise Resilience **Yejun Liu***

1. Chongqing University of Posts and Telecommunications, China

In this work, we focus on the challenges of hybrid free-space optical and microwave systems in structural complexity and transmission robustness. We propose and demonstrate experimentally a fused architecture with enhanced phase-noise resilience.

11:30–11:45 · ACP2026-0715-204

Submarine Cable Protection Based on Space-Ground SRLG in Optical Networks

Chunjv zhang¹, Yongli Zhao^{1*}, Wei Wang¹, Linhao Zhang¹, Yansong Fu¹, Jie Zhang¹

1. Beijing University of Posts and Telecommunications, China

We build a space-ground SRLG from a forward earthquake model and monthly cloud climatology, and configure SG-SDP, a 1+1 protection whose satellite backup stays SRLG-disjoint, lifting availability to 70.3% across 20 real hubs.

11:45–12:00 · ACP2026-0715-86

Predictive On-Board PEP Activation and Handover Optimization for TCP Goodput in Mega-LEO Optical Satellite Constellations

Yikai Liu¹, Bingli Guo^{1*}, Yu Zhou¹, Tong Liu¹, Luozhang Liang¹, Shanguo Huang¹

1. Beijing University of Posts and Telecommunications, China

We propose a workflow that predictively activates performance-enhancing proxies and optimizes their operation. Results show that it improves average TCP goodput by up to 56.78% over existing methods in mega-LEO optical satellite networks.

12:00–12:15 · ACP2026-0715-171

Masked Proximal Policy Optimization for Task Offloading in Satellite Networks with In-orbit Computing Capability

Danish Kumar¹, Wei Wang^{1*}, Kamlesh Kumar Sothar², Jie Zhang¹

1. Beijing University of Posts and Telecommunications, China; 2. Beihang University, China

Low Earth Orbit (LEO) mega-constellations are increasingly used as orbital edge-computing platforms, where tasks from a terrestrial network are offloaded to satellites across the globe. Choosing which satellite serves each task is hard due to constant orbital motion changes the reachable set continuously, constellations difference in speed and altitude, and per-satellite queues link each decision to future performance. Existing deep reinforcement learning (DRL) methods mostly leverage on synthetic connectivity and few baselines. We present a realistic, reproducible benchmark driven by real CelesTrak/SGP4 data across a ten-station global network and three heterogeneous constellations (Starlink, OneWeb, Iridium), modeling queueing, latency, energy, and deadline constraints in real units. Our proposed agent couples a masked PPO learner with reward shaping, normalization, and task-conditioned features, enforcing reachability by construction. Over five seeds against ten baselines, including a strong one-step oracle, it reaches 76% task success, surpassing learning baselines (DQN, QR-DQN, A2C, PPO) while matching the strongest heuristic and approaching the oracle.

08:30–10:00 · November 4, 2026 · Wednesday

Semantic and DCI Optical Networks

Presider: Nan Hua, Tsinghua University, China

08:30–09:30 · ACP2026-0908-7 **Tutorial**

Semantic Optical Communications: From Bits to Task-Relevant Data

Andrea Bianco*

1. Politecnico di Torino, Italy

Semantic optical communications focus on task-relevant information rather than bit-by-bit data transfer. This tutorial discusses transceiver and network design, channel modelling, and performance metrics from a task-oriented perspective, as well as future research opportunities for intelligent network services.

09:30–09:45 · ACP2026-0715-116

MASC-FEI: A Multi-Agent Sensing-Computing Collaborative Mechanism for Fiber Event Identification in DCI Networks

Wei Chen^{1,2}, Zhiqun Gu^{1,2*}, Yi Ding^{3,4}, Shuai Ren⁵, Jiawei Zhang^{1,2}, Yuefeng Ji^{1,2*}

1. State Key Laboratory of Information Photonics and Optical Communications, China; 2. Beijing University of Posts and Telecommunications, China; 3. China Telecom Research Institute, China; 4. State Key Laboratory of Optical Fiber and Cable Manufacture Technology, China; 5. Information Support Force Engineering University, China

We propose a multi-agent sensing-computing collaborative mechanism (MASC-FEI) for fiber event identification in data center interconnect networks. MASC-FEI reduces sensing data volume by 67.28% while maintaining accuracy under a confidence threshold of 0.92.

09:45-10:00 · ACP2026-0715-164

CoFlexPipe: Compute-Network Co-Design for Efficient LLM Training over Heterogeneous Cross-DC Optical Networks**Chunyuan Zhao¹**, Xiaofang Gao², Xin Li^{1*}, Tong Lin², Yang Wen², Zhidong Wu², Yongli Zhao¹*1. Beijing University of Posts and Telecommunications, China; 2. State Grid Information & Telecommunication Center, China*

We propose CoFlexPipe, a compute-network co-design scheme that optimizes cross-DC pipeline execution for large language model (LLM) training over optical transport networks. Simulations show up to 44.1% lower training time under heterogeneity and runtime disturbances.

10:00-10:30 Coffee Break

10:30-12:00 · November 4, 2026 · Wednesday

AI-assisted Optical Network

Presider: TBD

10:30-11:00 · ACP2026-0626-4 **Invited****Rethinking Perceptual Data for Autonomous Optical Networks: A Spectral-Space Digital Twin Perspective****Nan Hua^{1,2*}**, Tianyu Liang³, Jiaxi Li⁴, Xiaodong Liang⁵, Qingsong Luo⁵, Xiaoping Zheng^{1,2}

1. Department of Electronic Engineering, Tsinghua University, China; 2. Beijing National Research Center for Information Science and Technology (BNRist), China; 3. School of Information Science and Technology, Beijing University of Technology, China; 4. School of Computer, Electronic and Information, Guangxi Key Laboratory of Multimedia Communications and Network Technology, Guangxi University, China; 5. Guangxi Key Laboratory of Optical Network and Optical Information Security, The 34th Research Institute of China Electronics Technology Group Corporation, China

This paper evaluates perceptual data requirements for digital twin optical networks. By balancing hardware precision and deployment cost under a /good-enough/ criterion, intelligent processing reduces the impact of physical layer impairments, supporting automated control.

11:00-11:30 · ACP2026-0630-44 **Invited****Optical Amplifier Placement Reoptimization in Elastic Optical Networks with Hybrid HCF-SSMF Links****Mingyu Weng¹**, Guangxing Song¹, Huichao Xu¹, Pengfei Cai¹, Tingyu Fu¹, Wei Sun², Mingyi Gao¹, Yongcheng Li^{1*}, Gangxiang Shen¹*1. Soochow University, China; 2. Jiangsu Alpha Optic-Electric Technology Co., Ltd., China*

We investigate optical amplifier placement reoptimization in elastic optical networks (EONs) with hybrid hollow-core fiber (HCF) and standard single-mode fiber (SSMF) segments on a single transmission link. Two candidate-site-based EDFA placement reoptimization strategies are proposed to reduce redundant EDFAs while maintaining acceptable spectrum efficiency.

11:30-11:45 · ACP2026-0715-111

AI Agent Assisted Time Error Compensation for End-to-End Synchronization in Hybrid Fiber-Wireless Networks**Di Lu¹**, Hongxing Li¹, Hao Ma², Lei Yao³, Pengfei Wang³, Yiping Ren³, Wen Ying³, Guochu Shou¹

1. Beijing University of Posts and Telecommunications, China; 2. Signal & Communication Research Institute, China Academy of Railway Sciences Co., Ltd., China; 3. China Star Network Digital Technology Co., Ltd, China

Precise time synchronization forms the foundation of intelligent and automated societies. To mitigate the impact of wireless air interface delay jitter on synchronization accuracy in hybrid fiber-wireless networks, this paper proposes an error compensation method based on AI agent. Experimental results demonstrate that this approach reduces end-to-end time error to within the microsecond range.

11:45-12:00 · ACP2026-0715-92

Idle-Aware and Carbon-Efficient Stage Placement Scheme for Hybrid-Parallel LLM Training across Optical-Interconnected AIDCs**Mengtong Guo¹**, Xin Li^{1*}, Yongli Zhao¹, Tingting Bao¹, Jie Zhang¹*1. Beijing University of Posts and Telecommunications, China*

This paper proposes a carbon-aware hybrid-parallel training scheme for large language models over geo-distributed AIDCs, jointly optimizing pipeline stage placement and optical network resources to reduce carbon emissions while satisfying training latency constraints.

N2: Photonics for Data Center and Computing Systems

Conference Room 103A, 1F

13:30–15:30 · November 3, 2026 · Tuesday

Optical Interconnect and Integration

Presider: Meng Xiang, Guangdong University of Technology, China

13:30–14:30 · ACP2026–0903–4 **Tutorial**

Optical Interconnects for Cloud and AI Data Centers

Chongjin Xie¹

1. PhotonicX AI, Singapore

This tutorial presents optical interconnect technologies in data centers, driven by explosive bandwidth demands first from cloud and then from AI computing. Both intra- and inter-data center optical interconnects are described.

14:30–14:45 · ACP2026–0701–141

1.6 Tb/s OSFP–XD Transceiver Based on Silicon Photonic Integrated Circuit

Du Lei¹, Yiran Wei¹, Yan Yi^{1*}, Haiwei Cai^{1*}, Chu Wei^{1*}

1. Zhangjiang Laboratory, China

We demonstrate a 1.6 Tb/s (4×400G) FR4 silicon photonic WDM pluggable optical module in OSFP–XD transceiver. A novel multi-wavelength light-source solution and advanced high-frequency, high-density packaging techniques are employed to achieve low power consumption, low cost, and mass producibility. The fabricated module successfully passes full 400G–FR4 conformance tests, exhibiting clear optical eye diagrams and error-free transmission, thereby confirming the feasibility of silicon photonics for next-generation 1.6 Tb/s interconnects.

14:45–15:00 · ACP2026–0715–65

Metric–Driven Device–to–Link Electro–Photonics Co–Design for 106.25–Gb/s PAM4 Optical Interfaces

Jue Gong¹, Shaoliang Yu¹, Xiaolan Wang^{1*}

1. Zhejiang Lab, China

This paper presents a metric-driven end-to-end electro-photonics co-design workflow applicable to LPO/NPO/CPO. As an example, Transmitter and Dispersion Eye Closure Quaternary (TDECQ) and its equalizer penalty are used to optimize MZM electrode length.

15:00–15:30 · ACP2026–0515–1 **Invited**

Optoelectronic Integrated Information Sensing and Chips

Sha Zhu^{1*}

1. Nankai University, China

Integrated optoelectronic sensing technology has emerged as a key development direction for next-generation ubiquitous sensing systems. In this talk, we will present our recent advances in integrated optoelectronic sensing technologies and chip-scale implementations.

15:30–17:30 Coffee Break & Poster Session

08:30–10:00 · November 4, 2026 · Wednesday

Optical Switch for AI Infra

Presider: Wei Wang, Beijing University of Posts and Telecommunications, China

08:30–09:00 · ACP2026–0715–62 **Invited**

Liquid Crystal Devices for AI Computing

Haining Yang^{1*}

1. Southeast University, China

This talk will give an overview of a wide range of liquid crystal photonic devices for AI data center

09:00–09:15 · ACP2026–0715–192

An 8 x 8 High–Speed MZI Optical Switch with a Scalable Board–Level Driver

Yu Zhou¹, Wei Gao¹, Xin Li¹, Liangjun Lu^{1,2*}, Linjie Zhou^{1,2}, Jianping Chen^{1,2}

1. State Key Laboratory of Photonics and Communications, School of Information Science and Electronic Engineering, Shanghai Jiao Tong University, China; 2. SJTU–Pinghu Institute of Intelligent Optoelectronics, China

We demonstrate an 8×8 silicon photonic MZI switch with scalable board-level driving: 14 parallel SIPO lanes load the 112-bit switch state, enabling low-crosstalk routing across all 64 paths and 20-Gb/s transmission through a configured link.

09:15–09:30 · ACP2026-0630-124

RailBridge: A Sparse Optical Bridging Architecture for Multi-Tenant GPU Training Clusters

Xiaorun Wang¹, Jun Dai¹, Xingde Li¹, Zheng Yang¹, Kexiong Fang¹, Zhiquan Gu¹, Jiawei Zhang^{1*}

1. Beijing University of Posts and Telecommunications, China

Rail-optimized GPU clusters provide high bandwidth for LLM training by preserving communication locality within servers and rails. However, maintaining a fully shared electrical spine for the relatively small amount of cross-rail traffic incurs substantial uplink cost. Spine-less designs such as Rail-only forward the relatively small amount of cross-rail traffic through the HBI, making them highly cost-efficient when communication locality is preserved. However, multi-tenant placement fragmentation and GPU failures can introduce persistent cross-rail traffic that competes with native intra-server communication on the HBI. We propose RailBridge, a sparse optical bridging architecture that selectively restores inter-rail connectivity through an optical circuit switching (OCS) layer. RailBridge offloads dominant cross-rail traffic from the HBI, reducing the iteration time overhead relative to a full shared spine from 17.3% to 6.6% while requiring only one-quarter of the shared-spine uplink bandwidth.

09:30–10:00 · ACP2026-0911-11 **Invited**

Building Hybrid Optical/Electrical Data Center Networks for AI

Shizhen Zhao¹

1. Shanghai Jiao Tong University, China

The rapid growth of large-scale AI training and inference workloads places unprecedented demands on datacenter network bandwidth, flexibility, and cost, pushing conventional electrical fat-tree fabrics toward their limits. Hybrid optical-electrical datacenter networks, which use optical circuit switches (OCS) to reconfigure physical topologies, have recently moved from lab-scale research into production. However, adopting OCS faces fundamental challenges: limited one-to-one switching flexibility, millisecond-to-second-scale reconfiguration latency, and a mismatch between existing AI training/inference stacks and OCS fabrics.

This work presents the design and end-to-end systemization of hybrid optical-electrical switching for AI computing. Drawing on production lessons that made OCS reliable by design, we aim to build a full-stack solution that seamlessly integrates the entire pipeline—OCS, optical transceivers, switch/NIC coordination for fast switching, collective communication libraries, and AIOps for operation and maintenance—delivering a practical, scalable path toward next-generation AI datacenter fabrics.

10:00–10:30 Coffee Break

10:30–12:00 · November 4, 2026 · Wednesday

Photonic AI Computing

Presider: Liangjun Lu, Shanghai Jiao Tong University, China

10:30–11:00 · ACP2026-0701-64 **Invited**

Digital Optical Multiplication for High-Precision Photonic AI Computing

Deming Kong¹, Pierre Nay¹, Xiaojing Long¹

1. Technical University of Denmark, Denmark

We present our recent works on optical binary multiplication toward high-fidelity generative tasks. With a multidimensional encoding scheme, the digital computing architecture offers a route to overcome precision limits in analog photonic computing.

11:00–11:15 · ACP2026-0715-29

Programmable Photonic In-Memory Accelerator with Ultrafast Optical I/O

Tao Shu¹, Chenlei Li¹, Yueyang Zhang¹, Cunyu Shi¹, Wei Chen¹, Daoxin Dai^{1*}

1. Zhejiang University, China

We demonstrate a programmable thin-film PZT photonic in-memory accelerator integrating ultrafast optical I/O with non-volatile weight storage. A 16-channel microring array implements four convolutional kernels after non-volatile resonance alignment and weight programming, producing convolution waveforms with R^2 values above 0.98. Under 10-GHz operation, hardware-aware training improves the measured classification accuracy from 67% to 87%.

11:15–11:30 · ACP2026-0701-80

Hardware-Aware Training Based on Structural Re-parameterization for Optical Convolutional Neural Networks

Zheng Li¹, Yongmei Sun^{1*}, Ruijia Guo¹

1. Beijing University of Posts and Telecommunications, China

Hardware imperfections in MZI arrays hinder ONN training, while batch normalization remains difficult. We propose structural re-parameterization-based hardware-aware training, improving trainability on CIFAR-10 under finite loss compensation and achieving 27.5% higher accuracy than single-branch training.

11:30–12:00 · ACP2026-0627-1 **Invited****Low-Phase-Noise Optical Frequency Division for Photonic Computing and Data-Center Clocking****Xiaopeng Xie^{1*}***1. Peking University, China*

This talk reviews our recent advances in optical frequency division using EO combs, Kerr microcombs, and femtosecond fiber combs for generating ultrastable, low-phase-noise microwave clocks enabling photonic computing, coherent interconnects, and AI data-center systems.

12:00–13:30 Lunch

13:30–15:30 · November 4, 2026 · Wednesday

Optical AI Architecture and Network

Presider: Xiao Lin, Fuzhou University, China

13:30–14:30 · ACP2026-0724-1 **Tutorial****Toward All-Optical AI Fabrics for Sustainable Distributed Intelligence in ION-2030****Raul Munoz¹***1. CENTRE TECNOLÒGIC DE TELECOMUNICACIONS DE CATALUNYA (CTTC), Spain*

Artificial Intelligence is driving the evolution of optical networks toward Optical AI Fabrics. This paper introduces a three-phase road-map, architectural principles, and enabling technologies for deterministic, scalable, and sustainable infrastructures supporting distributed intelligence within the ION-2030 vision.

14:30–14:45 · ACP2026-0626-23

All-Optical Network Coding Enabled Collective Communication Using Multi-Agent DRL over Geo-distributed DC Networks**Xin Wang^{1*}**, Fansong Kong¹*1. Beijing Information Science and Technology University, China*

We propose a multi-agent DRL-based all-optical network coding algorithm for GPU ALLGATHER over geo-distributed DC networks (MA-NCGA), enabling dynamic coding-node selection, routing, and resource allocation for asynchronous GPU communication with significantly reduced bandwidth usage while maintaining transmission completion time.

14:45–15:00 · ACP2026-0716-9

Joint In-Network Storage and Transfer Scheme for Wide-Area Pipeline Parallelism in OCPNXiao Lin^{1*}, **Ziang Feng¹**, Haoyuan Zheng¹, Zuqi Teng¹, Weiling Lu¹, Enguo Chen^{1*}*1. Fuzhou University, China*

To address computation-communication mismatches, we propose joint in-network storage and transfer (JIST), a slack-aware scheme combining GCN-based routing-potential prediction with deterministic store-and-forward search to reduce blocking probability and computation time under massive payloads.

15:00–15:30 · ACP2026-0901-4 **Invited****PRON: A Low-Latency Periodically Reconfigurable Network Tailored for AI Pre-training****Fulong Yan^{1*}***1. Beijing University of Posts and Telecommunications, China*

To address the challenges of high concurrency traffic during large model training, PRON employs a two-layer optical network and optimizes topology configuration, resulting in a 35% reduction in latency and a 20%–30% cost saving.

15:30–16:00 Coffee Break

16:00–17:30 · November 4, 2026 · Wednesday

Photoics for AI and Computing

Presider: Yuxin Xu, Zhejiang University of Technology, China

16:00–16:30 · ACP2026-0629-24 **Invited****Opportunities and Challenges: The Future Outlook of Pluggable Optical Modules in AI Data Centers****Hao Liu^{1*}**, Xia Sheng¹, Yuyang Liu¹, Auxu Zhang¹, Kai Lv¹, Xiaoli Huo¹*1. China Telecom Research Institute, China*

This paper reviews the pluggable optical modules evolution, advantages and comparisons with other technology, thus having a clear and viable path to continued development in optical interconnection applications for the AI era.

16:30-17:00 · ACP2026-1022-1 **Invited****Multicast Routing Algorithms with Store-and-Forward in Space Division Multiplexing Elastic Optical Networks**
Xu Zhang¹*1. Chongqing University of Posts and Telecommunications, China*

Space-division multiplexing elastic optical networks (SDM-EONs) have been proposed to interconnect data centers. To address the massive data transmission demands between these centers, we introduce a multicast routing algorithm based on the time-shifted multi-layer graph (TS-MLG) in SDM-EONs. This algorithm not only alleviates spectrum fragmentation and inter-core crosstalk (IC-XT) but also facilitates the efficient convergence of storage and network functions. Simulation results show that, compared to benchmark algorithms, our proposed solution significantly reduces the blocking probability of traffic requests and enhances overall network throughput.

17:00-17:15 · ACP2026-0630-128

TOE-Map: Joint Thermal, Optical, and Electrical-aware Task Mapping for ONoCs
Zhongjie Mao¹*1. Beijing University of Posts and Telecommunications, China*

This paper proposes TOE-Map, a multi-objective task-mapping method that jointly considers thermal, optical, and electrical characteristics. Experimental results show TOE-Map lowers peak temperature and temperature standard deviation, shortens execution time, and improves traffic-weighted optical SNR.

17:15-17:30 · ACP2026-0715-41

Deep photonic reservoir computing based on lithium niobate microring resonators
Zhuoling Feng¹, Yixian Dong^{1*}, Xihua Zou¹, Wei Pan¹, Lianshan Yan¹*1. Southwest Jiaotong University, China*

We investigate the performance of lithium niobate microrings in deep reservoir computing. Driven by competitive thermo-optic and photorefractive effects, the cascaded system yields a 0.00117 SER (channel equalization) and a 0.0028 NMSE (MG prediction).

N3: Optical Network Architectures, Control and Management

Conference Room 102C, 1F

13:30–15:00 · November 2, 2026 · Monday

AI Agents and Autonomous Optical Network Control

Presider: Ning Deng, Great Bay University, China

13:30–14:00 · ACP2026–0618–4 **Invited**

Designing a Multi-Agent AI-Based Control Plane for Transport Networks

Luis Velasco^{1*}, Pol Gonzalez¹, Sima Barzegar²

1. Universitat Politècnica de Catalunya, Spain; 2. Barcelona Supercomputer Center, Spain

We propose a multi-agent AI-based control plane architecture for transport networks operation. Agents collaborate through the A2A protocol and access external tools, including SDN control, through MCP. Three workflows are experimentally assessed on a test-bed.

14:00–14:30 · ACP2026–0715–165 **Invited**

Toward the Right Abstraction Level for AI Agents Controlling Optical Networks

Dmitrii Briantsev^{1*}, Daniel Kilper¹, Merim Dzaferagic¹

1. Trinity College Dublin, Ireland

We study how the control-interface abstraction exposed to a language-based agent affects its ability to operate an optical network, arguing that safer, more efficient agentic control comes from better abstractions rather than finer device control.

14:30–14:45 · ACP2026–0630–51

A Self-Evolving Harness Engineering Framework for LLM Agents in Autonomous Optical Networks

Qizhi Qiu^{1,2}, Yihao Zhang¹, Xiaomin Liu¹, Jingyi Su¹, Weisheng Hu¹, Qunbi Zhuge^{1*}

1. Shanghai Jiao Tong University, China; 2. Monash University, Australia

We propose a self-evolving framework updating AI agents' skills in optical networks. It enhances a Qwen3–8B agent to achieve 2.85× improvement, outperforming >1000B Qwen3–max and ~200B GPT–4o, empowering locally deployed agent-driven AONs with continuous evolution.

14:45–15:00 · ACP2026–0623–2

LLM-Driven Multi-Agent Optical Digital Twin for Automated Data Generation

Sen Shen¹, Zhuojun Cai¹, Jing Han¹, Wanxin Zhao¹, Peiyun Ge¹, Yiran Teng¹, **Shuangyi Yan**^{1*}, Dimitra Simeonidou¹

1. University of Bristol, United Kingdom

We propose a multi-agent autonomous framework for optical-network data generation, integrating LLM orchestration with GNPpy and OptiCommPy to automate scenario expansion, iterative physical-layer analysis, and closed-loop optimisation for intelligent next-generation optical networks at scale efficiently.

15:30–16:00 Coffee Break

16:00–17:30 · November 2, 2026 · Monday

Optical Data Centers and Distributed AI Training

Presider: Yongcheng Li, Soochow University, China

16:00–16:30 · ACP2026–0904–6 **Invited**

AI-Enabled Evolution of All-Optical Switching From 1.0 to 2.0

Liangjia Zong^{1*}

1. Huazhong university of science and technology, China

All-optical switching is a key component for future intelligent computing networks. This talk focuses on integrating AI technologies with it to evolve the current 1.0 era to 2.0, supporting future computing network evolution demands.

16:30-16:45 · ACP2026-0630-49

Hollow-Core Fiber for Cross-Data-Center AI Training: A Performance Study with Deep Reinforcement Learning Optimization
Zixin He¹, Shan Yin^{1*}, Shikui Shen², Mengru Cai¹, Xiaodong Liu¹, Shanguo Huang¹*1. Beijing University of Posts and Telecommunications, China; 2. China Unicom Research Institute, China*

With rapid growth of large-scale AI models, cross-data-center distributed training becomes critical yet highly latency-sensitive. Hollow-core fiber (HCF), leveraging air-core light transmission with near-vacuum propagation speed and ultra-high bandwidth, significantly reduces communication delay. Simulation results show lower task blocking and training latency, further improved by reinforcement learning-based scheduling.

16:45-17:00 · ACP2026-0715-150

Lightpath Provisioning for Pipeline-Parallel Training in Dragonfly-Based All-Optical Data Center Networks with Distributed Small-Scale MEMS Optical Switches**Peng Zhou¹**, Guangfa Liu¹, Xinglong Zou¹, Liwei Zhu¹, Mengqi Wei¹, Yongcheng Li^{1*}*1. Soochow University, China*

This paper investigates lightpath provisioning for pipeline-parallel (PP) training in a Dragonfly-based all-optical data center network with distributed small-scale micro-electro-mechanical system (MEMS) optical switches. The proposed architecture replaces a centralized large-port-count MEMS switch with multiple small-scale MEMS switches deployed across different pods (PoDs), while preserving the low diameter and scalability of the Dragonfly topology. Based on the predefined local and global fiber mappings, the lightpath provisioning problem is formulated as a joint route and time-slot assignment (RTA) problem for GPU-to-GPU communication requests under different constraints. Three heuristic route selection strategies, namely First-Fit (FF), Traffic-Aware (TA), and Bubble-Aware (BA), are developed. Simulation results show that BA consistently outperforms FF and TA by selecting feasible routes that introduce smaller pipeline bubbles.

17:00-17:15 · ACP2026-0714-63

Lightpath-Aware Pipeline Stage Placement and Heterogeneous GPUs Assignment for Geo-Distributed LLM Training over Optical Networks**Qile Liu¹**, Dianxuan Fu¹, Xingyu Liu¹, Jiaqiu Li¹, Weisheng Hu¹, Qunbi Zhuge^{1*}*1. Shanghai Jiao Tong University, China*

Pipeline parallelism (PP) enables Transformer-based large language model (LLM) training across geo-distributed graphics processing unit (GPU) data centers (DCs), due to its low-frequency and point-to-point communication requirements. In PP, the layers of an LLM are partitioned into multiple sequential stages and assigned to different GPUs. However, in heterogeneous GPU clusters interconnected via Cross-DC optical networks, determining suitable PP stage placement is challenging. Because each placement decision affects the execution time on heterogeneous GPU, the message transfer delay over inter-DC lightpaths and their overlap. This paper proposes LA-GA, a lightpath-aware genetic algorithm for pipeline stage placement in heterogeneous geo-distributed GPU datacenters. It jointly considers stage computation costs, GPU heterogeneity, and routing and wavelength assignment (RWA) to reduce pipeline bubbles. Simulation results on NSFNET and USNET with Llama-7B/13B/34B show that LA-GA reduces iteration time by up to 88.1% and bubble ratio by up to 50.5% compared with baseline schemes.

17:15-17:30 · ACP2026-0630-54

Segment-Path Per-Packet Routing: An Adaptive Scheme Balancing Global Load and Packet Order for MoE Traffic in Optical-Electrical Network**Pengzhan Zheng¹**, Shan Yin^{1*}, Xiaodong Liu¹, Zixin He¹, Mengru Cai¹, Shanguo Huang¹*1. Beijing University of Posts and Telecommunications, China*

This paper proposes Segmented-Path Per-Packet Routing for MoE traffic in optical-electrical networks. The scheme divides an end-to-end path into common and packet-spraying segments, and adaptively adjusts the segmentation point using loss and reordering feedback. It improves packet ordering while preserving path diversity, reducing packet loss and tail latency.

08:30-10:00 · November 3, 2026 · Tuesday

Optical Network Sensing, Monitoring and Resilience

Presider: Yvan Pointurier, Huawei Technologies, France

08:30-09:00 · ACP2026-1012-4 **Invited****Integrated Sensing and Communications in terrestrial optical networks****Emanuele Virgillito^{1*}***1. PoliTo, Italy*

Terrestrial optical networks are pervasive infrastructures spanning vast geographical areas. We investigate the integrated sensing and communication paradigm, transforming existing networks into widespread environmental sensors through streaming telemetry and novel fiber-optic sensing devices.

09:00–09:30 · ACP2026-0831-7 **Invited****From Digital Twins to Autonomous Agents in Optical Network Control****Reda Ayassi^{1*}***1.Huawei, France*

Autonomous agents require an accurate physical-layer model to act safely. We examine how digital twins ground LLM reasoning for service deployment, equalization, and performance prediction, and discuss validation, operation-count reduction, and partitioning for scalability.

09:30–09:45 · ACP2026-0628-3

First Field Trial of Transfer Learning–Based OSNR Estimation for Opto–Electronic Decoupled Optical Networks**Xin Qin^{1*}**, Yuqing Han¹, Qian Hu¹, Xiaotian Jiang¹, Xiankun Zhu¹, Meng Chen¹, Huidi Peng¹, Yadong Gong¹, Xiaoli Huo¹*1.China Telecom, China*

A transfer learning–based OSNR estimation scheme is proposed, for the first time, for opto–electronic decoupled field networks. Validated in a multi–vendor field trial, it reduces MAE by 13.5%–21.46% across four ML models versus direct training.

09:45–10:00 · ACP2026-0630-86

Risk–Aware Machine Learning for Soft–Failure Classification in Optical Networks**Hussein Jammal^{1*}**, **Andrea Bianco¹**, Cristina Rottondi¹*1.Politecnico di Torino, Italy*

Machine Learning (ML)–based approaches for soft–failure classification in optical networks are commonly evaluated using aggregate metrics such as accuracy and F1–score, which fail to capture the operational impact of classification errors. In practice, different types of misclassification carry very different costs for the network operator, since failing to detect a degraded lightpath, raising an unnecessary alarm, and attributing a failure to the wrong root cause have distinct consequences on service continuity and maintenance effort. To address this asymmetry, we introduce a risk–aware multiclass soft–failure classification framework based on a Hybrid Ensemble (HE) architecture, which partitions the feature space into regions and allocates dedicated classifiers to each region. We also propose metrics to quantify the operational cost of classification errors and its distribution across failure types and feature–space regions. To verify that the gains come from forming meaningful feature–space regions rather than from the ensemble structure alone, we compare the HE against an Unguided Hybrid Ensemble (UHE) that follows the same ensemble architecture but whose regions are obtained through generic unsupervised clustering of the input features and unconditional acceptance of the classifiers assigned to those regions. Experiments on a multiclass soft–failure dataset show that the proposed approach improves overall accuracy by approximately 5% over a baseline model trained on the full dataset, while reducing expected decision risk by 95%, risk disparity across feature–space regions by 84%, and risk disparity across failure types by 95%.

10:00–10:30 Coffee Break

10:30–12:00 · November 3, 2026 · Tuesday

Digital Twins and Physical–Layer Optimization

Presider: Danshi Wang, Beijing University of Posts and Telecommunications, China

10:30–11:00 · ACP2026-0911-12 **Invited****Digital Twin for Optical Networks: Data Acquisition and Online Incremental Learning****Xiaomin Liu¹***1.Shanghai Jiao Tong University, China*

This talk presents a field trial demonstrating online continual learning for network performance modeling and QoT optimization under fluctuating traffic loads, integrating this capability with intelligent agents for adaptive network optimization and autonomous decision making.

11:00–11:15 · ACP2026-0629-18

Physical–Domain Prompt–Guided Latent–Space Calibration for Cross–Domain Few–Shot QoT Estimation in Optical Networks**Xue Xiao¹**, Chunyu Zhang², Qian Guo¹, Danshi Wang¹, Min Zhang¹*1.Beijing University of Posts and Telecommunications, China; 2.University of Science and Technology, China*

We propose a physical–domain prompt–guided latent–space calibration framework for few–shot cross–domain QoT estimation under heterogeneous physical–layer configurations, achieving 0.0316 OSNR–prediction MSE and 98.96% lightpath–feasibility accuracy using only four target–domain samples in four representative transfer scenarios.

11:15–11:30 · ACP2026-0701-192

Weakly Physics–Guided Fourier Neural Operator for Accurate EDFA Gain Spectrum Modeling**Yanqin Wang¹**, Yifeng Gao¹, Yicheng Jin¹, Junwen Guo¹, Yuqi Li², Ming Tang², Gangxiang Shen¹, Ning Liu^{1*}*1.Soochow University, China; 2.Huazhong University of Science and Technology, China*

We propose a weakly physics–guided Fourier neural operator for EDFA gain–spectrum prediction. The proposed model outperforms pure FNO and DeepONet–FNO baselines, reducing active–channel MAE from 0.1413 dB to 0.0521 dB.

11:30–11:45 · ACP2026–0701–200

Model-Free Telemetry-Based Online Power Prediction in Optical SystemsShuang Xie^{1*}, Dmitrii Briantcev^{1*}, Sumaiya Ali¹, Daniel Kilper¹*1. Trinity College Dublin, Ireland*

We introduce a model-free, telemetry-based method for one-step-ahead power prediction during single-channel add/drop operations, without ML training or device-level models. On a 290 km field link, it reaches 0.06 dB receiver-side MAE under dense loading.

11:45–12:00 · ACP2026–0701–230

Cross-EDFA Transfer of Channel Provisioning–Risk KnowledgeKaixuan Sun¹, Joshua Kempton¹, Dan Kilper^{1*}*1. Trinity College Dublin, Ireland*

We introduce channel provisioning–risk ranking via source-supervised transfer learning to identify worst-case EDFA power dynamics in wavelength assignment. Experiments show 80% recall of high-tilt worst cases after evaluating only 15.6% of candidates using load-only features.

13:30–15:00 · November 3, 2026 · Tuesday

Intelligent Optical Network Technologies and Quantum Networking

Presider: Xiaoliang Chen, University of Science and Technology of China, China

13:30–14:00 · ACP2026–0701–90 **Invited****Autonomous Metro Access Networks using Photonics Integrated SOA-based Switch Nodes**Nicola Calabretta^{1*}*1. Eindhoven University of Technology, Netherlands*

We propose an orchestration-informed reinforcement learning framework for autonomous cascaded SOA switch nodes. Guided by a Digital Twin baseline, the framework achieves fast optimization convergence, significantly reduces power consumption, and ensures stable transmission quality.

14:00–14:30 · ACP2026–0628–16 **Invited****Emerging Quantum Networking Problems over Fibers, Satellites, and HAPs**Qinglong Huang¹, Zheng Zhang¹, Qiaolun Zhang^{1*}, Jiaheng Xiong¹, Massimo Tornatore¹*1. Politecnico di Milano, Italy*

This talk focuses on several emerging resource-allocation problems for QKD networking over fibers, satellites, and HAPs, highlighting energy-efficient, resilient, and secure designs, while outlining key research challenges for future entanglement-based quantum networks.

14:30–14:45 · ACP2026–0701–109

Simultaneous Suppression of Positive and Negative Crosstalk Orders for LCoS–WSSs using CNN-Based DeconvolutionJiacheng Yan¹, Yuzhe Li¹, Bodong Shi¹, Zihuan Mo¹, Chen Liu^{1*}*1. Huazhong University of Science and Technology, China*

We propose neural-network-based deconvolution for crosstalk suppression in wavelength selective switches (WSSs). Experimental validation on a 32-port WSS demonstrates simultaneous suppression of positive and negative orders with 25 dB isolation, potentially doubling the port count.

14:45–15:00 · ACP2026–0701–72

Memory-Augmented LLM Agent for GSNR Power Optimization in S+C+L-Band Optical SystemsKaida Chen¹, Cong Wang¹, Junzhe Xiao¹, Zekun Niu^{1*}, Weisheng Hu¹, Lilin Yi^{1*}*1. Shanghai Jiao Tong University, China*

A memory-augmented LLM agent uses phase-conditioned strategy recommendations to optimize GSNR power in S+C+L-band optical systems, reducing ripple and inference cost across 80-, 160-, and 240-km spans under limited interaction budgets with stable generalization results.

15:30–17:30 Coffee Break & Poster Session

N3: Optical Network Architectures, Control and Management (Parallel Session)

Conference Room 102B, 1F

13:30–14:45 · November 3, 2026 · Tuesday

Optical Access and Satellite Networks

Presider: Jiawei Zhang, Beijing University of Posts and Telecommunications, China

13:30–14:00 · ACP2026–0908–10 **Invited**

AI-assisted System Recovery Design for Very High-Speed TDM-Flexible PON

Yanni Ou^{*}

1. Beijing University of Posts and Telecommunications, China

This work explores DSP and preamble design trade-offs for 100–200 Gbps TDM-based IM/DD flexible bandwidth-limited PONs. Proposed methods apply AI-assisted approach with evaluation of system complexity, receiver sensitivity, power budget, and transmission performance.

14:00–14:15 · ACP2026–0630–93

Real-Time Demonstration of 25G-Granularity P2MP, Featuring Automatic Power Control and Hitless Capacity Upgrade

Tiago Silvério^{1,2}, Sasipim Srivallapanondh¹, Amir Rashidinejad³, Miquel Masanas¹, Rafal Kapuscinski⁴, Giuseppe Parisi¹, Mohammad M. Hosseini¹, Steven J. Hand⁵, Luis Velasco², Antonio Napoli¹

1. Nokia Solutions and Networks GmbH & Co., Germany; 2. Universitat Politècnica de Catalunya, Spain; 3. Nokia Canada Inc., Canada; 4. Nokia Solutions and Networks, Poland; 5. Nokia of America Corporation, United States

We experimentally demonstrate the first Digital Subcarrier Multiplexing (DSCM)-based, Point-to-Multipoint transmission with 25Gbps granularity, hitless capacity upgrade, enabled by LEAF power optimization. Our solution is achieved within a 50GHz-grid, a relevant requirement for metro/access architectures.

14:15–14:30 · ACP2026–0701–8

Degradation-Aware Resource Allocation for LEO Satellite Networks Under Solar Radiation Storm

Hao Zhou¹, Long Chen², Zheng Zhang¹, Qiaolun Zhang^{1*}, Zhenggen Chen³, Meihan Wu¹, Xiaoyi Fan⁴, Cong Zhang², Yanran Xiao¹, Li-Chun Wang³, Francesco Musumeci¹, Massimo Tornatore¹

1. Politecnico di Milano, Italy; 2. Simon Fraser University, Canada; 3. National Yang Ming Chiao Tung University, China; 4. Jiangxing Intelligence Inc, China

We propose a time-varying model of solar energetic particle-induced capacity degradation in optical inter-satellite links and evaluate routing on a Starlink-based LEO topology, reducing average completion time by up to 16.0% during severe storm conditions.

14:30–14:45 · ACP2026–0714–43

Sun-Aware Computing Task Offloading and Routing in Optical Satellite Network with Space Datacenters

Zhuangzhuang Ma¹, Yongli Zhao^{1*}, Wei Wang¹, Yuan Cao², Yi An¹, Jie Zhang¹

1. Beijing University of Posts and Telecommunications, China; 2. Nanjing University of Posts and Telecommunications, China

In LEO optical computing networks, solar geometry imposes two deterministic constraints: eclipses deplete satellite batteries and sun outages block result return. We propose SALT, a sun-aware offloading and routing algorithm improving end-to-end task completion by up to 80%.

15:30–17:30 Coffee Break & Poster Session

N4: Optical Access and Last-Mile Networks

Conference Room 103C, 1F

13:30–15:30 · November 3, 2026 · Tuesday

Optical sensing and communication in access networks

Presider: Shikui Shen, China Unicom, China

13:30–14:30 · ACP2026-0902-11 **Tutorial**

AI-integrated Fibre Access & Broadband Customer Network (AI-FAN): Evolution of xPON, FTTR and AI Convergence Zhicheng Ye^{1*}

¹.Huawei, China

The integration of AI into broadband infrastructure generates new value strata, operationalized through three paradigmatic shifts for service provider: "AI Agentic as a Service" establishes a novel value proposition within the in-premises network devices, "Quality on Demand" transforms network performance into a tradable performance tier, and the "Self-Optimizing Network" materially enhances operational excellence via closed-loop automation. These intelligent capabilities are expected to drive non-linear growth in traffic and processing requirements, accelerating the decentralisation of computing resources toward the edge and into elementary network nodes. Consequently, the broadband ecosystem will evolve into a cognitively converged fabric of connectivity and computation, unlocking durable revenue streams and competitive differentiation for service providers.

14:30–15:00 · ACP2026-0701-19 **Invited**

Digital Signal Processing and Optical Sensing for Future Optical Access Networks Hwan Seok Chung¹

¹.ETRI, Korea

This paper reviews DSP technologies for C-band VHSP operation and discusses ODN monitoring techniques for assessing network performance, link conditions, and signal quality toward future optical access networks.

15:00–15:15 · ACP2026-0701-164

Mueller Matrix Analysis-based Forward Sensing in TDM-CPON

Yiwen Zhang¹, Yuhao Fang¹, Pu Zhou¹, Jiwei Xie¹, William Shieh^{1*}

¹.Westlake University, China

We propose and experimentally demonstrate the first Mueller-matrix-based sensing scheme for TDM-CPON, achieving ~11 m at a 40 km fiber with reliable data transmission and robust common phase noise resistance.

15:15–15:30 · ACP2026-0713-2

Experimental Demonstration of Similarity-Based DSP Monitoring for Discriminating ODN Loss Variation and OLT Transmitter Performance Degradation in 50G-PON ONU Receiver

Han Hyub Lee¹, Kyungmin Woo¹, Chung Hwan Seok¹

¹.Electronics and Telecommunication Research Institute, Korea

We experimentally demonstrate a receiver-side DSP method using cosine similarity of normalized FFE tap coefficient profiles to distinguish ODN loss from OLT EML degradation in 50G-PON ONU receivers without additional monitoring hardware under similar received power changed.

15:30–17:30 Coffee Break & Poster Session

N4: Optical Access and Last-Mile Networks

Conference Room 102C, 1F

08:30–09:45 · November 4, 2026 · Wednesday

Key technologies for VHSP (1)

Presider: Hanhyub LEE, ETRI, Korea

08:30–09:00 · ACP2026-0826-2 **Invited**

Coherent PON Transceivers: Design Trade-Offs and Implementation Considerations

Gabriele Di Rosa^{1*}

1. Adtran Networks SE, Germany

Future coherent PON transceivers should leverage mature optical transport designs while meeting the specific requirements of access networks. This presentation examines key trade-offs and implementation considerations for adapting coherent technology to PON systems.

09:00–09:30 · ACP2026-0628-8 **Invited**

Candidate Technologies and Challenges of Next-Generation Very High-Speed PON

Guoqiang Li¹

1. ZTE, China

This presentation reviews recent standardization progress of the next-generation very high-speed passive optical network (VHSP), analyzes candidate technologies including system architectures, advanced modulation formats and multiplexing schemes, and discusses major technical challenges.

09:30–09:45 · ACP2026-0701-160

47-dB Power Budget Bidirectional 256-Gb/s Coherent PON with a Laser-Free ONU over 25-km Hollow-Core Fiber

Yutong Pan¹, Tianhong Zhang¹, Yixiao Zhu^{2*}, Shikui Shen^{3*}, Yu Qin^{4,5}, Wenhao Wang⁶, Yichun Shen⁵, Ning Zhang⁶, Limin Xiao⁴, Shuailuo Huang³, Zelin Wang³, Fan Zhang^{1,7*}

1. Peking University, China; 2. Shanghai Jiao Tong University, China; 3. China Unicom Research Institute, China; 4. Fudan University, China; 5. Zhongtian Technology Advanced Materials Co., Ltd., China; 6. SiFotonics Technologies Co. Ltd., China; 7. Peng Cheng Laboratory, China

We demonstrate bidirectional 256-Gb/s coherent PON over 25-km HCF with a laser-free ONU using remotely delivered LO and CW carrier, packaged SiP coherent receivers, and achieving 47/49-dB downstream/upstream power budgets at the 15% SD-FEC threshold.

10:00–10:30 Coffee Break

10:30–12:00 · November 4, 2026 · Wednesday

Key technologies for VHSP (2)

Presider: Jim Zou, Adtran Networks, United States

10:30–11:00 · ACP2026-0630-115 **Invited**

Overview of Digital Chromatic dispersion Pre-Compensation (DCPC) techniques for Very High Speed PON

Roberto Gaudino^{1*}

1. Politecnico di Torino, Italy

We overview the performance and options for Digital Chromatic dispersion Pre-Compensation (DCPC) for downstream Very High Speed PON based on IM-DD transmission, showing our experimental results at 100G and simulations at 200G.

11:00–11:30 · ACP2026-0712-7 **Invited**

Carrier Leakage Suppression and Power Difference Equalization for TFDMA Coherent PON

Ji Zhou^{1*}, Haide Wang², Liangchuan Li^{1*}, Changyuan Yu³, Xiangjun Xin¹

1. Beijing Institute of Technology, Zhuhai, China; 2. Guangdong Polytechnic Normal University, China; 3. The Hong Kong Polytechnic University, Hong Kong, China

In this invited talk, we demonstrate the carrier leakage suppression and power difference equalization based on semiconductor optical amplifier (SOA) for TFDMA-based coherent PON, and propose a nonlinearity compensation algorithm to deal with SOA-induced nonlinear distortion.

11:30–11:45 · ACP2026-0701-167 **Industry Innovation Nomination****Low-Complexity 1-Order IIR Notch Filter for Efficient DC Leakage Frequency Estimation and Removal with 8.4-dB Tolerance Gain in 200G Upstream Coherent TDM-PON****Yicheng Xu¹**, Yixiao Zhu¹, Yongxin Sun¹, Weisheng Hu¹, Qunbi Zhuge^{1*}¹.Shanghai Jiao Tong University, China

We propose a DC leakage tracking and removal scheme with accurate frequency estimation and low-complexity notch filter for 200G upstream coherent TDM-PON. 6-dB power budget gain and 8.4-dB DC leakage tolerance improvement are experimentally achieved.

11:45–12:00 · ACP2026-0630-104

High Power Budget 160 Gbps PAM-4 Transmission for Next-Generation PONs Using Si-Ge PD**Xishan Yu¹**, Chao Cheng¹, Shenlei Bao¹, Xianglin Bu¹, Wenfu Zhang¹, Zhiyuan Yu^{1*}, Binhao Wang^{1*}¹.State Key Laboratory of Ultrafast Optical Science and Technology, Xi'an Institute of Optics and Precision Mechanics Chinese Academy of Sciences, China

To address the core physical-layer bottlenecks of bandwidth limitation and stringent power budgets in next-generation optical access networks, we propose and experimentally demonstrate a high-performance optical access architecture based on the synergistic architecture of a continuous-wave (CW) light at 1310 nm high-power distributed feedback (DFB) laser diode, wideband 67-GHz MZM, a high-gain semiconductor optical amplifier (SOA) pre-amplifier, and a custom-fabricated 57-GHz silicon-germanium photodiode (Si-Ge PD). Under the standard hard-decision forward error correction (HD-FEC) threshold, total power budgets of up to 32.2 dB and 31.4 dB are achieved for 128 Gbps and 160 Gbps transmission, respectively. This hardware-driven approach effectively circumvents the bandwidth bottlenecks and power budget constraints without relying on complex digital signal processing (DSP).

13:30–15:00 · November 4, 2026 · Wednesday

AI and access network

Presider: Dezhi Zhang, China Telecom, China

13:30–14:00 · ACP2026-0901-3 **Invited****AI Empowerment: Exploration on Intelligent Evolution of Optical Access Network****Yue Sun¹**¹.China Unicom, China

With the advent of the AI era, traditional access networks struggle to support elastic demands of AI-native services. This program investigates intelligent optical access network evolution toward computing-network integration, presenting technical paths, standards and trials for AI-broadband networks.

14:00–14:30 · ACP2026-0902-2 **Invited****Learning-Aware Optical Transport for Distributed AI over Mobile Networks****Emilio Paolini¹**¹.Scuola Superiore Sant'Anna, Italy

Federated learning over mobile networks generates asynchronous, deadline-sensitive traffic poorly matched to optical circuit switching. This talk explores learning-aware RAN aggregation and optical transport coordination, transforming distributed AI updates into predictable, schedulable high-capacity transfer demands.

14:30–15:00 · ACP2026-0721-7 **Invited****Multi-Agent Collaborative Optimization for Distributed Fiber-Optic Sensing-Computing Integration****Zhiqun Gu^{1*}**¹.Beijing University of Posts and Telecommunications, China

To enhance optical-network reliability, this work develops a multi-agent collaborative sensing-computing architecture that jointly optimizes distributed sensing and computing resources, suppresses multifrequency noise, and enables attention-based, accurate identification and localization of fiber-cable external threat events.

15:30–16:00 Coffee Break

16:00–17:00 · November 4, 2026 · Wednesday

New applications of access networks

Presider: Junwen Zhang, Fudan University, China

16:00–16:30 · ACP2026-0908-3 **Invited****Research and Verification of PON-Based Computing–Networking–Control Integrated Industrial Control System****Ziyao Yang**^{1*}*1.China Telecom Research Institute, China*

This paper leverages built-in PON computing power, integrating soft-PLC and deterministic OT-CT coordination to build an optical-computing-industrial-application system validated in mine scenarios.

16:30–16:45 · ACP2026-0713-16

Quality-of-Transmission-Aware Bandwidth Allocation for RAN Fronthaul over Flexible PON**Shangya Han**¹, Kai Jin¹, Yanlu Huang¹, Liyan Wu¹, Kun Xu¹, Yanni Ou^{1*}*1.Beijing University of Posts and Telecommunications, China*

A quality-of-transmission (QoT)-aware dynamic bandwidth allocation (DBA) algorithm is proposed for a time-division multiplexing flexible passive optical network (TDM Flex-PON) fronthaul architecture to better support vehicle-to-infrastructure (V2I) communications.

16:45–17:00 · ACP2026-0709-2

DARS: Reliability-Aware Joint Wi-Fi-PON Scheduling for FTTR Networks**Shun Zhao**¹, Jinhan Cai¹, Biswanath Mukherjee², Gangxiang Shen^{1*}*1.Soochow University, China;2.Department of Computer Science University of California, China*

This paper proposes DARS, a distributed resource unit (DRU)-aware reliable scheduling scheme for fiber-to-the-room (FTTR) networks that leverages Wi-Fi 8 DRUs to enhance wireless transmission reliability under frequency-selective fading. Unlike conventional FTTR scheduling schemes that mainly rely on queue status, traffic priority, or scheduled capacity, DARS formulates the scheduling decision as a regular resource unit (RRU)/DRU mode selection problem, evaluates RRU- and DRU-mode candidates through an effective signal-to-interference-plus-noise ratio (SINR)-based link abstraction, and selects the mode that maximizes the expected served bits. The expected wireless goodput is further used to guide next-cycle passive optical network (PON) pre-grant allocation. Simulation results show that DARS reduces the wireless retransmission ratio from about 18.2% to below 1%, decreases the 99th-percentile end-to-end (E2E) delay of voice (VO) and video (VI) traffic from 6.9/10.1 ms to 2.9/4.0 ms, and lowers the PON pre-grant mismatch ratio from 19.6% to 1.3%.

T1: Short-Reach Transmission Systems for Data-Center, Access, and Mobile Networks

Multi-function Hall A, 1F

13:30-15:30 · November 2, 2026 · Monday

FSO and Wireless Access

Presider: Jiahao Huo, University of Science and Technology Beijing, China

13:30-14:00 · ACP2026-0908-12 **Invited**

Enabling Could Radio Access Network (C-RAN): Why precise clock and carrier frequencies are essential and how to synchronise them

Zhixin Liu¹

1. University London College, United Kingdom

Future networks will require the convergence of fibre and wireless systems, together with new network capabilities beyond conventional data transmission. In this talk, I will present our published work on clock and carrier-frequency synchronisation for multifunctional radio access networks, with a particular emphasis on the co-transmission of clock and data signals over commercial fibre links.

14:00-14:30 · ACP2026-0701-172 **Invited**

Conflict-Aware Local Search for Single-Mirror OIRS Path Assignment in a 16-Rack FSO Data Center Pod

Yulin Wang¹, Fengyuan Tian¹, Xiaomin Cai¹, Cenqin Jin², Gan Zheng¹, Tianhua Xu^{1*}

1. University of Warwick, United Kingdom; 2. Nanjing University of Industry Technology, China

Conflict-aware local search assigns OIRS-assisted FSO paths in a 16-rack data-center pod, jointly accounting for rack and panel conflicts, link reliability, pointing error, and blockage while achieving near-optimal goodput under varied deployment conditions and loads.

14:30-15:00 · ACP2026-0701-218 **Invited**

Recent Progress of Millimeter-Wave and Optical Wireless Communications for Intra-Data Center Networks

Boli Wei¹, Li Pei¹, Zhouyi Hu^{1*}

1. Beijing Jiaotong University, China

Wireless intra-data center networks leveraging millimeter-wave or free-space optical links have attracted growing attention for improved flexibility and reconfigurability. This invited paper reviews recent advances and key challenges in this field.

15:00-15:30 · ACP2026-0625-9 **Invited**

Toward Converged Fixed-Mobile Coherent Optical Access Networks via Digital-Analog Hybrid Transmission

Qi Wu^{1*}, Chao Lu¹, Alan Pak Tao Lau¹, Kangping Zhong¹

1. The Hong Kong Polytechnic University, Hong Kong, China

We present several recent advances toward the integration of fixed and mobile optical access networks for efficient utilization of optical infrastructure, enabled by digital-analog hybrid modulation and detection techniques supporting both IM-DD and coherent solutions.

15:30-16:00 Coffee Break

16:00-17:30 · November 2, 2026 · Monday

Advanced Coding Technology

Presider: Tianwai Bo, Beijing Institute of Technology, China

16:00-16:30 · ACP2026-0818-2 **Invited**

Low-Power, High-Speed Optical Interconnects Enabled by Tomlinson-Harashima Precoding

Guoxiu Huang^{1*}

1. FINITY Inc., Japan

Ultra-high-speed optical interconnects such as 1.6T and 3.2T require wider analog bandwidth in transceivers, which increases power consumption. Tomlinson-Harashima Precoding enables lower-power operation using 1-sps DSP, higher transmit power and reducing bandwidth requirements.

16:30–16:45 · ACP2026–0701–186

FFE-Guided Cross-Module Low-Complexity LDPC Decoding for Coherent Optical Receivers**Pengfei He¹**, Mingyang Guo¹, Yifan Wang¹, Yanlu Huang¹, Liyan Wu¹, Yanni Ou^{1*}, Kun Xu¹*1.State Key Laboratory of Information Photonics and Optical Communications Beijing University of Posts and Telecommunications, China*

We propose a cross-module low-complexity LDPC decoding architecture driven by external FFE outputs. Experimental results in a 40-Gbaud coherent QPSK system demonstrate a 57.6% decoding complexity reduction while maintaining near-SPA error-correction performance.

16:45–17:15 · ACP2026–0831–1 **Invited****Chaotic Encryption for Secure Optical Data-center Interconnects****Calvin Chun-Kit Chan^{1*}**, Xiaoqian Liu¹*1.The Chinese University of Hong Kong, Hong Kong, China*

We discuss the design of chaotic encryption schemes for optical data-center interconnect links in both IM/DD and coherent-lite systems.

17:15–17:30 · ACP2026–0701–207

Low-Coherence ASE Source for SCBI Mitigation in Weakly-Coupled IM/DD-MDM Systems**Kuohai Zhang¹**, Sihong Bao¹, Youle Ni¹, Xian Zhou¹, Yuyang Gao^{1*}, Libin Song², Jun Ma², Guangsheng An²*1.University of Science and Technology Beijing, China; 2.CH Business Division BAIC Motor Co. Ltd., China*

A physical-layer SCBI mitigation scheme using ASE low-coherence sources is proposed for weakly-coupled MDM-IM/DD systems. Broadening SCBI spectra via ASE bandwidth enables electrical filtering suppression.

08:30–10:00 · November 3, 2026 · Tuesday

Impairments Mitigation

Presider: Kangping Zhong, The Hong Kong Polytechnic University, Hong Kong, China

08:30–08:45 · ACP2026–0713–15

Low Complexity Sub-band Volterra Equalizer For EML-based IM/DD System**Fuchan Xue¹**, Tianwai Bo^{1*}, Yihao Zhou¹, Zhongwei Tan¹, Yi Dong¹*1.Beijing Institute of Technology, China*

We propose to utilize a sub-band Volterra equalizer (SBVE) to mitigate nonlinear distortions in an intensity-modulation/direct-detection system. It achieves similar bit error ratio performance with 20% computational complexity as the conventional full-band Volterra equalizer.

08:45–09:00 · ACP2026–0715–34

High Sensitivity and RIN-Tolerant Multipath Interference Localization in IM/DD PAM4 Systems by Conditional Power Difference**Shen Wang¹**, Xuecheng Ren¹, Rui Wang¹, Shaohua Hu¹, Jing Zhang^{1*}, Kun Qiu¹*1.University of Electronic Science and Technology of China, China*

We propose and experimentally demonstrate a conditional power difference (CPD) method for MPI localization in IM/DD PAM4 systems. This approach maximizes beat components and suppresses intensity noise, successfully detecting MPI at 40-dB SIR.

09:00–09:15 · ACP2026–0630–117

Reset-Free Adaptive Polarization Control for LiNbO3 Polarization Controller in Self-Coherent Detection Systems**Lei Pang^{1,2}**, Haojie Zhu³, Jinhong Xu², Yuhao Fang³, Weiqi Lu³, Puzhen Yuan³, Dayu Shi³, Hao Chi¹, William Shieh^{3*}*1. Hangzhou Dianzi University, China; 2. Westlake Institute for Optoelectronics, China; 3. Westlake University, China*

We demonstrate a reset-free LiNbO3 adaptive polarization controller featuring momentum-assisted center-attraction stochastic parallel gradient descent (MCA-SPGD), elastic-boundary operation, and 12.5-krad/s tracking. 640-Gb/s self-coherent transmission over 50-km SSMF is successfully demonstrated.

09:15–09:30 · ACP2026–0701–158

Residual-Carrier Vector Compensation Enabling Nearly DSP-Free Coherent Transmission over 25-km Hollow-Core Fiber with MHz Lasers**Tianhong Zhang¹**, Yutong Pan¹, Yu Qin^{2,3}, Yixiao Zhu^{4*}, Xiang Cai¹, Shikui Shen^{5*}, Yichun Shen³, Limin Xiao², Shuailuo Huang⁵, Zelin Wang⁵, Xian Zhou⁶, Fan Zhang^{1,7*}*1.Peking University, China; 2.Fudan University, China; 3.Zhongtian Technology Advanced Materials Co., Ltd., China; 4.Shanghai Jiao Tong University, China; 5.China Unicom Research Institute, China; 6.University of Science and Technology Beijing, China; 7.Peng Cheng Laboratory, China*

We demonstrate residual-carrier-vector-compensated coherent-lite transmission over 25-km hollow-core fiber using 1-MHz DFB lasers. The receiver reconstructs 2×32-Gbaud 32QAM signals without adaptive equalization or carrier phase recovery, reducing receiver-side DSP complexity by 87.4% – 97.3%.

09:30–10:00 · ACP2026–0630–4 **Invited****"3U" Optical Interconnection Technology Towards Data Center Application****Chao Yang**^{*}*1. China Information Communication Technologies Group Corporation, China*

Driven by booming AI traffic, we propose diverse optical interconnection schemes leveraging SDM/WDM, MCF, HCF and silicon photonics to deliver high capacity, low latency and low power amid inherent physical constraints.

