2026 OGC

The 11th Optoelectronics Global Conference

第十一届全球光电大会

Program Book
日程手册

Shenzhen, China
September 08 – 11, 2026

中国·深圳
2026年9月08-11日

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CONFERENCE COMMITTEE

Honorary Chair

Xiancheng Yang, Chairman of China International Optoelectronic Exposition Organizing Committee Office, China

General Chairs

Baojun Li, Jinan University, China

Qionghua Wang, Beihang University, China

John Dudley, Université de Franche-Comté, France

Qihuang Gong, Peking University, China

Chennupati Jagadish, Australian National University, Australia

David Neil Payne, University of Southampton, UK

Program Chairs

Gina, Jinna Chen, Southern University of Science and Technology, China

Xia Yu, Beihang University, China

Sze Y. Set, The University of Tokyo, Japan

Anna Peacock, University of Southampton, UK

Ken Oh, Yonsei University, South Korea

George Humbert, CNRS, France

Neil Broderick, Auckland University, New Zealand

Xiang Zhou, Google, USA

Local Organizing Committee Chairs

Huanhuan Liu, Shenzhen Institute of Advanced Technology, CAS, China

Hai Yuan, Shenzhen Institute of Advanced Technology, Chinese Academy of Sciences, China

Zhaohui Li, Sun Yat-Sen University, China

Yunxu Sun, Harbin Institute of Technology, Shenzhen, China

Songnian Fu, Guangdong University of Technology, China

Changrui Liao, Shenzhen University, China

Publication Chairs

Yiyang Luo, Chongqing University, China

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

Lisong Yan, Huazhong University of Science and Technology, China

Sponsorship Chairs

Zhengji Xu, Sun Yat-sen University, China

Tianxun Gong, University of Electronic Science and Technology of China, China

Lei Han, Inner Mongolia Agricultural University, China

Special Session Chairs

Tianye Huang, China University of Geosciences (Wuhan), China

Xian Zhou, University of Science and Technology Beijing, China

Workshop Chairs

Dongmei Huang, The Hong Kong Polytechnic University, China

Francesco Chiavaioli, "Nello Carrara" Institute of Applied Physics, CNR-IFAC, Italy

Hong Dang, Hangzhou International Innovation Institute, Beihang University, China

Publicity Chairs

Howard Lee, University of California, Irvine, USA

Chao Wang, University of Kent, UK

Shuyan Zhang, Tokyo Electron America, USA

Finance Chairs

Huizi Li, Shanghai Institute of Microsystem and Information Technology, CAS, China

Chenxu Lu, Xiamen University, China

International Advisory Committee

Songhao Liu, South China Normal University, China

Yunjie Liu, China Unicom Co. Ltd., China

Xun Hou, Xi'an Institute of Optics and Precision Mechanics, Chinese Academy of Sciences, China

Jianquan Yao, Tianjin University, China

Huilin Jiang, Changchun University of Science and Technology, China

Ziseng Zhao, Wuhan Research Institute of Posts and Telecommunications, China

Zhizhan Xu, Shanghai Institute of Optics and Precision Mechanics, Chinese Academy of Sciences, China

Shuisheng Jian, Beijing Jiaotong University, China

Dianyuan Fan, Shenzhen University, China

Lijun Wang, Changchun Institute of Optics and Fine Mechanics and Physics, Chinese Academy of Sciences, China

Wenqing Liu, Anhui Institute of Optics and Fine Mechanics, Chinese Academy of Sciences, China

Shaohua Yu, China Information Communication Technologies Group Corporation, China

Ying Gu, The General Hospital of the People's Liberation Army, China

Symposia Chairs

S1. Laser Technology

Dingyuan Tang, Shenzhen Technology University, China

Guoqiang Xie, Shanghai Jiao Tong University, China

Rich Mildren, Macquarie University, Australia

Chen Yung-Fu, Yang Ming Chiao Tung University, China

S2. Optical Communication and Networks

Lei Deng, Huazhong University of Science and Technology, China

Xiaodan Pang, Zhejiang University, China

Junwen Zhang, Fudan University, China

Jianping Li, Guangdong University of Technology, China

Qi Yang, Huazhong University of Science and Technology, China

Xijia Zheng, Google LLC, Sunnyvale, CA, USA

S3. Metamaterials and Photonic Crystals

Longqing Cong, Southern University of Science and Technology, China

Hongchao Liu, University of Macau, China

Huifang Zhang, University of Electronic Science and Technology of China, China

S4. Quantum Optics and Information

Kemi Xu, Beijing Institute of Technology, China

Qiang Zhou, University of Electronic Science and Technology of China, China

Yong-Chun Liu, Tsinghua University, China

Xuejian Wu, Rutgers University-Newark, USA

S5. Fiber-Based Technologies and Applications

Xia Yu, Beihang University, China

Yuwen Qin, Guangdong University of Technology, China

Lei Wei, Nanyang Technological University, Singapore

Youngjoo Chung, Gwangju Institute of Science and Technology, South Korea

S6. Optoelectronic Devices and Applications

Huizi Li, Shanghai Institute of Microsystem and Information Technology(CAS), China

Hongwei Chen, Tsinghua University, China

Yu Yu, Huazhong University of Science and Technology, China

Xuhan Guo, Shanghai Jiao Tong University, China

Chaoran Huang, The Chinese University of Hong Kong, China

S7. Biophotonics and Optical Biomedicine

Gina, Jinna Chen, Southern University of Science and Technology, China

Linbo Liu, Nanyang Technological University, Singapore

Junle Qu, Shenzhen University, China

Haoyun Wei, Tsinghua University, China

Guanghui Wang, Nanjing University, China

S8. Data Center Optical Interconnects and Networks

Fan Zhang, Peking University, China

Yongli Zhao, University of Posts and Telecommunications, China

Jianqiang Li, LightsAI, USA

Liang Dou, Alibaba Cloud, Beijing, China

Yixiao Zhu, Shanghai Jiao Tong University, China

S9. Silicon Photonics

Mingbin Yu, Bei Jing Yan Dong Microelectronic Technology Co., Ltd., China

Zeng Li, Huawei Technologies CO., LTD., China

Xiao Xi, National Information Optoelectronics Innovation Center, CICT, China

Di Liang, Hewlett Packard Labs, USA

Qize Zhong, Shanghai University, China

S10. Computational Imaging

Fucai Zhang, Southern University of Science and Technology, China

Chao Zuo, Nanjing University of Science and Technology, China

Liangcai Cao, Tsinghua University, China

Special Sessions Chairs

T1. Mid Infrared Lasers and their Applications

Chunyu Guo, Shenzhen University, China

Ming Yan, East China Normal University, China

Tengfei Wu, Beijing Institute of Metrology, China

Houkun Liang, Sichuan University, China

Lei Jin, Harbin Engineering University, China

Meng Pang, Shanghai Institute of Optics and Fine Mechanics, CAS, China

T2. Photonics for Ocean

Qi Wu, Harbin Institute of Technology, China;
Southern Marine Science and Engineering Guangdong Laboratory (Guangzhou), China

Fuyin Wang, National University of Defense Technology, China

Guojun Wu, Xi'an Institute of Optics and Precision Mechanics, Chinese Academy of Sciences; Laoshan National Laboratory, China

Zhaohui Li, Sun Yat-Sen University, China

Jing Xu, Zhejiang University, China

Liyang Shao, Southern University of Science and Technology, China

Tuan Guo, Jinan University, China

Weihong Bi, ZhongShan Institute of Changchun University of Science and Technology, Changchun, China; Ocean Research Institute of Yanshan University, Qinhuangdao, China

T3. Optoelectronics EDA Software

Lei Wang, Pengcheng Lab, China

Genxiang Chen, Minzu University of China, China

Weiping Huang, Shandong University, China

T4. Automotive Optoelectronics

Gordon Ning Liu, Soochow University, China

Xian Zhou, University of Science and Technology Beijing, China

Haining Yang, Southeast University, China

Jing Wang, Southern University of Science and Technology, China

Zhiyong Feng, Huawei Technologies, China

T5. Optical Communication and Sensing Technologies

Jinlong Wei, Pengcheng Laboratory, China

Yuyang Liu, China Telecom, China

Jim Zou, Adtran Networks, USA

Xuping Zhang, Nanjing University, China

Muhammad Hunain Memon, University of Science and Technology of China, China

T6. Photonic Integration

Kan Wu, Shanghai Jiao Tong University, China

Hao Wang, Beihang University, China

Qifeng Ruan, Harbin Institute of Technology (Shenzhen), China

T7. Photonic Sensing

Tianye Huang, China University of Geosciences (Wuhan), China

Chunmei Ouyang, Tianjin University, China

Zhilin Xu, Huazhong University of Science and Technology, China

Zhiyong Zhao, Huazhong University of Science and Technology, China

Workshops Chairs

W1. Advanced Specialty Optical Fiber and Applications

Zhenggang Lian, Yangtze Optical Electronics Co., China

Meisong Liao, Shanghai Institute of Optics and Fine Mechanics, CAS, China

Jing Zhang, China University of Geosciences, Wuhan, China

Chong Hou, Huazhong University of Science and Technology, China

W2. Optical Sensing for Safety

Dongmei Huang, The Hong Kong Polytechnic University, China

Zhixun Wang, The Hong Kong Polytechnic University, China

W3. PhotoniX Life Workshop on Life Science and Application

Junle Qu, Shenzhen University, China

Ammasi Periasamy, University of Virginia, USA

Perry Ping Shum, IEEE Photonics Society

Xu-Feng Huang, University of Wollongong, Australia

Xiuyun Liu, Tianjin University, China

Kailiang Xu, Fudan University, China

Special Events Chairs

C1. Optoelectronics Innovation Challenge

Qizhen Sun, Huazhong University of Science and Technology, China

Lei Wei, Nanyang Technological University, Singapore

Jiajia Chen, Chalmers University of Technology, Sweden

Fei Luo, FLT Inc. USA

Xin Gong, FemtoFiberTec GmbH, Germany

INVITED TALKS

S1. Laser Technology

Dongmei Huang

The Hong Kong Polytechnic University, China

Yani Zuo

National Institute of Metrology, China

Kai Wang

Southern University of Science and Technology, China

Ran Xia

South-Central Minzu University, China

Wenjia Li

Shenzhen Gongda Laser Co., Ltd., China

Mohammed Zahed M Khan

Anglia Ruskin University, UK

Feng Li

Xi'an Jiaotong University, China

S2. Optical Communication and Networks

Jingchi Li

Shanghai Jiao Tong University, China

Tao Yang

Beijing University of Posts and Telecommunications, China

Xiaosong Yu

Beijing University of Posts and Telecommunications, China

Lihua Ruan

Pengcheng Laboratory, China

Anhui Liang

Yango University, China

Alan Pak Tao Lau

The Hong Kong Polytechnic University, China

Xu Wang

National University of Ireland Maynooth, Ireland

Kangping Zhong

The Hong Kong Polytechnic University, China

S3. Metamaterials and Photonic Crystals

Chen Chen

Nanjing University, China

Ran Chen

Institute of Process Engineering, Chinese Academy of Sciences, China

Hao Wang

Beihang University, China

Junxing Fan

Shenzhen Institute for Advanced Study, University of Electronic Science and Technology of China, China

Jihua Zhang

Songshan Lake Materials Laboratory, China

Fei Ding

Eastern Institute of Technology, Ningbo, China

Hongchao Liu

University of Macau, China

Yi Li

Southern University of Science and Technology, China

Yachao Liu

Shenzhen University, China

Guizhen Xu

Southern University of Science and Technology, China

Zi-Lan Deng

Jinan University, China

Wange Song

Nanjing University, China

S4. Quantum Optics and Information

Fan Jiang

National Laboratory of Electromagnetic Space Security, China

Ruoran Meng

University of Science and Technology of China, China

S5. Fiber-Based Technologies and Applications

Ye Tian

Harbin Engineering University, China

Yang Yue

Xi'an Jiaotong University, China

Yu Wang

Taiyuan University of Technology, China

Daiqi Xiong

Beihang University, China

Zhixun Wang

The Hong Kong Polytechnic University, China

Hao Li

Huazhong University of Science and Technology, China

Liangye Li

Xidian University, China

S6. Optoelectronic Devices and Applications

Changzheng Sun

Tsinghua University, China

Jiu-An Lv

Westlake University, China

Huifu Xiao

Lanzhou University, China

Jiawei Wang

Harbin Institute of Technology Shenzhen, China

Ang Li

Nanjing University of Aeronautics and Astronautics, China

Liang Liu

Shanghai Jiao Tong University, China

Dmitry Shtarev

St. Petersburg State University, Russia

Vincenzo Pecunia

Simon Fraser University, Canada

Qiancheng Zhao

Southern University of Science and Technology, China

Yuefei Cai

Southern University of Science and Technology, China

Qasim Muhammad

Beijing Institute of Technology, China

Muhammad Hunain Memon

University of Science and Technology of China, China

Xiankai Sun

The Chinese University of Hong Kong, China

Wenjia Zhang

Shanghai Jiao Tong University, China

S7. Biophotonics and Optical Biomedicine

Heming Wei

Shanghai University, China

Hongbao Xin

Jinan University, China

Yu Chen

Fujian Normal University, China

Ruochong Zhang

A*STAR Skin Research Labs, Singapore

Kun Chen

University of Electronic Science and Technology of China, China

Bingwei Liu

University of Shanghai for Science and Technology, China

S8. Data Center Optical Interconnects and Networks

Shaohua Hu

University of Electronic Science and Technology of China, China

Rongping Lin

University of Electronic Science and Technology of China, China

S9. Silicon Photonics

Yu He

Shanghai Jiao Tong University, China

Zhenzhou Cheng

Tianjin University, China

Feng He

Harbin Institute of Technology (Shenzhen), China

Qingming Chen

Sun Yat-Sen University, China

Yanjing Zhao

National Optoelectronics Innovation Center, China

Siyang Liu

Wuhan Wuyue Optoelectronic Technology, China

Jing Wang

Southern University of Science and Technology, China

Xiao Hu

Zhangjiang Laboratory, China

Kensuke Ogawa

Innovation & Research Center, Shenzhen Yuto Packaging Technology Co. Ltd, China

Ping Zhao

Sichuan University, China

Wei Wang

Shanghai Industrial μTechnology Research Institute (SITRI), China

Yan Yang

Institute of Microelectronics, Chinese Academy of Sciences, China

Zihao Wang

Institute of Physics, Chinese Academy of Sciences, China

Yuan Dong

Shanghai University, China

Baisong Chen

Jilin University, China

S10. Computational Imaging

Yuxi Fu

State Key Lab of Ultrafast Optical Science and Technology, China

Jingdan Liu

Shanghai Institute of Optics and Fine Mechanics, Chinese Academy of Sciences, China

Zhibin Sun

ShanghaiTech University, China

Hao Sha

Harbin Institute of Technology (Shenzhen), China

Ping Su

Tsinghua Shenzhen International Graduate School, China

Tomas Aidukas

EPFL, PSI, Switzerland

Honggang Gu

Huazhong University of Science & Technology, China

Yudong Yao

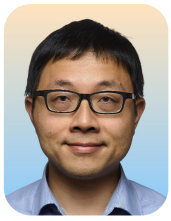
ShanghaiTech University, China

Hui Zhang

South China University of Technology, China

Huixiang Lin

Institute of Advanced Light Source Facilities, Shenzhen, China



Edmund Lam

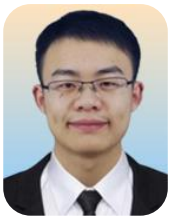
The University of Hong Kong, China

Qiegen Liu

Nanchang University, China

Chang Qiao

Tsinghua University, China



Jiaming Qian

Nanjing University of Science and Technology, China

Yunhui Gao

Tsinghua University, China

Shijie Feng

Nanjing University of Science and Technology, China

T1. Mid Infrared Lasers and their Applications

Junqing Zhao

Shenzhen Technology University, China

Chunyu Guo

Shenzhen University, China

T2. Photonics for Ocean

Fuyin Wang

National University of Defense Technology, China

Zhaoshuo Tian

Harbin Institute of Technology (Weihai), China

Qi Wu

1. Southern Marine Science and Engineering Guangdong Laboratory (Guangzhou), Guangzhou, China. 2. School of Sciences and Qingdao Research Institute, Harbin Institute of Technology

Jing Xu

Zhejiang University, China

Guojun Wu

Xi'an Institute of Optics and Precision Mechanics, Chinese Academy of Sciences; Laoshan National Laboratory, China

Zijing Zhang

Harbin Institute of Technology, China

Bin Luo

Southern University of Science and Technology, China

Zhengyong Liu

Sun Yat-sen University, China

Yang Yang

Harbin Institute of Technology, Shenzhen, China

Wenbo Sun

CICORE, China

Ran Liao

Southern University of Science and Technology, China

Weihong Bi

ZhongShan Institute of Changchun University of Science and Technology, Changchun, China; Ocean Research Institute of Yanshan University, Qinhuangdao, China

Yafei Li

Jinan University, China

Jiajin Li

CICO Research Global Co., Ltd., China

T3. Optoelectronics EDA Software

Ruping Cao

Semitronix, China

Xiaoming Liu

Empyrean Technology, China

Zheng Zhou

Ansys part of Synopsys, China

Qisheng Yang

Hunan University, China

T4. Automotive Optoelectronics

Yang Liu

Harbin Institute of Technology, Chin

Yaxi Yan

The Hong Kong Polytechnic University, China

Zixian Wei

The Hong Kong Polytechnic University, China

Zhenming Yu

Beijing University of Posts and Telecommunications, China

Wei Jiang

The Hong Kong University of Science and Technology (Guang Zhou), China

Wei Jiang

Nanjing University, China

Juan Liu

Beijing Institute of Technology, China

Enyu Zhou

Huawei Technologies Co. Ltd, China

Hui Li

Shenzhen Technology University, China

Yuning Zhang

Southeast University, China

Yuanbo Deng

Nanjing ReaVis Technology Co., Ltd., China

T5. Optical Communication and Sensing Technologies

Hongyan Fu

Tsinghua University, China

Xiang Li

China University of Geoscience (Wuhan), China

Yunping Bai

Beijing University of Posts and Telecommunications, China

Zhaopeng Xu

Pengcheng Laboratory, China

Yuan Luo

The Chinese University of Hong Kong (Shenzhen), China

Xianqing Jin

Great Bay University, China

Xiaodan Pang

Zhejiang University, China

Bowen Liu

Keio University, Japan

Gordon Ning Liu

Soochow University, China

Chunhui Yao

GlitterinTech Limited, China

Yunyun Huang

Jinan University, China

Yixiao Zhu

Shanghai Jiao Tong University, China

Lu Zhang

Zhejiang University, China

Qi Wu

The Hong Kong Polytechnic University, China

T6. Photonic Integration

Shiqi Hu

Pohang University of Science and Technology (POSTECH)/Korea Advanced Institute of Science and Technology (KAIST), China

Dezhi Tan

Zhejiang University, China

Bing Han

Shanghai Jiao Tong University, China

Qian Li

Peking University, China

Xiaoxin Li

Hangzhou International Innovation Institute of Beihang University, China

Yuanbin Liu

Shenzhen University, China

T7. Photonic Sensing

Huizi Li

Shanghai Institute of Microsystem and Information Technology, CAS, China

Jing Zhang

China University of Geosciences (Wuhan), China

Qingwen Liu

Shanghai Jiao Tong University, China

Zewei Luo

Sichuan University, China

W1. Advanced Specialty Optical Fiber and Applications

Fetah Benabid

GPPMM group, XLIM Research Institute, CNRS-Université de Limoges, France

Markus Roehner

CeramOptec/Biolitec, Germany

Fei Yu

Shanghai Institute of Optics and Fine Mechanics, CAS, China

George Y. Chen

Shenzhen University, China

Wei Li

Beihang University, Tianmushan Laboratory, China

Wei Gao

Yangtze Optical Electronics Co., Ltd., China

W2. Optical Sensing for Safety

Wei Jin

The Hong Kong Polytechnic University, China

Haoran Meng

Southern University of Science and Technology, China

Yongkang Dong

Harbin Institute of Technology, China

Linbo Liu

Guangzhou Laboratory, China

Kaiwei Li

Jilin University, China

Xi Liu

Huawei Technologies Co. Ltd, China

Jun He

Shenzhen university, China

Hongkun Zheng

Northeastern University, China

W3. PhotoniX Life Workshop on Life Science and Application

Ting Feng

Fudan University, China

Xiran Cai

ShanghaiTech University, China

Lili Gui

Beijing University of Posts and Telecommunications, China

Chunzhu Zhao

Peking University, China

Diya Wang

Xi'an Jiaotong University, China

Hongli Chen

Peking Union Medical College, China

CONFERENCE VENUE

OGC Location: South Lobby Conference Area (1st Floor) | 会场区域：一楼南登会议区（南登录大厅西侧）

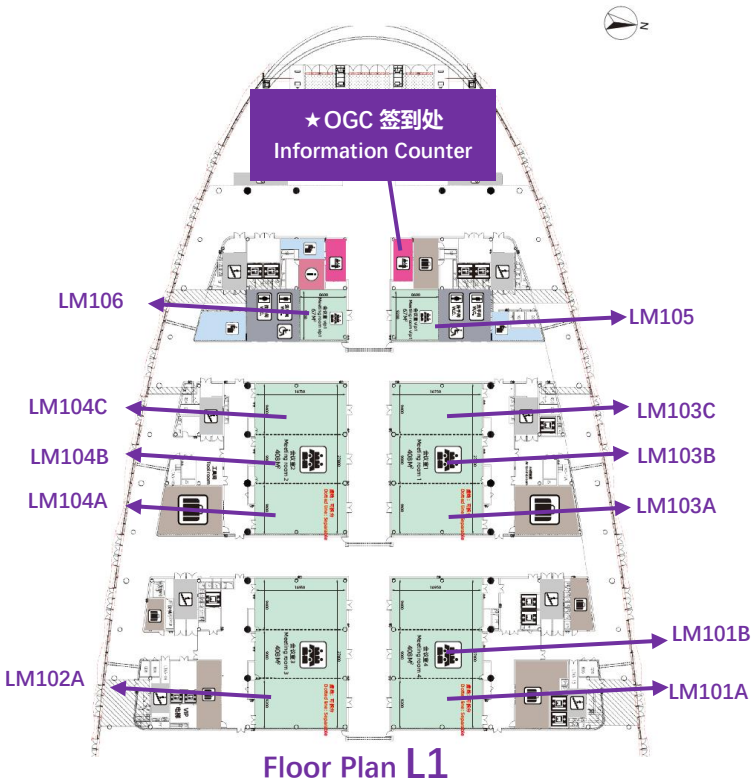
Information Counter: Outside LM105 /1F | 南登录大厅西侧一楼 LM 会议区域处

Opening Ceremony: South Ballroom A (Mangrove Hall A) /2F | 南登录大厅二层红树林厅 A

Lunch: Hall 7, Gate 10, 2nd Grab n Go| 7 号馆 10 号门二层

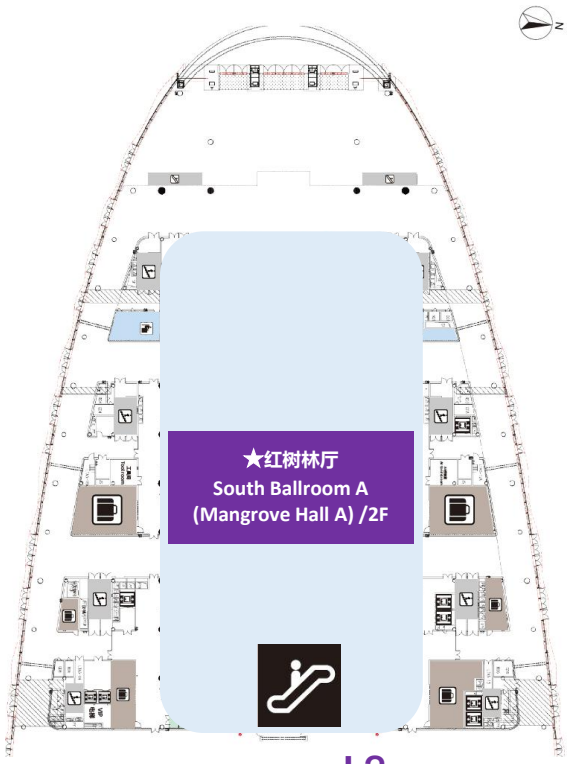
Banquet: Deking Multifunction Room 2F, Dejin Convention International Hotel| 深圳德金会展国际酒店 2F 德金多功能厅

Please inquire at the information counter and collect your daily meal voucher | 请于签到台咨询并领取当日餐券



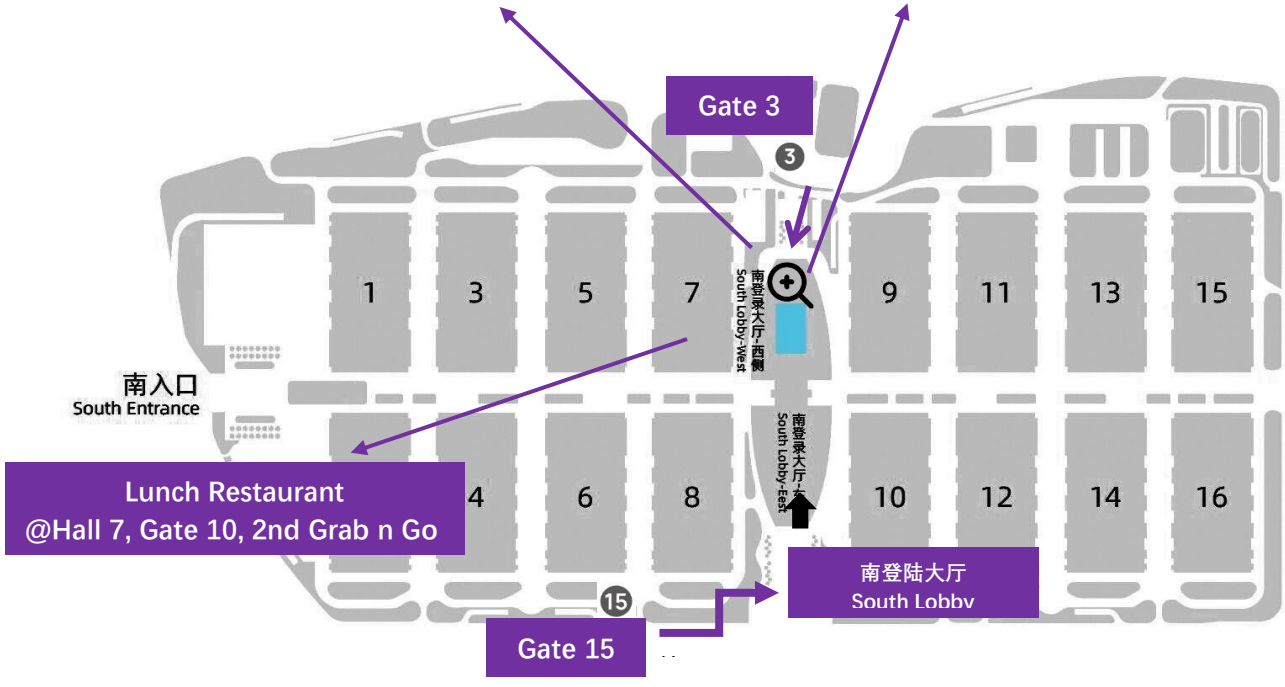
Floor Plan L1

南登录大厅西侧 1 楼



Floor Plan L2

南登录大厅西侧 2 楼



CONFERENCE GUIDELINE

➢ Oral Presentation

- The duration of an Invited Speech is 30 minutes, for paper presentation slot is 15 minutes. Please target your lecture for a duration of about 13 minutes for the presentation plus about 2 minutes for questions from the audience.
- Your punctual arrival and active involvement in each session will be highly appreciated.
- Get your presentation PPT or PDF files prepared and backed up.
- Laptops, projector & screen, laser sticks will be provided by the conference organizer.

➢ Poster Presentation

- It's expected that at least one author stands by the poster for (most of the time of) the duration of the poster session. This is essential both to present your work to anyone interest in it and to make sure that your presence is verified by committee.

➢ Security

- Please ensure that you take your belongings with you at all times when leaving a room. Do not leave bags or laptops unattended.

➢ Name Badge

- For security purposes, delegates, Presenters, exhibitors and staff are required to wear their name badge to all sessions and social functions. Entrance into sessions is restricted to registered delegates only. If you misplace your name badge, please replace at the registration counter.

CONFERENCE AGENDA

September 8, 2026 | Tuesday

Time	*Activities*	
10:00-17:00	**Sign-in & Materials Collection**	Venue: Outside LM105 /1F

September 9, 2026 | Wednesday

Opening Ceremony

EMCEE: Daiqi Xiong, Beihang University, China

ChenweiXu, Beijing Institute of Technology, Zhuhai, China

Venue: Mangrove A, Second Floor, South Entrance Hall, Shenzhen World Exhibition & Convention Center

Time	*Activities*
10:00-10:05	**OGC 2026 Opening Remark** Perry Ping Shum, The 37th President of IEEE Photonics Society
10:05-10:15	Signing Ceremony & Launch Ceremony for Longsight
10:15-10:20	OGC 2026 Plaque Awarding Ceremony
10:20-10:30	LSA Awards Ceremony
10:30-10:40	OGC 2026 Awards Ceremony
10:40-10:55	PhotoniX Life Journal Recommendation & Certificate of Appointment Ceremony

OGC 2026 Plenary Speeches

Venue: Mangrove A, Second Floor, South Entrance Hall, Shenzhen World Exhibition & Convention Center

Time	*Activities*
10:55-11:30	**Sub-10 nm Resolution in 3D Ultrafast Laser Manufacturing** **Hongbo Sun** Tsinghua University, China ***Presider:*** *Hong Dang, Hangzhou International Innovation Institute, Beihang University, China*
11:30-12:05	**Adaptive Holographic Interferometry as An Ultra-High Sensitivity Tool for Precision Measurements** **Roman Romashko** Far Eastern Branch of Russian Academy of Sciences, Russia ***Presider:*** *Gina, Jinna Chen, Southern University of Science and Technology, China*
12:05-12:40	**High-performance Light Field 3D Display** **Qionghua Wang** Beihang University, China ***Presider:*** *Qian Li, Peking University, China*
Lunch	

Technical Sessions

13:00-15:10	W03. PhotoniX Life Workshop on Life Science and Application	LM103C / 1F
15:10-15:35	**Coffee Break**	
15:35-17:30	PhotoniX Life Editorial Board Meeting (By Invitation Only)	LM103C / 1F
13:30-16:30	T04. Automotive Optoelectronics (I)	LM105 / 1F
16:30-17:00	**Coffee Break**	

September 10, 2026 | Thursday

Time	*Activities*	
07:00-08:00	Light Tai Chi Session, Level 3, Hilton Hotel (outdoor area next to K Kitchencraft)	
	Technical Sessions	
Time	**Activities**	**Venue**
09:00-10:30	S10. Computational Imaging (I)	LM103A / 1F
09:00-10:30	S09. Silicon Photonics (I)	LM103B / 1F
09:00-10:00	T02. Photonics for Ocean (I)	LM103C / 1F
09:00-10:30	S07. Biophotonics and Optical Biomedicine (I)	LM104A / 1F
09:00-10:30	S06. Optoelectronic Devices and Applications (I)	LM104B / 1F
09:00-10:30	T07: Photonic Sensing	LM104C / 1F
09:00-10:30	T05. Optical Communication and Sensing Technologies (I)	LM101A / 1F
09:00-10:30	S09. Silicon Photonics (II)	LM105 / 1F
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	Technical Sessions	
10:45-12:05	S10. Computational Imaging (II)	LM103A / 1F
10:45-12:15	S02. Optical Communication and Networks (I)	LM103B / 1F
10:30-12:00	T02. Photonics for Ocean (II)	LM103C / 1F
10:45-12:15	S07. Biophotonics and Optical Biomedicine (II)	LM104A / 1F
10:45-12:15	S06. Optoelectronic Devices and Applications (II)	LM104B / 1F
10:45-12:15	S04. Quantum Optics and Information	LM104C / 1F
10:45-12:15	T05. Optical Communication and Sensing Technologies (II)	LM101A / 1F
10:45-12:15	S09. Silicon Photonics (III)	LM105 / 1F
12:00-13:30	**Lunch**	
	Technical Sessions	
13:30-15:30	S10. Computational Imaging (III)	LM103A / 1F
13:30-15:20	W01. Workshop on Advanced Specialty Optical Fiber and Applications	LM103B / 1F
13:30-15:00	T02. Photonics for Ocean (III)	LM103C / 1F
13:30-15:30	W02. Workshop on Optical Sensing for Safety	LM104A / 1F
13:30-15:30	T06. Photonic Integration (I)	LM104B / 1F
13:30-15:30	S03. Metamaterials and Photonic Crystals (I)	LM104C / 1F
13:30-16:00	T05. Optical Communication and Sensing Technologies (III)	LM101A / 1F

13:20-15:50	S02. Optical Communication and Networks (II)	LM105 / 1F
15:30-15:45	**Coffee Break**	
	Technical Sessions	
16:00-17:40	S10. Computational Imaging (IV)	LM103A / 1F
15:35-17:20	W01. Workshop on Advanced Specialty Optical Fiber and Applications	LM103B / 1F
15:10-18:10	T02. Photonics for Ocean (IV)	LM103C / 1F
16:00-18:00	W02. Workshop on Optical Sensing for Safety	LM104A / 1F
16:00-18:00	T06. Photonic Integration (II)	LM104B / 1F
16:00-18:00	S01.Laser Technology (I)	LM104C / 1F
16:30-18:00	T01. Mid Infrared Lasers and their Applications	LM101A / 1F
16:00-18:00	S06. Optoelectronic Devices and Applications (III)	LM105 / 1F
18:30-21:00	**Banquet**	

September 11, 2026 | Friday

	Technical Sessions	
Time	**Activities**	**Venue**
09:00-11:30	S03. Metamaterials and Photonic Crystals (II)	LM102A / 1F
09:00-10:30	S10. Computational Imaging (V)	LM103A / 1F
09:00-10:15	S01. Laser Technology (II)	LM104A / 1F
09:00-10:30	S03. Metamaterials and Photonic Crystals (III)	LM103C / 1F
09:00-11:30	S09. Silicon Photonics (IV)	LM103B / 1F
09:00-10:30	S05. Fiber-Based Technologies and Applications (I)	LM104B / 1F
09:00-10:30	S06. Optoelectronic Devices and Applications (IV)	LM104C / 1F
09:00-10:30	T05. Optical Communication and Sensing Technologies (IV)	LM101A / 1F
09:00-10:30	T04. Automotive Optoelectronics (II)	LM105 / 1F
09:00-10:15	S01. Laser Technology (III)	LM101B / 1F
09:00-11:00	T03. Optoelectronics EDA Software	LM106 / 1F
10:30-10:45	**Coffee Break**	
	Technical Sessions	
10:45-12:05	S10. Computational Imaging (VI)	LM103A / 1F
10:45-12:00	S03. Metamaterials and Photonic Crystals (IV)	LM103C / 1F
10:45-12:15	S09. Silicon Photonics (V)	LM104A / 1F
10:45-12:15	S05. Fiber-Based Technologies and Applications (II)	LM104B / 1F
10:45-12:15	S06. Optoelectronic Devices and Applications (V)	LM104C / 1F
10:45-11:45	T05. Optical Communication and Sensing Technologies (IV)	LM101A / 1F
10:45-12:00	T04. Automotive Optoelectronics (III)	LM105 / 1F
10:45-12:15	S06. Optoelectronic Devices and Applications (VI)	LM101B / 1F
11:15-12:15	S08. Data Center Optical Interconnects and Networks	LM106 / 1F
11:30-12:15	Online Session	LM103B / 1F
12:00-13:30	**Lunch**	

PLENARY SPEAKERS

September 9, 2026 | South Ballroom A (Mangrove Hall A) /2F

Hongbo Sun

Academician of the Chinese Academy of Sciences
Tsinghua University, China

Bio.: Hong-Bo Sun received BS/PhD degrees in electronics from Jilin University, China, in 1992/1996. He worked as postdoctoral researcher at the University of Tokushima (1996-2000), assistant professor at Osaka University (2000-2006), Changjiang professor at Jilin University (2006-2017) and Tsinghua University since 2017. His research interest is ultrafast laser manufacturing. So far, he has published over 600 papers in above fields, which are cited for 45000+ times, and H factor is 102, according to ISI search report. He is CAS academician, IEEE, OSA, SPIE, COS and CSOE fellow, editor-in-chief of PhotoniX, and executive editor-in-chief of Light Science and Applications.

Speech Title: Sub-10 nm Resolution in 3D Ultrafast Laser Manufacturing

Abstract: Existing nanofabrication technologies typically require tools with nanoscale feature sizes (such as cutting edge thickness, tip dimensions, or particle beam diameters) or templates to interact directly with the workpiece to achieve nanoscale resolution. In contrast, photons, as a direct processing medium, offer unique advantages over physical tools, including flexibility and the absence of wear. However, the processing precision defined by the optical diffraction limit (approximately 550 nm for visible light) needs to be improved by an order of magnitude to meet the requirements of true nanofabrication. This report presents our research on utilizing femtosecond lasers for nonlinear manipulation of light–matter interactions, achieving three-dimensional fabrication with sub-10 nm resolution in additive, subtractive, and modification manufacturing. We have also made progress in photonic quantum integrated devices, such as integrated Rydberg-atom field detectors. The technology is expected to find important applications in optical interconnects for electronic chip integration, 3D photonic integration, and quantum integrated systems. Applications spanning from intelligent micro/nano-robots to photonic quantum integrated chips will also be introduced.

PLENARY SPEAKERS

September 9, 2026 | South Ballroom A (Mangrove Hall A) /2F

Roman Romashko

Corresponding Member of Russian Academy of Sciences
Far Eastern Branch of Russian Academy of Sciences, Russia

Bio.: Roman Romashko received the M.S. degree in condensed matter physics from the Moscow Engineering Physics Institute, Moscow, Russia, in 1995, the Ph.D. degree in measurement and control systems from Far-Eastern Federal University, Russia, in 2002, and Dr.Sc. degree in laser physics from the Institute of Auto¬mation and Control Processes, Far East Branch of the Russian Academy of Sciences (IACP FEB RAS), Vladivostok, Russia, in 2011. During 2004-2009 he was a visiting researcher at the University of Eastern Finland and at the Korea Electronics Technology Institute where he worked on adaptive interferometry, and dynamic and digital holography.

Since 2004 he works at the IACP FEB RAS as senior, leading, and chief researcher, and then, in 2019, he became a director of the IACP FEB RAS. Since 2010, he is professor of the Polytechnic Institute at the Far-Eastern Federal University, Vladivostok, Russia. In 2016 he was elected as a Corresponding Member of the Russian Academy of Sciences.

His research interest includes holography and interferometry, optical measurement and sensory systems, optoelectronics, photonics, and optical information processing, biomedical imaging. He is author of more than 270 scientific papers, including 3 monographies and 13 patents.

Prof. R. Romashko is a member of IEEE and IEEE Photonics Society.

Speech Title: Adaptive Holographic Interferometry as An Ultra-High Sensitivity Tool for Precision Measurements

Abstract: A laser interferometer is a quite promising and the most accurate technique for the detection and measurement of ultra-weak physical quantities on the pico- and even femtometer scale. However, owing to their high sensitivity, interferometric systems become open to the influence of the environment, which is usually quite unstable (due to temperature drift, accidental mechanical impacts, etc.) As a result, it becomes very difficult or even impossible to use the interferometer outside a laboratory for measurements. In turn, the use of dynamic holograms continuously recorded in a photorefractive crystal can make the interferometric measurement systems adaptive to slow temporal changes in the environment, providing their stable operation.

The report presents a review of recent achievements at IACP FEB RAS in the development of adaptive interferometry techniques based on dynamic photorefractive holography. Novel approaches for building fast and efficient adaptive interferometers, as well as multichannel adaptive holographic measurement systems with up to 10,000 channels, are proposed, developed, and studied. Experimental results of the practical use of advanced adaptive interferometry techniques for nanometrology, biosensing, NDT, acoustic measurements, and other applications are presented and discussed.

PLENARY SPEAKERS

September 9, 2026 | South Ballroom A (Mangrove Hall A) /2F

Qionghua Wang

Beihang University, China

Bio.: Qiong-Hua Wang is currently a professor of optics at Beihang University. She was a professor at Sichuan University from 2004 to 2018. She was a research scientist at the School of Optics/CREOL, the University of Central Florida from 2001 to 2004. She was a faculty member at the University of Electronic Science and Technology of China (UESTC) from 1995 to 2001. She received B. S., M. S. and Ph. D. degrees from UESTC in 1992, 1995 and 2001, respectively. She has authored over 400 peer-reviewed papers indexed in the Science Citation Index and three books, and holds approximately 200 U.S. and Chinese patents. She is a Fellow of SID, OPTICA, SPIE, COS and CSOE, and also serves on the editorial board or as an associate editor for journals including Photonix and the Journal of the Society for Information Display. Her research interests include display and imaging technologies.

Speech Title: High-performance Light Field 3D Display

Abstract: 3D display technology plays a vital role in the information era. Unlike conventional stereoscopic displays, light field 3D display eliminates the issue of visual fatigue, making it a particularly promising candidate in the field. This talk provides a comprehensive overview of light field 3D display, and introduces in detail two systems developed by our team: a desktop light field 3D display and a high-resolution light field 3D display. The former delivers impressive 3D performance with a full 360° horizontal viewing angle, while the latter achieves exceptional image quality with enhanced resolution. We will elaborate on the system architecture, operational principles, and performance characteristics of both displays. In addition, I will briefly present our other ongoing research, including holographic 3D displays with wide viewing angles, electrowetting liquid lenses, and a continuous optical zoom microscope based on liquid lens.

TECHNICAL SESSIONS / Sep. 9, 2026

W03. PhotoniX Life Workshop on Life Science and Application			
Session Chair: Xiuyun Liu, Tianjin University, China			
Time	13:00-15:10 September 9, 2026	**Venue**	LM103C / 1F
13:00-13:10	**Welcome Speech**		
Session 1: Neurophotonics			
Session Chair: Xiuyun Liu, Tianjin University, China			
Invited Talks			
13:10-13:30	**Title**: Mechanism Study on the Role of Photobiomodulation in Regulating Cognitive Function in Sleep-Deprived Mice **Speaker**: Hongli Chen, Peking Union Medical College, China		
13:30-13:50	**Title**: On-Chip Optical Brain-Computer Interface Technology for Low-Power and Adaptive Computing **Speaker**: Lili Gui, Beijing University of Posts and Telecommunications		
13:50-14:10	**Title**: Innovations and Applications of Miniaturized Multiphoton Brain Imaging **Speaker**: Chunzhu Zhao, Peking University		
Session 2: Photoacoustic Imaging			
Session Chair: Peng Huang, Shenzhen University, China			
Invited Talks			
14:10-14:30	**Title**: Three-dimensional Photoacoustic Imaging with Rotated Row-Column-Addressed Array **Speaker**: Xiran Cai, ShanghaiTech University		
14:30-14:50	**Title**: Research on Transcranial and Transosseous Photoacoustic Detection Method **Speaker**: Ting Feng, Fudan University		
14:50-15:10	**Title**: High Spatiotemporal Resolution 3D Multi-mode Echocardiography **Speaker**: Diya Wang, Xi'an Jiaotong University		
15:10-15:35	**Coffee Break**		
15:35-17:30	**PhotoniX Life Editorial Board Meeting (By Invitation Only)**		

Hongli Chen

Invited Talk Details

Bio: Institute of Biomedical Engineering, Chinese Academy of Medical Sciences & Peking Union Medical College

Title: Mechanism Study on the Role of Photobiomodulation in Regulating Cognitive Function in Sleep-Deprived Mice

Abstract: Sleep deprivation perturbs central nervous system homeostasis, resulting in neuroinflammation and cognitive impairment. Photobiomodulation (PBM), a non-invasive therapy using specific light wavelengths to modulate cellular metabolism and signaling, shows promise in cognitive enhancement. However, the neuroprotective mechanisms of 468 nm blue-light PBM in sleep deprivation-induced cognitive deficits remain unclear. Here, we used a sleep deprivation mouse model and lipopolysaccharide (LPS)-induced HT22 cell inflammation model to investigate the effects of 468 nm blue-light. Cognitive function was assessed through behavioral tests, while transcriptome sequencing (RNA-seq) analyzed differentially expressed genes (DEGs) and enriched signaling pathways after PBM. Biochemical and histological analyses measured neurotransmitter and inflammatory factor levels, neuronal damage and neuroinflammation, oxidative stress, and key proteins in the TLR4-mediated pyroptosis pathway. The role of this pathway was validated using the TLR4-specific inhibitor TAK-242. PBM markedly improved learning and memory, alleviated hippocampal neuronal damage, and downregulated inflammation-related genes and pathways. It inhibited microglial M1 polarization and astrocyte activation, reduced neuroinflammation, while decreasing reactive oxygen species (ROS) and enhancing superoxide dismutase (SOD) and catalase (CAT), mitigating oxidative stress. Importantly, it suppressed TLR4-mediated pyroptosis activation, with effects comparable to TAK-242. In conclusion, 468 nm blue-light PBM alleviates sleep deprivation-induced cognitive impairment by reducing neuroinflammation and oxidative stress via inhibiting the TLR4-mediated pyroptosis pathway, supporting its potential clinical application in sleep and cognitive disorders.

