

POEM 2026

W U H A N C H I N A

May. 8-10

The 17th
International Photonics and
OptoElectronics Meetings



Host

Huazhong University of Science and Technology

Organizers

Wuhan National Laboratory for Optoelectronics
School of Optical and Electronic Information
Advanced Biomedical Imaging Facility
Optics Valley Laboratory
Learning Conference

Technical Sponsor

SPIE

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Committee

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ORGANIZERS



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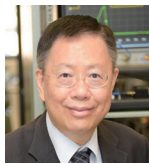
Huazhong University of Science and Technology

Subcommittee

Optoelectronic Devices and Integration (OEDI)

Topics in **Optoelectronic Devices and Integration** include but are not limited to: Optoelectronic materials and devices; Advanced quantum and optoelectronic applications; Physics and simulation of optoelectronic devices; Silicon photonics and optical interconnects; Photonic technology in artificial intelligence.

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City University of Hong Kong



Amit AGRAWAL
University of Cambridge



Cheng ZHANG
Huazhong University of Science and Technology

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Chi ZHANG, Huazhong University of Science and Technology
Hailong ZHOU, Huazhong University of Science and Technology

Biomedical Photonics (BP)

Biomedical photonics has been the one of the hottest topics in the optical field over the past years. As part of the POEM, the topical meeting of Biomedical Photonics aims to bring together scientists, engineers, and clinical researchers working across various fields related to the application of optics, photonics, and imaging technologies in solving critical challenges in biology and medicine. Topics include, but are not limited to: Advanced Optical Imaging, Photon Therapeutics, Bio-optical Sensing and Manipulation, Tissue Optical Spectroscopy, Nanobiophotonics, Tissue Optical Clearing, Multimodal Biomedical Imaging, AI for Biomedical Imaging and Diagnostics, Translational Optical Techniques for Basic Research and Clinical Medicine.

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Dan Zhu

Huazhong University of Science and Technology

Co-Chairs



Junle Qu

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Yu Chen, Fujian Normal University

Peng Fei, Huazhong University of Science and Technology

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Yao He, Soochow University

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Hong'en Liao, Shanghai Jiao Tong University

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Xiaolong Liu, Mengchao Hepatobiliary Hospital of Fujian Medical University

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Changfeng Wu, Southern University of Science and Technology

Tingting Yu, Huazhong University of Science and Technology

Jing Yuan, Huazhong University of Science and Technology

Shaoqun Zeng, Huazhong University of Science and Technology

Sponsors



Transportation

For participants for Plenary, Topical Meeting of OEDI, and other Workshops:

武汉 · 华中科技大学 · 光电信息大楼

Wuhan National Laboratory for Optoelectronics, Huazhong University of Science and Technology

武汉市洪山区珞喻路 1037 号

No.1037, Luoyu Road, Hongshan District, Wuhan

地铁 /Metro:

汉口火车站 Hankou Railway Station

汉口火车站（地铁 2 号线） → 华中科技大学（华中科技大学站 D 出口）

Hankou Railway Station (Metro Line 2) → Huazhong University of Science and Technology (Huazhong University of Science and Technology Station, Exit D)

武昌火车站 Wuchang Railway Station

武昌火车站（地铁 4 号线） → 中南路站（换乘地铁 2 号线） → 华中科技大学（华中科技大学站 D 出口）

Wuchang Railway Station (Metro Line 4) → Zhongnan Road Station (Transfer to Metro Line 2)

→ Huazhong University of Science and Technology (Huazhong University of Science and Technology Station, Exit D)

武汉火车站 Wuhan Railway Station

武汉火车站（地铁 4 号线） → 中南路站（换乘地铁 2 号线） → 华中科技大学（华中科技大学站 D 出口）

Wuhan Railway Station (Metro Line 4) → Zhongnan Road Station (Transfer to Metro Line 2)

→ Huazhong University of Science and Technology (Huazhong University of Science and Technology Station, Exit D)

武汉天河机场 Wuhan Tianhe International Airport

天河机场（地铁 2 号线） → 华中科技大学（华中科技大学站 D 出口）

Tianhe Airport (Metro Line 2) → Huazhong University of Science and Technology (Huazhong University of Science and Technology Station, Exit D)

For participants for Topical Meeting of BP and BRICS Workshop on Biophotonics:

武汉 · 华中科技大学 · 国际医学创新中心

International Medical Innovation Center, Huazhong University of Science and Technology