10:00–10:30 Coffee Break

10:30–12:00 · November 3, 2026 · Tuesday

High-Speed PON

Presider: Ming Luo, China Information and Communication Technologies Group Corporation, China

10:30–11:00 · ACP2026–0831–3 **Invited****Flexible PON Enabled by Asymmetric Polar-BCH Product Codes****Bin Chen**^{*}, Yifan Ye¹*1. Hefei University of Technology, China*

We propose a flexible-rate product code combining BCH and polar codes for coherent/IMDD PONs. Experimental validation shows up to 1.75-dB gain over hard-decision product codes and fine-grained rate adaptation, making it a highly suitable FEC solution for future high-speed and flexible PONs.

11:00–11:15 · ACP2026–0701–112

256 Gb/s Coherent PON over 25-km Hollow-Core Fiber with 52-dB Power Budget**Yutong Pan**¹, Tianhong Zhang¹, Yu Qin^{2,3}, Yixiao Zhu⁴, Wenhao Wang⁵, Shikui Shen^{6*}, Yichun Shen³, Ning Zhang⁵, Limin Xiao², Shuailuo Huang⁶, Zelin Wang⁶, Fan Zhang^{1,7*}

1. Peking University, China; 2. Fudan University, China; 3. Zhongtian Technology Advanced Materials Co., Ltd., China; 4. Shanghai Jiao Tong University, China; 5. SiFotonics Technologies Co. Ltd., China; 6. China Unicom Research Institute, China; 7. Peng Cheng Laboratory, China

We demonstrate a 256 Gb/s coherent PON over 25-km hollow-core fiber, achieving 52-dB power budget at the 15% SD-FEC threshold through reduced nonlinear impairment, with 11-dB improvement over SSMF under identical configuration.

11:15–11:30 · ACP2026–0713–13

Fast Convergence Joint Clock Recovery and Equalization for Non-integer-oversampling 200G DP-IM PON Burst Reception**Junxu Tang**¹, Jing Li¹, Zou Yang², Pengzhuo Sun¹, Zhen Tong¹, Shenmao Zhang¹, Xiaoxiao Dai^{1,3*}, Yang Qi^{1,3}, Liu Deming^{1,3}, Li Guo-qiang⁴, Huang Xingang⁴, Huang Xiatao⁴

1. Huazhong University of Science and Technology, China; 2. ByteDance Ltd., Beijing, China; 3. Shenzhen Huazhong University of Science and Technology Research Institute, Albania; 4. State Key Laboratory of Mobile Network and Mobile Multimedia Technology, China

A 1.6-sps joint CDR and TMM receiver DSP scheme is demonstrated for 200G upstream DP-IM coherent PON burst reduce sampling and interpolation complexity with only 0.12-dB sensitivity penalty relative to a 2-sps reference.

11:30–12:00 · ACP2026–0908–1 **Invited****Optical modulation alternatives for direct-detection based VHSP downstream****Ivan Cano**^{*}*1. Huawei, Germany*

This talk explores alternative modulation schemes for VHSP downstream transmission. The primary objective is to preserve direct-detection at the ONUs while centralizing transmitter complexity at the OLT and guaranteeing coexistence with legacy PON systems

13:30–15:30 · November 3, 2026 · Tuesday

Optoelectronics Devices for Short Reach

Presider: Xiang Li, China University of Geosciences, China

13:30–14:00 · ACP2026–0817–2 **Invited****Broadband Single-Drive Optical Single-Sideband Modulation on Thin-Film Lithium Niobate****Changjian Guo**¹*1. South China Normal University, China*

We present a single-drive broadband optical single-sideband modulator on thin-film lithium niobate using an integrated photonic Hilbert transformer, targeting data-center interconnects and LiDAR, with emphasis on broadband sideband suppression, transition-bandwidth limitations, and wavelength-detuning compensation.

14:00–14:15 · ACP2026–0626–1

Modal Bandwidth Requirements and Reach Capability of Multimode Fibers for 200G VCSEL Links Near 1060 nm**Xin Chen**^{1*}, Hao Dong¹, Simit Patel¹, Hao Chen¹, Meagan David¹, Ming-Jun Li¹, Vince E. Ferretti¹*1. Corning Incorporated, United States*

We analyzed OM3/OM4 multimode fiber transmission reaches for 200G VCSEL links near 1060 nm and estimated the modal bandwidth required to support 30–50 m reaches across the operating window.

14:15–14:30 · ACP2026–0715–126

Transmission Performance of Single-Mode VCSEL-Based 400G QSFP112 SR4 over Single-Mode Fiber**Yun Bao**^{1*}, Anbin Wang¹, Wenqiang Sun², Wei Chen², Zhiping Yao²*1. Alibaba Cloud, China; 2. Suzhou Crealights Technology Co., Ltd., China;*

This work demonstrates the transmission performance of a 400G QSFP112 SR4 transceiver over single-mode fiber, enabled by a novel optical design and single-mode VCSELs.

14:30–14:45 · ACP2026–0722–6

A TIR Concentrator Based High-Efficiency Micro-LED Array Optical Interconnect System**Mengze Qi**¹, Dayu Shi¹, Junwei Cao¹, Yu Yan¹, Zhengrong Zhao¹, Yuhao Fang¹, Weiqi Lu¹, Haojie Zhu¹, William Shieh^{1*}*1. Westlake University, China*

A total internal reflection (TIR) concentrator enhanced micro-light-emitting-diode (micro-LED) array based optical interconnect system is demonstrated, achieving a 12.9 dB increase in link budget and 1.2 Gb/s per pixel data rate under 3.8×10^{-3} threshold.

14:45–15:00 · ACP2026–0703–2

Net 3.15 Tb/s O-Band IM/DD DWDM Transmission Over 10-km SMF Enabled by a Quantum-Dot Mode-Locked Laser Frequency Comb for DCIs**Shouchuan Ma**^{1,2}, Quanxin Na¹, Qibing Wang^{1*}, Xu Zhang¹, Jingbin Feng¹, Xingfeng Li¹, Shuchao Mi¹, Yeping Lai¹, Xinke Tang¹, Zhaopeng Xu¹, Shujie Pan^{3,4}, Siming Chen⁴, Lei Wang¹, Jian Song², Zhixue He^{1*}*1. Pengcheng Laboratory, China; 2. Shenzhen International Graduate School, Tsinghua University, China; 3. HS Photonics Co., Ltd. Changsha, China; 4. Institute of Semiconductors, Chinese Academy of Sciences Beijing, China*

We report a record-high single-wavelength rate of 252-Gb/s/ λ for 15-channel O-band IM/DD DWDM transmission over 10-km SMF using a QD-MLL comb. Net capacities of 2.80-Tb/s using 100-Gbaud PAM4 and 3.15-Tb/s using 84-Gbaud PAM8 are achieved.

15:00–15:30 · ACP2026–0831–4 **Invited****Integrated Optical Frequency Combs for Broadband Signal Processing and Optical Communications****Huanfa Peng**^{1*}*1. Karlsruhe Institute of Technology, Germany*

In this talk, we will present our recent progress in optical frequency combs, covering hybrid integration technologies and applications in broadband optical arbitrary-waveform generation and measurement, photonic-electronic analog-to-digital conversion, and high-speed optical communications.

15:30–17:30 Coffee Break & Poster Session

T2: Optical Transmission Systems

Multi-function Hall B, 1F

13:30–15:30 · November 2, 2026 · Monday
High-Speed Coherent Transmission and DSP
 Presider: Fan Zhang, Peking University, China

13:30–14:30 · ACP2026-0805-1 **Tutorial**

Key Technology Breakthroughs in Coherent Optical Transmission: From 100G to 1.6T and Beyond **Minggang Si¹**

1. Huawei Technologies, Co., Ltd, China

This tutorial reviews key technology breakthroughs that shaped coherent optical transmission — from digital carrier recovery enabling 100G, through SD-FEC, PCS, and InP modulator advances, to the 1.6T frontier. Each breakthrough created a step up. What comes next?

14:30–15:00 · ACP2026-0828-1 **Invited**

Evaluation and Mitigation of the EEPN Penalties in OIF 1600ZR+ and ITU-T B1T-OTN Transmission Systems **Xiang Liu^{*}, Qirui Fan¹, Sisi Tan²**

1. Huawei Hong Kong Research Center, Hong Kong, China; 2. Huawei Technologies, China

We review recent progresses on the mitigation of the equalization-enhanced phase noise (EEPN) penalties in OIF 1600ZR+ and ITU-T beyond-1Tb/s optical transport network (B1T-OTN) systems via optimized laser frequency noise mask and DSP-based EEPN compensation.

15:00–15:15 · ACP2026-0701-233

Pilot-tone-free Ultra-Fast RSOP Tracking for 800G ZR Digital Subcarrier-Multiplexed Coherent Transmission **Dongxu Lu¹, Lei Pang^{1,2}, Yuhao Fang³, Dayu Shi³, William Shieh^{3*}**

1. Westlake Institute for Optoelectronics, China; 2. Hangzhou Dianzi University, China; 3. Westlake University, China

We propose a novel scheme for tracking ultra-fast rotation of the state of polarization (RSOP) in digital subcarrier-multiplexed (DSCM) coherent systems, featuring pilot-tone-free 50-Mrad/s RSOP tracking over an 800-Gb/s ZR-class transmission link.

15:15–15:30 · ACP2026-0714-59

Reliability-Weighted Hybrid Stokes-Jones Tracking for Sparse-Pilot Fast Polarization Demultiplexing in Coherent DP-16QAM System

Yumin Zhang¹, Guangzhe Wu¹, Mingming Zhang¹, Zichen Qian¹, Xinyu Hao¹, Hao Wu¹, Ming Tang^{*}

1. Huazhong University of Science and Technology, China

Reliability-weighted Stokes-Jones tracking enables sparse-pilot DP-16QAM polarization demultiplexing in coherent optical-fiber links. At 50 Mrad/s RSOP and 0.390625% pilot overhead, it reduces mean BER from 6.68×10^{-2} to 4.34×10^{-4} , outperforming block Jones tracking.

15:30–16:00 Coffee Break

16:00–17:30 · November 2, 2026 · Monday
Space-Division Multiplexing and Multicore Amplification
 Presider: Fan Yu, Huawei Optical Product Line Planning Department, China

16:00–16:30 · ACP2026-0824-1 **Invited**

Recent advances in space-division multiplexed transmission **Georg Rademacher^{*}**

1. University of Stuttgart, Germany

This invited talk presents breakthrough results in space-division multiplexing, including 19-core RC-MCF and 55-mode transmission, demonstrating unprecedented capacity and scalability. It further introduces novel DSP techniques enabling robust, efficient processing for next-generation SDM optical systems.

16:30–16:45 · ACP2026–0630–85

620-km Field-Deployed Transmission over a Submarine 7-Core Fiber Cable: A Record in Distance and Per-Core Capacity-Distance Product**Ruqi Chen**^{1*}, Yifan Zhang^{1*}, Yingyu Chen¹, Hanyu Gao¹*1.Sun Yat-sen University, China*

We demonstrate a record—long 620-km transmission over a field-deployed 7-core submarine fiber cable in the South China Sea, achieving a per-core capacity-distance product of 22.14 Pbit/s-km (net 17.7Pbit/s-km) —the highest ever reported for a field-deployed submarine MCF cable. The projected aggregate capacity-distance product across all seven cores reaches 155 Pbit/s-km, confirming the viability of MCF based submarine systems for next-generation transoceanic communication.

16:45–17:00 · ACP2026–0630–81

Fast-Converging Spatially Pre-Whitened LMS MIMO Equalization for MDL-Impaired Long-Haul Mode-Division Multiplexing Systems**Xiuli Ji**^{1,2}, Lingguo Cao¹, Gao Ye¹, Zhongliang Sun¹, Yingxiang Jia¹, Yaojun Qiao^{2*}, Jinlong Wei^{1*}*1.Pengcheng Laboratory, China;2.Beijing University of Posts and Telecommunications, China*

We propose a spatial pre-whitened LMS MIMO equalization scheme to mitigate MDL-induced slow convergence in long-haul strongly coupled MDM systems by reducing input covariance eigenvalue spread, achieving 2.5-fold faster convergence and 15% lower steady-state MSE.

17:00–17:15 · ACP2026–0701–10

A Highly Integrated 4-Core EDFA with a Record-low Noise Figure**Bowen Zhang**¹, Yanze Wang¹, Yu Wang¹, Shigui Zhang^{2,3}, Liping Ma^{2,3}, Yan Wang^{2,3}, Lingli Wang⁴, Jiajun Yuan⁴, Jiannan Lu⁴, Zhanhua Huang¹, Yaping Liu^{1*}, Lin Zhang^{1*}

1.State Key Laboratory of Precision Measuring Technology and Instruments, Key Laboratory of Opto-Electronic Information Technology of Ministry of Education, Tianjin Key Laboratory of Integrated Opto-Electronics Technologies and Devices, School of Precision Instruments and Opto-Electronics Engineering Tianjin University, China;2.HMN Technologies Co., Ltd., China;3.Jiangsu Key Laboratory for Subsea Communications and Sensing, China;4.Advanced Fiber Resources (Zhuhai), Ltd., China

We demonstrate a highly integrated 4C-EDFA incorporating a low-loss 4C-IWDM and the first reported 4C-IGFF, achieving 14.71-dB average gain, 0.95-dB gain ripple, and record-low NF below 4.40 dB.

17:15–17:30 · ACP2026–0701–66

Operating-Condition-Aware Modeling for Channel-Resolved C+L-Band Effective Inter-Core Crosstalk Budgeting in a Weakly Coupled Dual-Core EDFA**Wuyan Wang**¹*1. Huazhong University of Science and Technology, China*

We evaluate effective inter-core crosstalk spectra for a C+L-band dual-core EDFA, reveal pump-power- and WDM-loading-dependent mean-crosstalk variation and worst-channel risks, and develop an operating-condition-aware model that outperforms baselines in held-out spectral and worst-channel budget prediction.

08:30–10:00 · November 3, 2026 · Tuesday

Integrated Optical Fiber Sensing and Communication

Presider: Xian Zhou, University of Science and Technology Beijing, China

08:30–09:30 · ACP2026–0902–16 **Tutorial****Integrated Optical Fiber Sensing and Communication Systems****Chao Lu**¹*1.The Hong Kong Polytechnic University, Hong Kong, China*

Techniques, recent progress and challenges in integrated optical fiber sensing and communication systems will be discussed. Some application examples will be presented.

09:30–10:00 · ACP2026–0630–33 **Invited****Research on the Fiber-optic Integrated Sensing and Communication System using Enhanced Forward-transmission Distributed Vibration Sensor****Fei Liu**^{1*}*1.University of Science and Technology Beijing, China*

This report presents our works in fiber-optic integrated sensing and communication system based on enhanced forward-transmission distributed vibration sensor over recent years, from detection approach, laser phase noise suppression method, to integrated sensing/communication scheme.

10:00–10:30 Coffee Break

10:30-12:00 · November 3, 2026 · Tuesday

Optical Frequency Combs and Advanced Optical Transmission

Presider: Yixiao Zhu, Shanghai Jiao Tong University, China

10:30-11:00 · ACP2026-0608-2 **Invited****Electro-optic comb enabling next-generation multi-functional and power-efficient optical fiber networks****Chenbo Zhang^{1*}***1. Peking University, China*

We review our recent advances in electro-optic combs applied to next-generation optical networks, demonstrating Pb/s-level radio-over-fiber fronthaul, sub-picosecond synchronization, power-efficient baud-rate coherent reception for AI data centers, and high-sensitivity integrated sensing and communication.

11:00-11:30 · ACP2026-0830-1 **Invited****End-to-end autoencoder learning for photonic terahertz communication****Jiao Zhang^{1*}***1. Purple Mountain Laboratories, China*

In recent years, the rapid development of artificial intelligence and deep learning has demonstrated significant potential in designing 6G terahertz (THz) communication system due to their powerful learning capabilities. This talk aims to design intelligent and efficient data-driven algorithms for each module of the end-to-end THz transceiver system and integrate them into an end-to-end deep learning framework to tackle key digital signal processing (DSP) challenges in ultra-wideband THz transmission systems.

11:30-11:45 · ACP2026-0701-76

The Impact of SMF Patch Cords on Performance in the Multi-Span Real-time Transmission Systems**Lipeng Feng¹**, Xishuo Wang¹, Anxu Zhang¹, Zhengyu Liu¹, Xiaoli Huo¹, Qiang Fu¹, Tao Ma¹, Zhenfang Wang¹*1. China Telecom Beijing Research Institute, China*

We experimentally analyze the impacts of SMF patchcords on the real-time transmission systems with high input power, providing guidance for future deployment of hollow-core fiber (HCF) networks. Patch cords impose a notable limitation on the maximum achievable span count, and the resulting optical signal-to-noise ratio (OSNR) penalty rises with higher input power and an increasing number of spans.

11:45-12:00 · ACP2026-0715-5

Single Microcomb Source for Futuristic Submarine Links Employing 32 Fiber Pairs**Arjun Kurur^{1*}**, **Sameer Ahmad Mir^{2*}**, Silas Lasak Hedeboe², Oliver Larsen², Christian Schou², Yang Liu², Yi Zheng², Haoyang Tan², Minhao Pu², Kresten Yvind², Metodi Yankov³, Søren Forchhammer², David Moss⁴, Leif Katsuo Oxenløwe²*1. Technical University of Denmark, Denmark; 2. Technical University of Denmark, Denmark; 3. Ciena Corporation, Denmark; 4. Swinburne University of Technology, Denmark*

We demonstrate a microcomb as the sole source for submarine links by distributing its output across 32 fiber pairs. 32 GBaud PM-64QAM signals are transmitted on the highest-loss fiber over 2880 km, indicating the potential of microcombs for future multi-fiber-pair submarine networks.

T2: Optical Transmission Systems

Multi-function Hall A, 1F

08:30–10:00 · November 4, 2026 · Wednesday

Optical Interconnects

Presider: Yan He, The Hong Kong Polytechnic University, Hong Kong, China

08:30–09:00 · ACP2026-0630-123 **Invited**

Scaling Optical Interconnects for the AI Era: From Ultra-High-Speed TFLN Modulators to Cost-Effective Transceivers

Xiansong Fang¹, Yixiao Zhu², Lingjun Zhou³, Xiang Cai³, Weisheng Hu², Fan Zhang³

1.Huawei Technologies, China; 2.Shanghai Jiao Tong University, China; 3.Peking University, China

This talk explores scalable optical interconnects for AI clusters. We present ultra-high-speed TFLN modulators and optical multiplexing to break electronic bottlenecks, alongside cost-effective coherent transceivers utilizing DFB lasers and residual carrier tracking for terabit transmissions.

09:00–09:30 · ACP2026-0911-13 **Invited**

Multi-Dimensional Photonics Integrated Chips and Systems for Optical Interconnection and Computing

Junwen Zhang¹

1.Fudan University, China

TBD

09:30–09:45 · ACP2026-0626-3

12.8-Tbit/s Coherent WDM Bi-directional Transmission without Phase Recovery based on Wavelength Multicast of a Self-injection Locking Laser

Huabei Liu¹, Qijie Xie¹, Xueyang Li¹, Yaguang Hao¹, Quanxin Na¹, Chunyang Ma¹, Hui Chen¹, Zhixue He¹, Lei Wang¹

1.PengCheng Laboratory, China

The XPM-based wavelength multicast of a narrow-linewidth self-injection locking laser has enabled 12.8-Tbit/s coherent WDM transmission without carrier phase recovery. 10λ×80-GBaud DP-16QAM signals carried by the sub-kHz-linewidth optical carriers are transmitted bidirectionally over an 8-km anti-resonant hollow-core fiber, achieving a BER below 2E-2.

09:45–10:00 · ACP2026-0630-106

Joint Partial-Response Hybrid-Path Neural Network Equalization and Simplified MLSD for Short-Reach Optical Interconnects

Zedi Zhang¹, Mingche Lai¹, Zheng Peng¹, Chaolong Xu¹, Zhicheng Wang¹, Jianyong Chen¹, Xi Xiao², Zhang Luo^{1*}

1.National University of Defense Technology, China; 2.National Information Optoelectronics Innovation Center, China

Joint reception combining a partial-response hybrid-path neural equalizer and a two-region simplified MLSD is proposed. In 2-km, 212-Gb/s IM/DD PAM4 simulations, it cuts branch-metric computations by 43% and improves sensitivity by 1.19 dB at the 7% HD-FEC threshold.

10:00–10:30 Coffee Break

10:30–12:00 · November 4, 2026 · Wednesday

Transceiver Impairments and Nonlinear Equalization

Presider: Bin Chen, Hefei University of Technology, China

10:30–11:00 · ACP2026-0707-1 **Invited**

Practical and Accurate Assessment of Device Nonlinearities in Optical Transceivers

Zhenning Tao¹, Tong Ye¹, Jingnan Li¹, Xiaofei Su¹, Hisao Nakashima², Takeshi Hoshida², Yasuhiko Aoki²

1.Fujitsu R&D Center, China; 2.Finity Inc., Japan

Device nonlinearity assessment is challenging because measured nonlinearities rarely reflect those in actual communications. This talk reviews various assessment methods, highlighting the probability maintained (PM) notch method as a practical and accurate solution.

11:00-11:15 · ACP2026-0715-124

Polarization-Insensitive Transceiver IQ Polarity Reversal Identification in Dual-Polarization Coherent Systems**Hong Lin¹**, Jing Zhang^{1*}, Rui Wang¹, Xuecheng Ren¹, Bo Xu¹, Kun Qiu¹*1. University of Electronic Science and Technology of China, China*

We propose a transceiver IQ polarity reversal identification scheme based on the designed single-tone signals and joint polarization-diversity power metric. Experimental results demonstrate accurate polarity state identification under random polarization rotation.

11:15-11:30 · ACP2026-0626-22

Single-Step Digital Backpropagation for Kerr Nonlinearity Compensation in O-band Coherent Transmission**Ogulcan Erdogan^{1,2*}**, Robert Emmerich¹, Carsten Schmidt-Langhorst¹, Jonas Gläsel¹, Felix Ganzer¹, Patrick Runge¹, Colja Schubert¹, Ronald Freund^{1,3}*1. Fraunhofer Institute for Telecommunications, Heinrich-Hertz-Institut, HHI, Germany; 2. ID Photonics GmbH, Germany; 3. Technische Universität Berlin, Germany*

We propose a single-step digital backpropagation by neglecting the dispersion terms in the coupled nonlinear Schrödinger equation for coherent transmission at 1310 nm. The experimental findings demonstrate that this method compensates for intra-channel nonlinearity while reducing the computational effort, and the BER is reduced at least by one order of magnitude in the nonlinear regime.

11:30-11:45 · ACP2026-0701-157

Hybrid Physics-Guided ML-GN Model for Extended NLI Evaluation**Emanuele Virgillito^{1*}**, Edoardo Longo¹, Sai Kishore Bhyri², Joao Pedro², Gabriele Galimberti³, Nelson Costa³, Walid Wakim³, Vittorio Curri¹*1. Politecnico di Torino, Italy; 2. Nokia, India; 3. Nokia, Italy*

We propose a physics-guided machine learning Gaussian-Noise model extension for rapid and accurate nonlinear interference estimation leveraging a disaggregated approach to gaussianization and coherent accumulation, stress-tested against full C-band long-haul dispersion managed and uncompensated transmission.

11:45-12:00 · ACP2026-0715-191

Multi-Receptive-Field Residual Boosting Equalization for DML-IM/DD Links**Yuting Xu^{1,2}**, Zhaopeng Xu^{1*}, Zhixue He¹, Chuanchuan Yang², Yuping Zhao²*1. Pengcheng Laboratory, China; 2. Peking University, China*

We propose MRF-RB which combines multi-receptive-field FCNs, stage-wise residual learning, and adaptive shrinkage for PAM6 DML-IM/DD equalization, achieving lower BER than conventional, single-FCN, and bagging baselines over 10- and 40-km SSMF.

13:30-15:15 · November 4, 2026 · Wednesday

Hollow-Core Fiber Systems and Performance Monitoring

Presider: Fei Liu, University of Science and Technology Beijing, China

13:30-14:00 · ACP2026-0902-17 **Invited****Digital twin of Next-generation deployed HCF networks****Alan Pak Tao Lau^{1*}**, Yan He¹, Liang Dou², Sai Chen²*1. The Hong Kong Polytechnic University, Hong Kong, China; 2. Alibaba Cloud, China*

We review QoT modeling for hollow-core fiber (HCF) systems, where negligible fiber nonlinearity shifts design from Kerr limits to power-independent floors set by inter-modal interference, reshaping launch power optimization and practical margin allocation

14:00-14:15 · ACP2026-0625-2

Automatic Channel Number Aware Control of EDFAs for Hollow-Core Fiber Systems**Yang Lan¹**, Qingyi Guo¹, **Zhiping Jiang^{1*}***1. Huawei Technologies Canada, Canada*

We propose an automatic channel-number aware EDFA control strategy for hollow-core fiber systems that adaptively adjusts channel power during add/drop operations, enabled by a proposed single-photodiode-based channel number detection approach. Experimental validation in an 8-amplifier cascaded link demonstrates its advantages over conventional AGC and APC schemes.

14:15–14:30 · ACP2026-0728-7

Optical-Amplification-Free 305-GBd OOK and 165-GBd PAM-4 C-Band IM/DD Transmission Over 1.4-km AR-HCF at Faster-Than-Nyquist Ratios of 146.0% and 33.1%

Cancan Chen¹, Jianwei Tang¹, Zhaopeng Xu^{1*}, Yingmei Pan¹, Qi Wu², Tonghui Ji³, Xu Zhang¹, Honglin Ji¹, Zhongliang Sun¹, Linsheng Fan¹, Junpeng Liang¹, Lulu Liu¹, Shuchao Mi¹, Xingfeng Li¹, Qibing Wang¹, Rui Jiang¹, Jinlong Wei¹, Ke Li¹, Zhixue He¹, Weisheng Hu¹
 1. Pengcheng Laboratory, Japan; 2. The Hong Kong Polytechnic University, Hong Kong, China; 3. Great Bay University, China

We experimentally demonstrate C-band faster-than-Nyquist IM/DD transmission over a 1.4-km AR-HCF link without optical amplification, using an MZM-based transmitter and noise-whitening-assisted receiver DSP. Under a 62-GHz system bandwidth, 305-GBd OOK and 165-GBd PAM-4 AR-HCF transmission are successfully achieved, corresponding to FTN ratios of 146.0% and 33.1%, respectively.

14:30–14:45 · ACP2026-0519-1

Fading-Noise Suppression in ϕ -OTDR Based on Multi-Parameter Optimal-Weight Spatial-Mode Diversity

Qiong Wang¹, Ping Wu^{1,2,3}, Xueye Shen¹, Shuaijun Xu¹, Zhiliang Zhu^{1,2,3}, Feng Liu^{1,2,3*}

1. College of Electrical and Electronic Engineering, Wenzhou University, China; 2. Zhejiang Key Laboratory of Smart Low-Voltage Apparatus and New Energy Application, Wenzhou University, China; 3. Wenzhou Key Laboratory of Unmanned Intelligent Systems and Equipment, Wenzhou University, China

This paper proposes and experimentally demonstrates a fading-noise suppression method for few-mode ϕ -OTDR based on optimal-weight spatial-mode diversity combining. On the basis of the tunable parameters of a conventional optical time-domain reflectometry system, the proposed scheme further introduces the spatial-mode dimension. By jointly considering multidimensional weighting factors, including the detected vibration frequency, localization accuracy, and signal-to-noise ratio of each spatial mode, optimal-weight spatial-mode diversity combining is performed to effectively compensate for fading at different positions. As a result, the coherent fading effect is significantly suppressed.

14:45–15:00 · ACP2026-0715-17

Localization of Overlapped Fiber Anomalies via Spatial Response Function Matching for Power Profile Estimation

Rundong Xie¹, Zhudong Shi¹, Runzhe Fan¹, Guanlin Liu¹, Yuyang Gao¹, Yingming Peng², Fan Zhang³, Xian Zhou^{1*}

1. University of Science and Technology Beijing, China; 2. China United Network Communications Co., Ltd Foshan Branch, China; 3. Peking University, China

A spatial response function-based optimization algorithm resolves overlapping fiber anomalies in correlation method power profile estimation via least-squares envelope fitting, avoiding deconvolution ill-posedness and confining localization error below 0.5 km.

15:00–15:15 · ACP2026-0715-22

Quantitative Center-Frequency-Shift Estimation for DBP-Based Optical Filter Monitoring

Runzhe Fan¹, Yuyang Gao¹, Fei Liu¹, Fan Zhang², Xian Zhou^{1*}

1. University of Science and Technology Beijing, China; 2. Peking University, China

Center-frequency shift in cascaded optical filters degrades DWDM transmission. We propose a DBP-based CFS quantification method using learned inverse-response peaks for filter monitoring. Simulations over a 1200-km coherent link achieve 0.005-GHz minimum estimation error.

15:30–16:00 Coffee Break

16:00–17:30 · November 4, 2026 · Wednesday

AI-Enabled Networks and Advanced Communication Techniques

Presider: Danshi Wang, Beijing University of Posts and Telecommunications, China

16:00–16:30 · ACP2026-0701-159 **Invited****The Exploration and Practice of New Information Infrastructure in the AI Era**

Xiaotian Jiang^{1*}, Xin Qin¹, Yuyang Liu¹, Lipeng Feng¹, Xia Gao¹, Anxu Zhang¹, Yadong Gong¹, Xiaoli Huo¹

1. China Telecom Research Institute, China

This paper introduces the technical requirements, key technologies of the new information infrastructure in the AI Era, as well as China Telecom's exploration and practice in this field.

16:30–16:45 · ACP2026-0701-170

Dual-Time-Scale Statistical Analysis of Deep-Fading Suppression and Temporal Variability in Six-Mode Mode-Selective Photonic-Lantern Mode-Diversity Reception

Xiaokai Li¹, Wenjie Guo¹, Song Gao¹, Zhengjie Wang¹, Yaning Sun¹, Huijian Liang², Yan Li^{1*}, Jifang Qiu¹, Jian Wu¹

1. Beijing University of Posts and Telecommunications, China; 2. China Academy of Space Technology, China

A dual-time-scale analysis of a six-mode mode-selective photonic-lantern receiver reveals nonstationary power distributions and stronger diversity gain during deep fades in dynamic FSO links.

16:45-17:00 · ACP2026-0701-118

First Ultra-low-loss Large-effective-area Cut-off Wavelength Down-shifted Four-core Fiber Cable Testbed for Next-generation Ultra-high-speed S+C+L-band Transmission

Jian Cui^{1*}, Ninglun Gu¹, Cheng Chang¹, Yuxiao Wang², Yufeng Han³, Nan Sun³, Hong Liu⁴, Yue Tian⁵, Yu Deng¹, Zhuo Liu¹, Chao Wu¹, Zilin Fan¹, Bin Hao¹, Jinggang Cao², Yong Chen², Bin Wu², Zhihui Dong³, Wei Sun³, Yanchun Zhang³, Baoluo Yan⁴, Shang Cao⁵, Yan Sun¹, Qi Wan¹, Bing Yan²

1.Department of Networks, China Mobile Communications Group Co., Ltd., China; 2.Network Management Center, China Mobile Communications Group Shandong Co., Ltd., China; 3.Jiangsu Hengtong Optic-Electric Co., Ltd., China; 4.WDM System Department of Wireline Product R&D Institute, ZTE Corp., State Key Laboratory of Mobile Network and Mobile Multimedia Technology, China; 5.Huawei Technologies Co.,Ltd., China

The first ultra-low-loss large-effective-area cut-off-shifted four-core fiber cable testbed is field deployed, based on which a real-time 137.76-km unrepeated field trial over S+C+L bands using 400Gbps/800Gbps OTN transceivers is successfully demonstrated.

17:00-17:15 · ACP2026-0630-109

Multimodal Point Cloud Semantic Communication over Coherent Optical Fiber Links

Di Geng¹, Zhenming Yu^{1*}, Hongyu Huang¹, Wei Zhang¹, Yan Ma¹, Kun Xu¹

1.State Key Laboratory of Information Photonics and Optical Communications Beijing University of Posts and Telecommunications, China

Robust geometry--color point cloud transmission is essential for holographic and extended-reality services. Conventional separated coding-modulation schemes may suffer from abrupt reconstruction failure near the decoding threshold. This paper presents Multimodal Point Cloud Semantic Communication (MPC-SemCom), a semantic transmission framework for coherent optical fiber links. MPC-SemCom represents the geometry occupancy and color-attribute modalities as a spatially aligned tensor and maps it directly to continuous transmission symbols through a 3D dual-path semantic encoder. Performance validation over an 80-km coherent link shows that MPC-SemCom improves geometry reconstruction over conventional separated baselines while maintaining comparable color quality. The results show representative gains of approximately 3.7dB and 3.0dB in D1-PSNR and D2-PSNR, respectively, and the proposed scheme mitigates the cliff-effect behavior observed in the separated baselines over the considered optical signal-to-noise ratio range. In a geometry-only mode, MPC-SemCom further reduces the transmitted symbols required to achieve matched D1-PSNR and D2-PSNR by 39.1% and 20.8%, respectively, indicating improved transmission efficiency.

17:15-17:30 · ACP2026-0715-12

Short-Frame CRC-Aided Sequential Candidate Search for High-Order MPPM Optical Sensitivity Enhancement

Shumin Cheng¹, Lingxiao Li¹, Jinwang Qian², Zhennan Zheng^{1*}, Xinlu Gao¹, Shanguo Huang¹

1.Beijing University of Posts and Telecommunications, China; 2.Zhengzhou University of Aeronautics, China

We propose a short-frame CRC-aided successive candidate search for high-order MPPM, using Euclidean-gap-ranked Top-2/Top-3 replacements after CRC failure in 10-Gbaud simulations, achieving 0.33-0.79 dB extra OSNR gain and 2.50 dB over equal-net-rate QPSK at HD-FEC.

T3: Subsystems and Digital Signal Processing for Optical Communications

Multi-function Hall B, 1F

13:30–15:30 · November 3, 2026 · Tuesday

Novel Fibers and Space-Division Multiplexing: Transmission, DSP and Sensing

Presider: Anxu Zhang, China Telecom Research Institute, China

13:30–14:30 · ACP2026-0902-6 **Tutorial**

Fabrication Technology and Frontier Applications of Hollow Core Fibers

Peng Li¹

1. Yangtze Optical Fibre and Cable Joint Stock Limited Company, China

This tutorial summarizes hollow core fiber fabrication technologies, analyzes its core advantages, and explores its frontier applications and development prospects.

14:30–14:45 · ACP2026-0701-236

An ISI-Variance Closed Form and DSP-Aware OSNR Penalty for Gas Line Absorption in Hollow-Core-Fiber Coherent Links

Qingyi Guo¹, Md Ghulam Saber¹, Zhiping Jiang¹

1. Huawei Technologies Canada, Canada

A closed-form model based on ISI variance is proposed to evaluate the OSNR penalty induced by gas line absorption in hollow-core fibers, incorporating DSP equalization. Analytical predictions exhibit excellent agreement with Monte-Carlo simulations.

14:45–15:00 · ACP2026-0629-19

A Comparative Study on Iterative Solvers of Matrix Inversion for Frequency-Domain MIMO Equalized Optical SDM Systems

Xiuli Ji^{1,2}, Zhongliang Sun¹, Gao Ye¹, Lingguo Cao¹, Yingxiang Jia¹, Yaojun Qiao^{2*}, Jinlong Wei^{1*}

1. Pengcheng Laboratory, China; 2. Beijing University of Posts and Telecommunications, China

We present the first fair numerical and experimental comparison of iterative solvers of matrix inversion for FD-MIMO SDM systems, showing Chebyshev iteration (conjugate gradient) is the optimum solver under MDL of ≤ 6 dB (6 dB).

15:00–15:15 · ACP2026-0701-4

Differential Group-Delay-Assisted Forward Phase-Sensitive Sensing over a Parallel HCF-SMF Link

Jiwei Xie¹, Zexu Liu¹, Haojie Zhu¹, Weiqi Lu¹, Yuhao Fang¹, Pu Zhou¹, Yu Yan¹, Zhenrong Zhao¹, William Shieh^{1*}

1. Westlake University, China

We demonstrate forward vibration localization over parallel 1.5-km HCF-SMF links using self-homodyne balanced detection and robust sensing DSP. A calibrated 1.54-ns/m coefficient reduces a representative localization error from approximately 160 m to below 60 m.

15:15–15:30 · ACP2026-0630-7

Auxiliary-Measurement-Path-Assisted Phase Noise Compensation for Coherent Correlation OTDR Using Low-Cost Broad-Linewidth Lasers

Yimei Pan^{1,2}, Tao Zeng^{1*}, Guangming Huang², Ziyi Zhong^{1,2}, Chen Wang¹, Botao Yang¹, Te Ke¹, Ziqing Liu¹, Hanbing Li¹, Ming Luo¹, Xi Xiao¹

1. State key laboratory of Optical Communication Technologies and Networks, China Information Communication Technologies Group Corporation, China; 2. College of Physical Science and Technology, Central China Normal University, China

We propose an auxiliary-path-assisted phase noise compensation technique for CC-OTDR, enabling the use of a nominally low-cost, broad-linewidth laser in CC-OTDR. Experimental results demonstrate effective phase-noise suppression, achieving an SNR enhancement of approximately 12 dB.

15:30–17:30 Coffee Break & Poster Session

08:30–09:30 · November 4, 2026 · Wednesday

AI and Machine Learning for Optical Communications

Presider: Yi Yu, The Hong Kong Polytech University JinJiang Technology and Innovation Research Institute, China

08:30–09:00 · ACP2026–0629–21 **Invited****Autonomous AI agents for stable optical frequency comb generation and system optimization**Darko Zibar¹, Viswanathan Sankar¹, Christophe Peucheret², **Svitlana Matsenko¹***1. Technical University of Denmark, Denmark; 2. University of Rennes, France*

We present reinforcement learning based approach for stable optical frequency comb generation and system optimization. The framework is able to discover various non-intuitive control and optimization strategies.

09:00–09:15 · ACP2026–0630–2

Memory–Nonlinearity Trade-off in Mixture Reservoir Computing for Fiber–Optic Channel Equalization**Huangcheng Zhang¹**, Shunya Uchida¹, Soya Shimomura¹, Kensuke Sato¹, Moriya Nakamura^{1*}*1. Meiji University, Japan*

This study evaluates Mixture Reservoir Computing for fiber-optic equalization, demonstrating that combining linear and nonlinear reservoir nodes balances temporal memory and nonlinear representation, improving compensation of chromatic dispersion and Kerr nonlinearity in coherent transmission systems.

09:15–09:30 · ACP2026–0624–4

A Conditional Diffusion–Based Nonlinear Equalizer for Photonic Terahertz OFDM System**Shenao Cai¹**, Zhanjiang Wang¹, Feixiang Zhang¹, Long Zhou¹, Shuhui Zhou¹, Jianguo Yu^{1*}*1. Beijing University of Posts and Telecommunications, China*

We propose a conditional diffusion-based nonlinear equalizer for photonic terahertz OFDM system, which learns $p(x | \tilde{x})$ without explicit nonlinear modeling. Experimental results show that the proposed method reduces EVM from 25.8% to 1.9% and BER from 0.0115 to 0, significantly improving link quality.

10:00–10:30 Coffee Break

10:30–12:00 · November 4, 2026 · Wednesday

Transceiver Impairment Characterization, Calibration and Compensation

Presider: Zhaopeng Xu, Pengcheng Laboratory, China

10:30–11:00 · ACP2026–0623–6 **Invited****Modeling, Characterization, Calibration, and Compensation for the Impairments in Optical DAC Transmitters****Tong Ye^{1*}***1. Fujitsu R&D Center CO., LTD., China*

We propose a conditional diffusion-based nonlinear equalizer for photonic terahertz OFDM system, which learns $p(x | \tilde{x})$ without explicit nonlinear modeling. Experimental results show that the proposed method reduces EVM from 25.8% to 1.9% and BER from 0.0115 to 0, significantly improving link quality.

11:00–11:15 · ACP2026–0701–152

Theoretical and Simulation Study of Adaptive Periodic Time–Varying In–Service Compensation for TI–DAC Mismatches in 200–GSa/s Optical Transmission**Xin Zhang¹**, Yuming Zhao¹, Sunningchang Zhang¹, Linsheng Zhong^{2,3}, Chengxuan Ye¹, Shenmao Zhang^{1*}, Xiaoxiao Dai¹, Qi Yang¹, Deming Liu¹

1. National Engineering Laboratory for Next Generation Internet Access System, School of Optical and Electronic Information, Huazhong University of Science and Technology, China; 2. Research Institution of Generic Technology for Integrated Circuit, China; 3. Wuhan Trustservice Technology Co., Ltd., China

An in-service compensation method based on periodic time variation is proposed for TI–DACs. Simulations demonstrate over 9–dB SFDR enhancement, a 7.25–dB PAM4 effective–SNR gain, and a 3.21–dB 100–GBaud 16–QAM SNR gain with reduced EVM.

11:15–11:30 · ACP2026–0713–30

6.75–dB SNR Improvement by High–Frequency Pilot–Tone–Assisted TI–ADC Background Calibration for Transceivers**Xuanyu Zhou^{1,2}**, Yuming Zhao¹, Xin Zhang¹, Sunningchang Zhang¹, Chengxuan Ye¹, Shenmao Zhang^{1*}, Xiaoxiao Dai¹, Qi Yang¹, Deming Liu¹*1. Huazhong University of Science and Technology, China; 2. China Academy of Information and Communications Technology, China*

We propose a pilot–tone–assisted background calibration for TI–ADCs. Embedding a –25 dBc high–frequency probe enables continuous impairment compensation, yielding a 6.75–dB SNR improvement for 100–GBaud PAM4 signals without disrupting payload transmission.

11:30–11:45 · ACP2026–0715–203

An Integrated Calibration, Optimization, and Monitoring Architecture for High-Speed Coherent Optical TransmittersShaohua Hu^{*}, Junyuan Nie¹, Xuecheng Ren¹, Jing Zhang¹, Bo Xu¹, Kun Qiu¹*1. University of Electronic Science and Technology of China, China*

An integrated architecture combines IQ-mismatch calibration, SPSSA optimization of pre-emphasis, and in-service monitoring. In a 70-GBaud 16-QAM OBTB experiment, the SNR improves from 11.2 to 14.8 dB and rapidly recovers under disturbance.

11:45–12:00 · ACP2026–0625–5

A Low-Complexity Blind Joint Large CD and Skew Calibration Scheme for Coherent ReceiversMuxin Shi¹, Tian Qiu¹, Jing Li¹, Junxu Tang¹, Caixuan Zhuang¹, Shenmao Zhang¹, Xiaoxiao Dai¹, Qi Yang^{1*}, Deming Liu¹*1. Huazhong University of Science and Technology, China*

A low-complexity blind two-stage joint calibration scheme is proposed for coherent receivers under large chromatic dispersion (CD) and skew impairments. The proposed scheme first performs a separate coarse estimation of CD and skew to localize a search region, followed by a local joint refinement of residual CD and skew. This approach avoids wide-range multidimensional search while maintaining high estimation accuracy.

13:30–15:30 · November 4, 2026 · Wednesday

Short Reach Interconnects – Equalization, Coding, and Monitoring

Presider: Stephan Pachnicke, Christian-Albrechts-University of Kiel, Germany

13:30–14:00 · ACP2026–0901–1 **Invited****DSP and Electronic-Photonic Co-design for Silicon-Photonics Optical Engines**Son Le^{1*}*1. Ciena, United States Minor Outlying Islands*

This paper discusses state-of-the-art DSP techniques and how it is incorporated into electronic-photonic co-design for high-density, 200 Gb/s per lane PAM4 silicon-photonics optical engines

14:00–14:15 · ACP2026–0630–26

Burst Error Canceller for 1-Tap DFE via Start-Point Dynamic Traceback in 256-Gb/s Intra-DCIsZhengyu Ma¹, Yuxi Liu¹, Wentao Bian¹, Jiahao Zhou¹, Jing Zhang^{1*}, Kun Qiu¹*1. Key Laboratory of Optical Fiber Sensing and Communications, University of Electronic Science and Technology of China, China*

We propose a burst-error canceller using dynamic traceback to localize the start of 1-tap DFE error propagation. Combined with duobinary precoding, the scheme provides a 1.88-dB receiver-sensitivity gain in a 256-Gb/s PAM-4 link.

14:15–14:30 · ACP2026–0714–33

Characterizing Nonlinearities in IM-DD Links via the Best Linear Approximation: Distortion Analysis and Modulation OptimizationSebastian Fraga Fernández^{1*}, Leonardo Minelli², Fernando Di Bernardinis², Felipe Villenas¹, Yunus Can Gültekin¹, Alex Alvarado¹*1. Eindhoven University of Technology, Netherlands; 2. Marvell Technology, United States*

We use the best linear approximation (BLA) to characterize nonlinearities in IM-DD links. The orthogonal nonlinear distortion is shown to be non-Gaussian. The BLA is used to approximate the optimum modulation depth for different equalizers

14:30–14:45 · ACP2026–0701–171

Edge-Aware Mixed-Precision Kolmogorov–Arnold Network Equalization for High-Speed DML-Based IM/DD LinksCancan Chen¹, Zhaopeng Xu^{1*}, Qi Wu², Yingying Zhou¹, Honglin Ji¹, Jianwei Tang¹, Linsheng Fan¹, Junpeng Liang¹, Zhongliang Sun¹, Ziqi Liu¹, Rui Jiang¹, Jinlong Wei¹, Qibing Wang¹, Xu Zhang¹, Zhixue He¹, Weisheng Hu¹*1. Pengcheng Laboratory, China; 2. The Hong Kong Polytechnic University, Hong Kong, China*

We propose a low-complexity edge-wise mixed-precision KAN equalizer for DML-based IM/DD systems, enabling 100Gb/s PAM-6 over 20km SSMF and 126Gb/s PAM-8 over 10km SSMF with 86.8% and 83.5% storage reductions compared with traditional KAN equalizers.

14:45–15:00 · ACP2026–0713–5

Real-Time Golay-Coded OTDR for Full-Link Loss and Reflection Monitoring in PONsZhen Tong¹, Zhaolin Zeng², Yang Zou³, Jing Li¹, Qile Jiang¹, Junxu Tang¹, Xiaoxiao Dai¹, Qi Yang¹, Shenmao Zhang^{1*}*1. Huazhong University of Science and Technology, China; 2. FPGA Design Department, BIANFU Optoelectronics, China; 3. ByteDance Ltd, China*

This paper proposes an FPGA-based real-time Golay-coded OTDR scheme for optical distribution network monitoring in PONs. A spatial resolution of 10 m and a dynamic range of 13 dB are achieved.

15:00-15:15 · ACP2026-0715-56

Real-Time Demonstration of a Variable-Rate Indoor Interference-Resilient Communication Based on DS-CDMA**Qile Jiang¹**, Yizhou Wang¹, Yantao Dong², Bei Li², Yichao Zhang², Shenmao Zhang¹, Xiaoxiao Dai^{1*}, Qi Yang¹, Deming Liu¹*1. Huazhong University of Science and Technology, China; 2. Shanghai Radio Equipment Research Institute, China*

A fully real-time, variable-rate interference-resilient optical communication system based on RS coding and DS-CDMA is developed. Three transmission rates up to 1 Gbit/s, are validated in an indoor environment, achieving up to 19 dB SIR.

15:15-15:30 · ACP2026-0727-2

FPGA Implementation of an Optimized Layered QC-LDPC Decoder for 10 Gbps Satellite Laser Communications**Yuxi Liu¹**, Zhengyu Ma¹, Jing Zhang^{1*}, Hong Lin¹, Shaohua Hu¹, Kun Qiu¹*1. University of Electronic Science and Technology of China, Key Laboratory of Optical Fiber Sensing and Communications, China*

We propose an optimized layered QC-LDPC decoder with a dual-branch update mechanism for the CCSDS C2 code. The proposed method resolves the intra-layer conflicts caused by the weight-2 circulant structure. The corresponding FPGA implementation achieves a throughput of 10.82 Gbps at 290 MHz with six decoding iterations, satisfying the requirements of 10 Gbps Inter-satellite laser communications systems.

15:30-16:00 Coffee Break

16:00-17:30 · November 4, 2026 · Wednesday

Co-Packaged Optics and Advanced Coherent Transceiver DSP

Presider: Zhaopeng Xu, Pengcheng Laboratory, China

16:00-16:30 · ACP2026-0701-9 **Invited****From Pluggables to Co-Packaged Optics: Evolution, Key Enabling Technologies, and Future Direction****Xia Sheng¹**, Hao Liu¹, Anxu Zhang¹, Yuyang Liu¹, Xishuo Wang¹, Kai Lv¹*1. China Telecom Research Institute, China*

This paper reviews the evolution from pluggable optical transceivers to co-packaged optics, covering key enabling technologies, standardization, challenges, and future trends.

16:30-16:45 · ACP2026-0715-107

Sample-Based Digital Pre-Distortion for Coherent Digital Subcarrier Multiplexing Transmission Systems**Hexun Jiang^{1*}**, Miao Liu¹, Shuai Wei¹, Shiping Li², Lei Yuan¹, Ye Zhao³, Chengbo Li¹, Zhuo Wang¹, Yongben Wang^{1*}*1. ZTE Corporation, China; 2. Sanechips Technology Corporation, China; 3. Wired Systems Department Sanechips Technology Corporation, China*

We experimentally demonstrate a sample-based digital pre-distortion for mitigating transmitter nonlinearity in digital-subcarrier-multiplexing systems, achieving 0.28 dB gain with affordably complexity

16:45-17:00 · ACP2026-0701-7

Frequency-Domain 4×2 MIMO Equalizer with Two-Stage Phase Rotation for Coherent Optical Communications**Zihan Luo¹**, Huibin Zhang¹, Zhenming Yu^{1*}, Xiangyong Dong¹, Yan Ma¹, Kun Xu¹*1. Beijing University of Posts and Telecommunications, China*

We propose and experimentally demonstrate a low-complexity algorithm that combines frequency-domain 4×2 MIMO equalizer with two-stage phase rotation using DD-LMS feedback, enabling compact compensation of receiver IQ impairments and carrier phase variations. Experiments over 100-km SSMF with 50-GBaud PDM-16QAM show that the proposed scheme achieves comparable performance to the conventional scheme with improved IQ-skew tolerance and low core computational complexity.

17:00-17:15 · ACP2026-0716-7

A Low-Complexity Baud-Rate Timing Error Detector Robust to Polarization Mixing for Coherent-lite Systems**Jun Dong¹**, Tianwai Bo^{1*}, Zhuo Wang¹, Yifan Gou¹, Shiqi Liu¹, Zhongwei Tan¹, Yi Dong¹*1. Beijing Institute of Technology, China*

We propose a low-complexity triple-level Mueller-Müller timing-error detector for baud-rate coherent optical interconnects. By avoiding unreliable near-zero samples, it reduces polarization-induced wrong-sign updates and improves robustness of timing recovery against polarization mixing.

17:15-17:30 · ACP2026-0630-1

Nonlinearity-tolerant Temporal Optimization with Time Division Hybrid Shaping**Junzhe Xiao¹**, Zekun Niu¹, Lyu Li¹, Minghui Shi¹, Weisheng Hu¹, Lili Yi^{1*}*1. State Key Lab of Advanced Communication Systems and Networks, School of Electronic Information and Electrical Engineering, Shanghai Jiao Tong University, China*

We implement hybrid shaping via time-division scheme to optimize the symbol temporal structure. Perturbation-theory-based analysis reveals SPM and XPM are mitigated through the temporal structure. Numerical results from single-span system demonstrate GMI-gain of 0.26~bits/4D-sym.

T3: Subsystems and Digital Signal Processing for Optical Communications (Parallel Session)

Multi-function Hall C, 1F

13:30–15:30 · November 4, 2026 · Wednesday

Coherent Optics for Access and Datacenter Networks

Presider: Zhenning Tao, Fujitsu, China

13:30–14:00 · ACP2026-0711-5 **Invited**

An Equipment Vendor's Perspective on Evolving Coherent Optics and Network Architecture for AIDC Scale-Across Clusters

Baoluo Yan¹, Liu Hong¹, Dongchen Zhang¹, Hu Shi¹, Ningcheng Wang¹, Yisong Wang¹, Zhiyong Zhao¹, Yangguang Liu¹, Kezhi Qiao¹

1. WDM System Department of Wireline Product R&D Institute, ZTE Corporation, China

This paper reviews the motivations for the distributed deployment of AIDCs from an equipment vendor's perspective and analyses the evolutionary trends of cross-domain bandwidth requirements. Multi-rail or multi-fibre parallel technologies enable linear scaling of fiber capacity. Furthermore, some novel high-density DCI-BOX architectures are anticipated to be progressively adopted.

14:00–14:15 · ACP2026-0715-125

AMCC Enabled Wavelength-selective Transmission in Multi-Channel WDM Coherent Systems over 1000 km

Zhiwen Fan^{1,2}, Tian Qiu¹, Jing Li¹, Junxu Tang¹, Caixuan Zhuang¹, Linsheng Zhong^{3,4*}, Shenmao Zhang¹, Xiaoxiao Dai¹, Qi Yang¹, Deming Liu¹

1. Huazhong University of Science and Technology, China; 2. CICT Mobile Communication Technology Co., Ltd., China; 3. Research Institution of Generic Technology for Integrated Circuit, China; 4. Wuhan Trustservice Technology Co., Ltd., China

We propose and experimentally demonstrate an orthogonally coded AMCC scheme in a four-channel 127-Gb/s coherent WDM system over 1000 km. It enables wavelength-selective node identification consuming only 1% optical power, and achieves -52.07 dBm sensitivity with less than 0.2 dB average penalty.

14:15–14:30 · ACP2026-0629-4

Real-Time FPGA Implementation of a Carrier Phase Recovery Using a Simplified 8-Fold Phase LUT for Coherent Optical Communications

Jianyu Wang¹, Jianwei Tang¹, Lingguo Cao¹, Xiuquan Cui¹, Zhaopeng Xu¹, Yanfu Yang^{2*}, Jinlong Wei^{1*}, Weisheng Hu¹

1. Pengcheng Laboratory, China; 2. Harbin Institute of Technology, Shenzhen, China

A low-latency and high hardware-efficient real-time DSP is experimentally validated for coherent optical communications. An 8-fold phase LUT and EWMA are used for carrier phase compensation. Compared to conventional LUT, the storage resource occupation is reduced by 87.5%.

14:30–14:45 · ACP2026-0630-12

Low-Complexity FPGA Implementation of a Burst-Mode Coherent Receiver Using Dual-Polarization Training and feedforward polarization demultiplexing

Chen Wang¹, Botao Yang¹, Yimei Pan¹, Te Ke¹, Ziyi Zhong¹, Ziqing Liu¹, Tao Zeng^{1*}, Ming Luo¹, Hanbing Li¹, Xi Xiao²

1. State key laboratory of Optical Communication Technologies and Networks, China Information Communication Technologies Group Corporation, China; 2. National Optoelectronics Innovation Center, China

We demonstrate a real-time FPGA implementation of a 100-Gb/s DP-QPSK burst-mode coherent receiver using dual-polarization training and feedforward polarization demultiplexing. The receiver achieves -30 dBm back-to-back sensitivity for two alternating logical ONUs.

14:45–15:00 · ACP2026-0715-101

FPGA Implementation of Feedforward Clock Recovery for Coherent PDM-PAM4 PON Burst Reception

Pengzhuo Sun¹, Jing Li¹, Yang Zou², Chenghao Chay¹, Junxu Tang¹, Xiatao Huang³, Guoqiang Li³, Xingang Huang³, Shenmao Zhang¹, Xiaoxiao Dai¹, Qi Yang¹, Deming Liu¹

1. Huazhong University of Science and Technology, China; 2. ByteDance Ltd., China; 3. State Key Laboratory of Mobile Network and Mobile Multimedia Technology, China

A real-time feedforward clock and data recovery scheme for burst-mode coherent PON is proposed, enabling 100-Gb/s DP-PAM4 transmission over 20 km using only 1,284 DSP slices and achieving 20.48-ns synchronization under a 50-ppm clock-frequency offset

15:00-15:15 · ACP2026-0715-106

First FPGA Implementation of Fermat Number Transform DSP for Alamouti-Coded Simplified Coherent PON**Zheli Liu¹**, Siyu Chen¹, Mingming Zhang¹, Xiang Li², Ming Tang^{1*}*1. Huazhong University of Science and Technology, China; 2. China University of Geosciences (Wuhan), China*

We propose a low-cost, simplified-DSP self-homodyne coherent PON using Fermat number transform and Alamouti coding, successfully deployed on an FPGA at 120Gb/s. The design achieves 90% DSP48 multiplier saving and a 32-dB power budget.

15:15-15:30 · ACP2026-0701-97

A Cache-Optimal Blocked Lookup-Table Kernel for High-Throughput FEC Encoding and Decoding**Lingxin Zhang¹**, Chuanchuan Yang^{1*}*1. State Key Laboratory of Photonics and Communications, School of Electronics, Peking University, China*

We unify encoding parity generation and decoding syndrome computation in an efficient blocked-LUT kernel and model execution costs across cache levels to guide optimal block-width selection, yielding 22% higher throughput than the largest tested width.

15:30-16:00 Coffee Break

16:00-17:30 · November 4, 2026 · Wednesday

Ultra-Wideband and Multi-Core Fiber Transmission and Performance Monitoring

Presider: Bisma Kalla, Eindhoven University of Technology, Netherlands

16:00-16:30 · ACP2026-0818-1 **Invited****Modelling and design of ultra-wideband fibre transmission systems****Jiaqian Yang^{1*}***1. University College London, United Kingdom*

We review recent progress in ultra-wideband fibre transmission, covering modelling, model validation, system design, new fibre types and DSP. We demonstrate how combined experimental and numerical approaches support scalable high-capacity transmission across emerging optical systems.

16:30-16:45 · ACP2026-0714-62

Sub-band Power Profile Estimation-Based High Baudrate Transmitter Frequency Response Non-Flatness MonitoringYanhong Shi¹, **Ping Zong¹**, Feixue Chen¹, Guozhen Wang¹, Yingjie Jiang¹, Du Tang², Fan Zhang³, Yaojun Qiao^{1*}

1. State Key Laboratory of Information Photonics and Optical Communications, Beijing University of Posts and Telecommunications, China; 2. Institute of Technology and Standards China Academy of Information and Communications Technology, China; 3. State Key Laboratory of Photonics and Communications School of Electronics, Peking University, China

We use sub-band power profile estimation to monitor transmitter frequency response non-flatness in a 290 GBaud link over 80 km. A 4 dB tilt is estimated with 0.34 dB error, and slice count is evaluated.

16:45-17:00 · ACP2026-0630-53

Reliability-Aware Constellation Point Selection for Power Offset-Free Power Profile Estimation Using Hard-Decision Data**Du Tang^{1*}**, Yingjie Jiang², Zhiming Sun³, Fan Zhang³, Rui Tang¹, Yu Wang¹, Fang Li¹, Yaojun Qiao²

1. China Academy of Information and Communications Technology, China; 2. State Key Laboratory of Information Photonics and Optical Communications, China; 3. State Key Laboratory of Photonics and Communications, China

We propose a reliable constellation point selection method for power offset-free power profile estimation using hard-decision data. The proposed method is experimentally demonstrated in a 500-km 64-GBaud DP-16QAM transmission system.

17:00-17:30 · ACP2026-0722-3 · **Invited****Long-haul Multi-core Fiber Transmission and Inter-core Crosstalk Monitoring Using DSP Techniques****Yan Wang¹**, Zhongwei Tan^{1*}, Yihao Zhou¹, Siying Li¹, Ziqi Shen¹, Tianwai Bo¹, Yi Dong¹*1. Beijing Institute of Technology, China*

Inter-core crosstalk (IC-XT) is a unique impairment characteristic in multi-core fibers (MCF). We review the existing DSP-based IC-XT measurement solutions and introduce long-haul transmission over weakly-coupled MCF along with the corresponding monitoring method.