Lili Gui

Invited Talk Details

Bio: Lili Gui, Professor and PhD supervisor at the School of Electronic Engineering, Beijing University of Posts and Telecommunications, who is a nationally recognized overseas young talent. She obtained her bachelor and PhD degrees at Tsinghua University and did her postdoc at the University of Stuttgart in Germany. Her research mainly focuses on micro-/nano- photonic devices, laser technology, and biocomputing with in vitro biological neural networks. Her work has been published in journals like Science Advances, and she has led more than ten projects including the National Natural Science Foundation of China, the Carl Zeiss Foundation in Germany, and Beijing Nova Program of Science and Technology. She has received honors such as the Best Female Presenter Award at international academic conferences, the "Fiber Laser in 2024" Prize, and the Wiley China Excellent Author Program.

Title: On-Chip Optical Brain-Computer Interface Technology for Low-Power and Adaptive Computing

Abstract: This talk will introduce our recent progress on on-chip optical brain-computer interface technology for low-power and adaptive computing, which may bring insights for neurocomputing and biological intelligence.

Chunzhu Zhao

Invited Talk Details

Bio: Chunzhu Zhao, Peking University, specializes in in vivo multiphoton tissue imaging. He has published two Nature Methods papers as first/corresponding author (including co- authorship). He is the Principal Investigator of a National Natural Science Foundation of China (NSFC) Young Scientists Fund (Type B). Dr. Zhao was named among the MIT Technology Review Innovators Under 35 Asia Pacific 2023. As a principal contributor, he led the development of the miniaturized three- photon microscope for deep brain imaging, which was recognized as a major scientific achievement benefiting human health at the Zhongguancun Forum. His team's multicolor deep- brain miniaturized two- photon microscope was awarded as one of the Light 10: Top Social Impact Events in Optics in China (2025).

Title: Innovations and Applications of Miniaturized Multiphoton Brain Imaging

Abstract: Achieving high-resolution optical imaging of deep brain regions in freely behaving animals is essential for deciphering neural circuit mechanisms under natural conditions. However, strong tissue scattering and optical aberrations severely limit the imaging penetration depth. To overcome these limitations, I have conducted systematic innovations in miniaturized multiphoton imaging technology. First, I spearheaded the development of a miniaturized three-photon microscope weighing only 2.17 grams. By leveraging the long-wavelength excitation and higher-order nonlinearity of three-photon imaging to enhance penetration capability, and by designing an optical configuration that maximizes collection of scattered fluorescence, we improved signal acquisition from deep brain regions. This enabled functional neuronal observation from the full cortex down to the hippocampus in freely behaving mice, achieving calcium imaging at

depths up to 1.2 mm. Second, I developed a miniaturized two-photon microscope with millimeter-scale field of view, expanding the three-dimensional imaging volume by sixfold. Subsequently, I further contributed to the development of a multicolor deep-brain miniaturized two-photon microscope. By correcting deep-tissue optical aberrations through optical design and increasing the numerical aperture for fluorescence collection, we extended two-photon imaging depth to 800 μm. Meanwhile, we designed confocal micro-objectives that achieve both broadband apochromatic correction and compatibility with multiple magnification modes, enabling multicolor, deep, and cross-scale structural and functional imaging of neurons in freely moving mice. Together, these advances provide instrumental support for investigating deep-brain neural mechanisms.

Xiran Cai

Invited Talk Details

Bio: Xiran Cai is an Assistant Professor and Doctoral Supervisor in the School of Information Science and Technology at ShanghaiTech University and a Senior Member of the Acoustical Society of China. His research focuses on image-guidance and monitoring methods for focused ultrasound therapy. He serves as a Standing Committee Member of the Acoustic Instrumentation Committee of the China Instrument and Control Society, an external reviewer for the Natural Sciences and Engineering Research Council of Canada (NSERC), and a Technical Program Committee member of the IEEE International Ultrasonics Symposium (IUS). He has led seven research projects funded by national and provincial-level agencies, as well as industry partners. He has published more than 30 papers in leading journals, including Science Advances, IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control, IEEE Transactions on Medical Imaging, Ultrasonics, Ultrasound in Medicine & Biology, etc.

Title: Three-dimensional Photoacoustic Imaging with Rotated Row-Column-Addressed Array

Abstract: TBA

Ting Feng

Invited Talk Details

Bio: Ting Feng received her Ph.D. degree from Nanjing University in 2016. She is currently working at Fudan University. She was a visiting scholar at the University of Michigan and a joint-Ph.D. student at the same institution. Her current research interests focus on photoacoustic imaging and measurement techniques.

Title: Research on Transcranial and Transosseous Photoacoustic Detection Method

Abstract: TBA

Diya Wang

Invited Talk Details

Bio: Professor and PhD Supervisor at Xi'an Jiaotong University, recipient of the National Young Talent Program and Xiaomi Young Scholar Award. He previously served as an Associate Investigator at the University of California, San Francisco, USA. His research focuses on biomedical ultrasound diagnosis, therapy and equipment development.

He has presided over numerous research projects including the National Key R&D Program, Excellent Young Scientists Fund, General Program and Young Scientists Fund of the National Natural Science Foundation of China. He has published more than 40 papers in journals of the IEEE Transactions series and other academic publications. He has filed 30 intellectual property applications, among which 16 Chinese and US invention patents have been granted, and some technologies have achieved successful industrial transformation.

He has received multiple honors and awards, including the Best Award of Young Scholars Competition in CSE, IEEE Trans Med Imag Distinguished Reviewer Award, the First Prize of Shaanxi Provincial Science and Technology Award, and China Golden Patent Award, and China's Top Ten Medical Advances.

Title: High Spatiotemporal Resolution 3D Multi-mode Echocardiography

Abstract: Cardiovascular diseases pose a severe threat to people's lives and health. Efficient, accurate, and early screening and diagnosis of high-risk populations with myocardial and coronary artery dysfunction are crucial for the prevention and treatment of cardiovascular diseases. However, the spatiotemporal resolution of current 2D and 3D cardiac ultrasound imaging are still limited, which seriously compromises the quality and precision of multimodal 2D and 3D cardiac ultrasound imaging.

To address the above critical demands and key technical challenges, research on 3D multi-mode 3D Echocardiography with

high spatiotemporal resolution has been conducted. Successively, diverging wave transmission strategy, beamforming method, motion-compensation echocardiography, myocardium elastography, myocardium perfusion imaging with high spatiotemporal resolution, have been developed. Some of these technologies have been successfully implemented. This research aims to provide key technical support for the early diagnosis, treatment monitoring, and prognostic evaluation of cardiovascular diseases.

T04. Automotive Optoelectronics (I)			
Session Chair: Haining Yang, Southeast University, China			
Time	13:30-16:30 September 9, 2026	**Venue**	LM105 / 1F

Invited Talks	
13:30-14:00	**Title**: Silicon-based Optical Phased Arrays: Towards Advanced Beam-forming and Lower Power **Speaker**: Wei Jiang, Nanjing University
14:00-14:30	**Title**: CMOS Single Photon Avalanche Diodes for Biomedical Imaging Applications **Speaker**: Wei Jiang, The Hong Kong University of Science and Technology (Guang Zhou)
14:30-15:00	**Title**: Holographic 3D AR-HUD **Speaker**: Yuanbo Deng, Nanjing ReaVis Technology Co., Ltd.
15:00-15:30	**Title**: 3D HUD Technologies **Speaker**: Juan Liu, Beijing Institute of Technology
15:30-16:00	**Title**: Study on Polarization Volume Grating (PVG) for Head-up Displays **Speaker**: Yuning Zhang, Southeast University
16:00-16:30	**Title**: A Novel Actuators for Next-Generation Wafer Scanners **Speaker**: Yang Liu, Harbin Institute of Technology

Wei Jiang

Invited Talk Details

Bio: Wei Jiang is a professor of optical engineering at Nanjing University. Prior to working at NJU, he was an associate professor at Rutgers, the State University of New Jersey, USA. His research interests include silicon photonics and photonic crystals and their applications in optical interconnects, optical communications, LIDAR, and optical computing. He proposed half-wavelength pitch waveguide superlattices and demonstrated high-density low-crosstalk waveguide integration, which opened the door to half-wavelength pitch optical phased arrays. He contributed to the fundamental understanding of silicon electro-optic and thermo-optic devices, slow light, superprism effects, and photonic crystal surface physics. In 2007, the first high-speed photonic crystal modulator was demonstrated on silicon through his research project. Prof. Jiang received the DARPA Young Faculty Award, IEEE Region I Outstanding Teaching Award, and Ben Streetman Prize, among other honors.

Title: Silicon-based Optical Phased Arrays: Towards Advanced Beam-forming and Lower Power

Abstract: In recent years, silicon-based optical phased arrays have demonstrated their potential to overcome the limitations of prior OPAs in the angular range and speed. Particularly, the elimination of the grating lobes unleashes the true freedom to create complex beam profiles over a wide field of view, which is needed in complex application scenarios. We propose and demonstrate a general approach towards diverse beam forming possibilities, such as arbitrary suppression of the sidelobe intensity in a given direction, multi-beam and flat-top beams. After a one-time calibration of baseline phase errors, any beam pattern can be generated on demand without further experimental iterations, which drastically improve the efficiency. Extra tuning of elemental amplitudes is avoided to reduce the power consumption and control complexity. Wireless optical communication applications of advanced beam forming will be presented. Furthermore, the advanced beam-forming capability of OPAs can also enhance the angular measurement accuracies, as illustrated in a scheme exploiting the integrated amplitude of difference beam, which is promising for LiDAR applications. To reduce the power consumption, slow-light photonic crystal waveguides can be introduced into the phase shifters of silicon optical phased

arrays. We will experimentally show that such an OPA can maintain decent beam quality with a compact chip size while achieving four-fold power reduction. We will compare various power reduction schemes by key metrics.

Wei Jiang

Invited Talk Details

Bio: Wei Jiang is an Assistant Professor in the Microelectronics Thrust, Function Hub, Hong Kong University of Science and Technology (Guangzhou), China. He is also appointed as an Adjunct Assistant Professor in the Department of Electrical & Computer Engineering at McMaster University, Canada. Before joining HKUST(GZ), he was a Staff Analog Designer at Synopsys to design analog and mixed-signal integrated circuits for high-speed interfaces. He received Ph.D. degree in Biomedical Engineering from McMaster University, Canada, in 2021. He has more than 10 years' industry working experience in the development of hardware, and the design of optical sensors and integrated circuits for the healthcare applications such as biomedical instruments and wearable sensing device. His current research interests include high-performance optical sensors and high-speed integrated circuits for emerging applications.

Title: CMOS Single Photon Avalanche Diodes for Biomedical Imaging Applications

Abstract: Single-photon avalanche diodes (SPADs) are semiconductor optical sensors capable of detecting individual photons, offering ultra-high gain, exceptional sensitivity, and precision in timing measurements. These attributes have enabled their widespread adoption in biomedical imaging systems such as fluorescence lifetime imaging microscopy, Raman spectroscopy, diffuse optical imaging, and positron emission tomography—applications demanding sub-nanosecond or picosecond-level temporal resolution.

Advances in silicon manufacturing have facilitated the design of SPADs using standard CMOS processes, reducing production costs while enabling integration with complementary circuitry for compact, affordable photon detecting systems. However, the inherent constraints of CMOS technologies led to some key design challenges for CMOS SPADs such as low photon detection efficiency (PDE), high dark count noise (DCR). This presentation explores strategies to address these challenges through co-optimization of SPAD device architectures and readout circuit designs, targeting enhanced image quality and spatial resolution in biomedical imaging systems.

Yuanbo Deng

Invited Talk Details

Bio: TBA

Title: Holographic 3D AR-HUD

Abstract: TBA

Juan Liu

Invited Talk Details

Bio: Juan Liu

Professor and Doctoral Supervisor, School of Optics and Photonics, Beijing Institute of Technology

Optica Fellow, Optica (formerly Optical Society of America)

Dr. Juan Liu received her Ph.D. from the Institute of Physics, Chinese Academy of Sciences. She has long- term engaged in teaching and research on three- dimensional display, holography and diffractive optics. She has presided over more than 30 research projects, including the Key Regional Joint Program and General Program of the National Natural Science Foundation of China, National 973 and 863 Programs of the Ministry of Science and Technology, National Key Research and Development Projects, projects supported by Beijing Municipal Science & Technology Commission, and industry - university joint R&D projects.

She serves as Vice- Chair of the Holography & Optical Information Processing Committee of the Chinese Optical Society, Member of the Society for Information Display (SID), Chair of the SID China AR/VR Sub- Committee, Executive Editor- in- Chief of *Optical Technique*, and Editorial Board Member of the international journal *Optik*. She previously served as Editorial Board Member of *Applied Optics* (2014- 2020), General Chair of the International Digital Holography Conference (DH, 2019- 2020), and Conference Chair of the international conference OIT- 1 (2019- 2024).

She has published over 200 papers in peer- reviewed international optics journals such as *Nature Communications*,

Scientific Reports, *Applied Physics Letters*, and *Optics Letters*. Some of her publications have been selected as ESI Hot Papers and Highly Cited Papers by Springer Nature. She has filed more than 70 invention patents, among which over 50 have been granted.

Title: 3D HUD Technologies

Abstract: As a cutting-edge core technology in vehicle-mounted and immersive display fields, 3D HUD (3D Head-Up Display) technology breaks through the visual limitations of traditional two-dimensional head-up displays and builds authentic three-dimensional visual scenarios, possessing high application value and broad development prospects. This paper focuses on the core technical system of 3D head-up display, and systematically elaborates on three independently developed key 3D HUD technologies. Firstly, the multi-plane 3D HUD technology is introduced, which realizes the upgrading of 3D display from dual-plane and triple-plane to multi-layer plane, effectively expanding the longitudinal depth of field and three-dimensional spatial dimension of head-up display. Secondly, this paper intensively studies the integral imaging 3D HUD technology and super multi-view 3D HUD technology. By optimizing the optical architecture of integral imaging and designing the super multi-view array, it solves the problems of weak stereoscopic perception, limited viewing angle and visual discontinuity of traditional HUD, and greatly improves the continuity and immersion of 3D display. Finally, targeting the requirements of miniaturization and high-performance display, the Metal Surface 3D Mini Source technology is studied and integrated into the HUD system, which optimizes the system optical structure, reduces equipment volume and improves imaging accuracy. Through the iteration and integration of the three core technologies, this paper forms a high-performance, miniaturized and highly adaptable 3D HUD technical scheme, providing important theoretical support and engineering practical reference for the industrial application and technical upgrading of holographic optical elements in the field of 3D head-up display.

Yuning Zhang

Invited Talk Details

Bio: TBA

Title: TBA

Abstract: TBA

Yang Liu

Invited Talk Details

Bio: Prof. Liu Yang, a national-level young talent and deputy chief commander for technology of national major projects, is currently a professor and doctoral supervisor at Harbin Institute of Technology. His research focuses on precision control devices and methods for ultra-precision equipment, dedicated to solving core common problems in motion generation of cutting-edge ultra-precision equipment such as lithography machines. Over the past five years, he has presided over seven key projects related to lithography machines, including the Project 02 of the National Twelfth Five-Year Plan Science and Technology Major Special Project, which are commissioned by national ministries and commissions as well as leading enterprises in the industry. He has developed a software and hardware platform for ultra-precision, multi-axis, and high-real-time electronic control systems, and proposed a complete set of intelligent control methods driven by the fusion of data and mechanism. These achievements have realized the balance between high dynamic performance and high positioning accuracy of sub-nanometer-level multi-degree-of-freedom motion stages, and won 2 first prizes of provincial and ministerial-level technological invention awards.

Title: A Novel Actuators for Next-Generation Wafer Scanners

Abstract: With continuous improvements in throughput, lithography machines are now confronted with the challenge of balancing high acceleration, high velocity, and high positioning accuracy. Currently, Lorentz actuators (voice coil motors), which are widely employed in the positioning systems of lithography machines, are approaching their physical limits due to constraints in output density. As a result, they can no longer meet the high-acceleration demands of next-generation lithography machines within limited physical space. It is therefore imperative to explore new types of actuators with higher output density. The linear reluctance actuator, characterized by low current consumption, compact size, and high output force, presents itself as a promising alternative for next-generation lithography equipment. However, its application in high-end systems has been hindered by complex nonlinear behavior in its output. A particularly critical issue is the hysteresis nonlinearity between the input current and the output magnetic flux, which exhibits both rate-dependent and displacement-dependent characteristics and remains unresolved. The objective of this presentation is to investigate this complex hysteresis nonlinearity in the novel linear reluctance actuator, with the aim of mitigating the influence of the hysteresis loop and enhancing the magnetic flux tracking accuracy.

TECHNICAL SESSIONS / Sep. 10, 2026

S10. Computational Imaging (I)

Session Chair: Chao Zuo, Nanjing University of Science and Technology, China

Time	09:00-10:30 September 10, 2026	Venue	LM103A / 1F

Invited Talks

09:00-09:30	**Title**: Strong Femtosecond and Attosecond Light Source for Coherent Diffraction Imaging **Speaker**: Yuxi Fu, State Key Lab of Ultrafast Optical Science and Technology, Xi'an Inst. of Optics and Precision Mechanics of CAS
09:30-10:00	**Title**: Recent Advances in Single-Shot Computational Ultrafast Imaging **Speaker**: Jingdan Liu, Shanghai Institute of Optics and Fine Mechanics, Chinese Academy of Sciences
10:00-10:30	**Title**: AI-enabled Single-Particle Imaging with Ultrafast X-ray Free-Electron Lasers **Speaker**: Zhibin Sun, ShanghaiTech University

Yuxi Fu

Invited Talk Details

Bio: Yuxi FU got his Ph.D in State Key Laboratory of Strong Field Laser Physics, Shanghai Institute of Optics and Fine Mechanics, Chinese Academy of Sciences in 2010. From 2010 to 2019, he worked in attosecond science research team of RIKEN first as a postdoctor and then as a Research Scientist. Then, he joined Xi'an Institute of Optics and Precision Mechanics (XIOPM) as a professor. He is currently the deputy director of XIOPM and Director of state key laboratory of ultrafast optical science and technology. His research interest includes strong infrared femtosecond laser technology, high-order harmonic generation and attosecond science, and ultrafast dynamics.

Title: Strong Femtosecond and Attosecond Light Source for Coherent Diffraction Imaging

Abstract: Since the first demonstration of attosecond pulse generation and characterization at the beginning of this century, attosecond science has attracted a lot of attention due to its significant potential applications in revealing dynamics of electrons and ultrafast imaging. In this presentation, I will show our work on generating strong femtosecond and attosecond light pulses These high-energy pulses are significant for high resolution spatial-temporal imaging and ultrafast dynamics capturing of electrons. Also, I will present our recent work on ultrafast coherent diffraction imaging.

Jingdan Liu

Invited Talk Details

Bio: Dr. Jingdan Liu is a Professor at the Shanghai Institute of Optics and Fine Mechanics (SIOM), Chinese Academy of Sciences. She leads the Laboratory of Computational Imaging Systems. Her research interests cover ultrafast imaging, light field imaging, computational imaging and laser plasma diagnosis. She has published >20 papers, including Nature Communications and Optica. She has applied for 2 U.S. patents on ultrafast optical imaging and light field imaging technologies. She is a Member of Optica and SPIE and serves as a Young Editor of Ultrafast Science. She received the 2024 Overseas Excellent Youth Science Foundation from the National Natural Science Foundation of China (NSFC), and the 2021 Relève Étoile Louis-Berlinguet award from Fonds de recherche du Québec – Nature and Technologies (FRQNT) Canada. Her research works were awarded Optica's Year in Optics in 2021 and 2024, respectively. She received her Ph.D. degree in Optical Engineering from the Beijing Institute of Technology in 2017. From 2018 to 2023, she was a postdoctoral fellow in the Laboratory of Applied Computational Imaging (LACI) at Institut National de la Recherche Scientifique (INRS), Canada.

Title: Recent Advances in Single-Shot Computational Ultrafast Imaging

Abstract: Observing transient phenomena in the durations of their occurrences (i.e., real-time) is significant to understanding many physical, chemical, and biological processes. Many transient phenomena have timespans from femtoseconds to picoseconds. Single-shot computational ultrafast imaging is a novel imaging modality that synergizes computational imaging with conventional ultrafast imaging methods (e.g. the streak

camera) to record two-dimensional (2D) spatial information at hundreds of billions or trillions of frames per second of non-repetitive or difficult-toreproduce transient events in real-time. Recently, we reported a new computational ultrafast imaging scheme — swept coded aperture realtime femtophotography (SCARF), which can capture non-repetitive 2D ultrafast events at up to 156.3 trillion frames per second in a single-shot

measurement.

Zhibin Sun

Invited Talk Details

Bio: Dr. Zhibin Sun is an Associate Research Professor at the Center for Transformative Science, ShanghaiTech University, where he leads the Coherent Diffraction Endstation for Single Molecules and Particles (CDS) at the Shanghai High Repetition Rate X-ray Free-Electron Laser and Extreme Light Facility (SHINE). He previously worked at SLAC National Accelerator Laboratory and the Paul Scherrer Institute (PSI), contributing to the commissioning and operation of the LCLS and SwissFEL facilities. His research focuses on XFEL instrumentation, ultrafast X-ray science, and computational imaging. He has published over 30 peer-reviewed papers in the fields of XFEL science and coherent X-ray imaging.

Title: AI-enabled Single-Particle Imaging with Ultrafast X-ray Free-Electron Lasers

Abstract: Single-particle imaging (SPI) with X-ray free-electron lasers (XFELs) has emerged as a powerful technique for revealing the structures of non-crystalline biological specimens and nanoscale materials using the principle of diffraction before destruction. Recent advances in XFEL facilities have significantly expanded the capabilities of SPI, while posing new challenges in instrumentation, sample delivery, and large-scale diffraction data analysis. This talk will present our recent research on SPI experiments and instrumentation at LCLS, SwissFEL, and SHINE, highlighting developments in coherent diffraction imaging and experimental techniques for single-particle studies.

The talk will also discuss recent progress in data analysis for SPI, with particular attention to the application of machine learning and modern computational methods to high-throughput diffraction data processing and image reconstruction. Representative examples will illustrate how these approaches improve experimental efficiency and data quality, and how they support future high-repetition-rate XFEL experiments for structural and ultrafast dynamic studies.

S09. Silicon Photonics (I)

Session Chair: Mingbin Yu, Bei Jing Yan Dong Microelectronic Technology Co., Ltd., China

Time	09:00-10:30 September 10, 2026	**Venue**	LM103B / 1F

Invited Talks

09:00-09:30	**Title**: Silicon Photonic Innovations for Enhanced FMCW LiDAR: Devices, Modules and Engines **Speaker**: Jing Wang, Southern University of Science and Technology
09:30-10:00	**Title**: Fabrication Techniques for Thin-Film Barium Titanate Photonic Devices: Progress and Challenges **Speaker**: Yuan Dong, Shanghai University
10:00-10:30	**Title**: Silicon Electronic-Photonic Integration Technology and Applications **Speaker**: Yan Yang, Institute of Microelectronics, Chinese Academy of Sciences

Jing Wang

Invited Talk Details

Bio: Dr. Jing Wang is an associate professor and doctoral supervisor at SUSTech. With extensive industry experience at Huawei and RoboSense, Dr. Wang specializes in silicon photonics and solid-state LiDAR. He has led some national-level projects, contributed to LiDAR industry standards, and holds over 70 granted patents. He is also a senior member of IEEE.

Title: Silicon Photonic Innovations for Enhanced FMCW LiDAR: Devices, Modules and Engines

Abstract: This work reports advances in silicon photonic integrated circuits (PICs) for FMCW LiDAR, targeting higher integration and better ranging performance. A single-chip calibration module achieves sub-10^{-6} laser sweeping nonlinearity via an on-chip delay line and balanced detection. The proposed hybrid Archimedean-Euler spiral delay line boosts delay density by 41.5% (7.56 ns in 1×3 mm^2) while keeping a low 0.24 dB/cm propagation loss. A 3-channel dual-polarization balanced receiver with 1.09 A/W responsivity and 28 GHz bandwidth supports over 180 m detection range. These components are integrated into a compact 2.8×2.7 mm^2 silicon photonic engine, which realizes 200 m ranging (SNR > 10 dB) with 4-channel coherent detection and a 5.74 ns large-scale delay line. To break module-level bottlenecks, this work further presents two key devices: a waveguide superlattice delay line with ultra-high 3.5 ns/mm^2 delay density and 0.245 dB/cm insertion loss, and a single-layer polarization-insensitive optical switch with <2.3 dB insertion loss and >20 dB extinction ratio. These innovations form a robust, low-cost framework for highly integrated FMCW LiDAR systems.

Yuan Dong

Invited Talk Details

Bio: Yuan DONG, currently a professor at Shanghai University, earned a B.S. in Optoelectronics from Huazhong University of Science and Technology, a Ph.D. from the National University of Singapore. Formerly a Scientist and Principle Investigator (PI) at the Institute of Microelectronics (IME), A*STAR, Singapore, with research expertise covers silicon photonic devices, advanced micro/nano fabrication, and cryogenic optoelectronic interconnects. He has authored or co-authored over 130 papers, along with tens of patents either filed or granted.

Title: Fabrication Techniques for Thin-Film Barium Titanate Photonic Devices: Progress and Challenges

Abstract: The rapid development of artificial intelligence data centers imposes increasingly stringent requirements on electro-optic modulators. Barium titanate (BTO), with its exceptionally high electro-optic modulation coefficient (Pockels coefficient) and good compatibility with CMOS micro/nano fabrication processes, is considered one of the key candidate materials for next-generation high-performance, highly integrated silicon-based electro-optic modulators. However, current micro/nano fabrication techniques for thin-film BTO still face numerous challenges. This talk will focus on core process steps such as epitaxial growth, dry etching, wet etching, and surface planarization of thin-film BTO, systematically review cutting-edge research progress in related fields, and discuss existing technical bottlenecks as well as future development directions.

Yan Yang

Invited Talk Details

Bio: Yang Yan, Professor at the Institute of Microelectronics, Chinese Academy of Sciences. Formerly served photonics R&D position at Inphi/Marvell. Specializes in silicon-based photonic integration chips and 3D electronic-photonic TSV integration research. She had led key projects including the National Key R&D Program, National Natural Science Foundation General Program, and national-level talent initiatives. Published over 50 papers in international journals such as Nature Photonics and secured more than 30 US/CN patents.

Title: Silicon Electronic-Photonic Integration Technology and Applications

Abstract: The silicon-based electronic-photonic heterogenous/hybrid integration process platform provides high-performance and high compatibility research and development support for advanced EPIC, breaking through the performance limitations of single silicon material optoelectronic devices. It can achieve efficient integration of silicon materials with III-V group gain materials and silicon nitride passive materials. Currently, it widely supports chip research and development in cutting-edge fields such as high-speed optical interconnection, optical computing, and quantum computing. The report introduces the silicon-based electronic-photonic heterogenous/hybrid integration process of IMECAS, and its research in optical interconnection, quantum computing, and other fields.

T02. Photonics for Ocean (I)

Session Chair: Qi Wu, Harbin Institute of Technology, China; Southern Marine Science and Engineering Guangdong Laboratory (Guangzhou), China

Time	09:00-10:00 September 10, 2026	Venue	LM103C / 1F

Invited Talks	
09:00-09:30	**Title**: Digital Optical Fiber Underwater Sensing Array in Deep Ocean **Speaker**: Fuyin Wang, National University of Defense Technology
09:30-10:00	**Title**: Small-scale Fluorescence Spectroscopy Rapid Identification System for Marine Environmental Monitoring **Speaker**: Zhaoshuo Tian, Harbin Institute of Technology (Weihai)

Fuyin Wang

Invited Talk Details

Bio: Fuyin Wang received his bachelor's, master's and doctoral degrees at National University of Defense Technology (NUDT) in Optical Engineering. Currently, he is an associate researcher at the College of Meteorology and Oceanography, NUDT. he is awarded as Hu-Xiang Young Talent. His main research fields include optical fiber underwater acoustic sensing technology, emerging marine sensing technology, and deep-sea observation and detection systems. He has led a National Science and Technology Major Project as the chief scientist, and two National major engineering projects as the chief engineer. He has also been involved in two major national projects and led 10 various projects including Project supported by the National Natural Science Foundation and other Ministry of China. He led his team to R&D some new deep-sea observation systems and organized multiple pioneering deep-sea experiments. He has won one ministerial-level science and technology progress award, published over 50 papers and applied for more than 20 patents.

Title: Digital Optical Fiber Underwater Sensing Array in Deep Ocean

Abstract: Fiber-optic underwater acoustic sensors have found applications in numerous fields. However, their further extension of transmission distance is bottlenecked by the rising linear and nonlinear noise within optical fibers during long-distance transmission. Transoceanic communication technologies lay a sound technical foundation for deep-sea underwater energy supply and high-speed data transmission. Drawing on these mature technologies can support the extended deployment of fiber-optic underwater acoustic sensing arrays in the deep open ocean. In this work, we relocate the optoelectronic signal processors originally installed in communication equipment rooms to underwater locations. This addresses the challenges of autonomous underwater parameter control and the long-term reliability of active and passive optical devices, eliminates the need for remote pump optical amplification modules, and suppresses extra noise introduced along long-distance transmission links. Furthermore, targeting the sensing of faint underwater acoustic signals, we propose a broadband array detection method. Optically, this approach enables an array covering multiple octave bands, which is capable of accommodating radiated noise sources with varying sound pressure spectrum level distributions. By fusing beamforming outputs from different frequency bands, the adaptability of the sensing array is significantly improved.

Zhaoshuo Tian

Invited Talk Details

Bio: Professor, Doctoral Supervisor, New Century Excellent Talents. He currently serves as Director of the Institute of Marine Optoelectronic Equipment at Harbin Institute of Technology (Weihai), Director of the Shandong Provincial Collaborative Innovation Center for Marine Optoelectronic Monitoring Engineering Technology, and Director of the Shandong Provincial Key Laboratory of Marine Resources and Environmental Monitoring for Higher Education Institutions. He has published over 150 SCI-indexed and EI-indexed papers in prominent domestic and international journals and at various conferences, and has been frequently invited to deliver keynote speeches at academic conferences both domestically and internationally. He has received four provincial-level awards and holds more than 20 authorized national invention patents. Currently, he serves as a Council Member of the China Computer Measurement Technology Association, an Expert Committee Member for

Water Environment at the China Quality Inspection Associatio. His current research focuses on laser spectroscopic water quality monitoring technology, marine optoelectronic detection technology, lidar technology, lasers and their application technologies.

Title: Small-scale Fluorescence Spectroscopy Rapid Identification System for Marine Environmental Monitoring

Abstract: To meet the requirements of marine pollution monitoring particularly in terms of device portability, response speed, and in-situ detection capabilities, we developed a compact laser-induced fluorescence (LIF) spectroscopy system. This system integrates a miniature laser source, a high-sensitivity spectrometer, and an information processing module, enabling rapid detection and identification of organic compounds and oil contamination in seawater. For marine applications, this system facilitates multi-scenario monitoring through characteristic fluorescence spectroscopy: First, oil spill detection—by leveraging the characteristic fluorescence emitted by aromatic hydrocarbons in crude oil when excited by a laser, combined with fluorescence peak position shifts and an oil type database to achieve oil species identification and drift trajectory inversion; Second, red tide early warning—by measuring the spectral ratio of chlorophyll-a (685 nm fluorescence) to phycocyanin (650 nm) to rapidly determine the species and biomass of algal blooms (response time <5 seconds); Third, identification and detection of organic pollutants in water—enabling the measurement of parameters such as DOM, COD, BOD, and coliform bacteria.

S07. Biophotonics and Optical Biomedicine (I)

Session Chair: Jinna Chen, Southern University of Science and Technology, China

Time	09:00-10:30 September 10, 2026	Venue	LM104A / 1F

Invited Talks	
09:00-09:30	**Title**: Evaluation of Transplant Organ Viability with Optical Coherence Tomography **Speaker**: Yu Chen, Fujian Normal University
09:30-10:00	**Title**: Advancing Photoacoustic–Ultrasound Imaging for Breast Cancer: From Biochemical Mapping to Clinical Translation **Speaker**: Ruochong Zhang, A*STAR Skin Research Labs
10:00-10:30	**Title**: Graphene Ultra-wideband Terahertz Fingerprint Enhancement Sensing **Speaker**: Bingwei Liu, University of Shanghai for Science and Technology

Yu Chen

Invited Talk Details

Bio: Dr. Yu Chen received his BS from Peking University in 1997 and his PhD from the University of Pennsylvania in 2003. After postdoctoral training at MIT, he joined the University of Maryland (College Park) in 2007 as an Assistant Professor, and was promoted to Associate Professor in 2014. He moved to the University of Massachusetts (Amherst) in 2019, and was promoted to Professor in 2023. He is currently a Professor at the Fujian Normal University, China, and serves as the Director of the Minister of Education Key Laboratory of Optoelectronic Science and Technology for Medicine. Dr. Chen has published over 110 peer-reviewed journal publications. He received the National Science Foundation CAREER Award. He has been an associate editor of IEEE Transactions in BME, and an Editorial Board member of Scientific Reports. His research area is the development of optical techniques for biomedical applications including cancer detection and transplant organ evaluation.

Title: Evaluation of Transplant Organ Viability with Optical Coherence Tomography

Abstract: Human liver transplantation is severely constrained by a critical shortage of viable donor livers. In response to this shortage, marginal livers from extended criteria donors are increasingly used to expand the donor pool. Donor liver viability assessment remains limited by invasive, biopsy-based pathological sampling, and there is a need for more comprehensive

and non-invasive evaluation techniques to meet the increasing demand for liver transplants. In this study, we propose the use of polarization-sensitive optical coherence tomography (PS-OCT) to perform a thorough viability evaluation across the entire surface of donor livers. PS-OCT imaging was conducted on multiple regions of human donor livers and the findings were cross-validated with histopathological evaluations. Machine learning and texture analysis were used to evaluate hepatic steatosis, fibrosis, inflammation, and necrosis from PS-OCT measurements in comparison with traditional pathological assessments, finding a correlation (≥80%) between PS-OCT quantifications and pathology. Through normothermic machine perfusion and clinical transplantable liver imaging, PS-OCT imaging demonstrated a strong correlation with the functional performance of donor livers. PS-OCT offers a non-invasive assessment of liver viability by quantifying hepatic parameters across the entire donor liver, effectively complementing current pathological analysis. These results suggest that PS-OCT provides a robust approach to assessing donor liver viability, which could potentially decrease the discard rate of high-risk livers, thereby expanding the donor pool and reducing the inadvertent use of unsuitable livers for transplantation.

Ruochong Zhang

Invited Talk Details

Bio: Dr. Zhang Ruochong is a Senior Scientist at the Agency for Science, Technology and Research (A*STAR), Singapore. He received her Ph.D. in Electrical and Electronic Engineering from Nanyang Technological University (NTU), Singapore. Her research focuses on biomedical optics and biophotonics, with expertise in photoacoustic imaging, ultrasound imaging, Raman spectroscopy, and optical sensing technologies for clinical diagnosis and biomedical applications. She has authored more than 30 peer-reviewed publications and is an inventor on multiple international patents, with two technologies licensed to industry for commercialization, reflecting the translational impact of her research.

Title: Advancing Photoacoustic–Ultrasound Imaging for Breast Cancer: From Biochemical Mapping to Clinical Translation

Abstract: Photoacoustic–ultrasound (PA-US) imaging combines ultrasound-based anatomical information with optical absorption contrast, enabling label-free visualization of tissue morphology and biochemical composition. This complementary information is particularly valuable for breast imaging, where tissue heterogeneity can limit the specificity of conventional ultrasound.

Our previous studies demonstrated multispectral PA-US imaging of endogenous chromophores, including lipid, collagen, and hemoglobin, in breast tissue with close correlation to histopathology. Ex vivo assessment of lumpectomy specimens achieved 97.9% diagnostic accuracy for tumor margin evaluation, with 100% sensitivity and 97.6% specificity. Subsequent studies further demonstrated distinct lipid and collagen distributions across different breast densities and significantly elevated collagen signals in cancerous compared with normal tissue.

Building on these findings, our ongoing work focuses on improving imaging depth, spatial resolution, and multimodal integration through multi-frequency, multi-segment transducer design and handheld PA-US system development. These advances aim to facilitate the translation of PA-US from biochemical tissue mapping toward breast cancer diagnosis and intraoperative clinical applications.

Bingwei Liu

Invited Talk Details

Bio: Liu Bingwei, born in Changzhou, Jiangsu in September 1995, holds a PhD in optics and studied under Professor Peng Yan. He is currently a special research fellow at the Terahertz Technology Innovation Research Institute of Shanghai Institute of Technology and serves as a young editorial board member for the journal 《PhotoniX Life》.

At present, I have joined the terahertz team led by Academician Zhuang Songlin and Professor Peng Yan at Shanghai Institute of Technology to conduct research on terahertz science and technology. My main research directions include on-chip terahertz radiation sources and their manipulation mechanisms, metasurface micro nano structures for enhancing terahertz wave transmission mechanisms, terahertz biomedical applications, etc.

As the main person in charge, I have been the first to develop terahertz time-domain spectroscopy/polarization spectroscopy detection system, terahertz far-field multidimensional scanning and imaging system, and multiphoton pump terahertz detection system based on metasurface biosensing devices in China. I have participated in research projects such as the National Major Instrument and Equipment Development Project, National Key R&D Program, National Natural Science Foundation of China, and National Natural Science Foundation of China. I have also received funding from the Shanghai Super Postdoctoral Incentive Program.

At present, we have authorized 8 national patents and formulated 2 national standards in the field of terahertz. We have published nearly 20 SCI academic papers as the first or co author in relevant domestic and foreign academic journals such as PhotoniX, Advanced Science, Chemical Engineering Journal, etc., and many of them have been selected for ESI high citation. Among them, the paper Chem. Eng. J., 462, 142, 347 (2023) is one of the core works of the first prize of the Ministry of Education Technology Invention Award in 2023, "Terahertz Plasma Enhancement Technology and Its Application in Organic Trace Detection".

Title: Graphene Ultra-wideband Terahertz Fingerprint Enhancement Sensing

Abstract: The molecular fingerprint sensing technology based on metasurface has unique attraction in the biomedical field. However, in the terahertz (THz) band, existing metasurface designs based on multi-pixel or angle multiplexing usually require more analyte amount or possess a narrower tuning bandwidth. Here, we propose a novel single-pixel graphene metasurface. Based on the synchronous voltage tuning, this metasurface enables ultra-wideband (~ 1.5 THz) fingerprint enhancement sensing of trace analytes, including chiral optical isomers, with a limit of detection (LoD) ≤ 0.64 μg/mm2. The enhancement of the fingerprint signal (~ 17.4 dB) originates from the electromagnetically induced transparency (EIT) effect excited by the metasurface, and the ideal overlap between the light field constrained by single-layer graphene (SLG) and ultra-thin analyte. Meanwhile, due to the unique nonlinear enhancement mechanism in graphene tuning, the absorption envelope distortion is inevitable. To solve this problem, a universal fingerprint spectrum inversion model is developed for the first time, and the restoration of standard fingerprints reaches Rmax2 ≥ 0.99. In addition, the asynchronous voltage tuning of the metasurface provides an opportunity for realizing the dynamic reconfiguration of EIT resonance and the slow light modulation in the broadband range. This work builds a bridge for ultra-wideband THz fingerprint sensing of trace analytes, and has potential applications in active spatial light modulators, slow light devices and dynamic imaging equipments.

S06. Optoelectronic Devices and Applications (I)

Session Chair: Wenjun Ni, South-Central Minzu University, China

Time	09:00-10:30 September 10, 2026	Venue	LM104B / 1F

Invited Talks

09:00-09:30	**Title**: Reconfigurable Microfluidic Platform **Speaker**: Jiu-An Lv, Westlake University
09:30-10:00	**Title**: From Narrowband to Multi-Color: Engineering Spectrally Selective Organic Photodetectors **Speaker**: Vincenzo Pecunia, Simon Fraser University
10:00-10:30	**Title**: 10-MW-Level, Compact and Efficient Deep-Ultraviolet Generation in a Resonance-Free Hollow-Core Fiber **Speaker**: Daiqi Xiong, Beihang University

Jiu-An Lv

Invited Talk Details

Bio: Dr. Jiu-an Lv received his B. Sc. and M.S. degrees in the department of chemistry from northwest university, China, in 2005 and 2008, respectively. After that, he served as a process engineer at the China aerospace science and technology corporation for three years. In 2011, he began to study liquid crystal polymer materials at Fudan university and obtained Ph. D degree in 2016. Then he worked in the department of Materials in Fudan University as a postdoctoral researcher between 2016 and 2018. He joined Westlake University as an Assistant Professor in March 2018.

Title: Reconfigurable Microfluidic Platform

Abstract: Lab-on-a-chip systems seek to leverage microfluidic chips to enable small-scale fluid manipulation, holding significant potential to revolutionize science and industry. However, existing microfluidic chips have been largely designed with static fluid structures for specific single-purpose applications, which lack adaptability and flexibility for diverse applications. Inspired by the general-purpose design strategy of the customizable chip of integrated circuit - Field Programmable Gate Array whose hardware can be reconfigured via software programming for multifunctionality after manufacturing, we have devised a conceptual-new reconfigurable microfluidic chip — Field Programmable Topographic Morphing Array (FPTMA) with exceptional structural reconfiguration, field programmability, and function scalability for general-purpose lab-on-a-chip systems that beyond the reach of current state-of-art lab-on-chip systems. FPTMA can be software programmed to dynamically shape an elastic meta-interface from the initial smooth structure into desired time-varying topographic structures and thus generate spatiotemporal Topographic-Morphing-induced capillary forces to actively manipulate multi-droplets in parallel and enable real-time reconfiguring diverse microfluidic operations/functions/flow networks as well as workflows. We envision that the development of the FPTMA-driven lab-on-a-chip systems that leverage dynamic interfacial topographies to digitally handle microfluidics would significantly stimulate numerous technological innovations in biology/medicine/chemistry.

Vincenzo Pecunia

Invited Talk Details

Bio: Prof. Vincenzo Pecunia is the Head of the Sustainable Optoelectronics Research Group at Simon Fraser University (Canada). His research focuses on printable semiconductors and their applications in photovoltaics and sensing. He earned his Ph.D. in Physics and conducted postdoctoral research at the Cavendish Laboratory, University of Cambridge, UK, from 2009 to 2016. His research breakthroughs include pioneering lead-free-perovskite-based indoor photovoltaics, ultra-low-power printed-thin-film-transistor electronics, and advanced spectrally selective printable light sensors. He is a Fellow of the Institute of Materials, Minerals & Mining (FIMMM), the Institution of Engineering and Technology (FIET), and

the Institute of Physics (FInstP). He serves as Editor-in-Chief of Nano Futures (Institute of Physics).

Title: From Narrowband to Multi-Color: Engineering Spectrally Selective Organic Photodetectors

Abstract: Spectrally selective photodetectors have considerable potential for applications in wearable electronics, machine vision, and biosensing, where compact, filterless light detection is required. This talk traces our research progression in organic photodetectors engineered for spectral selectivity: from narrowband-absorption-type devices targeting specific spectral windows, to stacked configurations enabling multi-color sensing, and further to stacked architectures enhanced by internal gain for improved sensitivity. Together, these developments offer a panoramic view of strategies for engineering the performance and functionalities of spectrally selective organic photodetectors, and a look toward where such sensing capabilities may be heading next.

Daiqi Xiong

Invited Talk Details

Bio: Dr Daiqi Xiong won Young Talent of Zhejiang Province in 2026, Young Talent of Hangzhou City in 2025. She obtained her bachelor's degree from Wuhan University of Technology, and master's degree from the University of Southampton in the UK and Ph.D. from Nanyang Technological University in Singapore. She then continued her postdoctoral research at Nanyang Technological University in Singapore and joined the Sustainable Photonics Research Center in July 2025. Her research directions mainly include ultrafast optics, special optical fibers, laser technology and optical soliton dynamics, etc. During her doctoral studies, her research work won the Best Student Paper Award from OPTICA and was selected as Spotlight on Optics by the journal Photonics Research. In addition, she also serves as a reviewer for international journals such as Laser & Photonics Reviews, Optics Letters, Physical Review A and Optics Express, etc.