武汉市洪山区群英路 66 号

No.66, Qunying Road, Hongshan District, Wuhan

地铁 /Metro:

汉口火车站 Hankou Railway Station

汉口火车站 (地铁 2 号线) → 光谷广场 (换乘地铁 11 号线) → 光谷生物园站 E 出口 → 华中科技大学国际医学创新中心

Hankou Railway Station (Metro Line 2) → Optics Valley Square Station (Transfer to Metro Line 11) → Guanggushengwuyuan Station, Exit E → International Medical Innovation Center, HUST

武昌火车站 Wuchang Railway Station

武昌火车站 (地铁 4 号线) → 光谷生物园站 E 出口 → 华中科技大学国际医学创新中心

Wuchang Railway Station (Metro Line 4) → Guanggushengwuyuan Station, Exit E → International Medical Innovation Center, HUST

武汉火车站 Wuhan Railway Station

武汉火车站 (地铁 4 号线) → 光谷五路站 (换乘地铁 11 号线) → 光谷生物园站 E 出口 → 华中科技大学国际医学创新中心

Wuhan Railway Station (Metro Line 4) → Guanggu 5th Road Station (Transfer to Metro Line 11) → Guanggushengwuyuan Station, Exit E → International Medical Innovation Center, HUST

武汉天河机场 Wuhan Tianhe International Airport

天河机场 (地铁 2 号线) → 光谷广场站 (换乘地铁 11 号线) → 光谷生物园站 E 出口 → 华中科技大学国际医学创新中心

Tianhe Airport (Metro Line 2) → Optics Valley Square Station (Transfer to Metro Line 11) → Guanggushengwuyuan Station, Exit E → International Medical Innovation Center, HUST

Information to Participants

Venue

Huazhong University of Science and Technology

Activities	Wuhan National Laboratory for Optoelectronics (光电信息大楼)	Advanced Biomedical Imaging Facility, International Medical Innovation Center (国际医学创新中心高端生物医学成像设施)
Registration	✓	✓
Plenary	✓	
Topical Meeting of Optoelectronic Devices and Integration	✓	
Topical Meeting of Biomedical Photonics		✓
Other Workshops	✓	
BRICS Workshop on Biophotonics V-2026		✓

Onsite Speaker Preparation:

Invited Talk: 20-25 minutes, including Q & A.

Oral Talk: 10-15 minutes, including Q & A.

Presenters are required to be in the session room at least 30 minutes prior to their scheduled talk to upload and check their presentation. No shows of the oral presentation will be recorded and these papers will not be published.

Computers and USB flash drives are available on site. Presenters can copy their presentation to the venue computer, or use their own laptops.