T4: Free-Space Transmission and Communication Systems

Multi-function Hall C, 1F

13:30–15:30 · November 2, 2026 · Monday

Free-space Integrated Sensing and Communications

Presider: Xiong Deng, Southwestern Jiao Tong University, China

13:30–14:30 · ACP2026-0902-7 **Tutorial**

THz photonics-enabled ultrafast communication and high-resolution sensing

Xianbin Yu¹

1. Zhejiang University, China

This lecture will introduce the fundamentals of THz photonics, present recent research progress on ultrafast THz communication and high-resolution THz sensing assisted by photonics, and discuss the challenging aspects for future developments.

14:30–15:00 · ACP2026-0831-2 **Invited**

Optical Wireless Technology: Integrated Sensing and Communication, Photonic Integration, and Over-the-Air Computation

Chengwei Fang¹, Yapeng Xie¹, Da Huang¹, Ngan Nguyen¹, Khuong NGUYEN-VINH¹, Yameng Xu², Cuiwei He³, Sithamparanathan Kandeepan¹, **Ke Wang**^{*}

1. Royal Melbourne Institute of Technology (RMIT University), Australia; 2. Changchun University of Science and Technology, China; 3. Japan Advanced Institute of Science and Technology (JAIST), Japan

We will review emerging optical wireless technologies spanning integrated sensing and communication, photonic integration, and over-the-air computation, highlighting recent advances, enabling architectures, experimental demonstrations, and opportunities for intelligent, efficient, and multifunctional future communication systems.

15:00–15:15 · ACP2026-0627-5

Bidirectional Transmission for MLS-Assisted RO-ISAC Based on Code Division Duplexing

Du Jia¹, Zeng Zhihong¹, **Chen Chen**^{*}

1. Chongqing University, China

A bidirectional transmission scheme based on code-division duplexing (CDD) for the maximum length sequence (MLS)-aided RO-ISAC system is proposed, which enables simultaneous bidirectional transmission and high-precision sensing without sacrificing spectrum resources.

15:15–15:30 · ACP2026-0406-1

LACO-OFDM for Optical ISAC

Benben Li¹, Jiale Wang¹, Jie Lian^{*}

1. Northwestern Polytechnical University, China

An LACO-OFDM framework for free-space optical ISAC is developed, jointly modeling asymmetric clipping and turbulence. Closed-form performance metrics and weighted power allocation improve the communication-sensing trade-off, exploiting layered transmission gains across distances and channel conditions.

15:30–16:00 Coffee Break

16:00–17:30 · November 2, 2026 · Monday

Optical Wireless Receivers, Visible Light Communications and Positioning

Presider: Oskars Ozolins, Riga Technical University, Latvia

16:00–16:30 · ACP2026-0630-28 **Invited**

Recent Advances in Fluorescent Antennas for Optical Wireless Communications

Cuiwei He¹

1. Japan Advanced Institute of Science and Technology (JAIST), Japan

This talk reviews recent advances in fluorescent antennas for optical wireless communications, including fluorescent materials, WDM transmission, optical concentration enhancement, and material engineering techniques such as FRET to increase bandwidth and receiver performance.

16:30–16:45 · ACP2026–0629–32

Correlation-Assisted Adaptive Poisson Evidence Detection for Low-Light Photon-Counting Optical Communications under Time-Varying BackgroundsJianlei Zhang¹, **Linyu Zhang¹**, Yuhe Xun¹, Xun Wang¹, Shihang Dan¹*1. Xi'an University of Posts and Telecommunications, China*

CA-APED performs adaptive background estimation and Poisson evidence accumulation for repetitive-frame low-light photon-counting OOK communication, improving robustness against time-varying backgrounds, reducing the bit error rate, and approaching oracle detection performance while maintaining low implementation complexity.

16:45–17:00 · ACP2026–0630–110

A Real-Time QPSK-OFDM Visible Light Communication System with Automatic Gain Control and NLOS Channel Characterization**Shaojun Shi¹**, Aiyang Yang^{2*}, Shaoxi Ji², Lihui Feng²*1. Beijing Institute of Technology, China; 2. School of Optics and Photonics, Beijing Institute of Technology, China*

A real-time QPSK-OFDM VLC system with digital AGC is proposed and demonstrated. LOS transmission achieves $1e-9$ BER over 54 m and $1.67e-4$ at 60.6 m. NLOS reflection reaches 19.2 m using white retroreflective tape. The AGC effectively handles wide dynamic range.

17:00–17:15 · ACP2026–0630–10

Real-Time Smartphone-Based Mobile Optical Wireless Reception With XOR Recovery**Shaoxi Ji¹**, Aiyang Yang^{1*}, Lihui Feng¹*1. Beijing Institute of Technology, China*

This work demonstrates a real-time smartphone-based 4CASK-OCC receiver using YUV-domain processing and Repetition-XOR recovery with spatial reliability selection, achieving 2.06 kbit/s effective data rate and reliable mobile text demodulation without offline processing on Android smartphones.

17:15–17:30 · ACP2026–0628–17

Robust RSS-Based Visible Light Positioning with Dual-Ended Tilt Compensation**Ping Fu¹**, Xiong Deng^{1*}, Hao Chen¹, Wenyuan Ma¹, Xihua Zou¹, Yu Xiang¹, Wei Pan¹, Lianshan Yan¹*1. Southwest Jiaotong University, China*

In received signal strength (RSS)-based visible light positioning (VLP) systems, tilts of the light-emitting diode (LED) installation and the photodetector (PD) orientation introduce model mismatch and deteriorate positioning accuracy. Existing compensation methods primarily address single-ended tilt, lacking effective mechanisms to handle the coupled effects of simultaneous LED and PD tilts, which limits the robustness of positioning under dual-ended tilt scenarios. To address this issue, this paper proposes a robust evolutionary algorithm (REA) for joint calibration of the LED transmit orientation, the PD receive orientation, and the system gain under dual-ended tilt conditions. Both simulation and experimental results demonstrate that REA effectively mitigates the model mismatch induced by dual-ended tilt. Under sparse calibration conditions, REA achieves an average positioning error (APE) of 0.71 cm in simulation. In experiments, the 50th and 99th percentiles of the positioning error are 2.85 cm and 6.06 cm, respectively, outperforming both multilateration and Gaussian process regression (GPR) methods.

08:30–10:00 · November 3, 2026 · Tuesday

Beam Steering and Alignment for Mobile Optical Links

Presider: Ming Che, Kyushu University, Japan

08:30–09:00 · ACP2026–0902–18 **Invited****Beam-steered Optical Wireless Communications under Line-of-Sight and Non-Line-of-Sight links****Xuebing Zhang¹***1. Zhejiang University, China*

This talk explores beam-steered optical wireless communications, covering both line-of-sight and non-line-of-sight link architectures, performance optimization, and their emerging applications in next-generation high-speed, low-latency networks.

09:00–09:30 · ACP2026–0702–5 **Invited****The Minimalist FSO: Rethinking System Architecture via Positioning-Assisted Alignment****Bingcheng Zhu^{1*}***1. Southeast University, China*

We propose a novel mobile FSO architecture overcoming bulkiness and tracking latency via compact galvanometer beam steering, photodiode array detection, and fast optical positioning. Experiments demonstrate hierarchical link establishment and significantly simplified optical paths.

09:30–09:45 · ACP2026–0630–11

Gaussian–Approximated Free–Space–to–Fiber Coupling Based on Trilateration Positioning**Qirui Xu¹**, Yifei Zhu¹, Tianjin Mei¹, Qirun Fan¹, Chen Liu^{1,2*}*1. Huazhong University of Science and Technology, China; 2. Optics Valley Laboratory, China*

A Gaussian-approximated trilateration coupling method is proposed for fast alignment without beam splitting. Under $\pm 300 \mu\text{rad}$ disturbances, optimal power is restored using 5.34 sampling points on average. Error-free 10-min transmission is confirmed.

09:45–10:00 · ACP2026–0714–16

Laser Link Acquisition and Tracking for High–Dynamic Tethered Aerostat Free–Space Optical Communications**Xuan Wang^{1*}***1. Xi'an Institute of Optics and Precision Mechanics, CAS, China*

Field experiments demonstrate reliable laser-link acquisition and tracking between a tethered aerostat and ground terminal, achieving $10 \mu\text{rad}$ accuracy and continuous bidirectional 103.125 Gb/s transmission for 216 minutes under strong platform disturbances.

10:00–10:30 Coffee Break

10:30–12:00 · November 3, 2026 · Tuesday

Advanced Signal Processing for Optical Transmission

Presider: Jian Zhao, South China University of Technology, China

10:30–11:00 · ACP2026–0826–1 **Invited****Exploration of intelligent all–optical information processing technologies for laser communication****Tianlun Li^{1*}***1. Northwestern Polytechnical University, China*

The ever-increasing capacity and reach of modern optical communication systems impose stringent requirements on both ultra-sensitive weak signal reception and ultra-fast routing and control at network nodes, which are particularly critical in space laser communication scenarios. This work explores intelligent all-optical information processing technologies to address these challenges along two complementary axes. On the physical layer, we employ phase-sensitive optical parametric amplification based on integrated waveguides to achieve low-noise amplification and all-optical phase regeneration, significantly enhancing detection capability for ultra-long-distance inter-satellite links. To facilitate engineering deployment, we introduce convolutional neural networks for auxiliary phase locking, improving both efficiency and precision of phase control. On the data layer, to overcome the speed bottleneck of electronic decision circuits in optical packet switching, we propose an all-optical logic readout scheme using optical neuron structures, where machine learning algorithms enable robust decision-making from analog optical signals to stable digital levels, supporting packet header recognition and switching control. Together, these two efforts collectively meet the high bandwidth, low latency, and high reliability requirements of space laser communication systems, offering both theoretical insights and practical pathways for future integrated space-ground optical networks.

11:00–11:15 · ACP2026–0701–126

Trellis Shaping for Nonlinearity Mitigation in Coherent Ground–to–Satellite Optical Links with High–Power Optical Amplifiers**Yanling Sun¹**, Shuai Wei¹, Ao Li¹, Pengpeng Wei¹, Zulin Liu¹, Huijian Liang², Jifang Qiu¹, Xiaobin Hong¹, Yan Li^{1*}, Jian Wu¹*1. Beijing University of Posts and Telecommunications, China; 2. China Academy of Space Technology, China*

Channel-aware trellis shaping is investigated for HPOA-assisted coherent GTS-FSO uplink systems. Results show that TS-64QAM mitigates HPOA-induced nonlinear phase rotation, achieving 67.2 dB FSO loss tolerance and 1 dB higher optimal launch power than PS-64QAM.

11:15–11:30 · ACP2026–0714–47 **Industry Innovation Nomination****Coherent Receiver Utilizing Real–Time OPLL with Doppler Shift Resistance for Low–power Consumption Inter–satellite Laser Communication****Zhen Luo¹**, Yizhou Wang¹, Pengzhuo Sun¹, Shuren Mao², Jing Li¹, Shenmao Zhang¹, Xiaoxiao Dai^{1*}, Jing Zhang², Qi Yang¹, Changyuan Yu³*1. Huazhong University of Science and Technology, China; 2. University of Electronic Science and Technology, China; 3. The Hong Kong Polytechnic University, Hong Kong, China*

This paper designs a coherent receiver based on a delay-XOR phase frequency detector. It tracks a 100 MHz/s Doppler ramp rate, achieving -36.5 dBm sensitivity for 40 Gbps QPSK at the FEC BER threshold of 3.8×10^{-3} .

11:30–11:45 · ACP2026–0701–129

On Modeling and Experimental Assessment of Hybrid Fiber/FSO Links Under Varying Atmospheric Turbulence Conditions**Hangqian Li¹**, Li Pei^{1*}, Zhouyi Hu¹, Bang Yang², Jianshuai Wang¹, Han Gao¹*1. Beijing Jiaotong University, China; 2. Harbin Institute of Technology, China*

This paper proposes a novel modeling and characterization method for performance assessment of hybrid fiber/FSO links. Experimental results show that under different turbulence conditions, the maximum OSNR difference from the proposed model is 3.37 dB.

11:45–12:00 · ACP2026-0713-8

FSOC Link Quality Assessment Model and Its Application under Complex Atmospheric Conditions**Junpeng Zhang¹***1.Changchun University of Science and Technology, China*

A unified model assesses laser links under multiple atmospheric impairments. Results show 3800 nm outperforms in haze/fog/rain. A dual-threshold hysteresis switching rule using weather data aids link design and control.

13:30–15:30 · November 3, 2026 · Tuesday

Structured Light and Turbulence-Resilient Optical Communications

Presider: Huibin Zhou, Huazhong University of Science and Technology, China

13:30–14:30 · ACP2026-0911-15 **Tutorial****TBD****Martin Lavery¹***1.University of Glasgow, United Kingdom***TBD**

14:30–14:45 · ACP2026-0630-83

Propagation of Quadratic-Phase-Modulated Power-Exponent-Vortex Beams in Free Space Optical Links**Yunjie Hu¹**, Xiong Deng^{1*}, Bin Lv¹, Yu Zhou¹, Wenyuan Ma¹, Xihua Zou¹, Wei Pan¹, Lianshan Yan¹*1.Southwest Jiaotong University, China*

We propose a quadratic-phase-modulated power exponent vortex (QPEV) beam for turbulence-resilient free-space optical communication. By combining pin-like propagation, controllable focusing, and vortex modulation, the beam maintains stable propagation and enhanced structural robustness under atmospheric turbulence.

14:45–15:00 · ACP2026-0701-217

Phase-Optimized Structured Beams for Enhanced Turbulence Robustness in Underwater Wireless Optical Communications**Bing Han¹**, Jingfeng Liu¹, Ziyi Tang¹, Guofeng Yan¹, Jian Wang^{1*}*1.Huazhong University of Science and Technology, China*

We propose and demonstrate phase-optimized structured beams that are turbulence-resistant and require no demodulation. They exhibit a power gain of 2~3 dB under thermal turbulence and strong water flow, significantly increasing the probability of achieving a BER below the 7% HD-FEC threshold in UWOC links.

15:00–15:15 · ACP2026-0715-80

Spatiotemporal State Modeling of Degraded Optical Spots in Long-Distance Free-Space Laser Communication**Zengxin Liu¹***1.Xi'an University of Architecture and Technology, China*

This work presents a state-driven model for degraded optical spots in a 104.8-km atmospheric laser link, using field sequences to characterize morphology transitions and reproduce spot dynamics for robust detection, tracking, and link performance evaluation.

15:15–15:30 · ACP2026-0728-6

Semantic Domain Impairment Compensation for Free-Space Optical Communications**Yueqiu Mu¹**, Yuyang Liu^{1*}, Hongyu Huang^{2*}, Wenjie Guo¹, Jiuyu Xie¹, Zhenming Yu², Kun Xu²*1.China Telecom Research Institute State Key Laboratory of Optical Fiber and Cable Manufacture Technology, China; 2.State Key Laboratory of Information Photonics and Optical Communications Beijing University of Posts and Telecommunications, China*

We propose a receiver-side semantic impairment compensation scheme for free-space optical communications. A CNN-Transformer module repairs decoded sensing images under atmospheric turbulence. In a 30-Gbaud IM/DD FSO experiment, the scheme improves low-power receiver sensitivity by 0.5 dB and enhances image reconstruction quality under harsh channels.

15:30–17:30 Coffee Break & Poster Session

08:30–10:15 · November 4, 2026 · Wednesday

Mid-Infrared Free-Space Optical Communications

Presider: Haifeng Yao, Beijing Institute of Technology, China

08:30–09:00 · ACP2026-0825-2 **Invited****Advances in Mid-Infrared Free-Space Optical Communications****Huibin Zhou¹***1. Huazhong University of Science and Technology, China*

Free-space optical (FSO) communications operated in the mid-infrared (mid-IR) band have recently attracted growing interest. This presentation will provide an overview of advances in mid-IR FSO systems, as well as current challenges and future opportunities.

09:00–09:30 · ACP2026-0904-1 **Invited****Unipolar quantum optoelectronics for mid-IR FSO****Fabrice Monasterio^{1*}, Carlo Sirtori¹***1. Laboratoire de Physique de l'École Normale Supérieure, France*

We present the development of unipolar metamaterial quantum devices for mid-infrared free-space optical communications. We will discuss how, using a specific electronic amplifier, we aim to reach shot-noise-limited 10 μm detectors operating at room temperature.

09:30–10:00 · ACP2026-0911-16 **Invited****Mid-IR FSO Communications Using Unipolar Quantum Optoelectronic Devices****Darja Cirjulina¹, Zhidong Lyu²***1. Riga Technical University, Latvia; 2. Zhejiang University, China*

We review unipolar quantum optoelectronic approaches to free-space optical communications across MWIR and LWIR bands, high-lighting quantum cascade lasers, advanced detectors, and device-system co-design toward compact, energy-efficient transceivers, alongside recent progress and remaining challenges.

10:00–10:15 · ACP2026-0611-1

Machine Learning-aided Maximum Likelihood Sequence Estimation for Mid-Wave Infrared FSO Transmission Systems**Magnus Fischer^{1*}, Zhidong Lyu², Silas Oettinghaus¹, Lu Zhang², Xianbin Yu², Oskars Ozolins³, Baile Chen⁴, Xiaodan Pang², Stephan Pachnicke¹***1. Kiel University, Germany; 2. Zhejiang University, China; 3. Riga Technical University, Latvia; 4. ShanghaiTech University, China*

This work examines the performance of ML-based pre-equalization for optimized Viterbi branch metric estimation in 4.65 μm MWIR FSO transmission. Results indicate outperformance of conventional methods and KP4 FEC compliance up to 14 Gb/s.

10:15–10:30 Coffee Break

10:30–12:00 · November 4, 2026 · Wednesday

Satellite Optical Links: Standards, Turbulence and Adaptive Scheduling

Presider: Chen Chen, Chongqing University, China

10:30–11:00 · ACP2026-0818-3 **Invited****Recent progress of FSOC standards****Buzheng Wei^{1*}***1. China Unicom, China*

A brief introduction of FSO standards

11:00–11:15 · ACP2026-0722-8

Atmospheric Optical Turbulence Variability Revealed by Multi-site Fried Parameter Observations**Qingfang Jiang¹, Kanglian Zhao¹, Jianhao Yu¹***1. Nanjing University, China*

Atmospheric optical turbulence governs the coherence properties of optical propagation paths and introduces significant variability in free-space optical systems. This study investigates atmospheric turbulence variability using long-term multi-site Fried-parameter observations obtained from Differential Image Motion Monitors (DIMMs). The spatial variability, seasonal dependence, and temporal persistence of atmospheric coherence are characterized from multi-year observations across eight optical monitoring sites. A turbulence-conditioned coherence-threshold framework is further developed to translate observed Fried-parameter statistics into turbulence-conditioned availability metrics for satellite-to-ground optical links. For a representative target error probability of 10^{-6} , increasing the number of selected ground stations from 1 to 3 improves the mean availability from 83.3% to 94.8% and reduces the outage probability from 16.7% to 5.2%. These results reveal the spatial and temporal variability of atmospheric optical turbulence and demonstrate the potential of multi-site Fried-parameter observations for evaluating turbulence constraints on optical ground networks.

11:15–11:30 · ACP2026–0626–6

Revisiting Optical Turbulence Profiles in LEO Satellite-to-Ground Optical Links: Effects of Profile Simplification on Link Reliability**Xinyan Xie¹**, Xuesong Wang², Jinghua Zhang³, Haoyang He¹, Yongheng Wen¹, Fengrui Yang¹, Dong Zhao^{1*}*1.Fiber Optics Research Center, College of Smart Materials and Future Energy, Fudan University, China; 2.School of Science and Engineering, The Chinese University of Hong Kong, Shenzhen, China; 3.Technology and Engineering Center for Space Utilization, Chinese Academy of Sciences, China*

This paper quantifies how optical-turbulence profile simplification affects LEO satellite-to-ground FSO downlink reliability using ERA5-derived profiles. Temporal simplification produces limited mean signed outage bias, whereas vertical simplification causes larger bias despite preserving the Fried parameter.

11:30–11:45 · ACP2026–0722–4

Slant-Path Fried-Parameter Forecasting for Predictive Scheduling of LEO Satellite-to-Ground Optical Links**Qingfang Jiang¹**, Kanglian Zhao¹, Jianhao Yu¹*1.Nanjing University, China*

Atmospheric turbulence constrains the availability of low-Earth-orbit (LEO) satellite-to-ground optical links, especially under rapidly varying slant-path propagation geometries. This paper proposes a Slant-Path Wavelet Neural Operator (SP-WNO) framework to forecast future Fried-parameter fields for predictive link scheduling. By integrating multi-scale wavelet conditioning with a neural-operator backbone, SP-WNO models localized turbulence fluctuations and nonlocal spatio-temporal evolution under varying elevation conditions. Using WRF-derived turbulence fields with four seasonal conditions and two zenith-angle configurations, SP-WNO achieves average MAEs of 0.1968 cm and 0.1440 cm for the 0°–30° and 0°–80° cases, respectively. Furthermore, the predicted turbulence states are mapped into link-availability indicators for proactive transmission/deferral decisions. These results demonstrate the feasibility of integrating slant-path turbulence forecasting with link-availability-aware scheduling for improving the utilization of time-varying LEO optical links.

11:45–12:00 · ACP2026–0630–60

Training Objective, Not Architecture: Threshold-Near Weighting for MCS-Adaptive FSO Turbulence Link Adaptation**Rongmuhe Su¹**, Hui Yang^{1*}, Zhe Niu¹, Yuxuan Yan¹, Qiuyan Yao¹, Buzheng Wei², Jie Zhang¹*1. Beijing University of Posts and Telecommunications, China; 2. China Unicom Research Institute, China*

We ask whether training objective matters more than architecture for MCS-adaptive FSO turbulence forecasting. Single-variable ablation across three field sites shows threshold-near weighting reduces utility regret by 33%, while published architectures yield no significant gain.

NP1: Fiber-Based and Free-Space Sensing

Conference Room 206, 2F

13:30–15:30 · November 2, 2026 · Monday

DAS and Nano-sensing #1

Presdier: Li Pei, Beijing Jiaotong University, China

13:30–14:00 · ACP2026–0614–1 **Invited**

From Environmental Intelligence to Industrial Diagnostics: Innovative Applications of Distributed Fiber-Optic Sensing

Chun Hong Kang^{*}, Islam Ashry¹, Boon Siew Ooi^{1,2}

1. King Abdullah University of Science and Technology (KAUST), Saudi Arabia; 2. Rensselaer Polytechnic Institute (RPI), United States

This talk presents developments in distributed acoustic and temperature sensing technologies, highlighting innovative applications in ecological monitoring, oceanography surveillance, and energy operations, alongside the growing role of AI in transforming sensing data into actionable insights.

14:00–14:30 · ACP2026–0901–5 **Invited**

Femtosecond Laser 3D Nano-printed Optical Fiber Tip MEMS Sensor

Changrui Liao^{*}

1. Shenzhen University, China

A unified 3D nano-printing platform on optical fiber tips for high-performance MEMS sensing from pN force to multi-physics fields.

14:30–14:45 · ACP2026–0701–246

Medium Identification Based on Correlation Analysis: A DAS Field Trial with Telecom Fibers

Jiawei Luo¹, Ekhiñe Irurrozki¹, Pierre Pruvost¹, Yves Jaouën¹, Élie Awwad¹

1. Télécom Paris, Institut Polytechnique de Paris, France

Distributed acoustic sensing (DAS) enables infrastructure monitoring. However, DAS response strongly depends on cable deployment conditions. Based on field trial data, we propose medium-identification methods using cross-correlation, paving the way towards enhanced DAS data processing.

14:45–15:00 · ACP2026–0701–95

Topology-Aware Distributed Fiber-Optic Sensing for UWB-Degraded Indoor Positioning

Yi Cai^{1*}, **Zhiyang Xue¹**, Yuhang Jiang¹, Lei Wang¹, Huan Huang¹, Dongdong Zou¹

1. Soochow University, China

A dual-layer topology-aware distributed fiber-optic sensing and Ultra-wideband (UWB) fusion method enables indoor positioning under UWB degradation and reduces the twodimensional RMSE by 49.1% compared with UWB-only factorgraph optimization.

15:00–15:15 · ACP2026–0715–188

TV-Mamba: A Triple-View State-Space Framework for Robust Distributed Fiber-Optic Vibration Event Recognition

Yi Wang¹, Jiashuo Li¹, Xiaojuan Chen¹, Pengbo Liu¹, Gaoyang Jin¹, Chang Qu^{1*}

1. Changchun University of Science and Technology, China

TV-Mamba is a compact triple-view state-space framework for distributed fiber-optic vibration recognition, combining complementary signal views, bidirectional sequence modeling, and adaptive fusion to achieve high accuracy with substantially fewer parameters on two public benchmark datasets.

15:15–15:30 · ACP2026–0715–93

Condition-Aware Support-Space Learning for Unknown-Fault Detection in DAS-Monitored Belt Conveyors

Zhenwei Liu¹, Anjie Sun¹, Chenhui Huang¹, Peiyu Zhang¹, Yuanyuan Song¹, Huijuan Wu^{1*}

1. University of Electronic Science and Technology of China, China

This paper proposes a condition-aware open-set framework for distributed acoustic sensing-based belt-conveyor monitoring, enabling unknown-fault rejection without fault samples through support-space learning, SVM-guided candidate classification, and class-wise verification under realistic in-scene and cross-scene industrial conditions.

15:30–16:00 Coffee Break

16:00–17:30 · November 2, 2026 · Monday

DAS and Nano-sensing #2

Presider: TBD

16:00–16:30 · ACP2026-0911-1 **Invited****Revisiting Multimode Fibers: Emerging Frontiers in Optical Metrology and Interconnects****Ming Tang**^{*}*1. Huazhong University of Science and Technology, China*

Rethinking multimode fibers, this talk explores their growing significance beyond traditional limits. We present recent advances in using MMF for high-speed optical field measurement and semantic communication, revealing new potentials for advanced metrology and interconnects.

16:30–16:45 · ACP2026-0701-179

Geo-Referencing of Deployed Dark Fiber Segments Using GPS-tracked Vehicles**Tom Jürgensen**^{*}, Tobias Philipp¹, Annika Dochhan¹, René Baas², Daniel Giemsa³, Jan Seyfert³, Jaroslaw Piwonski⁴, Stephan Pachnicke¹*1. Chair of Communications, Kiel University, Germany; 2. elekom Deutschland Technik GmbH, Germany; 3. Telekom Deutschland Technik GmbH, Germany; 4. ADDIX GmbH, Germany*

A data-driven geo-referencing method for dark-fiber DAS is presented, matching projected public bus GPS trajectories to DAS vehicle signatures to estimate spatial and temporal offsets, enabling accurate localization of sensing fibers for traffic monitoring.

16:45–17:00 · ACP2026-0630-111

Simulation Assessment of Pulsed DAS and Coherent DWDM In-band Co-propagating CoexistenceFederico Nicotra¹, Ann M. Rosa Brusin¹, Giuseppe Rizzelli¹, **Roberto Gaudino**¹*1. Politecnico di Torino, Italy*

We present a numerical simulation analysis on the co-existence of chirped pulse Distributed Acoustic Sensing (DAS) and coherent DWDM data in the in-band co-propagating option, as introduced in ITU-T G.681 for terrestrial metro networks

17:00–17:15 · ACP2026-0630-91

Femtosecond laser inscribed mid-infrared FBG temperature sensors operating beyond 4.5 microns**Kyriacos Kalli**¹, Andreas Ioannou¹, Antreas Theodosiou¹*1. Cyprus University of Technology, Cyprus*

Mid-infrared, first order, fibre Bragg grating temperature sensors based on femtosecond-laser inscription are demonstrated in single-mode indium fluoride optical fibres. The fabricated gratings exhibit excellent spectral quality and reflectivity exceeding 98% at 4.6 microns. Temperature characterization reveals a highly linear wavelength response, with a maximum sensitivity of 51.96 pm/°C.

17:15–17:30 · ACP2026-0713-19

Fiber-Tip Fabry-Pérot Accelerometer Fabricated by Two-Photon Polymerization 3D Printing with Inverse Design Optimization**Xiaoliang Cao**¹, Xianhui Li¹, Ziqi Liu¹, Jun Hao¹, Zhaohui Li¹, Zhengyong Liu^{*}*1. Sun Yat-sen University, China*

This paper presents a fiber-tip Fabry-Pérot accelerometer fabricated via two-photon polymerization 3D printing and optimized by inverse design. It offers flat response (100–2500 Hz), 251.2 mV/g sensitivity, and high SNR.

08:30–10:00 · November 3, 2026 · Tuesday

Hollow-Core Fibers and Optical Imaging -based Sensor

Presider: Ting Feng, Northeastern University, China

08:30–09:00 · ACP2026-0625-12 **Invited****Flying Particles in Hollow-Core Fibres: Control and Sensing****Nicolas Joly**^{1,2}*1. University of Erlangen-Nuremberg, Erlangen, Germany; 2. Max Planck Institute for the Science of Light, Erlangen, Germany*

We present recent advances in trapping and manipulating micron-scale particles flying inside hollow-core fibers. We will show how such particles can be used for sensing, and how we control and cool down their mechanical motion.

09:00–09:15 · ACP2026–0616–2

A Precise Detection Method for Water Ingress in Hollow-Core Fiber Based on Multi-Feature Fusion of Side Images**Yanbiao Chang¹**, Chao Wang², Li Pei², Shuailuo Huang¹, Shikui Shen^{1*}, He Zhang¹, Zelin Wang¹, Guangquan Wang¹, Xiongyan Tang¹*1.Chinaunicom, China;2.Beijing Jiaotong University, China*

We firstly propose a HCF water ingress detection method based on multi-feature fusion of side images. The fused 3D feature vector eliminates the fiber rotation angle interference, with a 93.3% water ingress state recognition rate.

09:15–09:30 · ACP2026–0701–195

HyperRoad: A Spatial-Spectral Dual-Branch RT-DETR for Snapshot Hyperspectral Road Debris Detection**Chenhao Qi¹**, Zhenming Yu^{2*}, Yu Zhang¹, Xinyu Li¹, Kaiang Yang³, Kun Xu²

1.State Key Laboratory of Information Photonics and Optical Communications Beijing University of Posts and Telecommunications, China;2.State Key Laboratory of Information Photonics and Optical Communications Beijing University of Posts and Telecommunications and Xiong'an Aerospace Information Research Institute, China;3.Xiong'an Aerospace Information Research Institute, China

We propose HyperRoad, a snapshot hyper-spectral road debris detection framework based on a spatial-spectral dual-branch RT-DETR that integrates DGSF fusion and SPGQ query initialization. The results demonstrate that our framework achieves high-accuracy detection on our dataset, yielding 97.9% mAP₅₀ and 87.6% mAP.

09:30–09:45 · ACP2026–0701–214

Reconstruction-Free Hyperspectral Semantic Segmentation via Task-Driven Diffractive Optical Encoding**Xiqi Li¹**, Zhenming Yu^{1,2*}, Erxia Luo¹, Liang Lin¹, Liming Cheng¹, Kun Xu^{1,2}*1.Beijing University of Posts and Telecommunications, China;2.Xiong'an Aerospace Information Research Institute, China*

This paper proposes a task-driven hyperspectral sensing framework using a learnable diffractive optical element (DOE) for reconstruction-free semantic segmentation. The DOE encodes task-relevant spectral information into compressed RGB measurements, which are directly fed into an enhanced U-Net, eliminating explicit hyperspectral reconstruction while reducing computational burden and maintaining competitive performance.

09:45–10:00 · ACP2026–0713–7

High-Precision Few-mode Beam Spot Localization based on simplified HRNet**Kaihua Hu¹**, Li Pei¹, Jianshuai Wang¹, Zhouyi Hu¹, Wenxuan Xu¹, Han Gao¹*1.Beijing Jiaotong University, China*

The high-resolution net (HRNet) is simplified and trained for high-precision beam spot localization. Both the simulation and experimental results demonstrate that the localization error is less than 8 pixels.

10:00–10:30 Coffee Break

10:30–12:00 · November 3, 2026 · Tuesday

Advanced Reflectometry Techniques for Distributed Multi-Parameter Sensing

Presider: Zheng Zheng, Beihang University, China

10:30–11:00 · ACP2026–0704–1 **Invited****OFDR-based intelligent optical surface for human activity recognition****Ting Feng^{1*}***1.Northeastern University, China*

This report presents an optimized OFDR system for intelligent optical surfaces. Integrating high-density distributed fiber sensing with deep learning, it overcomes hardware bottlenecks, achieving high-resolution, real-time tactile perception for smart carpets and robotic skins.

11:00–11:15 · ACP2026–0626–15

Multi-Parameter Demodulation System Based on Co-located Overlapping Fiber Bragg Gratings**Peiyao Wang¹**, Li Pei^{1*}, Jianshuai Wang¹, Chaonan Wang¹, Jacheng Guo¹, Yingjie Wang¹*1.Beijing Jiaotong University, China*

An OFDR method with co-located overlapping FBGs enables simultaneous multi-parameter detection on a single link. With a static parameter linearity over 0.99, it delivers 200Hz–30kHz vibration monitoring and a spatial resolution under 4 mm.

11:15–11:30 · ACP2026–0701–149

DP-BPSK Coherent Correlation OTDR for Optical Phase Perturbation Detection with a Dual-Fixed-Window Differential Scheme**Botao Yang¹**, Tao Zeng^{1*}, Chen Wang¹, Te Ke¹, Yimei Pan¹, Ziyi Zhong¹, Ziqing Liu¹, Ming Luo¹, Hanbing Li¹, Xi Xiao^{1,2}

1.State Key Laboratory of Optical Communication Technologies and Networks, China;2.National Information Optoelectronics Innovation Center, China

A dual fixed-window differential phase scheme for DP-BPSK coherent C-OTDR improves SNR via continuous sequences. It requires no extra sensors, fits standard coherent transceivers, and experiments verify optical phase perturbation detection over 50-km fiber links.

11:30–11:45 · ACP2026–0715–1

Experimental Investigation of Spatial Thermal Heterogeneity in a Pouch Lithium–Ion Battery Using OFDRZiyi Xu¹, Zhi Wang¹, Dan Li¹, Jing Sun¹, Yang Hou¹, Yitian Fengge², Yang Hou¹, Qinzhuo Liao², Fei Liu^{1*}, Xian Zhou^{1*}*1. University of Science and Technology Beijing, China; 2. China University of Petroleum, China*

Distributed OFDR mapping reveals spatial thermal heterogeneity within pouch lithium–ion batteries by simultaneously measuring surface and embedded temperatures, providing experimental support for hotspot identification, thermal–model validation, and battery thermal–management design.

11:45–12:00 · ACP2026–0630–90

Comprehensive random multi–point vibration demodulation based on a weak– reflection FBG array with OFDRChaonan Wang¹, Li Pei^{1*}, Jianshuai Wang¹, Peiyao Wang¹, Jacheng Guo¹, Yingjie Wang¹*1. Beijing Jiaotong University, China*

A multi–point random vibration demodulation method based on OFDR was proposed. Vibration localization and demodulation from 200 Hz to 30 kHz were achieved, and the algorithm was validated on a pipeline with 207 gratings.

12:00–13:30 Lunch

13:30–15:30 · November 3, 2026 · Tuesday

Integrated Sensing and Communication in Optical Fiber Networks

Presider: TBD

13:30–14:00 · ACP2026–0902–10 **Invited****Integrated Forward Transmission Sensing and Communication Systems for optical access networks in the AI Era**Yaxi Yan^{1*}, Shuai Qu¹, Qi Wu¹, Zhihang Tang¹, Alan Pak Tao Lau¹, Chao Lu¹*1. The Hong Kong Polytechnic University, Hong Kong, China*

We present optical integrated sensing and communication (ISAC) schemes for AI–driven networks, highlighting linear frequency–modulated continuous–wave forward sensing in passive optical networks (PONs) and simultaneous sensing and communication in low–latency hollow–core fibers.

14:00–14:15 · ACP2026–0701–216

Experimental Demonstration of Coexisting High–Speed Coherent Transmission and Remote Sensing through a 10–km 7–core FiberBing Han¹, Ziyi Tang¹, Guofeng Yan¹, Ziqian Wang¹, Jun Liu^{1*}, Jian Wang^{1*}*1. Huazhong University of Science and Technology, China*

We propose and demonstrate an integrated system for remote sensing and high–speed coherent communication based on a 7–core fiber. The communication and sensing performances can coexist efficiently.

14:15–14:30 · ACP2026–0701–237

Vibration Localization over Coherent Optical Fiber Links by Using Full–Stokes TrajectoryPu Zhou¹, Yuhao Fang¹, Yiwen Zhang¹, Jiwei Xie¹, William Shieh^{1*}*1. Westlake University, China*

Full–Stokes trajectories are reconstructed on the Poincaré–sphere and converted into differential Euclidean–distance sequences. Cross–correlation between link terminals achieves 17.8–m vibration localization during 30–GBaud DP–16QAM transmission while the BER remains below the 7% FEC threshold.

14:30–14:45 · ACP2026–0626–12

Generalized Sensitivity Model for ODSP–Enabled Vibration Phase Detection in Coherent SystemsZhao Yan^{1*}, Zhongshu Zhang¹, Ting Jiang^{1*}, Wen Zuo¹, Baoluo Yan¹, Huan Chen¹, Hu Shi¹, Yangguang Liu¹*1. ZTE Corporation, China*

This paper proposes a generalized sensitivity model for ODSP–enabled vibration phase detection. It characterizes the correlation among laser linewidth, sampling duration, and vibration detection probability, offering design guidelines for laser linewidth and ODSP buffer configuration.

14:45–15:00 · ACP2026–0701–220

From Signal Representation to Quantum Placement: A Systematic Study of Quantum Learning for Optical Fiber Event ClassificationKhoulood Abdelli¹*1. Nokia Bell Labs, Germany*

We investigate quantum learning for SOP–based optical fiber event classification through comparative analysis of signal representations, Stokes parameter fusion, quantum architectures, and training data availability, demonstrating improved low–data performance and reduced model complexity using hybrid quantum–classifiers.

15:00–15:15 · ACP2026–0630–101

Low self-noise depolarized FOG by optimizing Sagnac Interferometer Assembly**Ze Gao¹**, Liangya Du¹, Yuanhong Yang^{1*}*1. Beihang University, China*

A secondary-coherence-based method is proposed to measure equivalent birefringence delay of a single-mode coil in a depolarized Sagnac Interferometer Assembly. Temperature characteristics and depolarizer optimization are experimentally verified, yielding reduced DFOG self-noise after parameter tuning.

15:15–15:30 · ACP2026–0701–31

Hierarchical Phase-Frequency Sweep Linearization for FMCW LiDAR Using a Shared-MZI Architecture**Hongduan Fan¹**, Tianqi Song¹, Jing Wang^{1*}*1. Southern University of Science and Technology, China*

We experimentally demonstrate a shared-MZI phase-frequency hierarchical calibration for FMCW LiDAR. This dual-domain predistortion system achieves a 90% region of interest, 2.1×10^{-6} residual nonlinearity, and 13.93 mm spatial resolution.

15:30–17:30 Coffee Break & Poster Session

08:30–09:45 · November 4, 2026 · Wednesday

Biophotonics and Optical Fiber Sensors for Healthcare

Presider: Nicolas Joly, Max Planck Institute for the Science of Light, Germany

08:30–09:00 · ACP2026–0818–5 **Invited****Terahertz metasensor for species identification of *Cryptococcus*****Haisu Li^{1*}**, Li Wang¹*1. Beijing Jiaotong University, China*

We propose QBIC-based terahertz metasurfaces for label-free, low-cost identification of four *Cryptococcus* species, achieving a record Q-factor of 4034 and revealing species-specific spectral differences linked to cell morphology and genetics.

09:00–09:15 · ACP2026–0715–82

Contactless Obstructive Sleep Apnea Detection System via Fiber Optic Sensors and Machine Learning**Zihan Yu¹**, Tianyu Chen¹, Yulin Qiu¹, Xiaolu Yang², Weimin Lyu^{1*}, Changyuan Yu¹*1. The Hong Kong Polytechnic University, Hong Kong, China; 2. Guangdong Provincial People's Hospital (Guangdong Academy of Medical Sciences), Southern Medical University, China*

A contactless overnight obstructive sleep apnea detection system using Mach-Zehnder fiber optic sensing with a radial basis function support vector machine classifier to identify apnea events is presented, which is validated against synchronized polysomnography.

09:15–09:30 · ACP2026–0715–54

Interferometric Sensor Based on Spliced Hollow-Core Fiber for Cardiovascular Multi-Parameter Measurement**Jing Li¹**, Ziqi Liu¹, Jun Hao¹, Chaorui Zhang¹, Wenxu Zheng¹, Zhengyong Liu^{1*}*1. Sun Yat-sen University, China*

This work presents a low-cost PDMS-packaged hollow-core quartz FPI sensor for BP, HR and PWV-based arterial stiffness measurement via 1550 nm 1 kHz demodulation and CNN.

09:30–09:45 · ACP2026–0715–66

Optical Fiber Driven Micro-catheter Robot based on Photothermal Effect**Zhongjie Hou¹**, Jun Hao¹, Ziqi Liu¹, Xiaoliang Cao¹, Zhengyong Liu^{1*}*1. Sun Yat-sen University, China*

A micro-catheter robot uses an attenuated optical fiber to photothermally drive LCE, achieving 12.35 mm tip displacement, 35.96° bending, wide range, and good repeatability at low laser power.

10:00–10:30 Coffee Break

10:30-11:30 · November 4, 2026 · Wednesday

Advanced Demodulation and Signal Processing for Fiber-Optic Sensing

Presider: Liang Zhang, Shanghai University, China

10:30-11:00 · ACP2026-0915-1 **Invited****Cross-Domain Hybrid Demodulation for Multiparameter Fiber-Optic Sensing and Its Applications****Beilei Wu¹**, Bin Yin²*1.Beijing Jiaotong University, China; 2.Ocean University of China, China*

To address the challenges of incomplete, inaccurate, and slow multiphysical-parameter measurements in complex atmospheric and marine environments, a cross-domain hybrid demodulation scheme integrating optical sensing with microwave photonic processing is proposed. In the optical domain, wavelength-, polarization-, and intensity-based hybrid interrogation is combined with composite fiber Bragg gratings, Fabry-Perot interferometers, and modal interferometers to enable high-precision sensing of vector flow velocity, salinity, temperature, strain, and electromagnetic fields. Microwave photonic processing based on optoelectronic oscillators (OEOs) and microwave photonic filters (MPFs) is further introduced to map physical quantities onto microwave spectral frequency and power. The high-Q OEO converts weak sensing variations into precisely measurable microwave frequency shifts, while reconfigurable MPFs separate multiple microwave components to improve interrogation accuracy and suppress cross-sensitivity. Experimental results demonstrate high-resolution and fast-response multiparameter sensing, with significantly improved response speed over conventional electrical approaches. The proposed scheme is further validated for real-time multiparameter monitoring in simulated atmospheric and marine environments, highlighting the potential of optical-microwave photonic integration for rapid and high-resolution sensing in complex scenarios.

11:00-11:15 · ACP2026-0630-34

Fourier Neural Operator-Based Spectral Expansion for High-Resolution FFT Demodulation of Fiber Fabry-Perot Sensors**Hao Luo¹**, Zongru Yang¹, Zijian Nie¹, Weijia Bao^{1*}, Yiping Wang¹*1.Shenzhen University, China*

We propose a Fourier neural operator-based spectral expansion method to overcome interrogator bandwidth limits in fiber Fabry-Perot sensors. The expanded spectrum enables high-resolution FFT demodulation, significantly improving sensing accuracy and real-time measurement.

11:15-11:30 · ACP2026-0630-40

Fiber-Optic Differential Phase Sensing with Large Dynamic Range**Haoyan Liu¹**, Fangshuo Shi¹, Yanjun Chen^{2*}, Zhengbin Li¹*1.Peking University, China; 2.Central South University, China*

A reciprocal fiber-optic differential interferometer is demonstrated for dynamic signal sensing. The system shows a flat phase noise response over 0.1-100 Hz, low harmonic distortion below -50 dB, and a dynamic range exceeding 86 dB.

NP2: Microwave Photonic Devices and Systems

Conference Room 101, 1F

13:30–15:30 · November 3, 2026 · Tuesday

Microwave Photonic Devices and Systems (1)

Presider: Xiangchuan Wang, Nanjing University of Aeronautics and Astronautics, China

13:30–14:00 · ACP2026–0701–73 **Invited**

Microwave Photonic Stepped-Frequency Signal Synthesis for Broadband Sensing Applications

Yihan Li*

1.Beihang University, China

This talk reviews recent advances in microwave photonic stepped-frequency signal synthesis enabled by frequency-agile optical sources, covering synthesis principles, optical architectures, and representative broadband sensing applications.

14:00–14:30 · ACP2026–0903–1 **Invited**

Photonic-Assisted Frequency Diverse Array

Yongsheng Gao*

1.Northwestern Polytechnical University, China

To overcome limitations of conventional frequency diverse array (FDA) radar signal generation, this study leverages microwave photonic (MWP) systems to enable FDA waveform generation and beamforming, exploiting inherent advantages in bandwidth, tunability, and integration capability.

14:30–14:45 · ACP2026–0715–9

Experimental 48-Gbps Wideband Non-Orthogonal Signal Over-the-Air Transmission at D-Band Using an Ultra-Low-Phase-Noise Photonic-Aided LO

Yalin Zhou¹, Izzat Darwazeh¹

1.University College London, United Kingdom

This work experimentally demonstrates 32–48 Gbps spectrally efficient frequency division multiplexing (SEFDM) transmission over a 153 GHz D-band over-the-air link. A photonic heterodyne-based low-phase-noise carrier generator is used to support stable ultra-wideband transmission. Compared with conventional orthogonal frequency division multiplexing (OFDM), the SEFDM waveform achieves up to 30% bandwidth saving, corresponding to a 5.3 GHz reduction at the same data rate. Experimental signal-to-noise ratio (SNR) reveal the tradeoff between noise tolerance and inter-carrier interference for different subcarrier numbers and spectral compression factors. Index Terms—Microwave photonics, D-band, photonic local oscillator, SEFDM, millimeter-wave communications.

14:45–15:00 · ACP2026–0630–16

Photonics-aided THz ISAC System Based on Time Frequency Efficient SFW-OFDM Waveform

Junhao Zhang¹, Mingzheng Lei², Min Zhu¹, Junjie Ding², Qing Zhong¹, Hongjia Liu¹, Long Zhang², Bingchang Hua², Yuancheng Cai², Jiao Zhang², Zhu Sha³, Jianjun Yu²

1.Southeast University, China;2.Purple Mountain Laboratories, China;3.Nankai University, China

We design a time-frequency efficient ISAC waveform by activating specific subcarriers across different OFDM symbols in a stair-like manner. Using the SFW-OFDM waveform, a photonics-aided THz ISAC system achieves 103.2-Gbps data transmission and 7-mm resolution.

15:00–15:15 · ACP2026–0715–19

Real-Time Simultaneous High-Precision Absolute Delay Measurement for Distributed Fiber Networks

Zixin Yuan¹, Wei Wei¹, Jinping Xiao¹, Jingyao Yuan¹, Xi Wang^{1,2}, Weilin Xie¹, Yi Dong¹

1.Beijing Institute of Technology, China;2.Shijiazhuang University, China

We demonstrate real-time absolute-delay measurement for multi-branch distributed fiber networks via path-specific remote frequency shifting and digital phase extraction. Simultaneous monitoring of two 2-km links over 3000s achieves root-mean-square errors of ~20fs.

15:15–15:30 · ACP2026–0629–22

Deep Unfolding Network for Phase Estimation and Tracking in Photonics-Terahertz Wireless Transmission

Yunfei Zhang¹, Feixiang Zhang¹, Zhanjiang Wang¹, Long Zhou¹, Jingqi Zhang¹, Jianguo Yu¹*

1.Beijing University of Posts and Telecommunications, China

We propose DUET, a deep unfolding network for joint equalization and carrier phase compensation in photonics-terahertz systems. DUET improves BER while maintaining computational complexity and physical interpretability, outperforming conventional and learning-based compensation methods experimentally.

15:30–17:30 Coffee Break & Poster Session

09:00–10:00 · November 4, 2026 · Wednesday

Microwave Photonic Devices and Systems (2)

Presider: Yiwei Xie, Zhejiang University, China

09:00–09:30 · ACP2026-0902-14 **Invited****Multi-band Frequency Conversion Method for Over-the-Horizon Communication Based on a Single Optical Frequency Comb**Luqiang Wang¹, Tao Pu^{1*}*1. Army Engineering University of PLA, China*

This paper proposes a frequency conversion method based on a single optical frequency comb (OFC), featuring simple structure, flexible tunability, and high stability. An optical frequency comb signal is generated by a gain-switched semiconductor laser, providing a multi-channel local oscillator source for over-the-horizon (OTH) communication frequency conversion. This OFC signal is further injected into a semiconductor laser acting as a channelized filter and split into two branches: the upper branch uses the local oscillator optical signal to achieve electro-optic loading of the baseband signal via carrier-suppressed single-sideband modulation, while the lower branch, combined with optical switches, enables flexible selection of multiple channels. Based on this architecture, arbitrary frequency conversion of the baseband signal of OTH communication to different frequency bands can be realized. Simulation results show that by controlling the operating modes of the optical switches in each branch with a Field-Programmable Gate Array (FPGA), the system can achieve stable frequency conversion within the 5–30 GHz range, covering multiple bands including C, X, Ku, and Ka, demonstrating significant advantages such as wide band coverage and strong anti-jamming capability.

09:30–09:45 · ACP2026-0521-1

Microwave Photonic Dual-Band Radar Signal Generation and De-chirp ReceptionHao Wang¹, Fangzheng Zhang^{1*}, Gengze Wu¹, Xiaoyue Yu¹, Jiayuan Kong¹, Zhenyu Xu², Chenchang Zeng¹, Zihao Zhao¹, Shilong Pan¹*1. Nanjing University of Aeronautics and Astronautics, China; 2. Shanghai Institute of Satellite Engineering, China*

A microwave photonic dual-band radar signal generation and de-chirp reception approach is proposed. Experimental results verify that the proposed method can generate dual-band LFM signals and implement de-chirp reception without crosstalk between the two frequency bands.

09:45–10:00 · ACP2026-0713-6

A Reconfigurable Integrated Microwave Photonic System for Rapid Broadband Spectrum Sensing and Agile Jamming Signal GenerationHan Qiu¹, Zeyong Ding¹, Jiangtao Zhang¹, Wei Zhang¹, Peng Liu², Pengsha Zuo², Lihan Wang^{1*}, Xiangchuan Wang^{1*}, Shilong Pan¹*1. National Key Laboratory of Microwave Photonics, China; 2. Jonhon Optron Technology Co., Ltd., China*

A microwave photonic system for rapid broadband spectrum sensing and jamming is proposed, achieving frequency sensing up to 67 GHz within an 11-ns sweep period and tunable interrupted-sampling repeater jamming.

10:00–10:30 Coffee Break

10:30–12:00 · November 4, 2026 · Wednesday

Microwave Photonic Devices and Systems (3)

Presider: Wei Wei, Beijing Institute of Technology, China

10:30–11:00 · ACP2026-0701-100 **Invited****Photonics-assisted multi-parameter extraction of microwave signals**Dan Zhu^{1*}*1. Nanjing University of Aeronautics and Astronautics, China*

Microwave photonic methods for multi-parameter extraction of microwave signals are reported. The multi-dimensional feature sensing of transient and wideband signals across the time, frequency, spatial, and modulation domains is achieved.

11:00–11:30 · ACP2026-0817-4 **Invited****High-precision and wideband microwave photonic frequency measurement**Yiwei Xie^{1*}, Zexu Wang¹, Daoxin Dai¹*1. Zhejiang University, China*

This paper reviews state-of-the-art microwave-photonic frequency-measurement techniques and pinpoints key bottlenecks for electromagnetic spectrum measurement. Innovative solutions are proposed, including channelized parallel-processing architectures, microcavities with high Q-factors and large free-spectral ranges, as well as on-chip reconfigurable photonic devices for improved system performance and flexibility.

11:30–11:45 · ACP2026-0701-74

Ultra Wide-bandwidth Silicon Microwave Frequency Measurement System**Zexu Wang¹**, Xiaowan Shen¹, Yuyan Yao¹, Ruitao Ma¹, Yiwei Xie¹, Daoxin Dai¹*1.State Key Laboratory for Modern Optical Instrumentation, College of Optical Science and Engineering, Zhejiang University, China*

We demonstrate a frequency measurement system based on an arrayed waveguide grating with a 400 GHz wavelength span, enabling scalable frequency measurement coverage and experimentally achieving 2–50 GHz operation with an error of 84 MHz.

11:45–12:00 · ACP2026-0626-8

Multidimensional Diffractive Meta-Neural Networks for Super-Resolution DOA Estimation**Songtao Yang¹**, Sheng Gao¹, Chu Wu¹, Zejia Zhao¹, Haiou Zhang¹, Xing Lin^{1*}*1.Tsinghua University, China*

We present a diffractive meta-neural network using meta-trained multidimensional metasurface modulation, multi-frequency coding, and polarization multiplexing for super-resolution DOA estimation, experimentally achieving 0.5° resolution and robust single- and dual-source angular sensing beyond Rayleigh diffraction limits.

13:30–15:30 · November 4, 2026 · Wednesday

Microwave Photonic Devices and Systems (4)

Presider: Zejie Yu, Zhejiang University, China

13:30–14:00 · ACP2026-0629-8 **Invited****Integrated Lithium Niobate microwave photonics****Hanke Feng¹***1.City University of Hong Kong, Hong Kong, China*

This talk covers thin-film lithium niobate integrated MWP systems, enabling high-fidelity conversion and signal processing. With low-cost manufacturability, this breakthrough offers critical solutions for overcoming RF limitations and advancing future 6G integrated sensing technologies.

14:00–14:30 · ACP2026-0903-2 **Invited****The Second Evolution of Integrated Optical Frequency Combs****Qifan Yang^{1*}***1.Peking University, China*

The second evolution of microcombs shifts emphasis from demonstrations to application requirements. I will discuss advances in noise reduction, spectral bandwidth, and optical power, highlighting opportunities in optical communications, precision measurement, and integrated microwave photonics.

14:30–14:45 · ACP2026-0714-46

Integrated Lithium Niobate Tri-comb for Broadband Instantaneous Frequency Measurement**Zeyuan Xie¹**, Jiaheng Fan¹, Fei Huang¹, Zhile Wu¹, Daoxin Dai¹, Zejie Yu^{1*}*1.Zhejiang University, China*

An integrated lithium niobate electro-optic tri-comb combined with ~MHz electronics is demonstrated for unambiguous instantaneous frequency measurement ranging from 10 MHz to 27.01 GHz using fast Fourier transform method.

14:45–15:00 · ACP2026-0715-145

On-chip programmable optical spectral shaper for microwave photonics filters**Haoran Zhang¹**, Xiaotian Zhu², Shifan Chen¹, Brent E. Little³, Sai T. Chu^{2*}, Xingyuan Xu^{1*}*1.Beijing University of Posts and Telecommunications, China; 2.City University of Hong Kong, Hong Kong, China; 3.QXP Technology Inc., China*

We present an on-chip programmable optical spectral shaper (OSS) based on a CMOS-compatible, high-index doped silica glass platform, capable of processing 100.3-GHz microcombs and demonstrated in microwave photonics filters (MPFs).

15:00–15:15 · ACP2026-0714-35

TOPS-Speed Complex-Valued Optical Convolutional Accelerator for Feature Extraction and Inference**Yifu Xu¹**, Shifan Chen¹, Yuhang Song¹, Yuhang Xie², Yunping Bai^{1*}, Xingyuan Xu¹*1.Beijing University of Posts and Telecommunications, China; 2.China Academy of Industrial Internet, China*

We report a complex-valued optical convolutional accelerator for phase-sensitive data streams. By mapping complex-valued kernels onto synthetic wavelengths and time multiplexing complex-valued inputs, the system reaches 1.0256 TeraOPS in the SAR-image demonstration.

15:15-15:30 · ACP2026-0715-94

Optomechanical Frequency Comb Generation in Silica Microspheres**Doudou Feng¹**, Jiamin Bai¹, Weiquan Zhu¹, Suwan Sun¹, Hairun Guo^{1*}*1. Shanghai University, China*

We generate optomechanical frequency combs in silica microspheres of different sizes, investigate the geometric dependence of the mechanical eigenfrequency, and characterize the linewidth and phase noise of the fundamental RF signal.

15:30-16:00 Coffee Break

16:00-17:45 · November 4, 2026 · Wednesday

Microwave Photonic Devices and Systems (5)

Presider: Qifan Yang, Peking University, China

16:00-16:30 · ACP2026-0604-2 **Invited****High-Precision Delay-Stabilized Fiber-Optic Transmission and Its Applications****Wei Wei^{1*}***1. Beijing Institute of Technology, China*

We demonstrate high-precision delay-stabilized fiber-optic transmission, achieving long-distance femtosecond-level stability. This work highlights broad applications in distributed coherent radars, interferometric antenna arrays, and stabilizing high-performance microwave photonic devices.

16:30-16:45 · ACP2026-0630-6

A GNSS-over-Fiber Array-Fusion Method under Non-Strict Common-Clock Conditions and Its Error Analysis**Chongmei Liu¹**, Yufei Wang¹, Wenlin Bai², Yang Li^{1*}, Jia Ye¹, Xihua Zou¹, Wei Pan¹, Lianshan Yan¹*1. Southwest Jiaotong University, China; 2. Southwest China Research Institute of Electronic Equipment, China*

This paper proposes a GNSS-over-fiber array fusion method leveraging short-baseline constraints to fuse multi-antenna observations, significantly enhancing positioning precision, ambiguity-fixing reliability, and solution accuracy by mitigating measurement noise and systematic calibration biases.

16:45-17:00 · ACP2026-0714-9

Widely Tunable Low-Phase-Noise Photonic Microwave Generation Using Stabilized Period-One Laser Dynamics**Kun Liu¹**, Pei Zhou^{1*}, Wenxin Chen¹, Nianqiang Li¹*1. Soochow University, China*

A widely tunable low-phase-noise photonic microwave source is demonstrated using stabilized P1 laser dynamics, achieving 7-52 GHz tuning, -110.3 dBc/Hz @ 10 kHz phase noise, and 65 dB SMSR via SBS-assisted FSOIL stabilization.

17:00-17:15 · ACP2026-0701-37

An Equalization Method Based on Dilated Convolutional Neural Network and Spatial Attention Mechanism for Photonic-Assisted W-Band NOMA-OTFS Systems**Lu Meng¹**, Jing He^{1*}, Kang Liu¹, Jiahui Wu¹, Bozhen Li¹*1. Hunan University, China*

In the paper, an equalization method based on a dilated convolutional neural network and a spatial attention mechanism (DCNN-SAM) is proposed and experimentally demonstrated in a photonic-assisted W-band non-orthogonal multiple access orthogonal time frequency space modulation (NOMA-OTFS) system. Experimental results indicate that, compared with conventional linear equalization schemes, the DCNN-SAM equalization method significantly enhances the communication performance for multiple users, particularly for weak users. In addition, relative to the CNN-based benchmark, the proposed equalization scheme adopts a lightweight network architecture, reducing the computational overhead by approximately 65%.

17:15-17:30 · ACP2026-0715-23

Optical-Power-Insensitive Phase-Stabilized Microwave Transmission System Over Fiber**Xiangyi Liu¹**, Wei Wei^{1*}, Zhuoran Li¹, Xin Wang¹, Zixuan Guo¹, Xi Wang^{1,2}, Weilin Xie¹, Yi Dong¹*1. Beijing Institute of Technology, China; 2. Shijiazhuang University, China*

We demonstrate power-insensitive phase-stabilized microwave transmission using independent optical-power control to mitigate delay errors from non-ideal phase discrimination and photodetection, reducing the delay-fluctuation standard deviation to 24.16fs with both loops enabled.