Title: 10-MW-Level, Compact and Efficient Deep-Ultraviolet Generation in a Resonance-Free Hollow-Core Fiber

Abstract: We generate 300-nm ultraviolet (UV) pulses at a 100-kHz repetition rate via 15-fs 1030-nm pulses in a 4-cm resonance-free anti-resonant hollow-core fiber, reaching 11.9 MW peak power for a compact portable UV source.

T07: Photonic Sensing

Session Chair: Tianye Huang, China University of Geosciences (Wuhan), China

Time	09:00-10:30 September 10, 2026	Venue	LM104C / 1F

Invited Talks

09:00-09:30	**Title**: Development of a High-Speed Optical Complex Spectrum Analyzer **Speaker**: Qingwen Liu, Shanghai Jiao Tong University
09:30-10:00	**Title**: Advanced Optical Fiber Sensing and Its Geoscience Applications **Speaker**: Jing Zhang, China University of Geosciences (Wuhan)
10:00-10:30	**Title**: Research on Cycle of Cytosensor and Photothermal Therapy Based on Cascaded Ω Shaped Optical Fibers **Speaker**: Zewei Luo, Sichuan University

Qingwen Liu

Invited Talk Details

Bio: Professor Qingwen Liu is a professor and doctoral supervisor at the State Key Laboratory of Photonics and Communications, Shanghai Jiao Tong University. He has long been engaged in research on laser and optical measurement technologies. His achievements include the first-ever detection of weak crustal deformation using fiber Bragg grating sensors, the proposal of the time- gated digital optical frequency domain reflectometry (TGD- OFDR) technique, the

development of a high‑ fidelity distributed fiber‑ optic acoustic sensing (DAS) technology with successful industrial deployment and promotion, and the realization of a wide‑ range solid‑ state swept laser based on a novel laser tuning mechanism, among others. He has led more than 20 projects funded by the National Natural Science Foundation of China and various other governmental and industrial sources. He has published over 60 journal papers as first or corresponding author, and has filed or been granted more than 40 invention patents. Several of his technologies have been commercialized and transferred to industry. Over the past five years, he has been consecutively listed in the Elsevier World's Top 2% Scientists ranking.

Title: Development of a High-Speed Optical Complex Spectrum Analyzer

Abstract: Spectrometers are fundamental measurement instruments in modern photonics, playing a critical role in optical communications, sensing, and precision metrology. Conventional spectrometers, however, are inherently constrained by a trilemma involving slow acquisition rates, limited wavelength resolution, and the inability to retrieve optical phase information. To address these challenges, we propose and demonstrate a high-speed optical complex spectrum analyzer built upon a custom-developed swept laser source. By employing the swept laser as a local oscillator for coherent heterodyne detection and implementing a matched-filtering scheme for robust signal extraction, we further introduce a digital resampling algorithm to rigorously compensate for the time-varying chirp nonlinearity inherent in the swept source. This integrated approach effectively breaks the conventional trade-off between measurement speed and resolution, while simultaneously unlocking the capability of phase-resolved analysis.

In our experimental implementation, the system achieves simultaneous multi-frequency measurement at an update rate of 5 kHz, with a frequency accuracy of better than 5 MHz and a resolution of 50 MHz across the entire C+L telecommunications band. Phase retrieval of optical waves is also successfully demonstrated. Beyond discrete-frequency characterization, we validate the analyzer's versatility by performing high-speed, high-precision measurements on broadband incoherent light sources and fiber Bragg grating (FBG) spectra. When deployed in a sensing configuration, the proposed technique enables wavelength-division-multiplexed (WDM) multi-channel interrogation at a sampling rate of 5 kHz, delivering a strain resolution of 0.1 με, which substantially outperforms leading commercial alternatives currently available.

Jing Zhang

Invited Talk Details

Bio: TBA

Title: Advanced Optical Fiber Sensing and Its Geoscience Applications

Abstract: Geophysical fields, including stress&strain, temperature, electromagnetic, and acoustic parameters, exhibit strong spatiotemporal coupling and multi-field interactions. Conventional observation methods, constrained by sparse coverage, limited timeliness, and poor parameter integration, fall short of the demand for multi-parameter, distributed, and long-term synchronous monitoring. This report highlights the innovative use of specialty optical fibers for multi-field geophysical observations, introducing a co-measurement system built on thermally drawn multimaterial functional fibers. By integrating diverse sensing mechanisms, the system enables simultaneous detection of strain, temperature, acoustic, and electromagnetic variations with high spatial resolution, long-term stability, and deployment flexibility. The presentation will outline fiber structural design, fabrication strategies, and signal demodulation principles, and will discuss prospects for advancing coupled field observation and intelligent geoscientific sensing.

Zewei Luo

Invited Talk Details

Bio: The researcher is an Associate Research Fellow and Master's Supervisor at the School of Mechanical Engineering, Sichuan University, and has been selected for the Sichuan Provincial High-Level Young Talent Program. Engaged in the field of "med-engineering integration," the researcher is dedicated to developing portable, miniaturized, on-site, rapid, easy-to-operate, and multifunctional analytical instruments. The primary research focus is on optical fiber biosensors, encompassing novel optical fiber device fabrication, optical fiber optical simulation and modeling, and medical diagnostics. The researcher has led multiple projects, including the National Natural Science Foundation Youth Fund and projects funded by the Department of Science and Technology of Sichuan Province and Shaanxi Province. As first/corresponding author, the researcher has published over 40 SCI papers in major journals in the sensor field, including Biosensors and Bioelectronics, Analytical Chemistry, ACS Sensors, Sensors and Actuators B: Chemical, and Optics Letters. In total, over 60 SCI papers have been published, with an H-index of 31, FWCI of 1.65 and over 2,300 citations. Six invention patents have been authorized. The researcher serves on the editorial board of Biosensors and as a youth editorial board member for PhotoniX Life, Interdisciplinary Medicine, BME Frontier, and Infrared and Laser Engineering. The researcher also serves as a

peer reviewer for more than 20 SCI journals, including Research, Nano Letters, Chemical Engineering Journal, ACS Applied Materials & Interfaces, Photonic Sensors, Optics Letters, Optics Express, IEEE Transactions on Instrumentation & Measurement, Journal of Lightwave Technology, Physics of Fluids, and Pharmacological Research. Additionally, the researcher is a youth committee member of the Spectroscopy Technology and Application Professional Committee of the Chinese Society for Optical Engineering and a consultant committee member of the Intelligent Manufacturing Expert Database of the Sichuan Provincial Science and Technology Collaborative Innovation Promotion Association.

Title: Research on Cycle of Cytosensor and Photothermal Therapy Based on Cascaded Ω Shaped Optical Fibers

Abstract: Circulating tumor cells within the bloodstream are the primary drivers of cancer metastasis. Developing devices that can both detect and eliminate cancer cells is of great significance for cancer therapy. Optical fiber sensors feature small size and low toxicity, enabling flexible delivery of light into deep tissues, making them suitable for the development of implantable photothermal therapeutic devices. Bent optical fibers effectively modulate the energy distribution between cladding modes and radiation modes. Owing to the high cladding mode energy, when cancer cells bind to recognition molecules modified on the fiber surface, the fiber probe efficiently excites localized surface plasmon resonance (LSPR) signals, facilitating the development of cell sensors. In addition, the radiation modes, in combination with nanomaterials on the fiber surface, can efficiently convert light energy into heat, thereby killing cancer cells attached to the fiber surface through thermal ablation. Given the small size of the optical fiber, the number of cancer cells captured and killed in a single operation is limited. By periodically modulating the light energy, the feasibility of the original concept of Circulating Optical fiber Cell sensing and Photothermal Therapy (COCP) has been successfully verified, significantly enhancing the killing efficiency against cancer cells in a simulated bloodstream circulation system. The COCP strategy exhibits high photothermal therapeutic efficiency and low side effects, offering a new technology for cancer treatment.

T05. Optical Communication and Sensing Technologies (I)			
Session Chair: Yixiao Zhu, Shanghai Jiao Tong University, China			
Time	09:00-10:30 September 10, 2026	**Venue**	LM101A / 1F

Invited Talks	
09:00-09:30	**Title**: Integrated Sensing and Communication From PTP to PTMP Networks **Speaker**: Yixiao Zhu, Shanghai Jiao Tong University
09:30-10:00	**Title**: Optical Wireless Integrated Sensing and Communication Systems **Speaker**: Hongyan Fu, Tsinghua University
10:00-10:30	**Title**: High-Speed Optical Interconnects for AI Infrastructure **Speaker**: Xiaodan Pang, Zhejiang University

Yixiao Zhu

Invited Talk Details

Bio: Dr. Yixiao Zhu is currently an associate professor at Shanghai Jiao Tong University. His research interest includes short-reach optical interconnects and optical access networks.

Title: Integrated Sensing and Communication From PTP to PTMP Networks

Abstract: In the AI era, optical networks are evolving not only toward higher capacity but also toward enhanced intelligence, where integrated sensing and communication (ISAC) emerges as a key enabling paradigm. Point-to-multipoint networks, such as passive optical networks, provide a cost-effective solution for last-mile connectivity to end users. However, the colorless optical splitters in the optical distribution network lead to the overlap of backscattered signals from different branches, making unambiguous localization of sensing events a significant challenge. In this talk, we present forward-sensing-based scheme that enables distributed sensing in point-to-point and point-to-multipoint networks while simultaneously supporting high-speed coherent communications.

Hongyan Fu

Invited Talk Details

Bio: Dr. Fu is currently a tenured-associate professor, and director of Nano-fabrication Platform, Tsinghua Shenzhen International Graduate School (SIGS), Tsinghua University, Shenzhen, China. He received the B.S. degree in electronic and information engineering from Zhejiang University and the M.S. degree in electrical engineering with specialty in photonics from Royal Institute of Technology (KTH), Sweden, and the Ph.D. degree from the Department of Electrical Engineering from Hong Kong Polytechnic University. His research focuses on integrated photonics and its related applications in communications and sensing, including optical wireless communication and LiDAR.

From 2005 to 2010, he was a research assistant and then research associate with Photonic Research Center, the Hong Kong Polytechnic University. From 2010 to 2017, Dr. Fu was a founding member and leading the advanced optic communications research at Central Research Institute, Huawei. He was the project manager of All-Optical Networks (AON), which was evolved to a company-wide flagship research project that covers whole aspects of next generation optical communication technologies to guarantee Huawei's leading position. He was also a representative for Huawei at several industry/academic standards/forums. He was an active contributor at IEEE 802.3 Ethernet and Optical Internetworking Forum (OIF) where he was an OIF Speaker from 2012 to 2013. He actively participates in organizing several photonic conferences, such as co-chair of International Nano-Optoelectronics Workshop (iNOW2019) and technical program co-chair of the 2022 Asia

Communications and Photonics Conference (ACP2022). He is a fellow of Optica, senior member of IEEE, and life member of SPIE. He is the founding advisors of Optica/IEEE Photonics Society/SPIE Student Chapters at Tsinghua SIGS, Tsinghua University. He serves as the associate editor of Frontiers in Photonics and reviewers for Nature, Science, etc. He has authored/coauthored over 400 journal or conference papers, 3 book chapters, over 80 granted/pending China /Europe/Japan/ US patents.

Title: Optical Wireless Integrated Sensing and Communication Systems

Abstract: Recent advancements in integrated photonics have revolutionized the fields of optical communications and sensing, leading to breakthroughs in short-reach high-speed data transmission and precise 3D sensing technologies. These innovations, primarily driven by light sources such as Micro-LEDs and VCSELs have paved the way for highly integrated systems in both commercial and industrial applications. The talk highlights the diverse applications and technological advancements enabled by Micro-LEDs and VCSELs across various optical communication and sensing systems. We explore the implementation of these light sources in enhancing data transmission rates, improving beam-steering capabilities, and sensing accuracy in systems ranging from indoor wireless communications and LiDAR to device-to-device and Internet of Things (IoT) networks. We will demonstrate how VCSEL technology contributes to increasing the efficiency, resolution, and reliability of optical systems. This talk explains why Micro-LED and VCSEL technology is becoming a cornerstone for future developments in short-reach high-speed communication and precise optical sensing.

Xiaodan Pang

Invited Talk Details

Bio: Xiaodan Pang is a Qiushi Distinguished Professor at the College of Information Science & Electronic Engineering, Zhejiang University, China. He received his Ph.D. degree from DTU Fotonik, Technical University of Denmark, in 2013. Prior to the current position he worked at RISE Research Institutes of Sweden, Infinera Corporation and KTH Royal Institute of Technology. His research focuses on high-speed transmission technologies in free-space and optical fiber. He authored over 300 peer-reviewed journal and conference publications, including 11 postdeadline papers at OFC, ECOC, IPC, ACP, OECC and CLEO-PR. He has given over 40 keynote/invited talks at international conferences. He will serve as the General Chair of OFC 2027, and was the Program Co-Chair of OFC 2025. He has served in the TPC of over 20 conferences, including OFC, GLOBECOM, OECC, ACP, and CLEO-PR. He is a Fellow of OPTICA and a senior member of IEEE.

Title: High-Speed Optical Interconnects for AI Infrastructure

Abstract: The explosive growth of AI infrastructure is placing ever-increasing bandwidth demands on intra-datacenter optical interconnects, accelerating the transition toward per-lane data rates of 400 Gbps with intensity modulation and direct detection (IM/DD). In this talk, we summarize our experimental work on beyond-200-Gbps per-lane IM/DD transmission using components from multiple platforms, including InP EML and DML, SiP MZM and RRM, and TFLN MZM. We further discuss the key challenges and opportunities on the path forward.

S09. Silicon Photonics (II)

Session Chair: Qize Zhong, Shanghai University, China

Time	09:00-10:30 September 10, 2026	Venue	LM105 / 1F

Invited Talks

09:00-09:30	**Title**: Silicon Photonics Modulators and Photodetectors for Single-Lane 400-Gbps Optical Interconnects **Speaker**: Xiao Hu, Zhangjiang Laboratory
09:30-10:00	**Title**: 300mm Silicon Photonics Platform in the Era of Optical Interconnect **Speaker**: Siyang Liu, Wuhan Wuyue Optoelectronic Technology

10:00-10:30	**Title**: Novel Silicon Photonic Devices for Gas Sensing **Speaker**: Zhenzhou Cheng, Tianjin University

Xiao Hu

Invited Talk Details

Bio: He is an Associate Research Fellow at Zhangjiang Laboratory, China. He previously worked at the National Optoelectronics Innovation Center as a Senior Engineer. He received his Ph.D. degree from Huazhong University of Science and Technology in 2017. His research interests include germanium photodetectors, microring modulators, and silicon traveling-wave Mach–Zehnder modulators. He has published research papers in Optica, Science Bulletin, Laser & Photonics Reviews, Photonics Research, OFC, and ECOC, including OFC Post-Deadline Papers (PDP). He was also invited to deliver a presentation at OFC 2023. His current research focuses on advanced silicon photonic devices and process-compatible photonic integration for next-generation high-speed optical interconnects and optical computing systems.

Title: Silicon Photonics Modulators and Photodetectors for Single-Lane 400-Gbps Optical Interconnects

Abstract: We report recent progress in high-speed silicon photonic devices on a 300-mm silicon photonics platform targeting single-lane 400-Gb/s optical interconnects. The demonstrated devices include 400-Gb/s silicon microring modulator, 400-Gb/s silicon Mach–Zehnder modulator, 300-Gb/s Ge electro-absorption modulator, and 400-Gb/s Ge–Si photodetector with a bandwidth exceeding 110 GHz. Together, these results highlight the capability of the 300-mm silicon photonics platform to enable high-performance devices for next-generation single-lane 400-Gb/s optical interconnects.

Siyang Liu

Invited Talk Details

Bio: Dr. Siyang Liu, Co-founder and Vice President of Wuyue Optoelectronic, leads the development of the 12-inch silicon photonics PDK. After returning to China, she used to work at SMIC Shanghai, CUMEC, and JFS Laboratory. She was involved in projects including 8-inch silicon photonics PDK development, 8-inch silicon-based InP and TFLN heterogeneous integration technology development, and 12-inch 14nm and below CMOS process development. She has introduced multiple domestic first-of-their-kind achievements in the field of silicon-based heterogeneous integration.

Title: 300mm Silicon Photonics Platform in the Era of Optical Interconnect

Abstract: Based on a holistic view of the development of the optical communication and optical interconnect industries, the large scale application history of silicon photonics technology in various core scenarios and the core bottlenecks and challenges currently facing industrial development will be discussed. The industrial advantages of silicon photonics is a key enabler for the optical communication and interconnect industries, particularly in high density integration and fan out. The global industrial layout and development trends of 12 inch silicon photonics platforms will be reviewed with a focus on the construction progress of domestic 12 inch platforms, key technological breakthroughs, and their supporting role for China's optical communication and interconnect industries.

Zhenzhou Cheng

Invited Talk Details

Bio: Dr. Zhenzhou Cheng is the Chairman and Professor of the Department of Optoelectronic Information Engineering at Tianjin University, and Deputy Director, State Key Laboratory of Precision Measuring Technology and Instruments, China. His research interests focus on silicon photonics. He is in charge of several projects funded by MOST, NSFC, and JSPS. He published over 300 peer-reviewed journal and conference papers and was featured in Stanford University's list of the Top 2% Scientists.

Title: Novel Silicon Photonic Devices for Gas Sensing

Abstract: Silicon photonics has been widely explored for the development of on-chip gas sensors. However, conventional silicon photonic integrated circuits typically exhibit moderate performance and a trade-off between low optical losses and large evanescent fields. In this talk, I present our efforts to develop novel silicon photonic devices to overcome the limitations.

S10. Computational Imaging (II)			
Session Chair: Chao Zuo, Nanjing University of Science and Technology, China			
Time	10:45-12:05 September 10, 2026	**Venue**	LM103A / 1F

Invited Talks	
10:45-11:15	**Title**: Dynamic Multispectral Microscopy for Tracking and Computational Analysis **Speaker**: Hao Sha, Harbin Institute of Technology (Shenzhen)
11:15-11:45	**Title**: Incorporating Single-Shot Measurement to Generate Realistic Simulation Data for Deep Learning in 3D Holographic Particle Fields **Speaker**: Ping Su, Tsinghua Shenzhen International Graduate School

Hao Sha

Invited Talk Details

Bio: I am an Assistant Researcher in the School of Computer Science at Harbin Institute of Technology (Shenzhen). My research focuses on multidimensional dynamic super-resolution imaging and tracking, with an emphasis on integrating optical imaging, computational modeling, and artificial intelligence to enable high spatiotemporal resolution observation and analysis of molecular dynamics.

Title: Dynamic Multispectral Microscopy for Tracking and Computational Analysis

Abstract: Dynamic multispectral microscopy is an emerging technique for acquiring spatial, spectral, and temporal information simultaneously. This talk presents our group's recent research on dynamic multispectral microscopy from both algorithmic and hardware perspectives. By developing novel optical encoding and computational imaging strategies, we aim to overcome the limitations imposed by the spatial bandwidth product (SBP), enabling efficient multidimensional imaging and quantitative analysis of dynamic biological processes.

Ping Su

Invited Talk Details

Bio: Dr. Ping Su is an associate professor in Tsinghua Shenzhen International Graduate School, Tsinghua University. She mainly engages in research on holographic display and imaging. She has published more than 100 papers in well-known peer-reviewed journals, including more than 50 papers indexed by SCI. She has been granted more than 20 invention patents in China. She serves as a young editorial board member of the ESCI-indexed journal "Laser & Optoelectronics Progress". She is the Deputy Secretary-General of the Computational Imaging Committee of the Chinese Optical Engineering Society, an executive committee member of the Photonic Information Committee of the Shenzhen Computer Association, a committee member of the Optical Display Committee of the Chinese Optical Engineering Society, the Holography Committee of the Chinese Optical Society, and the Three-Dimensional Display Committee of the Chinese Society for Graphical Images. She is also a member of the international professional society IEEE/OPTICA.

Title: Incorporating Single-Shot Measurement to Generate Realistic Simulation Data for Deep Learning in 3D Holographic Particle Fields

Abstract: Obtaining the ground truth for dynamic 3D particle fields is always a challenging task. One possible solution is to use simulation data for model training. However, the inherent scattering process caused by particle fields is too intricate to be accurately modeled by either traditional physical models or neural networks. To solve this problem, we propose a novel approach that utilizes the physical information from one single experimentally captured image to optimize the simulation data for training a simple U-Net, bypassing the multiple-scattering process. Training the model entirely on synthetic simulated data, the U-Net can quickly generalize to experimental data without any manual labeling. Simulation and experimental results are presented to demonstrate the effectiveness and robustness of the proposed technique in imaging of 3D holographic particle fields. This approach not only lays the foundation for reliable particle field imaging in high-concentration scenarios but also offers a broader application potential for deep learning-based imaging tasks involving complex scattering media.

Oral Information	
11:45-12:05	**Paper ID: 8793** **Title:** High Spatiotemporal Throughput and High Precision Quantitative Phase Imaging Based on Kramers-Kronig Relations **Presenter**: Qian Shen, Nanjing University of Science and Technology

S02. Optical Communication and Networks (I)

Session Chair: Xiaodan Pang, Zhejiang University, China

Time	10:45-12:15 September 10, 2026	Venue	LM103B / 1F

Invited Talks	
10:45-11:15	**Title**: Key Technologies and System Verification for Ultraviolet Communication **Speaker**: Tao Yang, Beijing University of Posts and Telecommunications
11:15-11:45	**Title**: Optical Fiber Distributed Acoustic Sensing for Traffic Monitoring and other metropolitan smart city applications **Speaker**: Alan Pak Tao Lau, The Hong Kong Polytechnic University
11:45-12:15	**Title**: Optical Encoding and QKD for High Speed Secure Optical Communication **Speaker**: Xu Wang, National University of Ireland Maynooth

Tao Yang

Invited Talk Details

Bio: Tao Yang is an Associate Professor at the School of Electronic Engineering, Beijing University of Posts and Telecommunications. His research focuses on optical fiber communication and wireless optical communication. He has led over 10 research projects, and with more than 70 academic publications and 12 patent applications.

Title: Key Technologies and System Verification for Ultraviolet Communication

Abstract: We present our research on solar-blind UV communication, which enables non-line-of-sight, covert, and interference-resilient transmission. Compared with radio, it eases spectrum congestion; versus IR/visible light, it offers better haze/smoke penetration. Our work addresses channel modeling, efficient demodulation, and high-speed long-range real-time systems. Key findings on UV channel characterization, DSP algorithms, and experimental verification are summarized to foster technical exchange.

Alan Pak Tao Lau

Invited Talk Details

Bio: Alan Pak Tao Lau received the Ph.D. degree in Electrical Engineering from Stanford University in 2008. He then joined The Hong Kong Polytechnic University and is currently Professor of the Department of Electrical and Electronic Engineering(EEE). He also serves as Associate Dean(Academic Programmes) of the College of Undergraduate Studies(CUS) and Programme Leader of PolyU's Bachelor's Degree Scheme in Interdisciplinary Studies(BDSIS). He was also a Visiting Professor of Stanford University in 2019.

Professor Lau's research includes analytical modelling, digital signal processing techniques and Machine Learning applications to optical communications, optical performance monitoring, physical layer-aware optical networking and optical fiber sensing

Professor Lau is a fellow of OPTICA for "developing digital signal processing techniques for optical communication systems" and is currently the Program co-Chair of Optical Fiber Communications (OFC) 2027 and a member of the Publication Council of IEEE Photonics Society.

Title: Optical Fiber Distributed Acoustic Sensing for Traffic Monitoring and other metropolitan smart city applications

Abstract: We will review recent efforts in Distributed Acoustic Sensing for Traffic Monitoring and other metropolitan smart city applications

Xu Wang

Invited Talk Details

Bio: Prof Xu Wang received BSc in Physics from Zhejiang University, Master of Engineering in Electronics Engineering from the University of Electronics Science and Technology of China (UESTC) and Ph.D. degree in Electronics Engineering from the Chinese University of Hong Kong (CUHK).

Prof Wang has worked at UESTC, CUHK, Osaka University (Japan), NICT (Japan) and Heriot Watt University (UK) before joining Maynooth University as Deputy Head of the MIEC.

Prof Wang has led over £10M research projects in UK, China and Japan, published over 220 papers, delivered over 40 keynote/invited speeches in international conferences and held 9 international patents. He has very broad international research collaborations and served as Distinguished Professor/Visiting Professor/Guest Researcher/Adviser for a number of universities and institutes in Chian and Japan. He has also served as General Chair/Steering Committee Chair/TPC Chair/TPC Member of numerous international conferences. Prof Wang has been awarded the prestigious Telecommunication Advancement Research Fellowship (2002-2004) by Telecommunication Advancement Organisation of Japan.

Prof Wang's current research interests include high speed optical communication and ultra-fast imaging. He is particularly interested in AI applications in these fields.

Title: Optical Encoding and QKD for High Speed Secure Optical Communication

Abstract: Quantum key distribution (QKD) can generate and share verifiably secure keys between two users using the properties of quantum mechanics. Meanwhile, optical encoding technology enables optical domain physical layer security in optical communication system. A highly secure encryption approach could be implemented by integrating computational layer and physical layer security measures in a system.

In this talk, we are going to introduce the recent progress in optical encoding and QKD based high-speed secure optical communication systems.

T02. Photonics for Ocean (II)			
Time	10:30-12:00 September 10, 2026	**Venue**	LM103C / 1F

Invited Talks	
Session Chair: Fuyin Wang, National University of Defense Technology	
10:30-11:00	**Title**: Photonics for Multi Parameter Oceanographic Sensors **Speaker**: Qi Wu, 1. Southern Marine Science and Engineering Guangdong Laboratory (Guangzhou), Guangzhou, China. 2. School of Sciences and Qingdao Research Institute, Harbin Institute of Technology
11:00-11:30	**Title**: Practical Implementation of Underwater Wireless Optical Communication **Speaker**: Jing Xu, Zhejiang University
Session Chair: Liyang Shao, Southern University of Science and Technology	
11:30-12:00	**Title**: Multidisciplinary Integration-Driven Underwater LiDAR: From Single-Scene Detection to Cross-Domain Perception **Speaker**: Guojun Wu, Xi'an Institute of Optics and Precision Mechanics, Chinese Academy of Sciences;Laoshan National Laboratory

Qi Wu

Invited Talk Details

Bio: Prof. Qi Wu is a Distinguished Professor at the Institute of Marine Science, Shandong University. His research focuses on the development and commercialization of marine sensors based on optoelectronic integrated chips.

Prof. Wu received his Ph.D. in Electrical Engineering from the University of Toronto, Canada. He has held senior research and leadership positions at Nortel Networks Advanced Technology Laboratory, Bell-Northern Research, and the California Institute of Technology–NASA Jet Propulsion Laboratory (JPL), where he worked as a senior scientist, project manager, and principal scientist. His research has centered on optoelectronic integrated devices and their applications in optical communications and aerospace systems.

He also founded the first U.S. company to commercialize silicon photonics technology, gaining extensive experience in translating advanced research into industrial applications. He holds 18 U.S. and European patents and 6 Chinese invention patents, and has published approximately 30 scientific papers.

His honors include the Canadian National Silver Shield Award and six NASA awards for technological innovation and invention. He was also selected for inclusion in Marquis Who's Who in Science and Engineering.

Title: Photonics for Multi Parameter Oceanographic Sensors

Abstract: Ocean temperature, salinity, depth (pressure), and current velocity are fundamental parameters for marine environmental monitoring, oceanographic research, and marine resource exploration and development. Long-term, in situ, and high-precision measurements of these parameters are essential for advancing ocean observation capabilities. Conventional oceanographic sensors still face challenges in measurement accuracy, long-term stability, immunity to electromagnetic interference, and multi-parameter integration. Photonic technologies, with their advantages of high sensitivity, high resolution, immunity to electromagnetic interference, long-distance transmission capability, and ease of integration, provide an important technological pathway for the development of next-generation oceanographic sensors. This presentation introduces recent progress in multi-parameter oceanographic sensors based on optical and optoelectronic integration technologies, with a focus on the optical sensing principles, sensor configurations, and signal demodulation methods for **temperature, salinity, depth (pressure), and current velocity** measurements. To address challenges associated with multiphysics coupling, weak-signal detection, long-term stability, and cross-sensitivity among multiple parameters in marine environments, the presentation discusses the development of highly sensitive optical sensing

structures, optoelectronic integrated devices, and multi-parameter coordinated measurement techniques. Related research efforts will also be presented to demonstrate the potential of optical temperature, salinity, depth, and current sensors for high-precision in situ ocean observations. Finally, the presentation will discuss future trends in the miniaturization, integration, intelligent sensing, and long-term in situ deployment of photonic oceanographic sensors, providing new technological approaches for the development of high-performance, multi-parameter integrated ocean observation systems.

Jing Xu

Invited Talk Details

Bio: Jing Xu received the B.S. degree in information engineering from Jinan University, Guangzhou, China, in 2007, and the Ph.D. degree in information engineering from the Chinese University of Hong Kong, Hong Kong, in 2011.

He is currently a Professor with Ocean College, Zhejiang University, Zhoushan, China, where he leads the Optical Communications Laboratory. He has served as Principal Investigator for multiple nationally funded projects, including the National Key Research and Development Program of China. He has authored or coauthored more than 160 papers on international journals or conferences with a total of more than 4000 citations and h-index 35, as reported by Google Scholar. He has been Co-Chair of several international conferences and served on some TPCs. He serves as an Associate Editor of IEEE Photonics Technology Letters and a Topical Editor of Chinese Optics Letters.

Title: Practical Implementation of Underwater Wireless Optical Communication

Abstract: Foreseeing the proliferation of underwater vehicles and sensors, underwater wireless optical communication (UWOC) is a key enabler for ocean exploration, with strong competitiveness in short-range bandwidth-intensive applications. UWOC has the advantages of anti-electromagnetic interference, high bandwidth, low power consumption and small device footprints. However, the UWOC transmission distance is severely limited by the rapid decay of light intensity in water. The transmission distance of UWOC can be enhanced by adopting new transmitters, ultra-sensitive detectors and signal processing techniques. This talk will mainly focus on the prototype development and sea trial conducted by the Optical Communications Laboratory of Zhejiang University.

Guojun Wu

Invited Talk Details

Bio: Wu Guojun is a Professor and doctoral supervisor at the Xi'an Institute of Optics and Precision Mechanics, Chinese Academy of Sciences. He serves as Executive Deputy Director of the Shaanxi Provincial Key Laboratory of Marine Optics, Director of the Marine Optical Technology Research Division, and Director of the Underwater Optical Technology Center at Laoshan Laboratory. He is also Secretary-General of the Marine Optics Professional Committee and a member of the Marine Technology and Equipment Committee.

As the academic leader in marine optics at his institution, Dr. Wu has proposed and advocated an integrated multidisciplinary framework centered on optical technologies, spanning ocean information acquisition, transmission, and processing, thereby advancing the development of marine observation and sensing systems. His research interests encompass underwater optical detection, marine ecological sensing, and underwater optoelectronic transmission. He has led more than 20 national and provincial research projects, under which his team has developed key instruments including China's first full-ocean-depth high-definition camera, wet-mateable optoelectronic connectors, and marine biogeochemical in-situ sensors for mobile platforms—all achieving internationally advanced performance metrics. Dr. Wu has published over 60 peer-reviewed papers and holds more than 50 authorized patents. His contributions have been recognized with the Second Prize of the National Award for Technological Invention, the Second Prize of the Military Scientific and Technological Progress Award, the First Prize of Technological Invention from the China Institute of Electronics, and the Second Prize of Scientific and Technological Progress from the Chinese Society for Optical Engineering.

Title: Multidisciplinary Integration-Driven Underwater LiDAR: From Single-Scene Detection to Cross-Domain Perception

Abstract: Underwater lidar is a core active sensing technology in marine stereoscopic observation systems. However, water absorption and scattering attenuate echo energy while superimposing target signals upon background scattering, pushing single optical detection schemes toward their physical limit. To address these constraints, multidisciplinary integration has emerged as a key breakthrough pathway: acousto-optical fusion leverages complementary acoustic and optical propagation characteristics to overcome the inherent range–resolution trade-off of a single physical field; polarization detection introduces an intensity-independent polarization dimension, separating mixed signals through differential polarization evolution between targets and scattering media; artificial intelligence replaces prior-model-based inversion with the high-dimensional nonlinear representation of deep networks, driving the system toward adaptive cognition.

Collectively, these three approaches—operating respectively at the levels of detection scheme, information dimension, and processing paradigm—promote the evolution of underwater lidar from a single optical sensor toward a cross-domain comprehensive sensing system.

Keywords: Underwater lidar; Acousto-optical fusion; Polarization detection; Intelligent sensing; Marine stereoscopic observation

S07. Biophotonics and Optical Biomedicine (II)

Session Chair: Yu Chen, Fujian Normal University, China

Time	10:45-12:15 September 10, 2026	**Venue**	LM104A / 1F

Invited Talks

10:45-11:15	**Title**: Optical Intraocular Pressure Monitoring System With AI **Speaker**: Heming Wei, Shanghai University
11:15-11:45	**Title**: Optical Micromanipulation: From in Vitro Trapping to in Vivo Actuation **Speaker**: Hongbao Xin, Jinan University
11:45-12:15	**Title**: Excitation-Encoded Volumetric Spectroscopy for Fast Multiplexed Imaging and Quantitative Physicochemical Mapping in Whole Cells **Speaker**: Kun Chen, University of Electronic Science and Technology of China

Heming Wei

Invited Talk Details

Bio: Heming Wei received his Ph.D. degree in optical engineering from the Dalian University of Technology, Dalian, China, in 2016. From 2014 to 2019, he was a Predoctoral and Postdoctoral Researcher with the Department of Mechanical Engineering and the Center for Smart Structures and Materials, Northwestern University, Evanston, IL, USA. He is currently an Associate Professor with the Key Laboratory of Specialty Fiber Optics and Optical Access Networks, School of Communication and Information Science, Shanghai University, Shanghai, China. He has authored and coauthored more than 60 refereed journals and conference proceeding articles. His research interests include 3D direct laser writing, nanophotonics, and fiber-optic sensors and systems for structural health monitoring. He received the support for Professor of Special Appointment (Young Eastern Scholar) with Shanghai Institutions of Higher Learning during 2019–2022.

Title: Optical Intraocular Pressure Monitoring System With AI

Abstract: This talk will discuss MEMS-based optical microcavities, and microcopical imaging and smartphone-based systems for intraocular pressure sensing with AI data processing method.

Hongbao Xin

Invited Talk Details

Bio: Hongbao Xin is currently a Professor and Doctoral Supervisor at Jinan University, Vice Dean of the College of Physics and Optoelectronic Engineering, and Executive Vice Dean of the Institute of Nanophotonics. He received his Bachelor's and Ph.D. degrees from Sun Yat-sen University, and subsequently conducted postdoctoral research at the National University of Singapore and the University of California, Berkeley. He joined Jinan University in 2018, focusing on biophotonic manipulation. As first/corresponding author, he has published 48 papers in journals such as Nature Photonics, Nature Reviews Materials, Nature Communications, Light: Science & Applications, and Advanced Materials. He has been honored as a Youth Changjiang Scholar of the Ministry of Education and a World's Top 2% Scientist. He leads projects including the NSFC Original Exploration Program and the National Key R&D Program for Young Scientists. His awards include the Top 10 Social Impact Events in Optics in China, the Youth Science and Technology Award of the China Instrument and Control

Society, the First Prize of Natural Science of Guangdong Province, and the First Prize of Optical Science and Technology of Guangdong Province. He serves as Associate Editor of Optics Express, Editorial Board Member of APL Photonics, and Youth Editorial Board Member for PhotoniX, Fundamental Research, JIOHS and other journals.

Title: Optical Micromanipulation: From in Vitro Trapping to in Vivo Actuation

Abstract: Optical micromanipulation has become indispensable for precise and non-contact handling of biological targets. However, conventional techniques are hindered by the diffraction limit, low throughput, and passive nature, restricting their application in complex biological environments. To address these challenges, we have developed two complementary strategies that bridge the gap from well-controlled in vitro trapping to active in vivo actuation. First, we developed two optical trapping methods based on opto-hydrodynamic cooperation and photon nanojet enhancement. By constructing flexible, stretchable, on-chip optical tweezers with orderly assembled microlenses on flexible substrates, we achieved high-throughput, precise manipulation of multi-scale bioparticles—from exosomes to cells—in complex in vitro settings. Second, we created optically controlled living-cell microrobots. By activating cellular ion channels with light, these biohybrid tools enable active, targeted biomedical operations inside living organisms, including pathogen clearance and photodynamic therapy. Together, these advances transform optical micromanipulation from a passive trapping tool into an active, multifunctional platform capable of operating in both in vitro and in vivo environments, opening new avenues for precision medicine at single cell level.

Kun Chen

Invited Talk Details

Bio: Kun Chen is a full professor in the College of Optoelectronic Science and Engineering at Univ. of Elect. Sci. & Tech. of China, (UESTC). His lab aims to develop and apply new optical imaging tools to better understand biology at the cellular and molecular level by integrating advanced laser techniques, single-molecule biophysics, fluorescence spectroscopy and super-resolution microscopy.

Title: Excitation-Encoded Volumetric Spectroscopy for Fast Multiplexed Imaging and Quantitative Physicochemical Mapping in Whole Cells

Abstract: Understanding how cellular organization relates to function requires imaging approaches that resolve structural and physicochemical information throughout three-dimensional volumes. Here we introduce light-sheet excitation spectroscopic microscopy (LS-ExSM), a method that captures full excitation spectra with ~10 nm spectral resolution at each voxel for multiplexed imaging and quantitative spectroscopic readout. Excitation-wavelength encoding makes this spectroscopic readout compatible with single-objective wide-field light-sheet imaging while maintaining high spectral fidelity. Combined with sparse volumetric sampling and deep-learning-based reconstruction, LS-ExSM achieves high-speed volumetric imaging while preserving structural and spectral information. We demonstrate six-color volumetric imaging of live cells at near-second temporal resolution with minimal crosstalk, enabling visualization and quantitative analysis of dynamic organelle interactions in three dimensions. We further apply LS-ExSM to three-dimensional mapping of lipid-droplet polarity at near-diffraction-limited resolution. Together, these results establish excitation-encoded volumetric spectroscopy as a route to whole-cell imaging of subcellular organization and physicochemical state.

S06. Optoelectronic Devices and Applications (II)			
Session Chair: Huizi Li, Shanghai Institute of Microsystem and Information Technology, CAS, China			
Time	10:45-12:15 September 10, 2026	**Venue**	LM104B / 1F

Invited Talks	
10:45-11:15	**Title**: All GaN 2T1C-microLED Active-Matrix Display Pixel with a MHz-level Switching Speed **Speaker**: Yuefei Cai, Southern University of Science and Technology
11:15-11:45	**Title**: Integrated acousto-optic modulators on thin-film lithium niobate and lithium tantalate **Speaker**: Xiankai Sun, The Chinese University of Hong Kong
11:45-12:15	**Title**: Task-hardware co-optimization for universal low-power programmable integrated photonic neural accelerators **Speaker**: Ang Li, Nanjing University of Aeronautics and Astronautics

Yuefei Cai

Invited Talk Details

Bio: Dr Yuefei Cai joined SUSTech in July, 2022. His past research focuses on wide bandgap semiconductor, to be specific, GaN devices (design, fabricaiton and characterization) and device monolithic integration. He has given three talks in top conference in compound semiconductor such as IWN, ICNS and CSW, published more than 20 papers in ACS Nano, ACS Photonics, IEEE EDL, APL, etc. His research has received many good comments from peers and been reported by many technolgoy media, such as IEEE spectrum, Semiconductor Today and Compound Semiconductor. He is also an IEEE and OSA memeber, reviewer of Photonics Research.

Title: All GaN 2T1C-microLED Active-Matrix Display Pixel with a MHz-level Switching Speed

Abstract: High-refresh-rate active-matrix microdisplays are essential components for many high-end applications, such as augmented reality (AR) displays. In this report, an all-GaN monolithic active micro-light-emitting diode (μLED) pixel with optical modulation at 2 MHz is demonstrated. The pixel consists of one 20 μm-diameter μLED, two depletion-mode GaN high-electron-mobility transistors (HEMTs), and one metal-insulator-metal (MIM) storage capacitor (2T1C), with a total footprint of 60 μm × 60 μm. The GaN-based 2T1C-driven circuit is integrated monolithically with μLEDs formed via selective-area growth (SAG) without sidewall etching. Quasi-static performance of the 2T1C-μLED circuit has been achieved under different VData conditions. Transient measurements show its capability for "write-on, hold-on, write-off, and hold-off" operation, with electrical and optical modulation verified at 2 MHz, indicating great potential for high-end AR microdisplays.

Xiankai Sun

Invited Talk Details

Bio: Prof. Xiankai Sun received his Ph.D. in Applied Physics from California Institute of Technology in 2010. From 2010 to 2014, he was a Postdoctoral Associate and then an Associate Research Scientist in Department of Electrical Engineering at Yale University. Since 2014, he has been with The Chinese University of Hong Kong, where he is currently a Professor of Electronic Engineering, serving as the Vice-Chair (Graduate) for Department of Electronic Engineering and as the Associate Director for Center of Optical Sciences. His current research focuses on novel photonic and optomechanical nanodevices for both fundamental research and practical applications. He has published 126 peer-reviewed journal papers, 85 conference papers, 3 book chapters, and 1 book, receiving 5387 citations and an h-index of 42 (Google Scholar). Prof. Sun is currently an Associate Editor for Optica and Journal of Lightwave Technology and an Editorial Board Member for Advanced Photonics Nexus. He was a session organizer/chair/co-chair at the conferences PIERS 2016, 2021, IMCO 2018, 2019, OGC 2022, and CIOP 2025, and a technical committee member at the conferences ACP 2018, 2020, ICOCN 2019, CLEO 2020–2022, AOPC 2021, MWP 2023, CLEO-PR 2024, 2026, POEM 2025, OECC 2026, and WOMBAT. Prof. Sun was honored as a finalist of the Blavatnik Awards for Young Scientists by New York Academy of Sciences in 2013. He received the Young Researcher Award

2022/23 from The Chinese University of Hong Kong. He also received the Early Career Award 2015/16 and Research Fellow Award 2023/24 from the Research Grants Council of Hong Kong. He is an Optica Fellow and SPIE Fellow.

Title: Integrated acousto-optic modulators on thin-film lithium niobate and lithium tantalate

Abstract: Photon–phonon interaction in solid-state systems has found many applications in microwave filters, beam deflectors, modulators, and lasers. With strong piezoelectricity and large transparency window, thin-film lithium niobate (LN) has been considered as the most promising platform for photonic integrated circuits. Compared with LN, although lithium tantalate (LT) has smaller nonlinear coefficients, it has piezoelectric effect at similar levels and possesses an even higher optical damage threshold, a broader transparency window, and a lower birefringence, making it advantageous for high-power applications and broader frequency comb generation. Here, we report integrated acousto-optic modulators on LN and LT thin films. These acousto-optic modulators are based on different types of optical structures, including rib waveguides, photonic crystal nanobeam cavities, racetrack resonators, and Mach–Zehnder interferometers. The experimental results have demonstrated the acousto-optically induced Stokes and anti-Stokes shifts, the resonance-mediated enhancement of sidebands, and the conversion of electrical signals to optical signals, which represent a significant advance in the exploration of on-chip light–sound coupling.

Ang Li

Invited Talk Details

Bio: Born in July 1990. Professor at National Key Lab of Microwave Photonics, Nanjing University of Aeronautics and Astronautics, China. Research focuses on intelligent photonic chips for sensing and computing. Published over 30 papers in peer-reviewed journals, incl. 2x NC, Light, Optica, OEA, PhotoniX, 4x LPR etc. Receipt of Excellent Young Scientist Fund of NSFC, PhotoniX Prize, ICOCN Young Scientist Award etc.

Title: Task-hardware co-optimization for universal low-power programmable integrated photonic neural accelerators

Abstract: Programmable photonic chips rely on hundreds to thousands of tuners to execute AI matrix operations, delivering unmatched bandwidth and latency. Yet the mainstream "train-then-map" workflow creates severe hardware burdens. Here we overturn this logic by proposing a task-hardware co-optimization framework that embeds physical constraints directly into end-to-end training. Three orthogonal regularizers embedded within the training loop jointly enforce voltage sparsity, suppress global power consumption and smooth inter-layer voltage transitions. We verify this transformative paradigm on 16×16 and 32×32 silicon photonic computing chips across three representative tasks: DnCNN image denoising, DR^2-Net compressive sensing reconstruction, and CIFAR-10 image classification, our method cuts tuning power by up to 97.5%, expands deactivatable low-voltage phase shifters by over 53-fold and reduces reconfiguration voltage swings by 93.4%, with mild task-fidelity trade-offs.