Onsite Poster Preparation

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

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

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

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

BP Poster Session: 17:00-18:00, Friday, 8 May

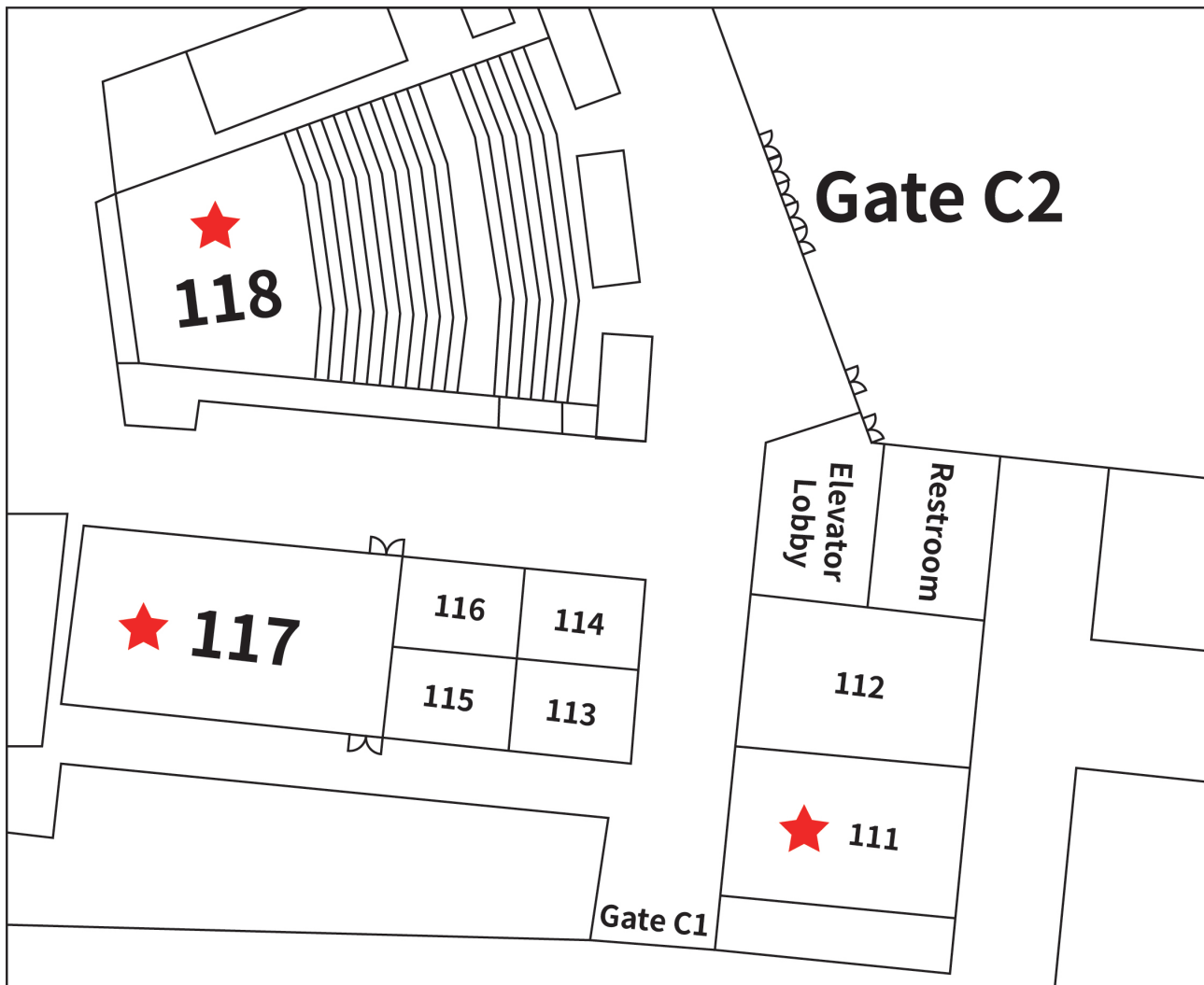
OEDI Poster Session: 16:30-18:00, Saturday, 9 May