17:30–17:45 · ACP2026-0715-151

High-order Dispersion Synthesizer with Dual-Chirped Multimode Waveguide Gratings**Ruitao Ma¹**, Fei Huang¹, Zexu Wang¹, Shujun Liu¹, Zejie Yu^{1*}, Daoxin Dai¹*1.State Key Laboratory for Modern Optical Instrumentation, College of Optical Science and Engineering, Zhejiang University, China*

We experimentally demonstrate a TFLN high-order dispersion synthesizer based on dual-chirped multimode waveguide gratings, realizing five prescribed group-delay profiles with variations exceeding 210 ps while maintaining an average insertion loss of 0.256 dB per stage.

NP3: Quantum Devices, Systems, Networking and Computing

Conference Room 207, 2F

14:00–15:30 · November 2, 2026 · Monday

Integrated Photonics for Quantum Communications

Presider: Xiaomin Hu, University of Science and Technology of China, China

14:00–14:30 · ACP2026–0908–11 **Invited**

Quantum photonic frequency processing via electro-optic modulation

Yanxiao Gong^{1*}

1. Nanjing University, China

I will introduce our two recent works. One is an experimental demonstrating of an integrated quantum photonic frequency processor. The other is a postselection-loophole-free Bell test with genuine energy-time entanglement.

14:30–15:00 · ACP2026–0902–13 **Invited**

Integrated Photonics for Quantum Communication Networks

Yun Zheng^{1*}

1. Peking University, China

Integrated photonics offers scalable, low-cost, high-performance solutions for quantum communication networks. We review recent advances in photonic technologies for quantum communication, focusing on key components enabling secure large-scale network implementation and real-world deployment.

15:00–15:15 · ACP2026–0715–11

Thin-Film SiN Moiré Photonic Molecule for Broadband Quantum Microcomb

Shuai Liu^{1*}, Xin Hua¹, Haotian Shi¹, Hongguang Zhang¹, Xi Xiao¹

1. National Information Optoelectronics Innovation Center, China

We propose a thin-film SiN Moiré photonic molecule for programmable broadband dispersion engineering and theoretically predict >10 dB on-chip squeezing across a 2-THz bandwidth for scalable continuous-variable quantum microcomb generation.

15:15–15:30 · ACP2026–0715–129

Chip-to-Chip Polarization Entanglement Distribution on a Silicon Photonic Platform

Xu Yan^{1*}, Xin Hua^{1*}, Yanxin Han¹, Shuai Liu¹, Lu Xu¹, Ying Zhu¹, Yanjing Zhao¹, Hongguang Zhang¹, Xi Xiao^{1*}

1. National Information Optoelectronics Innovation Center, China

We demonstrate the first fully silicon-photonic two-node chip-to-chip polarization entanglement distribution system, achieving a maximum raw visibility of 0.869 ± 0.005 (6.6% estimated QBER), providing a scalable architecture for entanglement-based quantum networks.

15:30–16:00 Coffee Break

16:00–17:30 · November 2, 2026 · Monday

High-dimensional quantum entanglement

Presider: Yanxiao Gong, Nanjing University, China

16:00–16:30 · ACP2026–0818–8 **Invited**

High-Dimensional Multiphoton Nonlocality and Its Metasurface-Based Implementation

Xiaomin Hu¹

1. University of Science and Technology of China, China

We demonstrate high-dimensional multiphoton nonlocality using a high-fidelity three-photon qutrit GHZ state, efficient entanglement witnesses, and dimension-sensitive Bell inequalities, while exploring metasurface-enabled scalable generation of multiphoton entanglement for advanced quantum information applications in integrated platforms.

16:30–17:00 · ACP2026–0702–4 **Invited**

High-dimensional quantum entanglement and chip-scale quantum interconnects

Xiang Cheng^{1*}

1. Huazhong University of Science and Technology, China

The realization of a high-rate, fault-tolerant quantum internet necessitates scalable photonic platforms that intrinsically support

high-dimensional Hilbert spaces and the multiplexing of multiple degrees of freedom (DOFs). This talk reports our recent experimental advances in both chip-integrated quantum logic and high-dimensional entanglement generation. Specifically, we demonstrate the first polarization-spatial-momentum quantum SWAP gate implemented on a silicon-on-insulator photonic chip. The gate operation is characterized by high process fidelity and the preservation of quantum coherence across the constituent DOFs, thereby functioning as a low-loss quantum interface that enables direct transduction between distinct photonic degrees of freedom for chip-to-chip quantum interconnects. Concurrently, we investigate high-dimensional time-frequency entanglement via a biphoton frequency comb, wherein we certify an effective Hilbert-space dimensionality of up to 648. Such high-dimensional entangled states constitute a fundamental resource for dense coding and noise-resilient quantum cryptography. To address the practical limitation of low distribution rates inherent to narrowband filtering, we propose and implement a singly-filtered scheme that significantly enhances the two-photon coincidence rate without compromising the dimensionality of the entangled state. The efficacy of this approach is validated through a proof-of-principle quantum key distribution (QKD) experiment. Collectively, these results establish an experimental pathway toward high-rate quantum networks, leveraging the combined advantages of on-chip manipulation and the large information capacity afforded by high-dimensional, multi-DOF photonic entanglement.

17:00–17:15 · ACP2026-0721-2

Quantum Two-Way Time Transfer with Adaptive Algorithmic Dispersion Compensation

Zhiyang Liu¹, Yunru Fan^{1*}, Tao Zhou¹, Hao Li², Lixing You², Guangcan Guo¹, Qiang Zhou^{1*}

1.University of Electronic Science and Technology of China, China; 2.Shanghai Institute of Microsystem and Information Technology Chinese Academy of Sciences, China

We demonstrate quantum two-way time transfer using an adaptive algorithmic dispersion-compensation method. By estimating the dispersion from the broadened coincidence histogram, the proposed method adaptively adjusts the compensation parameter and narrows the coincidence peak without using a hardware dispersion compensation module. The full width at half maximum of the histogram is reduced from 506 ps to 174 ps, and a time deviation of 1.65 ps at 10 s is achieved, compared with 4.10 ps and 2.14 ps at 10 s for the raw results without and with DCM, respectively. Our results pave the way for compact and low-loss quantum time transfer systems.

17:15–17:30 · ACP2026-0715-87

Machine Learning-Based Parameter Optimization of a Quantum Key Distribution System Under Limited Experimental Data

Hajar Bennouri^{1*}, Xupeng Wang¹, Dan Kilper¹, Dmitrii Briantsev¹

1.Trinity College Dublin, Ireland

Quantum Key Distribution (QKD) systems require careful parameter tuning to maximise secret key generation performance under varying channel conditions. However, practical optimisation is often constrained by limited experimental throughput, as obtaining reliable Secret Key Rate (SKR) measurements can require lengthy acquisition periods. This paper investigates a machine-learning-assisted optimisation framework for a commercial ID Quantique Clavis XGR QKD system implementing the decoy-state BB84 protocol. A total of 510 experimental samples were collected across three channel attenuation levels (16.68 dB, 21.68 dB and 26.68 dB). Gaussian Process (GP) regression and Neural Network (NN) models were evaluated as surrogate models for predicting SKR from attenuation and protocol parameters. Experimental results show that GP models outperform NN models on limited datasets and provide reliable interpolation across operating conditions. The final optimisation framework achieved approximately 20% higher SKR than vendor-default settings over the evaluated attenuation range. These results demonstrate the potential of data-driven optimisation for practical QKD deployments where exhaustive parameter search is prohibitively expensive.

08:30–10:00 · November 3, 2026 · Tuesday

Quantum memory

Presider: Jianwei Tang, Huazhong University of Science and Technology, China

08:30–08:45 · ACP2026-0714-57

Efficient integrated quantum memory for light

Ruoran Meng¹

1.USTC, China

By using membranes of $\text{Eu}^{3+}:\text{Y}_2\text{SiO}_5$ coupled with fiber-based microcavities, we achieve reliable integrated quantum storage with record efficiencies of 75.2% for weak coherent pulses and 69.8% for telecom-heralded single photons.

08:45–09:00 · ACP2026-0721-4

Properties of $^{167}\text{Er}^{3+}:\text{LiNbO}_3$ photonic quantum memory

Haoze Zhang¹, Yaoqing Zhang¹, Yunru Fan¹, Liang Zhai¹, Hao Li², Lixing You², Guangcan Guo¹, Qiang Zhou^{1*}

1.University of Electronic Science and Technology of China, China; 2.Shanghai Institute of Microsystem and Information Technology Chinese Academy of Sciences, China

We demonstrate a $^{167}\text{Er}^{3+}:\text{LiNbO}_3$ quantum memory for weak coherent optical storage. The memory achieves an on-chip storage efficiency of $5.36 \pm 0.02\%$ with storage time of 135 ns. Our results demonstrate the potential of $^{167}\text{Er}^{3+}:\text{LiNbO}_3$ for integrated quantum memory applications in the telecom band.

09:00–09:30 · ACP2026-0610-2 **Invited****Metropolitan-scale Multiplexed Quantum Repeaters: Bell Non-locality and Applications**
Zongquan Zhou^{1*}*1. University of Science and Technology of China, China*

Based on the multiplexed quantum repeater protocol using time measurements (MQR-TM), we have constructed a metropolitan-scale quantum repeater network, XingHan 2.0 [Nature Photonics, (2026)], extending our multiplexed quantum repeater from lab-scale demonstrations [Nature, 594, 41 (2021)] to city-scale deployment. In this talk, I will discuss our recent efforts in implementing quantum information tasks enabled by XingHan 2.0. I will also present our progress on long-lived and efficient quantum memories based on Eu:YSO [Nature Photonics 20, 437 (2026)].

09:30–10:00 · ACP2026-0902-5 **Invited****Integrated quantum memory based on bound states in the continuum**
Yuhui Chen¹*1. Beijing Institute of Technology, China*

Future quantum networks need scalable quantum memories. Hybrid silicon-erbium platforms are promising, yet suffer from weak light-matter coupling. We exploit bound-in-continuum modes to enhance light absorption, achieving telecom-band photon storage with bulk-comparable coherence on a silicon-foundry-compatible chip.

10:00–10:30 Coffee Break

10:30–11:45 · November 3, 2026 · Tuesday

Quantum Light Source

Presider: Fangxiang Wang, University of Science and Technology of China, China

10:30–11:00 · ACP2026-0506-1 **Invited****Cavity-Enhanced Semiconductor Quantum Dot Quantum Light Source**
Bang Wu^{1*}*1. Beijing Academy of Quantum Information Sciences, China*

This presentation covers novel cavity-enhanced quantum dot light sources: ultra-low-reflectivity micropillars enabling direct resonant excitation (purity 0.026), topological cavities for robust coupling, and a deterministic two-photon emitter achieving 98.3% two-photon contribution.

11:00–11:30 · ACP2026-0905-1 **Invited****Indistinguishable single-molecule single photon sources**
Jianwei Tang^{1*}*1. Huazhong University of Science and Technology, China*

We report an organic-inorganic hybrid integrated quantum photonic platform and demonstrate near-perfect on-chip two-photon Hong-Ou-Mandel quantum interference between indistinguishable single photons from independent molecules, a key step towards scalable optical quantum information processing.

11:30–11:45 · ACP2026-0701-96

Experimental Demonstration of Quantum Key Distribution and Classical Communications Co-propagation over Diverse 100 km+ Fibers**Weiwen Kong¹**, Tianqi Dou¹, Zhenhua Li¹, Lipeng Feng¹, Lei Zhang², Song Gao³, Zhengjun Pan⁴, Nan Lu⁵, Jianjun Tang¹*1. China Telecom Research Institute, China; 2. State Key Lab. of Opt. Fib. and Cab. Manuf. Tech. YOFC, China; 3. QuantumCTek Corporation Limited, China; 4. Huawei Technologies Co., Ltd., China; 5. ZTE Corporation, China*

We demonstrate our experimental work on QKD and classical communication co-propagation over diverse 100 km+ fibers (SMF/FMF/MCF/HCF) using commercial devices. Systematic performance with classical capacities of 1~374.4 Tbps and secure key rate >2 kbps is demonstrated, and offering deployment insights for quantum-classical network integration.

12:00–13:30 Lunch

13:30–15:30 · November 3, 2026 · Tuesday

Quantum Communication over Fiber Channels

Presider: Xiang Cheng, Huazhong University of Science and Technology, China

13:30–14:00 · ACP2026-0619-1 **Invited****Microcomb-driven large-scale fully-connected quantum network****Fangxiang Wang**^{1*}, Guowei Zhang¹, Shengteng Zheng¹, Long Huang², Wenfu Zhang^{2*}, Wei Chen^{1*}*1. University of Science and Technology of China, China; 2. Xi'an Institute of Optics and Precision Mechanics, Chinese Academy of Sciences, China*

The talk is about our recent works on integrated soliton microcomb (SMC) and photonic encoding chips, and a large-scale fully connected quantum network without trusting the network provider.

14:00–14:30 · ACP2026-0602-1 **Invited****Deterministic entanglement-assisted quantum communication over fiber channels****Siyu Ren**¹, Yanru Yan¹, Dongmei Han¹, Meihong Wang^{1,2}, Xiaolong Su^{1,2*}*1. State Key Laboratory of Quantum Optics Technologies and Devices, Institute of Opto-Electronics, Shanxi University, China; 2. Collaborative Innovation Center of Extreme Optics, Shanxi University, China*

Quantum communication is evolving toward practical applications. Based on the distributed entangled states, we realize deterministic entanglement-assisted quantum communication over 20-km unidirectional/10-km bidirectional fiber links, and dual-image transmission (BER 1E-5) at 1 km.

14:30–15:00 · ACP2026-0602-2 **Invited****Experimental distributed-phase-reference quantum key distribution with information theoretic security****Xiaoyu Cao**^{1*}*1. Nanjing University, China*

This work experimentally demonstrates information-theoretically secure DPR-QKD, including COW-QKD and DPS-QKD, closing key security loopholes while preserving simple modulation. Its simple transmitter module makes it a promising building block to future quantum networks.

15:00–15:15 · ACP2026-0622-5

First Real-Time Bidirectional Same-Wavelength CV-QKD at 2×100 kbps over an 11.5 dB-loss Hollow-Core Fiber Link**Yuqian Zhang**¹, Dong Wang¹, Sheng Liu¹, Dawei Ge¹, Mingqing Zuo¹, Han Li¹, Dechao Zhang^{1*}*1. Department of Fundamental Network Technology, China Mobile Research Institute, China*

We demonstrate bidirectional same-wavelength CV-QKD over an 11.5 dB-loss HCF link. Two independent systems operate stably with frequency separations from ~700 to 700 MHz, achieving a total SKR of 200 kbps and negligible crosstalk.

15:15–15:30 · ACP2026-0702-8

Integrated QKD-OTDR Co-Transmission System for Real-Time Fiber Eavesdropping Detection and Localization**Dongchen Zhang**^{1*}, Wen Zuo², Hu Shi², Dapeng Liang², Yan Zhao², Baoluo Yan², Shikui Shen³, Kezhi Qiao⁴, Yangguang Liu⁵*1. Beijing Zhongxing Guangtai Software Company Limited, China; 2. WDM System Department of Wireline Product R&D Institute, ZTE Corporation, China; 3. China Unicom Research Institute, Beijing, China, China; 4. State Key Laboratory of Mobile Network and Mobile Multimedia Technology, China; 5. WDM System Department of Wireline Product R&D Institute, China*

Optical Time Domain Reflectometer (OTDR) helps solve inaccurate attack, eavesdropping identification and localization issues in practical Quantum Key Distribution (QKD). We propose an integrated QKD-OTDR system, systematically study OTDR parameter effects on QKD performance, realize uninterrupted real-time security monitoring, and provide a practical solution for efficient QKD networks operation.

15:30–17:30 Coffee Break & Poster Session

NP4: Materials, Nanofabrication, and Characterization Techniques

Conference Room 101, 1F

13:30–15:30 · November 2, 2026 · Monday

Materials, Nanofabrication, and Characterization Techniques (1)

Presider: Yuanlin Zheng, Shanghai Jiao Tong University, China

13:30–14:30 · ACP2026-0902-4 **Tutorial**

Optical neural networks enabled by direct laser writing

Qiming Zhang¹

1. University of Shanghai for Science and Technology, China

This tutorial systematically introduces femtosecond direct laser writing technologies, diverse optical neural network architectures, cutting-edge applications, and discusses recent advances and key challenges in high-performance all-optical neuromorphic computing and ultrafast intelligent optical signal processing.

14:30–15:00 · ACP2026-0801-4 · **Invited**

Performance and Mechanism Research of Two-dimensional Polarized Photodetectors

Wei Xin^{*}

1. Northeast Normal University, China

Our work summarizes the principles, applications, and future prospects of 2D-material-based polarized photodetection, emphasizing the role of light vector characteristics and vectorial transformations during transmission.

15:00–15:30 · ACP2026-0903-3 · **Invited**

Hyperbolic Metamaterial based fiber plasmonic sensor and its biomedical sensing application

Yunhan Luo¹

1. Jinan University, China

This work proposes an SPR tuning theory based on multi-dimensional hypersurfaces. Through dispersion management of hyperbolic metamaterials and magneto-optical effect regulation, the sensitivity, detection range, and figure of merit of SPR sensors are significantly enhanced, demonstrating great potential for biomedical and magnetic field sensing applications.

15:30–16:00 Coffee Break

16:00–17:30 · November 2, 2026 · Monday

Materials, Nanofabrication, and Characterization Techniques (2)

Presider: Qiming Zhang, University of Shanghai for Science and Technology, China

16:00–16:30 · ACP2026-0818-6 · **Invited**

Nanofabrication of thin-film lithium niobate photonic crystals for deep sub-wavelength photonics

Yuanlin Zheng^{1*}

1. Shanghai Jiao Tong University, China

High-quality Moiré superlattice in thin-film lithium niobate (TFLN) is fabricated for efficient second-harmonic generation of focused beams containing broad oblique wavevector components, advancing TFLN Moiré superlattices as a versatile platform for compact, integrated nonlinear photonics.

16:30–17:00 · ACP2026-0909-2 · **Invited**

Progress in Light-Matter Interactions in 2D Materials from Visible to THz

Jianbin Xu^{1*}

1. The Chinese University of Hong Kong, Hong Kong, China

A comprehensive understanding of optoelectronic and photonic properties in hierarchically stacked two-dimensional materials and at hetero-interfaces is essential for high-performance device design. By meticulously engineering the interplay between matter and nanophotonic structures, we find new attributes of light-matter interaction that were previously unavailable. In this presentation, we highlight a series of innovative advances from our group in van der Waals (vdW) materials and hybrid nanophotonic platforms. We demonstrate: (1) polariton hybridization ranging from Fano-type interference to high-Q etch-free vdW metasurfaces and actively tunable Kerker scattering, realized through self-coupled polaritonic platforms grown by CVD bottom-up methods; (2) interlayer exciton engineering that reveals giant dipole moments via precise layer control and attains deterministic areal emission enhancement through plasmonic lattice-on-mirror architectures; (3) room-temperature active valley polarization control in WSe₂ enabled by the

synergistic action of chiral metasurfaces and hot-carrier injection; and (4) photonic–2D–material hybrids that extend these coherent interactions into the THz regime, yielding unique optoelectronic functionalities. Collectively, these results establish new design principles for polaritonic, excitonic, and valleytronic devices operating from the visible to the THz spectral range.

17:00–17:30 · ACP2026–0828–4 · **Invited**

Light- and Thermally Driven Self-Organization of Metallic Nanoparticle Arrays for Photonic Applications

Xiaoqin Wu^{1*}

1. Chongqing University, China

We present light- and thermally driven self-organization strategies for fabricating highly uniform plasmonic nanoparticle arrays with tunable periodicities, enabling narrowband resonances, structural colors, hybrid photonic resonators, and advanced information applications.

08:30–10:00 · November 3, 2026 · Tuesday

Materials, Nanofabrication, and Characterization Techniques (3)

Presider: Wei Xin, Northeast Normal University, China

08:30–09:00 · ACP2026–0902–8 · **Invited**

Nanostructure Lattices and Their Nanophotonic Devices

Shikai Deng^{1*}

1. Shanghai Institute of Microsystem and Information Technology, China

In this talk, we will share our recent progress on design and device demonstration of nanostructure lattices with tailored optical responses.

09:00–09:30 · ACP2026–0909–1 · **Invited**

Ultrafast laser-assisted etching of glass: From fabrication to device applications

Jian Xu^{1*}

1. East China Normal University, China

We demonstrate our newly developed ultrafast laser-assisted etching techniques for 3D glass microstructures, including polarization-independent etching, large-scale, high-precision microstructuring and deep, high-aspect-ratio microstructuring, together with exploratory applications in microfluidics, optofluidics, microscale separation, and organ-on-chip systems.

09:30–09:45 · ACP2026–0715–136

Superior Optical Gyromagnetic Response in a Magneto-Optical Metagrating

Tong-Huai Cheng¹, Jingyi Tian^{1*}, Feng Luo^{2*}, Jun Qin^{3*}, Weihao Yang³, Lei Bi^{3*}

1. Westlake University, China; 2. Nankai University, China; 3. University of Electronic Science and Technology of China, China

We report a magneto-optical metagrating with strong gyromagnetic response at optical frequencies, resulting from the excitation of surface plasmon resonance and waveguide mode. The equivalent off-diagonal element of permeability tensor is up to ~ 0.46 , representing the highest level to date.

09:45–10:00 · ACP2026–0701–57

Permanent Tuning of Silicon Photonic Devices by Multiple Near-Infrared Femtosecond Laser Pulses

Ruoheng Zhang^{1*}

1. University of Alberta, Canada

In this work, we demonstrate high-precision permanent tuning of silicon photonic devices using multi-shot nearinfrared femtosecond laser irradiation at a wavelength of 1030 nm. Using a superluminescent diode and an Optical Spectrum Analyzer allows the resonance wavelength of silicon microring resonators to be measured after irradiation within a minute, making it possible to track shot-to-shot wavelength shifts during laser exposure. Using silicon microring resonators, we achieved a permanent resonance tuning resolution of 0.82 ± 0.7 pm with a nearly constant round-trip loss of 0.47 ± 0.02 dB by using pulse energy of 5.3 nJ at a laser fluence of 0.016 J/cm². The tuning resolution is the smallest value reported for a permanent tuning method in silicon photonics to our knowledge, and is comparable to conventional thermo-optic tuning with microheaters. As practical applications of the method, we discussed how to tune the resonance wavelength of a silicon microring resonator requires a small shift or relative large shift, and we also performed tuning of a 1×3 wavelength DEMUX, achieving high wavelength accuracy with negligible extra loss. These results show that multi-shot femtosecond laser irradiation is a practical method for low-loss, high-precision post-fabrication correction of silicon photonic circuits.

10:00–10:30 Coffee Break

10:30–12:00 · November 3, 2026 · Tuesday

Materials, Nanofabrication, and Characterization Techniques (4)

Presider: Jian Xu, East China Normal University, China

10:30–11:00 · ACP2026–0823–2 · **Invited****Polarization and chiral metasurface devices based on symmetry-breaking engineering****Zilan Deng^{1*}***1. Jinan University, China*

We achieve intrinsic optical chirality in planar metasurfaces without 3D fabrication, using symmetry-broken BIC resonances. This strategy enables flexible tuning of chirality and Q factors simultaneously, offering a practical platform for chiral light emission, nonlinear optics, and quantum photonic applications.

11:00–11:30 · ACP2026–0902–12 · **Invited****Two-Photon Lithography via Metasurface****Hui Gao^{1*}***1. Huazhong University of Science and Technology, China*

Traditional laser systems are often bulky, single-function, with low integration. Taking two-photon lithography, this study shows how metasurfaces provide a new platform for realizing highly integrated optical systems.

11:30–11:45 · ACP2026–0626–9

Inverse Design of Metasurfaces for Laplace Differentiators**Haogen Yuan¹**, Sichao Shan², Qi Sun³, Zhitong Li^{2*}, Tianyue Zhang^{1,4*}

1. School of Integrated Circuits, Beijing University of Posts and Telecommunications, China; 2. School of Physical Science and technology, Beijing University of Posts and Telecommunications, China; 3. School of Electronic Engineering, Beijing University of Posts and Telecommunications, China; 4. State Key Laboratory of Information Photonics and Optical Communications, Beijing University of Posts and Telecommunications, China

Surrogate-assisted inverse design identifies hollow-pillar silicon metasurfaces for optical Laplace differentiation. FDTD, OTF and image-level tests verify single-wavelength and broadband candidates for edge-enhancing spatial filtering.

11:45–12:00 · ACP2026–0728–3

Ice Lithography Using Dicobalt Octacarbonyl on Silicon, Filter Paper, and Living Tardigrades**Zhirong Yang¹**, Limin Qi¹, Kang Zhao^{1*}, Ding Zhao^{1*}, Min Qiu^{1*}*1. Westlake University, China*

We demonstrate ice lithography using dicobalt octacarbonyl as a negative-tone metal-organic resist on silicon, filter paper, and a tardigrade. Cross-linked patterns remained after sublimation, and the tardigrade recovered activity after rehydration.

NP4: Materials, Nanofabrication, and Characterization Techniques

Conference Room 103B, 1F

13:30–14:15 · November 3, 2026 · Tuesday

Materials, Nanofabrication, and Characterization Techniques (5)

Presider: Shikai Deng, Shanghai Institute of Microsystem and Information Technology, China

13:30–13:45 · ACP2026-0714-10

Multiscale Insights into Ultrafast Laser-Induced Dynamics through Coupled Two-Temperature Model and Molecular Dynamics Prem Dheeraj Mortha^{1*}

¹.Indian Institute of Technology Bombay, India

Ultrafast laser ablation, particularly with femtosecond (fs) lasers, has emerged as a cutting-edge technique for precision material processing, enabling highly localized ablation. The ultra-short pulse duration (on the order of 10^{-15} seconds) triggers rapid heating and material removal before significant heat diffusion occurs. Despite its impressive advantages, understanding the underlying physics of fs laser-material interactions remains a challenge due to the complexity of processes occurring across multiple temporal and spatial scales. This study presents a multiscale hybrid modeling approach to fs laser heating in gold substrates, integrating the Two-Temperature Model (TTM) with Molecular Dynamics (MD) simulations within the LAMMPS framework using the Embedded Atom Method (EAM) potential. The TTM governs energy exchange between the electron and lattice subsystems, while MD tracks atomic-scale responses such as thermal expansion, surface deformation, and material ejection. This approach enables a high-fidelity representation of laser-induced surface modifications that are otherwise difficult to capture through classical thermal models. Validated against published studies, the TTM-MD model investigates surface heating dynamics under fs laser fluences of 35–70 mJ/cm². Simulations reveal that the substrate surface reaches peak temperatures exceeding 5000 K within 7–10 ps, initiating significant thermal expansion and surface restructuring. This model provides a robust computational framework for optimizing fs laser processing techniques while retaining atomic-scale resolution. It is well-suited for exploring a broad spectrum of laser-matter interactions, including multi-pulse effects, multiscale simulation volumes, and diverse material systems. Its adaptability enables the study of cumulative energy deposition, phase transitions, and defect formation under varying processing conditions, making it invaluable for applications where precision is paramount.

13:45–14:00 · ACP2026-0715-161

A SAM2-Based Model for Automatic Segmentation and Characterization of Quantum Dots

Yuerui Wu¹, Ruitong Wang¹, Xin Yan^{1*}, Xia Zhang^{1*}

¹.Beijing University of Posts and Telecommunications, China

We propose a segmentation model based on SAM2 that fuses intensity and edge cues for dense quantum-dot segmentation and automatic characterization, achieving Dice 0.9261, mIoU 0.8659.

14:00–14:15 · ACP2026-0728-1

Spectrally Tunable Electromagnetically Induced Transparency Resonances in All-dielectric Metasurfaces

Feng Liu¹, Lei Liu¹, Mingke Jin¹, Jingyi Tian^{1*}, William Shieh^{1*}

¹.Westlake University, China

We demonstrate spectrally-tunable EIT resonances in an all-dielectric silicon nanodisk and nanobar metasurface, achieving geometry-controlled spectral tuning through multi-parameter optimization and experimental validation of resonance shifts and coupling evolution.

15:30–17:30 Coffee Break & Poster Session

Best Top-Score Paper Award Competition Session

November 1, 2026 · Conference Room 207, 2F

I D-Track Presider: **Xingchen Ji**, Shanghai Jiao Tong University, China

08:30-08:45 · ACP2026-0701-146 Top-Score Paper

High-Fidelity Integer Factorization by QUBO Optimization on a Photonic Ising Chip

Kun Liu¹, Xin Ye¹, Luyu Si¹, Wenjia Zhang^{1*}, Zuyuan He¹

1. Shanghai Jiao Tong University, China

We demonstrate a hardware-assisted 32-bit integer factorization workflow that optimizes a QUBO-derived factorization energy model with a packaged photonic Ising chip. The Ising machine enabled by a multichannel cascaded Mach-Zehnder modulators provides the 7-bit calibrated optical readouts used to evaluate energy differences in order for performing spin flipping, Metropolis updating, and candidate factors verification. On a retained optimized five-instance set of 32-bit QUBO-derived block factorization models, the best optical-path annealing runs increase the aggregate factorization success count from 5/250 for direct bit flips and 22/250 for circuit annealing simulation to 91/250. These results demonstrate that a calibrated photonic chip can serve as a practical and scalable accelerator for hardware-assisted QUBO factorization, paving the way toward photonic-enabled large-scale integer factorization.

08:45-09:00 · ACP2026-0715-178 Top-Score Paper

A 1.2 dB Insertion Loss on-Chip Mach-Zehnder Interferometer Type Optical Isolator Based on Stoichiometric Ce:YIG Magneto-Optical Thin Films

Di Wu¹, Zhenyuan Ren¹, Tianchi Zhang¹, Zixuan Wei¹, Jun Qin¹, Lei Bi^{1*}

1. University of Electronic Science and Technology of China, China

We demonstrate a heterogeneously integrated Mach-Zehnder interferometer optical isolator on a silicon nitride platform. By eliminating intragranular defects in Ce:YIG films, the device achieves a record-low insertion-loss of 1.2 dB and 27.6 dB isolation ratio.

09:00-09:15 · ACP2026-0701-63 Top-Score Paper

Inverse-designed Waveguides Enable Sub-picometer Resolution Spectrometer over 700nm Bandwidth

Hao He¹, Zengji Tu¹, Lin Chang^{1*}

1. Peking University, China

We demonstrate a compact and high-performance on-chip spectrometer. By employing inverse design along the sidewalls of a single waveguide, this chip achieves a record full-width at half-maximum of 0.25 pm and an operation bandwidth over 700 nm.

09:15-09:30 · ACP2026-0729-4 Top-Score Paper

Slow-Light Modulator Based on Localized Mode-Recycling in Thin-Film Lithium Tantalate

Jiaxuan Gan¹, Weihang Wang¹, Zexu Wang¹, Mingyu Zhu¹, Aoyun Gao¹, Fei Huang¹, Zejie Yu¹, Weiwei Zhao^{1*}, Daoxin Dai^{1*}

1. Zhejiang University, China

Electro-optic modulators face an inherent trade-off between device footprint and operating bandwidth, which fundamentally limits their large-scale integration in modern optical communication networks. Herein, we develop a compact slow-light Mach-Zehnder interferometer (MZI) modulator based on thin-film lithium tantalate (TFLT). The core mechanism employs a series of Bragg gratings to manipulate optical signals. Lightwaves undergo round-trip reflection within a confined region via multiple modes to establish an equivalent slow-light effect, thereby enhancing electro-optic modulation. To introduce a microwave slow-wave effect and perfectly match the optical group index, capacitively loaded T-shaped electrodes are utilized, delivering a matched index of 3.43. The fabricated MZI modulator features an active length of merely 2.15 mm and a low insertion loss of 2 dB. Measurements show a half-wave voltage-length product $V_{\pi} \cdot L = 1.9 \text{ V} \cdot \text{cm}$, and the electro-optic response exhibits only 0.87 dB roll-off at 67 GHz. Furthermore, 100-Gbaud PAM-4 optical signal transmission is experimentally demonstrated with the device, providing a highly scalable technical route for next-generation optical transceivers.

09:30-09:45 · ACP2026-0715-119 Top-Score Paper

Nonlinear dynamics in heterogeneously integrated III-V-on-Si microring lasers with on-chip delayed optical feedback

Yue Niu¹, Andrew W. Poon^{1*}

1. The Hong Kong University of Science and Technology, Hong Kong, China

Microring lasers offer a compact integrated light source with rich nonlinear dynamics including self-pulsation, bistability, and chaos arising from counterpropagating mode interactions. These intrinsic nonlinearities and internal memory make them suitable for photonic reservoir computing. We develop a robust chip-scale fabrication process for heterogeneously integrated III-V-on-Si microring lasers and semiconductor optical amplifiers. Microring lasers (radius 48 μm) exhibit a threshold current density of $1.3 \text{ kA} \cdot \text{cm}^{-2}$ and 36.6 dB side-mode suppression ratio. Crucially, we present the first experimental demonstration of feedback-strength-dependent nonlinear dynamics in microring lasers with on-chip tunable delayed feedback, including single-to-multimode switching and oscillatory regimes.

09:45–10:00 · ACP2026–0715–20 Top-Score Paper**Impact of Wavelength Detuning on 100-Gb/s-PAM4 EML Performance and its Systematic Operating-Point Search****Koichi-H Huang^{1*}**, Jian Fang¹, Ming Yu¹, Xiaoli Ge¹, Chen Gao¹, Zhongbao Wu¹, Jiaheng Jing¹, Cedric Gao¹, Kaifeng Yang¹¹.Zetta Semiconductor Co., Ltd., China

We have demonstrated that wavelength detuning governs absorption, optical power, RF response, and PAM4 quality in EMLs. A pseudo-FoM identifies optimal bias, validated through 100-Gb/s PAM4 measurements, enabling systematic operating-point optimization.

10:00–10:30 Coffee Break10:30–10:45 · ACP2026–0701–24 Top-Score Paper Industry Innovation Nomination**A 4×128 Gbps 7.8pJ/b Compact Integrated Transmitter with Silicon Slow-Light Modulator****Erse Jia¹**, Weisheng Wang¹, Jun Li¹, Haiwen Cai¹, Nan Qi², Fenghe Yang^{1*}, Wei Chu^{1*}¹.Zhangjiang Laboratory, China; ².Institute of Semiconductors, China

A 4-channel high-speed hybrid-integrated transmitter for LPO is designed in 90 nm SiGe BiCMOS and 300 nm SiPh, consisting of a linear driver wire-bonded to a co-design silicon slow-light MZM. Measurement results demonstrate 128 Gbps per channel PAM-4 optical eye diagrams.

10:45–11:00 · ACP2026–0703–1 Top-Score Paper**Electrically Tuned High-Performance III-V/Lithium Tantalate External-Cavity Laser****Xiaoying Guo¹**, Xiao Wu², Yuyao Guo^{1,3*}, Yu Li^{1,3}, Liangjun Lu^{1,3}, Yang He², Cheng Zeng², Jinsong Xia^{2*}, Jianping Chen^{1,3}, Linjie Zhou^{1,3}

¹.State Key Laboratory of Photonics and Communications, Department of Electronic Engineering, Shanghai Jiao Tong University, China; ².Wuhan National Laboratory for Optoelectronics and School of Optical and Electronic Information, Huazhong University of Science and Technology, China; ³.SJTU-Pinghu Institute of Intelligent Optoelectronics, China

We demonstrate a high-performance III-V/lithium tantalate Pockels laser featuring 28.7-mW output power, 115.6-nm tuning range, and 260-Hz intrinsic linewidth. The laser enables agile FMCW ranging with 17-cm precision over 250-m fiber at 100-kHz modulation rate.

11:00–11:15 · ACP2026–0715–40 Top-Score Paper**An End-to-End 850-nm VCSEL-Based Optical Wireless Link Supporting 130-Gb/s NRZ and 180-Gb/s PAM-4 Transmission****Peng Yan¹**, Shenghui Wu², Yunhao Zhang¹, Yu Sun³, Zhen Zhen², Qijie Xie², Lei Wang^{2*}, Haowen Shu^{1*}, Xingjun Wang^{1*}¹.Peking University, China; ².Pengcheng Laboratory, China; ³.Beijing Information Science and Technology University, China

We experimentally demonstrate an end-to-end 850-nm VCSEL-based optical wireless communication link over a 1-m free-space path with offline Volterra-series nonlinear equalization. The link achieves 130-Gb/s NRZ and 180-Gb/s PAM-4 transmission, with both highest-rate signals remaining below the 20% soft-decision forward-error-correction threshold.

11:15–11:30 · ACP2026–0714–28 Top-Score Paper Industry Innovation Nomination**Monolithic SiN Passive Front-End for Polarization-Insensitive CWDM Applications****Qingyang Du¹**¹.Zhejiang Lab, China

We present a monolithic SiN passive platform for CPO, integrating ECs, PSRs, CWDM filters, and VCs in a 400-nm SiN layer via 12-inch CMOS. Wafer results: EC 1.7 dB (0.3 dB PDL), PSR PER 16.6 dB (loss 0.2 dB), CWDM loss 1.2 dB (crosstalk -14 dB), VC 44.1 mdB. SiN enables heater-free operation.

11:30–11:45 · ACP2026–0701–36 Top-Score Paper**High-Power-Tolerant and Low-Loss Si-SiN Interlayer Coupler Based on a Double-Tapered Adiabatic Structure****Tianqi Song¹**, Ningyu Zhang¹, Jing Wang^{1*}¹.Southern University of Science and Technology, China

We demonstrate a double-tapered adiabatic Si-SiN interlayer coupler achieving a 0.084-dB insertion loss at 1550 nm and a 1.5-dB enhancement in continuous-wave power tolerance compared to a single-tapered reference device.

11:45–12:00 · ACP2026–0715–153 Top-Score Paper**A compact 32-channel reconfigurable spectral processor based on a Loopback Arrayed Waveguide Grating****Haoran Zhang¹**, Xiaotian Zhu², Brent E. Little³, Sai T. Chu^{2*}, Xingyuan Xu^{1*}¹.Beijing University of Posts and Telecommunications, China; ².City University of Hong Kong, Hong Kong, China; ³.QXP Technology Inc., China

We present a compact 32-channel reconfigurable spectral processor based on a loopback arrayed waveguide grating (AWG) and experimentally demonstrate its capability for flexible microcomb spectral shaping.

I T-Track Presider: Liu Liu, Zhejiang University, China

13:30–13:45 · ACP2026-0701-127 Top-Score Paper Industry Innovation Nomination

First Real-time 128Tb/s and 256Tb/s Unrepeated Field Trial using 400Gbps and 800Gbps OTN transponders over Field-deployed 137.76-km Ultra-low-loss Multi-core Fiber Link

Zilin Fan¹, Chao Wu¹, Jian Cui^{1*}, Yu Deng¹, Zhuo Liu¹, Yuxiao Wang², Yufeng Han³, Nan Sun³, Yue Tian⁴, Bin Hao¹, Bin Wu², Jinggang Cao², Yong Chen², Shang Cao⁴, Zhihui Dong³, Wei Sun³, Yanchun Zhang³, Cheng Chang¹, Yan Sun¹, Bing Yan², Ninglun Gu¹

1.Department of Networks, China Mobile Communications Group Co., Ltd., China; 2.Network Management Center, China Mobile Communications Group Shandong Co., Ltd., China; 3.Jiangsu Hengtong Optic-Electric Co., Ltd., China; 4.Huawei Technologies Co., Ltd., China

First real-time unrepeated 137.76-km field trial over field-deployed ultra-low-loss large-effective-area 4-core fiber cable using 400Gbps and 800Gbps backbone OTN transponders is demonstrated, which achieves bit rates of 128Tb/s and 256Tb/s respectively.

13:45–14:00 · ACP2026-0701-229 Top-Score Paper

Photonic Integrated Complementary Carrier-Extracted Self-Coherent Receiver Enabled by Add-drop Resonators

Haojie Zhu¹, Zhengrong Zhao¹, Jinhong Xu², Boshu Sun¹, Yuhao Fang¹, Weiqi Lu¹, Dayu Shi¹, Jiwei Xie¹, Puzhen Yuan¹, Jingchi Li³, Lan Li^{1,2}, Yikai Su³, William Shieh^{1,2*}

1.Westlake University, China; 2.Westlake Institute for Optoelectronics, China; 3.Shanghai Jiao Tong University, China

Based on the bandpass and bandstop characteristics of the add-drop racetrack resonators, we demonstrate an integrated complementary carrier-extracted self-coherent receiver on the silicon photonic platform, achieving 360-Gb/s data rate over 50-km SSMF.

14:00–14:15 · ACP2026-0715-118 Top-Score Paper

Real-time 48-Tb/s C+L Band Transmission over 412.36 km Hollow-core Fiber with 800 Gb/s/λ

Shuchao Mi¹, Xu Zhang^{1*}, Xingfeng Li¹, Honglin Ji¹, Qibing Wang¹, Yeping Lai¹, Ming Jiang¹, Jingbin Feng¹, Chao Li¹, Wei Ding², Zhixue He^{1*}, Shaohua Yu¹

1.Pengcheng Laboratory, China; 2.Jinan University, China

A real-time C+L band transmission system over 412.36 km hollow-core fiber achieving a total capacity of 48 Tbit/s by using commercial 800G coherent optical modules.

14:15–14:30 · ACP2026-0701-35 Top-Score Paper Industry Innovation Nomination

Real-time 24λ×1.6 Tb/s Transmission over 960km G.652.D Fiber on Super C Band Using 230 GBaud 64-QAM-PCS Signals

Lingling Hu¹, Mingqing Zuo¹, Zihan Li², Shiyu Qin², Dawei Ge¹, Dong Wang¹, Dechao Zhang^{1*}

1.China Mobile Research Institute, China; 2.Huawei Technologies Co., Ltd., China

We demonstrate a real-time 1.6-Tb/s 230-GBaud dual-subcarrier WDM system over 960-km G.652.D fiber using EDFAs. All 24 channels achieve error-free operation with 1.2-dB OSNR margin ($\sigma=0.28$), marking the first demonstration to simultaneously achieve 1.6 Tb/s and 900 km.

14:30–14:45 · ACP2026-0701-125 Top-Score Paper

Modeling and Performance Analysis of Distributed Time-Varying Optical Fiber Channels

William Shieh¹, Weiqi Lu^{1*}

1.Westlake University, China

We propose a general model for distributed time-varying (DTV) optical channels. We analytically derive equalization-enhanced time-varying interference (EETI), quantifying performance degradation caused by the interplay between long dispersive memory and fast channel dynamics.

14:45–15:00 · ACP2026-0701-123 Top-Score Paper

First Real-time 256Tb/s 8×68.88-km and 384Tb/s 5×68.88-km Field Trials using 800Gbps and 1.2Tbps OTN Transponders over Field-deployed ULL MCF Cable

Jian Cui^{1*}, Yu Deng¹, Zhuo Liu¹, Yuan Li¹, Yuxiao Wang², Yue Tian³, Yufeng Han⁴, Nan Sun⁴, Chao Wu¹, Zilin Fan¹, Bin Hao¹, Jinggang Cao², Yong Chen², Bin Wu², Shang Cao³, Zhihui Dong⁴, Wei Sun⁴, Yanchun Zhang⁴, Cheng Chang¹, Yan Sun¹, Bing Yan², Ninglun Gu¹

1.Department of Networks, China Mobile Communications Group Co., Ltd., China; 2.Network Management Center, China Mobile Communications Group Shandong Co., Ltd., China; 3.Huawei Technologies Co., Ltd., China; 4.Jiangsu Hengtong Optic-Electric Co., Ltd., China

Real-time 256Tb/s 8×68.88-km and 384Tb/s 5×68.88-km field trials using C+L-band 800Gbps/1.2Tbps OTN transponders are demonstrated, which is achieved over high-performance ultra-low-loss large-effective-area 4-core fiber cable.

15:00–15:15 · ACP2026-0701-155 Top-Score Paper Industry Innovation Nomination

Low-Complexity Cascaded Error Feedback Noise Shaping with Residual In-Band Noise Suppression Achieving Over 10 dB SNR Gain for Fronthaul

Yicheng Xu¹, Yixiao Zhu¹, Yongxin Sun¹, Weisheng Hu¹, Qunbi Zhuge^{1*}

1.Shanghai Jiao Tong University, China

We propose a low-complexity 2-bit cascaded error feedback noise shaping (CEFNS) scheme. By using simple-structured FIR filters, a 2-GHz 65536-QAM signal is delivered at 69.2 dB SNR, showing ~10 dB gain over single-stage 2-bit EFNS.

15:15–15:30 · ACP2026-0701-140 Top-Score Paper**Fast and Accurate Waveform-Level Channel Modeling Using Deep Learning for 300 GBaud S+C+L-band systems****Mingzhe Chen¹**, Minghui Shi¹, Zekun Niu^{1*}, Kaiyan Jin¹, Junzhe Xiao¹, Weisheng Hu¹, Lilin Yi^{1*}*1. Shanghai Jiao Tong University, China*

We propose a Channel Decoupling Method and Temporal-Recurrent and Channel-Attention Network for waveform-level channel modeling in 300~GBaud S+C+L-band systems. It achieves ≤ 0.2 dB Q-factor error and 97.9% complexity reduction versus SSFM, outperforming BiLSTM- and Transformer-based baselines, enabling rapid performance evaluation and launch power optimization.

15:30–16:00 Coffee Break16:00–16:15 · ACP2026-0609-1 Top-Score Paper**Optical Frequency Comb-Assisted Multiband RF Signal Generation Using Actively Phase-Stabilized Spectral Stitching****Jincong Hu¹**, Xihua Zou^{1*}, Ningyuan Zhong¹*1. Southwest Jiaotong University, China*

We propose an optical frequency comb-assisted multiband RF generation system using an active PLL. Reducing DAC sampling rates by 50%, it can synthesize 120-Gbit/s communication or 20-GHz LFM signals for flexible radar and communications.

16:15–16:30 · ACP2026-0715-154 Top-Score Paper**Codeword-Error-Ratio-Based Transmitter Compliance Metric for High-Speed Optical Interconnects with DFE-Based Receivers****Leyan Fei¹**, Yongxin Sun¹, Yicheng Xu¹, Haiyun Xin², Weisheng Hu¹, Qunbi Zhuge^{1*}*1. State Key Laboratory of Photonics and Communications, School of Information Science and Electronic Engineering, Shanghai Jiao Tong University, China; 2. Huawei Technologies Co., Ltd, China*

We propose a novel codeword error ratio (CER)-aware transmitter and dispersion eye closure quaternary (TDECQ) metric for PAM4 transceivers based on a decision feedback equalizer (DFE). By utilizing generating function matrices, it jointly models transmitter impairments and DFE error propagation. Simulations and experiments show that our proposed DFE-CER-TDECQ metric can reflect the influence of time-varying transmitter impairments and DFE propagation on FEC performance. This metric accurately evaluates the received optical power (ROP) penalty introduced by the transmitters in the perspective of FEC codeword error ratio for DFE-based systems.

16:30–16:45 · ACP2026-0715-209 Top-Score Paper**1.08-Tb/s Visible-Light Optical Interconnect Using a 50-Channel PDM Transceiver****Xinyi Liu¹**, Yunkai Wang¹, Zhuoran Hu¹, Zengyi Xu¹, Suning Guan¹, Nan Chi^{1*}*1. Key Laboratory for the Information Science of Electromagnetic Waves Fudan University, China*

To meet rapidly growing data-center optical-interconnect demands, we demonstrate a 1.0847-Tb/s visible-light link enabled by high-speed laser diodes and coordinated DSP, using a 50-channel prototype transceiver with polarization-division multiplexing. Over a 1-m free-space link, all 100 branches achieve BERs below the 7% HD-FEC threshold.

16:45–17:00 · ACP2026-0701-27 Top-Score Paper**Demonstration of 10 Mbps Deep-Space Optical Uplink Communication at 0.711 Signal Photocounts per Information Bit****Yu Miao^{1,2}**, Yueying Zhan¹, Xiaowei Wu¹, Yang Sun^{1,2}, Yinan Li^{1,2}, Shanze Dong^{1,2}, Yunqi Nie^{1,2}, Lei Yang^{1*}*1. Technology and Engineering Center for Space Utilization, Chinese Academy of Sciences, China; 2. University of Chinese Academy of Sciences, China*

We propose a digital soft-gated SPAD array receiver for deep-space optical uplinks. The 10 Mbps 16-PPM demonstration system reaches 0.711 signal photocounts per information bit, delivering a 0.6 dB sensitivity gain versus the non-gated receiver.

17:00–17:15 · ACP2026-0629-25 Top-Score Paper**A Simplified Optical Wireless Communication System with Integrated Alignment and Ranging Using Retroreflected Beams****Tianjin Mei¹**, Wenjing Xuan¹, Yifei Zhu¹, Hanchang Xiao¹, Qirui Xu¹, Chen Liu^{1*}*1. Huazhong University of Science and Technology, China*

We demonstrate a simplified OWC system employing one photodetector per terminal and retroreflected beams for simultaneous alignment and ranging, achieving 10 Gbps bidirectional transmission and an average ranging error of 4.13 cm over 3--8 m.

17:15–17:30 · ACP2026-0715-168 Top-Score Paper**Highly Robust Time-Trajectory-Coded 4D-BPSK Format for Long-Range Coherent Optical Inter-Satellite Links****Fang Dong¹**, Yi Wei^{2,3}, Haoyu Zhang¹, Zhe Feng¹, Haiwen Cai⁴, Jianfeng Sun⁵, Feng Bao¹, Junwen Zhang^{1,6}, Nan Chi^{1,6*}*1. Fudan University, China; 2. Shanghai Key Laboratory of Collaborative Computing in Spatial Heterogeneous Networks (CCSN), China; 3. Shanghai Aerospace Electronic Technology Institute, China; 4. Zhang Jiang Laboratory, China; 5. Shanghai Satellite Network Research Institute (SSNRI), China; 6. Key Laboratory for Information Science of EMW (MoE), China*

We report a highly robust time-trajectory-coded 4D-BPSK (TTC-4D-BPSK) modulation format for long-range coherent optical inter-satellite links. By introducing temporal trajectory coding across consecutive 4D-BPSK symbols, the proposed format effectively enlarges the Hamming between distinct four-dimensional symbol trajectories, thereby enabling robust transmission in the low SNR

regime. Compared with conventional PM-4QAM modulation, the proposed TTC-4D-BPSK achieves a 1.9 dB improvement in photons per bit (PPB) at the forward-error-correction (FEC) threshold of 3.8×10^{-3} . We further demonstrate a TTC-4D-BPSK free space optical (FSO) transmission system over an equivalent distance of 2,000 km using dual-aperture reception, achieving a net data rate of 419.1 Gbit/s.

Best Top–Score Paper Award Competition Session

November 1, 2026 · VIP Room 2–2, 2F

I NP-Track Presider: Lan Li, Westlake University, China

08:30–08:45 · ACP2026–0723–4 Top–Score Paper

Bidirectional High–Capacity Integrated Sensing and Communication Emulation Using Interconnected Counter–Propagating Recirculating Loops

Junyu Wu¹, Zexu Liu¹, Lei Liu^{1,2}, Honglin Jin³, William Shieh^{1,2*}

1. Westlake University, China; 2. Westlake Institute for Optoelectronics, China; 3. Peng Cheng Laboratory, China

We demonstrate a bidirectional WDM integrated sensing and communication system using interconnected counter–propagating re–circulating loops emulating long–haul fiber links, achieving 6.016–Tbps transmission over 2187.72 km, and DAS sensing with 1.85–km spatial resolution and over 15–dB sensing SNR.

08:45–09:00 · ACP2026–0701–117 Top–Score Paper Industry Innovation Nomination

SIRT–Based Tomographic Reconstruction of Refractive Index Profiles in Specialty Sensing Fibers with Non–Circular Claddings

Chao Wang¹, Li Pei^{1*}, Jianshuai Wang¹, Zhouyi Hu¹

1. Beijing Jiaotong University, China

We propose a tomographic method based on a simultaneous iterative reconstruction technique with phase–domain alignment for refractive index profiling of non–circular cladding fibers. By eliminating the circular symmetry assumptions required by conventional methods, it achieves accurate reconstruction of D–shaped fibers under mechanical jitter, with superior accuracy for sensor metrology.

09:00–09:15 · ACP2026–0714–51 Top–Score Paper

Optomechanically enhanced ppb–level NH₃ sensing with a graphene–functionalized on–chip microcavity

Yanhong Guo¹, Yuchen Wang¹, Huize Yang¹, Guangming Zhao², Baicheng Yao¹, Teng Tan¹

1. University of Electronic Science and Technology of China, China; 2. Institute of Semiconductors, Chinese Academy of Sciences, China

We demonstrate a graphene–functionalized toroidal optomechanical sensor that preserves high optical Q and converts NH₃ adsorption into narrow–linewidth phonon–lasing frequency shifts, enabling ppb–level detection with -36.2 Hz decade⁻¹ sensitivity and a fast response time.

09:15–09:30 · ACP2026–0715–64 Top–Score Paper

High–Resolution Multi–Target Ranging via Coherent Chirped Pulse Interferometry

Yitian Gong¹, Yunjie Zeng¹, Chi Zhang^{1*}

1. Huazhong University of Science and Technology, China

Chirped pulse interferometry (CPI) measures absolute distance by stretching femtosecond pulses through asymmetric dispersion, –magnifying picosecond–scale delays into nanosecond–scale signals. All prior CPI implementations, however, detect only the optical intensity, discarding the phase of the optical field. When two targets lie closer than the temporal span of a single chirped fringe, their zero–frequency oscillation points coalesce and become indistinguishable. Here we show that coherent detection recovers the full complex amplitude of the optical field, enabling simultaneous high–resolution multi–target ranging at the full repetition rate of the frequency comb. Digital dechirping followed by a Fourier transform converts the time–domain fringe pattern into a frequency spectrum where each target appears as an independent spectral peak. Using a self–referencing architecture in which the chirped pulse itself serves as the local oscillator, we experimentally resolve two targets that direct detection cannot separate. The coherent system achieves an overlapping Allan deviation of 138 nm at $\tau = 1.26$ ms.

09:30–09:45 · ACP2026–0701–41 Top–Score Paper

Programmable Photonic Processor for Ultra–Low–Error Multi–Frequency Microwave Photonic Measurement

Ziyao Zhang¹, Yuxin Liang², Shijia Fan², Hanmeng Li², Naidi Cui^{2*}, Junbo Feng^{2*}, Guanyu Chen^{1*}

1. Chongqing University, China; 2. Chongqing United Microelectronics Center (CUMEC), China

We demonstrate a programmable photonic processor for ultra–low–error microwave frequency measurement, combining MZI coarse localization and microring fine detection. It achieves 9 MHz RMSE over 0–20 GHz and supports simultaneous multi–frequency measurement.

09:45–10:00 · ACP2026–0630–29 Top–Score Paper

Ultra–Low–Loss Silicon Nitride Tunable Photonic Delay Line with Nanosecond–Scale Delay

Yuyan Yao¹, Zexu Wang¹, Ruitao Ma¹, Zejie Yu¹, Yiwei Xie^{1*}, Daoxin Dai¹

1. State Key Laboratory for Modern Optical Instrumentation, College of Optical Science and Engineering, Zhejiang University, China

We demonstrate a 4–channel 7–bit true–time delay line on silicon nitride platform, achieving 10.006 ns delay, 78.42 ps resolution, and fiber–to–fiber insertion loss 12.26 dB, enabled by low–loss broadened spiral waveguides and Mach–Zehnder switches (MZSs).

10:00–10:30 Coffee Break

10:30-10:45 · ACP2026-0624-7 Top-Score Paper **Industry Innovation Nomination**

Fully On-Chip Ultra-Wideband Simultaneous Measurement of Doppler-Frequency-Shift and Angle-of-Arrival System

Xinyu Wang¹, Yuchen Shi¹, Zichen Guo¹, Shilan Zhou¹, Shuyue Zhang¹, Jianyi Yang¹, Qikai Huang², Qiang Zhang^{2*}, Hui Yu^{2*}

1.Zhejiang University, China; 2.Zhejiang Lab, China

We demonstrate a fully on-chip ultra-wideband microwave photonic system for the simultaneous measurement of DFS and AOA, achieving precise measurements with DFS errors within ± 0.03 Hz and AOA errors within $\pm 2^\circ$ for a range of $-90^\circ - 90^\circ$ in 2-40 GHz frequency band.

10:45-11:00 · ACP2026-0721-3 Top-Score Paper

Entanglement between Integrated Quantum Memories in the Telecom Band

Yaoqing Zhang¹, Haoze Zhang¹, Yunru Fan¹, Liang Zhai¹, Hao Li², Lixing You², Guangcan Guo¹, Qiang Zhou^{1*}

1.University of Electronic Science and Technology of China, China; 2.Shanghai Institute of Microsystem and Information Technology Chinese Academy of Sciences, China

We experimentally demonstrate entanglement between two integrated telecom-band quantum memories. This demonstration is compatible with existing fiber communication infrastructure, which is essential for future quantum networks.

11:00-11:15 · ACP2026-0714-20 Top-Score Paper

Coherent spin-photon interface of single PL6 color center in silicon carbide

Zhenxuan He¹

1.University of Science and Technology of China, China

In this talk, I will present our investigation of the oxygen-vacancy PL6 color center in 4H-silicon carbide as a coherent spin-photon interface. Although PL6 has recently emerged as a promising platform for quantum information processing, its spin-photon properties have remained largely unexplored. I will first show how we combine group-theoretical modeling with strain-dependent photoluminescence excitation spectroscopy to fully resolve the excited-state fine structure. Using resonant excitation, we achieve a spin initialization fidelity of $99.69 \pm 0.03\%$ and a readout contrast of $98.31 \pm 1.03\%$. The spin-photon entangled A2 transition exhibits narrow optical linewidths of about 180 MHz and a polarization visibility of $\sim 82\%$. I will then discuss coherent optical driving, where we obtain Rabi frequencies up to 2.895 GHz—approximately 130 times the optical saturation power. Finally, by applying dynamical decoupling, we extend the spin coherence time from 0.5 ms to 5.70 ms, a ten-fold enhancement. Our results establish the PL6 center as a competitive solid-state spin-photon interface hosted in a commercially available semiconductor platform, combining near-unity initialization, high-speed coherent control, and millisecond-scale coherence without isotopic purification.

11:15-11:30 · ACP2026-0715-57 Top-Score Paper

LED-Pumped Silicon-Based Nanocavity Light Source with Enhanced Spectral Purity

Jingyu Chang¹, Renjie Tang², Zezhao Jv³, Yalan Si³, Jinghan Yang⁴, Yingchun Wu¹, Yuting Ye², Zequn Chen², Hongtao Lin³, Lan Li^{2*}

1.Zhejiang Key Laboratory of 3D Micro/Nano Fabrication and Characterization, School of Engineering, Materials Science and Engineering, Westlake University, China; 2.Zhejiang Key Laboratory of 3D Micro/Nano Fabrication and Characterization, School of Engineering, Department of Electronic Information Engineering, Westlake University, China; 3.State Key Laboratory of Brain-Machine Intelligence, College of Information Science and Electronic Engineering, Zhejiang University, China; 4.Zhejiang Key Laboratory of 3D Micro/Nano Fabrication and Characterization, School of Science, Department of Physics, Westlake University, China

We demonstrate the first LED-pumped SWIR source using PbS CQDs in a silicon BIC cavity, enabling compact portable devices.