S04. Quantum Optics and Information

Session Chair: Yiyang Luo, Chongqing University, China

Time	10:45-12:15 September 10, 2026	Venue	LM104C / 1F

Invited Talks

10:45-11:15	**Title**: Rydberg Atomic Microwave Sensing for Electronic Reconnaissance: Challenges and Considerations **Speaker**: Fan Jiang, National Laboratory of Electromagnetic Space Security
11:15-11:45	**Title**: Efficient Integrated Quantum Memory for Light **Speaker**: Ruoran Meng, University of Science and Technology of China

Fan Jiang

Invited Talk Details

Bio: Fan Jiang received her Bachelor's degree in optical information science and technology from Huazhong University, Wuhan, China, in 2011, and the Ph.D. degree in optoelectronic information engineering from the same university, in 2016. She has been working as a research engineer at National Laboratory of Electromagnetic Space Security, Chengdu, China,

since 2016. Her research intrerst lies in electromagnetic spectrum sensing based on novel array architectures and has served as the principal investigator on several govenment-funded research projects. In recents years, her research emphasis has been on improving the engineering readiness of electromagnetic spectrum sensing technology based on Rydberg atomic microwave quantum sensing.

Title: Rydberg Atomic Microwave Sensing for Electronic Reconnaissance: Challenges and Considerations

Abstract: Rydberg atomic microwave quantum sensing technology is currently in a phase of rapid evolution from "physical phenomena" toward "engineering systems". For electromagnetic spectrum sensing applications, the core challenge lies in how to overcome physical limitations while preserving quantum advantages, in order to realize an engineered, array-based, and robust electromagnetic spectrum sensing system. This report introduces the engineering exploration of Rydberg atomic microwave quantum sensing technology as it transitions from laboratory principle validation to practical applications in electromagnetic spectrum sensing. The report is structured around four aspects: background and significance, challenges in electromagnetic spectrum sensing, exploration of Rydberg atomic microwave quantum sensing technology and outlook and summary.

Ruoran Meng

Invited Talk Details

Bio: He received his bachelor's degree from Huazhong University of Science and Technology and his Ph.D. degree from the University of Science and Technology of China. In 2026, he published the cover article "Efficient Integrated Quantum Memory for Light" in Nature Photonics as the first author. He has received several honors and awards, including recognition under a high-level talent program in physics and the President's Award of the Chinese Academy of Sciences.

Title: Efficient Integrated Quantum Memory for Light

Abstract: Scalable implementation of quantum networks and photonic processors demands integrated photonic memories with high efficiency, yet current integrated systems have been limited to storage efficiencies below 27.8%.

Here we demonstrate highly efficient integrated quantum memories based on rare-earth-ion-doped crystals coupled with impedance-matched

microcavities, realized in two novel architectures: 200-μm-thin membranes of Eu3+:Y2SiO5 integrated with fibre-based microcavities

and waveguide-based cavities fabricated using femtosecond lasers. Our approach achieves reliable integrated quantum storage with record

efficiencies of 80.3(7)% for weak coherent pulses and 69.8(1.6)% for telecom-heralded single photons, alongside the storage of 20 temporal

modes with an average efficiency of 51.3(2)%. Moreover, the thin-membrane Eu3+:Y2SiO5 architecture enables spectrally tunable efficient quantum storage via variable strain, providing a flexible interface for quantum networks. By combining high efficiency, large multimode capacity and tunability, our devices establish a versatile hardware foundation for scalable quantum repeaters and chip-scale photonic processors.

Oral Information	
11:45-12:00	**Paper ID: 9549** **Title:** Design and Research on Magnetorheological Polishing Machine with Dual-swing Axis for High-gradient Optical Elements **Presenter**: Shuang Cai, Hunan University
12:00-12:15	**Paper ID: 9746** **Title:** Noise Resilience of Quantum Support Vector Machine with Selected Feature Maps **Presenter**: Muhammad Faryad, Lahore University of Management Sciences

T05. Optical Communication and Sensing Technologies (II)			
Session Chair: Xianqing Jin, Great Bay University, China			
Time	10:45-12:15 September 10, 2026	**Venue**	LM101A / 1F

Invited Talks	
10:45-11:15	**Title**: Optoelectronic Intelligent Computing Based on Optical Communication Devices and Technologies **Speaker**: Yunping Bai, Beijing University of Posts and Telecommunications
11:15-11:45	**Title**: Machine Learning-Based Modeling for Coherence Ultrafast Photonics **Speaker**: Yuan Luo, The Chinese University of Hong Kong (Shenzhen)
11:45-12:15	**Title**: Constraint-Aware Interference Cancellation for IMDD-PON Uplinks **Speaker**: Xianqing Jin, Great Bay University

Yunping Bai

Invited Talk Details

Bio: Dr. Yunping Bai is an Associate Professor at the State Key laboratory of Information Photonics and Optical Communications(IPOC), Beijing University of Posts and Telecommunications, Beijing, China. His research interests include optical communications, photonic neuromorphic computing, photonic integrated circuits, and photoelectronic techniques. He has published over 50 academic papers in related fields, among which more than 20 were published as the first or corresponding author in international journals such as Nature Communications, Laser & Photonics Reviews, IEEE Journal of Lightwave Technology, and Nanophotonics.

Title: Optoelectronic Intelligent Computing Based on Optical Communication Devices and Technologies

Abstract: This report focuses on leveraging the multi-dimensional multiplexing capabilities— across time, space, and wavelength—of optical communication devices to construct a novel photonic computing architecture designed for the efficient execution of multiply-accumulate (MAC) operations, the core of neural networks. This presentation will highlight the design and systemic implementation of various reconfigurable photonic convolutional operators, and demonstrate a microcomb-driven self-calibrating optical convolution streaming processor.

Yuan Luo

Invited Talk Details

Bio: Dr. Yuan Luo received her B.Eng. degree from Tianjin University in 2008, M.Eng. degree from Beijing University of Posts and Telecommunications in 2011, and her Ph.D. degree from The Chinese University of Hong Kong in 2015. She was a Visiting Scholar at the University of California, Berkeley (UC Berkeley) in 2014, a Postdoctoral Researcher at CUHK from 2015 to 2017, and a Research Fellow at Imperial College London from 2017 to 2021. She is currently an Assistant Professor and a Presidential Young Scholar at The Chinese University of Hong Kong, Shenzhen. Dr. Luo's research interests broadly encompass AI, optical communication, and power and energy systems. She has co-authored several high-profile papers in Nature Electronics and APL Photonics. She has been the Principal Investigator (PI) on multiple research projects, including the National Natural Science Foundation of China (NSFC) Young Scientists Fund and General Program grants, as well as the Shenzhen General Program grant. She is an IEEE Senior Member and an Area Editor for the Springer Encyclopedia of Wireless Networks.

Title: Machine Learning-Based Modeling for Coherence Ultrafast Photonics

Abstract: Machine learning is a subset of artificial intelligence that uses advanced algorithmic methods to analyze data and to optimize system performance. Machine learning is emerging as a powerful tool in ultrafast nonlinear photonics, capable

of significantly reducing computational time compared to the conventional split-step numerical method. In this talk, I will review the advances of ML for nonlinear optics, with a focus on the applications in frequency combs.

Xianqing Jin

Invited Talk Details

Bio: Dr. Jin is currently a Tenured Associate Professor with the School of Computing and Information Technology, Great Bay University (GBU). Before joining GBU, he conducted cutting-edge scientific research at the University of Oxford (UK), Bangor University (UK), and the University of Science and Technology of China (USTC). Dr. Jin has led a number of national or provincial scientific research projects. He has authored and/or coauthored over 100 academic papers, multiple international and national patents, one book, and submitted two technical reports on next-generation mobile communication technologies.

His research interests cover high-capacity intelligent optical communication and signal processing, free-space optical transmission and positioning, light source tracking, optical fiber waveguides, and optical access networks. His research findings can be applied to satellite internet, robotics/unmanned aerial vehicles (UAVs), low-altitude economy, and air-space-ground-sea integrated networks.

Title: Constraint-Aware Interference Cancellation for IMDD-PON Uplinks

Abstract: A constraint-aware parallel iterative algorithm (CAPIA) is proposed to mitigate signal-signal beating and inter-channel interference in 250-Gb/s frequency-division-multiplexed IMDD-PON uplinks. CAPIA integrates ONU-specific constraints into iterative phase retrieval and supports single- and multi-wavelength transmission without modifying the network architecture. Simulations over 25–31 km of standard single-mode fiber show robust performance under various operating conditions. CAPIA reduces the required guard band to approximately −0.1 times the symbol rate and improves OSNR penalty compared with the conventional methods.

S09. Silicon Photonics (III)

Session Chair: Shuai Liu, National Optoelectronics Innovation Center, China

Time	10:45-12:15 September 10, 2026	Venue	LM105 / 1F

Invited Talks

10:45-11:15	**Title**: Nonlinear Topological Routing Enabled by Stimulated Brillouin Scattering **Speaker**: Feng He, Harbin Institute of Technology (Shenzhen)
11:15-11:45	**Title**: Platform Evolution for Optical Modulators in AI Datacenter Networks **Speaker**: Kensuke Ogawa, Innovation & Research Center, Shenzhen Yuto Packaging Technology Co. Ltd

Feng He

Invited Talk Details

Bio: Feng He is currently serving as an Associate Professor at Harbin Institute of Technology (Shenzhen). She obtained her Ph.D. in Materials Engineering from the University of Texas at Austin in 2018. She was awarded the Brookhaven National Laboratory (BNL) scholarship and recognized as a Rising Star by the Department of Mechanical Engineering at the Massachusetts Institute of Technology in 2018. Her research interests and expertise lie in light-matter interactions in quantum materials, ultrafast spectroscopy, coherent phonon dynamics, nonlinear acoustics, and nanoscale energy transport.

Title: Nonlinear Topological Routing Enabled by Stimulated Brillouin Scattering

Abstract: Stimulated Brillouin scattering (SBS) plays a vital role in optics and optoelectronics. Here, we demonstrate an on-chip directional coupling scheme based on SBS in a two-dimensional photonic crystal exhibiting topologically protected edge states. Our design achieves an SBS gain of / =

2.29 W−1 · m−1 at 10.01 GHz, with an estimated excitation threshold of 120 mW. The calculated coherent SBS coupling remains within 3 dB of its maximum phase-matched value over a full phononfrequency deviation range of approximately

0.75 GHz. In addition, the device maintains functional

directional coupling performance under substantial structural disorder, this robustness concerns the optical edge-state transport and port-mapping response. These findings highlight the potential of SBS-induced nonlinear interactions to realize arbitrary directional emission across three output ports. The proposed compact and resilient device opens avenues for integration into future photonic integrated circuits, particularly optical routing such as optical switches, and reconfigurable optical logic gates.

Kensuke Ogawa

Invited Talk Details

Bio: Kensuke Ogawa received Ph.D. degree in physics in Mar. 1987 from Osaka University, Japan. In Apr. 1987, he joined Central Research Laboratory, Hitachi Ltd., Japan, where he performed research on semiconductor photonic devices for optical computing. From May 1992 to Sep. 1994, he was appointed as Senior Researcher in Hitachi Cambridge Laboratory, UK in collaboration with Microelectronics Research Centre, University of Cambridge, UK, and conducted ultrafast electro-optic studies on nano-scale semiconductor devices. In May 2002, he joined Mitsui-founded nanotechnology institute, and organized research and development of photonic integrated circuits on silicon-photonics platform in collaboration with Institute of Microelectronics, Singapore. The projects were transferred to Fujikura Ltd., Japan in Jul. 2006. He accordingly moved to Optics and Electronics Laboratory as Chief Researcher. From Nov. 2017 to Mar. 2026, He had been with Department of Electrical and Electronic Engineering, Tokyo Institute of Technology (later, Institute of Science Tokyo), Japan as Specially Appointed Professor. He has been with Central Research Laboratory, Hamamatsu Photonics since Apr. 2023 and Shenzhen YUTO since Apr. 2026. His current research interest includes high-speed optical modulators on heterogeneous photonic integration platforms and ultrafast nonlinear photonic integrated circuits for optical signal processing and computing.

Title: Platform Evolution for Optical Modulators in AI Datacenter Networks

Abstract: Evolution of data recognition and processing with the benefit of AI system are supported by rapid growth of optical networks based on physical-layer hardware equipment consisting of photonic integrated circuits in co-packaged switch boxes and optical transceivers in AI datacenters. Small-footprint optical modulators on integrated photonics platforms are the most essential elements of the photonic integrated circuits that allow high-capacity optical data generation of high port counts in small footprints. Progress of the optical modulators is crucial to meeting with the demands for continuous growth of AI system at scale. There have been technological challenges for further enhancement of modulation speed with lowering optical loss and reducing in footprint. In this presentation, based on numerical analysis, approaches towards overcoming these difficulties are addressed in the aspect of platform evolution of heterogeneous photonic integrated circuits for low-power consumption low-loss optical modulators in small footprints.

Oral Information	
11:45-12:00	**Paper ID: 9678** **Title:** Stable Microcomb Operation in a Lensed Fiber-Packaged Silicon Nitride Microring from 233 K to Room Temperature **Presenter**: Xiaofan Ma, Shanghai University
12:00-12:15	**Paper ID: 7897** **Title:** Compact and low loss subwavelength grating - assisted trident SOI edge coupler working at O band wavelengths **Presenter**: Yifei Song, Shanghai University

S10. Computational Imaging (III)

Session Chair: Fucai Zhang, Southern University of Science and Technology, China

Time	13:30-15:30 September 10, 2026	Venue	LM103A / 1F

Invited Talks

13:30-14:00	**Title**: Towards 1 nm Resolution: Computational 3D X-ray Imaging of Microchips **Speaker**: Tomas Aidukas, EPFL, PSI
14:00-14:30	**Title**: Mueller Matrix Ptychography for Optical Anisotropies **Speaker**: Honggang Gu, Huazhong University of Science & Technology
14:30-15:00	**Title**: Deep Learning-Enabled Rapid 3D X-ray Coherent Diffraction Imaging: Methods and Applications **Speaker**: Yudong Yao, ShanghaiTech University
15:00-15:30	**Title**: Atomic-scale Imaging of Nanoporous Materials with Electron Ptychography **Speaker**: Hui Zhang, South China University of Technology

Tomas Aidukas

Invited Talk Details

Bio: Tomas Aidukas earned his PhD from the University of Glasgow in 2021, where he pioneered innovative computational microscopes, leveraging techniques like ptychography for low-cost and high-speed optical imaging. Transitioning these skills to the Paul Scherrer Institute as a Postdoctoral Researcher, he advanced the frontiers of 3D X-ray microscopy, notably achieving a world-record 4 nm resolution via ptychographic tomography. In June 2026, Tomas joined EPFL to lead the newly formed Laboratory for Nanoscale X-ray Metrology, backed by a highly competitive SNSF Starting Grant. The group will work on the NEXUS-3D project, dedicated to developing advanced X-ray microscopy methods for semiconductor metrology.

Title: Towards 1 nm Resolution: Computational 3D X-ray Imaging of Microchips

Abstract: The semiconductor industry is shifting toward new 3D transistor architectures and 3D device packaging technologies, where metrology plays a critical role in development and reliability assessment. I will present how we combined synchrotron X-ray sources with lensless imaging — ptychography, in which the image is computationally reconstructed rather than measured optically — to image microchips in 3D at 4 nm resolution. To resolve the critical dimensions of next-generation transistors an even finer imaging resolution of ~1 nm is required, which demands several orders of magnitude greater X-ray dose than our current measurements. This not only results in prohibitively long measurement times, but also risks damaging the sample. I will discuss our research direction aimed at mitigating these factors by exploiting the highly non-uniform structure of microchips and by incorporating prior knowledge such as microchip design information into the data acquisition and reconstruction process. Our goal is to establish X-ray microscopy as a viable tool for high-resolution metrology as well as for operando imaging of nanoscale dynamics.

Honggang Gu

Invited Talk Details

Bio: Honggang Gu is currently a Full Professor in School of Mechanical Science and Engineering, Huazhong University of Science & Technology (HUST). He received his B.S. and Ph.D. degrees from HUST in 2011 and 2016 respectively. He focuses on the research field of micro/nano optical measurement technology and instrumentation. His research interests include advanced ellipsometry, computational imaging and computational metrology, characterization of low-dimensional materials and complex nanostructures, light-matter interactions in low-symmetry crystals/meta-structures and applications in polarized optics, and optical modeling, analysis, and optimization of stratified optoelectronic devices (e.g. OLED, OPV, etc.). He has published more than 120 peer-reviewed journal papers and authorized more than 60 patents. He is the winner of the Paul Drude Award of the 9th international conference on spectroscopy ellipsometry (ICSE). He is a fellow of the

International Association of Advanced Materials (IAAM).

Title: Mueller Matrix Ptychography for Optical Anisotropies

Abstract: Optical anisotropies, such as birefringence and dichroism, can be widely found in both natural and artificial materials, and the precise characterization and analysis of them are crucial for both scientific research and engineering applications. The Mueller matrix contains abundant information and can be used to comprehensively characterize the optical anisotropies. However, traditional Mueller matrix imaging techniques are constrained by the trade-off between imaging resolution and field of view, and the complex imaging lenses will introduce polarization aberrations that notably reduce the measurement accuracy. The ptychography is a novel computational imaging paradigm that eliminates the need for complex imaging lenses while simultaneously offering high resolution and infinitely large field of view. By introducing Mueller matrix polarization modulation into the ptychography, we proposed a novel ptychographic Mueller matrix imaging, named as the Mueller matrix ptychography (MMP). We have developed a MMP prototype by solving several key technical challenges, including the system modeling, information reconstruction, and precision calibration. Furthermore, several typical applications have been explored with the developed MMP system, including the characterization of the optical anisotropies in two-dimensional materials, biological tissues, and liquid crystal components.

Yudong Yao

Invited Talk Details

Bio: Dr. Yudong Yao received her Ph.D. from the Shanghai Institute of Optics and Fine Mechanics, Chinese Academy of Sciences, in 2017. She subsequently worked at Northwestern University and Argonne National Laboratory, where her research focused on X-ray coherent diffraction imaging, 3D imaging, and deep-learning-based imaging methods. She also contributed to the development and operation of the ptychography platform at the Advanced Photon Source (APS), led U.S. DOE LDRD projects, and received the Impact Argonne Award.

Since joining the Center for Transformative Science at ShanghaiTech University in 2022 as an Associate Research Professor, she has focused on advanced X-ray imaging technologies and their applications. Her research centers on X-ray ptychography, 3D imaging, and physics-informed AI methods for high-throughput, high-resolution, nondestructive characterization of complex structures such as advanced semiconductor chips. She has led projects supported by the National Science Foundation for Young Scientists and the Shanghai Rising-Star Program, and has been selected for the Shanghai Overseas High-Level Talent Program and the Pudong New Area Pearl Talent Program.

Title: Deep Learning-Enabled Rapid 3D X-ray Coherent Diffraction Imaging: Methods and Applications

Abstract: X-ray coherent diffraction imaging (CDI) provides a powerful lensless approach for nondestructive three-dimensional characterization of materials and devices at nano- to micrometer-scale resolution. However, its broader application in high-throughput experiments and practical inspection is constrained by computationally intensive iterative phase retrieval, extensive data acquisition for volumetric imaging, and the challenge of converting reconstructed datasets into actionable structural information. This talk will highlight physics-informed deep learning methods for accelerating phase retrieval, reducing data requirements for three-dimensional reconstruction, and enabling efficient analysis of complex X-ray imaging datasets. By integrating physical forward models with data-driven neural networks, these methods improve reconstruction speed while maintaining reconstruction fidelity and physical consistency under limited measurements. Representative examples will illustrate a workflow spanning rapid coherent diffraction inversion, sparse-sampled 3D imaging, and automated interpretation of reconstructed structures. The potential of these methods for real-time experimental feedback, high-throughput characterization, and intelligent X-ray imaging of complex materials and devices will also be discussed.

Hui Zhang

Invited Talk Details

Bio: Dr. Hui Zhang is a professor at the Center for Electron Microscopy and the School of Emergent Soft Matter, South China University of Technology. His research group focuses on 4D scanning transmission electron microscopy and the study of multidimensional crystal defects that critically influence the properties and performance of electron-beam-sensitive materials.

Title: Atomic-scale Imaging of Nanoporous Materials with Electron Ptychography

Abstract: When the electron beam passes through materials, its wavefunction is altered by the local electric potential. While many microscopy techniques attempt to interpret these changes, electron ptychography captures the phase shift directly, providing clearer contrast, higher efficiency, and a unique ability to image delicate light-atom frameworks. In this presentation, I will showcase how we have leveraged this cutting-edge technique to push the boundaries of imaging

beam-sensitive materials like zeolites and MOFs. We have successfully visualized these structures with sub-Ångström resolution in-plane and down to 6–7 nm resolution in depth for zeolites, and achieved atomic resolution for MOFs. With this level of imaging capability, we are no longer just looking at ideal crystal structures; we are observing the real-world complexity of confined guest molecules, nanoscale domain boundaries, and structural imperfections.

W01. Workshop on Advanced Specialty Optical Fiber and Applications			
Session Chair: Zhenggang Lian, Yangtze Optical Electronics Co., Ltd., China			
Time	13:30-15:20 September 10, 2026	**Venue**	LM103B / 1F
13:30-13:40	**Welcome Speech** Zhenggang Lian, Yangtze Optical Electronics Co., Ltd., China		
Invited Talks			
13:40-14:20	**Title**: Hollow-Core PCF: Specialty fiber and AI-scale Datacom Fiber **Speaker**: Fetah Benabid, GPPMM group, XLIM Research Institute, CNRS-Université de Limoges, FranceGLOphotonics SAS, Université de Limoges FST Campus, Limoges, France		
14:20-14:50	**Title**: Pushing the limits: From UV Performance to Advanced Fiber Geometries for Emerging Applications **Speaker**: Markus Roehner, CeramOptec/Biolitec, Managing Director		
14:50-15:20	**Title**: Inverse Fiber Design Supporting Circular Super-Gaussian Modes **Speaker**: Fei Yu, Shanghai Institute of Optics and Fine Mechanics, Chinese Academy of Sciences		

PLENARY SPEAKER

Fetah Benabid

Professor and CNRS director of research
GPPMM group, XLIM Research Institute, CNRS UMR7252,
Unversité de Limoges, Limoges, France
GLOphotonics Founder/CTO

Bio.: Fetah Benabid is a CNRS director of research and honorary professor at Western Australia (Australia). He is the group founder and leader of Gas-Phase Photonic and Microwave Materials (GPPMM) at the CNRS UMR Xlim, Limoges, France. Fetah Benabid has pioneered the development of hollow-core photonic crystal fibres (HC-PCF) and their incorporation into scientific and technological applications. He is the inventor of Kagome HC-PCF and an all-fibre gas cells, coined photonic microcell (PMC). He is the inceptor of new optical guidance mechanism called inhibited coupling optical guidance that led to low loss optical fiber with negative curvature core-contour, and the "photonic tight-binding model" to explain the formation of photonic bandgap in photonic crystal fibres. He is the inceptor of a new mechanism of molecular trapping and gas nano-strcuturing. Fetah Benabid research interests covers guided photonics and gas-phase photonics. Fetah Benabid is also the founder and NE-CSTO of GLOphotonics, market leader in hollow-core fibers for industrial applications.

Speech Title: Hollow-Core PCF: Specialty Fiber and AI-Scale Datacom Fiber

Abstract: Since their emergence as a scientific concept, hollow-core photonic crystal fibers (HCPCFs) have evolved from a fascinating curiosity into both a versatile platform for unique gas-based photonic devices and a compelling candidate

for next-generation datacom and telecom transmission.

Through a historical account of this evolution, this talk will highlight the remarkable synergy between three interconnected drivers: fundamental science, fabrication technology, and applications. Advances in understanding how light can be confined and guided in a hollow core inspired new fiber structures and guidance mechanisms. In parallel, innovations in fabrication enabled increasingly sophisticated designs to be fabricated with greater precision and control. These advances opened new application opportunities, whose requirements and challenges, in turn, stimulated further developments in fiber science and technology. This continuous feedback between understanding, making, and applying HCPCFs has driven extraordinary progress in their performance and capabilities.

The talk will trace how this interplay enabled HCPCFs to develop along two major directions: as a platform for unique and varied light–gas interactions and novel photonic devices, and as an ultra-low-nonlinearity, low-latency transmission medium with rapidly decreasing loss. The latter is now bringing HCPCFs into the performance regime required by the unprecedented demands from artificial intelligence and hyperscale data centers for faster, higher-capacity, and more energy-efficient data transport. The talk will conclude with the remaining scientific and industrial challenges and the pathway toward widespread HCPCF deployment in future communication systems.

Markus Roehner

Invited Talk Details

Bio: since 06/2022: CeramOptec/Biolitec, Managing Director
2016-2021: Jenoptik, Director Global Sales Healthcare & Industry
2012-2016: Jenoptik, Global Head of Product Management BU Lasers
2006-2012: Rofin, Manager R&D
1998-2006: Fraunhofer ILT, Project/R&D Manager
2003: Graduation Dr.-Ing., RWTH-Aachen
1991-1998: Studies Mechanical Engineering, RWTH-Aachen

Title: Pushing the limits: From UV Performance to Advanced Fiber Geometries for Emerging Applications

Abstract: Advanced photonic applications increasingly require optical fibers to operate beyond the capabilities of conventional designs. At shorter UV wavelengths, long-term performance is strongly influenced by material composition, manufacturing-induced defects and post-processing. Meeting these requirements therefore involves engineering not only the fiber material, but the entire manufacturing process.

Using UV transmission as first example, this presentation discusses how core material selection, preform manufacturing technology and hydrogen treatment influence attenuation and solarization stability, including approaches for long-term hydrogen retention.

Beyond material and process engineering, fiber geometry provides an additional degree of freedom. Non-circular-core fibers demonstrate how controlled core geometries can tailor light propagation and enable rapid beam homogenization and stable intensity distributions over short fiber lengths.

Tapered fibers extend this concept into the longitudinal dimension, enabling controlled modification of beam diameter and numerical aperture. Combining these approaches further extends the design space, for example through active tapered fibers that integrate functional materials with tailored longitudinal geometries.

Together, these examples illustrate how material, process and fiber geometry can be tailored to specific applications - from demanding UV systems to illumination and laser processing. Non-circular cores enable customized, homogeneous beam profiles, while tapered and active tapered fibers provide new possibilities for efficient power scaling, particularly for ultrashort-pulse lasers in advanced laser material processing.

Fei Yu

Invited Talk Details

Bio: Fei Yu received his B.S. and M.S. degrees in physics electronics from the Beijing Institute of Technology, Beijing, China, in 2008 and 2010, respectively. He received the Ph.D. degree in optics from the University of Bath, Bath, U.K., in 2014. He is

currently a professor with Shanghai Institute of Optics and Fine Mechanics, Chinese Academy of Sciences. His research interests include optical fiber design and applications.

Title: Inverse Fiber Design Supporting Circular Super-Gaussian Modes

Abstract: We present an inverse fiber design supporting the circular super-Gaussian mode of 8th order at 1064 nm. Starting from the scalar Helmholtz equation under the weakly guiding approximation, a prescribed transverse field amplitude is converted into a closed-form normalized refractive-index distribution of fiber. The inverse fiber design is simulated by the finite-element method and the simulated field retains an intended flat central region and steep transverse edge, giving a RMS field amplitude error of 0.0099 relative to the target amplitude. Based on the inverse design, a super-Gaussian optical fiber is fabricated and characterized.

T02. Photonics for Ocean (III)			
Time	13:30-15:00 September 10, 2026	**Venue**	LM103C / 1F

Invited Talks

Session Chair: Liyang Shao, Southern University of Science and Technology

13:30-14:00	**Title**: Time-Resolved Stokes Polarimetric Imaging Through Scattering Media **Speaker**: Zijing Zhang, Harbin Institute of Technology

Session Chair: Guojun Wu, Xi'an Institute of Optics and Precision Mechanics, Chinese Academy of Sciences; Laoshan National Laboratory

14:00-14:30	**Title:** Submarine Distributed Acoustic Sensing for Ocean Observation and Monitoring **Speaker:** Bin Luo, Southern University of Science and Technology
14:30-15:00	**Title:** High-Accuracy and Low-Cost Multiparameter Interrogation Based on AI Enabled Photonics for Marine Applications **Speaker:** Zhengyong Liu, Sun Yat-sen University

Zijing Zhang

Invited Talk Details

Bio: Zhang Zijing, born in 1986, is a professor (doctoral supervisor) and currently serves as the deputy director of the Institute of New Optoelectronic Technology at Harbin Institute of Technology and the team leader of the Young Scientists Studio at Harbin Institute of Technology. She has been selected for the provincial talent program, is a provincial outstanding youth, and a "Longjiang Scholar" young scholar. She has won the second prize for scientific and technological progress from the China Radar Industry Association (ranked first). Primarily engaged in research on quantum detection and novel-system quantum LiDAR. In recent years, has led 1 national-level key project, headed 2 sub-projects of national-level key projects, directed 6 other national-level scientific research projects, and participated as the second-ranking core member in 8 national-level scientific research projects, with total funding exceeding 60 million RMB. Has published over 80 academic papers as first/corresponding author (including in top journals such as Laser Photonics Reviews and Light: Advanced Manufacturing), and has filed over 50 patents as the first inventor, with 32 invention patents currently authorized.

Title: Time-Resolved Stokes Polarimetric Imaging Through Scattering Media

Abstract: In strongly scattering environments, such as water mist, sea fog, and turbid underwater media, absorption within the medium attenuates target echoes, while scattering enhances backscattering noise, thereby limiting the capability of single-photon imaging systems to detect obscured targets. To address this challenge, we propose a time-resolved Stokes polarimetric imaging method that combines Stokes polarimetric characterization with single-photon detection to dynamically characterize the polarization state of echoes in the temporal domain. By characterizing and separating target echoes from scattering noise in the joint time-polarization domain, the proposed method enables the simultaneous acquisition of intensity, range, and polarization information of the target scene, providing additional observational dimensions for target detection in complex scattering environments. Experimental results demonstrate that, compared with conventional polarization-based methods, the proposed approach achieves superior suppression of scattering noise while additionally providing polarization information of the target surface. These results demonstrate that incorporating time-resolved polarization information can effectively enhance the information acquisition capability of single-photon ranging in complex scattering media, offering a new approach for single-photon target detection and three-dimensional polarimetric imaging in water mist, sea fog, and turbid underwater environments.

Bin Luo

Invited Talk Details

Bio: Bin Luo received his Ph.D. in Geophysics from Texas A&M University in 2018 and conducted postdoctoral research at the Colorado School of Mines and Stanford University. He is currently an Assistant Professor in the Department of Ocean Science and Engineering at Southern University of Science and Technology (SUSTech). His research focuses on distributed acoustic sensing (DAS) and earthquake physics, with applications of fiber-optic sensing to geophysical and ocean

observations.

Title: Submarine Distributed Acoustic Sensing for Ocean Observation and Monitoring

Abstract: Submarine distributed acoustic sensing (DAS) is emerging as a promising approach to ocean observation by transforming seafloor fiber-optic cables into dense sensing arrays. Its long-range coverage and continuous recording capability enable observations of marine processes at spatial and temporal scales that are difficult to resolve with conventional instruments. Recent studies have shown that submarine DAS can capture wavefields generated by both natural processes and human activities, highlighting the potential of existing fiber-optic infrastructure for persistent ocean observation. In particular, observations of ocean surface gravity waves have opened new possibilities for linking distributed wavefield measurements to the physical properties of the ocean environment. Combined with advances in understanding sensing response and wave propagation, submarine DAS is progressing from signal observation toward quantitative environmental sensing. These developments may enable existing submarine fiber networks to support continuous ocean monitoring and provide new perspectives on dynamic processes in coastal and shallow-water environments.

Zhengyong Liu

Invited Talk Details

Bio: Zhengyong Liu received the B.S. degree in information engineering from Zhejiang University, Zhejiang, China, in 2010, and the Ph.D. degree from The Hong Kong Polytechnic University, Hong Kong SAR, China, in 2015. From 2015 to 2019, he firstly worked as a Postdoctoral Fellow for two years and then a Senior Research Fellow with The Hong Kong Polytechnic University. He is currently a Professor with the School of Electronics and Information Technology, Sun Yat-Sen University. His current research includes the optical fiber sensing technology, machine learning based data analysis, fiber-optic sensing system particularly for biomedical applications and ocean environment monitoring. He has published over 100 peer-reviewed technical papers in international journals and conference proceedings, including 2 book chapters and 2 invited papers, as well as granted/applied 6 patents.

Title: High-Accuracy and Low-Cost Multiparameter Interrogation Based on AI Enabled Photonics for Marine Applications

Abstract: In this talk, I will present recent advances in optical fiber sensor technology for marine multi-parameter information acquisition, enabled by deep learning approaches. By integrating various sensor structure designs including fiber gratings and interferometers, we achieved high-performance monitoring of vibration, pressure, temperature, salinity, and metal ions. Furthermore, we have developed a multi-parameter submarine optical fiber sensing system capable of long-term, real-time marine data collection. The approach of deep learning models for temperature, salinity, pressure, and other parameters is established, enabling the miniaturization and cost reduction of undersea sensing systems, as well as offering a novel methodology and equipment suite for seabed environmental monitoring.

W02. Workshop on Optical Sensing for Safety

Session Chair: Dongmei Huang, The Hong Kong Polytechnic University, China

Time	13:30-15:30 September 10, 2026	Venue	LM104A / 1F

Invited Talks	
13:30-14:00	**Title**: Stress-Induced Self-Assembled Microstructured Fibers for Robotic Sensing Applications **Speaker**: Kaiwei Li, Jilin University
14:00-14:30	**Title**: High-Resolution Optical Coherence Tomography for Disease Diagnosis **Speaker**: Linbo Liu, Guangzhou Laboratory
14:30-15:00	**Title**: Breaking the Dynamic Range – Bandwidth Trade-off in Distributed Acoustic Sensing Using OPD-Based Interferometric Demodulation **Speaker**: Hongkun Zheng, Northeastern University

15:00-15:30	**Title**: Distributed Fiber-Optic Sensing Reveals Typhoon-Driven Seabed Transformation and Submarine Cable Failure **Speaker**: Yongkang Dong, Harbin Institute of Technology

Kaiwei Li

Invited Talk Details

Bio: Kaiwei Li is an associate Professor at the Key Laboratory of Bionic Engineering (Ministry of Education), Jilin University. He earned his B.E. from Jilin University in 2009 and his Ph.D. from the Changchun Institute of Optics, Fine Mechanics and Physics, Chinese Academy of Sciences, in 2014. He was a Research Fellow at Nanyang Technological University, Singapore (2015-2018) and served as an Associate Professor at the Institute of Photonics Technology, Jinan University (2019-2021). His work focuses on the intersection of bio-inspired tactile sensing, specialty optical fiber technology, and the development of multi-material multifunctional fibers. He has published over 130 journal papers with a Google Scholar H-index of 42 and has been consistently ranked among the World's Top 2% Scientists by Stanford University for the past three consecutive years.

Title: Stress-Induced Self-Assembled Microstructured Fibers for Robotic Sensing Applications

Abstract: Flexible optical fiber mechanical sensors featuring high sensitivity and excellent mechanical compliance hold great promise for robotic sensing, human–machine interfaces, and healthcare monitoring. However, conventional silica optical fibers are fundamentally constrained by mechanical brittleness, limited compliance, and intricate fabrication processes. To overcome these limitations, this presentation introduces a class of stress-modulated self-assembled multimaterial polymer optical fibers (SMM-POFs) that undergo deterministic structural evolution driven by controlled mechanical instabilities. By harnessing the modulus mismatch between the rigid core and elastomeric cladding, a "stretch–release" strategy enables programmable reconfiguration into wavy or 3D helical architectures governed by core eccentricity. The resulting SMM-POFs exhibit superior stretchability and serve as high-performance dual-modal sensors for the simultaneous detection of tactile pressure and tensile strain. Benefiting from the induced geometric non-linearity, the sensing sensitivity and mechanical robustness are substantially enhanced compared to straight fibers. This work provides an innovative paradigm for developing advanced wearable and robotic tactile sensory systems.

Linbo Liu

Invited Talk Details

Bio: Liu Linbo is currently with Guangzhou National Laboratory and research interests are mainly focused on development and validation of non-invasive, cellular and sub-cellular resolution imaging methods for early diagnosis and intervention of chronic respiratory diseases.

Title: High-Resolution Optical Coherence Tomography for Disease Diagnosis

Abstract: Chronic Respiratory Diseases are one of major burdens of human health. Deteting the early changes in the small airways requires a high-resolution 3D endoscopic imaging technology. We have developed ultrahigh resolution endobronchial OCT with a ultrathin flexible fiber probe. Cellular and subcellular level abnormal changes can be detected in vivo associated with small airway disease.

Hongkun Zheng

Invited Talk Details

Bio: Hongkun Zheng is an Associate Professor at the College of Information Science and Engineering, Northeastern University, Shenyang, China. He received his Ph.D. degree in Detection Technology and Automation Devices from Northeastern University in 2022.

He has led six research projects and has published more than 20 peer- reviewed papers in journals including IEEE Journal of Lightwave Technology, Optics Letters, and IEEE Transactions on Instrumentation and Measurement. His research interests cover point- type and quasi- distributed fiber- optic interferometric sensors, multi- parameter sensing, and intelligent signal- processing algorithms for fiber- optic sensing.

Title: Breaking the Dynamic Range–Bandwidth Trade-off in Distributed Acoustic Sensing Using OPD-Based Interferometric Demodulation

Abstract: Fiber-optic sensing plays an important role in safety-critical monitoring applications, including subsea surveillance, pipeline protection, and geophysical hazard warning. Distributed acoustic sensing (DAS) requires the capability to detect large-amplitude and high-frequency acoustic signals; however, conventional phase-demodulation-based DAS

suffers from an inherent trade-off between dynamic range and frequency response. In this work, an interferometric-array-based optical path difference optical time-domain reflectometry (OPD-OTDR) scheme is proposed for large-amplitude acoustic signal detection. The Doppler-effect-induced spectral distortion is analyzed and compensated using FFT–IFFT processing. Experiments with single-frequency, high-frequency, and complex acoustic signals demonstrate that the proposed method achieves enhanced signal-to-noise ratio with increasing signal amplitude and frequency, and significantly extends the measurable frequency range beyond conventional phase demodulation. Distributed sensing is further validated using an ultra-weak fiber Bragg grating array. This approach provides a promising solution for high-performance DAS in practical safety monitoring applications.

Yongkang Dong

Invited Talk Details

Bio: Yong kang Dong received the bachelor's and Ph.D.degrees from the Harbin Institute of Technology(HIT), Harbin, China, in 2003 and 2008, respectively.During 2008–2011, he was a Postdoctoral Fellow with the Physics Department, University of Ottawa,Canada. In 2012, he re-joined HIT as a Full Professor.He is currently the Chief Scientist of the National Key Scientific Instrument and Equipment Development Project of China. He has authored and coauthored more than 80 international journal papers. His current research interests involve nonlinear fiber optics and Brillouin scattering based optical fiber sensor and its applications in structural health monitoring. He was the recipient of the First Prize in Provincial Natural Science Award in 2013, the Innovation Award of Chinese Society for Optical Engineering in 2015, and the First Prize in Provincial Science and Technology Progress Award in 2017.

Title: Distributed Fiber-Optic Sensing Reveals Typhoon-Driven Seabed Transformation and Submarine Cable Failure

Abstract: Extreme ocean events can rapidly alter seabed conditions and destabilize submarine infrastructure, yet the transient pathway from environmental forcing to structural failure is rarely observed directly. Here, we use multimodal distributed fiber-optic sensing along an operational submarine power cable crossing the Qiongzhou Strait to capture its evolution during Super Typhoon Yagi. Distributed temperature measurements recorded typhoon-driven bottom-water cooling of approximately 4 °C and revealed progressive burial degradation, persistent exposure and newly exposed sections with cooling of up to ~6 °C. Distributed acoustic sensing used tidal currents as a natural excitation source to identify free-span formation, disappearance and post-storm evolution, while combined temperature and vibration measurements distinguished exposed from mechanically unsupported cable states. Near the failure site, a thermal anomaly emerged approximately 97 min before interruption, followed by a reversal in hydrodynamic disturbance propagation and strain exceeding 2,000 με about 6 min before failure. Post-storm free spans subsequently exhibited tide-modulated vortex-induced vibration. These observations reveal how typhoon-driven seabed transformation governs both acute cable failure and persistent post-event degradation.

T06. Photonic Integration (I)			
Session Chair: Hao Wang, Beihang University, China			
Time	13:30-15:30 September 10, 2026	**Venue**	LM104B / 1F

Invited Talks	
13:30-14:00	**Title**: 3D-Printed Optical Nanopixel **Speaker**: Shiqi Hu, Pohang University of Science and Technology (POSTECH)/Korea Advanced Institute of Science and Technology (KAIST)
14:00-14:30	**Title**: Photonic Glass and Applications **Speaker**: Dezhi Tan, Zhejiang University
14:30-15:00	**Title**: Chip-Integrated Computational Optical Sensing: From Robust Spectroscopy to High-Dimensional Imaging **Speaker**: Xiaoxin Li, Hangzhou International Innovation Institute of Beihang University
15:00-15:30	**Title**: Femtosecond Laser-Enabled Photonic Integration for Multifunctional Microrobots **Speaker**: Bing Han, Shanghai Jiao Tong University

Shiqi Hu

Invited Talk Details

Bio: Shiqi Hu is currently an InnoCORE postdoctoral fellow at the Korea Advanced Institute of Science and Technology (KAIST), with a joint affiliation with the Department of Mechanical Engineering at Pohang University of Science and Technology (POSTECH), advised by Prof. Junsuk Rho. He received his B.S. in Mechanical Engineering from Wuhan University (2020) and his Ph.D. in Mechanical Engineering from the University of Hong Kong (2024). His research focuses on micro/nanofabrication, novel optical metamaterials, and 3D nanoprinting. As first or co-first author, Dr. Hu has published papers in Nature Communications, Chemical Society Reviews, Light: Science & Applications, ACS Nano, and Nano Letters, etc.

Title: 3D-Printed Optical Nanopixel

Abstract: Optical nanopixels, individually addressable photonic units at the subwavelength to micrometer scale, are the fundamental building blocks of next-generation ultrahigh-resolution displays, holographic devices, and optical security platforms. However, conventional lithographic approaches are largely confined to planar geometries and face challenges in integrating diverse functional materials on demand. In this talk, I will present our efforts in three-dimensional (3D) nanoprinting as a versatile route toward optical nanopixels with geometries, compositions, and functionalities inaccessible to planar fabrication. First, I will introduce meniscus-on-demand 3D printing, which enables femtoliter-scale, site-specific delivery of functional inks with sub-100-nm resolution. Building on this platform, I will show 3D perovskite nanopixels for ultrahigh-resolution color displays and multi-level anticounterfeiting, and their extension to vertically stacked, full-color display pixels that multiplex color information along the out-of-plane axis for high-density optical encryption. I will then discuss crystal-engineered nanoprinting of perovskite microcavities toward on-demand miniature lasers, upgrading printed pixels from passive color elements to active light sources. Finally, I will present our recent bioinspired hybrid nanopixels combining high-index atomic layers with printed polymer architectures, in which Mie-interference resonance modulation yields vivid, tunable structural colors at the single-pixel level. Together, these results establish 3D nanoprinting as a scalable and material-agnostic manufacturing paradigm for optical nanopixels, and I will conclude with perspectives on AI-assisted inverse design and achromatic meta-optics for near-eye display applications.

Dezhi Tan

Invited Talk Details

Bio: Professor at Zhejiang University, recipient of national-level high-ranking young talent program. Awarded multiple honors including top 10 Chinese scientific advances for 2022 by the Ministry of Science and Technology, the top 10 Chinese optical advances for 2022, and the Youth Science and Technology Award from the Chinese Ceramic Society. Published over 60 first/corresponding-author papers in high-impact journals such as Science, Science Advances, Nature Communications,

Advanced Materials, and Light: Science & Applications.

Title: Photonic Glass and Applications

Abstract: A new mechanism for glass structure regulation has been proposed, involving ultrafast laser-induced nanoscale phase separation and ion exchange. This has led to the invention of three-dimensional micro/nano-photonic structures with broadly and continuously tunable photoluminescence, and the development of miniaturized light-emitting devices such as glass-based micro-LEDs. Construction of novel hierarchical heterogeneous structures, specifically nanocrystals@amorphous-nanoparticle@glass composites, were achieved for continuous-wave excited random lasing. A deep learning-driven optical field manipulation method was developed to enhance the precision and efficiency of glass structural regulation, enabling the fabrication of low-loss three-dimensional optical waveguides and photonic interconnects. Furthermore, a butt-coupled optical chip architecture has been introduced, along with an ultra-broadband, low-energy nonlinear optical modulation method. This method exhibits a ultrasmall threshold for nonlinear activation function that is an order of magnitude smaller than previously reported, enabling the construction of an optical neural network. The invention of the first glass optical chip capable of all-optical nonlinear operations has notably improved the accuracy of image recognition and classification in optical neural networks through its nonlinear activation functions.