LST Poster Session: 16:30-18:00, Saturday, 9 May

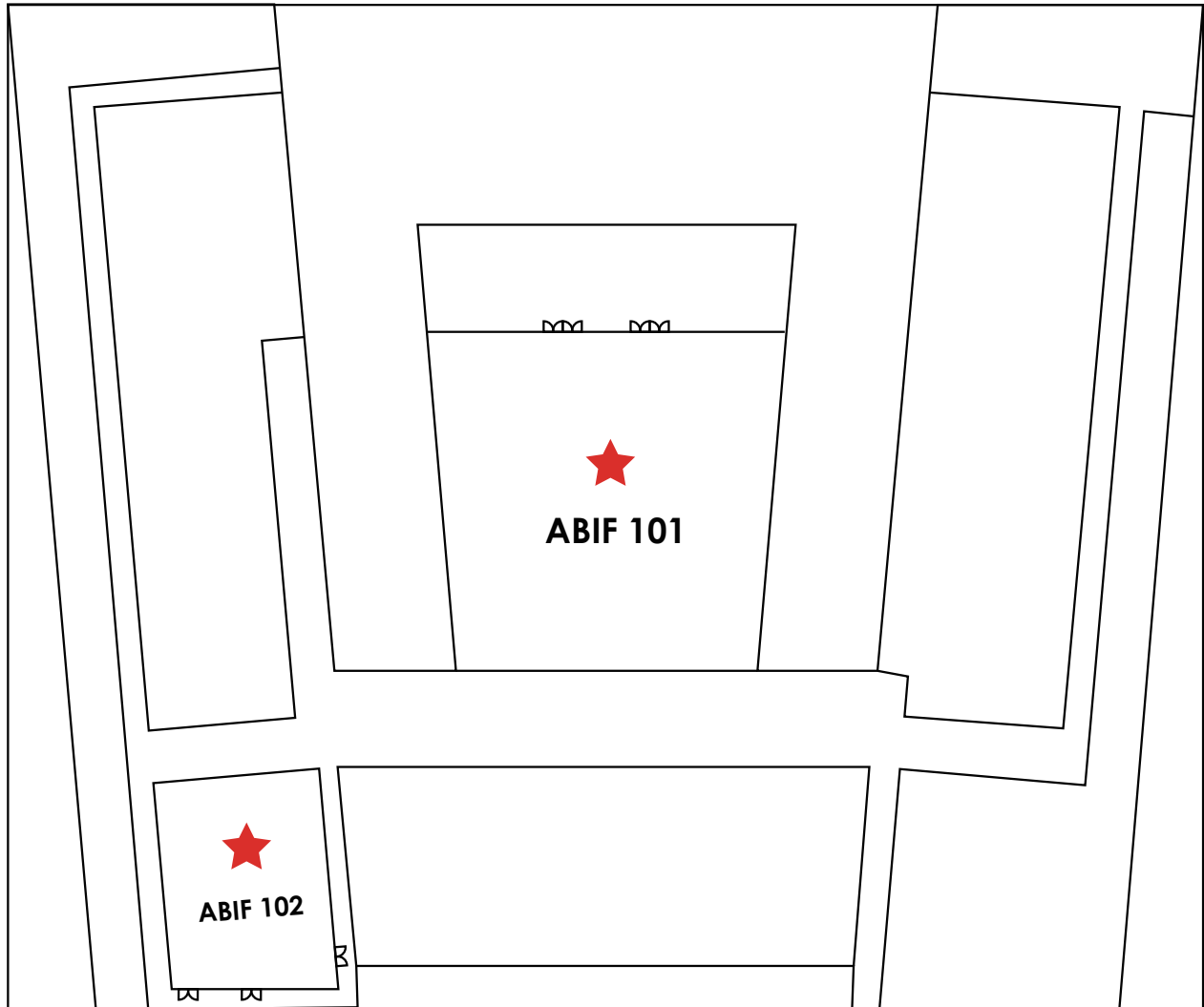
Note

Volunteers and staff will wear yellow slings. If you have any questions, you can ask them for help or go to the registration table for consultation.

Conference Map



Wuhan National Laboratory for Optoelectronics



Advanced Biomedical Imaging Facility, International Medical Innovation Center

General Program

Activities	May 8 Friday	May 9 Saturday	May 10 Sunday	Place	Meeting Room
Opening Ceremony		08:45-09:00		Wuhan National Laboratory for Optoelectronics	C118
Plenary Session		09:00-11:50		Wuhan National Laboratory for Optoelectronics	C118
Topical Meeting of Optoelectronic Devices and Integration		13:30-16:30	08:30-18:00	Wuhan National Laboratory for Optoelectronics	C117
Topical Meeting of Biomedical Photonics	08:20-16:40	14:00-18:00	08:30-18:00	Advanced Biomedical Imaging Facility, International Medical Innovation Center	ABIF 101 & ABIF 102
Poster Session (OEDI & LST)		15:30-17:30		Wuhan National Laboratory for Optoelectronics	C118 side hall
Poster Session(BP) & Welcome Reception	17:00-18:00			Advanced Biomedical Imaging Facility, International Medical Innovation Center	ABIF Floor1
Best Flash Oral Award Competition	15:00-16:50			Wuhan National Laboratory for Optoelectronics	C111
BRICS Workshop on Biophotonics V - 2026	08:20-16:40	14:00-18:00	08:30-18:00	Advanced Biomedical Imaging Facility, International Medical Innovation Center	ABIF 101 & ABIF 102
Workshop: China-UK Advanced Photonics Technology Symposium	14:00-17:35			Wuhan National Laboratory for Optoelectronics	C112
Workshop: Electronic-Photonic-Interconnects for AI	13:30-17:15			Wuhan National Laboratory for Optoelectronics	C115
Banquet and Award Ceremony		18:30-20:30		Hyatt Regency Wuhan Optics Valley	LEVEL6 Salon9

Workshop

Workshop 01: BRICS Workshop on Biophotonics V - 2026

Description

BRICS Workshop on Biophotonics V will be held in Wuhan, China and aimed to bring together scientists, engineers, and clinical researchers from BRICS and candidate countries working in various fields of science related to the application of optics, photonics, and imaging technologies in solving urgent problems in biology and medicine. The forum's scope ranges from basic research to instrument development, preclinical research, and clinical trials, mainly in areas where BRICS researchers are world leaders. We also accept some online presentations due to visa issues.