I N-Track Presider: **Qi Yang**, Huazhong University of Science and Technology, China

13:30–13:45 · ACP2026-0626-10 Top-Score Paper

Inverse-Designed Meta Processing Units for Task-aware Photonic Computing Systems

Chu Wu¹, Zeyu Cai¹, Songtao Yang¹, Ruoyu Shen¹, Yinan Zhao¹, Haiou Zhang¹, Wei Chu¹, Xing Lin^{1*}

1. Tsinghua University, China

Photonic matrix processors require compact, composable operators for task-aware computing. Here, we demonstrate inverse-designed meta processing units (MPUs) with coherent matrix cascading, hardware-in-the-loop dual-task learning, and neuron-level sharing, reducing programmable-mesh burden while preserving task-specific adaptation.

13:45–14:00 · ACP2026-0630-94 Top-Score Paper

A Vision-Language Model for Optical Equipment Understanding and Fiber Connection Generation

Rui Zhao¹, Shengnan Li¹, Fubin Wang¹, Xiaotian Jiang², Ydi Wang¹, Min Zhang¹, Danshi Wang^{1*}

1. Beijing University of Posts and Telecommunications, China; 2. China Telecom Research Institute, China

A vision-language model (VLM) framework for optical networks is proposed. Fine-tuning Qwen3-VL-8B with LoRA enables accurate panel recognition, layout validation, and automated fiber connection generation, significantly reducing manual effort and errors in on-site O&M.

14:00–14:15 · ACP2026-0716-8 Top-Score Paper

Storage-aided Hierarchical Aggregation and Orchestration for the Optical Internet of Agents

Xiao Lin^{1*}, Wang Li¹, Ziang Feng¹, Zuqi Teng¹, Haoyuan Zheng¹, Enguo Chen^{1*}

1. Fuzhou University, China

We propose SHAO-MoA, a storage-aided hierarchical orchestration framework for the Optical Internet of Agents. A spatio-temporal capacity graph and two-stage residual-flow scheduling improve state aggregation, resource utilization, and collaborative inference under constrained optical resources.

14:15–14:30 · ACP2026-0715-190 Top-Score Paper Industry Innovation Nomination

14.6-Tb/s GMI with 400G-per-channel Direct-Detection Optical Interconnects over 25-km AR-HCF

Yixiao Zhu^{1*}, Yutong Pan², Xiang Cai², Tianhong Zhang², Tianchi Zhong², Shikui Shen^{3*}, Yu Qin^{4,5}, Yichun Shen⁵, Limin Xiao⁴, Shuailuo Huang³, Zelin Wang³, Weisheng Hu¹, Fan Zhang^{2*}

1. Shanghai Jiao Tong University, China; 2. Peking University, China; 3. China Unicom Research Institute, China; 4. Fudan University, China; 5. Zhongtian Technology Advanced Materials Co., Ltd, China

We leverage the ultralow nonlinearity of anti-resonant hollow-core fiber to unlock launch power bottleneck for XPM-free massively-parallel DWDM transmission, enabling 400G-per-channel Kramers-Kronig direct detection with 17.4-Tb/s line rate and 14.6-Tb/s GMI-estimated capacity over 25 km.

14:30–14:45 · ACP2026-0713-1 Top-Score Paper

RingStitch: Demand-Aware Optical Stitching for Fragmented TPU Clusters

Huiru Ao¹, Fan Yang¹, Binglei Wang¹, Bo Liu¹, Jialong Li^{1*}

1. Shenzhen University of Advanced Technology, China

RingStitch is an OCS-based scheduler that combines fragmented TPU rack capacity into logical rings. By prioritizing local placement, fragment-aware selection, and topology-aware ordering, it improves utilization, reduces blocking and waiting time, and limits communication overhead.

14:45–15:00 · ACP2026-0701-84 Top-Score Paper

Hybrid ML-based Rapid Calibration Method for Wavelength Selective Switches

Zihe Zhang¹, Yuzhe Li¹, Xiao Zhang¹, Chen Liu¹, Liangjia Zong^{1*}

1. Huazhong University of Science and Technology, China

We propose a hybrid machine-learning-based rapid calibration method and first demonstrate its validation on a commercial-grade 32-port WSS module. Experimental results show over 97% calibration workload reduction while maintaining high port isolation.

15:00–15:15 · ACP2026-0714-26 Top-Score Paper Industry Innovation Nomination

MoSE: Mode-Switching Expander for Mixed LLM Training and Inference

Fan Yang¹, Ying Zhou², Binglei Wang¹, Zhenjie Zhou¹, Jialong Li^{1*}

1. Shenzhen University of Advanced Technology, China; 2. Beijing Jiaotong University, China

We propose MoSE, a mode-switching optical expander that reallocates a fixed-degree edge budget between P-D-biased and uniform topologies, reducing communication cost for mixed LLM inference and training without additional ports or routing-policy changes.

15:15–15:30 · ACP2026-0728-5 Top-Score Paper

A 35-dB-Power-Budget 228-Gb/s EDFA-Free Self-Coherent PON Enabled by Coordinated Two-Stage SOA Control

Yuhao Fang¹, Weiqi Lu¹, Haojie Zhu¹, Yuan Puzhen¹, Dayu Shi¹, William Shieh^{1*}

1. Westlake University, China

We demonstrate an EDFA-free 228-Gb/s burst-mode self-coherent PON over 40.72-km SSMF, using uncooled TO-CAN DFB laser and CSPR-optimized coordinated ONU/OLT SOA control we achieve a 35-dB power budget over 30dB ODN range.

Best Student Paper Award Competition Session

November 1, 2026 · VIP Room 1-2, 1F

Presider: **Lena Wosinska**, Chalmers University of Technology, Sweden

13:30-13:45 · ACP2026-0701-146

High-Fidelity Integer Factorization by QUBO Optimization on a Photonic Ising Chip

Kun Liu¹, Xin Ye¹, Luyu Si¹, Wenjia Zhang^{1*}, Zuyuan He¹

1. Shanghai Jiao Tong University, China

We demonstrate a hardware-assisted 32-bit integer factorization workflow that optimizes a QUBO-derived factorization energy model with a packaged photonic Ising chip. The Ising machine enabled by a multichannel cascaded Mach-Zehnder modulators provides the 7-bit calibrated optical readouts used to evaluate energy differences in order for performing spin flipping, Metropolis updating, and candidate factors verification. On a retained optimized five-instance set of 32-bit QUBO-derived block factorization models, the best optical-path annealing runs increase the aggregate factorization success count from 5/250 for direct bit flips and 22/250 for circuit annealing simulation to 91/250. These results demonstrate that a calibrated photonic chip can serve as a practical and scalable accelerator for hardware-assisted QUBO factorization, paving the way toward photonic-enabled large-scale integer factorization.

13:45-14:00 · ACP2026-0715-178

A 1.2 dB Insertion Loss on-Chip Mach-Zehnder Interferometer Type Optical Isolator Based on Stoichiometric Ce:YIG Magneto-Optical Thin Films

Di Wu¹, Zhenyuan Ren¹, Tianchi Zhang¹, Zixuan Wei¹, Jun Qin¹, Lei Bi^{1*}

1. University of Electronic Science and Technology of China, China

We demonstrate a heterogeneously integrated Mach-Zehnder interferometer optical isolator on a silicon nitride platform. By eliminating intragranular defects in Ce:YIG films, the device achieves a record-low insertion-loss of 1.2 dB and 27.6 dB isolation ratio.

14:00-14:15 · ACP2026-0701-205

Robust and Low-Complexity Duobinary-Encoded Out-of-Band Channel with Adaptive Equalization for Shared 200G Coherent Transceiver

Yongzhu Hu¹, Junhao Zhao¹, An Yan¹, Shouyun Cai¹, Penghao Luo¹, Xuyu Deng¹, Renle Zheng¹, Shuhong He¹, Aolong Sun¹, Zhenping Xing², Yanzhao Lu², Hongchen Yu², Zhicheng Ye², Nan Chi¹, Junwen Zhang^{1*}

1. Fudan University, China; 2. Huawei Technologies, China

We demonstrate a Duobinary-encoded out-of-band channel sharing a 200-Gbps coherent PON transceiver over 20-km SSMF, recovered by low-complexity absolute-value operation tolerant to frequency offset, phase noise, and polarization rotation, reaching 1E-6 threshold at -40.5 dBm.

14:15-14:30 · ACP2026-0723-4

Bidirectional High-Capacity Integrated Sensing and Communication Emulation Using Interconnected Counter-Propagating Recirculating Loops

Junyu Wu¹, Zexu Liu¹, Lei Liu^{1,2}, Honglin Jin³, William Shieh^{1,2*}

1. Westlake University, China; 2. Westlake Institute for Optoelectronics, China; 3. Peng Cheng Laboratory, China

We demonstrate a bidirectional WDM integrated sensing and communication system using interconnected counter-propagating recirculating loops emulating long-haul fiber links, achieving 6.016-Tbps transmission over 2187.72 km, and DAS sensing with 1.85-km spatial resolution and over 15-dB sensing SNR.

14:30-14:45 · ACP2026-0715-123

Thin-Film Lithium Niobate Reconstructive Spectrometer Based on Long-Period-Grating-Enabled Multimode Interference

Jincheng Yin¹, Yunlu Bai¹, Wenye Qiu¹, Tian Gao¹, Youkang Gao¹, Yiyang Zhang¹, Kaixuan Chen^{1*}, Liu Liu^{2*}

1. South China Normal University, China; 2. Zhejiang University, China

We demonstrate an electro-optic thin-film lithium niobate reconstructive spectrometer using cascaded long-period gratings and multimode phase shifters for low-correlation spectral encoding, achieving 165-nm bandwidth, 0.08-nm resolution, a 100-kHz scanning speed, and 0.12-mW average power consumption.

14:45-15:00 · ACP2026-0715-47

Pulse-Synchronous Time-Domain Segmented Entropy Loading for Co-Wavelength Integrated sensing and communication Systems

Bingbing Zhang¹, Meng Xiang^{1*}, Jiakai Liu¹, Weitao Zheng¹, Songnian Fu¹, Yuwen Qin¹

1. Key Laboratory of Photonic Technology for Integrated Sensing and Communication, Ministry of Education of China and School of Information Engineering Guangdong University of Technology, China

We propose a pulse-synchronous time-domain segmented entropy loading scheme for co-wavelength optical ISAC, achieving a 0.2-bit/symbol GMI improvement and 3-dB required OSNR reduction while preserving 1-kHz DAS over 10.91-km SSMF.

15:00–15:15 · ACP2026-0713-4

Low Memory Target-Response MLSE Receiver for Absorption-Notch-Resilient Hollow-Core Fiber Coherent Links**Tianhong Zhang¹**, Yutong Pan¹, Yixiao Zhu^{2*}, Shikui Shen^{3*}, Yu Qin^{4,5}, Tianchi Zhong¹, Limin Xiao⁴, Yichun Shen⁵, Zelin Wang³, Shuailuo Huang³, Xian Zhou⁶, Fan Zhang^{1,7*}*1.Peking University, China; 2.Shanghai Jiao Tong University, China; 3.China Unicom Research Institute, China; 4.Fudan University, China; 5.Zhongtian Technology Advanced Materials Co., Ltd., China; 6.University of Science and Technology Beijing, China; 7.Peng Cheng Laboratory, China*

An absorption-aware TR-MLSE receiver is demonstrated for 64-GBaud 16QAM transmission over 25-km hollow-core fiber, using notch-matched target-response equalization to mitigate gas-line absorption, improve BER performance, and substantially reduce adaptive-equalization complexity without transmitter-side spectral shaping.

15:15–15:30 · ACP2026-0626-10

Inverse-Designed Meta Processing Units for Task-aware Photonic Computing Systems**Chu Wu¹**, Zeyu Cai¹, Songtao Yang¹, Ruoyu Shen¹, Yinan Zhao¹, Haiou Zhang¹, Wei Chu¹, Xing Lin^{1*}*1.Tsinghua University, China*

Photonic matrix processors require compact, composable operators for task-aware computing. Here, we demonstrate inverse-designed meta processing units (MPUs) with coherent matrix cascading, hardware-in-the-loop dual-task learning, and neuron-level sharing, reducing programmable-mesh burden while preserving task-specific adaptation.

Poster Session-D-Track

Content

D1: Advanced Packaging, Interfacing, and System Integration

ACP2026-0630-102

Launch-Condition-Aware Modal Bandwidth Evaluation of 1310 nm Silicon Photonics Transmission over OM3 Multimode Fibers

Quanzhen Luo¹, Zhipeng Jin¹, Yi Cai¹, Gangxiang Shen¹, Xin Chen², Hao Chen², MingJun Li², Gordon Ning Liu^{1*}

1.Soochow University, China; 2.Corning Incorporated, United States

Through multi-wavelength Monte Carlo simulation, we evaluate the 1310 nm modal bandwidth of OM3 multimode fibers under parametric modeling launch conditions. The results offer practical guidance for assessing the feasibility of 1310 nm silicon photonics links over easy coupling OM3 multimode fibers.

ACP2026-0630-78

Optical Forward Error Correction Encoding Using Four-Wave-Mixing-Based Optical Frequency Combs

Yang Xiao¹, Shaoxing Wang¹, Jiangbing Du¹, Tianyan Guo², Zuyuan He¹

1.Shanghai Jiao Tong University, China; 2.Peking University, China

We propose a scalable optical forward error correction encoding scheme using four-wave-mixing-based optical frequency combs for optical matrix-vector multiplication, experimentally achieving tunable rates of 5, 10, and 20 Gbit/s with a 4-dB net coding gain.

ACP2026-0701-134

High-efficiency Silicon Mach-Zehnder Modulator Enhanced by Micro-Ring and Slow-Light

Yixiao Zhang¹, Jiangbing Du¹, Zuyuan He¹

1.Shanghai Jiao Tong University, China

We demonstrate a slow-light-enhanced micro-ring-assisted Mach-Zehnder modulator on a silicon photonics platform. One-dimensional photonic crystal waveguides with a 50% duty cycle are introduced in the Mach-Zehnder arms to enhance the carrier-depletion-induced phase shift. The fabricated device achieves a measured equivalent modulation efficiency of 0.27 V·cm for a 137 μ m modulation length. RF simulations of the capacitively loaded traveling-wave electrode indicate a 3-dB bandwidth exceeding 50 GHz with near-50 Ω impedance matching.

ACP2026-0701-77

A Broadband and Alignment-Tolerant Suspended Si₃N₄ Fork Edge Coupler

Zhenyu Ni¹, Fangcheng Cao¹, Xingyan Zhao¹, Yang Qiu^{1,2*}, Shaonan Zheng^{1,2}, Yuan Dong¹, Qize Zhong¹, Ting Hu^{1,2*}

1.School of Microelectronics, Shanghai University, China; 2.Shanghai Key Laboratory of Intelligent Connected Vehicle Interaction Chip and System, Shanghai University, China

This paper proposes a suspended Si₃N₄ edge coupler for highly efficient coupling between standard single-mode fibers (SMFs) and on-chip Si₃N₄ waveguides. The device features a suspended SiO₂ spot size converter (SSC) which serves to progressively compress the incident mode field. An embedded dual-arm adiabatic mode converter based on Si₃N₄ is employed to enlarge the effective receiving aperture and enhance the transition to the single-mode output waveguide. Influences of primary geometric parameters on transmission performance are systematically investigated, in addition to broadband response and alignment tolerance. The optimized structure, at the central wavelength of 1550 nm, achieves a TE₀ coupling efficiency of 80.21%, together with an insertion loss of 0.96 dB and a TE₀ mode purity of 96.32%. Across the entire 1500-1600 nm spectra, the device demonstrates a 1-dB bandwidth and a 1-dB alignment tolerance of at least $\pm 2 \mu$ m in both the lateral and vertical directions. These outcomes suggest not only promising broadband characteristics but also robust packaging tolerance, making the proposed coupler suitable for fiber-to-chip coupling.

ACP2026-0701-89

Cross-Shaped Dual-Etched Two-Dimensional Grating Coupler for Polarization-Insensitive Fiber-to-Chip Coupling

Weiwei Liu¹, Lei Wang^{1*}

1.Pengcheng Laboratory, China

A CMOS-compatible cross-shaped dual-etched 2D grating coupler is proposed for polarization-insensitive fiber-to-chip coupling, achieving -2.9 dB peak coupling efficiency and below 0.2 dB PDL across the C band.

ACP2026-0711-3

Facet-Attached Microlens via Two-Photon Polymerization for Short Near-Infrared Wavelength Edge Coupling

Caoyi Qian¹, Zhibiao Hao^{1*}, Lin Gan¹, Jian Wang¹, Bing Xiong¹, Chengzheng Sun¹, Lai Wang¹, Yanjun Han¹, Yi Luo¹

1.Tsinghua University, China

A facet-attached microlens fabricated via two-photon polymerization enables low-loss edge coupling in the short near-infrared band. The device experimentally achieves 2.2 dBper-facet loss and extends alignment tolerance.

ACP2026-0715-175

Normalization–Separated Modeling of Local AR–Coating Response in a GRIN–Assisted SMF–NANF Interface
Xiaowen Jiang¹, Yang Zhao², Tian Guo², Tong Zhai¹, Yao Guo¹, Zhiguo Zhang¹*1.Beijing University of Posts and Telecommunications, China; 2.State Grid Beijing Electric Power Company, China*

We present a normalization-separated SMF–GRIN–NANF model. A matched full-wave control lowers calibrated interface-scattered reflection from 3.49% to 0.093%, while keeping reflection, modal transmission, and mode overlap distinct for a power audit without mixing efficiency metrics.

ACP2026-0715-194

Heterogeneously-integrated III–V-on–SOI photodetector achieved by full–chiplet-level micro–transfer printing for Boolean function construction**Wenyu Li¹, Bingyao Cao¹, Wanjiao Zhang², Linjie Zhou³, Jia Zhao⁴, Yan Zhu⁵, Nan Ye¹, Yingxiong Song¹, Fufei Pang¹***1.Shanghai University, China; 2.University of Chinese Academy of Sciences, China; 3.Shanghai Jiao Tong University, China; 4.Shandong University, China; 5.Beijing Infrared Semiconductor Technology, China*

Full-chiplet micro-transfer printing realizes all-III–V-on–SOI photodetector with 0.04 A/W responsivity and 20-GHz bandwidth at 1550 nm. It transmits response generated by device-specific binary sequences for balanced Boolean functions with high nonlinearity and algebraic degree.

D2: Integrated Photonic Circuits and Heterogeneous Platforms

ACP2026-0520-1

Integrated Photonic Circularly Polarized Pumping for a Miniaturized NMR Co-magnetometer**Xiaoqin Meng^{1,2,3,4}, Zhen Chai^{1,2,3,4}***1.School of Instrumentation and Optoelectronic Engineering, Beihang University, China; 2.Quantum Science and Technology College, Beihang University, China; 3.Institute of Large-Scale Scientific Facility and Centre for Zero Magnetic Field Science, Beihang University, China; 4.Beihang Hangzhou Innovation Institute, Hangzhou, China*

We demonstrate a chip-level optical pumping system integrating the single-mode polarization maintaining fiber with an on-chip silicon nitride radiator for circularly polarized electron and nuclear spin pumping, achieving 2.6 nT/Hz^{1/2} sensitivity in an NMR co-magnetometer.

ACP2026-0622-4

A 1.6 Tb/s Heterogeneously Integrated Optical Transmitter Based on Thin-Film Lithium Niobate and Photonic Wire Bonding
Tongtong Yang¹, Laiwen Yu², Shenghong Xie¹, Yinyin Hu², Yuechun Shi²*1.National Laboratory of Solid State Microstructures, Nanjing University, China; 2.Yongjiang Laboratory, China*

We report a heterogeneously integrated optical transmitter capable of 1.6 Tb/s aggregate data rate (8 × 200 Gb/s) for high capacity interconnects. Using photonic wire bonding (PWB) technology, we demonstrate efficient hybrid integration of high power InP distributed feedback (DFB) lasers, thin film lithium niobate (TFLN) modulator arrays, and fiber arrays, thereby mitigating severe mode field mismatches. The custom designed TFLN modulators provide an electro optic bandwidth of over 59 GHz. The PWB based optical bridges yield an average coupling loss of only 2.33 dB. In system experiments with four level pulse amplitude modulation (PAM4) signals, all eight channels exhibit open eye diagrams, and the measured transmitter dispersion eye closure quaternary (TDECQ) is as low as 1.92 dB.

ACP2026-0625-6

Low-Loss Passive Silicon Photonic Devices in the C- and O-Bands on a 300-mm SOI Wafer**Jiawei Weng¹, Ying Sun¹, Jia Guo¹, Huiyun Jiang¹, Jun Zou¹, Hongtao Lin¹***1.Zhejiang University, China*

We demonstrate low-loss C- and O-band passive silicon photonic devices on a 300-mm silicon-on-insulator (SOI) platform. Wafer-level tests show a C-band strip-waveguide loss of 0.768 dB/cm at 1550 nm and characterize several representative passive components.

ACP2026-0626-16

Heterogeneously Integrated Low-Cost Sol-Gel Barium Titanate Spatial Light Modulators on Silicon with Ultrahigh Thermo-Optic Response**Hongguang Sun¹, Min Wang², Yi Chen¹, Ying Qiu¹, Ming Luo¹, Liang Liao¹, Xi Xiao³, Qiuyun Fu⁴***1.China Information and Communications Technology Group, China; 2.State Key Laboratory of Optical Communication Technologies and Networks (OCTN), China Information Communication Technologies Group Corporation (CICT) Wuhan, China; 3.National Information Optoelectronics Innovation Center, China; 4.Huazhong University of Science and Technology - Main Campus, China*

We demonstrate low-cost sol-gel BTO-on-silicon SLM with record 12.2×10^{-4} K⁻¹ thermo-optic coefficient, 55% modulation depth, 0.14 ms response and halved power for beam steering & 6G optical interconnects.

ACP2026-0626-18

First Demonstration of a Grating-Lobe-Free 3.45–3.85 μm Silicon Optical Phased Array for Two-Dimensional Solid-State Beam SteeringYuheng Liu¹, Lipeng Xia¹, Yixiang Zhang¹, Hong Zhang¹, Yuhang Sun¹, Yi Zou^{1*}¹.ShanghaiTech University, China

We demonstrate the first optical phased array operating in the 3.45–3.85 μm atmospheric transparency window. By employing a broadband, crosstalk-suppressed 32 channel dense waveguide array, a full 180° grating-lobe-free beam steering is achieved.

ACP2026-0626-24

Robust Direct Binary Search for Fabrication-Tolerant Inverse Design of Digital Photonic DevicesQi Zhou^{1,2}, Jiahao Li^{1,3}, Xiang Li^{2,4*}, Ming Luo¹, Lin Wu¹, Bohao Sun¹, Hanbing Li¹, Ying Qiu^{1*}

¹.State Key Laboratory of Optical Communication Technologies and Networks (OCTN); China Information and Communication Technologies Group Corporation (CICT) Wuhan, China; ².School of Mechanical Engineering and Electronic Information; China University of Geosciences (Wuhan) Wuhan, China; ³.College of Future Information Technology Fudan University, China; ⁴.Wuhan National Laboratory for Optoelectronics; Huazhong University of Science and Technology, China;

A robust direct binary search brings fabrication tolerance into discrete inverse design by optimizing worst-case performance across hole radii; demonstrated on silicon power splitters, it sharply improves etch tolerance for digital photonic devices.

ACP2026-0628-10

Multi-Channel Silicon Photonic Spectrometer Based on a Microring Resonator ArrayHaorui Liu¹, Long Zhang¹, Da Lv¹, Zhiwei Bu¹, Gaopeng Wang¹, Tingting Wei¹, Daoxin Dai^{1*}¹.Zhejiang University, China

We present a compact multi-channel silicon photonic spectrometer using a microring array with global thermo-optic tuning. It achieves 90 nm bandwidth, 0.5 nm resolution, and accurately reconstructs single-peak, dual-peak, and 64-channel spectra.

ACP2026-0630-82

A PZT-Chalcogenide Micro-ring Integrated Ultrasonic Sensing Patch for Continuous Blood Pressure MonitoringZhangyi Sun¹, Ling Luo¹, Huilin Xie¹, Hongzhi Pan¹, Jingshun Pan^{2*}, Zhaohui Li^{1,3*}

¹.School of Electronics and Information Technology and Guangdong Provincial Key Laboratory of Optoelectronic Information Processing Chips and Systems, Sun Yat-sen University, China; ².School of Optoelectronic Science and Engineering SCNU South China Normal University, China; ³.the Southern Marine Science and Engineering Guangdong Laboratory (Zhuhai), China

We present an ultrasonic patch with optoelectronic heterogeneous integration of a piezoelectric transducer and chalcogenide microring resonator for continuous, accurate vascular diameter monitoring and blood pressure derivation, achieving 2 mmHg error vs. commercial sphygmomanometer.

ACP2026-0701-11

Detector-Constrained Path-Encoded Weak-Value Coherent Readout for Integrated Photonic Phase SensingDaoming You¹, Hongguang Zhang¹, Xi Xiao¹¹.National Information Optoelectronics Innovation Center China Information Communication Technologies Group Corporation, China

We present a detector-constrained coherent weak-value readout for integrated photonic phase sensors, showing how near-dark path encoding increases allowable launch power under photodiode limits, yielding bounded SNR gains without contradicting fixed-input known fundamental estimation limits.

ACP2026-0701-154

Broadband tunable hybrid integrated 2 μm III-V-Si₃N₄ laser based on an InP gain chipShu Lin¹, Zehang Xu¹, Qing Gao¹, Jincheng Wei¹, Ruijun Wang^{1*}, Siyuan Yu¹¹.Sun Yat-sen University, China

We demonstrate a broadband tunable hybrid integrated 2- μm laser by coupling an InP-based gain chip with a silicon nitride chip. The laser achieves a 63 nm tuning range and a 49 dB side-mode suppression ratio.

ACP2026-0701-166

Metasurface-Integrated Optical Hybrid for Miniaturized Coherent Optical ReceiversMengjing Xu¹, Bing Xiong^{1*}, Changzheng Sun¹, Jian Wang¹, Zhibiao Hao¹, Lai Wang¹, Yanjun Han¹, Hongtao Li¹, Li Gan¹, Jiyuan Zheng¹, Zhiqian Yuan¹, Yi Luo¹¹.Tsinghua university, China

We demonstrate a 1550-nm metasurface-enabled coherent optical receiver with an ultrafast membrane InGaAs photodetector array, achieving integrated I/Q detection, polarization extinction ratios above 15 dB, and a 64 dB common-mode rejection ratio.

ACP2026-0701-178

Inverse Design of Silicon Nitride Photonic Devices via Diffusion Models**Qian Chen¹, Toby Bi², Shuangyou Zhang³, He Gao¹, Zhiyu Mai¹, Chengxi Cai¹, Pascal Del'Haye², Yaojing Zhang^{1*}***1. The Chinese University of Hong Kong (Shenzhen), China; 2. Max Planck Institute for the Science of Light, Germany; 3. Technical University of Denmark, Denmark*

We propose a deep generative framework based on diffusion models for Si₃N₄ photonic devices, eliminating iterative simulations and simultaneously generating both power splitters and WDM demultiplexers on demand with compact footprints and good performance.

ACP2026-0701-182

Multifunctional Polarization Management Device Based on Low-Loss Phase-Change Material Sb₂Se₃**Lun Zhang¹, Yin Xu^{1*}, Zhikun Hu¹, Jiale Chen¹, Hualong Bao^{1*}***1. Soochow University, China*

We have proposed a reconfigurable and multifunctional polarization management device based on the low-loss phase-change material Sb₂Se₃. By switching the phase state of Sb₂Se₃, we can achieve three functions on a single device.

ACP2026-0701-215

High-Sensitivity Silicon Photonic Temperature Sensor Based on a Dual-Layer Si/SiN Cascaded Asymmetric Mach-Zehnder Interferometer**Zhuoting Wang¹, Huan Guan^{2*}, Zhiyong Li², Shuhui Bo^{1*}***1. Minzu University of China, China; 2. Institute of Semiconductors, Chinese Academy of Sciences, China;*

Silicon photonic temperature sensors have attracted considerable attention owing to their compact footprint, and high integration capability. In this work, a Si/SiN cascaded asymmetric Mach-Zehnder interferometer (CMZI) is proposed. By exploiting the large difference in thermo-optic coefficients between silicon and silicon nitride, the cascaded structure generates a pronounced optical Vernier effect, resulting in significantly enhanced temperature sensitivity. Simulation results demonstrate that the proposed sensor achieves a temperature sensitivity of 2.9387 nm/K, representing a significant improvement over a conventional single-stage silicon Mach-Zehnder interferometer. The proposed Si/SiN cascaded Vernier architecture provides a promising approach for the development of high-sensitivity integrated photonic temperature sensors.

ACP2026-0701-245

MPW-compatible low-loss silicon nitride photonics technology with thermo-optic tuning**Aleksandr Baburin^{1,2}, Kirill Buzaverov^{1,2}, Evgeny Sergeev², Dmitriy Serkin², Sergey Avdeev², Evgeniy Lotkov², Sergey Bukatin², Ilya Stepanov², Aleksey Kramarenko², Ali Amiraslanov², Ilya Ryzhikov², Ilya Rodionov^{1,2}***1. VNIIA, Russia; 2. BMSTU, Russia*

We present a low-loss thermo-optic silicon nitride photonic integrated circuits fabrication technology. For our platform we measured microring resonators with linewidth of $k_0/2\pi = 20.44$ MHz corresponding to intrinsic quality factors up to 9.6×10^6 and propagation loss of 0.033 dB/cm. The presented technology provides phase shifter with isolation trenches for the C-band manufacturing. Deep isolation trenches in the SiO₂ cladding lower the π -shift power consumption from 195 mW to 65 mW while preserving a 12 kHz modulation bandwidth.

ACP2026-0701-30

High-Speed Waveguide Ge/Si Avalanche Photodetector with Loop-Enhanced Absorption and Inductive Peaking**Zhen Zhen¹, Xiaobin Liu¹, Chengyang Wu¹, Lei Wang¹***1. Pengcheng Laboratory, China*

We report a waveguide-coupled germanium/silicon avalanche photodiode combining loop-reflector-enhanced optical absorption with an on-chip inductive-peaking electrode. The device exhibits an extracted unity-gain responsivity of approximately 0.78 A/W at 1 V. Avalanche operation produces a peak extracted gain of 61.8 at low optical power, while under an input optical power of -9.64 dBm, the responsivity reaches 2.38 A/W with a multiplication factor of 3.13. The high-bias electro-optic -3 dB bandwidth remains within the 50–56 GHz range. Successful transmissions of 128 Gb/s OOK and 208 Gb/s PAM4 signals with clear, open eye diagrams verify its capability for high-speed optical reception.

ACP2026-0701-40

Low-Power Octave-Spanning Supercontinuum Generation in TeO₂-Clad Silicon Nitride Waveguides with Alternating Dispersion**Wenjie Zheng¹, Feng Ye¹, Hongyan Fu², Qian Li^{1*}***1. Peking University, China; 2. Tsinghua Shenzhen International Graduate School, China*

We achieve octave-spanning supercontinuum at a low peak power of 300 W (61.7 pJ) in a 9.2-mm-long Si₃N₄ waveguide with TeO₂-cladded dispersion engineering.

ACP2026-0701-50

Reconfigurable TE-Pass Polarizer Based on Etchless Sb₂Se₃-Silicon Nitride Waveguide**Zhikun Hu¹, Yin Xu^{1*}, Jiale Chen¹, Lun Zhang¹, Hualong Bao^{1*}***1. Soochow University, China*

We propose a reconfigurable TE-pass polarizer based on an etchless Sb₂Se₃-silicon waveguide platform. The device achieves a high-contrast polarization control and dynamically tunable working band. Such device is fabricated without any etching process.

ACP2026-0701-56

High-Extinction-Ratio Silicon-Based Sb₂Se₃ Microring Resonator Across the Full Crystallization Range**Yiting Luo¹, Yuru Li², Wanting Ou¹, Zhaohui Li^{3,4,5*}***1. Sun Yat-sen University, China; 2. South China Normal University, China; 3. School of Electronics and Information Technology, China; 4. Guangdong Provincial Key Laboratory of Optoelectronic Information Processing Chips and Systems, China; 5. Southern Marine Science, China*

We present a silicon microring resonator using low-loss Sb₂Se₃ phase-change material. Modeled via Lorentz-Lorenz theory, the device achieves continuous wavelength tuning while maintaining a high extinction ratio exceeding 20 dB across all crystallization states.

ACP2026-0701-60

Silicon-Waveguide-Assisted Tri-Layer Edge Coupler for SiN-BTO Heterogeneous Photonic Platforms**Meican He¹, Jifang Qiu^{1*}, Yaqi Feng¹, Yingfei Wan¹, Jian Wu¹***1. Beijing University of Posts and Telecommunications, China*

We propose a silicon-waveguide-assisted tri-layer edge coupler for SiN-BTO heterogeneous photonic platforms. Simulations show 0.88 dB TE single-facet coupling loss at 1550 nm, outperforming a conventional single-layer taper while maintaining good fabrication tolerance.

ACP2026-0701-86

On-Chip Reconfigurable Polarization Beam Splitter Based on Low-Loss Phase-Change Material Sb₂Se₃**Jiale Chen¹, Yin Xu^{1*}, Zhikun Hu¹, Lun Zhang¹, Hualong Bao^{1*}***1. Soochow University, China*

We present an on-chip reconfigurable polarization beam splitter enabled by low-loss phase-change material Sb₂Se₃. Such device can operate flexibly in both beam splitting and no splitting states, without any etching steps.

ACP2026-0714-39

Ultralow-threshold near-infrared supercontinuum generation in nanophotonic suspended aluminum gallium arsenide waveguides**Luyao Fan¹, Qiankun Li², Xueying Sun², Bing Xiong¹, Jian Wang¹, Zhibiao Hao¹, Lai Wang¹, Yanjun Han¹, Hongtao Li¹, Lin Gan¹, Jiyuan Zheng¹, Yi Luo¹, Hairun Guo^{2*}, Changzheng Sun^{1*}***1. Tsinghua University, China; 2. Shanghai University, China*

Ultralow-threshold near-infrared supercontinuum generation is demonstrated in suspended aluminum gallium arsenide (AlGaAs) waveguides. A three-quarter-octave-spanning supercontinuum from 1100 to 1880 nm is generated with an on-chip pulse energy of only 19.5 pJ.

ACP2026-0714-60

Inverse-Designed Silicon Polarization Splitter-Rotator Covering the E- to U-Bands with Low Crosstalk**Bowen Xia^{1,2}, Min Liu^{2,3*}, Daigao Chen², Hongguang Zhang², Yanjing Zhao², Dong Wang², Xi Xiao²***1. Wuhan Research Institute of Posts and Telecommunications, China; 2. National Optoelectronics Innovation Center, China; 3. Central China Normal University, China*

We numerically demonstrate an inverse-designed silicon polarization splitter-rotator on a 220-nm SOI platform, achieving a 350-nm 1-dB bandwidth spanning 1340–1690 nm, insertion loss below 0.25 dB, crosstalk below -33 dB, and robust fabrication tolerance.

ACP2026-0715-144

Turnkey Soliton Microcomb Generation Using Electrically-Tuned Coupled Si₃N₄ Microrings**Zixuan Jia^{1,2}, Suwan Sun^{1,3}, Siyang Li^{1,3}, Zhiming Shi^{1,3}, Jiamin Bai^{1,3}, Hairun Guo^{1,3*}***1. Shanghai University, China; 2. Key Laboratory of Specialty Fiber Optics and Optical Access Networks, China; 3. Key Laboratory of Specialty Fiber Optics and Optical Access Networksdept, China*

We demonstrate turnkey single-soliton microcomb generation in chip-integrated coupled silicon nitride (Si₃N₄) microcavity platform by electrically tuning the auxiliary-ring resonance with a direct current (DC) power supply. Reproducible access to the single-soliton state is achieved through electrode-voltage switching.

ACP2026-0715-163

Integrated Heterodyne Laser Doppler Vibrometer on Thin-Film Lithium Niobate**Yuanchen Chen¹, WeiXi Liu¹, Fei Huang¹, Xijie Wang¹, Daoxin Dai¹, Yaocheng Shi^{1*}***1. State Key Laboratory of Extreme Photonics and Instrumentation, Center for Optical & Electromagnetic Research, College of Optical Science and Engineering, International Research Center for Advanced Photonics, Zhejiang University, China*

We demonstrate a miniaturized thin-film lithium niobate laser Doppler vibrometer featuring efficient broadband heterodyne shifting, achieving 3-nm minimum detectable displacement at 300 Hz. This enables a 20.4-μm theoretical maximum displacement, ensuring wide dynamic range.

ACP2026-0715-195

Design of Etchless Photonic Waveguides and Grating Couplers Enabled by Bound States in the Continuum**Deqing Kong^{1,2}, Fangcheng Cao^{1,2}, Xingyan Zhao^{1,2}, Yang Qiu^{1,2}, Yuan Dong^{1,2}, Qize Zhong^{1,2}, Shaonan Zheng^{1,2}, Ting Hu^{1,2}***1. School of Microelectronics, Shanghai University, China; 2. Shanghai Key Laboratory of Chips and Systems for Intelligent Connected Vehicle, Shanghai University, China*

This work investigates an etchless photonic waveguide and grating coupler based on bound states in the continuum (BICs) to address propagation loss and fabrication challenges in AlScN and BTO thin-film photonic platforms.

ACP2026-0715-207

Impact of Fabrication Imperfections on Bandgap Properties of Lithium Niobate Valley Photonic Crystals**Peyman Baggheri¹, Bitan Nasserfarahmand²***1. Zhejiang University, China; 2. Xi'an Jiaotong University, China*

The formation of slanted sidewalls and finite-depth holes is an inherent drawback of imperfect fabrication processes for thin-film lithium niobate (TFLN) valley photonic crystals (VPCs). We investigate the influence of non-vertical sidewalls and partial etching on the valley bandgap properties of suspended LN VPC slabs, using the gap-to-midgap ratio $\Delta\omega/\omega_m$ as a figure of merit. The bandgap width and central wavelength are evaluated by varying the slab thickness, lattice constant, structural asymmetry, and thickness of the unetched LN layer beneath the holes, with fabrication feasibility taken into account. Increasing the asymmetry enhances $\Delta\omega/\omega_m$ up to 200% and reduces its relative sensitivity to sidewall-angle variation from 20% to 12%. Over the investigated ranges, increasing the slab thickness enlarges the bandgap by $\sim 71\%$, while increasing the lattice constant results in reduction in bandgap size by 33%. For a fixed etching depth of 300 nm, a 100 nm unetched LN layer reduces $\Delta\omega/\omega_m$ by more than 70% and substantially increases the influence of non-vertical sidewalls. Our results provide design guidelines for preserving and tuning the valley bandgap in fabrication-realistic suspended LN VPC devices.

ACP2026-0715-28

An Eccentric-Coupled Piezoelectric MEMS Actuator for Tunable Microring Resonators**Miaowen Zheng¹, Lixiang Wu¹***1. Northwestern Polytechnical University, China*

This work proposes an eccentrically coupled piezoelectric MEMS microring resonator achieving stress focusing and displacement enhancement via geometric eccentricity. Proximal gap closure and high-stress overlap enhance electromechanical coupling, surpassing conventional uniform designs in photonic circuits.

ACP2026-0715-63

Non-volatile Reconfigurable Single- and Coupled Double-Ring Based on Phase Change Materials**Ying Sun¹, Kai Xu¹, Weiquan Wang¹, Jiawei Weng¹, Hongtao Lin¹***1. Zhejiang University, China*

We demonstrate Sb₂Se₃-integrated single- and coupled double-ring silicon microring resonators featuring nonvolatile resonance tuning. Independent programming of the coupled rings enables low-power programmable filtering for scalable reconfigurable silicon photonic integrated circuits.

ACP2026-0715-67

Lithography-Aligned Transfer Printing of Electrically Pumped InAs/GaAs Quantum-Dot Micro-Ring Lasers on Silicon**Wentao Ma^{1,2}, Jiawei Yang^{1,2}, Xuan Pu^{1,2}, Ying Yu^{1,2}, Siyuan Yu^{1,2}***1. State Key Laboratory of Optoelectronic Materials and Technologies, Sun Yat-sen University, China; 2. School of Electronics and Information Technology, Sun Yat-sen University, China*

A transfer-then-pattern method integrates III-V lasers on silicon, replacing mechanical alignment with lithography for improved robustness. The InAs/GaAs micro-ring laser achieves CW lasing at 15 °C, enabling scalable photonic integration.

ACP2026-0715-91

Bonding-Layer Co-Design of Cavity Q and Threshold Gain in Heterogeneously Integrated III-V/Si PCSELS**Chufan Wang¹, Yucong Yang², Xiuyan Ren¹, Shuyuan Liu¹, Bingzhou Hong¹, Wei Chu¹***1. Zhangjiang Laboratory, China; 2. University of Electronic Science and Technology of China, China*

Bonding-layer engineering co-designs hybrid-mode confinement, cavity Q, and threshold gain in heterogeneously integrated III-V/Si PCSELS, revealing distinct Q and gain optima and a fabrication-tolerant route toward scalable C-band surface-emitting light sources for silicon photonic integration.

D3: Active Optoelectronic Devices

ACP2026-0603-1

Broadband F-Band MUTC-PD Module with Low-Loss Waveguide Transition and Integrated Bias-Tee

Yuxin Tian^{1,2}, Bing Xiong², Changzheng Sun², Zhibiao Hao², Jian Wang², Lai Wang², Yanjun Han², Hongtao Li², Lin Gan², Yi Luo²

1.China Mobile Research Institute, China; 2.Beijing National Research Centre for Information Science and Technology (BNRist), Department of Electronic Engineering, Tsinghua university, China;

A broadband F-band MUTC-PD module incorporating low-loss passive circuits is demonstrated, featuring only ± 2.1 dB power fluctuations over the F band and a high saturated power of -4.4 dBm at 90 GHz.

ACP2026-0624-1

Optimization of Dynamic Extinction Ratio in 100 GHz Electro-Absorption Modulators

Zhenyao Li¹, Lei Yu¹, Shuyan Hao¹, Yifan Xin¹, Guangzhen Luo¹, Yejin Zhang¹, Xuliang Zhou¹, Hongyan Yu¹, Jiaoqing Pan¹

1.Institute of Semiconductors, Chinese Academy of Sciences, China

We propose a composite EAM design with graded SCH, carrier-blocking layer, and reverse doping. Dynamic ER penalty reduces by 46% at 100 GHz. Eye diagrams improve significantly at 400 Gbps, with 98.8% eye-height enhancement.

ACP2026-0626-19

Orbital angular momentum erbium doped fiber amplifier based on a tunable multimode pump

Xinrui Jiang¹, Jin Deng¹, Zhao Tan¹, Taowei Jin¹, Shengzhe Wang¹, Shuxin Liu¹, Baojian Wu²

1.Southwest Institute of Technical Physics, China; 2. University of Electronic Science and Technology of China, China

We propose an OAM-EDFA with a tunable multimode pump by simultaneously manipulating phase and polarization through metasurfaces. By adjusting the pump mode components via polarization, 12-mode amplification with a DMG of 0.45 dB is achieved.

ACP2026-0628-7

Generation and Relative Intensity Noise of Few-Cycle Supercontinuum Emission from a Carbon Nanotubes Mode-Locked Fiber Laser

Yifan Wang¹, Kai Wang¹, Qiankun Li¹, Lunian Zhang¹, Jiaxin Xu¹, Chaoqian Wei¹, Meng Gao¹, Hairun Guo¹, Chengbo Mou¹

1.Shanghai University, China

We demonstrate supercontinuum generation from a carbon nanotube mode-locked fiber laser. Normal and anomalous dispersion highly nonlinear fibers exhibit lower relative intensity noise than the amplifier output, and cascaded fibers generate 18.79-fs few-cycle pulses.

ACP2026-0629-23

Linewidth-Reduced Optical Injection-Locked Laser Utilizing Continuous Phase-Shift Grating

Zhefan Wang¹, Mohanad Al Rubaiee¹, Yiming Sun¹, Weiqing Cheng², Ahmet Seckin Hezarfen¹, Weiwei Huang¹, Stephen J. Sweeney¹, John H. Marsh¹, Anthony E. Kelly¹, Lianping Hou¹

1.University of Glasgow, United Kingdom; 2.China University of Petroleum, China

Continuous phase-shift grating (CPSG) monolithic master-slave DFB lasers combine deterministic wavelength control with strong grating coupling. Two injection-locked devices demonstrate stable locking, SMSRs exceeding 40 dB, and linewidths below 250 kHz near 1545/1550 nm.

ACP2026-0630-119

High-power narrow-divergence VCSEL integrated with surface stepped grating

Yufei Wang^{1,2}, Kairui Liu^{1,2}, Yanmei Su^{1,2}, Yejin Zhang^{1,2}

1.State Key Laboratory of Optoelectronic Materials and Devices, Institute of Semiconductors, Chinese Academy of Sciences, China;

2.Center of Materials Science and Optoelectronic Engineering, University of Chinese Academy of Sciences, China

By integrating a stepped grating on the surface of a tunnel-cascaded three-junction VCSEL, single-beam emission with watt-level output power is achieved, with a far-field divergence angle of $1.8^\circ \times 10^\circ$.

ACP2026-0630-21

Overlap-Free High-Speed Wavelength-Swept Laser Based on On-Chip Switching-SOA-Gated REC-DFB Array for HR-FBG Interrogation

Zimeng Liang¹, Pan Dai¹, Yuan Liu¹, Kaichuan Xu¹, Chaobo Zhu¹, Minglei Li¹, Junwei Dong¹, Zhenxing Sun¹, Feng Wang¹, Xiangfei Chen¹

1.Nanjing University, China

A high-speed overlap-free HR-FBG wavelength-swept scheme based on an 8-channel REC-DFB laser array with FPGA-controlled on-chip integrated SOAs achieves 21 nm coverage at 12.5 kHz, demonstrating ± 2.5 pm center-wavelength repeatability over 625 cycles.

ACP2026-0630-24

Non-volatile optoelectronic memory based on ferroelectric material CuInP2S6**Jingmei Zhang¹, Yandong He^{1*}, Haowen Shu¹, Xingjun Wang^{1*}**¹.Peking University, China

We demonstrate for the first time an on-chip non-volatile optoelectronic memory using a two-dimensional ferroelectric CuInP2S6 flake integrated with a silicon Mach-Zehnder interferometer, achieving stable voltage-free optical states, a 1.06 nm spectral shift, and 9.67 dB output power contrast for photonic computing.

ACP2026-0630-9

S-band Thin-Film Lithium Niobate Mach-Zehnder Modulator with 200 GHz EO Bandwidth**Yuefeng Hu¹, Lulu Liu¹, Junbo Zhu¹, Daoqun Liu¹, Yuhan Wang¹, Ke Li¹, Lei Wang¹, Chen Zhang^{1*}**¹.Pengcheng Laboratory, China

We demonstrate an S-band thin-film lithium niobate Mach-Zehnder modulator featuring a V_{π} ·L of 2.14 V·cm and 1.59 dB EO roll-off at 145 GHz. Physics-informed extrapolation indicates a 3-dB EO bandwidth exceeding 200 GHz, providing a promising platform for optical interconnects operating beyond 200 GBaud.

ACP2026-0701-124

Surface-Illuminated Ge-on-SOI Photodetector at 2 μ m Wavelengths Based on Multi-Holes Array Photonics-Crystal Micro-cavity**Kangli Zhang¹, Zhenglong Zhu¹, Wei Wang², Baiyin Wang², Nan Ye^{1*}**¹.Shanghai University, China; ².Shanghai Industrial Technology Research Institute, China

A 2 μ m two-photon absorption surface-illuminated Ge-on-SOI photodetector is demonstrated with the multi-holes array photonics-crystal cavity. Fabricated by the 8-inch silicon photonics process platform, it achieves a 1.61 mA/W photoresponsivity and 25 GHz RF bandwidth.

ACP2026-0701-13

Impact of Residual Amplitude Modulation in Depletion-Mode Silicon-Photonic Phase Modulators on Fiber-Optic Gyroscopes**Daoming You¹, Hongguang Zhang¹, Xi Xiao¹**¹.National Information Optoelectronics Innovation Center China Information Communication Technologies Group Corporation, China

We study residual amplitude modulation in depletion mode silicon phase modulators and propagate it into open loop fiber optic gyroscope bias, revealing lock in leakage, modulation depth amplification and practical design rules for compensation strategies.

ACP2026-0701-147

Suppression of Servo Bump in a passively Harmonic Mode-Locked Fiber Laser via Second-Order Phase Compensation**Jiaxin Xu¹, Qianqian Huang¹, Kai Wang¹, Lilong Dai¹, Yifan Wang¹, Haochen Tian¹, Youjian Song¹, Linghui Yang¹, Chengbo Mou^{1*}**¹.Shanghai University, China

We report a cascaded RC second-order phase-lead scheme to suppress relative intensity noise in harmonic mode-locked fiber lasers. Overcoming PI loop delays, it suppresses the servo bump and reduces integrated RIN to 0.027%.

ACP2026-0701-15

Multistate Dark-Bright Composite Soliton Pairs in a Short-Cavity NL-MMI Fiber Laser**Enfan Zhou¹, Dongfang Jia^{1*}, Danyang Wang¹, Yi Liu¹, Chunfeng Ge¹, Zhaoying Wang¹**¹.Tianjin University, China

We report a short-cavity NL-MMI erbium-doped fiber laser producing switchable dark-bright, bright-dark, composite and high-order dark-bright soliton pairs at 54.5 MHz third-order repetition rate, demonstrating its capacity for high repetition rate dark-light composite soliton manipulation.

ACP2026-0701-161

Mid-Infrared Circular Polarization Detection based on Chiral Metasurface Integrated Two-Dimensional Black Phosphorus**Yihong Chen¹, Zhanlong Lou¹, Yang Chen¹, Yangcan Long¹, Mingjin Dai^{2*}, Chao Wang^{1*}**¹.Huazhong University of Science and Technology, China; ².Zhengzhou University, China

We propose a black phosphorus-integrated chiral MIM metasurface detector for mid-infrared circular polarization, achieving 89% CD and 1.61 g-factor via the photothermoelectric effect.

ACP2026-0701-175

Single-shot Polarization Dynamics During Soliton Explosions in a mode-locked fiber laser**Meng Gao¹, Qianqian Huang¹, Fan Wu¹, Bo Zhang¹, Yifan Wang¹, Lunian Zhang¹, Lilong Dai¹, Sergey V. Sergeyev², Chengbo Mou^{1*}**¹.Shanghai University, China; ².Aston University, United Kingdom

We report the first single-shot observation of soliton explosions in a CNT mode-locked laser. Crucially, both the spectral and polarization evolutions exhibit identical stable-chaos-stable transitions, accompanied by consistent energy relaxation oscillations.

ACP2026-0701-177

Analysis of Uniaxially Tensile-Strained Five-Layer Ge/SiGe Coupled Quantum Wells for Optical Modulators**Peilin Jiang¹, Tianheng Zhang¹, Junqiang Sun^{1*}***1. Wuhan National Laboratory for Optoelectronics and School of Optical and Electronic Information, Huazhong University of Science and Technology, China*

We propose uniaxially tensile-strained five-layer Ge/SiGe asymmetric coupled quantum wells for C-band operation. Achieving a 6.16 absorption contrast and a 1.53×10^{-2} electro-refractive index change under 1.1% strain, it promises simultaneous high-efficiency electro-absorption and phase modulation.

ACP2026-0701-18

1550 nm High-Power Buried-Heterostructure Distributed Feedback (DFB) Laser with a Partially Corrugated Grating Design**Yifan Xin^{1,2}, Lei Yu^{1,2}, Zhenyao Li^{1,2}, Xuliang Zhou^{1,2}, Pengfei Wang^{1,2}, Yejin Zhang^{1,2}, Jiaoqing Pan^{1,2*}***1. Key Laboratory of Semiconductor Materials Science, Institute of Semiconductors, Chinese Academy of Sciences, China; 2. Center of Materials Science and Optoelectronics Engineering, University of Chinese Academy of Sciences, China*

We report a novel BH-DFB laser. By employing an optimized partially-corrugated-grating design beneath the active region, the device achieves an output power of 122 mW@500mA@25°C, with a SMSR exceeding 50dB, and a RIN below -158dB/Hz.

ACP2026-0701-206

Segment-Voting-Based Synchronization Parameter Selection Method for Asynchronous Optical Sampling**Meng Qiu¹, Feng Tian¹, Junjie Jiang¹, Chuanji Yan¹, Jianwei Zhou¹, Jing Zhang¹***1. Beijing University of Posts and Telecommunications, China*

A segment-voting-based synchronization parameter selection method is proposed in this paper. The proposed approach can identify a synchronization parameter more suitable for waveform recovery beyond the global maximum spectral peak. Experimental results show that, compared with the conventional direct coarse-to-fine synchronization estimation procedure, the Pearson correlation coefficient between the recovered waveform and the original waveform is improved by 8.167%.

ACP2026-0701-44

Hybrid Integrated Multi-Wavelength Laser Based on a Multi-Microring External Cavity**Yi Xiao¹, Hongfei Zhang¹, Yilin Wu¹, Liwei Tang², Hui Wang², Ciyuan Qiu³, Wendi Li⁴, Minghua Chen^{1*}***1. Department of Electronic Engineering, Tsinghua University, China; 2. Changzhou Smartcore Optoelectronic Limited Changzhou, China; 3. State Key Laboratory of Advanced Optical Communication Systems and Networks, Department of Electronic Engineering, Shanghai Jiao Tong University, China; 4. Department of Mechanical Engineering, The University of Hong Kong, Hong Kong, China*

We demonstrate an eight-wavelength hybrid integrated laser using a silicon nitride multi-microring external cavity, achieving C-band lasing with 200-GHz spacing, 50-dB SMSR, and 73-kHz integrated linewidth for optical interconnects.

ACP2026-0701-53

TCAD-Assisted Analysis of Doping-Diffusion-Induced Performance Variation in 12-inch SOI Dual-Drive Depletion MZMs**Xuankai Fang¹, Chunlei Sun¹, Zhiqiang Zhang¹, Jia Guo¹, Huiyun Jiang¹, Hongtao Lin^{1,2*}***1. College of Integrated Circuits, Zhejiang University, China; 2. College of Information Science and Electronic Engineering, Zhejiang University, China*

Process-aware dopant modeling is proposed for silicon depletion MZMs. Experiments reveal IMPdis-dependent loss, with α increasing from 5.44 to 8.50 dB/cm as IMPdis decreases, while V_{ITL} changes moderately, highlighting TCAD necessity for reliable manufacturable-device prediction.

ACP2026-0701-98

A Chip-Scale Thermally Self-Calibrated Lithium Niobate Electro-Optic Modulator with Dual-Domain Feedback for Robust Resonance Stabilization**Chenyang Wu¹, Zhen Zhen¹, Hui Chen¹, Siyue Jin¹, Zhenyi Yang¹, Lei Wang^{1*}***1. Peng Cheng Laboratory, China*

A thermally self-calibrated LNOI electro-optic modulator with dual-domain feedback is presented. The architecture combines feedforward thermal compensation and closed-loop optical stabilization, achieving 0.02 nm locking error and 5% valley fluctuation without external TEC, preserving the intrinsic high-Q response.

ACP2026-0707-3

High-Speed Fiber Bragg Grating Demodulation Using an Adaptive Scan-Window Strategy with a Wavelength-Tunable Laser**Xu Wang¹, Rui Zhou², Yuanle Su¹, Yang Zhao³, Tian Guo³, Huiran Cao⁴, Zhiguo Zhang¹***1. Beijing University of Posts and Telecommunications, China; 2. University of Science and Technology Beijing, China; 3. State Grid Beijing Electric Power Company, China; 4. Beijing Institute of Computer Technology and Applications, China*

Full-range scanning limits tunable-laser FBG demodulation speed. An adaptive scan-window strategy for DSDBR lasers is proposed, increasing the demodulation rate 39-fold while maintaining picometer accuracy, enabling low-cost, dynamic measurements without major hardware changes.

ACP2026-0712-5

Novel Michelson interferometer modulator with low return loss**Yao Sun¹, Shihuan Ran¹, Linjie Zhou¹***1. Shanghai Jiao Tong University, China*

We demonstrate a Michelson interferometer modulator (MIM) with a return loss reduction of 7.5 dB. The device employs TE0/TE1 mode-selective routing implemented through multimode (de)multiplexers and multimode-compatible PIN phase shifters.

ACP2026-0713-23

Deep Learning-Driven Wide and Flat Gain Spectrum Inverse Design for Power-Uniform Multi-Wavelength Laser Arrays**Yunping Cui¹, Bing Xiong¹, Changzheng Sun¹, Jian Wang¹, Zhibiao Hao¹, Lai Wang¹, Yanjun Han¹, Hongtao Li¹, Lin Gan¹, Yi Luo¹***1. Tsinghua University, China*

We report a deep-learning inverse-design framework for quantum wells to achieve wide and flat gain. Experimentally, the optimized multi-wavelength DFB lasers yield 80% and 60% power uniformities over 36-nm and 53-nm spans, respectively.

ACP2026-0714-65

High-Speed Electro-Optic Fano Switch and Modulator on Thin-Film Lithium Niobate**Ziliang Ruan¹, Xijie Wang¹, Weilong Ma², Kaixuan Chen², Liu Liu¹***1. Zhejiang University, China; 2. South China Normal University, China*

We propose and experimentally demonstrate a high-speed electro-optical Fano switch on thin-film lithium niobate. The device employs a side-coupled traveling-wave-like Fabry-Pérot cavity formed by two apodized asymmetric multimode waveguide gratings. It exhibits an average spectral slope of 165.6 dB/nm, a normalized on-chip insertion loss of 0.39 dB, an extinction ratio exceeding 29 dB, an effective half-wave voltage of 26.8 V, and a tuning efficiency of 7.2 pm/V. A 12.6-GHz electro-optical bandwidth and a clearly open 30 Gb/s on-off keying eye diagram are demonstrated.

ACP2026-0714-66

Investigation of Scaling Exponents in Coupling Modes of Raman Random Fiber Laser**Taichao Wang¹, Yifei Qi¹, Minglu Li¹, Runhao Li¹, Anderson Gomes², Ernesto Raposo^{3*}, Zinan Wang^{1*}***1. Key Laboratory of Optical Fiber Sensing and Communications, University of Electronic Science and Technology of China, China;**2. Departamento de Física, Universidade Federal de Pernambuco, Brazil; 3. Laboratório de Física Teórica e Computacional,**Departamento de Física, Universidade Federal de Pernambuco, Brazil*

Owing to disorder and mode interactions, RFLs show collective dynamics resembling brain activity. We transfer PRG — a tool for neural criticality — to a Raman RFL, revealing scaling analogies to brain fMRI, hinting at universal principles across complex systems.

ACP2026-0715-10

1.77 μ m GHz Pulse Generation via Soliton Self-Frequency Shift in a Fiber Laser**Lunian Zhang¹, Qianqian Huang¹, Mengxue Guo¹, Kai Wang¹, Yifan Wang¹, Yuhang Yan¹, Jiaxin Xu¹, Lilong Dai¹, Chengbo Mou^{1*}***1. Shanghai University, China*

We demonstrate 1.77- μ m GHz solitons generated by soliton self-frequency shift in dispersion-shifted fiber using a passively harmonic mode-locked Er-doped fiber laser, achieving a 199-nm shift to the longest wavelength reported for this configuration.

ACP2026-0715-141

Temperature-Dependent Nonlinear Optical Properties of Carbon Nanotubes Saturable Absorber in a Harmonic Mode-Locked Fiber Laser**Yuhang Yan¹, Qianqian Huang¹, Lilong Dai¹, Lunian Zhang¹, Yifan Wang¹, Hairun Guo¹, Chengbo Mou^{1*}***1. Shanghai University, China*

We reveal the impact of temperature response characteristics of the single-walled carbon nanotubes saturable absorber on the harmonic mode-locking performance. It is found that elevating the temperature simultaneously reduces the non-saturable loss and the effective modulation depth of the single-walled carbon nanotube saturable absorber, thus leading to the spectral redshift and decreasing spectral bandwidth and pump power necessary for the harmonic mode-locking.