Xiaoxin Li

Invited Talk Details

Bio: Xiaoxin Li is currently a postdoctoral researcher at the Sustainable Photonics Research Center (SPRC), Hangzhou International Innovation Institute of Beihang University, China. He received his Ph.D. degree in Optics from Harbin Institute of Technology in 2026. His research interests include dielectric metasurfaces, optical computing, diffractive optical neural networks, and multidimensional computational imaging. His recent research focuses on metasurface-enabled optical computing and intelligent imaging, with an emphasis on integrating optical information processing with advanced imaging and sensing systems. He has published more than 20 peer-reviewed papers, including first/co-first-author articles in Nature Communications, ACS Photonics, Advanced Photonics Nexus, and Advanced Optical Materials.

Title: Chip-Integrated Computational Optical Sensing: From Robust Spectroscopy to High-Dimensional Imaging

Abstract: Optical sensing typically relies on dedicated dispersive, filtering, and polarization-analysis components to separate different properties of light. As the information dimensionality increases, such systems become increasingly complex and difficult to integrate. In this talk, I will discuss an alternative framework based on physical optical encoding and computational decoding, where nanophotonic structures encode high-dimensional optical information into compact intensity measurements for computational reconstruction.

I will first introduce a topological-waveguide-based on-chip spectrometer that exploits topological protection to maintain stable optical responses against fabrication variations, enabling spectral reconstruction without device-specific recalibration. I will then extend this framework from point spectroscopy to snapshot thermal spectral imaging using inverse-designed hybrid metasurface encoders in the long-wave infrared. Finally, I will present a CMOS-integrated metasurface image sensor that jointly encodes spectral and polarization information, enabling single-shot hyperspectral and full-Stokes imaging.

Together, these studies demonstrate a progression from robust spectral sensing to spatially resolved multidimensional imaging, highlighting physical optical encoding as a promising route toward compact, robust, and intelligent optical sensors.

Bing Han

Invited Talk Details

Bio: Bing Han is an Associate Professor (tenure-track) at the School of Biomedical Engineering, Shanghai Jiao Tong University. Her research interest lies in the field of femtosecond laser micro/nanofabrication, multifunctional miniature robotic systems, and functional sensing for biomedical manipulation, minimally invasive intervention, and in situ detection.

She received her Ph.D. in Physical Electronics from the College of Electronic Science and Engineering (2019), Jilin University. From 2019 to 2021, she worked as a postdoctoral research fellow at the Department of Precision Instrument, Tsinghua University, and was selected as the "Shuimu Tsinghua Scholar". She has published more than fifty articles on international academic journals, including Nature Communications, Advanced Materials, Advanced Functional Materials, Nano Energy, etc.

Title: Femtosecond Laser-Enabled Photonic Integration for Multifunctional Microrobots

Abstract: Photonic integration on complex three-dimensional and nonplanar platforms is increasingly important for

next-generation miniature devices, yet remains challenging due to limitations in material compatibility, fabrication flexibility, and functional integration. In this talk, I will present our recent progress in femtosecond laser-enabled photonic integration, with an emphasis on direct, conformal, and multimaterial micro/nanofabrication. By integrating optical, plasmonic, magnetic, and stimuli-responsive functionalities onto miniature devices and robotic platforms, we demonstrate new opportunities for light delivery, optical actuation, high-sensitivity sensing, and biomedical micromanipulation. These approaches provide a versatile route toward highly integrated photonic microsystems capable of combining fabrication, actuation, sensing, and intervention within compact three-dimensional architectures.

S03. Metamaterials and Photonic Crystals (I)

Session Chair: Feng Li, Xi'an Jiaotong University, China

Time	13:30-15:30 September 10, 2026	**Venue**	LM104C / 1F

Invited Talks	
13:30-14:00	**Title**: Optical Corner Detection Imaging **Speaker**: Chen Chen, Nanjing University
14:00-14:30	**Title**: Quantum Terahertz Detection in Two-Dimensional Electron Gases via the In-Plane Photoelectric Effect **Speaker**: Ran Chen, Institute of Process Engineering, Chinese Academy of Sciences
14:30-15:00	**Title**: High Efficiency BIC Metasurface for Terahertz Beam Deflection **Speaker**: Junxing Fan, Shenzhen Institute for Advanced Study, University of Electronic Science and Technology of China
15:00-15:30	**Title**: Overcoming Adiabatic Limitations in Topological Photonic Waveguides **Speaker**: Wange Song, Nanjing University

Chen Chen

Invited Talk Details

Bio: She received her bachelor's and Ph.D. degrees from Nanjing University in 2016 and 2021, respectively. She has conducted visiting and research work at National Taiwan University, the Institute of Applied Sciences and Intelligent Systems in Italy, and City University of Hong Kong, among others. Her research mainly focuses on multidimensional optical field manipulation based on metasurfaces, as well as metalens imaging and detection. Her related work has been recognized with awards such as "Outstanding Achievements in Optical Metamaterials" and "Top Ten Industrial Technologies in China Optics," and has been clinically tested at Jiangsu Cancer Hospital. In recent years, she has published more than 30 SCI-indexed papers, including 19 as first or corresponding author (including co-first/co-corresponding), in journals such as Science Advances, Light: Science & Applications, Optica, Physical Review Letters, Advanced Photonics, PhotoniX, Nano Letters, Nature Reviews Electrical Engineering, and Photon. Insights.

Title: Optical Corner Detection Imaging

Abstract: Animals efficiently interpret complex scenes by extracting geometric cues such as corners, motivating nature inspired, hardware feature detection for low power vision. Here we propose an optical corner imaging scheme based on azimuthal Hilbert transformation metasurfaces. A single metasurface simultaneously extracts corners of multiple objects, independent of their amplitude, phase, or incident angle, with broadband response and full field of view. We also analyze spatial–angular resolution trade offs to provide design guidelines, and experimentally demonstrate motion tracking as a proof of concept application within this data compressed corner imaging framework. The results highlight a compact route toward energy efficient, next generation optical information processing systems.

Ran Chen

Invited Talk Details

Bio: Ran Chen is a scientist at Institute of Process Engineering, Chinese Academy of Sciences. She received her Bachelor of

Science degree in physics from Nankai University, China, and her Master of Research degree from the University of Cambridge. Then she completed her PhD at Cavendish Laboratory, University of Cambridge. Her current research focuses on optoelectronic systems and semiconductor devices operating in terahertz and infrared spectral regions.

Title: Quantum Terahertz Detection in Two-Dimensional Electron Gases via the In-Plane Photoelectric Effect

Abstract: Field effect transistors based on two-dimensional electron gases (2DEGs) have shown promising performance as terahertz (THz) detectors over the past few decades. In 2022, a novel quantum phenomenon, the in-plane photoelectric (IPPE) effect, was discovered (Science Advances 8, eabi8398, 2022). It represents an efficient THz detection mechanism which gave rise to a new type of THz detectors, the photoelectric tunable-step (PETS) detectors. The first PETS detector was built on an AlGaAs/GaAs heterostructure with a 2DEG, covered by a dual-gated antenna, and showed a strong photoresponse to 1.9 THz radiation at ca. 10 K. A detailed theory of the IPPE effect was subsequently developed (Phys. Rev. B 106, 075411, 2022). In this mechanism, an electrically tunable potential step is artificially created within the 2D electron channel by biasing two gates on top of the device independently. Under THz illumination, electrons in the vicinity of the artificially created potential step are photoexcited by absorbing THz photons and jump onto the potential step. This leads to a strong net electron flow of purely quantum nature, from the high to the low electron density regions within the 2DEG.

In 2024, a dipole-antenna PETS THz detector with optimized dimensions doubled the responsivity at ca. 10 K (128 mA/W), and elevated the operating temperature of the IPPE effect in AlGaAs/GaAs heterostructures to 75 K (Nanophotonics 13, 1917, 2024). Besides single-pixel antennas, the IPPE effect was also integrated with metasurfaces, which achieved a high responsivity of 2.7 A/W at 10 K (Advanced Photonics 8, 026011, 2026). Recently, the IPPE effect was observed in the AlGaN/GaN material system with a higher responsivity compared with the previously demonstrated AlGaAs/GaAs-based devices. The demonstration of the IPPE effect in diverse materials suggests its universality in 2DEG-based systems.

In this talk, the physical principle of the in-plane photoelectric effect and its recent developments in AlGaAs/GaAs and AlGaN/GaN material systems will be reviewed.

Junxing Fan

Invited Talk Details

Bio: Junxing Fan is an Associate Researcher at the Institute of Advanced Studies, University of Electronic Science and Technology of China (Shenzhen). His research focuses primarily on terahertz bound-state-in-the-continuum (BIC) metasurfaces and their applications in wireless communications, sensing, temporal boundaries, and nonreciprocal photonics.

To date, he has published more than 20 research papers in internationally recognized journals, including Science Advances, Nature Communications, Advanced Materials, Opto-Electronic Science, Ultrafast Science, and Laser & Photonics Reviews. Among these publications, he is the first or corresponding author of 13 papers.

He has served as principal investigator for a Young Scientists Fund project supported by the National Natural Science Foundation of China, a General Program funded by the Department of Science and Technology of Guangdong Province, and a General Program supported by the Shenzhen Science and Technology Program. He has also participated as a key member in several major national, provincial, and municipal research projects, including a Key Program of the National Natural Science Foundation of China, the National Key Research and Development Program of China, and a Key Program of the Shenzhen Science, Technology and Innovation Commission.

He also serves as an invited reviewer for international journals such as Advanced Materials and Optics Letters.

Title: High Efficiency BIC Metasurface for Terahertz Beam Deflection

Abstract: Efficient, low-power, and highly integrated optoelectronic devices remain a critical yet challenging objective. Here, we introduce a multipoint Kerker-effect membrane metasurface that integrates Kerker's condition with quasi-bound states in the continuum (q-BICs). By engineering dual-mode dispersion, the proposed metasurface functions as a high-efficiency beam deflector while simultaneously achieving robust parameter tolerance and narrow-linewidth resonances—two characteristics that are typically difficult to reconcile. Experimentally, we demonstrate an absolute beam-deflection efficiency exceeding 92%, together with exceptional spectral and spatial selectivity, including a linewidth of 4 GHz, a divergence angle of 2.8°, and a quality factor of 114. Furthermore, the device enables 94% transmission-intensity modulation under an ultralow continuous-wave pump intensity of 0.5 W/cm^2. These results establish the Kerker-effect framework as a scalable and energy-efficient photonic platform, providing a promising route toward highly integrated optoelectronic systems for next-generation wireless communication and LiDAR applications.

Wange Song

Invited Talk Details

Bio: Wange Song is an Associate Professor and Ph.D. supervisor at Nanjing University. He received his B.S. in Materials Physics and Ph.D. in Optical Engineering from Nanjing University. He is a Yuxiu Young International Scholar at Nanjing University and was a visiting scholar at The University of Hong Kong. He is the principal investigator of a National Natural Science Foundation of China Young Scientists Fund project, Category B [formerly the Excellent Young Scientists Fund]. He has received several awards, including the Wang Daheng Optical Award from the Chinese Optical Society and the Jiangsu Young Optical Science and Technology Award.

His research focuses on micro-/nano-optics and integrated optics. As first or corresponding author, he has published more than 50 SCI papers in journals including *Physical Review Letters* (8 papers), *Nature Reviews Physics*, *Nature Communications* (2 papers), *Science Advances* (2 papers), etc. He has delivered more than 30 invited talks at international and domestic academic conferences. He also serves as a young editorial board member and guest editor for several academic journals, including *Science Bulletin*, *Photonics Insights*, *Chinese Science Bulletin*, and *Infrared and Laser Engineering*.

Title: Overcoming Adiabatic Limitations in Topological Photonic Waveguides

Abstract: Topological photonic waveguides are at the forefront of robust light transport technologies, capitalizing on protected edge states that are resilient to disorder and defects. Despite their advantages, practical implementations often encounter challenges associated with adiabaticity, such as unwanted mode mixing, backscattering, and diminished topological protection during rapid parameter changes. This talk systematically addresses these adiabatic problems and highlights state-of-the-art solutions to approach adiabatic control limits. We discuss the role of the quantum metric in quantifying and optimizing adiabatic evolution, and explore the application of shortcut-to-adiabaticity techniques to enable rapid and robust state transfer. The concept of the adiabatic infinum is introduced as a theoretical bound for control protocols, and inverse design approaches are presented as powerful tools for engineering waveguide geometries that minimize non-adiabatic transitions. Through theoretical analysis and experimental verifications, we demonstrate how these strategies can enhance topological protection and device performance for high-density integrations. Our findings provide valuable guidelines for the next generation of high-speed, reliable topological photonic devices.

T05. Optical Communication and Sensing Technologies (III)			
Session Chair: Xiang Li, China University of Geoscience (Wuhan)			
Time	13:30-16:00 September 10, 2026	**Venue**	LM101A / 1F

Invited Talks	
13:30-14:00	**Title**: Phase Noise Characterization and Optimization Strategies for Terahertz OFDM Systems **Speaker**: Bowen Liu, Keio University
14:00-14:30	**Title**: EPDA and System Platform for 400G/Lane Optical Interconnects **Speaker**: Lu Zhang, Zhejiang University
14:30-15:00	**Title**: Fiber Optic Biosensors: From Single Molecule Detection to Theranostics **Speaker**: Yunyun Huang, Jinan University
15:00-15:30	**Title**: Polarization Sensing in Fiber Transmission System **Speaker**: Xiang Li, China University of Geoscience (Wuhan)
15:30-16:00	**Title**: Quantization-Aware Equalization for High-Speed IM/DD Optical Interconnects **Speaker**: Zhaopeng Xu, Pengcheng Laboratory

Bowen Liu

Invited Talk Details

Bio: Bowen Liu's research interests include terahertz wireless communication, optical frequency combs, and ultrafast fiber lasers. He received his bachelor's degree from Huazhong University of Science and Technology in 2017, and completed his Ph.D. at the University of Tokyo in 2024. He also served as president of the U-Tokyo OPTICA chapter and was fully funded for the Ignite Programme in Judge Business School and Clare Hall, at the University of Cambridge. Since 2025, Bowen has been an assistant professor in EEE at Keio University, where his research focuses on microring resonators and terahertz-link digital signal processing. He has authored or co-authored over 60 journal and conference papers and holds 6 granted patents.

Title: Phase Noise Characterization and Optimization Strategies for Terahertz OFDM Systems

Abstract: In Terahertz OFDM systems, phase noise (PN) is a critical factor limiting transmission performance. This report systematically elaborates on the behavioral mechanisms of phase noise, key physical-layer mitigation techniques, and the cross-layer impacts and configuration strategies within the standard framework. In particular, we quantitatively investigates the impacts of different noise components through ablation studies, explicitly establishing a strong correlation among high-frequency noise, inter-subcarrier interference (ICI), and the ultimate bottleneck of transport quality. For pilot and equalizer design, a low-overhead scattered pilot scheme is evaluated, comparing the transmission performance and overhead trade-offs under different pilot distribution patterns. Meanwhile, a phase-noise-oriented adaptive MMSE equalizer is presented. Furthermore, concerning channel coding, the report deeply explores the forward error correction (FEC) failure boundaries under phase noise constraints and analyzes the characteristics of the resulting burst errors. Finally, the evaluation is extended to the packet level, providing packet-level performance evaluation and optimal configurations under the impact of phase noise based on the IEEE 802.15.3d standard.

Lu Zhang

Invited Talk Details

Bio: Lu Zhang serves as a Tenured Associate Professor at Zhejiang University, specializes in high-speed optical transmission systems, photonics-based millimeter-wave/terahertz communication and sensing systems, and intelligent photonic signal processing. His research contributions include 100+ publications in top-tier journals such as Journal of Lightwave Technology, Nature Communications, Laser & Photonics Reviews, and Advanced Photonics, along with Post-Deadline Papers (PDP) at premier conferences including OFC, ECOC, and ACP, accumulating over 4,000 citations.

Title: EPDA and System Platform for 400G/Lane Optical Interconnects

Abstract: For single-wavelength 400G optical interconnects, targeting the bandwidth and nonlinearity challenges in IM/DD systems, we construct a global optimization framework that encompasses devices, modulation, and intelligent signal processing. Integrated with silicon photonics and leveraging our self-developed electronic-photonic design automation (EPDA) software and system platform, this framework provides a system-level vertically integrated solution toward the practical implementation of energy-efficient single-wavelength 400G interconnects.

Yunyun Huang

Invited Talk Details

Bio: Professor Yunyun Huang is with the Key Laboratory of Optical Fiber Sensing and Communications, Jinan University. Huang's primary research focus is on fiber optic biochemical sensors, with a particular emphasis on enhancing sensor sensitivity and achieving multi-functionality. She has published more than 50 papers, including Science Advances, Light, Advanced Materials, and Advanced Science. She has presented more than 10 invited talks at academic conferences. Many of the research were highlighted as Covers or Hot articles in high standard journals, and as best paper awards in academic conferences.

Title: Fiber Optic Biosensors: From Single Molecule Detection to Theranostics

Abstract: The sensitivity of the sensor is a key parameter that limits its clinical application. To address this issue, we focused on three aspects: specific surface area, evanescent field energy density, and phase transformation amplification. As a result, we developed a label-free and highly sensitive fiber optic biosensor for detecting nucleic acids, amino acids, proteins, cells, and other biomasses. We were able to increase the detection limit from the pM level (before sensitization) by 8 orders of magnitude to enable single-molecule detection of protein molecules ranging from tens and hundreds of nanometers to subnanometer-sized small molecules and ions (10-20 mol/L). In addition, we have developed an approach to integrate optical fiber detection and photothermal therapy by incorporating photothermal agents onto the sensors through interface construction. This innovative method enables the selective targeting and eradication of cancer cells using optical fibers.

Xiang Li

Invited Talk Details

Bio: Li Xiang is a professor at China University of Geosciences (Wuhan) and a recipient of the Hubei Provincial Talent Program. He received his Ph.D. degree from the School of Electrical and Electronic Engineering at Nanyang Technological University, Singapore, in 2015. From 2015 to 2019, he worked as a senior engineer at the State Key Laboratory of Optical Fiber Communication Technologies and Networks, Wuhan Research Institute of Posts and Telecommunications Co., Ltd. Between 2019 and 2021, he served as a senior research associate at the Centre for Advanced Photonics and Electronics, University of Cambridge, UK. His research interests include novel architectures for optical fiber communication systems, extraction of optical fiber channel characteristics and loss compensation, optical signal modulation and coding, and applications of optical fiber sensing in fiber-optic networks. He has published over 150 academic papers in journals such as Nature Photonics, Nature Electronics, and Nature Communications, with over 2,500 citations. He has also delivered more than 10 invited talks at major international optics conferences such as OFC, OECC, and ICOCN.

Title: Polarization Sensing in Fiber Transmission System

Abstract: Optical fiber networks are now pervasive across both terrestrial and submarine infrastructures, creating a compelling opportunity to repurpose these assets for anomaly detection alongside their primary telecommunications role. While distributed acoustic sensing (DAS) has garnered considerable attention for its sensitivity and spatial resolution, its deployment within existing networks remains technically intricate and cost-prohibitive. An alternative approach exploits the received state of polarization (SOP), which is inherently sensitive to external perturbations and is already estimated by coherent receivers during routine data demodulation—requiring no additional hardware and potentially only a software upgrade. In this study, we investigate the viability of polarization-based sensing for detecting anomalous conditions in metropolitan fiber deployments. Recent experimental results in Smart Grid are provided.

Zhaopeng Xu

Invited Talk Details

Bio: Zhaopeng Xu received the B.S. and M.S. degrees from Peking University, Beijing, China, in 2015 and 2018, respectively, and the Ph.D. degree from the University of Melbourne, Parkville, VIC, Australia, in 2022. Since 2023, he has been a research scientist at Pengcheng Laboratory, Shenzhen, China. His research interests include digital signal processing and machine learning for optical transmission systems. He has authored over 170 peer-reviewed papers in journals and conferences

related to optical communications.

Title: Quantization-Aware Equalization for High-Speed IM/DD Optical Interconnects

Abstract: High-speed IM/DD optical interconnects increasingly rely on linear/nonlinear equalizers whose practical deployment is often limited by high parameter precision and hardware complexity. In this invited talk, we will first review existing quantization approaches for efficient equalization in high-speed IM/DD systems. We will then present a series of our recently proposed novel quantization methods and their applications, including clustering- and density-aware non-uniform quantization schemes for linear FFE and advanced nonlinear equalizers. These approaches enable substantial reductions in storage and implementation complexity of IM/DD receivers while maintaining reliable system performance.

S02. Optical Communication and Networks (II)

Session Chair: Roman Romashko, Far Eastern Branch of Russian Academy of Sciences, Russia

Time	13:20-15:50 September 10, 2026	**Venue**	LM105 / 1F

Invited Talks	
13:20-13:50	**Title**: Multicast-Capable Optical Circuit Switching and Communication Scheduling for Efficient Collective Communications **Speaker**: Lihua Ruan, Pengcheng Laboratory
13:50-14:20	**Title**: Bionic Optical Communication, Biological Optical AI and Natural Biological Diodes and Transistors **Speaker**: Anhui Liang, Yango University
14:20-14:50	**Title**: Evolution and Prospects of Networking Technologies for QKD-Based Optical Networks **Speaker**: Xiaosong Yu, Beijing University of Posts and Telecommunications
14:50-15:20	**Title**: Picking Up a Factor of 2 for IM/DD Transmission with Polarization Tracking **Speaker**: Kangping Zhong, The Hong Kong Polytechnic University
15:20-15:50	**Title**: Silicon Photonic Advanced Direct Detection Receiver for Optical Interconnects **Speaker**: Jingchi Li, Shanghai Jiao Tong University

Lihua Ruan

Invited Talk Details

Bio: TBA

Title: Multicast-Capable Optical Circuit Switching and Communication Scheduling for Efficient Collective Communications

Abstract: This invited talk will review our recent work on the development of a multicast-capable (MC) optical circuit switch (OCS) and the co-design of multicast-aware collective communication (CC) schedule. While OCS has emerged as a promising technology for next-generation AI data centers (DCs), existing OCSes natively do not support one-to-many multicast, which is an essential pattern underlying a class of CC primitives. In light of this, we present a MC-OCS design that utilizes multi-plane light conversion technique to achieve reconfigurable port-to-multi-port optical multicast for DC networking. Building on this hardware ability, we study multicast-based communication schedules that exploit optical multicast to accelerate CC.

Anhui Liang

Invited Talk Details

Bio: Professor Anhui Liang is a national high level talent of China and the second level professor, Deputy Director of University Academic Committee, YanGo University and Dean of Electronic Information and Interdisciplinary Research Institute. He held several high level positions in USA and China, e.g. Tyco Submarine Systems Ltd. (a part of former Bell Labs) in USA, Chief Scientist, FiberHome Technologies Group; Deputy Director of University Academic Committee, Nanjing

University of Posts and Telecommunications; Head of Optical Engineering Disciplinary, Guangdong University of Science & Technology etc.

He has made significant contributions in the fields of quantum mechanics, optical fiber communications, vision, biological optical AI, Chinese meridian and biological fibers. He is China Overseas Chinese Contribution Award recipient (2014); Yearly Person of "Scientific Chinese"(2015). He has made significant contributions in 9 questions which were among 125 questions: exploration and discovery listed by the famous journal Science. The New York Times listed 11 questions, which are most wanted to know by human, and he first proposed one new theory to answer one of these important questions.

His contributions have been well reported in famous national media. Their interview by Baidu Scholar received 180 millions of internet exposures in the first month of the video release in 2021. There are over 700 thousands of audiences in his 8 super-large online scientific lectures.

Title: Bionic Optical Communication, Biological Optical AI and Natural Biological Diodes and Transistors

Abstract: In 2011, he first proposed the bionic optical communication by mimicking the array of cones and rods on human retinas to design the photodetector array with high sensibility and large dynamic range! In 2012, he first proposed the liquid cooling transponders by mimicking human eyes to enhance heat dissipation and reduce audio noise, and the liquid cooling transponders have been widely used in the products of many companies recently (e.g, Nvidia, Zhongji Innolight etc.). In 2026, he first proposed that human eyes are liquid cooling CPOs. In 2012, he first proposed that multi-core fibers with reasonable coupling strength by mimicking the ratio of the cones' separation and mode-field-diameter (MFD), and several well-known fiber companies have manufactured these products.

He first proposed that the inverted retina structure of human and vertebrates is a biological optical AI, which is consisted of cone optical fiber couplers and saturable absorbers. He first found there are optical couplers on human and vertebrate retinas. This biological optical AI does color pre-processing, and it can save energy, reduce heat and reduce time delay significantly. By using this theory, he can unify the two important color theories: the tricolor theory and the opponent color theory, where these two theories have had controversy over more 140 years.

In 2024, he first proposed that the axons of cones (and rods) form biological optical fiber gratings (OFGs), and it was the first discovery of biological optical gratings in animal's eyes. The roles of the biological OFGs include to increase the color resolution and to improve the coupling efficiency into cones and rods.

In 1998 and 2013, he first proposed there are natural biological diodes and transistors in animal eyes, brains and bodies respectively, and many well known organizations (including MIT, NIH, RIKEN, Lund University etc.) have proved his theory partially recently. If his theory can be proved fully, it may change the histories of invention on the diodes and transistors.

Xiaosong Yu

Invited Talk Details

Bio: Yu Xiaosong is an Associate Professor and Ph.D. Supervisor at Beijing University of Posts and Telecommunications (BUPT). He received his joint Ph.D. degree under the China Scholarship Council (CSC) program at the University of California, Davis (UC-Davis). His primary research interest lies in quantum key distribution networks. He has led or participated in more than 30 research projects and has received 8 prestigious academic and governmental awards. He has authored or co-authored over 90 academic papers in prominent journals and conferences. He has led and contributed to more than 20 ITU-T international standards, 8 national/industry standards, and authored 4 academic books. He holds over 40 national invention patents and has submitted over 100 international standard documents being accepted.

Title: Evolution and Prospects of Networking Technologies for QKD-Based Optical Networks

Abstract: This talk will review the state-of-the-art in QKDN networking architectures and standardization activities, with particular emphasis on control and management frameworks, interoperability schemes, and network survivability mechanisms—along with the associated challenges and potential solutions. Critical issues in practical deployment, including multi-protocol compatibility, network performance optimization, and dynamic key management, are examined. This talk will further summarize the open challenges and future research directions for QKDN networking technologies, offering perspectives on the transition from current QKDN implementations toward next-generation quantum information networks. As standardization efforts advance, particularly within ITU-T, ETSI, and ISO/IEC, and as underlying hardware and control-plane technologies continue to evolve, QKDN is expected to play an increasingly vital role within future trusted network infrastructures. Ultimately, this talk aims to provide a cohesive roadmap for building a robust and scalable foundation for the broader quantum information network ecosystem.

Kangping Zhong

Invited Talk Details

Bio: Dr. Zhong Kangping is an Assistant Professor in the Department of Electrical and Electronic Engineering at The Hong Kong Polytechnic University. Dr. Zhong received his PhD degree in fiber optical communications in 2014. He was appointed as the Director of Research and Development in the POET Technologies, focusing on advanced silicon photonics, PIC, hybrid electronic-photonics integration for next generation optical communications from 2020 to 2023. From 2017 to 2020, he was the principal engineer with MACOM Technologies, focusing on advanced photonics technology. Prior to that, he was a postdoctoral fellow in The Hong Kong Polytechnic University from 2014 to 2017. He was a Visiting Research Fellow at The Queen's University, Canada from 2011 to 2012.

Dr. Zhong has more than a decade of solid experience in both academia and industry, particularly in the fields of fiber communication systems and associated electronics, optical coherent communications, short reach systems, advanced digital signal processing and its hardware implementation. He is also an expert in optical module, optoelectronic device, silicon photonics, hybrid integrated PIC and high-speed electronic IC, such as CDR chip, TIA, driver and coherent and PAM4 DSP ASIC.

Dr. Zhong has published over 100 papers (citation>2400+) in top-tier journals and international conferences including one book chapter, three ESI high citation papers (top 1% most-cited paper), one invited talk in the signature conference OFC 2017 and one top scored paper in OFC 2019. He has been ranked among the world's top 2% most-cited scientists in the released metrics compiled by Stanford University in 2021&2022&2024&2025. He is a recipient of the first prize of Guangdong Technological Invention Award of 2020 and 2025 Optoelectronics Global Conference (OGC) Young Scientist Award.

Title: Picking Up a Factor of 2 for IM/DD Transmission with Polarization Tracking

Abstract: In this talk, we will discuss doubling the transmission capacity of IM/DD by using polarization multiplexing enabled by optical polarization tracking techniques.

Jingchi Li

Invited Talk Details

Bio: Jingchi Li is an assistant professor at the School of Integrated Circuits, Shanghai Jiao Tong University. His research focuses on high-speed optical communications and silicon photonic integrated optical interconnect chips. As the first author, he has published on Laser & Photonics Reviews, OFC Postdeadline papers, ECOC Postdeadline papers and so on. He has been invited to deliver oral presentations at various international conferences, such as OECC, ACP, OGC, CIOP, and ICAIT. His achievements have been recognized with honors and awards, including the "Rising Star" title at the Forum on Photonic Integrated Circuits 2024, the "Outstanding Oral Presentation Award" at the 4th National Photonics Technology Forum (Greater Bay Area), and selection for the Shanghai "Super Postdoctoral Incentive Program."

Title: Silicon Photonic Advanced Direct Detection Receiver for Optical Interconnects

Abstract: The proliferation of large-scale AI models has created an urgent demand for high-capacity and low-cost integrated photonic interconnects. Here we demonstrate a monolithically integrated SiP local oscillator-free homodyne receiver which supports single-polarization 600 Gb/s transmission.

S10. Computational Imaging (IV)			
Session Chair: Fucai Zhang, Southern University of Science and Technology, China			
Time	16:00-17:40 September 10, 2026	**Venue**	LM103A / 1F

Invited Talks	
16:00-16:30	**Title**: Coherent Diffraction Imaging with Broadband Illumination **Speaker**: Huixiang Lin, Institute of Advanced Light Source Facilities, Shenzhen
16:30-17:00	**Title**: Computational Optical Imaging in Neuromorphic Sensing and Digital Holography **Speaker**: Edmund Lam, The University of Hong Kong

Huixiang Lin

Invited Talk Details

Bio: Dr. Huixiang Lin is currently a postdoctoral researcher at Shenzhen Advanced Light Source Research Institute. He received his PhD in Physics from Southern University of Science and Technology in 2026 under the supervision of Prof. Fucai Zhang. His research focuses on coherent diffraction imaging, ptychography, and partially coherent phase retrieval algorithms. He is particularly interested in developing advanced imaging models and reconstruction algorithms that relax the stringent coherence requirements of conventional coherent diffraction imaging. He developed a series of broadband diffraction imaging techniques for overcoming temporal decoherence and model mismatch under broadband illumination. His work includes ultra-broadband ptychography for dispersive samples, single-shot broadband coherent modulation imaging, single-frame multiwavelength coherent diffraction imaging using extreme ultraviolet high-harmonic comb sources. These studies aim to enable high-resolution, quantitative, and chemically sensitive lensless imaging with laboratory-scale EUV and X-ray sources.

Title: Coherent Diffraction Imaging with Broadband Illumination

Abstract: Coherent diffraction imaging (CDI) enables high-resolution imaging without objective lenses. Conventional CDI generally requires highly coherent illumination. In this talk, we present our recent progress in CDI with broadband illumination. To relax the coherence requirement, we developed a coherence compensation method based on joint deconvolution. The method enables stable phase retrieval under broadband illumination without prior knowledge of the source spectrum. It has been demonstrated with visible light at bandwidths up to 60% and further validated using a high-harmonic EUV source. We also explored single-shot multiwavelength CDI, providing a potential route to dynamic imaging with spectrally resolved information.

Edmund Lam

Invited Talk Details

Bio: Edmund Lam received the BS, MS, and PhD degrees in electrical engineering from Stanford University. He is currently a professor of electrical and computer engineering with The University of Hong Kong. His research interest includes computational imaging algorithms, systems, and applications. He is a fellow of IEEE, Optica, SPIE, IS&T, and HKIE; and a founding member of the Hong Kong Young Academy of Sciences.

Title: Computational Optical Imaging in Neuromorphic Sensing and Digital Holography

Abstract: In the quest to overcome the physical limits of traditional imaging, computational optical imaging harnesses the power of unconventional sensors and optical setup to encode object information, and computational algorithms to decode the visual data. This presentation is divided into two core segments that represent our recent work in this area. The first part introduces Computational Neuromorphic Imaging (CNI), tracing the journey from early explorations of event-based sensing in computational imaging to recent advancements. We examine how the high temporal resolution and low data redundancy of neuromorphic sensors enable high-speed and high-dynamic-range capture that was previously inaccessible to conventional systems. The second part shifts to Digital Holography (DH), an essential tool for three-dimensional quantitative phase imaging. While Deep Learning (DL) has dramatically accelerated DH reconstruction, it faces significant challenges regarding data fidelity and generalization. We discuss these hurdles and demonstrate how the integration of Domain Knowledge (DK)—specifically physical priors and optical wave propagation models—can effectively complement DL architectures to achieve more robust and accurate holographic imaging.

Oral Information	
17:00-17:20	**Paper ID: 1003** **Title:** Improving Accuracy for Scene Text Recognition in Compound Degraded Images via Video Restoration and Perceptual Loss **Presenter**: Tomio Goto, Nagoya Institute of Technology
17:20-17:40	**Paper ID: 9232** **Title:** On the Generalization of Radiative Gaussian Splatting for Digital Rock CT Reconstruction **Presenter**: Luoyuan Liao, The University of Queensland

W01. Workshop on Advanced Specialty Optical Fiber and Applications

Session Chair: Zhenggang Lian, Yangtze Optical Electronics Co., Ltd., China

Time	15:35-17:20 September 10, 2026	Venue	LM103B / 1F

Invited Talks	
15:35-16:00	**Title**: Long-Distance Distributed Fiber-Optic Sensing Using Forward Transmission and Specialty Fibers **Speaker**: George Y. Chen, Shenzhen University
16:00-16:25	**Title**: Quantum Sensors Inside Hollow-Core Fibers **Speaker**: Wei Li, Beihang University, Tianmushan Laboratory
16:25-16:50	**Title**: Specialty Optical Fiber Technologies and Applications Across Multiple Domains **Speaker**: Wei Gao, Yangtze Optical Electronics Co., Ltd.
16:50-17:20	**Launch Event for Device-Grade Polarization-Maintaining Fiber Technology and Mass-Production Achievements** **Zhenggang Lian; Yangtze Optical Electronics Co., Ltd.**

George Y. Chen

Invited Talk Details

Bio: Dr. George Yuhui Chen received his Bachelor's and Master's degrees from Imperial College London, UK in 2009, and obtained his PhD from the Optoelectronics Research Centre (ORC) at the University of Southampton, UK in 2014. From 2013 to 2015, he conducted postdoctoral research at the joint laser research laboratory of SPI Lasers Ltd and the University of Southampton. In 2015, he joined the University of South Australia as a research fellow. In 2021, he joined Shenzhen University as a Distinguished Professor. In 2022, he became Deputy Director of the Shenzhen Key Laboratory of Ultrafast Laser Micro/Nano Manufacturing Science and Technology. In recent years, his research has focused on ultra-long-distance distributed sensing and integrated sensing and communication technologies.

Title: Long-Distance Distributed Fiber-Optic Sensing Using Forward Transmission and Specialty Fibers

Abstract: Forward-transmission distributed acoustic sensing (forward DAS) is emerging as a powerful alternative to conventional backscatter-based distributed sensing. By interrogating the much stronger forward-propagating optical field, forward DAS can provide long sensing distances, high sensitivity, broad frequency response, and natural compatibility with existing fiber-optic communication links. This invited talk will review our recent progress in combining forward DAS with specialty optical fibers to expand both sensing functionality and system flexibility. In helical multi-core fiber, the engineered optical-path difference between straight and helically wound cores provides an intrinsic spatial reference, enabling unidirectional vibration positioning without long-distance synchronization, multiple wavelengths, or bidirectional propagation. In few-mode fiber, modal diversity provides additional sensing degrees of freedom, allowing vibration and temperature perturbations to be separated even when their temporal frequencies overlap. These examples illustrate a broader concept: specialty fibers can transform forward DAS from a long-range vibration sensor into a multi-dimensional distributed sensing platform. We will discuss the underlying interferometric principles, system architectures, signal

demodulation methods, and practical trade-offs associated with spatial-, modal-, and polarization-diverse implementations.

Wei Li

Invited Talk Details

Bio: Dr. LI Wei received his Bachelor's and Ph.D. degrees from Beihang University in 2013 and 2021, respectively. From 2017 to 2020, he was supported by the China Scholarship Council (CSC) for a joint doctoral training program at Johannes Gutenberg University Mainz in Germany. His research primarily focuses on cold-atom quantum information and quantum metrology, with a particular interest in light-atom interactions in hollow-core optical waveguides. He is dedicated to exploring cold-atom interferometry based on this platform and its applications in high-precision inertial sensing.

In 2021, he was selected for the Postdoctoral Innovative Talents Support Program. He currently conducts several research grants, including the National Natural Science Foundation of China (NSFC) Youth Project and the Beijing Natural Science Foundation General Program. He has also served as the technical lead and played a key role in four major national research projects. He has published 11 papers as first or corresponding author in prestigious physics and optics journals such as *Physical Review Letters, Light: Science & Applications, and Optics Letters,* and has filed over ten invention patent applications.

Title: Quantum Sensors Inside Hollow-Core Fibers

Abstract: Hollow-core optical fibers provide a unique platform in which light and atoms can be confined within the same extended interaction region, opening new possibilities for compact and deployable quantum sensors. This talk introduces the motivation, operating principles, and recent progress of quantum sensing inside hollow-core fibers, with a primary focus on fiber-guided cold-atom interferometry. Conventional free-space atom interferometers offer exceptional sensitivity to gravity, acceleration, and rotation, but their size and interrogation time are limited by atomic-cloud expansion and relative motion between the atoms and laser beams. Guiding cold atoms inside a hollow-core fiber can suppress transverse expansion, maintain light–atom overlap, and enable flexible measurement geometries. I will present our progress from proof-of-principle experiments to an integrated prototype, including the observation of atom-interference signals, studies of decoherence mechanisms, optimization of fiber modes and optical coupling, and the demonstration of absolute gravity measurement. Beyond cold-atom interferometry, hollow-core fibers can also function as miniature atomic vapor cells. Their small size, long interaction length, low optical-power requirements, and compatibility with fiber components make them attractive for atomic references and Rydberg-atom electromagnetic-field sensing. The long-term objective is to integrate hollow-core fibers, atomic media, laser delivery, detection, and control systems into versatile quantum-sensing modules for inertial measurement, electromagnetic-field sensing, and distributed sensing.

Wei Gao

Invited Talk Details

Bio: Wei Gao, Ph.D., is a Senior R&D Engineer at Yangtze Optical Electronics Co., Ltd., primarily focusing on photonic crystal fibers and their applications. He has led one research project and published multiple SCI papers in this field. In recent years, his research has centered on anti-resonant hollow-core fibers and radiation-resistant specialty optical fibers.

Title: Specialty Optical Fiber Technologies and Applications Across Multiple Domains

Abstract: With the rapid development of aerospace and deep-space exploration technologies, the complex space radiation environment imposes stringent requirements on the reliability and service life of high-precision fiber optic gyroscopes (FOGs). As the core sensing element of FOGs, the radiation resistance of the optical fiber directly determines the system's space adaptability. This report focuses on radiation-resistant specialty optical fiber technologies for space-grade FOG applications, with an emphasis on recent research and breakthroughs in three types of core fibers: panda-type polarization-maintaining fibers, solid-core photonic crystal fibers, and hollow-core photonic bandgap fibers.

T02. Photonics for Ocean (IV)			
Time	15:10-18:10 September 10, 2026	**Venue**	LM103C / 1F

Invited Talks	
Session Chair: Zhaoshuo Tian, Harbin Institute of Technology (Weihai)	
15:10-15:40	**Title**: Progress on Flexible and Self-Powered Sensors for Marine Environmental Monitoring **Speaker**: Yang Yang, Harbin Institute of Technology, Shenzhen
15:40-16:10	**Title:** A Novel Anti-Interference Lidar **Speaker:** Wenbo Sun, CICORE
Session Chair: Jing Xu, Zhejiang University	
16:10-16:40	**Title**: High-Throughput Marine Particle Classification by Polarized Light Scattering **Speaker**: Ran Liao, Southern University of Science and Technology
16:40-17:10	**Title**: Study on the Toxicity Discrimination and Sensor of Red Tide Algae Based on Three-Dimensional Fluorescence Spectrum **Speaker**: Weihong Bi, ZhongShan Institute of Changchun University of Science and Technology, Changchun, China; Ocean Research Institute of Yanshan University, Qinhuangdao, China
Session Chair: Weihong Bi, ZhongShan Institute of Changchun University of Science and Technology, Changchun, China; Ocean Research Institute of Yanshan University, Qinhuangdao, China	
17:10-17:40	**Title**: Research on Optical Fiber Sensing Technology for Seawater Dissolved Gas Monitoring **Speaker**: Yafei Li, Jinan University
17:40-18:10	**Title**: Anti-Sunlight Interference Circularly Polarized Hyperspectral Measurement **Speaker**: Jiajin Li, CICO Research Global Co., Ltd.

Yang Yang

Invited Talk Details

Bio: Yang Yang is a Full Professor at Harbin Institute of Technology, Shenzhen. He received his Ph.D. in electrical engineering from IMEC and Ghent University, Belgium, in 2017. From 2017–2018, he was a JSPS Postdoctoral Fellow at Osaka University, Japan, and from 2018 to 2020, he worked at Pacific Northwest National Laboratory, USA. From 2020–2026, he served as a Full Professor at the Institute of Deep-Sea Science and Engineering, Chinese Academy of Sciences. His research interests include sensors, energy harvesting, and artificial intelligence for oceanic and low-altitude environments.

Title: Progress on Flexible and Self-Powered Sensors for Marine Environmental Monitoring

Abstract: Focusing on the demands of deep-sea exploration under extreme environmental conditions, this report presents the team's recent research progress in two key technologies: flexible sensing and self-powered sensing. It covers advances in novel sensing mechanisms, flexible device design, self-powered system development, and intelligent sensing technologies, while highlighting the potential applications of these technologies in deep-sea environmental monitoring, marine equipment, and marine biological observation. These efforts provide new insights into the development of next-generation intelligent sensing technologies for deep-sea exploration.

Wenbo Sun

Invited Talk Details

Bio: Dr. Wenbo Sun is a Research Scientist in CICORE, Zhejiang Province, China. He got his BSc from Peking University, MSc from the National Oceanic Administration of China, and PhD from Dalhousie University in Canada. He is the Chief Scientist and Director of CICORE's Institute of Detection and Sensing. He engaged in research in remote sensing for transportation, and optical equipment development. He published over 100 papers in SCI-indexed journals and books. He is also the recipient of NASA's Exceptional Public Achievement Medal, and Zhejiang Province's West Lake Friendship Medal.

Title: A Novel Anti-Interference Lidar

Abstract: Lidar remote sensing in water bodies are interfered by natural light and multiple scattering of the water components. Optical remote sensing free of natural light contamination and multiple scattering noise is desired for ocean studies. In this talk, a novel lidar system that can reduce sunlight interference and light path multiple scattering noise is introduced.

Ran Liao

Invited Talk Details

Bio: Dr. LIAO Ran is the research professor from Advanced Institute for Ocean Research, Southern University of Science and Technology, Shenzhen, China. Dr. Liao's research activity focuses on in-situ classification of marine particles by use of polarized light scattering. He has published more than 50 peer reviewed papers in recent 5 years, including Limnology and Oceanography: Methods, Marine Pollution Bulletin, IEEE Journal of Oceanic Engineering, IEEE Transactions on Instrumentation and Measurement, Optics and Laser Technology, Optics Letters, etc. Developed prototypes have been deployed in Northwest Pacific Ocean and the Chinese Seas. He has been funded by two NSFC general projects, and as a key member participated in several national projects.

Title: High-Throughput Marine Particle Classification by Polarized Light Scattering

Abstract: High-throughput marine particle classification can efficiently acquire the seawater's particulate composition, providing a promising tool to for marine environment monitoring and resource development. Due to the complexity of marine particles, high-throughput classification is still challenging to the community of marine technology. Recently, the methods based on polarized light scattering have been proposed to measure the individual particles suspended in water and classify them with high accuracy and high throughput. In this report, I will present the progresses made over the last year in both techniques and applications, which convincingly indicates the power of polarized light scattering in marine particle classification.

Weihong Bi

Invited Talk Details

Bio: Professor Bi Weihong, PhD and doctoral supervisor. Since joining in 1982, she has held positions including head of the Department, vice dean, and dean of the School of Information Science and Engineering at Yanshan University, and director of the Marine Intelligent Sensing Technology and Equipment R&D Center at Sunshan Research Institute, Changchun University of Science and Technology. She also serves as vice chairman of the Opto-Mechatronics Committee of the Chinese Society for Instrumentation, and as a member of the Marine Resources Professional Committee of the Ministry of Natural Resources of China. She has received honors such as the National Women's 'Merit in Career' model and 'Hebei Province Teaching Master'.

Professor Bi Weihong mainly focuses on research in in-situ marine optical sensors, marine organism identification and biomass assessment, and anti-corrosion and anti-fouling equipment for marine instruments

Title: Study on the Toxicity Discrimination and Sensor of Red Tide Algae Based on Three- Dimensional Fluorescence Spectrum

Abstract: Toxic red tide algae can swiftly harm fish tissues, potentially leading to poisoning or fatalities in humans, thereby persistently endangering China's marine ecological security, aquaculture sector, and public health. Addressing scientific challenges like the inherent relationship between the three-dimensional fluorescence spectra of algal pigments and cell densities, the overlapping signals in three-dimensional fluorescence spectra when multiple algal species coexist, and the multifaceted interferences in the marine milieu, this study aims to develop a model for detecting cell concentrations of toxic red tide algae in intricate marine settings through the application of three-dimensional fluorescence spectroscopy and deep learning techniques.

Yafei Li

Invited Talk Details

Bio: Yafei Li received his MS and Ph.D. degree from the College of Electronic Science and Engineering, Jilin University, Changchun, China, in 2020 and 2023, respectively. He is now a lecturer at Jinan University, Guangzhou, China. His research interests include optical fiber sensing technology and its applications in energy and ocean fields.

Title: Research on Optical Fiber Sensing Technology for Seawater Dissolved Gas Monitoring

Abstract: This study conducts in-depth research on innovative principles and key core technologies for accurate measurement of dissolved gas in seawater, focusing on optical fiber gas sensing technology. The aim is to develop miniaturized optical fiber gas in-situ detection sensors to achieve high-precision measurement of dissolved seawater gas and promote the leapfrog development of the overall capabilities of in-situ monitoring and evaluation of dissolved seawater gas. Through the above research, we will master core technologies such as principle innovation, functional development, standardized design, manufacturing and mass production of the next generation of marine sensors, and provide original, systematic and standardized technical and equipment support for marine "carbon capture, utilization and storage."

Jiajin Li

Invited Talk Details

Bio: Jiajin Li holds a Ph.D. from Tsinghua University, with research interests in polarized light scattering, polarization instrumentation, and polarization imaging. He pioneered rapid in-situ Mueller matrix measurements of individual suspended particles and developed an anti-interference circularly polarized oceanic LiDAR system, validated in both shipborne and airborne trials. He has published 30+ peer-reviewed papers (16 as first author) and holds 10 Chinese patents. His honors include the Beijing Outstanding Doctoral Graduate Award, five National Scholarships, and Tsinghua's Academic Rising Star Award.

Title: Anti-Sunlight Interference Circularly Polarized Hyperspectral Measurement

Abstract: Active hyperspectral sensing of natural waters is valuable for detecting suspended particles and dissolved organic matter. However, outdoor use is limited by sunlight background. Thus, we introduce an active circularly polarized hyperspectral measurement system that suppresses sunlight interference. We describe the system design and operating principles, and we present experiments showing robust performance under simulated sunlight. The measured circularly polarized hyperspectral features support quantifying substance concentrations and identifying suspended particle types in water. This approach enables in-water spectrometers and hyperspectral LiDAR to operate in marine exploration and ecological monitoring under intense sunlight.

W02. Workshop on Optical Sensing for Safety

Session Chair: Dongmei Huang, The Hong Kong Polytechnic University, China

Time	16:00-18:00 September 10, 2026	**Venue**	LM104A / 1F

Invited Talks	
16:00-16:30	**Title**: Fiber and Waveguide Based Gas Sensors **Speaker**: Wei Jin, The Hong Kong Polytechnic University
16:30-17:00	**Title**: High-Performance Optical Fiber Distributed Acoustic Sensor (DAS) **Speaker**: Jun He, Shenzhen University
17:00-17:30	**Title**: Fiber Sensing Empowers Industrial Safety **Speaker**: Xi Liu, Huawei Technologies Co. Ltd
17:30-18:00	**Title**: Infrastructure Health Monitoring Using DAS and Geophysical Techniques Enhanced by AI Agents **Speaker**: Haoran Meng, Southern University of Science and Technology

Wei Jin

Invited Talk Details

Bio: Wei Jin holds the position of Chair Professor of Photonic Instrumentation at the Hong Kong Polytechnic University (PolyU). He has published over 300 Journal papers and successfully supervised >30 PhDs. He received PolyU President Awards (twice) for Outstanding Performance in Research, PolyU Outstanding Professional Service and Innovation Award for

technology transfer, NSFC Distinguished Oversea Young Scholar Award, Chiang Jiang Chair Professor Award, and 2020 and 2025 China's Top Ten Optical Advances in applied research category. He was the Co-Chair of the 25th International Conference on Optical Fiber Sensors (OFS-25) and the Technical Chair of OFS-22. He invented fiber-based photothermal spectroscopy techique for gas sensing.

Title: Fiber and Waveguide Based Gas Sensors

Abstract: Traditional laser gas spectroscopy systems use discrete components and open-path gas cells, which are difficult to align, large-in-size, and have stability problems when used outdoor. Here we talk about fiber- and waveguide-enhanced laser spectroscopy for gas sensing. Microstructured hollow-core or nano-core optical fibers and waveguides are used as gas cells, which have special waveguiding, thermodynamic and acoustic properties, and enhance the interaction of light, gas molecules and waveguide structures (materials) significantly. The fiber and waveguide gas cells may be flexibly spliced to other fiber and waveguide-based components to form sophisticated photonic circuits for robust and high precision measurement of optical phase and intensity, promoting practical applications of spectroscopic gas sensing and instrumentation.

Jun He

Invited Talk Details

Bio: Jun He (Member, IEEE) was born in Hubei, China, in 1985. He received the B.Eng. degree in electronic science and technology from Wuhan University, Wuhan, China, in 2006, and the Ph.D. degree in electrical engineering from the Institute of Semiconductors, Chinese Academy of Sciences (CAS), Beijing, China, in 2011. From 2011 to 2013, he was with Huawei Technologies, Shenzhen, China, as a Research Engineer. From 2013 to 2015, he was with Shenzhen University, Shenzhen, as a Post-Doctoral Research Fellow. From 2015 to 2016, he was with The University of New South Wales Sydney (UNSW), Sydney, NSW, Australia, as a Visiting Fellow. Since 2017, he has been with Shenzhen University as an Assistant Professor/an Associate Professor/Distinguished

Professor. He has served as the principal investigator of a Young Scientist Project under the National Key R&D Program of China, as well as several major NSFC-funded projects, including Key Programs, Key Programs of the Joint Funds, and the Excellent Young Scientists Fund. He has published 132 SCI papers, with more than 4,300 citations and an H-index of 38, and holds 22 authorized Chinese invention patents.

Title: High-Performance Optical Fiber Distributed Acoustic Sensor (DAS)

Abstract: Distributed acoustic sensing (DAS) based on phase-sensitive optical time-domain reflectometry (Φ-OTDR) is widely used in border security, pipeline monitoring, and structural health diagnosis. However, due to weak backscattered signals along the fiber, pulse-width constraints, and system self-noise, severe trade-offs exist among sensing distance, spatial resolution, frequency response, and noise level, hindering high-performance DAS in practice. To address limited sensing distance, a weak-reflection fiber Bragg grating array extends the sensing distance to 70 km, and remote pump amplification further extends it to 120 km. Combining positive- and negative-swept-pulse Φ-OTDR with scattering-enhanced fiber achieves a spatial resolution of 1.2 cm and a Doppler frequency shift suppression ratio of 20 dB. A frequency-phase orthogonal coding method overcomes the mutual constraints among sensing distance, spatial resolution, and frequency response, enabling distributed ultrasonic sensing with >1 MHz bandwidth. A deep learning-based Kalman filtering phase demodulation method tracks the complex phase vector evolution, achieving high precision (10 pε/√Hz at 45 km). Using fiber self-reference and an oversampling/downsampling algorithm, common-mode noise is suppressed, allowing detection of a 1 mHz signal at 10 km. Finally, optimized FPGA dataflow and parallel computing yield a real-time DAS prototype. Field experiments on underwater sensing and 3D localization of low-altitude drones show maximum positioning and angular errors of 0.1 m and 3°, respectively. This high-performance DAS technology has significant scientific value and engineering application prospects.

Xi Liu

Invited Talk Details

Bio: LIU XI

VP of Enterprise Optical Domain Optical Business Productor Line

Over 20 years of experience in Huawei's optical product line, served as R&D Engineer for optical transmission products, Asia - Pacific Optical Pre- sales Solution Chief Engineer, Global MSTP Sales Director, Director of Enterprise Dedicate Line SDT, and Director of Enterprise Optical Domian Product Management Department.

Title: Fiber Sensing Empowers Industrial Safety

Abstract: Huawei's AI-based distributed fiber optic sensing, built on a large AI model and utilizing highly sensitive optical receiving components as the sensing nerves, achieves high-precision perception with "zero" false negatives and low false positives in the security field. This helps customers protect the safety of critical assets such as oil and gas pipelines, communication cables, railways, and water conservancy facilities; ensures the security of important sites like airports, substations, and oil and gas stations; and safeguards the operational safety of key equipment—belt conveyors—in industries such as building materials, mining, smelting, and thermal power generation. Huawei's fiber optic sensing empowers safety across all industries.

Haoran Meng

Invited Talk Details

Bio: Haoran Meng is an Associate Professor in the Department of Earth and Space Sciences at Southern University of Science and Technology. He received his B.S. and M.S. degrees in Geophysics from Peking University and his Ph.D. in Earth Sciences from the University of Southern California. He then conducted postdoctoral research at the University of California, San Diego and Florida State University. In 2022, he returned to China to join the faculty, was selected as a national high-level young talent, and has led multiple research projects, including a General Program of the National Natural Science Foundation of China and a project of the National Deep Earth Science and Technology Major Project. His main research interests include multi-scale earthquake source physics and mechanisms by integrating experiments, observations, and numerical simulations; dispersion and attenuation imaging based on dense arrays and distributed fiber-optic sensing; and associated time-lapse monitoring and mechanism studies.

Title: Infrastructure Health Monitoring Using DAS and Geophysical Techniques Enhanced by AI Agents

Abstract: Continuous structural health monitoring faces fundamental challenges in spatial coverage, sensor longevity, and data interpretability. Distributed Acoustic Sensing (DAS) repurposes existing fiber-optic networks as dense seismic arrays, achieving meter-level resolution across tens of kilometers without external power. DAS measures dynamic strain from propagating waves, where waveforms encode subsurface rigidity and fluid content. On bridges, DAS continuously tracks eigenvibrations and strain-rate responses to detect stiffness changes from thermal expansion, cracking, or fracture opening, while pinpointing local weaknesses under loading. For dams, DAS enables subsurface imaging that identifies weakened zones and seepage pathways before visible signs of distress emerge. To make these geophysical outputs actionable, we integrate an LLM-based agent that retrieves baseline data from a structural database, invokes prescribed processing functions on demand, and synthesizes results into clear reports and plain-language advisories. This framework empowers engineers without extensive geophysical training to interpret anomalies, distinguish environmental effects from damage, and prioritize interventions. By translating complex seismic data into actionable intelligence, the integrated DAS-AI system enables timely maintenance decisions, enhances public safety, extends infrastructure service life, and helps protect communities from preventable failures.

T06. Photonic Integration (II)

Session Chair: Qifeng Ruan, Harbin Institute of Technology (Shenzhen), China

Time	16:00-18:00 September 10, 2026	Venue	LM104B / 1F

Invited Talks

16:00-16:30	**Title**: Parallel Wavelength-Division-Multiplexed Signal Transmission and Dispersion Compensation Enabled by Soliton Microcombs and Microrings **Speaker**: Yuanbin Liu, Shenzhen University
16:30-17:00	**Title**: Manipulation of Epsilon-Near-Zero Platforms towards Applications for Complex Photonic Systems **Speaker**: Qian Li, Peking University
17:00-17:30	**Title**: Micro-Nano Optical Structure-Driven Thin-Film Fluorescence Sensing **Speaker**: Huizi Li, Shanghai Institute of Microsystem and Information Technology, Chinese Academy of Sciences

Yuanbin Liu

Invited Talk Details

Bio: Yuanbin Liu, an assistant professor from Shenzhen University, got his bachelor degree from the University of Electronic Science and Technology of China (UESTC) in 2018 and his doctoral degree from Shanghai Jiao Tong University (SJTU) in 2024. He joined the Institute of Micro-Nano Optoelectronics at Shenzhen University as an assistant professor in 2026. His research interests focus on silicon-based integrated on-chip optical signal processing and on-chip optical interconnects. He has published more than 15 journal and conference papers.

Title: Parallel Wavelength-Division-Multiplexed Signal Transmission and Dispersion Compensation Enabled by Soliton Microcombs and Microrings

Abstract: The proliferation of computation-intensive technologies has led to a significant rise in the number of datacenters, posing challenges for high-speed and power-efficient datacenter interconnects (DCIs). Although inter-DCIs based on intensity modulation and direct detection (IM-DD) along with wavelength-division multiplexing technologies exhibit power-efficient and large-capacity properties, the requirement of multiple laser sources leads to high costs and limited scalability, and the chromatic dispersion (CD) restricts the transmission length of optical signals. We proposed a scalable on-chip parallel IM-DD data transmission system enabled by a single-soliton Kerr microcomb and a reconfigurable microring resonator-based CD compensator. We experimentally demonstrated a line rate of 1.68Tb/s over a 20-km-long SMF. The energy consumption for CD compensation is ~0.3 pJ/bit, which is around 6 times less than that of the commercial 400G-ZR coherent transceivers.

Qian Li

Invited Talk Details

Bio: Qian Li is Tenured Associate Professor and Vice Dean at School of Electronic and Computer Engineering (ECE), Peking University. Her research interests include ultrafast lasers, silicon photonics and epsilon near zero (ENZ) photonics. She has authored an invited technical review paper in Nature in 2022, published over 100 papers in journals such as Nature Communications, Laser & Photonics Reviews, and Photonics Research, and over 100 papers at international conferences such as CLEO. She is an invited speaker at leading international conferences like OFC and ECOC. She is a Senior Member of Optica and has been the advisor for the Optica student branch at Peking University Shenzhen Graduate School since 2015. She is also a Senior Member of the Institute of Electrical and Electronics Engineers (IEEE) and served as the Vice Chairman of the IEEE Electron Devices and Solid-State Circuits (ED/SSC) Beijing Section (Shenzhen) Chapter and the Chairman of EDS from 2017 to 2019. Since 2019, she has been the advisor for the IEEE Photonic Society Student Branch Chapter at Peking University Shenzhen Graduate School. Currently she serves as Chair for IEEE Photonics Society Guangdong Chapter.

Title: Manipulation of Epsilon-Near-Zero Platforms towards Applications for Complex Photonic Systems

Abstract: Epsilon-near-zero ENZ materials, with their vanishing permittivity, have emerged as a compelling platform for nanophotonics and nonlinear optics due to extreme field enhancement, phase engineering capabilities, and compatibility

with complementary metal-oxide-semiconductor technology. Based on these unique features and great performance, ENZ materials can play a significant role in optical communication, data processing and laser technology. Here, a comprehensive overview of ENZ photonics is presented, revealing its fundamental principles and highlighting our research endeavors. Our recent investigations of ENZ photonics include ultrafast electro- and all-optical switching, ENZ modulators, light-matter interactions in ENZ devices and the manipulation of ENZ properties. We introduce supercritical fluid (SCF) technology to epsilon-near-zero (ENZ) photonics for the first time and experimentally demonstrate the manipulation of the ENZ wavelength for the enhancement of linear and nonlinear optical absorption in ENZ indium tin oxide (ITO) nanolayer. By reducing oxygen vacancies and electron scattering in the SCF oxidation process, the ENZ wavelength is shifted by 23.25 nm, the intrinsic loss is reduced by 20%, and the saturable absorption modulation depth is enhanced by > 30%. We also propose a novel protocol of ITO thin film pre-treated by ALD, and deposited by magnetron sputtering. The experimental results show higher mobility (μ = 82.760 cm2/V·s) and lower optical loss (k = 0.000107) compared to ITO films grown by conventional magnetron sputtering. Based on the experimental manipulation of ENZ materials, we show how ENZ elements can be integrated into complex photonic systems through the demonstration of a fiber laser cavity incorporating indium tin oxide nanolayers. The intra-cavity ENZ component introduces frequency-selective optical potential barriers that fundamentally reshape the mode-locking dynamics, enabling wavelength reselection and spectral redistribution through gain competition. This cavity configuration exhibits behavior analogous to radio-frequency superconducting quantum interference devices (RF-SQUID), illustrating how ENZ photonics can bridge optical phenomena with concepts from other physical domains. What's more, while substantial progress has been made in understanding their linear and Kerr nonlinear properties, the role of temperature in governing ENZ behavior has remained largely unexplored despite its critical importance for integrated photonic systems where heat generation is unavoidable. We present a comprehensive investigation of thermo-optic ENZ effects in indium tin oxide nanolayers, revealing that temperature systematically tunes the ENZ frequency across telecommunication bands with modulation rates reaching several gigahertz per kelvin. These findings reported here offer a deeper insight into ENZ photonics and pave the way to the potential applications in nanophotonic on-chip devices.

Huizi Li

Invited Talk Details

Bio: Dr. Huizi Li is an Associate Professor at the State Key Laboratory of Transducer Technology, Shanghai Institute of Microsystem and Information Technology, Chinese Academy of Sciences. She received her Bachelor's degree from Huazhong University of Science and Technology and her Ph.D. from Nanyang Technological University (NTU), Singapore. Subsequently, she worked as a Research Fellow at The Photonics Institute, NTU. Dr. Li joined the Shanghai Institute of Microsystem and Information Technology, CAS, in 2022. Her research focuses on micro/nano-structured optical waveguide devices, with particular interests in trace gas sensors based on optical micro/nano-structure modulation, micro/nano-fiber gas sensors, and on-chip waveguide fluorescence gas sensors.

Title: Micro-Nano Optical Structure-Driven Thin-Film Fluorescence Sensing

Abstract: Accurate and efficient trace gas detection is of critical importance across diverse domains including public security, human health, and environmental monitoring. Thin-film fluorescence-based gas sensing, owing to its high sensitivity and specificity, constitutes a key enabling technology in this field. Nevertheless, its practical device-level implementation remains constrained by several challenges, such as low optical signal excitation and collection efficiency, limited signal-to-noise ratio enhancement, and inadequate photostability. To address these limitations, we propose the use of micro-nano optical structures to effectively modulate the optical signals within fluorescent sensing films, thereby enhancing overall sensing performance. Specifically, our approach leverages surface plasmonic structures and on-chip micro-ring resonators for signal enhancement. Through such optical modulation, we synergistically optimize the core "3S1R" performance metrics—Sensitivity, Specificity, Stability, and Response time—of fluorescent gas sensing film devices.

\Oral Information	
17:30-17:45	**Paper ID: 0696** **Title:** Backside Release Cavity Engineering for Suspended Thin-Film Lithium Niobate Photonics **Presenter**: Lingfei Li, Shanghai University
17:45-18:00	**Paper ID: 4646** **Title:** Miniaturized and Arrayed Optomechanical Ultrasonic Sensing Systems for Photoacoustic Applications **Presenter**: Beibei Li, Institute of Physics, Chinese Academy of Sciences

S01.Laser Technology (I)			
Session Chair: Wei Jiang, Nanjing University, China			
Time	16:00-18:00 September 10, 2026	**Venue**	LM104C / 1F

Invited Talks	
16:00-16:30	**Title:** Recent Progress in High-Power Short-Wavelength Fiber Lasers **Speaker:** Wenjia Li, Shenzhen Gongda Laser Co., Ltd.
16:30-17:00	**Title**: Surface-Emitting Lasers based on Colloidal Nanocrystals **Speaker**: Kai Wang, Southern University of Science and Technology
17:00-17:30	**Title**: Optical Skyrmions in Single Microcavities Formed by Photonic Spin-Orbit Coupling **Speaker**: Feng Li, Xi'an Jiaotong University
17:30-18:00	**Title:** Advancements in an 171Yb+ Optical Clock: From E3 Probing to Inter-species Comparison **Speaker:** Yani Zuo, National Institute of Metrology, China

Wenjia Li

Invited Talk Details

Bio: Wenjia Li serves as Deputy Director of R&D at Shenzhen Gongda Laser Co., Ltd. and is currently a Ph.D. candidate. The main research interests include high-power green and UV fiber lasers, nonlinear frequency conversion, and laser processing applications. Recent work focuses on the development of high-power short-wavelength fiber lasers and their applications in laser welding, metal additive manufacturing, and precision laser processing, especially for highly reflective materials such as copper and aluminum.

Title: Recent Progress in High-Power Short-Wavelength Fiber Lasers

Abstract: High-power green and UV fiber lasers are promising light sources for advanced manufacturing, especially for processing highly reflective metals and high-precision micromachining. This invited talk will present our recent research progress in high-power short-wavelength fiber lasers, together with application-oriented process validation at different development stages. The technical route is based on high-power fiber amplification and nonlinear frequency conversion. For continuous-wave green fiber lasers, high-power fundamental-frequency fiber amplification is combined with second-harmonic generation to achieve kilowatt-level and multi-kilowatt-level green output. Representative results include 1.1 kW green output, 4 kW-level output enabled by higher single-channel frequency-converted power and polarization beam combining, and 2.7 kW single-mode green output through further optimization of the single-channel architecture. Along with laser development, process tests in copper welding, deep-penetration welding, and metal additive manufacturing will be discussed, showing the advantages of green lasers in energy coupling, processing stability, and manufacturing quality. For UV fiber lasers, recent work focuses on high-power fundamental-frequency pulsed fiber laser output and efficiency optimization in cascaded nonlinear frequency conversion. Key topics include spectral and temporal control, nonlinear effect suppression, frequency-conversion efficiency, crystal thermal management, and system reliability. Preliminary validation for precision laser processing and micromachining will also be introduced. These results demonstrate the potential of high-power green and UV fiber lasers as efficient, stable, and scalable laser source platforms for next-generation advanced manufacturing.

Kai Wang

Invited Talk Details

Bio: Kai Wang, Ph.D., is currently a full Professor of Southern University of Science and Technology (SUSTech). His research focuses on semiconductor light-emitting devices. A series of achievements have been made in quantum dot/perovskite surface-emitting lasers for optoelectronic integration, quantum dot LEDs for advanced displays, and spin-LEDs for next-generation information technologies. He has published over 200 articles on academic journals with more than 13,000 citations and an H-index of 64. His research achievements are awarded the National Award for Technological Invention and the National Ministry of Education Award for Technological Innovation. He is the recipient of the National Outstanding Youth Scholar, Guangdong Province Distinguished Youth Scholar and also is selected as the World's Top 2% Scientists

identified by Stanford University and Elsevier.

Title: Surface-Emitting Lasers based on Colloidal Nanocrystals

Abstract: Colloidal nanocrystal light sources (e. g. CQD, perovskite) possess unique advantages including low-cost fabrication, facile heterogeneous integration and widely tunable emission wavelengths, offering a new route for surface-emitting lasers. However, it remains challenging to achieve low-threshold surface-emitting CQD/perovskite laser array with high stability and integration density. Here, we will introduce low-threshold surface-emitting CQD circular Bragg laser array with near-unity mode confinement factor, high Purcell factor, high density and high operation stability. Moreover, achieving high-quality circularly polarized light sources with intrinsic chirality lasing in the vertical direction remains a long-standing challenge. Here, we will demonstrate vertically emitted perovskite chiral lasing enabled by intrinsic chiral BIC in planar metasurfaces.

Feng Li

Invited Talk Details

Bio: Feng Li got his bachelor's and master's degree at Tianjin University in China in 2006 and 2008. He got his PhD at CNRS and the University of Nice Sophia Antipolis in France in 2013, supported by the European Marie Curie ITN project CLERMONT4. Then he worked as a research associate at the University of Sheffield in UK from January 2014 to May 2017. Feng Li joined Xi'an Jiaotong University (China) as a professor in June 2017, with main research interest in light-matter interaction in microcavities and micro/nanostructures.

Title: Optical Skyrmions in Single Microcavities Formed by Photonic Spin-Orbit Coupling

Abstract: Fabry-Perot (FP) microcavities with metal or DBR (distributed Bragg reflector)-coated mirrors provide an excellent platform for investigating the collective behavior of confined 2-dimensional photons and polaritons. The TE-TM mode splitting in such cavities acts as an effective magnetic field, leading to photonic spin-orbit (SO) coupling effect that the pseudospin of cavity photons changes anisotropically with their momenta. Such mechanism has led to interesting observations including optical spin-Hall effect, magnetic-monopole-like half solitons, spinor condensate with half-quantum circulation, and polaritonic topological insulators . In recent years, we report the direct measurement of the Berry curvature and quantum metric in anisotropic organic microcavities, which leads to divergent quantum metric at Voigt exceptional points and dual lasing of orthogonal polarization by polariton relaxation via the imaginary Fermi Arics.

Furthermore, by analyzing the photonic SO coupling mechanism with the perturbation theory of Hamiltonians, we predict that in fully confined systems the eigenstates of the second excited manifold under TE-TM splitting are degenerate skyrmions which can be selected and manipulated by the non-Hermitian properties. This theory was experimentally demonstrated by coupling the microcavity with a single quantum dot. We further explore how the evolution of the skyrmions wavefunction with non-Hermitian gain and loss, highlighting the special properties at the exceptional points.

Yani Zuo

Invited Talk Details

Bio: Yani Zuo received the Ph.D. degree in physics from Tsinghua University, Beijing, China, in 2020, where her dissertation addressed microwave atomic clocks based on sympathetically cooled cadmium ions. She is currently an Associate Researcher with the Division of Time and Frequency Metrology, National Institute of Metrology (NIM), Beijing. Her research interests include ytterbium-ion optical frequency standards, ion trap physics, ultrastable cavity-stabilized laser systems, and optical-to-microwave frequency transfer. She is the Principal Investigator of a National Natural Science Foundation of China (NSFC) Young Scientists Fund project and leads several additional national-level research programs. She has authored publications in *Nature Communications*, *Optics Letters*, and *Applied Physics Letters*, and was awarded First Place in the Student Paper Competition at the IEEE International Frequency Control Symposium (IFCS) in 2018.

Title: Advancements in an 171Yb+ Optical Clock: From E3 Probing to Inter-species Comparison

Abstract: We demonstrate a $^{171}Yb^{+}$ optical clock, using a transfer-oscillator scheme to coherently transfer the frequency of a 698 nm ultra-stable laser to a 934 nm clock laser, achieving cross-wavelength stabilization and enabling inter-species comparison with a Sr optical lattice clock for high-precision optical frequency metrology.

T01. Mid Infrared Lasers and their Applications

Session Chair: Junqing Zhao, Shenzhen Technology University, China

Time	16:30-18:00 September 10, 2026	Venue	LM101A / 1F

Invited Talks

16:30-17:00	**Title**: High Power Ultrafast Laser Sources With Optical Parametric Conversion to the Mid-Infrared **Speaker**: Junqing Zhao, Shenzhen Technology University
17:00-17:30	**Title**: High Power Mid Infrared Fiber Lasers and the Applications **Speaker**: Chunyu Guo, Shenzhen University, China

Junqing Zhao

Invited Talk Details

Bio: Junqing Zhao, senior member with both IEEE and OPTICA. His research has covered device, system, and application aspects of high power ultrafast lasers and nonlinear optics, successively with the Shenzhen Key Laboratory of Laser Engineering, Shenzhen University, China, the Optoelectronics Research Centre (ORC), University of Southampton, U.K., and the Jiangsu Key Laboratory of Advanced Laser Materials and Devices, Jiangsu Normal University, China. He is currently with the Key Laboratory of Advanced Optical Precision Manufacturing Technology of Guangdong Higher Education Institutes, Shenzhen Technology University, Shenzhen, China. He published over 100 academic papers, hold over 10 patents, wrote 2 book chapters, and presided over 10 research projects.

Title: High Power Ultrafast Laser Sources With Optical Parametric Conversion to the Mid-Infrared

Abstract: Our group's recent progress on high power near infrared laser sources as well as their further mid-infrared parametric conversion will be presented, especially emphasizing on new breakthroughs in efficiency, power level, robustness, etc.

Chunyu Guo

Invited Talk Details

Bio: Prof. Chunyu Guo is from Shenzhen University, the Chief Scientist of the National Key R&D Program of China. The main interests of his research are near-infrared and mid-infrared fiber lasers. He has published more than 50 academic papers, and presided 6 national scientific research projects, including the National Key R&D Program of China, the key Project of National Natural Science Foundation of China. He has developed some fiber lasers, among which the "mid-infrared high-power all-fiber laser" won the "Excellent Product Award" at the China International High-tech Fair and the Laser Innovation Award for "Red Light Award". He won the second prize of the 2023 Technology Invention Award for Chinese Society for Optical Engineering (1/6) and the 2022 China Patent Award (Excellence Award,1/6).

Title: High Power Mid Infrared Fiber Lasers and the Applications

Abstract: Mid infrared lasers have important application value in fields such as medical surgery, molecular spectroscopy, remote sensing, and material processing. We proposed a method to improve the efficiency of a 2.8 μ m erbium-doped fiber laser based on excited state absorption; developed key components for mid infrared fluoride fiber laser, including a mid infrared fluoride fiber combiner, FBG, cladding power stripper, fiber end cap, and fluoride pigtail; demonstrated mid infrared passive mode-locked lasers, hybrid mode-locked lasers, synchronous pump mode-locked lasers, and spatiotemporal mode-locked lasers based on erbium-doped fluoride fibers. Furthermore, 3 μ m high-power mid infrared ultrafast laser systems with free space and all fiber structure were constructed respectively by combining fluoride fiber amplifiers, achieving the highest average power of 8.12 W and a pulse width of 148 fs, as well as the first all-fiber watt-level femtosecond laser with an output power of 3.42 W and a pulse width of 115 fs. An improved soliton self frequency shift (SSFS) system based on cascaded amplification was proposed, which achieved watt-level pure-soliton femtosecond pulses with a wide wavelength-tunable range of 3-3.8 μ m, and the highest output of 1.6 W.

Oral Information	
17:30-17:45	**Paper ID: 0569** **Title:** Real-Time Infrared Gas-Leak Segmentation with SPDConv and CBAM Enhanced YOLO26 for Edge Deployment **Presenter**: Rui Wang, Jilin University
17:45-18:00	**Paper ID: 5516** **Title:** Deeply Supervised VGG-UNet++ for Infrared SF6 Gas Leak Segmentation in Power Equipment **Presenter**: Feng Sun, Jilin University

S06. Optoelectronic Devices and Applications (III)

Session Chair: Bowen Liu, Keio University, Japan

Time	16:00-18:00 September 10, 2026	Venue	LM105 / 1F

Invited Talks	
16:00-16:30	**Title**: High-Speed Reconfigurable Silicon Photonic Tensor Processing Engine **Speaker**: Huifu Xiao, Lanzhou University
16:30-17:00	**Title**: Engineering Layered Hybrid Perovskites with DJ and RP Architectures: Pathways to High-Performance Next-Generation Optoelectronics **Speaker**: Dmitry Shtarev, St. Petersburg State University
17:00-17:30	**Title**: Ultra-Wideband Photodetectors for Photonics-Assisted Wireless Communications **Speaker**: Changzheng Sun, Tsinghua University
17:30-18:00	**Title**: Electrically Reconfigurable Mode Chirality in Integrated Microresonators **Speaker**: Jiawei Wang, Harbin Institute of Technology Shenzhen

Huifu Xiao

Invited Talk Details

Bio: Huifu Xiao received the B.S. and Ph.D. degrees in Microelectronics and Solid-State Electronics from Lanzhou University, China, in 2013 and 2019, respectively. He is currently a research professor and PhD supervisor at the School of Physical Science and Technology in Lanzhou University. His research interests include silicon photonic and thin-film lithium niobate devices, such as mode division multiplexers, optical computing systems, and optical routers.

Title: High-Speed Reconfigurable Silicon Photonic Tensor Processing Engine

Abstract: In this talk, I will show you a novel silicon photonic computing paradigm that uses multidimensional multiplexing in wavelength, mode, space, and time domains to accelerate tensor processing. High-speed microring modulators (MRMs), capable of 120 Gbaud NRZ and 80 Gbaud PAM4 modulation, to serve as multiple virtual and real neuron nodes in the time domain are adopted to implement different tensor processing applications.

Dmitry Shtarev

Invited Talk Details

Bio: Dmitry Shtarev, Doctor of Physical and Mathematical Sciences, Professor and Leading Researcher at the Laboratory of Crystallophotonics, St. Petersburg State University, Professor and Head of the Laboratory of Photoactive Semiconductor Materials, Far Eastern Federal University (Russia). Prof. Shtarev is a recognized expert in the synthesis and optical characterization of low-dimensional perovskites, with a particular focus on layered hybrid structures such as Dion–Jacobson and Ruddlesden–Popper phases. He/she has authored over 80 high-impact publications in leading journals, covering topics

from structure–property relationships to advanced light–matter interactions. His work has demonstrated room-temperature exciton stability in these materials, paving the way for next-generation polaritonic devices. He regularly serves as a reviewer and invited speaker at major international conferences on optoelectronics and perovskite photonics.

Title: Engineering Layered Hybrid Perovskites with DJ and RP Architectures: Pathways to High-Performance Next-Generation Optoelectronics

Abstract: Layered hybrid perovskites, particularly Dion–Jacobson (DJ) and Ruddlesden–Popper (RP) phases, have recently emerged as a versatile platform beyond traditional photovoltaics and light-emitting diodes. Their natural quantum-well structure — organic spacer layers alternating with inorganic semiconductor slabs — gives rise to highly stable excitons at room temperature, large exciton binding energies, and strong oscillator strengths. These characteristics enable strong exciton–polariton coupling under optical confinement, making DJ and RP perovskites exceptionally promising for polaritonic applications that require robust light–matter interaction at ambient conditions.

This invited talk first discusses the structure–property relationships that govern exciton stability and optical response in DJ versus RP systems. Unlike RP phases, which contain bilayers of flexible organic cations separated by weak van der Waals gaps, DJ architectures employ monovalent or divalent organic spacers directly anchored to the inorganic framework. This results in reduced interlayer distances, enhanced dielectric confinement, and even larger exciton binding energies. The presentation shows how molecular engineering — for example, using fluorinated spacers, conjugated diamines, or chiral molecules — enables fine control over exciton lifetime, transition dipole moment, and the strength of light–matter coupling.

Second, recent progress is reviewed in realizing room-temperature exciton-polaritons in microcavities and photonic structures based on DJ and RP perovskites. Owing to their large exciton oscillator strength and low disorder, these materials support strong coupling regimes even at room temperature, leading to coherent polariton formation, ultrafast nonlinear response, and polariton lasing — phenomena previously confined to cryogenic temperatures in conventional semiconductors.

Finally, the emerging potential of DJ/RP perovskites for polaritonic devices is outlined: low-threshold switches, polariton logic gates, and tunable coherent light sources. Key challenges remain, including large-area film homogeneity, orientation control of the inorganic layers, and compatible cavity integration. By bridging structural design and polariton physics, layered perovskites open a new route toward next-generation optoelectronics rooted in strong light–matter coupling.

Changzheng Sun

Invited Talk Details

Bio: Changzheng SUN received the B.E., M.E. and Ph.D. degrees in electronic engineering from Tsinghua University, China, in 1995, 1997 and 2000, respectively. He became a faculty member of the Dept. of Electronic Engineering, Tsinghua University, China, in 2000, and was promoted to full professor in 2010. His research interests include physics and fabrication technologies of high-speed photonic integrated circuits, nonlinear dynamics in semiconductor lasers and nonlinear optics in optical micro-resonators. Up to now, he is the author or co-author of over 150 scientific papers.

Title: Ultra-Wideband Photodetectors for Photonics-Assisted Wireless Communications

Abstract: Wideband photodetectors (PDs) are key components for next generation wireless communications. In this talk, we present our recent work on ultra-wideband PDs for THz photonic transmissions. F-, D- and G- band photomixers based on uni-travelling carrier photodiodes (UTC-PDs) are designed and fabricated, exhibiting flat frequency responses and high output powers. Photonic assisted THz wireless communications with bit-rate exceeding 100 Gbps are demonstrated with our photomixers.

Jiawei Wang

Invited Talk Details

Bio: Wang Jiawei is currently a professor in the School of Integrated Circuits, Harbin Institute of Technology (Shenzhen). He received his bachelor and PhD degrees from the School of Physics and Engineering of Sun Yat-sen University and the School of Electronic and Computer Engineering, Hong Kong University of Science and Technology in 2011 and 2016, respectively. From 2016 to 2020, he was engaged in post-doctoral research at the Leibniz IFW Dresden, Germany. From 2017 to 2020, he was also a research associate of the Department of Electronics and Information Engineering at Chemnitz University of Technology, Germany. The current main research interests include silicon photonics, non-Hermitian photonics, and applications in optical sensing and optical manipulation. He has published 80+ papers in journals such as Nature Photonics, Nature Nanotechnology, Science Advances, etc.

Title: Electrically Reconfigurable Mode Chirality in Integrated Microresonators

Abstract: Chirality is a universal phenomenon in physics that underpins many fascinating effects in modern electromagnetism and drives a wide range of industrial applications. As integrated optoelectronic and all-optical devices continue to advance rapidly, controlling on-chip light flow using optical chiral modes has become a critical research frontier, offering access to numerous counterintuitive phenomena. Nevertheless, existing studies on chiral modes in whispering-gallery-mode microcavities often rely on meticulous post-fabrication adjustments or external off-chip tuning methods.

In this presentation, I will introduce an electrically reconfigurable approach to mode chirality within an on-chip integrable resonator platform. I will discuss our experimental realization of microring resonators exhibiting yet tunable strong mode chirality, fabricated using standard photonic foundry processes on both silicon and lithium niobate. As an optically passive building block, the engineered mode chirality enables asymmetric backscattering and non-reciprocal transmission. Furthermore, in the context of light–matter interactions, this chirality-mediated optically active system facilitates on-chip directional lasing and the regulation of single-photon dynamics.

TECHNICAL SESSIONS / Sep. 11, 2026

S03. Metamaterials and Photonic Crystals (II)

Session Chair: Huifang Zhang, University of Electronic Science and Technology of China, China

Time	09:00-11:30 September 11, 2026	Venue	LM102A / 1F

Invited Talks

09:00-09:30	**Title**: MEMS-Enabled Electrically Tunable Metasurfaces **Speaker**: Fei Ding, Eastern Institute of Technology, Ningbo
09:30-10:00	**Title**: Optical Encryption Applications Based on Single-Pixel Imaging and Metasurface Imaging **Speaker**: Hongchao Liu, University of Macau
10:00-10:30	**Title:** An Effective Medium Method Description of Bound States in the Continuum in a Planar Photonic Crystal **Speaker**: Yachao Liu, Shenzhen University
10:30-11:00	**Title**: Enhanced Photon Pairs From a Semiconductor Brillouin Zone Folding Metasurface **Speaker**: Jihua Zhang, Songshan Lake Materials Laboratory
11:00-11:30	**Title**: Compact Metasurface Systems for 3D Imaging and Sensing **Speaker**: Hao Wang, Beihang University

Fei Ding

Invited Talk Details

Bio: Dr. Fei Ding is a tenured associate professor at Eastern Institute of Technology, Ningbo, China. He earned his Bachelor's and PhD degrees from Zhejiang University in 2010 and 2015, respectively. He is an Optica Fellow and a recipient of the Villum Young Investigator, DFF Inge Lehmann, and Carlsberg Semper Ardens Accelerate grants. His research interests include nanophotonics, metasurfaces, plasmonics, and quantum nanophotonics. He has published over 100 articles in peer-reviewed journals, such as Nature Communications, Science Advances, Physics Review Letters, etc. Remarkably, his papers have been cited > 9900 times (Google Scholar) with an H-index of 46, and his publication list contains 13 ESI Highly Cited Papers. Dr. Ding was honored with the Wang Daheng Optical Prize for Graduate Student from the Chinese Optical Society (2014), the Young Scientist Award from the Progress in Electromagnetics Research Symposium (2018 and 2019), Villum Young Investigator from Villum Fonden (2021), Danish Optical Society (DOPS) Award (2022), Materials Today Rising Star (2022), the World's Top 2% Scientists by Stanford University and Elsevier publisher (career-long list since 2022 and singer-year list since 2021), and the Highly Cited Researcher in the field of Cross-Field (2024). He is an active reviewer of more than 30 international journals and received the Publons Peer Review Awards (2018 and 2019). He is now an Associate Editor of IEEE Photonics Journal, a Topical Editor of Applied Optics, an Editorial Board Member of Opto-Electronic Technology and the youth editor of SCIENCE CHINA Physics, Mechanics & Astronomy, Nano-Micro Letters, and Chinese Optics Letters.

Title: MEMS-Enabled Electrically Tunable Metasurfaces

Abstract: Plasmonic metasurfaces have attracted increasing attention due to their unprecedented capabilities of manipulating optical fields at subwavelength spatial resolutions. Despite significant progress, most metadevices demonstrated to date are passive and lack dynamic modulation post-fabrication. Therefore, it is highly desirable to realize tunable metasurfaces with functionalities actively controlled by external stimuli. In this talk, I will discuss a MEMS-integrated tunable metasurface platform for active wavefront shaping by integrating MEMS mirrors and optical metasurfaces (OMSs), with the mirror-OMS separation being electrically controlled. Recent experimental demonstrations of electrically controlled full-range phase retarders, non-Hermitian topological transition, and dynamic linear polarizers that rely on MEMS and

single-layered metasurfaces will be discussed first. Through engineering double-layered metallic metasurfaces, the dynamic functionality can be implemented between two arbitrary functionalities.

Hongchao Liu

Invited Talk Details

Bio: Hongchao LIU obtained his B.Sc. degree at the Beijing Normal University in 2010, and Ph.D. degree at the Hong Kong University of Science and Technology in 2014. He then did postdoc research work at the Hong Kong University of Science and Technology, the Chinese University of Hong Kong, and the University of Birmingham, during 2014-2019. He joined University of Macau as an Assistant Professor in 2019, and was promoted to Associate Professor in 2025. His research interests include computational imaging and ghost imaging, metamaterials, topological materials and photonics. He has published more than 120 reviewed papers (Citation over 5200, H index 34) including Science, Science Advances, Nature Communications, Physical Review Letters, ACS Nano, etc.

Title: Optical Encryption Applications Based on Single-Pixel Imaging and Metasurface Imaging

Abstract: By controlling the different degrees of freedom of light, such as amplitude, phase, polarization, and wavelength, metasurfaces provide a novel platform for direct imaging. In contrast, as a novel indirect imaging technique, single-pixel imaging employs computational methods to reconstruct the target image by solving an inverse problem. Both metasurface imaging and single-pixel imaging hold great potential in optical encryption and anti-counterfeiting. For metasurface imaging, the degrees of freedom of light serve as the key to encryption and anti-counterfeiting. For single-pixel imaging, a series of designed random patterns act as the key for encrypting and decrypting the target image. Our work integrates metasurface-generated images into the single-pixel imaging framework, serving as the key (i.e., the random patterns) and the ciphertext (i.e., the light intensity values), respectively. Based on the combination of the two imaging modalities, we further propose and discuss novel optical encryption schemes and their robustness. Simulation and experimental results demonstrate that the combination of the two imaging modalities can greatly enhance the security of optical encryption and anti-counterfeiting. Our work builds a new bridge between direct and indirect imaging and directs metasurfaces and single-pixel imaging toward specific applications in optical encryption.

Yachao Liu

Invited Talk Details

Bio: Dr. Yachao Liu is currently an associate professor in the College of Physics and Optoelectronic Engineering at Shenzhen University (SZU). He received his bachelor's and doctoral degrees from Hunan University in 2013 and 2018 respectively. He was a postdoctoral research fellow at SZU from 2018 to 2021, and served as a visiting researcher at the University of Birmingham (UK) from 2019 to 2021. Dr. Liu's current research focuses on the physical theory and experimental study of artificial optical structures and light field manipulation. He has published more than 40 papers indexed in SCI, with his work being cited over 2,000 times. Dr. Liu's achievements have been recognized with funding from the China Scholarship Council (CSC), the China Postdoctoral Science Foundation (CPSF), and Shenzhen Municipality. He currently leads two projects funded by the National Natural Science Foundation of China (NSFC).

Title: An Effective Medium Method Description of Bound States in the Continuum in a Planar Photonic Crystal

Abstract: Bound states in the continuum (BICs) represent an enabling paradigm for high-Q nanophotonic devices, but their rational design is hampered by the need for resource-intensive numerical searches. Although effective medium methods furnish an efficient theoretical language for periodic metamaterials, they have not been adapted to describe BIC resonances. In this work, we introduce a nonlocal effective medium model that accurately predicts BIC modes in planar photonic crystals. The model reproduces band structures, reflection spectra, and field patterns in close agreement with full-wave numerical results and experimental observations. By bypassing costly parameter scans, our method substantially accelerates the inverse design of accidental BICs and supports the systematic optimization of merged-BIC platforms for compact lasers and ultrasensitive biochemical sensors.