ACP2026-0715-158

Practical Erbium-Doped Optical Frequency Comb on a Glass-Ceramic Substrate**Rongwei Zhu¹, Hongjian Yang¹, Ti Qian¹, Liang Hu^{1*}, Guiling Wu¹, Jianping Chen¹***1. Shanghai Jiao Tong University, China*

This paper presents a practical erbium-doped optical frequency comb based on nonlinear amplifying loop mirror (NALM) mode locking. The mode-locked laser is integrated onto a low-thermal-expansion glass-ceramic substrate, enabling a compact free-space optical layout.

ACP2026-0715-162

Room-Temperature Continuous-Wave Quantum-Dot Photonic-Crystal Nanobeam Laser with an Electrical-Injection-Compatible Architecture**Xuebo Zhao^{1,2}, Wentao Ma^{1,2}, Kun Zhan^{1,2}, Jiawei Yang^{1,2}, Ying Yu^{1,2*}, Siyuan Yu^{1,2}***1.State Key Laboratory of Optoelectronic Materials and Technologies, China; 2.School of Electronics and Information Technology Sun Yat-sen University, China*

Here, we demonstrate a room-temperature continuous-wave optically pumped InAs/GaAs quantum-dot photonic-crystal nanobeam laser. A linearly graded one-dimensional photonic-crystal cavity provides strong optical confinement, with a measured quality factor of approximately 4200.

ACP2026-0715-24

Wavelength-Tunable Dissipative Solitons From an All-Normal-Dispersion NOLM Mode-Locked Yb-Doped Fiber Laser**Jianwei Zhou¹, Feng Tian^{1*}, Jing Zhang¹, Qi Zhang¹, Haipeng Yao¹, Ran Gao², Qinghua Tian¹, Fu Wang¹***1.Beijing University of Posts and Telecommunications, China; 2.Beijing Institute of Technology, China*

A wavelength-tunable all-normal-dispersion Yb-doped mode-locked fiber laser is demonstrated, achieving stable dissipative-soliton operation from 1032 to 1062 nm while maintaining pulse energies above 1.6 nJ throughout the tuning range.

ACP2026-0715-6

Low-Voltage High-Speed Lateral Ge-on-Si Avalanche Photodiode with an Intrinsic-Si-Free Doping Architecture**Xu Liu^{1*}, Huimin Yan¹, Jialin Cheng¹, Shangdong Zou¹, Jiayin Yan¹, JianJun He¹***1.Zhejiang University, China*

We demonstrate a 445GHz gain-bandwidth product (GBP) low-voltage lateral Ge-on-Si avalanche photodiode utilizing an intrinsic-Si-free architecture to achieve a highly reduced breakdown voltage of -7.4V.

ACP2026-0715-68

Topological Structured Light Field to Photocurrent Conversion in Two-Dimensional Materials**Yujie Tao¹, Ruiguang Yao¹, Yanfei Mu¹, Xiaoping Huang^{1*}***1.University of Electronic Science and Technology of China, China*

We demonstrate topological structured-light-to-photocurrent conversion in graphene/hBN, where six-beam optical textures modulate macroscopic structural currents. Amplitude, phase, and polarization topology map to distinguishable electrical signatures, enabling compact structured-light detection and decoding for integrated optical communication.

ACP2026-0715-95

Erbium-Doped Silicon Nitride Waveguide Amplifiers under Bidirectional Pumping at 980 and 1480 nm**Yuxiang Yu¹, Qingming Chen^{1*}, Chunxu Wang¹, Yongguang Xiao¹, Zhaohui Li^{1*}***1.Sun Yat-sen University, China*

Bidirectionally pumped erbium-doped silicon nitride amplifiers show wavelength-dependent operating regimes: 1480-nm pumping favors long devices and high input signal power, whereas 980-nm pumping provides higher gain in short devices under small-signal operation for integrated photonics.

D4: Passive Photonic Components Across Domains

ACP2026-0628-6

Spectral Recovery for Integrated Photonic Devices Based on Fourier Neural Operator**Yingxue Zhang¹, Zhenyu Zhao¹, Yikai Su¹, Xuhan Guo¹***1.Shanghai Jiao Tong University, China*

We propose a system based on Fourier neural operator for spectral recovery of unknown devices, enabling resolution adjustable prediction, and provide a promising method for analyzing the intermediate devices of integrated photonic systems.

ACP2026-0629-27

Study of transverse mode filter based on ring core fiber in a laser cavity**Yafan Su^{1,2}, Youchao Jiang^{1,2*}, Zhiming Yao^{1,2}, Shiyong Xiao^{1,2}, Bellei Wu^{1,2}, Wenhua Ren^{1,2}, Guobin Ren^{1,2}***1.Key Laboratory of All Optical Network & Advanced Telecommunication Network, Ministry of Education, Beijing Jiaotong University, China; 2.Institute of Lightwave Technology, Beijing Jiaotong University, China*

An all-fiber transverse mode filter based on ring-core fiber (RCF) is proposed for high-order mode control in few-mode fiber lasers. By exploiting the mismatch of transverse mode field distributions between the few-mode fiber and RCF, mode loss is introduced to achieve selective filtering and enable mode competition in the laser cavity. A vectorial overlap-integral model is employed to evaluate mode coupling efficiencies of three RCF designs, showing that RCF3 exhibits the strongest mode selectivity. Experimental results demonstrate that a 3.8 cm RCF3 inserted into a fiber laser cavity enables stable LP₁₁ mode lasing at 1548.65 nm, indicating effective suppression of the fundamental mode and selective excitation of higher-order modes. This filter reduces the need for complex spatial optical components, providing both a design reference for mode control in all-fiber high-order transverse-mode lasers.

ACP2026-0630-18

Tunable optical delay line based on thin-film lithium niobate at 2- μ m waveband
Shihan Hong^{1,2}, Weixun Zhu², Lei Wang¹, Zejie Yu², Yiwei Xie², Daoxin Dai^{2*}*1. Pengcheng Laboratory, China; 2. Zhejiang University, China*

We demonstrate a tunable optical delay line at 2- μ m waveband based on thin-film lithium niobate, with low propagation loss of 0.27 dB/cm and switching speed of 27 ns, featuring tuning range of 511 ps.

ACP2026-0630-19

Few-Mode Gain Flattening Filter Based on Core-Mode Coupling with Long-Period Fiber Gratings**Shuailuo Huang¹, Yanbiao Chang¹, Shikui Shen¹, He Zhang¹, Zelin Wang¹, Guangquan Wang¹, Xiongyan Tang¹***1. China Unicom, China*

Relying on independent coupling from low-order modes to high-order modes with LPFGs in the core of weakly-coupled FMF, a few-mode gain flattening filter is designed, achieving a flatness of 0.51 dB at C band.

ACP2026-0630-23

Reconfigurable Single-SLM Folded Multi-Plane Diffractive Optical Network for Direct Imaging through a Ring-Core Fiber
Xinyi Deng^{1,2}, Sitong Zhou^{1,2*}*1. School of Electronic Engineering, Beijing University of Posts and Telecommunications, China, China; 2. State Key Laboratory of Information Photonics and Optical Communications, Beijing University of Posts and Telecommunications, China*

A reconfigurable single-SLM folded diffractive optical transmission system is proposed for ring-core-fiber imaging, enabling programmable speckle-field reconstruction and target-image recovery through cascaded phase modulation and free-space propagation without explicitly measuring the complex fiber transmission matrix.

ACP2026-0630-41

Interaction- and Polarization-Resolved Design of a Multi-Segment Polarization Volume Grating Out-Coupler for Augmented Reality Waveguide Displays**Qiyun Zhu¹, Yu Zhang², Lei Zhang¹, Yue Wang¹, Qi Wei², Hongfei Qian², Bin Huang^{1*}***1. Hangzhou Institute of Technology, Xidian University, China; 2. K-tronics (Su Zhou) Technology Co., LTD, China;*

An interaction- and polarization-resolved multi-segment PVG out-coupler improves AR waveguide eyepiece uniformity by jointly using beam-hit position, local power, and circular-polarization components, increasing minimum retinal efficiency and reducing leakage without changing pupil-expansion geometry or topology.

ACP2026-0630-64

Genetic Algorithm-Based Inverse Design of a Topological Beam Splitter with Arbitrary Power Ratios**Yubing Wang¹, Ganggang Li¹, Faisal Nadeem Khan^{1*}***1. Institute of Data and Information, Tsinghua Shenzhen International Graduate School, Tsinghua University, China*

This work presents a topological beam splitter with arbitrary power splitting ratios. Genetic algorithm is used to inverse design the region near the splitting point. Transverse spin matching is introduced to improve the coupling efficiency.

ACP2026-0630-95

Ultra-Compact Direction-Encoded Diffractive Chip for Asymmetric Optical Transmission**Kangrui Wang¹, Tianhao Fu¹, Xiaoxiao Ma¹, Junjie Chen¹, Jian Wang¹***1. Huazhong University of Science and Technology, China*

We demonstrate an ultra-compact bidirectional diffractive neural network chip fabricated by two-photon polymerization, which encodes propagation direction for asymmetric optical transmission and achieves distinct forward/backward transformations with experimental PCCs exceeding 0.8 in passive integrated optics.

ACP2026-0701-101

LLM-Driven Iterative LCoS Phase-Map Refinement with Physics-Gradient Updates for Port-Power Distribution Control in Wavelength Selective Switch**Zhixiong Zheng¹, Mingzhe Chen¹, Zekun Niu¹, Weisheng Hu¹, Lilin Yi^{1*}***1. Shanghai Jiao Tong University, China*

An LLM-driven iterative refinement method is proposed for LCoS phase map generation and port power distribution control in a WSS.

ACP2026-0701-110

Comparison of Fiber Nonlinear Expansion and Shaping Methods for Cavity-Less Optical Frequency Comb Generation
Yijia Cai¹, Yuan Luo², Alexander.M.Heidt³, Zhixin Liu^{1*}*1.Univeristy College London, United Kingdom; 2.Chinese University of Hong Kong, Hong Kong, China; 3.University of Bern, Switzerland;*

We compare different frequency comb expansion architecture based on fiber loop mirror for cavity-less EO-comb-seeded parametric frequency comb generation. Specifically, we compare the spectral shape, flatness and optical signal to noise ratio (OSNR) of three types of comb expansion and shaping systems, including conventional nonlinear optical loop mirror (NOLM), nonlinear amplifying loop mirror (NALM) and our recently proposed chirp-nonlinear optical loop mirror (C-NOLM). We show that C-NOLM system achieves 3 dB flatness over 35nm and OSNR 0.1nm higher than 33 dB, which is promising for high channel count wavelength-division multiplexing (WDM) transmission systems

ACP2026-0701-197

Fast Multilayer Aberration Evaluation for 1550 nm STED Beam Focusing**Xiaojie Guo¹, Baoying He¹, Boyi Yang¹, Wenhua Ren¹, Youchao Jiang¹, Guobin Ren^{1*}***1.Beijing Jiaotong University, China*

A fast Richards-Wolf/S-matrix/CZT-FFT model evaluates 1550 nm NIR-II STED focusing and shows that oil-coverslip-sample matching with a 0.13-0.17 mm coverslip best preserves the annular depletion focus by reducing spherical aberration, side lobes, and axial shift.

ACP2026-0701-210

Generalized formulation of topological skyrmion and bimeron beams**Zhaoyang Li¹, Qinghua Gong², Jinnan Zhang²***1.University College London, United Kingdom; 2.Beijing University of Posts and Telecommunications, China*

Optical skyrmion and bimeron beams are topologically structured light fields whose polarization textures wrap the Poincaré sphere, with promising applications in optical communication, metrology, and topological photonics. Existing constructions fall into two separate frameworks: a spinor-based formulation

ACP2026-0701-232

Broadband Spatial Mode Multiplexer for a 7-Core, 6-Mode Multicore Fiber Based on Multi-Plane Light Conversion**Ying Zheng¹, Lin Yu¹, Di Lin¹, Jianping Li¹, Songnian Fu¹, Yuwen Qin¹***1.Institute of Advanced Photonics Technology, School of Information Engineering Guangdong University of Technology Guangzhou, China, China*

We propose a multi-plane light conversion based spatial multiplexer for 7-core, 6-mode multicore fibers over the S+C+L bands, achieving an insertion loss of 1.4 dB, a mode-dependent loss of 1.6 dB, and an average crosstalk of -37.2 dB at 1550 nm.

ACP2026-0702-7

Six-Channel Silicon Photonics Wavelength Beam Combiner for the 2 μ m and 2.3 μ m Wavebands**Ruoyu Xiong¹, Kan Huang¹, Songjian Lin¹, Jincheng Wei¹, Ruijun Wang^{1*}, Siyuan Yu¹***1.Sun Yat-sen University, China*

We demonstrate a six-channel silicon-photonics wavelength combiner for broadband spectroscopy in the 2 and 2.3 μ m wavebands. Integrating two intra-band MZI networks and a 2/2.3 μ m diplexer, it achieves minimum losses of -3.0 and -5.1 dB.

ACP2026-0703-3

Ultra-broadband Femtosecond Soliton Molecule Generation in an Er-doped All-fiber Laser**Qianqian Huang¹, Zinanian Huang^{1, 2}, Zhijun Yan³, Chengbo Mou^{1*}***1.Shanghai University, China; 2.Shanghai Institute of Technical Physics, China; 3.Huazhong University of Science and Technology, China*

We demonstrate the generation of ultra-broadband femtosecond soliton molecules in an Er-doped all-fiber laser using the nonlinear polarization rotation technique. Through precise engineering of intracavity dispersion and nonlinearity, the fiber laser directly emits stable soliton molecules with a pulse duration of 78 fs and a 3 dB spectral bandwidth of 104.11 nm, setting the highest bandwidth record achieved to date for soliton molecules in fiber lasers. This ultra-broadband femtosecond soliton molecule all-fiber source represents a highly promising candidate for frontier optical applications.

ACP2026-0713-26

Mode Field Diameter Estimation in Antiresonant Hollow-core Fibers from Propagation Constant Difference**Minghao Zhong¹, Shaoyong Ji¹, Caoyuan Wang¹, Limin Xiao^{1*}***1.Fudan University, China*

The mode-field diameter (MFD) is an important parameter in anti-resonant hollow-core fibers (AR-HCFs). Here we propose an eigenvalue-based method to estimate the MFD from the propagation constant difference between the LP₀₁ and LP₁₁ core modes, derived from a Bessel-field approximation combined with the definition. Finite-element simulations of nested AR-HCFs show agreement within 1% over parameter sweeps of core diameter, wavelength, and cladding structure in the anti-resonant regime, with larger deviations near resonance. The method provides a fast way to estimate the AR-HCF mode size without repeated near-field integration.

ACP2026-0714-1

Silicon Nitride Metalens-Based Imaging Systems**Jiahao Han¹, Ruixiang Song¹, Shuaihong Qi¹, Yanping Li^{*}***1.State Key Laboratory of Photonics and Communications, School of Electronics, Peking University, China*

This paper proposes and implements a broadband silicon nitride metalens operating in the visible band. In simulation design, a design framework combining polynomial phase functions and genetic algorithm optimization is established, achieving efficient design of millimeter-scale metalenses. In fabrication, by adjusting etching parameters, high-aspect-ratio silicon nitride nanopillar arrays are successfully fabricated. Finally, the focal length and point spread function of the fabricated metalens are experimentally tested, demonstrating excellent imaging performance.

ACP2026-0714-23

Low-Loss Directional Couplers Based on Femtosecond-Laser-Written Three-Dimensional Glass Waveguides**Rongyi Lin¹, Xinliang Xu¹, Zaichuan Xing¹, Jianning Su¹, Ting Lei^{*}***1.Nanophotonics Research Center Shenzhen Key Laboratory of Microscale Optical Information Technology Institute of Microscale Optoelectronics Shenzhen University, China*

Femtosecond laser written glass waveguides enable low loss three dimensional photonic integration with tunable directional coupling, wavelength dependent transfer, and multiwaveguide field control for versatile passive optical functions beyond conventional two port power splitting schemes.

ACP2026-0715-115

Spectral-Continuity and Low-Rank Residual Network for Diffractive Snapshot Hyperspectral Reconstruction**Zaiwei Cao¹, Zhenming Yu^{1,2*}, Tongshuo Zhang¹, Jingyue Ma¹, Liang Lin¹, Kaiang Yang², Kun Xu^{1,2}***1.State Key Laboratory of Information Photonics and Optical Communications Beijing University of Posts and Telecommunications, China; 2.Xiong'an Aerospace Information Research Institute, China*

We propose a Spectral-Continuity and Low-Rank Residual Network (SCLRN) that combines adjacent-band continuity with low-rank spectral basis modeling for end-to-end diffractive snapshot hyperspectral reconstruction. The results demonstrate 31-band hyperspectral reconstruction from 400 to 700 nm, achieving improvements of 0.88 dB in PSNR and 0.002 in SSIM while reducing computational cost by 22.1%.

ACP2026-0715-138

Four-Core Fiber Coupler Based on Helical Long-Period Fiber Gratings**Suying Wu¹, Siyu Chen¹, Rui Zhang¹, Wei Chen¹, Chengbo Mou¹, Yunqi Liu^{*}***1.Shanghai University, China;*

A four-core fiber coupler based on helical long-period fiber gratings is demonstrated. Tunable grating periods enable wavelength-selective inter-core coupling and multipoint power transfer, providing an all-fiber solution for space-division multiplexing systems.

ACP2026-0715-166

High-Q Fabry-Pérot Cavity with Retroreflector on AlGaAs-on-insulator Platform**Zhichao Qian^{1,2}, Zhengshun Lei³, Yikai Su³, Weiqiang Xie^{3*}***1.School of Information and Electronic Engineering, Shanghai Jiao Tong University, China; 2.State Key Laboratory of Photonics and Communications, China; 3.Shanghai Jiao Tong University, China*

This paper proposes and experimentally demonstrates a high-Q Fabry-Pérot cavity using conical reflectors on the AlGaAs-on-insulator platform. The measured Q factor is as high as 0.3×10^6 at 1550 nm.

ACP2026-0715-176

Compact and Broadband Dual-polarization 2 × 2 Multimode-Interference Coupler on AlGaAs-on-insulator Platform**Yonggang Han¹, Zhengshun Lei¹, Yikai Su¹, Weiqiang Xie^{*}***1.Shanghai Jiao Tong University, China*

We design and demonstrate a dual-polarization 2 × 2 multimode-interference coupler on the AlGaAs-on-insulator platform. The coupler features a $2.169 \mu\text{m} \times 17.160 \mu\text{m}$ multimode region and operates over an optical bandwidth exceeding 160 nm.

ACP2026-0715-182

Generation of Second- and Third-order Orbital Angular Momentum Modes Using a Helical-core Long-Period Fiber Grating**Aozuo Li¹, Xiaolong Fan¹, Lu Chen¹, Siyu Chen¹, Chengbo Mou¹, Yunqi Liu^{*}***1.Shanghai University, China*

We demonstrate the simultaneous generation of second- and third-order orbital angular momentum (OAM) modes using a helical-core long-period fiber grating (HC-LPFG) fabricated in a few-mode fiber by CO₂ laser.

ACP2026-0716-5

Data-Driven Bidirectional Modeling for Optical Field Control in Multimode Fibers**Yifan Sun¹, Jun Wang¹, Zhihong Liu¹, Tianyun Wang¹, Nan Chi¹, Ziwei Li^{*}***1.Fudan University, China*

This paper presents a data-driven bidirectional modeling framework for multimode fiber output control, enabling point focusing, two-dimensional scanning, and image projection without reference beams or mechanical scanning components.

Poster Session-N-Track

Content

N1: Network, System and Service Innovations

ACP2026-0608-1

Link-Level Time-Domain Slicing for Deterministic Resource Isolation in AI Interconnect Networks

Tingyi Yao¹, Taoning Zheng¹, Jiayuan Li¹, Bitao Pan¹

1. Beijing University of Posts and Telecommunications, China

We propose a link-level time-domain network slicing mechanism for AI training interconnects where bulk traffic usually affects synchronization-critical flows. The proposed mechanism features hard isolated slicing and class-based flow scheduling, providing deterministic performance for critical AI flows. An Astra-Sim and ns-3 evaluation against a RoCE baseline shows up to 95.6% reduction in p99 critical-flow latency and consistently improved collective completion times.

ACP2026-0617-3

Passive Optical Identification and Resource Management of ODF Ports and Fiber Links Based on FiberGrating ArrayEncoder

Junfeng Cheng¹, Yishuai Wang¹, Wei Shi¹, Guoqin Liao¹, Weiqi Hu¹, Ming Li², Lei Yu², Xiaohe Lu², Ruisi Wang³, Yijie Zhang³, Xiangpeng Xiao³, Zhijun Yan³

1. Xiaohongshu Inc, China; 2. ACCELINK Technologies CO., LTD., China; 3. Huazhong University of Science and Technology, China

A COTDR-based ODF resource management scheme using 4-bit grating-arrayencoder is demonstrated. Accurate identification of ODF ports and fiber links is achieved with only 0.01 dB additional insertion loss, enabling automated optical resource management.

ACP2026-0624-5

Experimental Evaluation on Low-Latency Characteristics of OSU in Optical Transport Networks

Ruiquan Jing¹, Heng Zhou¹, Tao Ma², Wei Wang², Lingquan Wang², Guoxin Zhang³

1. China Telecom Research Institute, China; 2. China Telecom Corporation Limited, China; 3. China Information Consulting & Designing Institute Co. Ltd., China

This paper evaluates OSU's low-latency and high-efficiency performance for OTN private line services via theoretical analysis, lab tests and field trials, verifying its significant advantages over traditional VC and ODU for next-generation metro OTN deployment.

ACP2026-0626-7

Energy-Efficient Neighbor Discovery Protocol for Ultraviolet Communication Networks

Tian Luo¹, Yong Zuo¹, Dong Zhu¹, Siyuan Cai¹, Xiaobin Hong¹, Jian Wu¹

1. Beijing University of Posts and Telecommunications, China

Ultraviolet communication networks need reliable neighbor discovery. We introduce hyper-cyclic wake scheduling, whose extended listening window removes phase blind spots, reducing energy by 73% versus always-awake discovery while limiting average latency growth to 80%.

ACP2026-0629-33

ATP-aware Constellation Sizing: How Many LEO Satellites Are Enough?

Chang Min¹, Hui Yang¹, Zhe Niu¹, Buzheng Wei², Qiuyan Yao¹, Yuxuan Yan¹, Jie Zhang¹

1. Beijing University of Posts and Telecommunications, China; 2. China Unicom Research Institute, China

We propose LACP, a constellation planning framework for satellite optical networks. Using DPSO to optimize Walker parameters, we identify an ATP-constrained critical scale and derive optimal constellations that enhance QoS satisfaction.

ACP2026-0630-121

End-to-End Scheduling for Maritime IoT over Spaceborne Non-Terrestrial Networks with Time-Sensitive Networking

Zhixiang Shi¹, Hongxing Li¹, Lei Yao², Pengfei Wang², Yiping Ren², Wen Ying², Guochu Shou²

1. Beijing University of Posts and Telecommunications, China; 2. China Star Network Digital Technology Co, China

We propose a PPO-based TSN joint scheduling scheme for LEO spaceborne optical networks, coordinating space-ground links and priority queues to enhance deterministic multimodal maritime IoT transmission, latency, schedulability, and reliability.

ACP2026-0701-121

Demand-Aware Deployment Ordering for Partially Deployed Laser Inter-Satellite Networks

Xingyao Liu¹, Chen Lin¹, Tao Li¹, Wenhui Fan^{1,2}, Xin Liu^{1,2}, Yifan Zhu^{2,3}

1. The 29th Research Institute of China Electronic Technology Group Corporation, China; 2. Aerospace Products Department The 29th Research Institute of China Electronics Technology Group, China

This paper optimizes the staged deployment ordering for LEO megaconstellations. Evaluations on two representative constellations reveal that our strategy improves early-stage coverage by a factor of 5-7 while maintaining low latency. Strong robustness is verified.

ACP2026-0701-168

Demonstration of Flexible Timeslot Switching Architecture for Spaceborne Optical Networks**Zihan Qiu¹, Changsheng Yang¹, Xiangyu Ge¹, Bitao Pan¹, Yu Zhou¹, Xuwei Xue^{1,2*}, Bingli Guo^{1,2*}, Shanguo Huang^{1*}***1. Beijing University of Posts and Telecommunications, China*

We propose a flexible time-slot switching optical-electrical hybrid architecture for multi-service spaceborne optical networks and experimentally demonstrates its feasibility on an engineering prototype of a spaceborne switching payload.

ACP2026-0701-235

A Unified Interpretable Semantic Framework for Multi-Modal Fiber Sensing Under Data Scarcity**Khoulood Abdelli^{*}***1. Nokia Bell Labs, Germany*

We propose a unified semantic framework for multi-modal fiber sensing that transforms heterogeneous measurements into shared physics-grounded descriptors. Retrieval-assisted reasoning enables interpretable and data-efficient inference without retraining, achieving robust performance different sensing modalities.

ACP2026-0714-15

High-Performance Golay-Coded Correlation OTDR for Dual-Port ONU Monitoring and Protection in Smart Grid EPONs**Zihao Fu^{1,2*}, Peizhe Xin^{1,2}, Zhibo Xu^{1,2}, Zhiyi Chen^{1,2}, Yue Wu^{1,2}, Zhaojun Xu¹***1. State Grid Economic and Technological Research Institute Co., Ltd, China; 2. Beijing Key Laboratory of Low-Carbon and Flexible Urban Power Supply Technology and Equipment, China*

We propose a complementary Golay-coded C-OTDR for smart grid EPON monitoring. Eliminating algorithmic sidelobes, it achieves 0.6 m resolution and -25dBm sensitivity over 20-km, ensuring precise fault localization and seamless dual-port ONU protection switching.

ACP2026-0715-122

Backup Ground Station Preselection based on Rainfall Morphology in Optical Satellite Networks**Linhao Zhang¹, Yongli Zhao^{1*}, Wei Wang¹, Shiyu Yang¹, Zijian Cui¹, Jie Zhang¹***1. Beijing University of Posts and Telecommunications, China*

Organized precipitation can cause correlated outages of multiple ground stations. We propose a backup ground station preselection based on rainfall morphology to extract morphology-dependent strong core propagation patterns and select safer backup stations in advance.

ACP2026-0715-177

Handover-Aware Alarm Management for Dynamic LEO Network Services**Zhenyi Li¹, Xiaodan Yan^{1*}, Yongli Zhao¹, Jian Yang¹***1. Beijing University of Posts and Telecommunications, China*

Low Earth orbit access transitions can trigger nuisance service alarms. We propose a calibrated residual Handover Normality Score, yielding a 1.58 percent false-alarm rate and full recall at the primary evaluated attack strengths.

ACP2026-0715-49

Wavelength-Dependent Loss-Aware Protection Switching Threshold Design for Reliable C+L-Band Data-Center Interconnects**Xiaoyun Li^{1,2}, Xin Li^{1,2}, Wei Wang^{1,2}, Yongli Zhao^{1,2*}, Jie Zhang¹***1. Beijing University of Posts and Telecommunications, China; 2. Beijing University of Posts and Telecommunications Shenzhen Institute, China*

Fiber bending induces wavelength-dependent loss (WDL) in C+L-band systems, causing QoT violations before conventional optical multiplex section protection switching. A WDL-aware threshold design eliminates unsafe switching and achieves 100% protection safety for reliable data-center interconnects.

ACP2026-0715-97

Traffic-Aware Dynamic Scheduling for High-Concurrency Geo-Distributed Inference over IP-over-WDM Networks**Yujie Han¹, Yang Wen², Xin Li¹, Tong Lin², Xiaofang Gao², Zhidong Wu², Yongli Zhao¹***1. Beijing University of Posts and Telecommunications, China; 2. State Grid Information & Telecommunication Center, China*

In high-concurrency geo-distributed inference, stage placement and ready-stage ordering shape inter-stage traffic. TDIS dynamically incorporates expected grooming gain from current traffic and active-lightpath states to balance computation and communication overheads while improving active lightpath reuse.

ACP2026-0720-1

Multipath Scheduling for Geo-Distributed MoA in Computing Power Optical Transport Networks**Xiao Lin^{1*}, Haoyuan Zheng¹, Zuqi Teng¹, Ziang Feng¹, Weiling Lu¹, Enguo Chen^{1*}***1. Fuzhou University, China*

To resolve OTN bandwidth bottlenecks in geo-distributed MoA inference, we propose a SnCnF scheme. To manage scheduling complexity, our CNT-MSc method fuses neural topology pruning with exact optimization, significantly reducing computational overhead.

ACP2026-0729-3

A joint task offloading and resource allocation algorithm for MEC systems interconnected by metro optical networks
Jing Zhao¹, Yi Huang², Yuanmou Chen¹*1. China Telecom Research Institute, China; 2. Beijing University of Posts and Telecommunications, China*

Aiming at the joint optimization problem of task offloading and resource allocation in multi-server mobile edge computing (MEC) network, a solution based on a mixed integer nonlinear program (MINLP) and a novel heuristic algorithm are proposed, which can achieve low latency and higher system benefits.

N2: Photonics for Data Center and Computing Systems

ACP2026-0506-2

LCOS-WSS-Based Optical Multicast for Collective Communication in AI Computing Center
Yixuan Wu¹, Fu Wang¹, Qi Zhang¹, Haipeng Yao², Sitong Zhou¹, Xiangjun Xin³, Shiyu Mo¹*1. School of Electronic Engineering, Beijing University of Posts and Telecommunications, China; 2. School of Information and Communication Engineering, Beijing University of Posts and Telecommunications, China; 3. School of Information and Electronics Beijing Institute of Technology, China*

This paper investigates LCOS-WSS-based collective communication for AI computing centers. Experimental results show multi-cast-enabled LCOS-WSS supports high-bandwidth, low-latency communication, while a hybrid phase-generation algorithm significantly reduces RMSE and inter-port crosstalk compared with conventional methods.

ACP2026-0604-3

Construction and Performance Analysis of Peripheral Component Interconnect Express 6.0 High-Speed Transmission System
Yue Geng¹, Xuhui Liu¹, ChunZhang Chen¹, Liang Wang¹, Quan Pan², Hanming Wu¹*1. Peng Cheng Laboratory, China; 2. Southern University of Science and Technology, China*

High bandwidth and low-latency demands drive interconnect upgrades. This work builds a 64 GT/s per-lane × 16 PCIe 6.0 transmission system achieving up to 100% link utilization, with power-consumption characterization for next-gen data-center interconnection research.

ACP2026-0607-1

A Digital-Optical Co-Design Training Strategy for Robust Photonic Neural Networks
Jiayuan Guo¹, Wenjia Zhang¹, Zhimo Zhu¹, Zuyuan He¹*1. Shanghai Jiao Tong University, China*

We propose a digital-analog co-design framework incorporating various noise aware progressive 4-bit quantization training approaches to improve computation accuracy of photonic convolutional neural networks with Lightelligence PACE2 simulators.

ACP2026-0618-3

A Multi-Subcarrier-Based Optical Label Rewriting Scheme For AI Data Centers
Zexu Lu¹, Fu Wang¹, Wenkui Guo¹, Deping Lin², Qi Zhang¹, Ce Shi², Xiangjun Xin¹*1. Beijing University of Posts and Telecommunications, China; 2. Beijing Institute of Aerospace Microsystems and Information Technology, China*

We demonstrate a multi-subcarrier optical label rewriting scheme for OCS-based AI data centers, enabling payload-continuous OAM information updating. Experiments verify FFT-based label recovery, low BER impact, and reduced cost and insertion loss than conventional schemes.

ACP2026-0628-1

A Residual-Driven Hierarchical Hybrid Readout for VCSEL-Based Photonic Reservoir Computing
Ling Zheng^{1,2}, Sichen Wen¹, Siyu Chen¹, Xingxing Guo², Yahui Zhang², Shuiying Xiang²*1. Xi'an University of Posts and Telecommunications, China; 2. Xidian University, China*

Reservoir computing has attracted considerable interest for complex temporal signal processing because of its training efficiency and low hardware overhead. However, traditional optical RC architectures that rely on linear readouts often fail to fully capture the high-order nonlinear features embedded in the physical reservoir, leading to limited accuracy when handling challenging signals such as laser-generated chaotic sequences. To overcome this limitation, we propose a novel residual-driven hierarchical hybrid readout based on a spin-polarized vertical-cavity surface-emitting laser. The core innovation is a "refined fitting and robust correction" mechanism: the first stage employs a random forest model, leveraging its strong nonlinear decision-making ability to learn complex evolutionary patterns directly from the high-dimensional reservoir states; the second stage applies a ridge regression to perform global smoothing and bias correction on the structured residuals from the first-stage prediction. To mitigate overfitting caused by the high multicollinearity of reservoir states, a dedicated optimization strategy combining feature subsampling for the random forest. Experimental results demonstrate that the proposed "RF + Ridge" hierarchical hybrid architecture achieves state-of-the-art performance across both benchmark scientific tasks and practical engineering scenarios.

ACP2026-0628-2

Feature-Adaptive Modulation Enhanced Time-Delay Reservoir Computing for Network Traffic Prediction**Ling Zheng^{1,2}, Song Wu¹, Siyu Chen¹, Xingxing Guo², Yahui Zhang², Shuiying Xiang^{2*}***1.Xi'an University of Posts and Telecommunications, China; 2.Xidian University, China*

To address the constraint in existing VCSEL based TD-RC mask designs, where injection amplitudes of multidimensional input features are independent of frequency domain information content, limiting prediction accuracy, a feature-adaptive modulation for TD-RC (FAM-TD-RC) was proposed. Spectral entropy was introduced into mask design as an unsupervised feature importance metric to adaptively calculate differentiated injection amplitudes, whereby features rich in frequency-domain information induced stronger phase modulation, while features with limited frequency-domain information were proportionally suppressed. The performance of FAM-TD-RC was validated using two-level, six-level, and random masks on two datasets from different institutions in CESNET-TimeSeries24 real backbone traffic, and the effects of model parameters on prediction performance were investigated. Compared with TD-RC, the MAPE of FAM-TD-RC for the two datasets decreased by 25%–45% and 34%–56%, respectively, offering an efficient photonic computing solution for multi-feature traffic prediction.

ACP2026-0630-73

A Reconfigurable Photonic Processor Descrambling Multicore Fiber SDM with Flexible Optical Routing**Xueyi Jiang^{1,2}, Ying Zhu^{1,2,3}, Yifan Liu¹, Xinyu Yang¹, Yuhang Gong⁴, Chao Yang⁴, Shuang Zheng⁵, Hongguang Zhang¹, Daigao Chen¹, Xi Xiao^{1,3*}***1.National Optoelectronics Innovation Center, China; 2.Optics valley laboratory, China; 3.Peng Cheng Laboratory, China; 4.State Key Laboratory of Optical Communication Technologies and Networks China Information and Communication Technologies Group Corporation, China; 5.Huazhong University of Science and Technology, China*

We demonstrate a photonic processor for MCF interconnects, enabling joint MIMO channel descrambling and reconfigurable spatial routing. It achieves 13dB BER suppression, and 4×4 programmable connectivity for ultra-low-energy and low-latency AI clusters.

ACP2026-0630-89

Robust optical adder based on spatial-encoded diffractive deep neural networks**Xiaoxiao Ma^{1,2,3}, Junjie Chen^{1,2,3}, Kangrui Wang^{1,2,3}, Jinfeng Liu^{1,2,3}, Zhenyu Wan^{1,2,3}, Jian Wang^{1,2,3*}***1.Huazhong University of Science and Technology, China; 2.Hubei Optical Fundamental Research Center, China; 3.Optics Valley Laboratory, China*

We propose and demonstrate a diffractive optical adder based on spatial feature encoding, realizing all-optical addition. We verify its computational performance and stability under complex environments such as random phase distortion through simulation and experiments.

ACP2026-0630-99

Nanosecond-Scale Crystal-Switch-Based 100 Gb/s Fast Optical Switching for Data Center Networks**Qin Bai^{1,2}, Xiongxin Fu¹, Chunlai Cui², Xing Fu², Zichen Liu², Fulong Yan^{1,2}***1.Beijing University of Posts and Telecommunications, China; 2.Pengcheng Laboratory, China*

We propose a 100 Gb/s fast optical switching system using nanosecond-response crystal optical switches, which enables nanosecond-level coordinated control and achieves a link recovery time of less than 3 μ s.

ACP2026-0701-189

A Flow Continuity-Aware Dynamic Scheduling Mechanism for Optical Switching Networks**Qingna Shi¹, Shan Yin¹, Haocheng Feng¹, Zixin He¹, Mengru Cai¹, Xiaodong Liu¹, Yian Li¹, Shanguo Huang¹***1.Beijing University of Posts and Telecommunications, China*

We propose an intelligent optical switching scheduling mechanism based on Group Relative Policy Optimization, which achieves 88.35% throughput and maintains 73.35% flow continuity under full traffic load, substantially outperforming traditional algorithms.

ACP2026-0714-24

Beyond Mattis Decompositions: Direct Optical Hamiltonian Learning for Programmable Spatial Photonic Ising Machines**Maryam Dehbashizadeh Chehreghan¹, Ripalta Stabile¹***1.TUE, Netherlands*

We propose optical Hamiltonian learning for spatial photonic Ising machines. Rather than using Mattis decompositions, the system learns energy landscapes from spin configurations. On simulated 64-spin MaxCut, it preserves low-energy states and provides gradients that drive true-energy descent.

ACP2026-0714-27

FLOPS-DCN: A Fault-Aware Scalable Optical Packet Switching Architecture for Large-Scale Data Center Networks**Wenkui Guo¹, Fu Wang¹, Qi Zhang¹, Feng Tian¹, Qinghua Tian¹, Xiangjun Xin²***1.Beijing University of Posts and Telecommunications, China; 2.Beijing Institute of Technology, China*

This paper proposes FLOPS-DCN, a scalable optical packet switching architecture for large-scale data center optical interconnection. By introducing micro-amplitude pilot tone optical labels, the proposed architecture enables real-time link-state monitoring and rapid fault-aware control.

N3: Optical Network Architectures, Control and Management

ACP2026-0620-1

A Beam-Splitting-Assisted Hot-Standby Link Switching Method for LCOS-Based Wavelength Selective SwitchesShiyu Mo¹, Fu Wang¹, Deping Lin², Qi Zhang¹, Ce Shi², Xiangjun Xin³

1.Beijing University of Posts and Telecommunications, China; 2.Beijing Institute of Aerospace Microsystems and Information Technology, China; 3.Beijing Institute of Technology, China

This paper presents a hybrid GS-ACO phase-hologram optimization method for LCOS-based wavelength selective switches, enabling programmable beam splitting for hot-standby link switching while effectively reducing output-intensity RMSE or port crosstalk under different weighted optimization objectives.

ACP2026-0629-20

Autonomous High Reliable Service Planning and Provisioning in Elastic Optical Network Based on Multi-Agent CollaborationHaibin Huang¹, Yang Zhao¹, Mingqing Zuo¹, Dechao Zhang¹, Jin Wang², Yongsheng Xu², Yvan Pointurier³, Reda Ayassi³, Han Li¹, Dong Wang¹

1.Department of Fundamental Network Technology, China Mobile Research Institute, China; 2.Optical Product Line, Huawei Technologies Co., Ltd., China; 3.Huawei Technologies France, France

We propose a multi-agent collaborative mechanism for autonomous service provisioning in EON. Experimental results demonstrate that the multi-agent-based controller enables autonomous tool invocation and efficient service configuration for high-reliability services in complex scenarios within 4 minutes.

ACP2026-0629-34

FF-OTS: Fine-grained Fast Optical Timeslot Switching for Accelerating Mixture-of-Experts Training in LLMYun Teng¹, Hui Yang¹, Qiuyan Yao¹, Zhihao Wu¹, Zhao Li¹, Jie Zhang¹

1.Beijing University of Posts and Telecommunications, China

We present FF-OTS, a fine-grained fast optical timeslot switching control plane for accelerating Mixture-of-Experts training. FF-OTS combines dynamic packet-to-timeslot mapping with precise synchronization, achieving 711.14 ns switching latency and a bit error rate below 8.97×10^{-9} .

ACP2026-0630-46

Temporal-Aware Protection Selection and Capacity Planning for SLA-Differentiated Optical Transport NetworksXinyi Zhou^{1,2}, Kai Lv^{1,2}, Xiaotian Jiang^{1,2}, Qian Zhang^{1,2}, Yueqiu Mu^{1,2}, Anxu Zhang^{1,2}

1.China Telecom Research Institute, China; 2.State Key Laboratory of Optical Fiber and Cable Manufacture Technology, China

TF-GAT enables availability-driven protection and capacity planning in SLA-differentiated optical transport networks by combining time-mean link states, transition-count fingerprints, and sparse graph attention, achieving 94.7% strategy accuracy and eightfold lower latency in extensive backbone simulations.

ACP2026-0701-14

Spatio-Temporal Wireless-Optical Planning for Multi-UAV NetworksJialong Li¹, Binglei Wang¹, Huiru Ao¹, Fan Yang¹, Zhenjie Zhou¹, Zhonghua Peng¹, Heng Xu¹

1.Shenzhen University of Advanced Technology, China

We propose STWO, a spatio-temporal wireless-optical planner for multi-UAV networks. It jointly considers flight distance, wireless quality, and backhaul load, reducing optical congestion while maintaining reliable communication in dense urban low-altitude environments.

ACP2026-0701-17

ACCO: Adaptive Communication-Computing Co-Optimization Expert-Routing Algorithm for Mixture of Expert (MoE) Inference in Data CentersJinxiang Lin¹, Gangxiang Shen¹

1.Soochow University, China

We propose an adaptive communication-computing co-optimization (ACCO) expert-routing algorithm for Mixture of Experts (MoE) inference, which jointly optimizes gating preferences, available bandwidth, and expert load in datacenter networks. Simulation results demonstrate that ACCO achieves lower inference completion time and tail latency while maintaining high routing consistency compared with conventional Top-K routing across various data center network topologies.

ACP2026-0701-190

GNN Enabled Communicative MARL for Joint Computing and Network Scheduling in Intelligent Computing Optical NetworksZongxun He¹, Xiaodong Liu¹, Mengru Cai¹, Yian Li¹, Yuchen Liu¹, Shan Yin¹

1.Beijing University of Posts and Telecommunications, China

This paper proposes a GNN enabled communicative hierarchical multi-agent reinforcement learning algorithm, namely GCH-MARL, for joint scheduling in intelligent computing optical networks. By integrating GNN based state encoding, multi-agent communication, and hierarchical decision-making, GCH-MARL jointly schedules computing and network resources, thereby improving the service success rate and reducing latency under concurrent delay-constrained requests.

ACP2026-0701-198

CausalKG-ReAct: Temporal Causal Graph Attention with Interactive Reasoning for DWDM Optical Network Fault Diagnosis
Peng Zhang¹, Hui Li¹, Xinyang Li², Rentao Gu²*1. Beijing University of Posts and Telecommunications (BUPT), China; 2. State Key Laboratory of Information Photonics and Optical Communications Beijing University of Posts and Telecommunications (BUPT), China*

We present CausalKG-ReAct, a framework for DWDM optical network fault diagnosis that integrates a causally verified knowledge graph with a ReAct agent for interactive, auditable reasoning. Evaluated on fault events collected from real DWDM networks, CausalKG-ReAct achieves 92.1% fault-type and 90.3% device-level localization accuracy under stratified 5-fold cross-validation, surpassing GraphRAG by 3.8 and 9.9 percentage points respectively with statistical significance ($p < 0.001$, McNemar).

ACP2026-0701-87

Reliable QoT Estimation for Imbalanced Data from Deployed Optical Networks Using MDN-ResKAN**Shaowen Xiang¹, Qizhi Qiu¹, Yihao Zhang¹, Siyuan Wu¹, Ruidong Liu¹, Weisheng Hu¹, Qunbi Zhuge¹***1. State Key Laboratory of Photonics and Communications, School of Information Science and Electronic Engineering, Shanghai Jiao Tong University, China*

This paper proposes MDN-ResKAN to model Q-factor distributions for reliable QoT estimation under imbalanced deployed-network data. It reduces nominal RMSE by 32.5% and achieves 97% anomaly recall on a field-deployed WDM testbed.

ACP2026-0702-2

Joint Data-Key Path Provisioning for Physical-Layer Encryption in Optical Networks**Tianhe Liu¹, Wei Wang¹, Yajie Li¹, Yongli Zhao¹, Jie Zhang¹***1. Beijing Univ. of Posts & Telecom., China*

We study joint DP-RP provisioning for physical-layer-encrypted services and design the SF and CF schemes. Simulations show SF has zero exposure but 22.87% blocking, while CF cuts blocking to 4.82%, exposure near 29.

ACP2026-0714-8

Connectedness-Aware Routing in Optical Satellite Networks with Hybrid 10/100 Gbps Laser ISLs**Lihan Zhao¹, Yongli Zhao¹, Wei Wang¹, Yansong Fu¹, Zijian Cui¹, Jie Zhang¹***1. Beijing University of Posts and Telecommunications, China*

With the development of transmission technology in optical satellite networks (OSNs), future OSNs are expected to enter a stage featuring the coexistence of 10 and 100 Gbps laser inter-satellite links (LISLs). This paper proposes a connectedness-aware routing algorithm (CARA) in hybrid 10/100 Gbps OSNs. The proposed algorithm reduces excessive occupation of scarce 10 Gbps LISLs and enhances the connectedness of OSNs by selecting the one with the minimum 10 Gbps LISL consumption cost among candidate paths. Simulation results show that the proposed algorithm reduces blocking probability by 19.36% and average latency by 5.47% compared with the Dijkstra algorithm and the maximum bandwidth routing (MBR) algorithm, respectively.

ACP2026-0715-102

HOPP: Heterogeneous-GPU Pipeline Partitioning for Distributed LLM Inference over Datacenter Optical Transport Networks**Xingde Li¹, Jiawei Zhang¹, Jun Dai¹, Chengyuan Zhang¹, Xiaorun Wang¹, Jun Luo², Zhicheng Ye², Hongchen Yu², Xin Liu², Yang Yu², Zhiqun Gu¹, Yuefeng Ji¹***1. Beijing University of Posts and Telecommunication, China; 2. Huawei Technologies Co., Ltd., China*

HOPP integrates DC-OTN transmission characteristics, heterogeneous GPU computation properties, and microbatch-based pipeline execution into candidate partition evaluation, enabling exposed communication time and pipeline idle time to be estimated under different Transformer-block partitions.

ACP2026-0715-137

Explicit Modeling of Multiple Optical Components for Highly Generalizable QoT Prediction**Shaopeng Li^{1,2}, Zhiqun Gu^{1,2*}, Xin Qin^{3,4}, Wei Chen^{1,2}, Jiahui Xu^{1,2*}, Yuefeng Ji^{1,2*}, Meng Chen^{5,6}, Huidi Peng^{5,6}***1. State Key Lab of Information Photonics and Optical Communications., China; 2. Beijing University of Posts and Telecommunications., China; 3. State Key Laboratory of Optical Fiber and Cable Manufacture Technology., China; 4. China Telecom Research Institute., China; 5. China Telecom Co. Ltd., China; 6. Research Institute China Telecom Intelligent Network Technology Co. Ltd., China*

We propose MDLS-QoT, which explicitly models multi-component optical-link structures for generalized QoT prediction across optical-link scenarios. Experiments show that, with 10-shot residual adaptation, average MAEs for power and OSNR decrease to 0.235 and 0.222 dB

ACP2026-0715-147

AdaSync: An Adaptive Disturbance-Resilient Time-Frequency Synchronization Mechanism for All-Optical Metropolitan Spine-Leaf Networks**Xiaobo Du^{1,2}, Yuanhang Shi^{1,2}, Yunan Chen^{1,2}, Jie Sheng^{1,2}, Jiawei Zhang^{1,2*}***1.State Key Lab of Information Photonics and Optical Communications, China; 2.Beijing University of Posts and Telecommunications, China*

We propose AdaSync, an adaptive disturbance-resilient time-frequency synchronization scheme for all-optical Metropolitan Spine-Leaf Networks (MSLN). To counter complex link disturbances, AdaSync dynamically updates Kalman filter parameters within a three-state model. It employs a digitally controlled oscillator (DCO) for continuous joint servo control to eliminate discrete synchronization jitter, and introduces concurrent information broadcasting at leaf nodes. Experimental results show that AdaSync achieves sub-6 ns inter-gateway accuracy, a 64% stability improvement, and a 15.4% latency reduction, validating its high precision, efficiency, and scalability for next-generation optical networks.

ACP2026-0715-183

Selective Network Equipment Upgrading and Carbon-efficient Traffic Grooming in Optical Networks**Yanran Xiao¹, Wei Wang¹, Kexin Gao¹, Yibo Wang¹, Hece Han², Yajie Li¹, Yongli Zhao¹, Jie Zhang^{1*}***1.Beijing University of Posts and Telecommunications, China; 2.Beijing Information Science and Technology University, China*

We propose TCU-CAG, a traffic-aware equipment-upgrade and carbon-aware grooming framework for distributed AI networks. On a 52-site topology, it reduces carbon emissions by 22.6%-27.8% with acceptable blocking.

ACP2026-0715-198

DAFSync: Delay-Aware Feedback Scheduling for Precise Time Synchronization in All-Optical Metro Spine-Leaf Networks**Yuanhang Shi^{1,2}, Jiawei Zhang^{1,2*}, Huitao Zhou^{1,2}, Zhiquan Gu^{1,2}, Bojun Zhang^{1,2}, Yuefeng Ji^{1,2*}***1.Beijing University of Posts and Telecommunications, China; 2.State Key Lab of Information Photonics and Optical Communications, China*

We propose DAFSync, a delay-aware feedback scheduling scheme for precise time synchronization in all-optical metro spine-leaf networks. DAFSync combines leaf-side link delay compensation (LDC), feedback scheduling unit (FSU) construction, and gateway-side release scheduling. The schedule arranges group-level feedback in consecutive leaf reception slots, while each gateway retains its individual timestamps for four-timestamp clock-offset estimation. In the field-programmable gate array (FPGA) comparison, jointly enabling FSU aggregation and the assigned waiting times yields a residual-offset mean absolute error (MAE) of 5.62 ns, compared with 7.90 ns when both are disabled. In the evaluated 48-gateway simulation, the MAE is 4.36 ns for DAFSync and 6.46 ns for the reimplemented FASync baseline.

ACP2026-0716-1

Velocity-based Laser Linking in LEO Constellations with Non-uniform Altitude Orbital Planes**Junhao Hu¹, Yongli Zhao^{1*}, Yi An¹, Wei Wang¹, Minghui Sun¹, Jie Zhang¹***1.Beijing University of Posts and Telecommunications, China*

Partial deorbiting creates HIGH and LOW layers with different orbital velocities, causing frequent cross-layer reconfiguration. LASB selects persistent bridges using predicted LOS angular rate, reducing reconfigurations by 60.4-84.8% while keeping throughput and blocking differences small.

ACP2026-0720-2

Load Forecasting and Collaborative Scheduling for Token and KV-cache Flows in Elastic Optical IoA**Xiao Lin¹, Zuqi Teng¹, Haoyuan Zheng¹, Ziang Feng¹, Weiling Lu¹, Enguo Chen^{1*}***1.Fuzhou University, China*

Resource contention between latency-critical token and bandwidth-intensive KV-cache flows, exacerbated by dynamic traffic tides and bursts, challenges the Elastic Optical Internet of Agents. We propose a dual-timescale load forecasting and collaborative scheduling scheme. Macroscopically, an attention-based forecaster and recurrent reinforcement learning (RL) solver establish proactive capacity boundaries. Microscopically, a graph-aware RL scheduler executes fine-grained per-flow dispatching. Supported by a fault-tolerance safety net of token preemption and source-side VRAM residency, simulations confirm this closed-loop architecture seamlessly absorbs prediction deviations, maximizing resilience and system utility.

ACP2026-0727-1

Joint Optical-Computing Orchestration Based on Cross-Domain Cost-Efficiency for LLM Training**Zheng Han¹, Wei Wang¹, Yibo Wang¹, Yanlei Zheng², Yanxia Tan², Yongli Zhao¹, Jie Zhang¹***1.Beijing University of Posts and Telecommunications, China; 2.China Unicom & Network Technology Research Institute, China*

FC-CEM jointly selects DCs and wavelengths for cross-DC LLM training, trading compute gains, latency, and optical cost. NSFNET tests show lower blocking and wavelength-hop use than prior schemes across diverse traffic loads in all cases.

N4: Optical Access and Last-Mile Networks

ACP2026-0630-56

Intelligent Interconnection Bus for Optical Access Networks: Enabling Edge-Device Computing Collaboration**Tian Tang¹, Ming Jiang¹, Ziyao Yang¹, Ddezhi Zhang²***1. Research Institute of China Telecom Corporation Limited, China; 2. China Telecom Corp Ltd, Beijing Res Inst, China*

OAN lacks integrating and controlling computing-power. This paper proposes an intelligent interconnection bus to unify network and computing-power, enabling edge-device computing collaboration. Experiments validate improved inference efficiency, computing resource scheduling stability, multi-node collaborations, deterministic guarantees.

ACP2026-0630-75

Two-Timescale Reinforcement-Inspired Dynamic Bandwidth Allocation for Coordinated-Time Services in Higher-Speed PONs**Xiao Zhang¹, Qinghua Tian¹, Yongjun Wang¹, Fu Wang¹, Feng Tian¹, Xiangjun Xin²***1. Beijing University of Posts and Telecommunications, China; 2. Beijing Institute of Technology, China*

This paper proposes a two-timescale reinforcement-inspired dynamic bandwidth allocation (TRI-DBA) algorithm for coordinated-time services in higher-speed PONs. At an offered load of 0.9, TRI-DBA improves the CT satisfaction ratio by 150.5% over fixed-parameter queue-level DBA.

ACP2026-0701-79

Research and Verification of PON Deterministic Transmission Technology for Industrial Long Distance Closed-Loop Control**Yi Weng¹***1. China Telecom, China*

PON meets remote industrial closed-loop control needs. We model, optimize latency scheduling, achieving closed-loop control over 20km fiber.

ACP2026-0707-2

Real-Time User Traffic Detection for Energy-Saving Control in Fiber-to-the-Room Networks**Jinhan Cai¹, Shun Zhao¹, Houfei Xiao², Xiaolong Zhang², Xiang Wang², Gangxiang Shen¹***1. Soochow University, China; 2. Huawei Technologies Co., Ltd., China*

We propose a real-time user traffic detection method for Fiber-to-the-Room (FTTR) energy saving. By analyzing Wi-Fi medium access control (MAC)-layer metadata, the main fiber unit (MFU) detects user traffic and dynamically controls device power states. Experiments on a commercial prototype demonstrate 93.9% detection accuracy with 108-ms latency, achieving 26.4% energy savings.

ACP2026-0713-11

Experimental Demonstration of a Low-Jitter Industrial PON Using Slot-Oriented Deterministic Bandwidth Allocation and Time-Aware Shaping**Kyeong Hwan Doo¹, Kwang OK Kim¹, Hwan Seok Chung¹***1. Electronics and Telecommunications Research Institute, Korea*

We experimentally demonstrate upstream jitter compensation based on slot-oriented DBA and TAS to achieve sub-microsecond jitter for industrial PON systems. Upstream jitter of less than 1 μ s was achieved for four periodic industrial flows using a 50G/25G PON prototype.

ACP2026-0715-193

Two-Stage LSTM-BiGRU for Attack Detection and Localization in Passive Optical Networks**Hussain Shah Syed Bukhari¹, Jie Zhang¹, Wei Wang¹, Yajie Li¹, Shahbaz Khan¹, Asif Ali Wagan¹***1. Beijing University of Post and Telecommunications, China*

Passive optical networks (PONs) carry high-speed traffic for residential, enterprise, and industrial users, and their shared branching topology leaves them open to physical-layer attacks: fiber eavesdropping, bending, and cutting. An operator watching a live PON often cannot tell whether a trace anomaly is a routine fault or an attack, nor which branch it sits on, using only the OLT power and SNR readings. This paper builds a four-branch PON topology from a public OTDR dataset and tests a two-stage LSTM-BiGRU pipeline against that problem. Detection and localization train as separate models, each with its own loss, so the two tasks do not compete over shared gradients. The LSTM detects an attack at 97.25% accuracy on held-out data. The BiGRU then classifies the attack type at 97.14% accuracy and maps it to an ONU branch, with a mean distance error of 37.8 m. Both models beat four classical baselines, with the BiGRU leading on localization by 2.48 points

ACP2026-0715-205

Real-Time FPGA Implementation of Frequency-Domain I/Q Skew Compensation and Timing Recovery for Coherent PON Downstream Reception**Renle Zheng¹, Yi Wei², An Yan¹, Penghao Luo¹, Yongzhu Hu¹, Xuyu Deng¹, Junhao Zhao¹, Nan Chi¹, Junwen Zhang¹***1. Fudan University, China; 2. Shanghai Aerospace Electronic Technology Institute, China*

We propose a frequency-domain I/Q skew-compensation and 1.125-sps timing-recovery scheme, implement it in real time on an FPGA, and experimentally validate it for 100G coherent PON downstream reception, achieving a receiver sensitivity of -37 dBm at a BER of 2×10^{-2} after 40-km SSMF transmission.

Poster Session-T-Track

Content

T1: Short-Reach Transmission Systems for Data-Center, Access, and Mobile Networks

ACP2026-0626-20

Chaos-Enhanced End-to-End Constellation Shaping for Secure OTFS Based Data Centers

Xinshuai Liang¹, Chongfu Zhang¹, Jiao Du¹, Yan Zheng¹, Yuchi Tian¹, Yue Lin¹

1. University of Electronic Science and Technology of China, China

We propose a chaos-assisted end-to-end secure orthogonal time frequency space (OTFS) scheme to enhance performance and security of optical data-center interconnects. Its effectiveness is verified through secure transmission over 10km standard single-mode fiber.

ACP2026-0629-1

Impacts of Component Bandwidth and Sampling Constraints on 1.6 Tbit/s 240 Gbaud Coherent Single-Carrier Transmission

Adrian A. Juarez¹, Yanjun Zhu², Xin Chen¹, Mingjun Li¹

1. Corning Incorporated, United States Minor Outlying Islands; 2. Infracore Inc., United States Minor Outlying Islands

Bandwidth-limited components and reduced ADC sampling are numerically studied for 1.6 Tbit/s single-carrier coherent transmission. Simulations show a receiver sensitivity near -19 dBm at 2×10^{-2} BER level with less than 1 dB penalty.

ACP2026-0630-14

225-Gbit/s IM/DD Mobile Fronthaul over 10-km SSMF Using Sub-Band Multiplexed Circular 8-QAM and 7-tap FFE

Shupeng Li¹, Chao Li¹, Yunhong Liu¹, Yuru Tang¹, Shen Li¹, Ji Wang¹, Zhongshuai Feng¹, Zhixue He¹

1. Pengcheng Laboratory, China

We demonstrate a 5-sub-band multiplexed IM/DD mobile fronthaul system using circular 8-QAM at 15 GBaud per sub-band, achieving 225 Gbit/s aggregate over 10-km Oband SSMF. All sub-bands achieve BER below the 7% HD-FEC threshold with only 7-tap linear FFE.

ACP2026-0630-5

LDPC-assisted BCJR equalization for Bandwidth-efficiency PAM4 Optical Interconnection

Shaonan Liu¹, Dong Ze¹, Ming Jun¹, Yujia Mu¹, Hailian He¹, Xuanwei Liu¹

1. Beijing Institute of Technology, China

We propose an LDPC-assisted decision-directed LMS and BCJR in a 200 Gb/s PAM4 system. By employing feedback loops to optimize the iterative decoding-equalization process, which achieves over 3 dB receiver sensitivity improvement compared with conventional methods.