Jihua Zhang

Invited Talk Details

Bio: Jihua Zhang is a researcher at Songshan Lake Materials Laboratory. Before joining Songshan Lake Materials Laboratory in 2024, he was a research fellow in the Centre of Excellence for Transformative Meta-Optical Systems (TMOS) at Australian National University and a postdoctoral fellow in the Institute of Optics at University of Rochester. He obtained dual PhD degrees from University Paris-Saclay and Huazhong University of Science and Technology in 2016. His research focuses on

metasurfaces and integrated nanophotonics for miniaturized and scalable quantum photonics.

Title: Enhanced Photon Pairs From a Semiconductor Brillouin Zone Folding Metasurface

Abstract: TBA

Hao Wang

Invited Talk Details

Bio: Professor at Beihang University and Adjunct Professor at the Sustainable Photonics Research Center (SPRC), Hangzhou International Innovation Institute. He received his Ph.D. from Harbin Institute of Technology and was jointly trained at the École Polytechnique Fédérale de Lausanne (EPFL), Switzerland. He previously served as a Senior Research Fellow at the Singapore University of Technology and Design (SUTD).

His research focuses on nanophotonics, particularly light-field manipulation and imaging technologies enabled by micro/nano-fabrication. His work covers two-photon 3D printing, intelligent nanostructure design (metasurfaces and metalenses), structural color devices, and diffractive optical components. He has published more than 60 SCI-indexed papers in leading journals including Nature Nanotechnology, Nature Electronics, Nature Communications, and Science Advances. He serves as a Young Editorial Board Member for journals such as PhotoniX, Nano-Micro Letters, Materials Futures, Opto-Electronic Advances and iOptics. He has received honors including the PIERS Young Scientist Award and the IEEE OGC Global Young Scientist Award, also serves at the organization committee of IEEE Photonics Conference, PIERS, and Sustainable Photonics Conference (SPC). He has participated in multiple research projects funded by the National Research Foundation of Singapore, the National Natural Science Foundation of China, the Singapore–Israel Joint Research Program, as well as industrial R&D projects with THALES (France) and Lite-On.

Title: Compact Metasurface Systems for 3D Imaging and Sensing

Abstract: Metasurfaces have emerged as a powerful platform for manipulating light at the nanoscale, enabling compact and high-performance optical systems. Here, we present distinct advances that leverage metasurface design to address critical challenges in 3D imaging and sensing. First, we introduce a compensation strategy for dot array projection in structured light 3D imaging, correcting distortions under large fields of view (FoV) by mapping spherical wavefronts to Cartesian coordinates. Using 3D-printed diffractive optical elements (DOEs), we demonstrate a uniform dot array over a 100° FoV, significantly improving peripheral reconstruction resolution for applications in surface inspection and autonomous navigation. Second, we present a double-helix (DH) meta-microscope that achieves single-shot 3D imaging with all-dielectric metasurfaces. In 4f and 2f configurations, the system delivers axial localization accuracies of 0.12 μm and 1.12 μm over detection ranges of 15.47 μm and 227.33 μm, respectively, enabling high-precision biological imaging of mouse kidney tissue and peach anther. Third, we propose a convergence phase-based design method for ultra-dispersive metasurfaces, achieving phase variations exceeding 1200π—a 30-fold enhancement over existing approaches. This enables a miniaturized chromatic confocal 3D imaging and sensor device with 13 mm measurement range and 50 nm axial resolution, as well as millimeter-scale depth-of-field spectral tomography. Collectively, these advances highlight the transformative potential of metasurfaces in 3D precision metrology, biomedical optics, and industrial inspection.

S10. Computational Imaging (V)

Session Chair: Liangcai Cao, Tsinghua University, China

Time	09:00-10:30 September 11, 2026	**Venue**	LM103A / 1F

Invited Talks

09:00-09:30	**Title**: Generative Diffusion Models and Their Applications in Computational Optical Imaging **Speaker**: Qiegen Liu, Nanchang University
09:30-10:00	**Title**: Intelligent Super-resolution Fluorescence Microscopy **Speaker**: Chang Qiao, Tsinghua University

10:00-10:30	**Title:** Structured Illumination Microscopy for Live-Cell Super-Resolution Imaging **Speaker**: Jiaming Qian, Nanjing University of Science and Technology

Qiegen Liu

Invited Talk Details

Bio: Professor at Nanchang University and Executive Dean of the School of Information Engineering. His primary research focuses on system construction, signal processing, and algorithm implementation for intelligent imaging systems and visual displays. He has co-authored over 100 papers in IEEE Transactions and leading journals in imaging and visual display. He serves as a committee member for dozens of international and domestic academic organizations, including IEEE and CCF, and is an editorial board member for journals such as IEEE TMI. He has led more than 30 projects, including those funded by the National Natural Science Foundation of China (Excellent Young Scientists Fund and Key Joint Projects) and enterprise-commissioned initiatives. He has received six scientific and technological awards, including the First Prize of the Jiangxi Provincial Natural Science Award and the First Prize of the Wu Wenjun Artificial Intelligence Technology Invention Award.

Title: Generative Diffusion Models and Their Applications in Computational Optical Imaging

Abstract: This report first introduces diffusion models and their various derived algorithms from the perspectives of generation and representation. Then, based on the requirements of typical computational optical imaging scenarios such as lensless imaging and single-pixel imaging, it shares some recent work by our team on generative diffusion model-empowered computational optical imaging applications.

Chang Qiao

Invited Talk Details

Bio: Chang Qiao is an Assistant Professor in the Department of Precision Instrument at Tsinghua University. He received both his bachelor's and doctoral degrees from the Department of Automation, Tsinghua University. His research focuses on intelligent photonics, with an emphasis on interdisciplinary innovations at the interface of optical engineering and artificial intelligence. His work aims to overcome the space–time bandwidth limitations of conventional optical microscopy, as well as the computing power and energy-efficiency bottlenecks of existing electronic computing systems. He has published more than ten first-author papers in leading journals, including Nature Methods and Nature Biotechnology. His research has led to more than 20 granted Chinese patents, PCT applications, and US patents. He serves as a Young Editorial Board Member of PhotoniX and Photonics Insights. His honors include Forbes China 30 Under 30, the WAIC Yunfan Award, the Outstanding Doctoral Dissertation Award of the Chinese Institute of Electronics, etc.

Title: Intelligent Super-resolution Fluorescence Microscopy

Abstract: Super-resolution microscopy overcomes the optical diffraction limit, enabling the nanoscale observation of dynamic biological processes in living specimens. However, conventional super-resolution microscopy is constrained by the space–time bandwidth product: imaging resolution, speed, and observation duration are intrinsically coupled, making it difficult to achieve high-speed, long-term super-resolution imaging of living systems simultaneously. In recent years, interdisciplinary innovations that integrate artificial intelligence (AI) with conventional optics have shown great potential for overcoming existing performance bottlenecks in optical imaging. In this talk, I will introduce the applications of optics-inspired neural networks in super-resolution fluorescence microscopy, drawing on a range of super-resolution optical microscopy modalities and systems. I will also present our proposed Intelligent Super-resolution Fluorescence Microscopy framework and demonstrate its capability for ultralong-term, super-resolution observation of diverse fine-scale and high-speed dynamic biological processes.

Jiaming Qian

Invited Talk Details

Bio: Jiaming Qian received his PhD degree in Optical Engineering from Nanjing University of Science and Technology (NJUST). He is a Postdoctoral fellow of NJUST, China.

Title: Structured Illumination Microscopy for Live-Cell Super-Resolution Imaging

Abstract: Structured illumination microscopy (SIM) has been widely applied in live-cell super-resolution imaging due to its advantages such as high photon efficiency and compatibility with regular fluorescent proteins. However, the quality of SIM super-resolution images heavily depends on the numerical reconstruction algorithms. The estimation of illumination

parameters is crucial for accurate image reconstruction, as even minor errors in parameter estimation may introduce severe reconstruction artifacts. Moreover, SIM typically requires at least nine raw frames per reconstruction, limiting imaging speed and increasing phototoxicity—challenges for long-term dynamic live-cell observation. To address these challenges, we have conducted a series of studies focused on efficient illumination parameter estimation and super-resolution reconstruction with reduced frame numbers. We propose the principal component analysis (PCA)-based method for structured illumination parameter estimation, along with the spatiotemporal multiplexing approaches for efficient super-resolution reconstruction. These techniques enable fast, adaptive compensation of illumination parameters under complex, low signal-to-noise conditions, and achieve minimally invasive, high spatiotemporal resolution imaging of fine subcellular structures in living cells.

S01. Laser Technology (II)

Session Chair: Ran Xia, South-Central Minzu University, China

Time	09:00-10:15 September 11, 2026	Venue	LM104A / 1F

Invited Talks

09:00-09:30	**Title**: Swept Lasers and the Applications **Speaker**: Dongmei Huang, The Hong Kong Polytechnic University
09:30-10:00	**Title**: Breathing Solitons in Mode-Locked Fiber Lasers **Speaker**: Ran Xia, South-Central Minzu University

Dongmei Huang

Invited Talk Details

Bio: Dr Dongmei Huang received her Ph.D. from The Hong Kong Polytechnic University in 2020, Hong Kong. She is currently an assistant professor in the Department of Electrical and Electronic Engineering, The Hong Kong Polytechnic University. Her research focuses on both fundamental physics including mode locked lasers, swept lasers, nonlinear optics, integrated optics, and applications of photonics including biomedical imaging, high resolution measurement and LiDAR, optical fiber sensing. She is the guest editor of Photonics. She served as local arrangement chairs of OECC 2021 and ACP/IPOC 2022, and a TPC member of OECC 2021. She has co-authored 100 papers and 12 patents.

Title: Swept Lasers and the Applications

Abstract: Swept lasers are at the cutting edge of laser technology, known for their ability to “sweep” through a range of wavelengths in microseconds, are essential tools in a wide range of applications. This talk will introduce two kinds of highly coherent swept lasers including Fourier domain mode locked laser and time stretched swept lasers. Based on the own developed highly coherent swept lasers, we will demonstrate the applications in high speed gas sensing, optical coherent tomography, LiDAR and high precision measurement.

Ran Xia

Invited Talk Details

Bio: Ran Xia received the Ph.D. degree in Huazhong University of Science and Technology. He was awarded as a High-Level Talent of Fujian Province (Class C) when working in Xiamen University at 2025. His research focuses on dynamics and manipulation of ultrashort pulses. Several works were published in Laser Photonics Review, Photonics Research, Journal of Lightwave Technology, et al. He has led several grants including an NSFC Young Scientist Fund (Class C), a sub-project of an innovation fund project, and a China Postdoctoral Science Foundation grant.

Title: Breathing Solitons in Mode-Locked Fiber Lasers

Abstract: We investigate breathing soliton dynamics in mode-locked fiber lasers. Experiments reveal asymmetric pulsations with localized spectral peaks, quasi-periodic vector breathers, and breathing soliton pairs showing synchronous/asynchronous states. Numerical simulations with coupled Ginzburg–Landau equations confirm that energy, birefringence, and bistability govern these complex behaviors, offering new insights into breather control.

Oral Information

10:00-10:15	**Paper ID: 1193** **Title:** Intracavity Gain-Integrated Laser Feedback Interferometric Measurement System **Presenter:** Yifan Wang, Tsinghua University

S03. Metamaterials and Photonic Crystals (III)

Session Chair: Longqing Cong, Southern University of Science and Technology, China

Time	09:00-10:30 September 11, 2026	Venue	LM103C / 1F

Invited Talks

09:00-09:30	**Title**: Gallium Phosphide Nanodevices for Generation and Control of Gigahertz Hypersonic Waves **Speaker**: Yi Li, Southern University of Science and Technology
09:30-10:00	**Title**: Chiral and Polarization Metasurface Devices Based on Symmetry-Breaking Engineering **Speaker**: Zi-Lan Deng, Jinan University
10:00-10:30	**Title**: Terahertz Spectral Imaging With Pixelated Nonlocal BIC Metasurfaces **Speaker**: Guizhen Xu, Southern University of Science and Technology

Yi Li

Invited Talk Details

Bio: Prof. Yi Li is a tenured associate professor in School of Microelectronics, Southern University of Science and Technology China. His research focuses on nano-optics and biomedical related applications, including single-molecule detections and DNA sequencing.

Title: Gallium Phosphide Nanodevices for Generation and Control of Gigahertz Hypersonic Waves

Abstract: All-dielectric gallium phosphide (GaP) nanostructures offer a versatile platform for generating and manipulating gigahertz hypersonic waves at the nanoscale. Here, we present two complementary design strategies to overcome key limitations in optoacoustic performance. First, suspended GaP fishnet membranes support long-lasting, unshifted resonant modes with exceptionally low loss ($\eta \approx 0.01$) and high quality factors ($Q > 90$), owing to the dominance of out-of-plane vibrations. Second, by breaking isotropy in GaP nanodisks via a double-hole configuration, we achieve directional launching of surface acoustic waves and generate orbital angular momentum through spiral arrangements. A unified figure-of-merit accounting for both optical and vibrational responses guide the design. These results establish GaP nanodevices as promising building blocks for hypersound routing, phononic metasurfaces, and quantum phononic applications.

Zi-Lan Deng

Invited Talk Details

Bio: Dr. Zi-Lan Deng is currently a Professor at the Institute of Photonics Technology, College of Physics and Optoelectronic Engineering, Jinan University. He received his Ph.D. in Optics from Sun Yet-Sen University in 2014 and his B.S. degree in Optical information science and technology from the same University in 2009. He is the recipient of the National Science Foundation for Excellent Young Scholars of China, and the recipient of Science Foundation for Distinguished Young Scholars of Guangdong Province. He is the world's top 2% highly cited scientists. His research work mainly focuses on multi-degree-of-freedom metasurfaces, artificial intelligent metasurfaces, quantum metasurfaces, light emitting metasurfaces and chiral metasurfaces. He has published 1 book and more than 60 peer-reviewed research papers in high impact scientific journals including Phys. Rev. Lett., Nat. Comm., Sci. Adv., eLight, Light: Sci. & Appl., Nano Lett., Adv. Mater., Laser & Photon. Rev., including 9 ESI highly cited papers and 1 ESI hot paper.

Title: Chiral and Polarization Metasurface Devices Based on Symmetry-Breaking Engineering

Abstract: We report merging-BIC dielectric metasurfaces enabling robust, wide-k-space chiral resonance. Symmetry-breaking controls accidental BIC merging, enhancing Q-factors and nonlinear THG. We demonstrate chirality-controlled imaging and Q-dependent modulation, establishing a programmable platform for nonlinear chiral photonics and information encryption.

Guizhen Xu

Invited Talk Details

Bio: Guizhen Xu, a postdoctor in the Department of Electrical and Electronic Engineering at the Southern University of Science and Technology (SUSTech), where she works in the research group led by Associate Professor Longqing Cong. Her research focuses on bound states in the continuum (BICs) and ultrafast modulation in terahertz metasurfaces. She has published more than 10 papers in internationally renowned journals, including Advanced Materials, Opto-Electronic Advances, and Laser & Photonics Reviews. She is a recipient of Optoelectronics Global Student Achievement Awards 2025.

Title: Terahertz Spectral Imaging With Pixelated Nonlocal BIC Metasurfaces

Abstract: Terahertz (THz) single-pixel imaging is detector-efficient but often limited by slow sequential acquisition. Here, we present a spectral-spatial hybrid imaging approach based on a pixelated nonlocal metasurface supporting quasi-bound states in the continuum (QBICs). Distinct high-Q resonances encode spatial information into spectrally resolved channels, enabling frequency-division multiplexing along one spatial dimension and mechanical line scanning along the orthogonal direction. A 5 × 1 pixelated metasurface encoder was fabricated and used to reconstruct 5 × 5 binary patterns. All 87 tested patterns were correctly recovered by extracting the calibrated resonance responses, without iterative image reconstruction. The results demonstrate that high-Q nonlocal resonances can provide a practical route toward reduced-dimensional, single-detector THz imaging systems, with potential applications in nondestructive evaluation, security screening, and spectroscopic sensing.

S09. Silicon Photonics (IV)

Session Chair: Li Zeng, Institute of Semiconductors, CAS, China

Time	09:00-11:30 September 11, 2026	Venue	LM103B / 1F

Invited Talks

09:00-09:30	**Title**: Metamaterial-Enabled Integrated Photonic Devices Towards Optical Interconnect **Speaker**: Yu He, Shanghai Jiao Tong University
09:30-10:00	**Title**: Heterogeneously Integrated Erbium- Doped Optical Waveguide Amplifiers **Speaker**: Qingming Chen, Sun Yat-Sen University
10:00-10:30	**Title**: Integrated Optical Frequency Combs for Next-Generation Multi-Wavelength Light Sources **Speaker**: Yanjing Zhao, National Optoelectronics Innovation Center
10:30-11:00	**Title**: AI-Driven Development of Silicon Photonics Process Technology **Speaker**: Wei Wang, SITRI
11:00-11:30	**Title**: System-Level Validation of 224G LPO Links Against the OIF CEI-224G-Linear Specification **Speaker**: Terence Chen, Latitude Design Systems

Yu He

Invited Talk Details

Bio: Dr. He is an associate professor at Shanghai Jiao Tong University, he is a recipient of the CAST Young Elite Scientists Sponsorship Program and a multiple- year honoree of the World's Top 2% Scientists list. His research focuses on silicon photonic integrated circuits and metasurface devices. He has authored over 40 papers in leading journals and conferences including Nature Communications, Advanced Photonics, and Light: Science & Applications, with 11 as first/corresponding author, accumulating >2,500 citations (Google Scholar) and multiple citations from Nature and Science.

Title: Metamaterial-Enabled Integrated Photonic Devices Towards Optical Interconnect

Abstract: The rapid growth of 5G, AI, and big data centers drives exponential global data traffic, raising performance demands on optoelectronic chips. Traditional optical interconnect and computing chips, constrained by bandwidth density and energy efficiency, must evolve from single-wavelength to multi-dimensional, multi-channel high-capacity optical multiplexing. However, on-chip systems face bottlenecks such as limited multiplexing dimensions, poor mode-order scalability, and low integration, hindering high-performance photonic integrated circuits. To address these challenges, this report systematically presents the physical mechanisms, methods, and breakthroughs of metasurfaces for multi-dimensional on-chip optical field manipulation, and explores the potential of mode multiplexing in revolutionizing optical interconnect and computing architectures.

Qingming Chen

Invited Talk Details

Bio: Dr. Qingming Chen is currently an Associate Professor at Sun Yat-Sen University. His research is centered on integrated photonics. He obtained his B.Sc. in Optical Information Science and Technology from the Huazhong University of Science and Technology in 2011, his M.Eng. in Optical Engineering from Jinan University in 2014, and his Ph.D. in Applied Physics from The Hong Kong Polytechnic University in 2018. Prior to his current appointment, he served as a Postdoctoral Fellow at The Hong Kong Polytechnic University (2018) and the City University of Hong Kong (2019). He joined Sun Yat-Sen University as an Associate Professor in 2021.

Title: Heterogeneously Integrated Erbium- Doped Optical Waveguide Amplifiers

Abstract: In the past decade, photonic integrated circuits (PICs) have made tremendous progress due to the development of advanced micro & nano technology. With the increasing scalability of on-chip optical elements, the attenuation of on-chip optical power has become a bottleneck restricting the development of PICs. It is impractical to compensate the PICs optical attenuation by using the external amplifiers, such as erbium doped fiber amplifier (EDFA). Therefore, the optical waveguide amplifier has become a research hotspot. One mainstream is rare earth doping technology, which is derived from the matured EDFA. This talk will focus on the development of Erbium doped optical waveguide amplifiers, which includes the state of the art, fabrication method, integration with PIC and the prospects of optical waveguide amplifiers.

Yanjing Zhao

Invited Talk Details

Bio: Yanjing Zhao received her B.Eng. degree and Ph.D. degree from Huazhong University of Science and Technology (HUST) in 2015 and 2020 respectively. From 2020 to 2025, she conducted postdoctoral research at the Technical University of Denmark (DTU). In 2025, she joined the National Optoelectronics Innovation Center as the head of integrated light sources. Her research focuses on integrated photonics and nonlinear optics, with particular interests in on-chip optical frequency combs. She has authored 30+ papers, including publications in Laser & Photonics Reviews, Photonics Research, and Communications Physics, as well as presentations at major international conferences such as ECOC and CLEO. She holds two granted international invention patents, serves as the principal investigator of the Wuhan Natural Science Foundation Exploratory Program, and is a Young Editorial Board Member of Acta Optica Sinica. She has also been selected for the National Overseas High-Level Young Talent Program and the Wuhan Talent Program for Outstanding Young Professionals.

Title: Integrated Optical Frequency Combs for Next-Generation Multi-Wavelength Light Sources

Abstract: As AI clusters scale rapidly, optical interconnects demand highly integrated, energy-efficient, and coherent multi-wavelength light sources for high-capacity wavelength-division multiplexing. Integrated nonlinear photonics offers a promising route through optical frequency combs. This talk will highlight our recent advances in high-power soliton frequency combs, broadband coherent supercontinuum generation toward on-chip self-referenced combs, and efficient parametric amplification for scalable multi-wavelength sources.

Wei Wang

Invited Talk Details

Bio: Wang Wei, PhD from the Institute of Semiconductors, Chinese Academy of Sciences, is a Shanghai High-Level Talent, Senior Director of Silicon Photonics at SITRI, and chief scientist of National Key R&D Program projects. With over 15 years of experience in R&D of silicon-based optoelectronic materials and devices, he has published more than 80 papers in top international conferences and journals in this field, and holds over 30 authorized national invention patents. As a project/topic leader, he has led a number of national key and major projects, and spearheaded the construction of SITRI's silicon photonics process platform and the company's external wafer foundry services.

Title: AI-Driven Development of Silicon Photonics Process Technology

Abstract: Introduce the development trends of silicon photonic platform technology driven by AI

Terence Chen

Invited Talk Details

Bio: Terence Chen is Co-founder and Chief Technology Officer of Latitude Design Systems, a silicon photonics EDA company. He leads the development of PIC Studio, an integrated design platform encompassing PhotoCAD, pSim, pVerify, and pMaxwell, which today supports over 200 users across tape-outs on TSMC, Tower Semiconductor, and SilTerra foundry platforms. His career spans TSMC, MediaTek, and Siemens EDA, giving him deep expertise across silicon photonics device physics, compact modeling, design rule verification, and heterogeneous integration including CPO, hybrid bonding, and FAU coupling architectures. He collaborates extensively with academic institutions and foundry partners on photonic IC design methodology, with particular focus on high-speed optical interconnect and 224G LPO link design. Beyond product leadership, he authors technical book chapters on chiplet and photonic integration technologies and regularly delivers industry seminars to institutional investors and ecosystem stakeholders on silicon photonics and optical interconnect trends.

Title: System-Level Validation of 224G LPO Links Against the OIF CEI-224G-Linear Specification

Abstract: The migration to 224G per lane in Linear Pluggable Optics (LPO) eliminates in-module DSP, shifting the signal integrity burden onto host-side equalization and channel design, where the margin for error approaches zero. This talk presents a rigorous 1:1 validation of pSim Plus against the Semtech-authored OIF CEI-224G-Linear benchmark (oif2024.367.00), establishing system-level fidelity across every critical link component. We demonstrate exact replication of the 6-tap TX FIR, the 8.4–19.6 dB TE Connectivity host channel insertion loss sweep, the 0.7 A/W photodiode with nonlinear TIA, and the 20-tap FFE plus 1-tap DFE equalization architecture. Resolved eye diagrams confirm mathematical alignment with specification targets rather than approximation. Beyond passive compliance, we introduce the pSim Plus Accelerator, which reverse-designs waveguide geometries to actively hit OIF thresholds. The framework extends to multi-channel CWDM systems with Matlab and Python automation, positioning pSim Plus as a definitive design environment for next-generation 224G LPO tape-outs.

S05. Fiber-Based Technologies and Applications (I)

Session Chair: Zhixun Wang, Hong Kong Polytechnic University, China

Time	09:00-10:30 September 11, 2026	Venue	LM104B / 1F

Invited Talks

09:00-09:30	**Title**: Optical Fiber Monitoring Technology for Shape of Marine Slender Structures **Speaker**: Ye Tian, Harbin Engineering University
09:30-10:00	**Title**: Non-Zero Dispersion-Shifted Ring-Core Fibers for Orbital Angular Momentum Modes **Speaker**: Yang Yue, Xi'an Jiaotong University
10:00-10:30	**Title**: Advanced Optical Pulse Coding Distributed Optical Fiber Acoustic Sensing System **Speaker**: Yu Wang, Taiyuan University of Technology

Ye Tian

Invited Talk Details

Bio: Ye Tian has presided 10 projects, such as General/Youth Program of National Natural Science Foundation of China, National Key Research and Development Program of China and High-tech ship major special projects. He has published 24 SCI papers (8 Top journals of the measurement field papers), 3 invited review papers and 22 invention patents. He has participated in the writing of standard, won the first prize of national defense technology invention and third prize of scientific and technological progress of electric power construction.

Title: Optical Fiber Monitoring Technology for Shape of Marine Slender Structures

Abstract: Hydrophone arrays, marine pipelines, and other high aspect ratio flexible structures serve as the "lifelines" for oceanic defense surveillance, energy development, and information transmission, holding significant military and civilian value in China's maritime rights protection and deep-sea resource development strategies. The core challenge in three-dimensional shape monitoring arises from the distortion of these high aspect ratio flexible structures caused by strong multi-physical field coupling under complex marine environments. Such deformation creates blind zones in hydrophone target detection, compromising national maritime security, and also triggers fatigue fractures in marine cables, threatening marine resources and environmental safety. This report focuses on intelligent optical fiber-based marine structures, establishing an integrated system encompassing modeling, technology, equipment, and applications to overcome the challenges of shape sensing in high aspect ratio flexible structures. A full-chain error correction model has been developed, achieving breakthroughs in long-range, high-precision shape sensing. The framework enables in-situ error correction, autonomous decoupling of multi-field interactions, and high-fidelity reconstruction. An innovative integrated weak-coupling encapsulation process has been designed, resulting in the world's first self-sensing intelligent dynamic marine cable capable of real-time attitude perception, serving critical sectors including underwater security and deep-sea resource exploitation.

Yang Yue

Invited Talk Details

Bio: Yang Yue received the B.S. and M.S. degrees in electrical engineering and optics from Nankai University, China, in 2004 and 2007, respectively. He received the Ph.D. degree in electrical engineering from the University of Southern California, USA, in 2012. He is currently a Professor with the School of Information and Communications Engineering, Xi'an Jiaotong University, China. He is the founder and current PI of Intelligent Photonic Application Technology Laboratory (iPatLab). Dr. Yue's current research interest is intelligent photonics, including optical communications, optical perception, and optical chip. He has published >300 journal papers (including Science) and conference proceedings with >14,000 citations, two books (Elsevier, Springer Nature), eight edited books, two book chapters, >50 issued patents (including 30 U.S. patents and 6 European patents), >200 invited presentations (including 1 tutorial, >30 plenary and >100 keynote talks). Dr. Yue is a Fellow of Optica and SPIE. He is an Associate Editor for IEEE Access and Frontiers in Physics, Editor Board Member for four other scientific journals, Guest Editor for >10 journal special issues. He also served as Chair for >100 international conferences, Reviewer for >80 prestigious journals.

Title: Non-Zero Dispersion-Shifted Ring-Core Fibers for Orbital Angular Momentum Modes

Abstract: Orbital angular momentum (OAM) modes, characterized by their helical phase front and annular intensity profile, are a complete set of orthogonal basis functions for spatial distribution with theoretically infinite topological states, offering an additional spatial multiplexing dimension that enables significant capacity increases for communication system. To improve the transmission distance of the communication system, we have proposed and designed a series of non-zero dispersion-shifted ring-core fibers (NZDSRFs), including solid step-index non-zero dispersion-shifted ring-core fiber (SS-NZDSRF), hollow step-index non-zero dispersion-shifted ring-core fiber (HS-NZDSRF), solid graded-index non-zero dispersion-shifted ring-core fiber (SG-NZDSRF), trench-assisted non-zero dispersion-shifted ring-core fiber (TA-NZDSRF), and anti-resonant non-zero dispersion-shifted ring-core fibers (AR-NZDSRF).

Yu Wang

Invited Talk Details

Bio: Dr. Wang Yu is an professor and doctoral supervisor. He currently serves as the associate dean of the College of Robotics Science and Engineering at Taiyuan University of Technology. His primary research focus is on optical fiber sensing technology. He has presided more than 10 scientific and technological projects. Dr. Wang has been selected into the list of the world's top 2% scientists, the Shanxi Provincial Outstanding Youth Science Fund Support Program, and the Shanxi Provincial "San Jin Talents" Support Program. He has won one Second Prize and one Third Prize of Shanxi Provincial Science and Technology Award, and one Second Prize of Shanxi Provincial Teaching Achievement Award. He holds over 50 authorized invention patents, has published more than 60 academic papers, and has guided students to win more than 10 awards in discipline competitions.

Title: Advanced Optical Pulse Coding Distributed Optical Fiber Acoustic Sensing System

Abstract: Phase-sensitive optical time-domain reflectometry (Φ-OTDR) is a typical distributed optical fiber acoustic sensor. It achieves distributed, long-range, and highly sensitive monitoring of vibration events by demodulating Rayleigh backscattering (RBS) signals in optical fibers. Nevertheless, its performance enhancement is severely limited by the intrinsic trade-offs between critical sensing metrics. To address this constraint, an optical pulse coding scheme is proposed for long-distance Φ-OTDR. This scheme is based on a single-group poly-phase code with perfect periodic autocorrelation. Features are extracted from multi-frequency RBS beat signals and fed into a support vector machine classifier, realizing fading classification. Fading label generation and restoration enable intelligent aggregation of multi-frequency signals, which substantially reduces coherent fading. Furthermore, a crosstalk noise suppression approach based on compressed sensing is developed. Multi-channel frequency-shifted components are generated via electro-optic modulation. Through frequency-domain compression, sparse reconstruction and feature enhancement of Rayleigh scattering signals are implemented. This method alleviates crosstalk-induced interference, enabling precise detection of high-frequency vibration signals. It also provides a robust basis for the practical engineering deployment of high-performance Φ-OTDR systems in perimeter security, fault diagnosis, pipeline monitoring, and earthquake detection.

S06. Optoelectronic Devices and Applications (IV)

Session Chair: Changzheng Sun, Tsinghua University, China

Time	09:00-10:30 September 11, 2026	Venue	LM104C / 1F

Invited Talks

09:00-09:30	**Title**: Spintronic Terahertz Emission: Material Engineering and Experimental Characterization **Speaker**: Liang Liu, Shanghai Jiao Tong University
09:30-10:00	**Title**: Tantalum Pentoxide Integrated Photonic Devices **Speaker**: Qiancheng Zhao, Southern University of Science and Technology
10:00-10:30	**Title**: Photonic Ising Machines for Solving Combinatorial Optimization Problems **Speaker**: Wenjia Zhang, Shanghai Jiao Tong University

Liang Liu

Invited Talk Details

Bio: Liang Liu obtained his bachelor's degree from Huazhong University of Science and Technology in 2011 and his PhD from Peking University in 2016. Afterward, he embarked on his postdoctoral research journey at the National University of Singapore, under the supervision of Jingsheng Chen. In 2022, he joined Shanghai Jiao Tong University as a tenure-track associate professor. Dr. Liu's research focuses on spintronics and topological materials, with a particular emphasis on controlling novel spin currents in low-symmetry systems and their applications in memory devices and THz technology.

Title: Spintronic Terahertz Emission: Material Engineering and Experimental Characterization

Abstract: Spintronic terahertz emission provides an alternative route for ultrafast THz generation based on optically induced spin currents and spin-to-charge conversion. In this work, we investigate the representative W/CoFeB/Pt material platform through thin-film preparation and systematic THz characterization. The effects of layer structure, magnetic-field reversal, and pump excitation are experimentally examined, together with quantitative evaluation of the emitted THz field. The results establish a practical basis for further optimization of THz output and future exploration of new material platforms.

Qiancheng Zhao

Invited Talk Details

Bio: Dr. Zhao is an assistant professor at the School of Microelectronics in Southern University of Science and Technology. His research interest focuses on tantalum pentoxide integrated photonics and gallium phosphide integrated photonics.

Title: Tantalum Pentoxide Integrated Photonic Devices

Abstract: Low-loss optical waveguides lay the foundation for the integrated external cavity lasers, photonic filters, optical computing, and optical sensing. Suppressing the thermo-optic response of low-loss optical waveguides is key to further improving the frequency stability of integrated photonic devices. Recenlty, tantalum pentoxide (Ta2O5) has gained attention due to its ultra-low thermo-optic coefficient and low propagation loss. This talk will present the latest research progress of the tantalum pentoxide photonic devices, including high-Q cavities, athermal filters, external cavity lasers, nonlinear photonic devices, and modulators realized on this platform.

Wenjia Zhang

Invited Talk Details

Bio: Dr. Wenjia Zhang is a professor at the state key laboratory of photonics and communications, Shanghai Jiao Tong University. His research is centered on intelligent optical computing, with a particular focus on large-scale photonic Ising machine, optical tensor convolution chips, and minimalist optical interconnection technologies. He has authored over 100

papers in leading journals and prestigious conferences and holds more than 10 national invention patents. He also serves on the technical program committees for international conferences including ECOC 2025/2026 and a youth editorial board member of Study on Optical Communications and was appointed as an independent consultant for Huawei and a visiting expert at Peng Cheng Laboratory. He serves as a principal investigator for key and general projects of the National Natural Science Foundation of China and is recognized as a recipient of the Shanghai Oriental Talents Program.

Title: Photonic Ising Machines for Solving Combinatorial Optimization Problems

Abstract: With the rapid advancement of artificial intelligence, big data, and related technologies, the demand for large-scale combinatorial optimization in fields such as logistics scheduling, financial risk control, and bioinformatics has become increasingly urgent. However, such problems are generally NP-hard. Conventional von Neumann electronic computing systems face severe bottlenecks in both computational power and energy consumption when processing large-scale, highly interconnected models. Photonic computing, owing to its inherent physical advantages—including high parallelism, low latency, and high energy efficiency—offers a promising technological pathway for constructing dedicated physical computing systems for combinatorial optimization, known as Ising machines. Nevertheless, existing photonic Ising machines still struggle to simultaneously achieve high-speed parallel operation, large-scale spin expansion, and accurate mapping of arbitrary Ising models. To address these challenges, this talk investigates key technologies of photonic Ising machines for solving combinatorial optimization problems.

T05. Optical Communication and Sensing Technologies (IV)

Session Chair: Qi Wu, The Hong Kong Polytechnic University, China

Time	09:00-10:30 September 11, 2026	Venue	LM101A / 1F

Invited Talks	
09:00-09:30	**Title**: Integrated QKD and High-Throughput Classical Communications Over Field-Deployed MCFs **Speaker**: Qi Wu, The Hong Kong Polytechnic University
09:30-10:00	**Title**: CPO/NPO Like Intra-Vehicle Optical Interconnect **Speaker**: Gordon Ning Liu, Soochow University
10:00-10:30	**Title**: Chip-scale Spectroscopic Metrology: From Programmable Photonics to Biomedical Sensing **Speaker**: Chunhui Yao, GlitterinTech Limited

Qi Wu

Invited Talk Details

Bio: Qi Wu received the B.Eng. degree in communication engineering from the University of Electronic Science and Technology of China, Chengdu, China, in 2020, and the Ph.D. degree from Shanghai Jiao Tong University, Shanghai, China, in 2025. He is currently a Postdoctoral Researcher with The Hong Kong Polytechnic University, Hong Kong. His research interests include short-reach optical communications, optical access networks, and the integration of quantum and classical optical communications.

Title: Integrated QKD and High-Throughput Classical Communications Over Field-Deployed MCFs

Abstract: We report, for the first time, a field demonstration of quantum key distribution coexisting with 110-Tb/s full C-band dense wavelength-division multiplexed coherent transmission over field-deployed uncou-pled-core multi-core fibers with a standard 125-μm cladding diameter in L'Aquila, Italy. Various coexistence configurations and transmission distances are evaluated.

Gordon Ning Liu

Invited Talk Details

Bio: Gordon Ning Liu is currently a Distinguished Professor and a Ph.D. Advisor with the School of Electronic and

Information Engineering, Soochow University. He is the vice president of IEEE China Council Sensors Council and Systems Council Joint Chapter, and a Member of Electrical Technology Committee of China Society of Automotive Engineers. Before joining Soochow University, he was the Optical Technology Director of Huawei France Research Institute. He has published more than 100 academic papers, issued > 20 US/EU patents and > 20 Chinese invention patents, and given invited talks at international conferences such as OFC. He has presided one project of National High-tech R&D Program of China (863 Program). He currently presides one General Program granted by National Natural Science Foundation of China and one project funded by National Key R&D Program of China.

Title: CPO/NPO Like Intra-Vehicle Optical Interconnect

Abstract: With the development of physical AI, the bandwidth demand caused by a large number of sensors sending data to computing chips is set to explode. As a typical large-scale physical AI application, intelligent vehicles, with the growth of intelligent driving and smart cockpits, are putting demands on high-speed intra-vehicle networks. Fiber optic communication has advantages like high bandwidth, resistance to electromagnetic interference, and lightweight design, making it potentially widely applicable in high-speed intra-vehicle network scenarios. However, the low-cost, high-reliability requirements and harsh environments with wide temperature ranges and strong vibrations in vehicles limit the direct deployment of traditional fiber optic communication technologies in intra-vehicle networks. To address this, based on trends in silicon photonic devices in AIDCs, we propose a silicon photonics-based CPO/NPO-like high-speed optical interconnect for vehicles to tackle the reliability issue of increased laser failure rates under wide temperature ranges in conventional architectures.

Chunhui Yao

Invited Talk Details

Bio: Chunhui Yao received his PhD from the Centre for Photonic Systems at University of Cambridge in 2024. He is currently the Chief Scientist at Glitterintech Limited, while also serving as a Research Associate at the University of Cambridge. His research interests focus on integrated photonic devices and systems for applications in optical sensing, switching, and computing. He has published extensively in leading journals, including Nature Photonics, Nature Communications, and Light: Science & Applications, and regularly serves as a reviewer for the major journals in photonics and optics.

Title: Chip-scale Spectroscopic Metrology: From Programmable Photonics to Biomedical Sensing

Abstract: Miniaturized spectroscopy offers a route toward compact, low-cost, and deployable chemical and biomedical sensing, but practical systems must simultaneously achieve broad bandwidth, high accuracy, and robust operation. This talk presents our recent progress in reconstructive and convolutional spectrometers based on integrated photonics platforms. We demonstrate chip-scale devices with bandwidths exceeding 500 nm, low-cost implementation, scalable manufacturing, and strong thermal tolerance. These platforms enable practical spectroscopic metrology, including material classification, solution quantification, and non-invasive wearable sensing of multiple human biomarkers, highlighting a pathway from integrated photonic devices to real-world sensing systems.

T04. Automotive Optoelectronics (II)

Session Chair: Gordon Ning Liu, Soochow University, China

Time	09:00-10:30 September 11, 2026	Venue	LM105 / 1F

Invited Talks	
09:00-09:30	**Title**: In-Vehicle Optical Communication: Use-Case Value, Integration Architecture and Key Challenges **Speaker**: Enyu Zhou, Huawei Technologies Co. Ltd
09:30-10:00	**Title**: Integrated Forward Optical Fiber Sensing and Communication Systems **Speaker**: Yaxi Yan, The HK Polytechnic University
10:00-10:30	**Title**: High-speed Micro-LEDs for Optical Interconnect **Speaker**: Zixian Wei, The Hong Kong Polytechnic University

Enyu Zhou

Invited Talk Details

Bio: TBA

Title: In-Vehicle Optical Communication: Use-Case Value, Integration Architecture and Key Challenges

Abstract: TBA

Yaxi Yan

Invited Talk Details

Bio: Yaxi YAN received her PhD degree in the Department of Electronic and Information Engineering at the Hong Kong Polytechnic University in 2021, where she currently serves as a Research Assistant Professor. She has co-authored over 50 papers in peer-reviewed journals and international conference proceedings, including Science China Information Sciences, Journal of Lightwave Technology, and Optics Letters. Dr. Yan has delivered invited talks at numerous prestigious international conferences, including the OPTICA Advanced Photonics Congress (SPPCom), OECC, ACP, CIOP, and Photonics Asia. Active in the academic community, she serves as a technical program subcommittee member for OECC 2026 and OFC 2027. Her research interests focus on distributed fiber sensing (including forward transmission-based and light backscattering-based systems), integrated optical fiber sensing and communication, micro/nano fiber-based sensors, and advanced sensing applications. As a Principal Investigator, she has secured competitive research funding from key institutions such as the National Natural Science Foundation of China (NSFC), the Hong Kong Research Grants Council (RGC), and industry partners like Huawei.

Title: Integrated Forward Optical Fiber Sensing and Communication Systems

Abstract: Integrated optical fiber sensing and communication (IOFSAC) enables existing fiber infrastructure to support both high-speed data transmission and real-time environmental monitoring. In this talk, we will review forward transmission-based optical phase sensing (FT-OPS) as a promising approach for realizing IOFSAC. Compared with conventional backscattering-based sensing, FT-OPS provides longer reach, better compatibility with communication signals, and greater feasibility for hollow-core fiber links. We will discuss how FT-OPS can be integrated with coherent communication systems and further extended to passive optical networks.

Zixian Wei

Invited Talk Details

Bio: Zixian Wei is a Postdoctoral Fellow at The Hong Kong Polytechnic University, supported by the Hong Kong RGC Junior Research Fellowship Scheme. He is also a Paul Baran Young Scholar of the Marconi Society. He received his Ph.D. from McGill University in 2024, earned his MPhil. from Tsinghua University in 2020 and his B.Eng. degree Jinan University in 2017. His research interests focus on optical transmission, optical access, and optical wireless systems, with nearly 120 publications in peer-reviewed journals and international conferences. He is the recipient of numerous awards, including SPIE Optics and Photonics Education Scholarship 2022, IEEE Photonics Society Graduate Student Fellowship 2023, and the

Tingye-Li Memorial Award 2024. He has also received the Photonics Research Editor's Pick Award 2022, Best Student Paper Awards at OECC 2021, ACP 2025, and ACP 2020, and Top-Scored Paper Awards at OFC 2023 and ECOC 2025. He has delivered numerous oral and post-deadline presentations, including post-deadline papers at ACP 2019 and OFC 2024. He serves as a reviewer for multiple Optica/IEEE journals in the field.

Title: High-speed Micro-LEDs for Optical Interconnect

Abstract: With the rapid development of AI large models and HPC, traditional copper and conventional optical interconnects can no longer meet the demand for ultra-high bandwidth, ultra-low power consumption, and high density in ultra-short-range (< 10 m) scenarios such as intra-rack and die-to-die connections. High-speed Micro-LEDs, as a novel non-coherent light source for optical interconnects, adopt a "wide and slow" parallel architecture, featuring ultra-low energy efficiency (<5 pJ/bit), high bandwidth density (>1 Tbps/mm^2), and CMOS compatibility, making them an ideal candidate for breaking through the "bandwidth, power consumption, and density walls". This talk summarizes the core characteristics of micro-LEDs, recent technical breakthroughs, current industrial challenges, and our demonstrations, forming a complementary pattern with VCSEL and silicon photonics to support the development of next-generation AI data centers.