ACP2026-0630-66

Record 200-Gbps PAM6 Transmission over 200-m MMF Enabled by an 850-nm Single-Mode Multiaperture VCSEL

Chen Cheng^{1,2}

1. The Hong Kong Polytechnic University, Hong Kong, China; 2. Huazhong University of Science and Technology, China

We report record 200-Gbps PAM6 transmission over 200 m OM4 MMF using an 850-nm single-mode VCSEL, achieving two-fold reach improvement over state of the art, highlighting SM-VCSEL potential for high-speed extended-reach optical interconnect scaling applications.

ACP2026-0701-116

Optical Multipath Interference Mitigation in PAM-4 IM/DD System via Enhanced Decision Thresholding

Xinping Wang^{1,2,3}, H. N. Parajuli^{1,2}, Tonghui Ji^{1,2}, Ning Deng^{1,2*}, Jian Zhao⁴, Chunfu Wu⁵

1. School of Computing and Information Technology, Great Bay University, China; 2. Dongguan Key Laboratory for Intelligence and Information Technology, China; 3. Department of EEE, Southern University of Science and Technology, China; 4. School of Electronic and Information Engineering, South China University of Technology, China; 5. Luxshare-Tech, China

We propose an effective and low-complexity thresholding technique based on symbol-wise exponential averaging, which tracks and mitigates MPI-induced fluctuation in the received signal. Experiment in a 56 Gbit/s PAM-4 IM/DD system demonstrates enhanced performance.

ACP2026-0701-88

A Memory-Assimilation-Accommodation Semi-Supervised DNN Equalizer for 256 Gbps Data Center Interconnects

Zhang Luo¹, Zedi Zhang¹, Xi Xiao², Zheng Peng¹, Zhicheng Wang¹, Jiayue Wang¹, Zhenxing Sun¹, Mingche Lai^{1*}

1. National University of Defense Technology, China; 2. National Information Optoelectronics Innovation Center, China

We propose a memory-assimilation-accommodation semi-supervised DNN equalizer for 256 Gbps PAM4 data center interconnects, which reduces the labeled data requirement by 68.2% compared with the fully supervised approach.

ACP2026-0702-6

T-Spaced versus Oversampled Digital Transmitters: A Power-Budget Study for Unamplified Coherent Lite Links
Wing Chau Ng¹, Scott Yam², Can Zhao³, Bin Chen³*1. Carleton University, Canada; 2. Queen's University, Canada; 3. Hefei University of Technology, China*

We compare T-spaced and oversampled transmitters for coherent-lite systems, assuming 8 dB link loss and realistic RF losses with state-of-the-art TFLN modulators. Lower PAPR in T-spaced designs reduces modulation loss by up to 3.5 dB, improves received SNR, and enables reliable unamplified-link closure.

ACP2026-0714-37

Net 640-Gb/s Coherent Transmission over 3.2-km Double Nested Anti-resonant Nodeless Hollow-core Fibre without Compensation of Chromatic Dispersion and Polarization Mode Dispersion**Shouchuan Ma^{1,2}, Qibing Wang¹, Wei Ding³, Xu Zhang¹, Honglin Ji¹, Jingbin Feng¹, Xingfeng Li¹, Ming Jiang¹, Yeping Lai¹, Chao Li¹, Hui Chen¹, Ke Li¹, Lei Wang¹, Zhixue He¹***1. Pengcheng Laboratory, China; 2. Shenzhen International Graduate School, Tsinghua University, China; 3. College of Physics & Optoelectronic Engineering, Jinan University Guangzhou, China, China*

We demonstrate a hardware-efficient coherent transmission over a 3.2-km DNANF with an ultra-low CD of 1.125 ps/nm/km at 1550 nm. Compared with OB2B, the transmission penalty is negligible for both 64-Gbaud 16-QAM and 64-QAM signals.

ACP2026-0714-50

Low-Complexity Carrier Phase Recovery Using a BPS-Seeded DDPLL Bank for Framed Coherent 16QAM Transmission
Yifan Wang¹, Mingyang Guo¹, Pengfei He¹, Yanlu Huang¹, Liyan Wu¹, Yanni Ou¹, Kun Xu¹*1. Beijing University of Posts and Telecommunications, China*

A low-complexity BPS-seeded DDPLL-bank carrier phase recovery scheme is proposed for framed coherent 16QAM, achieving approximately 18% of BPS64 complexity with only 0.13-dB ROP penalty in 20-Gbaud, 20-km experiments.

ACP2026-0715-169

Latency-Optimized Transmission of Tokenized Video Over Parallel HCF-SMF Links**Jiwei Xie¹, Weiqi Lu¹, Mingyuan Wang¹, Haojie Zhu¹, Dayu Shi¹, Yuhao Fang¹, Puzhen Yuan¹, Yu Yan¹, William Shieh¹***1. Westlake University, China*

We demonstrate the first latency-optimized tokenized-video transmission over parallel HCF-SMF links. For the balanced profile, the initial-latent stream completes 2.45 μ s earlier; three 50-Gbaud PAM-4 profiles achieve 97.38%-98.36% correct token-ID rates and 28.50-32.57 dB PSNR.

ACP2026-0715-60

Demonstration of Optical Integrated Sensing, Communication, and Power Transfer System over Hollow-Core Fibers
Xiao Huang¹, Yuhan Gong¹, Pengfei Ma², Cheng Du², Ming Luo¹, Chao Yang¹*1. China Information and Communication Technologies Group Corporation, China; 2. Wuhan FiberHome International Technologies Co., Ltd, China*

An O-ISCPT system based on HCF was successfully demonstrated over the C-band. Experimental results reveal that the proposed architecture achieves higher bitrate transmission, superior sensing sensitivity and improved power transfer efficiency relative to SMF-based scheme.

ACP2026-0715-77

Baud-Rate Timing Error Detector Robust to Laser Phase Noise for Coherent-Lite Systems**Tianwai Bo¹, Shiqi Liu¹, Jun Dong¹, Zhongwei Tan¹, Yi Dong¹***1. Beijing Institute of Technology, China*

We propose a novel baud-rate clock recovery algorithm for coherent-lite optical interconnect. By exploiting the differential phases of adjacent symbols, it exhibits enhanced tolerance to laser phase noise.

ACP2026-0728-2

Power Scaling of Silicon-Photonic Links from Retimed Pluggables to Co-Packaged Optics for 51.2-Tb/s Datacenter Switches
Dayu Shi¹, Puzhen Yuan¹, Weiqi Lu¹, Haojie Zhu¹, Yuhao Fang¹, William Shieh¹*1. Westlake University, China*

We present an interface-aware energy model for 1.6-3.2-Tb/s silicon-photonic datacenter links. At 51.2 Tb/s, co-packaged optics lowers modeled communication power by 34.57% for IM/DD and 22.58% for coherent systems compared with conventional full-retimed pluggable implementations.

ACP2026-0729-2

Wafer-scale uniform SiN DWDM multiplexer based on Fabry-Perot cavity optical filters**Mingyu Zhu¹, Wei Han Wang¹, Dajian Liu¹, Zhang Yijing¹, Yaochen Shi¹, Daoxin Dai¹***1. Zhejiang University, China*

We demonstrate wafer-scale SiN DWDM multiplexers using cascaded high-order 1×2 FP cavities. The devices achieve flat-top spectra, low crosstalk and weak thermal drift, with excellent uniformity on 8-inch wafers for scalable optical interconnects.

T2: Optical Transmission Systems

ACP2026-0610-1

Verify the Impact of the Cutoff Wavelength of G.654.E Fiber on S-band Signal Transmission**Chuangye Wang¹, Shikui Shen¹, He Zhang¹, Yu Tang¹, Wei Sun², Gan Luo², Zelin Wang¹, Guangquan Wang¹, Xiongyan Tang¹***1.China Unicom Research Institute, China; 2.Jiangsu Alpha Optic-Electric Technology Co., Ltd., China*

The MPI penalty of the S+C+L band multiple splice points transmission system was tested using four sets of G.654.E fiber with different cutoff wavelengths, demonstrating that cutoff wavelength has no effect on S-band signals transmission

ACP2026-0616-1

100.8Tbit/s Real-Time Transmission Over 300km Based on a Seven-Core Erbium-Doped Fiber Amplifier**Yi Chen¹, Qingyu He¹, Hongguang Sun¹, Cheng Du², Chengpeng Fu³, Hanbing Li¹, Ming Luo¹, Wenhao Li², Shaokun Liu², Ying Qiu¹***1.State Key Laboratory of Optical Communication Technologies and Networks, China; 2.Ruiguang ICT Technology Co., LTD, China; 3.Accelink Technologies Co., Ltd, China*

We demonstrate a 100.8-Tbit/s optical transmission over a distance exceeding 300 km of multicore fiber using a recirculating configuration. The bit-error-rates of all 36 WDM channels remain below the FEC threshold.

ACP2026-0626-2

Study on Capacity Evaluation of Subsea Open Cable System**Bangtian Xu¹, Pengkui Chu², Yanpu Wang¹, Quanying Wen¹, Jiang Lin¹, Jianping Li¹***1.HMN Technologies Co., LTD, China; 2.China Telecom Global Limited, China*

In this paper, a method based on the Shannon's equation is proposed for evaluating the Potential capacity of subsea open cable system, and the accuracy of the method has been verified in various scenarios in the laboratory with an error of less than 3.3%

ACP2026-0629-5

Algorithm-Driven Design of Trench-Assisted Multi-Ring-Core Few-Mode Fiber for Weakly Coupled Mode-Division Multiplexing**Yingying Zhou^{1,2}, Junpeng Liang¹, Xiuquan Cui¹, Cancan Chen¹, Gao Ye¹, Jianwei Tang¹, Zhongliang Sun¹, Linsheng Fan¹, Lingguo Cao¹, Zhaopeng Xu¹, Zhixue He¹, Jinlong Wei¹***1.Pengcheng Laboratory, China; 2.South China University of Technology, China*

GA, PSO, and BO are numerically compared for 10-mode TAMRC-FMF design using a unified FEM framework. GA achieves the best single-run mode spacing, while PSO and BO show advantages in mean performance and stability, respectively.

ACP2026-0630-13

Nonlinear Phase Compensation for Coexistence of Multi-carrier Optical Transmission and Distributed Acoustic Sensing**Shutong Jiang¹, Zhiwei Liang¹, Yang Li¹, Jiwei Xu¹, Yi Lei¹, Xiang Li², Bin Chen¹***1.Hefei University of Technology, China; 2.China University of Geosciences, China*

Optical communication, distributed acoustic sensing, digital subcarrier multiplexing, phase compensation

ACP2026-0630-17

Enhancing Physical-Layer Security in Optical Fiber Communications via Joint Chaotic Encryption and Dual-Polarization 4D Modulation**Yuchen Zhang^{1,2}, Yi Lei², Chuanyu Du², Ming Luo³, Bin Chen^{2*}***1.Wuhan Research Institute of Posts and Telecommunications, China; 2.Hefei University of Technology, China; 3.China Information and Communication Technology Group Co., Ltd., China*

In this paper, a chaotic encryption scheme based on dynamic key generation from the instantaneously transmitted information is proposed by employing dual-polarization 4D modulation schemes. The impacts of four-dimensional and two-dimensional chaotic encryption on both security and transmission performance are analyzed, and the encryption performance under different modulation formats is systematically evaluated.

ACP2026-0630-36

Research on Nonlinear Coefficient of Highly Nonlinear Photonic Crystal Fibres at 1064 nm and in SCL Bands**Qiqiang Yang¹, Yaping Liu¹, Liyan Zhang¹, Jingxiong Yu¹, Hui Zhang¹, Lei Shen¹, Zhaolong Liao¹, Weiguang Wang¹, Zheng Feng¹, Zhuang Xiong¹, Lixin Gu¹, Tiejun Wang¹***1.State Key Laboratory of Optical Fibre and Cable Manufacture Technology Yangtze Optical Fibre and Cable Joint Stock Limited Company, China*

We propose a method to reduce the measurement error of nonlinear coefficients and test the nonlinear coefficients of highly nonlinear photonic crystal fibres at 1064 nm and in SCL bands for the first time.

ACP2026-0630-43

Cascaded Filtering Scheme for Power Enhancement in Power-over-Fiber Transmission Systems**Yao Guo¹, Tian Guo², Yang Zhao², Tong Zhai¹, Yuyao Wu¹, Zhiguo Zhang¹***1.Beijing University of Posts and Telecommunications, China; 2.State Grid Beijing Electric Power Company, China*

A cascaded filtering scheme is proposed for enhancing the power transmission capacity of power-over-fiber (PoF) systems. A 46-km PoF experimental link is constructed, achieving 2.45-fold and 2.25-fold increases in threshold power and maximum output power.

ACP2026-0630-45

Complex-Valued FFNO Based Equalization for Coherent Optical Communication Systems**Hong Yang¹, Anlin Yi¹, Lianshan Yan¹***1.Southwest Jiaotong University, China*

A nonlinear impairment equalization method based on a complex-valued factorized Fourier neural operator (CVFFNO) is proposed. The proposed method extends the real-valued FFNO to a complex-valued architecture and incorporates a phase-rotation module to improve the representation of nonlinear impairments. The proposed method is validated in a 2400-km, 28-Gbaud polarization-division-multiplexed 16-QAM (PDM-16QAM) simulated transmission system. Results show that, at the optimal launched power of 3 dBm, CVFFNO achieves performance comparable to digital back-propagation with 16 steps per span (DBP-16StPS), with only a 0.11-dB Q-factor gap, while reducing the execution time by 98.6%. Compared with DBP-10StPS with similar Q-factor performance, CVFFNO reduces the execution time by 98.0%. Furthermore, under comparable computational complexity, CVFFNO improves the Q factor by 1.15 dB over the real-valued FFNO, demonstrating its superior nonlinear equalization performance.

ACP2026-0630-59

Topology Modeling and Perturbation Propagation Analysis of Cross-Channel Gain Competition in WDM-EDFA Systems**Yiwei Zhao¹, Liqian Wang¹, Kunfeng Liu¹***1.Beijing University of Posts and Telecommunications, China*

A competition-topology model based on local gain responses is proposed for WDM-EDFA systems, enabling perturbation propagation prediction, critical wavelength identification, and operating-point-dependent competition structure characterization.

ACP2026-0630-62

Inversion-Guided Design of Dual-Stage Erbium-Doped Fiber Remote Gain Units for Pump-Limited Unrepeated Optical Transmission**Yiwei Zhao¹, Liqian Wang¹, Kunfeng Liu¹***1.Beijing University of Posts and Telecommunications, China*

An inversion-guided pump-bypass dual-stage EDF RGU is proposed for pump-limited unrepeated optical transmission. Combining Giles-based inversion analysis with cascaded OSNR evaluation identifies an optimal 10 m + 11 m configuration with an improved gain-noise tradeoff.

ACP2026-0630-69

Generalizable Wideband Fiber Channel Modelling using Physics-Guided Fourier-KAN Enhanced Neural Network**Zhen Xu¹, Hongcheng Wu¹, Yuji Wang¹, Ganggang Li¹, Faisal Khan¹***1.Tsinghua University, China*

We propose a physics-guided Kolmogorov-Arnold network for generalizable wideband fiber channel modelling. Validated on 13-channel 1200-km WDM systems, our model delivers superior waveform fidelity and maintains ESNR prediction error within 0.2 dB.

ACP2026-0701-136

An Efficient Bit-Loading-Assisted Continuous-Spectrum Nonlinear Frequency Division Multiplexing System with Optimized Subcarrier Bit Allocation**Na Wu¹, Xinkuo Yu^{1,2}, Chenglin Bai^{1,2}, Runyang Zhang¹, Hengying Xu^{1,2}, Yining Zhang^{1,2}, Shijie Hou¹, Shuzhan Liu¹, Yaozheng Yue¹***1.School of Physics Science and Information Engineering Liaocheng University, China; 2.Liaocheng Key Laboratory of Industrial-Internet Research and Application, China*

Conventional CS-NFDM systems face a GI trade-off: insufficient GI causes ISI and degrades edge subcarriers, whereas excessive GI reduces SE. We propose BLA-NFDM to adaptively allocate bits per subcarrier. Simulations show 0.94 dB Q-factor and 0.6 bit/s/Hz SE gains over 800 km.

ACP2026-0701-219

Time-Reference-Assisted LSTM Feedforward Timing Compensation for Seven-Core Fiber Coherent Transmission**Jing Zhang^{1,2}, Feng Tian^{1,2}, Chuanji Yan^{1,2}, Jianwei Zhou^{1,2}, Yawei Zheng^{1,2}, Hualei Shi^{1,2}***1.State Key Laboratory of Information Photonics and Optical Communications, China; 2.Beijing University of Posts and Telecommunications, China*

We experimentally demonstrate time-reference-assisted LSTM feedforward timing compensation in seven-core fiber transmission. A causal LSTM predicts 625-MHz timing drift, reducing synchronization search complexity and achieving up to 2.25dB receiver-sensitivity gain across six 10-GBaud 64QAM channels.

ACP2026-0701-223

Hybrid Angular-Symmetry Fiber for Topology-Selective Transmission of OAM Modes**Yanbang Zheng¹, Xiongfeng Rao², Li Yang^{1*}***1. University of Science and Technology of China, China; 2. Guilin University of Electronic Technology, China*

Exploiting the topological selection mechanism of angular symmetry, we propose a Hybrid Angular Symmetry Fiber for stable transmission of OAM modes across multiple topological charges.

ACP2026-0701-226

A Time-Domain Encryption Scheme Based on Real-Valued Chaotic Orthogonal Matrix Transform**Qiaoyan Yu¹, Menghao Liu¹, Han Gao¹, Li Pei¹, Jianshuai Wang¹, Zhouyi Hu^{1*}***1. Beijing Jiaotong University, China*

We propose and experimentally demonstrate a novel time-domain encryption scheme based on digital chaos for single-carrier formats. The results show that the proposed scheme can provide a large key space of 10^{623} against brute-force attacks.

ACP2026-0701-23

Low-Complexity Training Sequence Based I/Q Imbalance Compensation for Coherent Optical Systems**Tiantian Zhang¹, Xiaoxue Gong¹, Wenling Xiao¹, Yuxin Xu², WeiGang Hou¹, Lei Guo¹***1. Chongqing University of Posts and Telecommunications, China; 2. Zhejiang University of Technology, China*

We propose a training-sequence-based localization and pilot-assisted I/Q imbalance compensation scheme for coherent optical systems, enabling low-complexity estimation and robust receiver performance in high-speed optical transmission.

ACP2026-0701-94

Prediction of Per-Channel Power, OSNR, and GSNR for Long-Haul Submarine Systems Based on a Cascaded CNN-Physical Framework**Yang Wang¹, Shigui Zhang¹, Liping Ma¹, Jiang Lin¹, Bangtian Xu¹, Zhongyi Li¹, Yanpu Wang¹, Jiachao Xu¹, Jianping Li¹, Yan Wang¹, Lin Zhang²***1. HMN Technologies CO., LIMITED, China; 2. Tianjin University, China*

We propose a temperature-compensated hybrid CNN-physical framework with one-shot calibration for submarine QoT prediction. A physics-data-driven formula extends the valid temperature range to $4\text{--}35\text{ }^{\circ}\text{C}$. The framework achieves average MAEs $0.22/0.22/0.27$ dB for a 3000-km experimental system.

ACP2026-0712-2

DSCM Partitioning Guided by the Wideband/Narrowband Boundary Criterion Theory for All-Order PMD and Rapid RSOP Compensation**Yan Zhang¹, Xiaoguang Zhang¹, Nan Cui^{1*}***1. Beijing University of Posts and Telecommunications, China*

We propose a DSCM partitioning strategy guided by the wideband/narrowband boundary criterion theory, enabling compensation of 30 ps all-order PMD and 12 Mrad/s RSOP in 200 GBaud PDM-QPSK transmission at the 99.9% confidence level.

ACP2026-0714-18

Real-time 27.2 Tb/s (34×800 Gb/s) Unrepeated Transmission over 57.5 dB in the C-band**Tong Li¹, Liping Ma¹, Jiang Lin¹, Yanpu Wang¹, Quanying Wen¹, Bangtian Xu¹, Jianping Li¹***1. HMN Technologies Co., LTD, China*

We demonstrate a real-time 27.2 Tb/s (34×800 Gb/s) PCS-16QAM unrepeated transmission with a record span loss of 57.5 dB in the C-band. The proposed system integrates of high-order Raman pump, backward ROPA, and low-loss, large effective mode area fiber.

ACP2026-0714-19

Deep photonic reservoir computing for fiber nonlinearity mitigation in long-haul optical fiber communication systems**Hansen Peng¹, Yu Zhang¹, Yaping Liu¹, Zhiquan Yang¹, Zhanhua Huang¹, Lin Zhang^{1*}***1. Tianjin University, China*

A deep microring-resonator-based photonic reservoir computing network mitigates nonlinear distortion in long-haul QPSK transmission, achieving 5×10^{-4} BER over 3960 km, with tenfold improvement over FFE/VNLE and 75% lower BER than single-layer PRC while remaining robust.

ACP2026-0714-25

On the Accuracy of Split-Step Fourier Simulations and EGN Model for Coupled-Core Multicore Fiber Transmission Systems**Xu Zhu¹, Zhiwei Liang¹, Can Zhao¹, Yi Lei¹, Tianwai Bo², Bin Chen^{1*}***1. Hefei University of Technology, China; 2. Beijing Institute of Technology, China*

We investigate the numerical accuracy of the split-step Fourier method (SSFM) in strongly coupled multicore fiber (SC-MCF) transmission systems. Simulations of two-core and four-core SC-MCF systems indicate that accurate SSFM simulations require a smaller propagation step size than those typically reported for conventional single-mode fiber in previous studies. From this the accurate SSFM results are used as a reference to evaluate the consistency of the enhanced Gaussian noise (EGN) model, and excellent agreement is observed for both QPSK and 16QAM modulation formats.

ACP2026-0714-54

Experimental Demonstration of Optical Power and Data Co-transmission over G.654.E Fiber**Jie An¹, Yang Zhao², Tian Guo², Tong Zhai¹, Yao Guo¹, Zhiguo Zhang¹***1. Beijing University of Posts and Telecommunications, China; 2. Beijing Electric Power Company State Grid Corporation of China, China*

We built a 1310/1550-nm WDM system for simultaneous optical power delivery and 6.25-Gbit/s data transmission over G.654.E fiber. Co-transmission experiments over 2, 5, 10, and 20 km links achieved received optical powers of 5.98, 2.67, 1.516, and 0.572 W, respectively. BER and eye-scan results verify the feasibility of long-distance power-and-data transmission and reveal the trade-off between delivered optical power and communication performance, providing an experimental reference for integrated fiber-based power and communication links.

ACP2026-0715-109

1.344 Eb/s-km C+L-Band SDM Transmission over 3314.4-km Weakly-Coupled Seven-Core Fibers**Xingfeng Li¹, Shuchao Mi¹, Shangcheng Wang¹, Xu Zhang¹, Hui Chen¹, Yao Lu¹, Siyue Jin¹, Zhaopeng Xu¹, Shouchuan Ma^{1,2}, Ming Luo^{1,3}, Honglin Ji¹, Chao Li¹, Qibing Wang¹, Zichen Liu¹, Zhixue He¹, Shaohua Yu¹***1. Pengcheng Laboratory, China; 2. Tsinghua University, China; 3. CICT, China*

We demonstrate a 405.5 Tb/s broadband long-haul SDM-WDM transmission over 3314.4-km weakly-coupled seven-core fiber using only 2×2 MIMO equalization, as the highest reported capacity-distance-product in seven-core fiber transmission of 1.344 Eb/s-km.

ACP2026-0715-114

High-Sensitivity Multidimensional Modulation With Joint ML Reception for Photon-Starved Optical Links**Lingxiao Li¹, Shumin Cheng¹, Hao Zhang¹, Zhennan Zheng¹, Xinlu Gao¹, Shanguo Huang¹***1. Beijing University of Posts and Telecommunications, China*

We propose a multidimensional signaling scheme for photon-starved links. Employing a globally joint ML receiver, the 16PPM-16FSK-4PolSK-6PSK format achieves an OSNR of 9.18 dB at a 7% HD-FEC threshold and transmission rate of 125 Gb/s.

ACP2026-0715-157

Physical Layer Encryption Based on Key-Controlled Cascaded Mode-Coupling Matrices for Few-Mode Fiber MDM Transmission**Xinge Liu¹, Xianfeng Tang¹, Zeyu Xu¹, Zhihan Li¹, Xinran Zhu¹, Xiaoguang Zhang¹***1. Beijing University of Posts and Telecommunications, China*

We propose a physical-layer encryption scheme based on key-controlled cascaded mode-coupling matrices for few-mode fiber mode-division multiplexing (MDM) transmission systems.

ACP2026-0715-202

Co-transmission of over 100 W laser power and high-speed communication in a 5 km anti-resonant hollow-core fiber link**Jingwen Pei¹, Guosheng Lin¹, Zirong Pan¹, Yifan Zou¹, Di Xia¹, Nuoqi Yang¹, Liyang Luo¹, Ziyou Zhao¹, Zhaohui Li¹, Bin Zhang¹***1. Guangdong Provincial Key Laboratory of Optoelectronic Information Processing Chips and Systems, China*

We demonstrate a 5-km AR-HCF power-over-fiber link co-transmitting 111.1-W laser power and 400-Gbit/s DP-16QAM data at 1080/1550 nm, enabled by dual-band guidance and high-isolation filtering with low crosstalk.

ACP2026-0715-52

Hardware-Efficient Asymmetric IQ-MIMO Equalization for High Speed Coherent Systems**Xuecheng Ren¹, Shen Wang¹, Wenlong Xu¹, Jing Zhang¹, Bo Xu¹, Kun Qiu¹***1. University of Electronic Science and Technology of China, China*

We propose a hardware-efficient asymmetric equalizer for optical coherent transmission systems. By truncating cross-taps based on the short memory of IQ interference, we reduce multiplier complexity by 60% without performance penalty in 25-Gbaud QPSK experiments.

ACP2026-0715-90

A Multidimensional Parameter Design Method for Optical Fibers Enabling Efficient Broadband Four-Wave Mixing**Yu Yang¹, Keyuan Yang¹, Changjian Ke¹, Qishang Xu¹, Qun Wang¹, Yun Wang¹***1. Huazhong University of Science and Technology, China*

We propose an efficient fiber design methodology in multi-dimensional parameter space. A dispersion-stabilized fiber is optimized, achieving a four-wave mixing conversion efficiency greater than 0 dB and a conversion bandwidth exceeding 100 nm.

T3: Subsystems and Digital Signal Processing for Optical Communications

ACP2026-0618-2

Wavelet Neural Network Nonlinear Equalization with Generalized Cross-Validation-Based Adaptive Thresholding**Yawei Sun¹, Fei Wang¹, Qi Xu¹, Mingrui Lin¹, Chenchen Wang¹, Huan Chang¹, Dong Guo¹, Sitong², Zhang Qi Zhou², Wei Yan¹, Ran Gao¹, Xiangjun Xin¹***1. Beijing Institute of Technology, China; 2. Beijing University of Posts and Telecommunications, China*

We propose a GCV-WNN equalizer enabling adaptive nonlinear equalization for OAM-MDM, achieving 0.3dB sensitivity gain at 20% SD-FEC for $|l|=2$ OAM mode and 3.3dB at 7% HD-FEC for $|l|=3$ OAM mode over Volterra equalization.

ACP2026-0622-1

Demonstration of a pre-nonlinearity compensation system by digital back-propagation and spectrum-QAM transmitter
Saiyang Liu¹, Yitian Gong¹, Chi Zhang^{1*}*1. Huazhong University of Science and Technology, China*

We propose a fiber nonlinearity compensation scheme via digital back-propagation and spectrum-QAM transmitter. We experimentally recover 5-channel 40-Gbaud RZ-QPSK signals over 415-m HNLF and simulate Q^2 improvement on 400-km SMF transmission in the C-band.

ACP2026-0623-9

Low Complexity Blind Phase Recovery Based on Phase Pre-Rotation and Threshold-Guided Search Skipping
Yuesheng Chen¹, Fei Wang^{1*}, Qi Xu¹, Mingrui Lin¹, Chenchen Wang¹, Huan Chang¹, Dong Guo¹, Sitong Zhou², Qi Zhang², Wei Yan¹, Ran Gao¹, Xiangjun Xin¹*1. Beijing Institute of Technology, China; 2. Beijing University of Posts and Telecommunications, China*

We propose a low complexity blind phase search (BPS) scheme using phase pre-rotation and threshold-guided search skipping for M-QAM coherent systems, achieving BER comparable to conventional BPS with substantially reduced computational complexity.

ACP2026-0629-28

Low-Complexity Physics-Aware Residual Adapters for Multi-Impairment Compensation and Accelerated On-Site Training in 200G PON**Qian Guo¹, Xue Xiao¹, Tao Yang¹, Min Zhang^{2*}***1. Beijing University of Posts and Telecommunications, China; 2. Shenzhen Research Institute of Beijing University of Posts and Telecommunications, China*

We propose an LCPARA equalizer for multi-impairment compensation, accelerated on-site training, and complexity reduction in 200 Gbps PON downlink transmission systems, which can achieve performance equivalent to that of individually self-training each ONU, while reducing training time by an average of 30.82% and total complexity by 40.42%.

ACP2026-0630-113

Block-Based PAM-4 Equalization Network with Oversampled Waveform Fusion for Digitized Radio-over-Fiber Systems
Shibo Yin¹, Jia Ye^{1*}, Jiongbin Deng¹, Yue Zhu¹, Qiyue Hu¹, Wei Pan¹, Lianshan Yan¹, Xihua Zou¹*1. Southwest Jiaotong University, China*

This paper proposes BPEN, a block-based neural equalizer for PAM-4 DRoF links, exploiting PCM physical blocks and oversampled waveform features to improve receiver-side decisions, with experimental validation over 15-km SSMF transmission.

ACP2026-0630-61

High-Speed PAM-4 and PAM-8 Signal Transmission Using Multi-Scale Parallel Convolution and Self-Attention Equalization
Kaijing Hu¹, Xinyu Chu¹, Wei Li^{1*}, Yujia Hu¹, Ming Luo², Liyan Huang³*1. Wuhan National Laboratory for Optoelectronics Huazhong University of Science and Technology, China; 2. The State Key Laboratory of Optical Communication Technologies and Networks China Information Communication Technologies Group Corporation, China; 3. Accelink Technologies Co., Ltd., China*

We propose a neural network equalizer termed multi-scale parallel convolution with lightweight attention. By integrating multi-scale local feature extraction with global dependency modeling, MPC-LA compensates for ISI, while maintaining low parameter complexity.

ACP2026-0630-71

Decision-Residual Clock Recovery Based on THP-Extended Constellation for FTN Coherent Optical Systems
Jianfeng Han¹, Kangyue Shen¹, Jingpeng Liu¹, Menghong Xu¹, Mingming Zhang¹, Sheng Cui^{1*}, Ming Tang¹*1. Huazhong University of Science and Technology, China*

We propose a decision-residual timing phase error detector leveraging the THP-extended constellation for short-haul coherent FTN systems with symbol-rate DSP. Numerical simulations over standard single-mode fiber links confirm that the proposed detector significantly outperforms the conventional 3Sign-TPED in both effective noise ratio and post-modulo BER. Moreover, it enables low-compression-factor FTN transmission and delivers a receiver sensitivity gain exceeding 3 dB.

ACP2026-0701-103

Combined Algorithmic and Architectural Improvements for Low-Power 400G OFEC Implementation
Evgeny Sirotkin^{1*}, Vladislav Obolentsev¹, Andrey Gorbunov¹, Vladimir Treshchikov¹*1. T8 company, Russia*

In our work, we show superior combination of algorithmic and architectural improvements to achieve low-complexity, low-power OFEC decoding solution. The designed BCH component code decoding SISO-core, as main building block of soft decoder, demonstrates ASIC complexity of ~130.3 K gates only. At the same time, the error correction capability of our entire OFEC decoder is maintained at the required level of $2 \cdot 10^{-2}$ in BER, which corresponds to $\text{SNR} \leq 6.25$ dB or $\text{NCG} \geq 11.14$ dB at QPSK. The developed decoder successfully supports 100/200/400G operational modes, while the estimated power consumption of ~1.1 W at 400G payload results in energy efficiency ~2.75 pJ/bit.

ACP2026-0701-135

GOCT-Based Intra-Sub-band Precoding for SINR Equalization in DSBM-NFDM System**Runyang Zhang¹, Zhihang Sun¹, Shijie Hou¹, Yining Zhang^{2,3*}, Tianshuo Zhou¹, Na Wu¹, Chenglin Bai^{1,3*}, Hengying Xu^{1,3*}, Xinkuo Yu^{1,3}***1.School of Physics Science and Information Engineering Liaocheng University, China; 2.School of Mathematical Sciences Liaocheng University, China; 3.Liaocheng Key Laboratory of Industrial-Internet Research and Application, China*

To address the non-uniform SINR distribution in DSBM-NFDM system, we propose a GOCT-based sub-band precoding scheme that equalizes SINR, reduces its variance, and enhances Q-factor performance.

ACP2026-0701-138

Two-Stage EEPN Compensation with Higher Walk-Off Tolerance Using Selective Subcarrier Equalization in DSCM Systems**Tianshuo Zhou¹, Shijie Hou¹, Xiaozheng Li¹, Hengying Xu^{1,2*}, Conghao Zhuang¹, Yaozheng Yue¹, Chenglin Bai^{1,2*}, Xinkuo Yu^{1,2}, Tongxin Yang^{1,2}***1.School of Physics Science and Information Engineering Liaocheng University, China; 2.Liaocheng Key Laboratory of Industrial-Internet Research and Application, China*

To address residual EEPN caused by TIPTs walk-off truncation errors, we propose a two-stage scheme combining interleaved pilots and all-pass FIR filters. By effectively reversing phase errors, this approach enhances both system performance and stability.

ACP2026-0701-173

EMS-Oriented Geometry-Aided Truncated Soft Demapping for NB-LDPC-Coded Golden Angle Modulation**Jing Wang¹, Zhongxing Tian¹, Huan Huang¹, Dongdong Zou¹, Yi Cai^{1*}***1.Soochow University, China*

We propose GA-TSD for NB-LDPC-coded 64-GAM with EMS decoding, achieving 0.3 dB Eb/N0 gain over 64-QAM and 63.83% fewer distance-evaluation

ACP2026-0701-183

An FPGA-Based VSS-NLMS-DFE Receiver for NLOS Ultraviolet Communications**Dong Zhu¹, Yong Zuo^{1*}, Tian Luo¹, Siyuan Cai¹, Xiaobin Hong¹, Jian Wu¹***1.Beijing University of Posts and Telecommunications, China*

This paper presents a low-resource FPGA-based VSS-NLMS-DFE receiver for NLOS UVC. Simulations and HIL experiments demonstrate that the proposed receiver effectively suppresses ISI and reduces BER, confirming its feasibility.

ACP2026-0701-184

Phase Spreading-Enabled Multipath Interference Mitigation for IM/DD Interconnections**Xiaobo Zeng^{1*}, Pan Liu¹, Liangcai Chen¹, Ruonan Deng²***1.Xiangtan University, China; 2.National University of Defense Technology, China*

We proposed a phase spreading technique using baseband Gaussian white noise-enabled to transform destructive multiplicative deep fading into additive incoherent noise, yielding a 2 dB reflection tolerance improvement and 9 dB power budget relaxation.

ACP2026-0701-204

Class-Wise Amplitude-Stratified Resampling for Small-Sample Neural-Network Equalization in IM/DD Systems**Yingmei Pan^{1,2}, Zhaopeng Xu^{2*}, Cancan Chen², Jianwei Tang², Linsheng Fan², Zhongliang Sun², Rui Jiang², Qibing Wang², Xu Zhang², Yan Li¹, Jian Wu¹, Zhixue He^{2*}***1.State Key Laboratory of Information Photonics and Optical Communications, Beijing University of Posts and Telecommunications, China; 2.Pengcheng Laboratory, China*

A class-wise amplitude-stratified resampling data augmentation method is proposed for small-sample neural-network equalization in IM/DD systems. About 62.5% and 56.4% reductions in the required training symbols are achieved for FNN- and CNN-based equalization, respectively, in a 10-km 50-GBaud PAM4 link.

ACP2026-0701-51

Experimental Demonstration of Complex-Valued ETDKAN for Digital Predistortion in Analog Radio-over-Fiber Links**Tianyu Jiang¹, Carlos Daniel Fontes Da Silva², Dan Li¹, Lu Zhang³, Vjaceslavs Bobrovs⁴, Xianbin Yu³, Xiaodan Pang³, Oskars Ozolins^{4*}, Edson Porto da Silva^{2*}***1.KTH Royal Institute of Technology, Sweden; 2.Federal University of Campina Grande, Brazil; 3.Zhejiang University, China; 4.Riga Technical University, Latvia*

We experimentally demonstrate a complex-valued envelope time-delay Kolmogorov-Arnold network for DPD in ARoF links, improving attenuation-robust linearization with up to 3.2-dB ACLR and 1.75-point EVM gains.

ACP2026-0701-59

CFO-Tolerant Feedforward Frequency-Domain MIMO Equalization for Coherent Optical Communications in the Presence of Severe IQ Impairments**Gao Ye^{1,2}, Jinlong Wei¹, Jian Zhao^{2*}, Linsheng Fan¹, Zhaopeng Xu¹, Zhongliang Sun¹, Lingguo Cao¹, Hao Shi¹, Jianwei Tang¹, Yingying Zhou¹, Xiuli Ji¹, Jianyu Wang¹, Zhixue He¹***1. Pengcheng Laboratory, China; 2. South China University of Technology, China*

This paper proposes a carrier frequency offset (CFO)-tolerant feed-forward frequency-domain MIMO equalizer using real-valued training sequences. By applying localized inverse modulation, it perfectly decouples receiver IQ impairments from CFO, enabling robust post-MIMO CFO recovery.

ACP2026-0711-2

Hardware-Efficient Real-Time Chromatic Dispersion Compensation with FIR Folding and Three-Multiplier Complex Multiplication**Han Wang¹, Zhenming Yu¹, Xiangyong Dong¹, Bohang Huang¹, Xu Zhang¹, Kun Xu¹***1. Beijing University of Posts and Telecommunications, China*

We propose a hardware-efficient real-time CDC architecture for coherent optical receivers, combining 32-GSPS-to-12-GSPS resampling, symmetric FIR folding, and three-real-multiplier complex multiplication to reduce DSP usage while maintaining comparable 100-km BER/EVM performance relative to same-throughput references.

ACP2026-0712-6

Gamma-Function-Based Digital Predistortion for MZM Nonlinearity Compensation in IM/DD Optical Transmission Systems**Zhiheng Liu¹, Aiyang Yang¹, Peng Guo¹, Meng Yang¹, Zhe Zhao¹, Yi Dong¹***1. Beijing Institute of Technology, China*

This work presents Gamma-DPD, a gamma-function-based digital predistortion method for compensating Mach-Zehnder modulator nonlinearity in PAM-based IM/DD systems, improving receiver sensitivity for PAM4 and PAM8 transmission across baud rates and distances.

ACP2026-0713-28

Dual-Polarization IQ Impairment Estimation Based on Single-Pixel Optical Modulation Analysis and Fourier Transform**Xinyue Yang¹***1. Beijing Institute of Technology, China*

A full-IQ-impairment-oriented SP-OMA with Fourier transform is proposed to jointly estimate dual-polarization IQ distortions for high-order coherent signals with reliable accuracy.

ACP2026-0714-29

Rate-Specific Decimation with Improved CFO Tolerance for Real-Time Multi-Rate Coherent Receivers**Yuwen Sun¹, Yizhou Wang¹, Chenghao Chay¹, Jing Li¹, Qile Jiang¹, Shenmao Zhang¹, Xiaoxiao Dai¹, Qi Yang¹, Deming Liu¹***1. Huazhong University of Science and Technology, China*

A rate-specific decimation scheme is proposed for real-time multi-rate coherent receivers. Simulation and FPGA experiments show CFO tolerance improvement from 12.8% to 24% at both low-rate 312.5 Mbaud and high-rate 1.25 Gbaud.

ACP2026-0714-48

Performance Gain of WDM O-band Coherent Transmission using Machine Learning Clustering**Ogulcan Erdogan^{1,2*}, Shi Li³, Elias Giacomidis³, Muiyiwa Balogun³, Robert Emmerich¹, Carsten Schmidt-Langhorst¹, André Richter³, Jonas Gläsel¹, Felix Ganzer¹, Patrick Runge¹, Colja Schubert¹, Ronald Freund^{1,4}***1. Fraunhofer HHI, Germany; 2. ID Photonics GmbH, Germany; 3. VPI Photonics GmbH, Germany; 4. Technical University Of Berlin, Germany*

We present experimental results of WDM 32 GBd DP-16QAM transmission in the O-band over up to 80 km and two channel spacings. We demonstrate through simulations the effectiveness of a range of machine learning clustering algorithms in mitigating intra-/inter-channel nonlinearities while keeping computational cost low.

ACP2026-0714-58

A Residual Bidirectional Mamba-Based Nonlinear Equalization Method with Hard Block Partitioning for DP-16QAM Coherent Optical Systems**Zening Zhang¹, Chenling Bai^{1,2*}, Hengying Xu^{1,2*}, Honglei Yang¹, Lishan Yang^{1,2}, Haotian Zhu¹, Yang Gao¹, Yubin Li¹, Chunyi Su¹***1. School of Physics Science and Information Engineering, Liaocheng University, China; 2. Liaocheng Key Laboratory of Industrial-Internet Research and Application, Liaocheng University, China*

A nonlinear equalization scheme combining guard-band-free block partitioning and Res-BiMamba is proposed for DP-16QAM coherent optical communications, providing superior Q-factor, higher data utilization efficiency, efficient long-sequence modeling, and reduced computational complexity.

ACP2026-0715-127

Rank-Aware Boundary Relaxation of Spatially Coupled LDPC Codes for Coherent Optical Links
Changfeng Wang^{1,2}, Rui Jiang^{2*}, Xinke Tang², Zhaopeng Xu², Jian Song¹, Yuhan Dong^{1*}*1. Tsinghua University, China; 2. Pengcheng Laboratory, China*

We propose a rank-aware boundary relaxation method to mitigate termination-induced rate loss in short-chain SC-LDPC codes for coherent optical links. This design recovers 75% of the rate loss while preserving the desirable finite-length decoding performance.

ACP2026-0715-135

Low-Complexity Non-Integer Fractionally Spaced Equalization for 200-Gb/s PAM-4 Transmission**Huan He¹, Qiang Bin¹, Junwei Zhang^{1*}, Zhaohui Li¹, Chao Lu²***1. Sun Yat-Sen University, China; 2. The Hong Kong Polytechnic University, Hong Kong, China*

A joint equalization scheme utilizing a non-integer fractionally spaced FFE (NIFS-FFE) and a LUT-MLSE is proposed for 200-Gb/s PAM-4 transmission over 1-km SSMF, improving receiver sensitivity while reducing computational complexity compared with previously proposed NIFS-FFE-MLSE.

ACP2026-0715-140

A Low-Complexity Fully Parallel 80-Point Non-Power-of-Two DFT Architecture for Frequency-Domain Clock Recovery
Hongyi Gan¹, Kaiyang Dong¹, Xuefeng Zou¹, Zuyu Li¹, Yuheng Liu¹, Fan Li^{1*}*1. Sun Yat-Sen University, China*

We propose a two-path fully parallel 80-point FT for non-integer-oversampling optical receivers using CRT/PFA, Winograd FT5, and DSP48E2 packing, achieving 280 DSP blocks, 40,696 LUTs, and 12-cycle latency, with Modified-Godard validation against MATLAB FFT.

ACP2026-0715-185

Full-Memory-Projection KAN Equalizer for Low-Complexity Nonlinearity Compensation in Coherent Fiber-Optic Systems
Shuaihang Wang¹, Yongjun Wang^{1*}, Xinyu Yuan¹, Feng Tian¹, Qi Zhang¹, Xiangjun Xin²*1. Beijing University of Posts and Telecommunications, China; 2. Beijing Institute of Technology, China*

Full memory projection compresses symbol windows before an unpruned Kolmogorov-Arnold network, preserving nonlinear memory while reducing equalizer complexity. Experiments over 560 km using PM-64QAM demonstrate comparable performance with 34.45% fewer real multiplications required per symbol.

ACP2026-0715-212

Hardware Fingerprint Identification Based on Spiking Neural Networks for Trusted Access Networks
Weidong Shao^{1*}, Mingyi Gao¹, Gordon Ning Liu¹, Yi Cai¹, Gangxiang Shen¹*1. Soochow University, China*

Hardware fingerprint-based authentication emerges as a promising solution for inherent uniqueness and environmental adaptability. We propose a hardware fingerprint recognition strategy leveraging spiking neural networks, offering a power-efficient and low-latency alternative for trusted PON access.

ACP2026-0715-7

Detuning-Factor-Aided Newton-Schulz Iteration for Low-Complexity TSA-FD-MIMO Equalization in SDM Systems**Zhongliang Sun¹, Linsheng Fan¹, Zhaopeng Xu¹, Junpeng Liang¹, Tonghui Ji¹, Hui Chen¹, Chao Li¹, Lingguo Cao¹, Ye Gao¹, Jianwei Tang¹, Jianyu Wang¹, Hao Shi¹, Xiuquan Cui¹, Shunfeng Wang¹, Zhixue He¹, Jinlong Wei^{1*}***1. Pengcheng Laboratory, China*

We demonstrate a detuning-factor-aided Newton-Schulz iterative method for TSA-FD-MIMO equalization. Theoretical analysis establishes the feasibility of single-iteration optimization, which is experimentally validated with only 0.22/0.25 dB OSNR penalties at the 7%/20% FEC thresholds.

ACP2026-0715-99

Pilot-Distribution Optimization for Joint-Channel Carrier-Phase Estimation in Finite Symbol Blocks**Yawei Zheng¹, Feng Tian^{1*}, Qi Zhang¹, Haipeng Yao¹, Jing Zhang¹, Jianwei Zhou¹, Fu Wang¹, Hualei Shi¹, Chuanji Yan¹***1. Beijing University of Posts and Telecommunications, China*

We optimize the pilot distribution for finite-block joint-channel carrier-phase estimation to lower the phase-error variance. The proposed edge-aware hill-climbing algorithm reduces the MSE by 7.02% over the adapted staggered-pilot distribution.

ACP2026-0721-8

Joint Digital Predistortion and KK Detection-Enabled Second-Order Impairment Mitigation for Analog Mobile Fronthaul Link with PMDD**Mingliang Deng^{1*}, Ke Li¹, Xiangheng Luo¹, Qiang Liu¹, Chunsun Deng¹, Dengji Song¹***1. Chongqing University of Posts and Telecommunications, China*

A joint DPD and KK detection scheme is proposed for PMDD-based analog mobile fronthaul links, suppressing second-order impairments and SSBI. The scheme improves SFDR by 22.1 dB and extends power dynamic range by 4.9 dB.

ACP2026-0723-3

Theoretical Analysis and Design Boundaries of Pilot-Tone-Assisted Optical Phase-Locked Loops for DSP-Free Coherent SystemsYu Yan¹, Puzhen Yuan¹, Zhengrong Zhao¹, William shieh^{1*}*1. Westlake University, China*

We establish a framework for pilot-tone-assisted optical phase-locked-loops (OPLL) in DSP-free coherent systems, showing that feedback delay constrains the achievable loop bandwidth, while laser-phase-noise, pilot-path noise, and data leakage jointly determine the feasible operating region.

ACP2026-0728-4

Tailored Training-Aided Ultra-Low-Complexity Real-Time Frame Synchronization via Coefficient-Clustered Accumulation
Jianwei Tang^{1,2}, Jianyu Wang¹, Lingguo Cao¹, Hao Shi¹, Gao Ye¹, Cancan Chen¹, Yingmei Pan¹, Zhaopeng Xu¹, Junpeng Liang¹, Zhongliang Sun¹, Linsheng Fan¹, Yanfu Yang², Zhixue He¹, Jinlong Wei^{1*}*1. Pengcheng Laboratory, China; 2. Harbin Institute of Technology, China*

A real-time frame synchronization scheme is proposed for coherent optical receivers using tailored preamble, coefficient-clustered accumulation, and shift-register reuse. For a 64-symbol header, adjacent-product evaluations decrease by 98.3%, with validated FPGA alignment.

ACP2026-0729-5

Chromatic-Dispersion-Robust Digital Clock Recovery for C-Band 128-Gb/s Single-Sideband PAM4 Direct-Detection Transmission over 20-km SMFPuzhen Yuan¹, Haojie Zhu¹, Yuhao Fang¹, Pu Zhou¹, Yu Yan¹, Weiqi Lu¹, Dayu Shi¹, William Shieh^{1,2*}*1. Westlake University, China; 2. Westlake Institute for Optoelectronics, China*

We experimentally demonstrate that chromatic dispersion degrades Mueller-Müller clock recovery in 128-Gb/s SSB PAM4 IM/DD systems and mitigate it using an embedded 7-tap FFE.

T4: Free-Space Transmission and Communication Systems

ACP2026-0604-1

Autoregressive Generation of Atmospheric Turbulent Wavefront Phase Using Speckle-Based Optical Reservoir Computing
Yifan Wang¹, Yicong Ma¹, Dongye Xu¹, Haodong Liu², Wei Lin^{1*}, Haifeng Liu¹, Bo Liu¹*1. Institute of Modern Optics, College of Electronic Information and Optical Engineering, Nankai University, China; 2. College of Electronic Information and Optical Engineering, Nankai University, China*

We propose a speckle-based optical reservoir computing method for autoregressive generation of turbulent wavefront phases, producing long-term sequences consistent with true turbulence in amplitude, spatial structure, spectra, and statistics for real-time adaptive optics prediction tasks.

ACP2026-0610-4

Dynamic Power Allocation for NLOS CSS-VLPC With LED NonlinearityZhaoqiang Zeng^{1,2,3,4}, Shiyao Gu^{2,3,4,5}, Jiakun Zhang^{1,2,3,4}, Zhiqiang Zheng^{1,2,3,4}, Bangjiang Lin^{2,3,4*}*1. School of Advanced Manufacturing, Fuzhou University, Quanzhou, China; 2. Quanzhou Institute of Equipment Manufacturing, Haixi Institutes, Chinese Academy of Sciences, Quanzhou, China; 3. University of Chinese Academy of Sciences, Fujian College, Quanzhou, China; 4. Fujian Provincial Key Laboratory of Intelligent Identification and Control of Complex Dynamic System, Quanzhou, China; 5. The College of Mechanical and Electrical Engineering, Fujian Agriculture and Forestry University, Fuzhou, China*

This paper presents a DWSAC-based optical power allocation framework for NLOS CSS-VLPC, balancing LED nonlinearity, BER, spectral-efficiency lower bound, and CRLB positioning accuracy to optimize DC/AC operating points for robust integrated links.

ACP2026-0629-17

Adaptive Input-Enhanced SE and Gated Residual Network for Label-Free Channel Estimation in UAV-FSO Communications
Jiqing Liu¹, Tingwei Wu^{1*}, Lei Guo¹*1. Communications and Information Engineering Chongqing University of Posts and Telecommunications, China*

AdaSERes-Net achieves label-free UAV-FSO channel estimation under atmospheric turbulence via input-enhanced squeeze-excitation and gated residual connections, reducing NMSE by 59.3% over FC-DNN at 30 dB SNR with superior data efficiency.

ACP2026-0629-29

Kolmogorov-Arnold Network-Based Equalizer for PAM4 Chaotic Space Optical Communication under Turbulence and MismatchZekun Feng¹, Yuan Feng¹, Yilin Song¹, Jiahao Ge¹, Yuan Liu¹, Li M^{1*}*1. Nanjing University, China*

A physics-guided Kolmogorov-Arnold Network (KAN) equalizer is proposed for 25-GBaud PAM4 chaotic free-space optical (FSO) transmission over a 1000-km turbulent downlink. It shows BER improvement under turbulence and receiver parameter mismatch.

ACP2026-0630-116

Physics-Driven Unsupervised Multi-Mode OAM Decomposition under Atmospheric Turbulence
Zhiyang Zhang¹, Xiongfeng Rao², Li Yang^{1*}*1. University of Science and Technology of China, China; 2. Guilin University of Electronic Technology, China*

We propose PRISM, a physics-driven unsupervised neural network for quantitative OAM decomposition across multi-order Laguerre-Gaussian modes. Without ground-truth labels, PRISM achieves 0.918 amplitude correlation under strong atmospheric turbulence, outperforming supervised baselines by +0.307.

ACP2026-0630-22

A TCN Based Adaptive ATP Control Method for Inter Satellite Laser Communication**Xinyu Wang¹, Hui Yang^{1*}, Zhe Niu¹, Yuxuan Yan¹, Qiuyan Yao¹, Buzheng Wei²***1. Beijing University of Posts and Telecommunications, China; 2. China Unicom Research Institute, China*

This paper proposes TPA-ATP, a TCN based ATP method for optical links between satellites. The proposed method improves multiple ATP tasks in one control framework, shortens the tracking error convergence time, and improves BER performance.

ACP2026-0630-38

Propagation and dynamic obstacle evasion properties of a radially polarized partially coherent crescent-like beam in turbulence atmosphere**Jiaao Shi¹, Bing Zhu^{1*}***1. Department of Electronic Engineering and Information Science, University of Science and Technology of China, China*

We introduce a radially polarized partially coherent crescent-like beam that maintains a highly stable asymmetric profile in atmospheric turbulence. Utilizing phase pre-compensation and its inherent self-healing, we demonstrate controllable dynamic obstacle evasion for robust communications.

ACP2026-0630-47

Vector-Beam Concurrence Keying for Turbulence-Resilient Free-Space Optical Communication**Jiazhen Ding^{1*}, Shuangcheng Chen¹, Mengjie Zhou¹, Zheng Wu¹, Shiyu Shi², Mingfeng Xu²***1. Tianfu Xinglong Lake Laboratory, China; 2. National Key Laboratory of Optical Field Manipulation Science and Technology, Chinese Academy of Sciences, China*

We propose a vector-beam concurrence keying (VCK) scheme for turbulence-resilient free-space optical communications. By encoding information in vector-beam concurrence, the method suppresses scintillation-induced degradation and achieves improved error performance under atmospheric turbulence.

ACP2026-0630-88

Adaptive Beam Aiming and Tracking Based on Relative Positions for Moving-Terminal Optical Wireless Communications**Tongling He¹, Chengze Ming¹, Yining Xu¹, Jiaheng Lyu¹, Zihui Lin¹, Shiming Gao¹***1. Zhejiang University, China*

A beaconless adaptive beam tracking method using relative position is proposed for moving-terminal OWC. With kinematic compensation and dynamic feed-forward overdrive, it achieves 0.06° accuracy, ensuring moving-target connectivity when tailored to different divergence angles.

ACP2026-0701-199

Transmission Performance Assessment of Turbulent Free-Space Optical Channels Using a Hot-Air Optical Turbulence Generator**Tianze Lin^{1*}, Li Pei¹, Jianshuai Wang¹***1. Beijing Jiaotong University, China*

This paper presents an experimental assessment of transmission-performance degradation in a turbulent free-space optical (FSO) channel using a hot-air optical turbulence generator as a repeatable channel emulator. The generated turbulence is characterized by off-axis digital holography and beam-wander analysis, and its impact on an IM/DD PAM4 link is evaluated through received power, SNR, and BER. The results link turbulence-induced optical-field perturbations with measurable coupling loss and signal-quality deterioration.

ACP2026-0701-238

Research on Propagation Characteristics of Vector Vortex Beams in Turbulent Atmosphere**Lequn Yang¹, Bing Zhu^{1*}***1. Department of Electronic Engineering and Information Science, University of Science and Technology of China, China*

Hybrid-polarization vector vortex beams suppress scintillation and wander, while perfect vector vortex beams perform best due to constant ring radius, guiding beam selection for turbulence-resilient FSOC.

ACP2026-0701-243

Impairment-Calibrated Sim-to-Real Transfer for OFDM-FSO Modulation Format Recognition**Qianwu Zhang¹, Xiaofang Zhang¹, Ke Zhang¹, Zhiyu Li¹***1. Shanghai University, China*

Impairment-calibrated Sim-to-Real transfer enables label-efficient modulation recognition in an experimental OFDM-FSO link. Pre-training on calibrated simulations and fine-tuning with 36 measured frames improves accuracy from 61.0% to 81.8%, reaching 95.9% with full measured training data.

ACP2026-0701-3

Wavefront-Sensorless Adaptive Optics Using a Lightweight Compensation Model for Turbulence-Resilient FSO Communications**Haifeng Deng¹, Yue Zhu¹, Yuhao Zhou¹, Caiying Li¹, Yejun Liu¹, Shasha Liao¹, Lei Guo¹***1. Chongqing University of Posts and Telecommunications, China*

This paper proposes a wavefront-sensorless AO compensation scheme based on a lightweight residual network model. Experimental results demonstrate that the proposed scheme effectively improves the Strehl ratio and coupling efficiency under various turbulence strengths.

ACP2026-0701-39

Turbulence-Tolerant High-Dimensional Information Coding with Multi-Ring Perfect Vector Vortex Beams**Xiaohang Jia¹, Changlin Yi¹, Wenbiao Hou¹, Yulu Dai¹, Andong Wang¹, Long Zhu¹***1. Chongqing University of Posts and Telecommunications, China*

Multi-ring perfect vector vortex beam enables 16-bit/symbol transmission with 216 states. Under D/r04, BER remains below the 7% HD-FEC limit of 0.38% and the state decoding accuracy is above 0.97, enhancing free-space optical communication capacity.

ACP2026-0701-42

Transmission characteristics of free-space autofocusing vortex beams with joint amplitude and phase modulation under atmospheric turbulence**Xiaohang Jia¹, Changlin Yi¹, Wenbiao Hou¹, Yulu Dai¹, Andong Wang¹, Long Zhu¹***1. Chongqing University of Posts and Telecommunications, China*

Joint amplitude-phase modulated vortex beam (JAP-VB) is proposed. Under atmospheric turbulence with limited apertures, it improves received power and BER versus phase-only modulation, demonstrating superior robustness for free-space optical communications.

ACP2026-0710-2

Optical-Power-Aware Fast Wake-Up Modeling for Low-Power Satellite Coherent Optical Receivers**Hao Ding^{1,2}, Yanhao Chen³, Decai Liu^{1,2}, Qianwu Zhang^{1,2,3}, Yingxiong Song^{1,2,3}, Junjie Zhang^{1,2,3}***1. Key Laboratory of Specialty Optics and Optical Access Networks, Shanghai, China; 2. Institute for Advanced Communication and Data Science, Shanghai University, China; 3. Teralink Optical Corporation (Shanghai), China*

We present an optical-power-aware fast sleep/wake method for satellite coherent receivers. EDFA input power guides FPGA-controlled ADC and clock power states, reducing receiver power by 10.71W and wake-up time to 0.461s without full power cycling.

ACP2026-0711-4

2D Optical Wireless Communications via WDM Enabled Optical Phased Array**Caiming Sun¹, Jiarui Zhang¹***1. The Chinese University of Hong Kong - Shenzhen, China*

2D OWC are experimentally demonstrated WDM excited OPA. The angle coverage of this OPA enabled OWC is achieved as $50^\circ \times 29.6^\circ$ in 2D directions of ψ by θ with 1-Gbps data rate for each user.

ACP2026-0711-7

Reservoir Computing Based on VCSEL Model for Signal Equalization in Optical Wireless Communication**Yunhan Jiang¹, Xiong Deng¹, Junlin Chen¹, Yeping Huang¹, Ping Fu¹, Hongna Zhu¹, Xihua Zou¹, Wei Pan¹, Lianshan Yan¹***1. Southwest Jiaotong University, China*

Optical Wireless Communication (OWC) is a promising technology for next-generation wireless communication, but signal distortion caused by device nonlinearity remains a critical challenge. Vertical-cavity surface-emitting lasers (VCSELs) offer significantly higher modulation bandwidth than LEDs, which makes them attractive for high-speed OWC systems.

However, VCSELs introduce more complex nonlinear dynamics due to relaxation oscillations that arise from the coupled carrier-photon interaction. In this paper, we propose a model-driven reservoir computing (RC) method that utilizes a nonlinear VCSEL rate-equation model as the activation function for RC to improve the performance of OWC. Unlike traditional RC with randomly connected reservoirs, the proposed approach embeds the physical VCSEL dynamics, which are characterized by coupled carrier and photon densities with multi-timescale memory, directly into the reservoir layer. Numerical simulation results demonstrate that the model-driven RC method achieves the lowest BER among all compared methods across the entire SNR range. At high SNR, the model-driven RC consistently outperforms both Volterra and traditional RC equalizers.

ACP2026-0713-21

Wavefront-Sensorless Turbulence Compensation via D2NN for OAM-based Free-Space Optical Communication
Changlin Yi¹, Yulu Dai¹, Wenbiao Hou¹, Lang Zhou¹, Xiaohang Jia¹, Andong Wang¹, Long Zhu¹*1.School of Communications and Information Engineering, Chongqing University of Posts and Telecommunications, China*

Atmospheric turbulence severely degrades OAM mode demultiplexing in free-space optical links. Conventional compensation schemes, however, generally mandate the use of wavefront sensors or cameras for optical field interrogation, resulting in highly complex and bulky receiver architectures. To address this, we leverage a single-screen numerical model to recast turbulence compensation as a task-specific, detector-window-power-driven optimization problem rather than a full wavefront reconstruction task. The distorted field is sequentially probed by three fixed phase masks alongside the frozen D2NN itself. Crucially, only the resulting 3×5 detector-window powers are gathered as sensing data to derive label-free input features. A multilayer perceptron (MLP) maps these features to 55 low-order phase-basis coefficients, which synthesize a phase-only compensation mask placed before the frozen D²NN to redistribute power toward the intended detector window. For $D/r_0 = 4$, this method substantially enhances the mode purity from 0.6985 to 0.9630, while suppressing the total off-target crosstalk from -4.46 dB to -15.22 dB, approaching the theoretical oracle baseline of -15.44 dB.

ACP2026-0714-17

MAP-SFViT: A Spatial-Fourier Fusion Vision Transformer for Robust OAM Symbol Recognition over Turbulent FSO Links
Huadong Wu¹, Xiaotian Du², Xiongfeng Rao³, Li Yang¹*1.Department of Electronic Engineering and Information Science, University of Science and Technology of China, China; 2.School of Information and Communication Engineering, University of Electronic Science and Technology of China, China; 3.School of Optoelectronic Engineering, Guilin University of Electronic Technology, China*

We propose MAP-SFViT (Mode-Amplitude-Phase Spatial-Fourier Fusion Vision Transformer), a demodulator for 1000-m OAM-FSO links. It jointly exploits mode, power-allocation, and relative-phase for multi-DoF modulation, achieving 100% accuracy under weak-to-moderate turbulence and 86.85% even in severe turbulence.

ACP2026-0714-4

Iterative-Refinement One-Bit DSM for DAC-Free OFDM in Optical Camera Communications**Dechun Wu¹, Xiaodi You¹, Yang Hong², Bingyun Liu¹, Jian Chen³, Changyuan Yu⁴, Mingyi Gao¹, Gangxiang Shen¹***1.Soochow University, China; 2.Microsoft, United Kingdom; 3.Nanjing University of Posts and Telecommunications, China; 4.The Hong Kong Polytechnic University, Hong Kong, China*

We propose a DAC-free orthogonal frequency division multiplexing scheme for optical camera communications using one-bit delta-sigma modulation, where iterative preprocessing mitigates rolling-shutter-induced inter-symbol interference. Experimental results demonstrate reliable transmission with support for higher-order modulation formats.

ACP2026-0715-152

Modeling and Analysis of Asymmetric Product Codes for Lunar Coherent Laser Communications**Yiwei Wu^{1,2}, Ruibin Zheng³, Yifan Ye³, Mingyuan Sun³, Yan Xia^{1,2}, Yi Lei³, Bin Chen³***1.Deep Space Exploration Lab, China; 2.National Key Laboratory of Deep Space Exploration, China; 3.Hefei University of Technology, China*

Earth-Moon free-space optical (FSO) communication is a promising solution for future lunar communication systems. In this paper, an Earth-Moon coherent FSO channel model is established by jointly considering the major channel impairments, and the recently proposed asymmetric polar-BCH product-code (PC) scheme is evaluated using the proposed model. Simulation results show that the proposed polar-BCH PC achieves up to 8.06 dB reduction in required launch power compared with the conventional BCH-BCH PC under Earth-Moon optical laser communication scenarios.

ACP2026-0715-170

A Real-Time 16-PPM Transceiver Architecture With 10GbE-Compatible Service Interface for Deep-Space Optical Communication Terminals**Caixuan Zhuang¹, Yuwen Sun¹, Yuanxiang Wang², Erzhao Sun², Mingkun Teng², Shenmao Zhang¹, Xiaoxiao Dai¹, Qi Yang¹, Deming Liu¹***1.Huazhong University of Science and Technology, China; 2.Bianfu Optoelec. Technologies Co., China*

A real-time 16-PPM transceiver architecture with a 10GbE-compatible interface is proposed for deep-space optical communications. Prototype validation demonstrates 1-h continuous operation with BER performance at the 10^{-8} level.

ACP2026-0722-5

Chaos Assisted Directional Acquisition and Adaptive Tracking for Free Space Optical Communication**Meitong Yu¹, Jiaheng Wang¹, Jinting Chen¹, Shicheng Zhu¹, Qianyun Ling¹, Xiqi Gao¹***1.Purple Mountain Laboratories, China*

A chaos assisted directional acquisition and adaptive tracking method is proposed, combining spatial probability mapping, YOLOv8s sub-pixel positioning, and chaotic Kalman filtering. It shortens acquisition time and improves beam tracking stability in free-space optical communication.

Poster Session-NP-Track

Content

NP1: Fiber-Based and Free-Space Sensing

ACP2026-0617-2

Field Trial of Urban Traffic Vibration Monitoring with In-Service Communication Optical Cable

Chuanbiao Zhang¹, Xiongyan Tang¹, Shikui Shen¹, He Zhang¹, Zelin Wang¹, Hu Li², Shaohui Wu³, Yu Tang¹

1. China Unicom Research Institute, China; 2. China Unicom Beijing Branch, China; 3. Beijing Municipal National Defense Mobilization Office, China

Using redundant urban optical fibers, this paper monitors a 2.7 km tunnel and 1.8 km metro section to reveal traffic operation differences.

ACP2026-0623-1

Polarization Diversity Combining Algorithms for DAS: A Comparative Study

Jiaying Chang¹, Mingda Zhu¹, Minghai Wang¹, Ruihao Duan¹, Xinxin Wang¹, Jacopo Nanni², Giovanni Tartarini²

1. China University of Petroleum (Beijing), China; 2. University of Bologna, Italy

We compare five polarization diversity combining algorithms for distributed acoustic sensing (DAS). Evaluated by amplitude fluctuation, fading rate, phase signal-to-noise ratio (SNR) and background noise, rotation vector summation (RVS) achieves the best performance.

ACP2026-0623-3

Effective Four-Domain Joint Fading Noise Suppression Method for DAS

Jiaying Chang¹, Mingda Zhu¹, Ruihao Duan¹, Minghai Wang¹, Xinxin Wang¹, Jacopo Nanni², Giovanni Tartarini²

1. China University of Petroleum (Beijing), China; 2. University of Bologna, Italy

This paper proposes a four-domain joint suppression method to mitigate fading noise in distributed acoustic sensing. Achieving 0.35% fading rate and -70.03 dB background noise over 10 km fiber, this method significantly enhances the detection capability of weak vibrations.

ACP2026-0624-3

High-Precision Submarine Earthquake Localization and Magnitude Estimation via Bent-Segment Wavefront Masking

Bing Yue¹, Yan Zheng², Shaoyi Chen², Bo Wu¹, Peng Sun¹, Xumeng Liu¹, Yichang Wu², Zhaohui Li², Chao Li¹, Zhixue He¹

1. Pengcheng Laboratory, China; 2. Sun Yat-sen University, China

We present a distributed acoustic sensing-based submarine earthquake localization method using bent-segment wavefront masking of cables, achieving 3.878 km location error and Mw 0.16 magnitude error for events within 500 km with a single cable.

ACP2026-0626-13

Optimized Design of Photonic Integrated Interferometric Imaging Based on an Offset Multistage Microlens Array

Jiaheng Wang¹, Yong Zuo¹, Xiaohan Song¹, Ziteng Gao¹, Haijian Ji¹, Jian Wu¹

1. Beijing University of Posts and Telecommunications, China

This paper proposes an integrated interferometric imaging scheme based on an offset multistage microlens array and a compressed-sensing-based image reconstruction algorithm, which addresses imaging artifacts and distortions and significantly improves imaging quality.

ACP2026-0629-2

A dual-channel fiber-optic sensing scheme based on phase-shift fiber loop ring-down technology

Aodi Yu¹, Ningxiang Yan¹

1. Jimei University, China

A dual-channel fiber-optic sensing scheme based on phase-shift fiber loop ring-down (PS-FLRD) technology is proposed and experimentally demonstrated. Independent channel demodulation is achieved through loop length mismatch and frequency-switched interrogation.

ACP2026-0629-6

SpatialNet-Assisted Separation of Two-Source Mixed Sound Signals in Distributed Acoustic Sensing

Haijun He¹, Zhen Zhang¹

1. Southwest Jiaotong University, China

SpatialNet is adapted to separate two-source mixed sound signals recorded by DAS, using multichannel spatial information, simulated pretraining, and delay-compensated CI-SDR loss to improve separation performance while reducing labeled data dependence.

ACP2026-0629-7

Laser Frequency Drift Suppression of Φ -OTDR Using Electro-Optic Modulated Symmetric Dual-Reference Pulses**Ziyi Xu¹, Mincong Deng¹, Fan Li^{1*}***1. Sun Yet-sen University, China*

This paper presents a triple-pulse Φ -OTDR system based on a single IQ modulator for low-frequency vibration detection. An amplitude-weighted dual-reference fitting algorithm suppresses low-frequency noise caused by laser frequency drift and reduces fading-related phase distortion.

ACP2026-0630-118

Improved PGC-Arctan Demodulation Algorithm by Combining Odd Harmonics**Fangshuo Shi¹, Haoyan Liu¹, Yuxiang Wei¹, Yan He¹, Yanjun Chen^{2*}, Zhengbin Li¹***1. Peking University, China; 2. Central South University, China*

We propose an improved PGC-Arctan demodulation algorithm that combines odd harmonics proportionally to maximize the signal-to-noise ratio of fiber-optic interferometric sensor. Without changing optical configuration, the proposed algorithm enhances sensitivity by a factor of 1.59.

ACP2026-0630-120

Temperature-Insensitive Long-Period Fiber Gratings in Anti-Resonant Hollow-Core Fibers**Tianze Zhang¹***1. Fudan University, China*

Long-period fiber gratings (LPFGs), based on anti-resonant hollow-core fibers (AR-HCFs), are fabricated by use of the electric arc discharge method. Periodic refractive index modulation is achieved via localized arc-discharge-induced microdeformation without compromising the structural integrity of the AR-HCF. The fabricated LPFG features dual resonant dips of -18.2 dB at 1401.6 nm and -17.5 dB at 1638.6 nm. Notably, the proposed AR-HCF-LPFG demonstrates excellent temperature stability. One resonant dip exhibits near-zero temperature sensitivity, while the other dip shows a sensitivity of -3.22 pm/ $^{\circ}$ C over 20 – 100 $^{\circ}$ C, effectively suppressing temperature-induced cross-sensitivity.

ACP2026-0630-42

High-Accuracy FBG Temperature Interrogation Based on a DFB Laser Array and an MLP Neural Network**Shuaixiao Zhou¹, Yaqiang Fan^{1*}, Haolin Xia¹, Jingxuan Zhang¹, Zhenxing Sun¹, Yuan Lv¹, Xiangfei Chen¹***1. Nanjing University, China*

A high-speed FBG temperature interrogation system based on a REC-DFB laser array and an MLP neural network is demonstrated, achieving accurate and robust temperature measurement over a wide sensing range.

ACP2026-0630-65

Experimental Investigation of the Spectral Resolution of a Tapered Multimode Fiber Computational Spectrometer**Siyue Jin¹, Zhen Zhen¹, Hui Chen¹, Qibing Wang¹, Xu Zhang¹, Jingbin Feng¹, Lei Wang¹, Zhixue He^{1*}***1. Peng Cheng Laboratory, China*

A tapered multimode fiber computational spectrometer is proposed, achieving broadband single-peak reconstruction across the S, C, and L bands and dual-peak reconstruction with 20 pm spacing. Speckle correlation analysis experimentally determines its spectral resolution.

ACP2026-0630-76

Demonstration of Fiber-Dependent Brillouin Frequency Variations in a Submarine Telecommunications Cable**Hailiang Zhang¹, Hui Dong¹, Nhu Khue Vuong¹, Yixin Wang¹, Meng Fai Yue², Bien Aik Tan³, Dora Juan Juan Hu¹***1. Institute for Infocomm Research (I2R), Agency for Science, Technology and Research (A*STAR), Singapore; 2. Singapore Telecommunications Limited (Singtel), Singapore; 3. Maritime Port Authority of Singapore, Singapore*

BOTDA measurements on a submarine telecommunications cable demonstrated fiber-dependent responses to natural environmental variations. The results highlight the influence of cable-fiber coupling and emphasize the need to account for fiber-specific characteristics when using existing submarine telecommunications cables for distributed environmental sensing.

ACP2026-0701-130

A 1550 nm All-Fiber Mode-Selective Coupler for Annular Beam Generation Toward NIR-II STED Applications**Baoying He¹, Xiaojie Guo¹, Boyi Yang¹, Wenhua Ren¹, Youchao Jiang¹, Guobin Ren¹***1. Beijing Jiaotong University, China*

A 1550 nm all-fiber mode selective coupler generates LP₁₁ and annular beams for NIR-II STED microscopy. Experiments characterize its conversion efficiency, purity, excess loss and compatibility with our home-built STED system after objective focusing.

ACP2026-0701-142

High-sensitivity audible acoustic sensing based on WGM microbubble resonator**Shenghan Hou¹, Yu Guo¹, Bing Duan^{1*}, Xiaochong Yu^{2*}, Xiaoning Guan¹, Feng Qin³, Daquan Yang¹***1. Beijing University of Posts and Telecommunications, China; 2. Beijing Normal University, China; 3. No. 34 Research Institute of China Electronics Technology Group Corporation, China*

We propose a high-sensitivity audible acoustic sensor based on a microbubble resonator integrated with a suspended beam. Benefit from the efficient mechanical conduction, this structure achieves a peak sensitivity of $12.9 \mu\text{Pa/Hz}^{1/2}$ at 4430 Hz.

ACP2026-0701-241

Wide-Dynamic-Range Polarization-Sensitive Optical Fiber Vibration Sensor Based on a PM 3x3 Coupler Phase Demodulation Scheme**Geyi Chen¹, Yi Jiang¹, Haosen Wang¹, Huimin Huang¹, Zhenrong Zhang¹, Xuefeng Wang^{1*}***1. Guangxi University, China*

This paper proposes a PM 3x3 coupler fiber vibration sensor using adaptive ellipse fitting. Over a 1.1–15.2 rad range, the proposed G3 scheme maintains high correlation (0.999), significantly reduces THD, and eliminates signal fading.

ACP2026-0701-49

Density-Aware Sparse Regional Transformer for LiDAR Point Cloud Object Detection**Jinpeng Su¹, Lulu Guo², Tian He¹, Xihua Zou¹, Lianshan Yan¹, Hui Yang^{1*}***1. Southwest Jiaotong University, China; 2. Beijing Dohitech Technology Co., Ltd., China*

DASRT improves LiDAR 3D detection with shared-query dual-scale attention and density-aware region selection, adapting contextual aggregation to non-uniform point density and outperforming CenterPoint-Pillar on KITTI, especially for sparsely targets, with up to 4.39 mAP gains.

ACP2026-0714-3

Tracking of Optically Propelled Nanoparticles in a Hollow-Core Fiber Using an Event-based Camera**Qikai Chang¹, Fei Wang¹, Rui Wang¹, Shangran Xie^{1*}***1. Beijing Institute of Technology, China*

Event-based tracking of 150-nm-diameter silica nanoparticles propelled within an anti-resonant hollow-core fiber is demonstrated. Through the integration of defocused particle imaging with a two-step trajectory tracking framework, continuous and high-precision nanoparticle velocimetry is achieved.

ACP2026-0714-42

V-Shaped Tapered Optical Fiber Sensor for Enhanced Refractive-Index Sensing and In-Pouch Electrolyte Spectral Monitoring**Zhi Wang^{1*}, Xianda Wang^{1*}, Ziyi Xu^{1*}, Huibo Han^{2*}, Jing Sun^{1*}, Kumar Santosh^{3*}, Bingyuan Zhang², Junxian Hou^{1*}, Fei Liu^{1*}, Xian Zhou^{1*}***1. University of Science and Technology BJ, China; 2. Liaocheng University, China; 3. Koneru Lakshmaiah Education Foundation, India*

Bending tapered optical fibers into a V geometry increases refractive index sensitivity from 20.44 to 96.95 nm/RIU with a 40 μm waist, enabling qualitative spectral monitoring of LiFSI composite electrolyte during heating in pouch cells.

ACP2026-0714-5

Rep-U-Net: A Deep Learning Framework for Pixel-level Heartbeat Bipolar-IJK Complex Segmentation Based on Fiber-BCG**Yuqing Li¹, Xiaodi You^{1*}, Sihan Yu², Jian Chen³, Changyuan Yu⁴, Wei Xu^{5*}***1. Soochow University, China; 2. National University of Singapore (Suzhou) Research Institute, China; 3. Nanjing University of Posts and Telecommunications, China; 4. The Hong Kong Polytechnic University, Hong Kong, China; 5. Southeast University, China*

A novel Rep-U-Net multi-task deep learning framework is presented for pixel-level heartbeat bipolar-IJK complex segmentation using fiber phase-sensitive ballistocardiogram (-BCG) with a segmentation accuracy of 96.93%, showing great potential in future nonobtrusive cardiac diagnosis.

ACP2026-0714-53

Learnable Wavelet Packet Transform for Time-Efficient Denoising of HCF-OTDR**Jialun He¹, Bingjie Zhang¹, Mingchun Chen¹, Jiaping Xu¹, Jiawei Wan¹, Tao Yang^{1*}***1. State Key Lab of Information Photonics and Optical Communications, Beijing University of Posts and Telecommunications, China*

We present a learnable wavelet packet transform (LWPT) for time-efficient HCF-OTDR denoising. LWPT shortens the acquisition-and-processing time by over one order of magnitude relative to conventional wavelet denoising, while preserving noise-suppression performance and event integrity.

ACP2026-0714-61

High-precision FMCW optical time delay measurement with optical phase noise suppression**Zhenglin Tang^{1,2}, Junji Chen^{1,2}, Yuzhe Wu^{1,2}, Yaowen Zhang^{1,2*}, Zhiyao Zhang^{1,2}, Yong Liu^{1,2}***1. University of Electronic Science and Technology of China, China; 2. State Key Laboratory of Electronic Thin Films and Integrated Devices, China*

A frequency modulated continuous wave optical time-delay measurement system with optical phase noise cancellation is demonstrated. The Allan deviation is calculated to be 0.12 ps at an averaging time of 243.1 μs .

ACP2026-0715-130

High-Precision Optical Cavity Length Demodulation Method for Fiber-Optic FPE Pressure Sensors Based on a Normalized Cross-Correlation Algorithm**Haiqin Wang¹, Cheung Yang^{1*}, Boda Yu¹, Yuefeng Qi^{1*}, Zhenguo Jing¹, Wei Peng¹***1. Yanshan University, China*

A normalized cross-correlation based method is proposed for F-P cavity length demodulation in a fiber-optic pressure sensor. Experiments from 0 to 1000 kPa yield 3.88 nm/kPa sensitivity with excellent linearity, high accuracy, and strong noise immunity.

ACP2026-0715-15

Experimental Response of Distributed Sensing to Simulated Ice Coating on OPGW**Qin Xiao^{1*}, Xiaomeng Xia^{2*}, Ziqi Dong², Mingyang Sun², Yixuan Tan³, Min Zhao³, Jian Xu¹, Juntao¹, Wu Jianjun Rao¹, Shiyu Zhang¹, Hualin Qi¹, Ying Tie¹***1. ACCELINK Technologies CO., LTD., China; 2. Information & Telecommunication Center State Grid Corporation of China, China;**3. Information & Communication Company State Grid Sichuan Electric Power Company, China*

Ice coating on OPGW is simulated in laboratory by loading weight on the cable. A ϕ OTDR based ice sensing model is verified under circumstances of uniform icing distribution and unilateral icing distribution within a span.

ACP2026-0715-197

Resonance Enhanced Readout of Low Frequency Magnetic Fields Using a Heterogeneous Integrated Optical Fiber with a Side Nickel Core**Mengting Mou¹, Zhuoyue Sun¹, Mengshi Zhu¹, Liang Zhang¹, Heming Wei¹, Fufei Pang^{1*}***1. Shanghai University, China*

We demonstrate frequency conversion using a side nickel core fiber magnetic field sensor. Translating low frequency components to the 360 Hz resonant region improves average SNR by 33.1 dB and supports offline phase waveform synthesis.

ACP2026-0715-31

A Fast Full-Spectrum Frequency-Band Energy Extraction Method for High-Volume DAS Data in Hydraulic Fracturing Interpretation**Yunchuan Xiong¹, Fei Liu¹, Xin Huang^{2*}, Yichen Wang¹, Guo Zhu¹, Xian Zhou¹***1. University of Science and Technology Beijing, China; 2. Sinopec Petroleum Exploration and Production Research Institute, China*

This paper proposes FFS-FBE for DAS data, organizing phase records as a window-sample-depth array, using tensor batch operations to build reusable PSD tensors, generating FBE images via spectral accumulation, reducing overhead while maintaining principle.

ACP2026-0715-43

Birefringence-Derived Distributed Large-Strain Sensing in Polarization-Maintaining Fiber Based on Polarization OFDR**Lijie Wang¹, Huajian Zhong¹, Shijie Li¹, Rongyi Shan¹, Cailing Fu¹, Yiping Wang^{1*}***1. Shenzhen University, China*

A polarization-OFDR method measures distributed strain from birefringence variation between PANDA fiber polarization axes. Dual-axis matching enables 0–12000 $\mu\epsilon$ sensing at 5 mm resolution, with $5.26 \times 10^{-9} / \mu\epsilon$ sensitivity and $R^2 = 0.9997$.

ACP2026-0715-44

Gain-Enhanced Carbon Monoxide Sensing in a D-Shaped Active Fiber Cavity**Manjun Zhang¹, Yu Tan², Lei Peng¹, Yuchen Wang², Baicheng Yao², Teng Tan^{2*}***1. Guangdong Provincial Key Laboratory of Electric Power Equipment Reliability, Electric Power Research Institute of Guangdong Power Grid Co., Ltd., China; 2. Key Laboratory of Optical Fiber Sensing and Communications (Education Ministry of China), University of Electronic Science and Technology of China, China*

We propose and experimentally demonstrate a gain-enhanced CO sensor using an In/ZnO-functionalized D-shaped erbium-doped active fiber Fabry-Pérot cavity. The sensor exhibits a logarithmic response over CO concentrations from 100 ppb to 1000 ppm, with a sensitivity of 0.165 pm/log(ppb) and an estimated limit of detection of 0.27 ppm.

ACP2026-0715-73

Real-Time Localization of Lightning Strike on Transmission Lines Based on State of Polarization**Huan Yang^{1,2}, Zhiliang Wei^{1,2}, Chenhui Wang^{1,2}, Xiang Li^{1,2}, Tianye Huang², Hanbing Li¹, Ming Luo¹, Jie Li¹, Ying Qiu^{1*}***1. State Key Laboratory of Optical Communication Technologies and Networks (OCTN) China Information and Communication Technologies Group Corporation (CICT), China; 2. School of Mechanical Engineering and Electronic Information China University of Geosciences (Wuhan), China;*

An FPGA-based state-of-polarization system enables real-time lightning localization over long-distance optical links. Controlled magnetic-field and OPGW current-pulse tests yielded mean deviations below 0.3%; repeated 80.586-km measurements showed a 0.04-km standard deviation, confirming stable online operation.

ACP2026-0722-2

Eye-Inspired Structural Recognition for Pipeline Leak Detection Using Distributed Acoustic Sensing**Zhichao Zeng¹, Baoqiang Yan², Keqing Zhang¹, Cunzheng Fan^{1*}, Zhijun Yan¹, Qizhen Sun¹***1. Huazhong University of Science and Technology, China; 2. Wuhan Textile University, China*

This study presents a pipeline leak detection method using distributed acoustic sensing. The method combines candidate prescreening with an eye-inspired structural recognition process to enhance leak related time frequency features. It distinguishes leakage from background and transient noise, achieving a recognition accuracy of 97.2%

ACP2026-0722-7

Horn-Enhanced Highly Sensitive and Directional Fiber-Optic Ultrasound Sensor**Zhi Zhang¹, Zongjing Li², Liangye Li³, Xuhao Fan⁴, Dongchen Xu¹, Geng Chen¹, Hao Li^{1*}, Wei Xiong^{2*}, Qizhen Sun¹**

1. School of Optical and Electronic Information, Huazhong University of Science and Technology, China; 2. Wuhan National Laboratory for Optoelectronics, Huazhong University of Science and Technology, China; 3. School of Information Mechanics and Sensing Engineering, Xidian University, China; 4. Department of Mechanical and Automation Engineering, The Chinese University of Hong Kong, Hong Kong, China

A horn-enhanced fiber-optic ultrasound sensor with high sensitivity and directivity is demonstrated. The sensor achieves a sensitivity of 70.3 mV/kPa and a -6 dB full angular width of 34.3°.

NP2: Microwave Photonic Devices and Systems

ACP2026-0422-1

Photonic-Electronic Co-Design for Decoupling the Linearity-CSPR Deadlock in D-Band Fiber-Wireless Links**Jiongbin Deng¹, Jia Ye^{1*}, Ningyuan Zhong¹, Peng Li¹, Xihua Zou¹, Lianshan Yan¹***1. Southwest Jiaotong University, China*

We investigate the fundamental linearity-CSPR conflict in self-coherent D-band fiber-wireless links. By employing tone reservation to relax Kramers-Kronig carrier-power constraints, our 126-GHz experiment significantly lowers the required CSPR, achieving robust 26.91-Gbps data transmission.

ACP2026-0616-4

Experimental Demonstration of a Photonics-Assisted mmWave ISAC System Using CE-LFM-OTFS Waveform**Heng Lin¹, Yanyi Wang^{1*}, Yingxiong Song¹, Jianjun Yu²**

1. Key Laboratory of Specialty Fiber Optics and Optical Access Networks, Shanghai University, China; 2. Key Laboratory for Information Science of Electromagnetic Waves, Fudan University, China

We experimentally demonstrate a photonics-assisted mmWave ISAC system using a CE-LFM-OTFS waveform, embedding a 2-GBaud 16-QAM OTFS signal into a 4-GHz LFM carrier to simultaneously achieve 3.413-Gbit/s communication and 3.75-cm sensing resolution in practical measurements.

ACP2026-0623-4

Wideband Microwave Stepped-Frequency Chirp Signal Generation Using an Optical Counter Frequency-Shifting Loop**Yudi Li¹, Chunlei Guo¹, Cong Ma^{1*}, Zhijian Zhang², Xiangchuan Wang^{2*}, Shilong Pan²***1. Dezhou University, China; 2. Nanjing University of Aeronautics and Astronautics, China*

A wideband microwave stepped-frequency chirp (SFC) signal generation method is proposed based on an optical counter frequency-shifting loop. Experimentally, a coherent SFC signal spanning 17.9–33.7 GHz with a 400 MHz frequency step is generated.

ACP2026-0625-3

Conditional Diffusion Channel Surrogate Model for End-to-End Optimization in Photonics-Aided Terahertz Communication System**Xiande Lin¹, Zhanjiang Wang¹, Cunqiang Song¹, Feixiang Zhang¹, Shuhui Zhou¹, Jianguo Yu^{1*}***1. Beijing University of Posts and Telecommunications, China*

We propose and experimentally demonstrate a single-step consistency distilled conditional diffusion channel surrogate model for end-to-end photonics-aided THz communications. It precisely captures complex channel distortions and provides high-fidelity gradients for joint transceiver optimization, achieving 3.5 Gbit/s capacity gain and 4.2 dB shaping gain at 320 GHz.

ACP2026-0626-5

High-Speed Parallel Photonic ADCs Enabled by Mode-Multiplexed Dual-Output Modulator**Peilin Li¹, Na Qian^{1*}, Rui Zhang¹, Yinfu Liu¹, Gengle Han¹, Gangqiang Zhou², Jing Wang¹, Weiwen Zou¹***1. Shanghai Jiao Tong University, China; 2. Zhejiang Lab, China*

We propose a balanced photonic ADC based on high-uniformity mode-multiplexed dual-output modulators. The two-channel ADC achieves 7.04/7.08-bit ENOBs, a maximum 0.42-dB gain imbalance and 0.58° phase error within 40-GHz input bandwidth.

ACP2026-0628-14

Atomic-Clock-Level Stabilization of Optical Frequency Division via Photothermal Locking**Haocheng Ke¹, Jiahao Hu¹, Heng Zhou¹***1. University of Electronic Science and Technology of China, China*

We stabilize a fiber Brillouin laser-based two-point optical frequency division system via photothermal feedback, producing a 10 GHz signal with phase noise of -109 dBc/Hz @100 Hz and Allan deviation of 3.4×10^{-13} @1 s.

ACP2026-0630-103

Interleaved Spectral Reshaping for Kerr-Microcomb Photonic Signal Processing**Qiao Cheng¹, Zhihui Liu^{1*}, Yuhao Xie², Chengrui Wang¹, Yunping Bai^{1*}, Xingyuan Xu¹***1. Beijing University of Posts and Telecommunications, China; 2. China Academy of Industrial Internet, China*

We propose interleaved spectral reshaping for dense Kerr microcombs, reducing required dispersion and mitigating RF power fading, offering a scalable and integrable route to high-speed photonic signal processing.

ACP2026-0630-125

A Broadband 1.0-mm Coaxial-Connector-Based Photodetector Module with RF Output Bandwidth Beyond 110 GHz**Tianyu Long^{1,2}, Beixiao Zhu¹, Linze Li^{1,2}, Baile Chen^{1*}***1. ShanghaiTech University, China; 2. FastPhide Photonics, China*

A broadband modified uni-travelling-carrier photodiode (MUTC-PD) module based on a 1.0-mm coaxial connector is demonstrated, achieving an RF output power bandwidth beyond 110 GHz. Both passive transition characterization and active photodiode module measurement are performed.

ACP2026-0630-30

Amplifier-Cutoff-Enabled 300-GHz IM/DD Photonic THz VSB Fiber-Wireless Transmission**Dayu Shi¹, Weiqi Lu¹, Yuhao Fang¹, Puzhen Yuan¹, Haojie Zhu¹, William Shieh^{1*}***1. Westlake University, China*

We propose and experimentally demonstrate a dispersion resilient 300-GHz intensity-modulation/direct-detection (IM/DD) photonic THz fiber-wireless system based on amplifier-cutoff-enabled THz vestigial sideband (VSB) formation, achieving over 100 Gb/s data rate after 50-km fiber and 1-m wireless transmission.

ACP2026-0630-37

Performance Enhancement of Photonics-Assisted Terahertz Systems via NTF-Based Adaptive Bit-Power Loading DSM**Cunqiang Song¹, Zhanjiang Wang¹, Xiande Lin¹, Feixiang Zhang¹, Shuhui Zhou¹, Jianguo Yu^{1*}***1. Beijing University of Posts and Telecommunications, China*

We propose a DSM scheme that employs adaptive bit-power loading based on the frequency response of the noise transfer function (NTF). The scheme was successfully validated through B2B transmission, as well as hybrid transmission over a 10 km SSMF link and a 10 m wireless link in a 320 GHz photonics-assisted terahertz communication system. The experimental results show that, compared to conventional schemes, the proposed scheme achieves a 7.8% improvement in spectral efficiency and, at the HD-FEC threshold of 3.8×10^{-3} , provides a gain of 0.3 dB in receiver sensitivity.

ACP2026-0630-48

Generation of Programmable Ultra-Broadband Optical Chaos via Chaos-Driven Electro-Optic Comb and Spectral Slicing**Shiyu Shi^{1,2}, Yiqun Zhang³, Mengjie Zhou⁴, Xianglei Yan³, Yunxia Yang³, Mingfeng Xu^{3*}***1. Institute of Optics and Electronics, Chinese Academy of Sciences, China; 2. College of Materials Science and Opto-Electronic Technology, University of Chinese Academy of Sciences, China; 3. State Key Laboratory of Optical Field Manipulation Science and Technology, Chinese Academy of Sciences, China; 4. Tianfu Xinglong Lake Laboratory, China*

We demonstrate a programmable ultra-broadband optical chaos architecture that drives an electro-optic comb with a chaotic microwave signal, achieving 543.8 GHz single-channel optical chaos and enabling programmable parallel chaotic channel generation.

ACP2026-0701-16

Mitigating Dispersion-Induced Power Fading in 200-GHz Fiber-Wireless Links by Injection-Locked Direct Detection**Yijun Guo¹, Xuguang Zhang¹, Yunhao Zhang¹, Bitao Shen^{1*}, Linshan Yang¹, Minglu Li¹, Luyu Wang², Tianyu Long², Lei Wang³, Baile Chen², Xingjun Wang^{1*}, Haowen Shu^{1*}***1. State Key Laboratory of Photonics and Communications, School of Electronics, Peking University, China; 2. School of Information Science and Technology, ShanghaiTech University, China; 3. Peng Cheng Laboratory, China*

We demonstrate injection-locked direct detection to mitigate dispersion-induced power fading in 200-GHz fiber-wireless links. A theoretical model is developed to reveal the fading. Experimentally, we achieve 120-Gbps signal transmission over 20-cm wireless and 15-km fiber link.

ACP2026-0701-32

Towards Non-Line-of-Sight Terahertz Physical-Layer Security Communication Using a Cyclic-Embedded Chaotic Encryption Paradigm**Qing Zhong¹, Jiao Zhang^{2*}, Min Zhu^{1*}, Zhigang Xin¹, Zhiruo Guo³, Jianxin Ren³, Mingzheng Lei², Junjie Ding², Yuancheng Cai², Bingchang Hua², Yucong Zou², Jianjun Yu⁴***1.Southeast University, China; 2.Purple Mountain Laboratories, China; 3.Nanjing University of Information Science and Technology, China; 4.Fudan University, China*

We demonstrate secure non-line-of-sight terahertz transmission at 340 GHz using an embedded cyclic chaotic system for data encryption, achieving 150 Gb/s, a key space of 10124, and up to 100% data scrambling.

ACP2026-0701-70

CNN-TCN-Attention-Based Temperature Demodulation for Multi-Notch-Depth Microwave Photonic Sensing**Jinke Wang¹, Lin Gui¹, Yue An¹***1.Shanghai polytechnic university, China*

This paper proposes a notch-depth-conditioned CNN-TCN-Attention temperature demodulation model. The experimental data cover four notch depths of 8.1, 18.3, 18.6, and 25.1 dB, the final model achieves a test-set RMSE of 1.443 °C.

ACP2026-0708-5

High-Gain Photonic RF Repeater Based on Sideband Amplification Injection Locking in Optically Injected Semiconductor Lasers**Xiaolong Zhao¹, Jin Li¹, Tao Pu^{1*}, Jilin Zheng¹, Hua Zhou¹, Haoming Li¹***1.Army Engineering University of PLA, China*

A high-gain photonic RF repeater based on sideband amplification injection locking (SAIL) in optically injected semiconductor lasers is proposed and experimentally demonstrated.

The system achieves arbitrary frequency up/down conversion across C-, Ku-, and Ka-bands with conversion efficiency exceeding -3 dB. The SAIL-induced electrical gain exceeds 37 dB across all bands, reaching up to 49.5 dB for Ka-band signals. A 20 Msymbol/s BPSK signal and a 10 Msymbol/s QPSK signal are successfully processed with error-vector magnitude (EVM) values below 6.28 % and 8.79%, respectively. The scheme requires only a single low-frequency RF source and five semiconductor lasers, offering a compact, low-power solution for reliable satellite communication links.

ACP2026-0713-20

A Low-complexity Broadband Photonic 2D Phased Array for Simultaneous Multi-beamforming**Shilong Chen^{1*}, Xue Lan¹, Zhiyuan Yang¹, Xinpeng Wang¹, Haoyan Xu¹, Feifei Yin¹, Kun Xu¹, Yitang Dai^{1*}***1.Beijing University of Posts and Telecommunications, China*

A photonic broadband 2D phased array receiver is proposed, utilizing channelization and dimension compression to enable simultaneous multibeam reception while drastically reducing control and structural complexity. Experimentally, simultaneous multibeam forming is demonstrated using a 4×4 array over within 6–10 GHz.

ACP2026-0714-55

Microwave Photonic Common-Path TDM Stepped-Frequency Ranging System Based on Serrodyne Modulation**Yufei Fu¹, Jiazhen Cai¹, Liangshun Zhao¹, Xinlu Gao^{1*}, Zhennan Zheng¹, Shanguo Huang¹***1.Beijing University of Posts and Telecommunications, China*

This paper presents a common-path coherent ranging system utilizing Serrodyne phase modulation and TDM stepped-frequency. Overcoming laser nonlinearity, environmental noise, and intermodulation distortion, both simulations and experiments validate this robust high-SNR microwave photonic ranging architecture.

ACP2026-0715-37

A Backside-Illuminated 224-Gb/s InGaAs/InP Photodetector Chip for Short-Reach Optical Interconnects**Peng Li¹***1.Southwest Jiaotong University, China*

We demonstrate a backside-microlens-assisted InGaAs/InP vertical PIN photodetector with chip-package co-design, achieving 49.4-GHz bandwidth, 0.667-A/W responsivity, 0.38-nA dark current, and 226.875-Gb/s PAM4 transmission, offering a promising solution for 224-Gb/s-class optical receivers.

ACP2026-0715-55

Hybrid GA-SA Phase Modulation Design for SBS Suppression in High-Power Narrow-Linewidth Lasers**Guangtai Zou¹, Guoqing Pu¹, Mengyue Shi^{1*}, Weisheng Hu¹, Lilin Yi^{1*}***1.Shanghai Jiao Tong University, China*

A hybrid genetic algorithm and simulated annealing approach optimizes multi-frequency phase-modulated signals to suppress stimulated Brillouin scattering in high-power narrow-linewidth fiber lasers, achieving a high threshold with enhanced spectral flatness and convergence stability.

ACP2026-0721-6

A Hybrid Frequency-To-Time and Phase Mapping Approach for Microwave Frequency Measurement**Jian Zhang¹, Lei Shan¹, Rui Ma², Chongjia Huang^{1*}, Erwin H. W. Chan^{3*}, Shengbao Wu¹, Xinlun Cai², X. Steve Yao¹***1. Hebei University, China; 2. Sun Yat-sen University, China; 3. Charles Darwin University, Australia*

A hybrid frequency-to-time and phase mapping approach using a tunable TFLN microring resonator enables accurate microwave frequency measurement from 2 to 12 GHz, achieving ± 3 MHz error and $10 \mu\text{s}$ measurement time.

ACP2026-0722-9

Demonstration of DSCM 300-GHz THz Signal Transmission over AR-HCF**Shengze Xu¹, Xuemeng Hu^{1,2}, Zebang Pi¹, Shuo Qin¹, Xiang Li², Ming Luo¹, Yunlong Bai³, Cheng Du³, Jin Tao¹, Hanbing Li¹, Ziwei Wang^{1*}, Jie Li^{1*}***1. China Information and Communication Technologies Group Corporation, China; 2. China University of Geosciences, Wuhan, China;**3. Ruiguang ICT Technology Co., LTD., China*

We demonstrate the photonics-aided 300-GHz THz transmission with digital subcarrier multiplexing signal over a 20-km AR-HCF, achieving a net data rate of 112 Gb/s with launch powers of up to 24 dBm.

NP3: Quantum Devices, Systems, Networking and Computing

ACP2026-0630-63

High-Extinction-Ratio On-Chip Optical Switch for Continuous-variable Quantum Key Distribution**Yuting Tian¹, Xuesong Xu¹, Yuanhao Li², Shiqi Zhang², Song Yu¹, Lei Zhang², Yichen Zhang^{1*}**

1. State Key Laboratory of Information Photonics and Optical Communications School of Electronic Engineering Beijing University of Posts and Telecommunications, China; 2. State Key Laboratory of Information Photonics and Optical Communications School of Integrated Circuits Beijing University of Posts and Telecommunications, China

We report a silicon photonic integrated optical switch for shot-noise-unit calibration in continuous-variable quantum key distribution system, featuring 50 dB extinction ratio, 1 dB insertion loss, and outstanding long-term switching stability.

ACP2026-0630-98

Silicon Photonic Quantum Autoencoder for Low-Overhead State Monitoring**Qiwei Wang¹, Baojie Hou¹, Haoran Ma¹, Qishen Liang¹, Zichao Zhao¹, Yueyang Liu¹, Huihui Zhu¹, Yuehai Wang¹, Jianyi Yang^{1*}***1. Zhejiang University, China*

We demonstrate reference-assisted single-port anomaly monitoring on a two-qubit silicon photonic quantum autoencoder, enabling low-overhead discrimination of channel anomalies and chip drift via trash-qubit coincidences, supported by 91.9% RHOM visibility and 97.64% state-preparation fidelity.

ACP2026-0701-54

Adaptive disaster prediction and recovery with enhanced reliability for cloud-edge collaborated quantum key distribution networks**Xinyu Wang¹, Jianghao Li^{2*}, Xiaoguo Cheng¹, Zhaopeng Xu³, Xiaosong Yu¹***1. Beijing University of Posts and Telecommunications, China; 2. Ocean University of China, China; 3. Pengcheng Laboratory, China*

We propose an adaptive disaster recovery (DR) scheme for quantum key distribution networks. Results show that the success rate of DR can be improved by 90% with sacrificing recovery latency of less than 60%.

ACP2026-0714-11

Routing based on Purification Gain Evaluation in Entanglement Resource Limited Quantum Networks**Yucen Yuan¹, Xiaosong Yu^{1*}***1. Beijing University of Posts and Telecommunications, China*

Since entanglement purification incurs additional resource consumption and latency, a purification-gain-evaluation based routing algorithm (PGER) is proposed to avoid ineffective purification. Compared with benchmark algorithms, PGER effectively balances resource consumption and fidelity gain.

ACP2026-0714-36

Achieving Fairness for Entanglement Routing under Fidelity Constraints in Quantum Networks
Samin Shokrivahed¹, Qiaolun Zhang^{1*}, Massimo Tornatore¹, Giacomo Verticale¹*1. Politecnico di Milano, Italy*

Fair resource allocation in quantum networks is challenging because entanglement routing must allocate limited link-generation capacity and quantum memory under probabilistic swapping, fidelity (entanglement quality) constraints, and purification (improving entanglement quality by consuming more pairs) overhead. As a result, requests spanning long or noisy paths are inherently harder to serve, as they have lower swapping success probability, often need purification, and consume more entanglement per usable end-to-end pair. Since previous studies on fairness in quantum networking do not account for the resource cost of meeting fidelity constraints, the problem of how fairness can be guaranteed under fidelity constraints remains open. In this work, we address this gap by proposing a new two-stage fairness-aware ER framework. We first generate, for each request, candidate strategies for (i) routing, (ii) purification (rounds of purification per link), and (iii) provisioning level (amount of resources assigned to the request). We then use an Integer Linear Programming (ILP) model to select one strategy per request under shared link and memory constraints. We measure fairness through the utility loss of each request, defined as the gap between its selected generation rate and its best achievable generation rate. This evaluates fairness relative to each request's own achievable performance, separating allocation unfairness from physical limitations due to path length, swapping loss, and purification overhead. Numerical results show that the proposed framework provides tunable fairness-efficiency trade-offs, allowing network operators to balance fairness against throughput, resource allocation, or worst-case performance.

ACP2026-0714-7

Hollow-Core-Fiber-Enabled Repetition-Rate Stabilization of Soliton Microcombs in a Silicon Nitride Microring Resonator
Zhaoyu Chen¹, Lili Wang¹, Zihang Huang¹, Yunru Fan¹, Wenwen Cui², Yu Qin³, Limin Xiao³, Yichun Shen⁴, Yong Geng¹, Kun Qiu¹, Qiang Zhou^{1*}*1. University of Electronic Science and Technology of China, China; 2. Tianfu Jiangxi Laboratory, China; 3. Fudan University, China; 4. Zhongtian Technology Advanced Materials Co., Ltd, China*

We demonstrate efficient repetition-rate noise suppression of Kerr microcombs using a hollow-core-fiber-based unbalanced Michelson interferometer (HCF-UMI). Benefiting from the reduced environmental sensitivity and chromatic dispersion of the hollow-core fiber delay line, the proposed approach suppresses long-term repetition-rate fluctuations from 8.68 kHz to 368 Hz compared with a conventional solid-core fiber implementation, achieving an approximately 20-fold improvement in repetition-rate stability.

ACP2026-0715-113 **Industry Innovation Nomination****All-Optical Suppression of Exciton Fine-Structure Splitting in a Semiconductor Quantum Dot under Continuous-Wave Two-Photon Resonant Excitation****Zihao Liu^{1,2}, kunyue Li^{1,2}, Jiawei Yang^{1,2*}, Xuan Pu^{1,2}, Ying Yu^{1,2*}, Siyuan Yu^{1,2}***1. State Key Laboratory of Optoelectronic Materials and Technologies, China; 2. School of Electronics and Information Technology, Sun Yat-sen University, China*

We suppress quantum dot fine-structure splitting via optical Stark effect under continuous-wave two-photon excitation, reducing it to 0.26 μeV . This all-optical approach holds promise for realizing high-fidelity entangled photon sources without external fields.

ACP2026-0715-2

A Timing Exposure Mitigation Algorithm Based on Path Synchronization for Entanglement Distribution Services in Quantum Networks**Zihao Wang¹, Xiaosong Yu^{1*}, Yongli Zhao¹, Liquan Chen²***1. Beijing Univ. of Posts and Telecommunications, China; 2. Southeast University, China*

This paper proposes a Path Synchronization Algorithm (PSA) for long-lived entanglement distribution services in quantum networks, mitigating waiting-induced fidelity degradation while revealing an efficiency-fidelity tradeoff.

ACP2026-0715-201

Power-Spectral-Density-Aware Noise Modeling in Quantum-Classical Coexistence Systems
Yongmei Sun^{1*}, Yuting Wang¹, Yaoxian Gao¹*1. Beijing University of Posts and Telecommunications, China*

This paper proposes a power-spectral-density-aware (PSDA) noise model for quantum-classical coexistence systems, incorporating the PSD of classical signals into nonlinear noise evaluation and reducing relative error in achievable transmission distance from 26.06% to 1.37%.

ACP2026-0715-30

Towards coherent interaction between electron qubits on solid neon via a cavity bus
Xinyuan Rong¹, Zhicheng Liu¹, Ruiming Liu¹, Zilei Zhang¹, Wang Jiang¹, Xinhao Li^{1*}*1. Westlake University, China*

We report preliminary efforts on coupling two electron qubits on solid neon via a superconducting cavity bus.

ACP2026-0715-61

High-Rate 1×4 Quantum Access Network Based on Passive Optical Network Architecture**Yan Pan¹, Jiale Mi², Heng Wang¹, Xuesong Xu², Jie Yang^{1,2}, Yang Li¹, Wei Huang¹, Yichen Zhang^{2*}, Bingjie Xu^{1*}***1. National Key Laboratory of Security Communication, Institute of Southwestern Communication, China; 2. State Key Laboratory of Information Photonics and Optical Communications, Beijing University of Posts and Telecommunications, China*

We demonstrate a high-rate 1×4 discrete-modulated continuous-variable quantum access network based on passive optical network architecture, achieving an average per-user secret key rate of 21.48 Mbps over an 11-km fiber link.

ACP2026-0715-78

A Prediction-Assisted Risk-Aware Adaptive K-Shortest-Path Routing for QKD Networks**Yuanchen Hao^{1*}, Qi Zhao¹, Jianjun Tang¹***1. China Telecom Research Institute, China*

To mitigate bottleneck depletion in trusted-relay QKD networks, PRAK-QKD combines inventory prediction, K-shortest-path generation, and two-stage risk-aware selection, yielding the lowest average comprehensive routing cost across seven request arrival intensities, 27.41% below Key-Aware OSPF overall.

ACP2026-0721-1

Correlated Photon Pairs Generation via Cascaded Forward SHG and Backward SPDC Processes**Hongyu Cai¹, Yunru Fan¹, Dan Xu¹, Yanyu Wei¹, Hao Li², Lixing You², Guanggan Guo¹, Qiang Zhou³***1. University of Electronic Science and Technology of China, China; 2. Shanghai Institute of Microsystem and Information Technology Chinese Academy of Sciences, China; 3. University of Science and Technology of China, China*

We demonstrate the generation of correlated photon pairs via cascaded forward SHG and backward SPDC processes. By integrating the periodically poled lithium niobate (PPLN) waveguide with a reflection structure, we obtain a coincidence-to-accidental ratio (CAR) of approximately 1000 at a pump power of 2 mW, with single-side photon count rates of 0.80 MHz and 0.75 MHz, and a coincidence count rate of approximately 180 kHz. Our results pave the way for the development of practical, high-signal-to-noise-ratio, and long-distance quantum communication networks.

NP4: Materials, Nanofabrication, and Characterization Techniques

ACP2026-0612-1

End-to-End Optimization of Metasurface Encoders for Snapshot Near-Infrared Hyperspectral Imaging**Jiayu Di^{1,2}, Zhenming Yu^{1,2*}, Qifan Liu^{1,2}, Yanfeng Liu^{1,2}, Wei Zhang³, Kun Xu^{1,2}***1. Beijing University of Posts and Telecommunications, China; 2. Xiong'an Aerospace Information Research Institute, China; 3. Hebei Xiong'an Transportation Investment Co., Ltd, China*

We propose an end-to-end optimization framework for 700–1000 nm snapshot near-infrared hyperspectral imaging with 31 spectral channels. A differentiable surrogate model is trained using 500 informative hard samples selected from 2000 FDTD-generated C4-symmetric metasurface structures, together with full-dataset samples to preserve the physical structure-spectrum mapping. The trained surrogate is embedded into the reconstruction pipeline, enabling joint optimization of the metasurface encoder and neural reconstruction network under reconstruction loss and spectral-correlation regularization. Simulation results show that the optimized system achieves a PSNR of 35.60 dB with a spectral correlation coefficient of 0.21, demonstrating the effectiveness of task-driven metasurface encoder design for compact snapshot NIR hyperspectral imaging.

ACP2026-0627-6

Magnetic induction intensity sensor based on accidental quasi-bound states in the continuum**Chengbo Du¹, Donghe Sheng¹, Huiping Tian^{1*}***1. Beijing University of Posts and Telecommunications, China*

We propose a magnetic induction intensity sensor with a large asymmetry parameter base on accidental quasi-bound states in the continuum. The sensor has high quality-factor and high figure of merit.

ACP2026-0628-9

Data-Efficient Speckle Spectral Reconstruction via Reinforcement Learning-Assisted Sample Re-Selection**Ruiying Yang¹, Sitong Zhou^{1*}***1. Beijing University of Posts and Telecommunications, China*

We present a data-efficient fiber speckle spectral reconstruction method based on reinforcement learning (RL)-agent-assisted labeled sample selection. A ViT-based end-to-end network maps speckle images to spectra, while the RL-agent selects informative samples using reconstruction uncertainty, error, and spectral characteristics. Compared with the end-to-end baseline, the RL-agent-assisted strategy reduces RMSE and SAM by 11.13% and 11.03%, respectively, improving reconstruction accuracy and spectral similarity under the same acquisition budget.

ACP2026-0630-105

A Metallic Quasi-BIC Dual-rod Metasurface for High-Sensitivity Label-Free Biosensing
Chengcheng Huang¹, Zhengtai Ma¹, Yiyang Xie^{1*}*1. Beijing University of Technology, China*

Plasmonic metasurface sensors have garnered substantial interest for label-free, real-time biochemical detection; however, their practical deployment is frequently constrained by intrinsic Ohmic losses in metals and concomitantly low quality (Q) factors, which together curtail the achievable resolution and sensitivity. Here, we propose and demonstrate a Au dual-strip metasurface that supports quasi-bound states in the continuum (QBIC) for the refractive-index sensing of sodium chloride (NaCl) solutions. The metasurface unit cell comprises two vertically oriented, asymmetric rods. By intentionally breaking the in-plane symmetry, the otherwise optically dark bound state in the continuum is converted into a leaky quasi-BIC mode. When the metasurface is immersed in NaCl solutions of varying concentrations, the resonance wavelength exhibits a systematic redshift with increasing refractive index, yielding a sensitivity of 227.9 nm/RIU. Our findings demonstrate that metallic QBIC metasurfaces provide a straightforward yet high-performance pathway for liquid-phase biochemical sensing. With further structural optimization and surface functionalization, this platform holds promise for applications in biomolecular assays, water-quality monitoring, and lab-on-a-chip systems.

ACP2026-0701-222

A Multi-Parameter Surface Measurement Method Based on Dual-Channel Signal Fusion
Weimin Lou¹, Huan Chen^{1*}, Peng Yang¹, Kaiqing Chen¹, Xinyi Huang^{1,2}, Bosong Duan³*1. Zhejiang Institute of Quality Sciences, China; 2. China Jiliang University, China; 3. Zhejiang University, China*

A dual-modal fusion method combining coaxial light-field imaging and laser scanning enables non-contact measurement of cement test blocks, simultaneously acquiring 2D profiles and 3D flatness with errors within 0.29 mm and 0.02 mm.

ACP2026-0701-52

Microscopic conjugate imaging and amplitude gradient phase retrieval for physical phase decoupling and reconstruction of double-sided wafers**Tuo Li^{1*}, Tianyu Gao¹, Lei Liang¹, Kaili Ren¹***1. Xi'an University of Posts & Telecommunications, China*

The microscopic conjugate imaging and amplitude gradient phase retrieval method is an effective solution for double-sided objects. However, when signals from the front and back surfaces overlap, the performance of traditional phase retrieval methods will sharply decrease due to defocus noise. Ptychography can reconstruct 3D information, but it is slow because it needs many images. To address this issue, we propose a method that uses only two intensity images to separate and reconstruct the phase of both surfaces. The performance of this method is much better than traditional methods because it reduces data and stops interference between layers. Therefore, this method is useful for double-sided objects, and a series of simulations and experiments demonstrates its effectiveness.

ACP2026-0715-104

Curvature-Engineered Imbalanced Silicon Nitride Slot Microring for Liquid-Phase Refractometric Sensing**Zida Zheng¹, Yinyin Song², Yuxiang Zeng², Lan Li^{1*}***1. Westlake University, China; 2. Westlake Institute for Optoelectronics, China*

Bending a slot waveguide into a microring creates rail inequivalence and mode redistribution. We introduce an imbalanced SiN slot microring with unequal rail widths to compensate curvature effects, achieving 330 nm/RIU sensitivity and demonstrating rail-width imbalance as an effective design parameter.

ACP2026-0715-89

In-Situ Fabrication of All-Dielectric Metasurfaces on Optical Fiber End Facets**Mingke Jin¹, Jingyi Tian^{1*}***1. Westlake University, China*

We report an in-situ fabrication process for integrating all-dielectric silicon metasurfaces onto optical fiber end facets using EBL and ICP-RIE with custom holders, achieving high-fidelity nanostructures and high-Q BIC resonances in the C-band.

ACP2026-0716-6

A Compact FTIR System for Rapid Screening of Toxic Precursors in Plastic Recycling**Wei Luo¹, Chaoqia Wei¹, Suwan Sun¹, Qiankun Li¹, Xinbo Di¹, Xueying Sun¹, Liangliang Zhang¹, Chengbo Mou¹, Hairun Guo^{1*}***1. Shanghai University, China*

We set up a compact Fourier transform infrared spectrometer with commercial-grade performance on a 30 cm×30 cm breadboard. The system enables characteristic functional group detection and presorting of three macroscopic polymer materials.

Demo Zone

ACP2026-0701-20	Demonstrating Agentic AI for Intent–Aware Soft Failure Recovery in Optical Networks
ACP2026-0801-1	First Real–Time Demonstration of 6G Holographic Immersive Communications over an All–Optically Integrated Photonic Terahertz System
ACP2026-0801-2	Interactive Demonstration of an 8K Super Multi–View Light Field 3D Display with 234 Directional Views for Glasses–Free Visualization
ACP2026-0801-3	A Demonstration of Underwater Multi–Robot Cooperative Localization Enabled by Optical Wireless Links

ACP2026-0701-20

Demonstrating Agentic AI for Intent–Aware Soft Failure Recovery in Optical Networks

Mehrad Vaezi^{1*}, Qingyi Guo¹, Yujiao Hao¹, Bowen Ding¹, Mahdi Hemmati¹, Yuren You¹, Christopher Janz¹

1. Huawei Canada, Canada

We demonstrate an intent–driven multi–agent system for autonomous soft failure recovery. It integrates knowledge graph–driven diagnosis with digital twin validation to achieve automated service restoration on a real testbed.

ACP2026-0801-1

First Real–Time Demonstration of 6G Holographic Immersive Communications over an All–Optically Integrated Photonic Terahertz System

Jiao Zhang¹, Yucong Zou¹, Min Zhu², Hongfei Xia³, Yanbin Liu³, Bingchang Hua¹, Mingzheng Lei¹, Yuancheng Cai¹, Junjie Ding¹, Ping Lu³, Yongming Huang¹

1. Purple Mountain Laboratories, China; 2. Southeast University, China; 3. ZTE Corporation, China

The first photonic terahertz holographic communication prototype is demonstrated, featuring an all–optical architecture with 10–200 Gbps and sub–50 ms latency, enabling real–time holographic transmission and immersive 6DoF multimodal interaction via edge–cloud rendering.

ACP2026-0801-2

Interactive Demonstration of an 8K Super Multi–View Light Field 3D Display with 234 Directional Views for Glasses–Free Visualization

Yuhang Zhao¹

1. Beihang University, China

We demonstrate a super multi–view light field 3D display with 234 directional views over a 45° viewing angle on an 8K LCD, achieving a balanced trade–off among spatial resolution, angular sampling, and glasses–free 3D visualization.

ACP2026-0801-3

A Demonstration of Underwater Multi–Robot Cooperative Localization Enabled by Optical Wireless Links

Yifan Peng¹, Qihang Liu¹, Binbin Zhu², Changyuan Yu³, Zixian Wei^{3*}, Junfeng Wu^{1*}

1. The Chinese University of Hong Kong, Shenzhen, China; 2. Shenzhen Hua Chuang Chip Lighting Co., Ltd., China; 3. Hong Kong Polytechnic University, Hong Kong, China

We demonstrate an underwater multi–robot prototype integrating optical communication with visual–inertial SLAM for low–latency exchange of states, observations, and maps through transceiver exhibits, computer–based node emulation, and recorded underwater tests in an interactive onsite demonstration.

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