S01. Laser Technology (III)

Session Chair: Yani Zuo, National Institute of Metrology, China

Time	09:00-10:15 September 11, 2026	**Venue**	LM101B / 1F

Oral Information

09:00-09:15	**Paper ID: 3501** **Title:** Displacement Talbot Lithography for High-Volume Manufacturing of DFB Laser, EML, VCSEL, and PCSEL **Presenter**: Zhixin (Jason) Wang, Eulitha AG
09:15-09:30	**Paper ID: 7814** **Title:** Chaotic Bandwidth Stabilization in a State-switching Fourier Domain Mode-Locked Laser **Presenter:**Wenhao Zhu, The Hong Kong Polytechnic University
09:30-09:45	**Paper ID: 7980** **Title:** Experimental and numerical investigation of noise-like pulses in a 1.9 μm mode-locked Tm-doped fiber laser **Presenter:** Wanquan Lv, Shenzhen University
09:45-10:00	**Paper ID: 2679** **Title:** A CNN-Based LEL-Constrained Hierarchical Routing Framework for FTIR Gas Concentration Retrieval **Presenter**: Weiling Chen, Chongqing University
10:00-10:15	**Paper ID: 2344** **Title:** Distance-Adaptive Optical Frequency Comb Ranging Enabled by Active Pulse Alignment **Presenter:** Xueting Zhang, Chongqing University

T03. Optoelectronics EDA Software			
Session Chair: Lei Wang, Pengcheng Lab, China			
Time	09:00-11:00 September 11, 2026	**Venue**	LM106 / 1F

Invited Talks	
09:00-09:30	**Title**: Scaling Silicon Photonics With Software Automation: Shift-Left Constraints And Data Closed-Loop **Speaker**: Ruping Cao, Semitronix
09:30-10:00	**Title**: Trends and Industrial Practices in Intelligent Photonics-Electronics Co-Design Methodology **Speaker**: Xiaoming Liu, Empyrean Technology
10:00-10:30	**Title**: From Circuit to System: Co-Simulation for High-Performance Electronic–Photonic Designs **Speaker**: Zheng Zhou, Ansys part of Synopsys
10:30-11:00	**Title**: LightningFNO: Ultra-Fast Modeling and Inverse Design for Photonic Matrix-Vector Multiplication Computing Units **Speaker**: Qisheng Yang, Hunan University

Ruping Cao

Invited Talk Details

Bio: Ruping Cao is the Co-founder and President of Luceda Photonics. In 2021, she spearheaded the establishment of Luceda China, dedicated to the localization and industrialization of cutting-edge photonic chip design software. She actively builds a close-knit ecosystem spanning upstream and downstream industry partners as well as top universities. Under her leadership, the team focuses on the R&D of design automation software tailored for silicon photonics, co-packaged optics (CPO), and advanced packaging. By driving the delivery of full-flow design solutions, she aims to empower frontier fields such as high-speed optical communications and AI computing.

Title: Scaling Silicon Photonics With Software Automation: Shift-Left Constraints And Data Closed-Loop

Abstract: To break the volume production barriers of high costs and yield loss in Silicon Photonics, Luceda leverages EDA to 'shift left' manufacturing, testing, and packaging constraints into early design. Meanwhile, powered by a data plane, test data is efficiently parsed to feed process variations back into PDK models, closing the "manufacturing-testing-design" yield loop. This presentation also highlights how Luceda empowers industry collaboration through design automation to enable scalable Silicon Photonics deployment.

Xiaoming Liu

Invited Talk Details

Bio: Xiaoming Liu is the senior product director of Empyrean Technology. He has more than 10 years of experience in ASIC chip design, manufacturing, and packaging EDA software product development and management, focusing on the planning, development, and promotion of EDA products. He helps Empyrean build up a mature Analog/Mixed-Signal design flow, and expand it to the fields of other full custom design such as flat panel display, signal chain, memory, RF and Optoelectronics. He is building a PPAC-oriented AI-driven design-manufacturing-packaging collaborative design solution. The solutions are widely adopted by national and international leading design houses.

Title: Trends and Industrial Practices in Intelligent Photonics-Electronics Co-Design Methodology

Abstract: Optoelectronic integrated circuits (OEICs), which combine the strengths of photonics and electronics, hold broad application prospects in communication, computing, and sensing. Photonics-electronics convergence has therefore become one of the key trends shaping their future development. Yet converged design today still faces persistent challenges: optical and electrical simulations remain decoupled, physical verification lacks accuracy, and a standardized design flow is missing. What is needed is EPDA—electronic-photonic design automation—as the enabling bridge, allowing OEIC designers and foundries to jointly establish a standard design methodology for photonics-electronics convergence. Building on its decades of EDA expertise, Empyrean Technolog is actively fostering an OEIC ecosystem, working with partners to deliver

integrated, end-to-end solutions for converged photonics-electronics design.

Zheng Zhou

Invited Talk Details

Bio: Master's degree in Optoelectronic Engineering from Huazhong University of Science and Technology and University Paris-Saclay. Currently serving as Optical Application Engineering Manager at Synopsys, dedicated to enabling customers to drive photonics innovation across photonic integrated circuits (PICs), silicon photonics devices, high-speed optical interconnects, and optoelectronic co-design and simulation. Possesses extensive experience in silicon photonics EDA workflows and electro-optic co-design from device-level to system-level integration.

Title: From Circuit to System: Co-Simulation for High-Performance Electronic–Photonic Designs

Abstract: Silicon photonics is driving next-generation applications in datacom, AI, sensing and quantum computing, where higher bandwidth and lower power are demanded. Since Photonic Integrated Circuits (PICs) are tightly coupled with electronics, a unified electronic–photonic co-design methodology is essential. At Synopsys, we extend electronic design automation (EDA) behavioral modeling standards such as Verilog-A and IBIS-AMI to generate compact and physics-aware photonic models that integrate seamlessly with electronic counterparts for electronic–photonic design automation (EPDA) at both circuit and system level. In this talk, we demonstrate how this approach enables fast and accurate co-simulation and end-to-end system design, accelerating the development of high-performance electronic–photonic systems.

Qisheng Yang

Invited Talk Details

Bio: Qisheng Yang is an Associate Professor and Ph.D. supervisor at the College of Semiconductors (College of Integrated Circuits), Hunan University, and the founder of PhotonCore (Beijing) Technology Co., Ltd. He received his Ph.D. in Electronic Science and Technology from Tsinghua University and studied technology commercialization at the PBC School of Finance, Tsinghua University. His research focuses on photonic computing, metasurface-based optical neural networks, electronic-photonic design automation, and optoelectronic heterogeneous integration. He has published in Nature Machine Intelligence, DAC, ACS Nano, and other leading venues. His recent work includes LightningFNO and the PhotonCore EPDA platform.

Title: LightningFNO: Ultra-Fast Modeling and Inverse Design for Photonic Matrix-Vector Multiplication Computing Units

Abstract: Metasurface-based photonic computing offers high parallelism, low latency, and negligible static power, but inverse design and end-to-end evaluation remain bottlenecked by large-scale Maxwell solvers and fragmented tool flows. This talk presents LightningFNO, a dual Fourier neural operator framework that couples inverse topology generation with fast forward optical-response prediction for photonic matrix-vector multiplication units. For 4×4 designs, LightningFNO achieves a 1,245,550× speedup over adjoint-based optimization while maintaining comparable accuracy. Fabricated 3×3 prototypes demonstrate an RMSE of 0.043, and a metasurface-deployed MNIST classifier reaches 97.69% accuracy. The talk will further discuss how AI-accelerated device models can be integrated into electronic-photonic design automation workflows linking inverse design, system evaluation, manufacturability checks, and layout generation, providing a scalable route from photonic concepts to manufacturable optoelectronic computing chips.

S10. Computational Imaging (VI)

Session Chair: Liangcai Cao, Tsinghua University, China

Time	10:45-12:05 September 11, 2026	**Venue**	LM103A / 1F

Invited Talks	
10:45-11:15	**Title**: Exploiting Spatiotemporal Priors for Motion-Resolved Computational Microscopy **Speaker**: Yunhui Gao, Tsinghua University
11:15-11:45	**Title**: Spatiotemporal Super-Resolution Structured-Light 3D Imaging With Physics-Guided AI **Speaker**: Shijie Feng, Nanjing University of Science and Technology

Yunhui Gao

Invited Talk Details

Bio: Yunhui Gao is a postdoctoral researcher at the Department of Precision Instrument, Tsinghua University. He received his B.E. and Ph.D. degrees both from the same department in 2021 and 2026, respectively, under the supervision of Prof. Liangcai Cao. His research interests include computational imaging, inverse problems, and holography. He is the recipient of the ISOM'25 Student Award, 2025 SPIE ABC Best Poster Award, and 2020 SPIE Optics and Photonics Education Scholarship.

Title: Exploiting Spatiotemporal Priors for Motion-Resolved Computational Microscopy

Abstract: Computational microscopy integrates optical hardware and reconstruction algorithms to realize extended functionalities, higher resolution, etc., over conventional microscopes. However, sequential measurements are typically required to obtain high-dimensional data due to the limited information throughput of commercial image sensors, resulting in an inherent tradeoff between temporal resolution and imaging fidelity. Here, we introduce a general computational framework, termed spatiotemporally regularized inversion (STRIVER), that exploits the spatiotemporal priors of dynamic scenes to jointly eliminate reconstruction artifacts and motion blurs. Specifically, STRIVER leverages spatiotemporal domain sparsity and learned priors as effective regularizers to remove motion artifacts and ambiguities. When combined with diversity measurement schemes, it enables physically reliable, time-resolved holographic reconstruction with a same temporal resolution as single-shot methods.

Shijie Feng

Invited Talk Details

Bio: Shijie Feng is a Zijin Distinguished Professor and doctoral supervisor at Nanjing University of Science and Technology, selected for a national high-level young talents program. His research focuses on high-speed 3D measurement based on structured-light illumination. He has published more than 70 SCI-indexed papers with over 10,000 Google Scholar citations. He has been selected as a Clarivate "Highly Cited Researcher" and listed in Stanford University's "World's Top 2% Scientists" (Career-long impact). As a key contributor, he received one First Prize of the Jiangsu Science and Technology Award and two First Prizes of the CSOE Technological Invention Award.

Title: Spatiotemporal Super-Resolution Structured-Light 3D Imaging With Physics-Guided AI

Abstract: Structured-light 3D imaging is an important optical sensing technique for industrial inspection, robot perception, and dynamic process measurement. However, its performance in high-speed scenes is still limited by camera frame rate, spatial sampling density, and the amount of phase information available from a single frame. This talk presents a physics-guided artificial intelligence (AI) approach to spatiotemporal super-resolution structured-light 3D imaging. By combining optical coding, physical priors, and learning-based decoding, the method improves the information efficiency of structured illumination under limited sampling conditions. Frequency-division multiplexing and angular, color, and multi-frequency fringe coding are used to encode multiple phase cues into compact measurements, while deep neural networks decouple the multiplexed information and recover dense 3D geometry. Single-frame spatial super-resolution further enhances fine-detail reconstruction during high-speed acquisition. For dynamic scenes, sequence-aware phase recovery incorporates motion continuity, optical flow alignment, and temporal redundancy to improve phase accuracy and noise robustness. The related methods have been validated in challenging high-speed scenarios such as rotating blades and turbofan engine measurements, demonstrating 3D imaging from kilohertz to hundred-kilohertz rates. These results show how the integration of optics, physical modeling, and AI can enable fast, accurate, and robust 3D perception for complex dynamic processes.

Oral Information	
11:45-12:05	**Paper ID: 1156** **Title:** Flat-Risk Guided Column-Field Correction and Clean-Detail Enhancement for Lightweight Infrared Image Restoration **Presenter**: Jiongnan Lou, Nanjing University of Science and Technology

S03. Metamaterials and Photonic Crystals (IV)

Session Chair: Longqing Cong, Southern University of Science and Technology, China

Time	10:45-12:00 September 11, 2026	Venue	LM103C / 1F

Oral Information

10:45-11:00	**Paper ID: 9126** **Title:** Topological Phase Mapping of Light with Ferrofluids **Presenter**: Alberto Tufaile, Universidade de Sao Paulo
11:00-11:15	**Paper ID: 1798** **Title:** Differentiable Inverse Design of Multidimensional Multiplexed Metasurfaces via Frozen-Weight Neural Surrogates **Presenter**: Rui Yu, Tianjin University
11:15-11:30	**Paper ID: 6256** **Title:** Terahertz Dynamically Switchable Wavefront-Manipulation Integrated Metasurface Based on Dual-Frequency Liquid Crystal **Presenter**: Zhihao Wang, Tianjin University
11:30-11:45	**Paper ID: 2846** **Title:** Impact of Transfer-Induced Non-uniform Strain on the Performance of Graphene/Si Photodetectors **Presenter**: Liting Huang, China Agricultural University
11:45-12:00	**Paper ID: 7002** **Title:** Metamaterial Circular Polarizer Using Double-Layer Split-Ring Resonators for Ku-band Applications **Presenter**: Farman Ali Mangi, Shah Abdul Latif University, Department of Physics and Electronics, Khairpur

S09. Silicon Photonics (V)

Session Chair: Yanjing Zhao, National Optoelectronics Innovation Center

Time	10:45-12:15 September 11, 2026	Venue	LM104A / 1F

Invited Talks

10:45-11:15	**Title**: Integrated Photonic Waveguide Parametric Amplification and Its Applications in Communications **Speaker**: Ping Zhao, Sichuan University
11:15-11:45	**Title**: Silicon Photonic Integrated LiDAR Chips for 4D Imaging **Speaker**: Baisong Chen, Jilin University
11:45-12:15	**Title**: Quantum-Dot Light Sources in the AI Computing Era: Opportunities and Challenges **Speaker**: Zihao Wang, Institute of Physics, Chinese Academy of Sciences

Ping Zhao

Invited Talk Details

Bio: Professor Dr. Zhao Ping is with College of Electronic Information Engineering at Sichuan University, IEEE senior member, receiving bachelor's and doctorate degrees in optical engineering from Huazhong University of Science and Technology in 2009 and 2014 respectively. Dr. Zhao worked at Huawei Technologies Co., Ltd. for 5 years and then joined Chalmers

University of Technology in 2019, being a professor at Sichuan University in 2024. To date, he has co-authored 30 peer-reviewed technical papers (OFC 2021 / CLEO 2021 / ACP2023 post-deadline papers) and 10 granted patents, with his research highlighted by Optica in "Optics in 2022". His research interests are photonic integrated devices, nonlinear optics, optical communications and signal processing.

Title: Integrated Photonic Waveguide Parametric Amplification and Its Applications in Communications

Abstract: TBA

Baisong Chen

Invited Talk Details

Bio: Baisong Chen received the B.S. and Ph.D. degrees from Jilin University, Changchun, China, in 2019 and 2024, respectively. He is currently a Postdoctoral Researcher with the College of Electronic Science and Engineering, Jilin University.

His research interests include the design of optical phased array (OPA) chips, FMCW LiDAR, all-solid-state LiDAR systems, and fully automated calibration systems for photonic chips.

Title: Silicon Photonic Integrated LiDAR Chips for 4D Imaging

Abstract: With the rapid growth of perception demands in autonomous driving, robotics, and intelligent terminals, LiDAR is evolving toward fully solid-state, chip-scale, and highly integrated solutions. Silicon photonics, with its advantages in low cost, scalable manufacturing, and optoelectronic co-integration, provides a promising technological platform for integrated LiDAR systems.

This presentation focuses on "Silicon Photonic LiDAR Chip Design and System Applications" and introduces key photonic chips and system implementations for frequency-modulated continuous-wave (FMCW) LiDAR. The main topics include a widely tunable narrow-linewidth on-chip external-cavity laser, a low-noise Ge/Si bridge-type balanced photodetector, optical phased-array transceiver chips, and solid-state LiDAR architectures based on optical phased arrays and focal-plane switching arrays.

At the system level, we will demonstrate ultra-wide-field-of-view 4D imaging, long-range detection, high-precision measurement, and target-adaptive scanning through the fusion of LiDAR and RGB cameras. These studies provide new approaches for improving the integration density, detection sensitivity, scanning flexibility, and system reliability of LiDAR, and lay a technological foundation for applications in autonomous driving, robotics, and spatial perception.

Zihao Wang

Invited Talk Details

Bio: TBA

Title: Quantum-Dot Light Sources in the AI Computing Era: Opportunities and Challenges

Abstract: The rapid growth of cloud computing and artificial intelligence is driving an ever-increasing demand for higher-speed data transmission and processing. With its ultrahigh speed, low latency, strong compatibility with CMOS fabrication, and excellent scalability, silicon photonics is emerging as a transformative platform for next-generation optical interconnects. However, the integration of semiconductor lasers onto silicon photonic platforms remains a major technological challenge. An ideal on-chip laser source should offer a broad optical bandwidth to increase data-transmission capacity, operate without optical isolators to enable high-density integration, and be directly grown on silicon substrates for monolithic integration. This talk will discuss the opportunities and challenges of quantum-dot lasers for AI computing applications, with a particular focus on how their intrinsic physical properties can help address these requirements.

S05. Fiber-Based Technologies and Applications (II)			
Session Chair: Yu Wang, Taiyuan University of Technology, China			
Time	10:45-12:15 September 11, 2026	**Venue**	LM104B / 1F

Invited Talks	
10:45-11:15	**Title**: Optoelectronic Fibers and Their Applications in Smart Textiles **Speaker**: Zhixun Wang, Hong Kong Polytechnic University
11:15-11:45	**Title**: Highly Integrated All-Fiber Active Ultrasonic Transducer and High-Resolution Imaging Applications **Speaker**: Hao Li, Huazhong University of Science and Technology
11:45-12:15	**Title**: High-Sensitivity Bio-inspired Optical Fiber Sensing Technology and Applications **Speaker**: Liangye Li, Xidian University

Zhixun Wang

Invited Talk Details

Bio: Dr. Zhixun WANG received his B.Eng. and M.Eng. degrees in Materials Science and Engineering from Central South University, and his Ph.D. in Electrical and Electronic Engineering from Nanyang Technological University. He is now an Assistant Professor in the Department of Electrical and Electronic Engineering at The Hong Kong Polytechnic University.

His research interests encompass the development of devices in fiber and fabric form factors for diverse applications, including sensing, actuation, energy harvesting, power supply, and data processing. His work has a highly interdisciplinary nature, combining materials, electrical, and mechanical engineering in the design, fabrication, and integration of fiber devices into system-level architectures. He has authored multiple peer-reviewed papers in journals such as Nature, Nature Biomedical Engineering, and Chemical Society Reviews. His work on semiconductor fibers has been recognized in a Nature editorial and featured by media outlets including Physics World and Tech Xplore.

Title: Optoelectronic Fibers and Their Applications in Smart Textiles

Abstract: The transition of fibers from passive structural components into active optoelectronic platforms is opening new opportunities for smart textiles. Recent advances in fiber manufacturing and functional material integration have enabled long and flexible semiconductor fibers for photodetection and optical signal reception, further extending fiber functionalities toward wavelength-selective sensing, synaptic signal processing, and adaptive interaction. This talk will cover our recent progress in semiconductor optoelectronic fibers, used in flexible photodetecting and neuromorphic processing textiles.

Hao Li

Invited Talk Details

Bio: Dr. Hao Li is a lecturer of the School of Optical and Electronic Information of Huazhong University of Science and Technology, and a specially-appointed associate researcher of the National Engineering Research Center for Next Generation Internet Access System (NGIA). He is a Member of the Chinese Society for Optical Engineering, and the Youth Editorial Board Member of Infrared and Laser Engineering.

He is mainly engaged in the research of optical fiber acoustic sensing technology and imaging applications, and has won the Postdoctoral Fellowship Program (Grade B) of China and the Postdoctoral Innovation Research Position in Hubei Province. He has been supported by several major science and technology projects such as National Natural Science Foundation of China--Youth Science Foundation Project, Subtask of the National Key Research and Development, and China Postdoctoral Science Foundation. He has Published over 30 papers as the first or corresponding author in the leading scholarly journals and conferences in optical field including Opto-Electronic Advances, Opto-Electronic Science, Light: Advanced Manufacturing, SCIENCE CHINA Information Sciences, etc., Selected as OES Journal Cover Paper, Editor's Pick, and LAM Journal Annual Outstanding Paper, and invited to give a review article at Acta Optica Sina. He has been authorized 3 national invention patents as the first/student first inventor, and also dedicated to promote the industrial applications of

the developed sensors. Invited to give 10 presentations at international academic conferences such as ACP, ICAIT, OFSC, etc, and awarded the OFSC2025 Excellent Invitation Report.

The research achievements have been awarded with the second prize for technical invention from the Chinese Society of Optical Engineering as the first author, the Excellent Doctoral Dissertation Award of the Chinese Society of Optical Engineering, the Postdoctoral research performance evaluation and assessment first tier funding and the Young Scientist Award of Photonics Global Conference.

Title: Highly Integrated All-Fiber Active Ultrasonic Transducer and High-Resolution Imaging Applications

Abstract: Fiber optic ultrasonic sensing technology has emerged as a focal point in recent years due to its notable advantages, including high sensitivity, ease of array and multiplexing, and resistance to electromagnetic interference. This report will highlight the research progress of our team in active fiber optic ultrasonic sensing technology and its high-resolution imaging applications. The study focuses on developing highly sensitive, high-efficiency, integrated, all-fiber optic ultrasonic transducers, advancing high-resolution fiber optic ultrasonic imaging algorithms, proposing array-based ultrasonic rapid imaging techniques, and exploring their critical applications in fields such as medicine and non-destructive testing.

Liangye Li

Invited Talk Details

Bio: Dr. Liangye Li is an Associate Professor at the School of Information Mechanics and Sensing Engineering, Xidian University. Her research focuses on bio-inspired fiber-optic technologies for sensing and their applications. She received support from the NSFC Basic Research Program for Young Students (Doctoral Students), followed by subsequent continuation funding from the NSFC. She was also selected for the inaugural Doctoral Student Special Program of the Youth Talent Support Project of the China Association for Science and Technology, as well as other young-talent programs. Dr. Li has published 13 papers as first or co-first author in leading journals, including Nature Communications, Advanced Fiber Materials, and PhotoniX, and holds 10 granted Chinese invention patents.

Title: High-Sensitivity Bio-inspired Optical Fiber Sensing Technology and Applications

Abstract: High-sensitivity sensing technologies are essential for information acquisition. Traditional sensing methods often face challenges with integration and multifunctionality. In nature, organisms such as fish and bats have developed effective sensory systems that inspire new approaches to sensing technology. In this talk, we present several developments in bioinspired optical fiber sensing. First, we introduced a 3D micro-encapsulation technique to integrate biomimetic cell cavities onto optical fiber tips. By combining femtosecond laser direct writing (FsLDW) with chemical vapor polymerization (CVP), we improved the durability and environmental resistance. This method ensures the sensors maintain high sensitivity and stability, even in challenging fluidic and mechanical conditions. Using this technique, we developed the biomimetic optical fiber neuromast (BOFN), which is inspired by the fish lateral line system. The BOFN can detect underwater acoustic signals, marine turbulence, and micro-vibrations. The sensor is compact, highly sensitive, and stable, making it suitable for marine resource exploration. We also developed a bioinspired optical fiber sensilla, modeled after bat wing structures, for detecting both inhalation and exhalation. This sensor can monitor breathing patterns and conditions like sleep apnea, with potential for integration into medical devices for managing chronic respiratory diseases. In summary, this work presents reliable, sensitive, and compact bionic sensors that contribute to the intelligent Internet of Things and the Embodied Artificial Intelligence.

S06. Optoelectronic Devices and Applications (V)

Session Chair: Qiancheng Zhao, Southern University of Science and Technology, China

Time	10:45-12:15 September 11, 2026	Venue	LM104C / 1F

Invited Talks

10:45-11:15	**Title**: Highly Responsive Broadband Si-Based MoS2 Photodetector on High-K Dielectric. **Speaker**: Qasim Muhammad, Beijing Institute of Technology

11:15-11:45	**Title**: Deep-Ultraviolet LEDs: Device Engineering and Integration for Optical Communication **Speaker**: Muhammad Hunain Memon, University of Science and Technology of China

Qasim Muhammad

Invited Talk Details

Bio: Dr. Muhammad Qasim received his Ph.D. in Optoelectronics from the Beijing Institute of Technology, Beijing, China, where his doctoral research focused on the design and characterization of high-performance photodetectors based on low-dimensional and layered semiconductor materials. He is currently a Postdoctoral Researcher at the Beijing Institute of Technology, where he continues to work on next-generation optoelectronic devices, with an emphasis on photodetector architectures, interface engineering and device performance optimization for visible and broadband light sensing. He has authored and co-authored more than 20 peer-reviewed articles in reputed international journals in the field of optoelectronics and photodetection. His current research interests include two-dimensional materials, high-responsivity phototransistors, and integrated optoelectronic systems.

Title: Highly Responsive Broadband Si-Based MoS2 Photodetector on High-K Dielectric.

Abstract: Two-dimensional materials are an emerging class of semiconductors with a wide range of electronic and optical properties suited to practical optoelectronic applications. Although graphene is the most extensively studied two-dimensional material, its gapless band structure limits its usefulness for photodetection, and layered semiconductors such as MoS_2 are attracting increasing attention as photoactive channel materials. Monolayer MoS_2 is a direct-bandgap semiconductor owing to quantum-mechanical confinement, giving it a high absorption coefficient and efficient electron–hole pair generation under photoexcitation. In practice, however, the performance of MoS_2 photodetectors is governed as much by the supporting dielectric as by the channel itself, since charged impurities, surface roughness and interfacial traps of conventional SiO_2 substrates scatter carriers and introduce persistent photoconductive behaviour. Here, we demonstrate ultrasensitive phototransistors based on monolayer MoS_2 transferred onto an atomic-layer-deposited Al_2O_3 dielectric, where the high dielectric constant screens Coulomb scattering from charged impurities and the smooth, low-trap-density Al_2O_3 interface improves device mobility and ON current relative to MoS_2 on SiO_2. Under 532 nm illumination at an incident power intensity of 20 μW cm^{-2}, our devices deliver a peak photoresponsivity of 3.01 × 10^3 A W^{-1}, corresponding to an external quantum efficiency of ~ 7.0 × 10^5 %, together with a specific detectivity of 1.03 × 10^{14} Jones. With continued progress in large-scale production techniques such as liquid-phase exfoliation and chemical vapour deposition growth, the MoS_2/Al_2O_3 platform shows important potential for integrated optoelectronic circuits, light sensing, biomedical imaging, video recording and spectroscopy.

Muhammad Hunain Memon

Invited Talk Details

Bio: Dr. Muhammad Hunain Memon is currently a Researcher at the School of Microelectronics, University of Science and Technology of China (USTC). His research focuses on III-nitride optoelectronic devices and their integration, as well as photonic integrated circuits. He has published extensively in prestigious journals, including Nature Electronics, Advanced Optical Materials, Journal of Lightwave Technology, and others. His work has resulted in over 35 SCI-indexed publications and more than 2,600 citations on Google Scholar. He actively contributes to the scientific community as a reviewer for high-impact journals such as Nano-Micro Letters, Advanced Functional Materials, Advanced Photonics, and more. He significantly contributes to science and technology initiatives, serving on the IEEE SSCS Chapters Steering Committee and as Chair of the SSCS Arduino Contest for the Asia-Pacific region. Additionally, he is currently serving as counselor of the IEEE USTC Student Branch and previously played a pivotal role in establishing IEEE student branches. He won many national and international awards.

Title: Deep-Ultraviolet LEDs: Device Engineering and Integration for Optical Communication

Abstract: The growing demand for faster and more reliable data transmission is driving the development of advanced optical communication technologies for next-generation wireless and integrated systems. AlGaN-based deep-ultraviolet (DUV) light-emitting diodes offer distinct advantages for short-range, high-speed communication, particularly within the solar-blind spectral region. This invited talk will present device-engineering and integration strategies for improving the optical and communication performance of DUV LEDs. The discussion will cover geometry engineering, device scaling from conventional LEDs to micro-LEDs and micro-LED arrays, and the optimization of optical output power and modulation bandwidth. Multifunctional device structures capable of both light emission and photodetection will also be introduced, together with their use in bidirectional optical links. Finally, the integration of these devices into free-space and on-chip optical communication systems will be discussed. These developments demonstrate how advances in device architecture,

microfabrication, and optoelectronics integration can enable high-speed optical links and provide versatile building blocks for future integrated photonic platforms.

Oral Information	
11:45-12:00	**Paper ID: 2015** **Title:** Defect engineering in silicon pin photodetectors for room temperature SWIR detection **Presenter**: Yi Li, Helmholtz-Zentrum Dresden-Rossendorf
12:00-12:15	**Paper ID: 1283** **Title:** Microfluidic Controllable Synthesis of Blue Quantum Dots for Optoelectronic Displays **Presenter**: Jing Li, Tianjin University

T05. Optical Communication and Sensing Technologies (IV)

Session Chair: Cuiwei He, Japan Advanced Institute of Science and Technology, Japan

Time	10:45-11:45 September 11, 2026	Venue	LM101A / 1F

Oral Information

10:45-11:00	**Paper ID: 6830** **Title:** Thermo-Elastic Optical Indicator Microscopy for Visualization of Microwave-Induced Electromagnetic Interactions in Metal Nanoparticle Suspensions **Presenter**: Nelli Babajanyan, Yerevan State University
11:00-11:15	**Paper ID: 5683** **Title:** A Three-Channel Wavelength-Division Multiplexing (WDM) Optical Wireless Communication System Using Fluorescent Antennas **Presenter**: Cuiwei He, Japan Advanced Institute of Science and Technology (JAIST)
11:15-11:30	**Paper ID: 5897** **Title:** Polarization Optical Microscopy Platform for GHz–mm-Wave EM Field Visualization **Presenter**: Arsen Babajanyan, Yerevan State University
11:30-11:45	**Paper ID: 3404** **Title:** A Hybrid WDM-DDM Interrogation System for Multiplexed FBG Sensors using a tunable VCSEL for Structural Health Monitoring **Presenter**: Zhixuan Cheng, Kanazawa University

T04. Automotive Optoelectronics (III)

Session Chair: Xian Zhou, University of Science and Technology Beijing, China

Time	10:45-12:00 September 11, 2026	Venue	LM105 / 1F

Invited Talks

10:45-11:15	**Title**: Optical communication with integrating transmission and computational Imaging **Speaker**: Zhenming Yu, Beijing University of Posts and Telecommunications
11:15-11:45	**Title**: Study on High-Power VCSELs with Temperature Stability for Automotive Applications **Speaker**: Hui Li, Shenzhen Technology University

Zhenming Yu

Invited Talk Details

Bio: Zhenming Yu is currently working as a professor and a doctoral and master's supervisor in the State Key Laboratory of Information Photonics and Optical Communications, Beijing University of Posts and Telecommunications. He is also the director of the Optical Communication Systems Center. He received Ph.D. degree in electronic science and technology from Tsinghua University. He is the recipient of the National Natural Science Foundation of China (NSFC) Class B Youth Fund, chief scientist of the National Key Research and Development Program of China Young Scientist Project, "Beijing Science and Technology Rising Star" and "Xiaomi Young Scholar." He has received numerous awards, including the Second Prize of Natural Science from the Ministry of Education, the Second Prize of Science and Technology Progress Award from the China Society for Image and Graphics, the SPIE Optics and Photonics Education Scholarship, and the IEEE Photonics Society Graduate Student Fellowship. His current research interests are computational imaging system, optical and digital signal processing for coherent and direct-detection optical communication.

Title: Optical communication with integrating transmission and computational Imaging

Abstract: Communication enables the expansion of human visual perception beyond the limitations of time and distance, while computational imaging overcomes the constraints of depth and breadth. However, the independent information flow between the two techniques has become a bottleneck that restricts high-throughput and low-latency visual perception and interaction. Herein, this report proposes an integrated framework of communication and computational imaging (ICCI), enabling minimalist visual information perception through full-link optimization of acquisition, transmission, and interpretation. Focusing on ground and aerospace scenarios, the reports established experimental systems and developed key spaceborne payloads, achieving validation of the ICCI from ground to in-orbit. Experimental results show that the ICCI can achieve millisecond-level optical acquisition, hundred-gigabit high-speed optical transmission, and millisecond-level optical interpretation, facilitating the development of intelligent optical interconnection for everything and aerospace remote sensing satellite optical interconnection.

Hui Li

Invited Talk Details

Bio: Hui Li，Professor at the College of Integrated Circuits and Optoelectronic Chips, Shenzhen Technology University. She has long been engaged in research on the principle exploration, structural design, material and device fabrication of VCSEL microcavity lasers and novel micro-nano integrated lasers. She has published over 80 journal and conference papers, and has been granted 19 authorized invention patents in China and 2 in the United States. She has led more than 30 projects, including three projects funded by the National Natural Science Foundation of China, and multiple industry-commissioned horizontal research projects. She has also completed one technology transfer project.

Title: Study on High-Power VCSELs with Temperature Stability for Automotive Applications

Abstract: Vertical-cavity surface-emitting lasers (VCSELs) are key light sources for optical interconnects and sensing, yet their performance degrades under thermal stress. This talk presents our recent progress on temperature-stable high-speed VCSELs through epitaxial design, gain engineering, and atomic-scale structural analysis.

For 850 nm VCSELs, gain-cavity detuning and polyimide-based thermal management enable >30 GHz modulation bandwidth with minimal degradation over 25–55 °C, achieving 106 Gbit/s PAM4 transmission with RIN below –145 dB/Hz at 85 °C. For 980 nm VCSELs, asymmetric quantum wells broaden the gain spectrum, reducing threshold current variation by 41.75% and bandwidth degradation by over 50% across 298–358 K. Atomic-resolution STEM reveals that cation-site compositional inhomogeneity within quantum wells drives unconventional internal strain localization, while DBRs exhibit intrinsic compositional fluctuations beyond ideal alloy models.

These results demonstrate that co-optimized thermal and carrier design, supported by atomic-scale structural understanding, enables robust VCSELs for next-generation high-speed optical interconnects and harsh-environment applications.

Oral Information	
11:45-12:00	**Paper ID: 8195** **Title: S**oftware-Defined Automotive TSN Implementation on a General-Purpose Embedded Platform Using RTLinux **Presenter**: Jitao Huang, Soochow University

S06. Optoelectronic Devices and Applications (VI)

Session Chair: Anhui Liang, Yango University, China

Time	10:45-12:15 September 11, 2026	Venue	LM101B / 1F

Oral Information

10:45-11:00	**Paper ID: 8026** **Title:** A Cascaded Ultra-Narrow-Band Fiber Bragg Grating Based Light Source for Simultaneous CO and CO2 Gas Sensing Using Wavelength Modulation Spectroscopy **Presenter**: Xiao Xiao, Hubei University of Science and Technology
11:00-11:15	**Paper ID: 1267** **Title:** Flexible delivery of 100 μJ femtosecond laser pulses through a 10-m dual-thickness anti-resonant hollow-core fiber **Presenter**: Yuzhou Liao, Shenzhen University
11:15-11:30	**Paper ID: 5315** **Title:** Constrained Thermomechanical Response of Polycarbonate Fibers for Passive Thermal Triggering **Presenter**: Hetao Huang, Southern University of Science and Technology
11:30-11:45	**Paper ID: 2582** **Title:** Light-responsive Materials based on Near-infrared Emissive CuInS_2ZnS Core-Shell Quantum Dots and UV visible Light Activated Diarylethene Photoswitches **Presenter**: Kezhou Chen, Tianjin University
11:45-12:00	**Paper ID: 2727** **Title:** A Study on the 1D AlexNet-Based SERS Classifier for Pesticide Identification **Presenter**: Song Li, Yunnan University
12:00-12:15	**Paper ID: 3444** **Title:** Label-Free Tracking of Intracellular Structural Dynamics During Migratory Protrusion Formation Using Dual-Polarizer Microscopy **Presenter**: David Campos Quiñonez, Universidad de Guadalajara

S08. Data Center Optical Interconnects and Networks

Session Chair: Qian Li, Peking University, China

Time	11:15-12:15 September 11, 2026	Venue	LM106 / 1F

Invited Talks

11:15-11:45	**Title**: Direct detection-based complex-valued signal recovery and channel monitoring **Speaker**: Shaohua Hu, University of Electronic Science and Technology of China
11:45-12:15	**Title**: Parallel Processing for High-Performance Software Switches **Speaker**: Rongping Lin, University of Electronic Science and Technology of China

Shaohua Hu

Invited Talk Details

Bio: Dr. Shaohua Hu is currently an Associate Professor at the School of Information and Communication Engineering, University of Electronic Science and Technology of China (UESTC). He received his B.E. and Ph.D. degrees in Communication Engineering and Communication and Information Systems from UESTC in 2015 and 2022, respectively, and was a

CSC-funded joint Ph.D. student at Bangor University, UK, from 2019 to 2020. His research focuses on advanced optical transmission technologies and integrated sensing and communication systems, including high-speed coherent communication algorithms, direct-detection system linearization, and signal processing for integrated sensing and communication. He has published over 90 papers in leading journals and conferences, serves as the Principal Investigator for an NSFC Youth Program project, and is a reviewer for several prestigious journals including the Journal of Lightwave Technology and Optics Express.

Title: Direct detection-based complex-valued signal recovery and channel monitoring

Abstract: Direct-detection (DD) receivers offer a cost-effective solution for short-reach optical interconnects, yet their intensity-only nature discards phase information, limiting both signal recovery and system monitoring capabilities. In this invited presentation, we present two complementary DD-based schemes that address chromatic dispersion compensation and coherent transmitter monitoring, respectively, without requiring high-bandwidth coherent receivers.

First, we demonstrate a C-band 224-Gb/s PAM4 transmission over 25-km SSMF using a Gerchberg–Saxton iteration-aided Volterra decision-feedback equalizer. This scheme effectively compensates for severe chromatic dispersion and achieves a bit-error rate of 2.5×10^{-2} with fewer than 20 iterations.

Second, for coherent transmitter monitoring—essential for high-speed network optimization—we model the link as a Wiener–Hammerstein system and propose an alternating-iteration algorithm that decouples linear filter identification from nonlinear MIMO estimation, significantly accelerating convergence. Experiments show that a 3-GHz PD can characterize IQ skew and frequency responses of a 70-Gbaud 64-QAM signal within ~10 iterations, with an IQ skew estimation error of 0.16 ps. We further theoretically derive that the required training length is inversely proportional to the PD bandwidth.

These results collectively demonstrate that tailored iterative algorithms enable both robust dispersion compensation and high-precision transmitter monitoring under direct-detection constraints.

Rongping Lin

Invited Talk Details

Bio: Rongping Lin received the Ph.D. degree from the School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore, 2013. From 2012-2013, he was with City University of Hong Kong as a Senior Research Assistant. He is currently an Associate Professor with the School of Information and Communication Engineering, University of Electronic Science and Technology of China (UESTC), Chengdu, China. His research interests include high-performance network systems, networking protocol design, wireless communications, and edge computing.

Title: Parallel Processing for High-Performance Software Switches

Abstract: The explosive growth of distributed AI clusters has overwhelmed modern data centers with massive, high-speed traffic, exposing severe performance bottlenecks in traditional SDN software switches, such as single-core RX limitations and inefficient CPU allocation. In this talk, I will present a novel parallel processing and intelligent scheduling framework designed to break these transmission barriers. First, we introduce a DPDK-based high-concurrency packet processing mechanism with multi-PMD (Poll Mode Driver) thread parallelism and a lightweight ordering technique, significantly boosting throughput while eliminating out-of-order packets. Second, we propose an adaptive scheduling module combining Reinforcement Learning (RL) and heuristic strategies. By monitoring real-time performance metrics, it dynamically optimizes the mapping between PMD threads and RX queues. Our real-world testbed evaluations demonstrate that this framework remarkably enhances maximum throughput, reduces forwarding latency, and maximizes resource utilization, offering a robust software-hardware co-optimization path for next-generation AI-driven networks.

ONLINE SESSION / Sep. 11, 2026

Time	11:30–12:15, September 11, 2026	Venue	LM103B / 1F

Information	
11:30-11:45	**Paper ID: 8695** **Title:** Colliding-Pulse Mode-Locked Laser as a Coherent Optical Frequency Comb Generator for Terahertz Atmospheric Spectroscopy **Presenter**: Ruirui Hou, University College London
11:45-12:00	**Paper ID: 2705** **Title:** Robust FTIR-Based Thickness Estimation of SiC Epitaxial Layers Using Dual-Angle Consistency and Fabry-Perot Correction **Presenter**: Yueyang Zhang, Hubei University of Technology
12:00-12:15	**Paper ID: 5211** **Title:** Spatiotemporal Graph Meta-Learning with a Network Digital Twin for ROADM Soft-Failure Localization **Presenter**: Rohit Rana Magar, Bragança Polytechnic University

POSTER SESSIONS / Sep. 10, 2026

Time	15:30-17:50, September 10, 2026	Venue	Poster Area

Board No.	Paper Information
01	**Paper ID: 3107** **Title: Investigation of the Spectral Resolution Limit of Multi-Wavelength Coherent Modulation Imaging** **Presenter:** Ninghan Xia, Southern University of Science and Technology
02	**Paper ID: 9732** **Title: Highly Sensitive Fiber-Optic Fabry–Pérot Acoustic Sensor Based on a Circular Kirigami-Patterned Diaphragm** **Presenter:** Songqi Zhang, Northeastern University
03	**Paper ID: 0489** **Title: Real-Time Triaxial Magnetic-Field Measurement Using an Elliptically Polarized Atomic Magnetometer** **Presenter:** Xiaoshu Ding, Beihang University
04	**Paper ID: 7516** **Title: 1555 nm Ultra-Narrow Linewidth Semiconductor Laser via MgF_2 Microresonator Self-Injection Locking** **Presenter:** Yuchen Jia, Nanjing University
05	**Paper ID: 8578** **Title: Reference-Coupled Drift Suppression for Atomic Magnetometer Readout Under Environmental Disturbance** **Presenter:** Xinyi Li, Beihang University
06	**Paper ID: 3288** **Title: A Visible Light Color·Code Communication System Using a Display with Error Correction and Sequential Generation of Color Thresholds** **Presenter:** Yuqing Zheng, Kitami Institute of Technology
07	**Paper ID: 2755** **Title: Classification of Insulating Oil-Related Materials Based on Terahertz Spectroscopy and Multidimensional Feature Fusion** **Presenter:** Jing Shen, State Grid Zhejiang Electric Power Company Limited
08	**Paper ID: 5554** **Title: Submillimeter Spatial Resolution and Signal Enhancement in SERF Atomic Magnetometers** **Presenter:** Yuesong Wu, Beihang University
09	**Paper ID: 0056** **Title: Dual-Point Temperature Sensing Using a Fiber Ring Laser Cavity Incorporating Cascaded π-Phase-Shifted Fiber Bragg Gratings** **Presenter:** Qi Chen, Xiamen Institute of Technology

Board No.	Paper Information
10	**Paper ID: 3162** **Title: Simultaneous Temperature and Salinity Sensing Based on Time-Stretch Effect and a TFBG Cascaded with a Sagnac Interferometer** **Presenter:** Qi Chen, Xiamen Institute of Technology
11	**Paper ID: 6723** **Title: A Low-Cost Active AprilTag System for Daytime and Dark Environments** **Presenter:** Ye Liu, Xi'an Jiaotong-Liverpool University
12	**Paper ID: 8668** **Title: Robustness Enhancement of Micro-LED Optical Computing System Against Pixel Alignment Errors** **Presenter:** Haobo Zhu, Shanghai University
13	**Paper ID: 3350** **Title: Phase-Aware Adaptive Optical Circuit Switching Topology Reconfiguration for Distributed Training** **Presenter:** Shan Yin, Beijing University of Posts and Telecommunications
14	**Paper ID: 4914** **Title: Precise Localization and Dual-parameter Sensing Based on an Overlapping FBG array with OFDR** **Presenter:** Peiyao Wang, Beijing Jiaotong University
15	**Paper ID: 1308** **Title: Cycle-by-Cycle Radiation Optimization and Beam Steering of Terahertz Leaky-Wave Antenna Based on Unidirectional Surface Magneto Plasmon** **Presenter:** Qingyu Li, Zhejiang University of Technology
16	**Paper ID: 5358** **Title: Probability-Shaped DFT-Spread APSK Modulation with Polarization-Diversity Fusion for Turbulence-Resilient Underwater Visible Light Communication** **Presenter:** Haozheng He, King Abdullah University of Science and Technology
17	**Paper ID: 9815** **Title: Photonic Reservoir Computing via a Hexagonal Light Rod for Signal Equalization in Optical Wireless Communications** **Presenter:** Cuiwei He, Japan Advanced Institute of Science and Technology (JAIST)
18	**Paper ID: 3750** **Title: Optimized Linearization of Laser Frequency Sweep Chirps for FMCW LiDAR** **Presenter:** Xin Hu, Shenzhen Institute of Artificial Intelligence and Robotics for Society
19	**Paper ID: 1231** **Title: Multiphysics Design and Preliminary Validation of a Dual FBG Hydrogen Sensing System** **Presenter:** Qi Liu, Beihang University

Board No.	Paper Information
20	**Paper ID: 2219** **Title: Spectral Characteristics of Apodized Silicon-Based Rib Bragg Gratings for Low-Crosstalk DWDM Systems** **Presenter:** CHIA-CHUAN,YU, Central University
21	**Paper ID: 6482** **Title: A Comparative Study of Peak Tracking Algorithms for Michelson Salinity Sensors under Dynamic Temperature Variations** **Presenter:** Yikai Chen, Guangzhou University
22	**Paper ID: 5638** **Title: Transient Dynamic Modeling and Bias Pump Optimization of Quasi-Continuous Wave Thulium- Doped Fiber Lasers** **Presenter:** Ningyin Liang, Southern University of Science and Technology
23	**Paper ID: 2557** **Title: Monolithic GaN Refractometers Enabled by Droplet-Guided Light Coupling** **Presenter:** Yumeng Luo, The Hong Kong University of Science and Technology
24	**Paper ID: 9495** **Title: Wavelength-Engineered Monolithic GaN Optopairs for On-Chip Thermometry** **Presenter:** Hongying Yang, Southern University of Science and Technology
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