Organized by

Huazhong University of Science and Technology (HUST), China
Hainan University, China
Biomedical Photonics Committee of Chinese Optical Society, China
Saratov State University (SSU), Russia
FRC "Saratov Scientific Centre of the Russian Academy of Sciences", Saratov, Russia
University of São Paulo, Brazil
Manipal Academy of Higher Education, India
University of Johannesburg, the Republic of South Africa (RSA)

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Sathish Kumar, University of Johannesburg, RSA

Workshop 02: China-UK Advanced Photonics Technology Symposium

Organizers

Prof. Xuewen Shu, Huazhong University of Science and Technology

Prof. Sergei Turitsyn, Aston University, UK

Introduction

The China-UK Advanced Photonics Technology Symposium is an academic forum dedicated to fostering collaborative research, academic exchange, and technological innovation between China and the United Kingdom in the field of advanced photonics. Bringing together leading researchers, faculty members, postdocs, and graduate students from top universities and research institutions across both countries. By strengthening bilateral academic ties and Facility a sustainable communication platform, the symposium seeks to accelerate the development of next-generation photonic technologies and expand their impact in communications, biomedicine, precision sensing, and advanced manufacturing.

[14:00-14:20] Dr. Kaiming Zhou, Aston University, UK

Title: Novel fs laser inscription of fibre gratings

Abstract: We present an advanced femtosecond (fs) laser inscription technique for fabricating fibre-optic devices without the need for refractive index matching. Conventional fs inscription in optical fibres must overcome astigmatism arising from the cylindrical geometry of the fibre cladding, typically mitigated using refractive index matching gel. However, this approach requires complex and time-consuming alignment to achieve high-quality inscription.

In this work, we introduce a novel method that exploits the astigmatism induced by a cylindrical lens to either compensate for or enhance the intrinsic astigmatism of the fibre cladding during grating inscription. This approach enables efficient and flexible control of the focal field, allowing the fabrication of gratings that extend over a larger portion of the fibre core. As a result, the technique produces devices with reduced insertion loss while significantly simplifying the inscription process.

[14:20-14:40] Dr. Zhenggang Lian, Yangtze Optical Electronic Co., Ltd., China

Title: Demonstration of anti-resonant hollow-core fiber enabling flexible delivery of hundreds of megawatt-peak-power femtosecond ultrashort pulses

Abstract: The flexible delivery of high-peak-power ultrafast lasers is challenging due to trade-offs among loss, nonlinearity, and beam quality in optical fibers. In this work, we demonstrate a home-made single-ring anti-resonant hollow-core fiber (AR-HCF) with a record-low loss of 1.6 dB/km at 1058 nm. The fiber supports robust, near-diffraction-limited single-mode guidance with M^2 of 1.05/1.07 across the 1- μ m band. Using this platform, we achieve damage-free transmission of 450-fs, 70- μ J pulses, corresponding to a peak power of 156.7 MW-the highest ever reported for low-loss AR-HCFs. A comparative study using 60-cm and 15-m fiber segments reveals that the short fiber maintains 85.7% transmission efficiency and stable beam quality up to 70 W input, confirming low intrinsic nonlinearity. In contrast, the long fiber exhibits efficiency roll-off to 54% and spectral broadening of 87

nm. Critically, these degradations are extrinsic and can be fully suppressed by core evacuation or inert-gas replacement. Our work establishes a new benchmark for AR-HCFs and provides a clear pathway toward flexible, high-fidelity delivery of multi-megawatt ultrafast pulses.

[14:40-15:00] Dr. Rokas Drevinskas, Microsoft Research, UK/Yiotta Technology Co. Ltd.

Title: Femtosecond laser writing techniques for durable optical data storage

Abstract: The exponential growth of global data requires archival solutions that are cost-effective, sustainable, and scalable. Femtosecond laser writing in glass has emerged as a superior alternative, offering high-density 3D data encoding on abundant, low-cost media that is resistant to extreme environmental conditions. Despite over thirty years of research into multi-dimensional encoding within transparent dielectrics, a commercial standard has yet to be fully realized. However, recent breakthroughs in writing speed and density are finally bridging the gap between laboratory demonstrations and industrial viability. This overview traces the evolution of the technology from its inception in the 1990s to modern innovations capable of achieving century-long data preservation.

[15:00-15:20] Prof. Chaotan Sima, Huazhong University and Science and Technology, China

Title: Advanced Photoacoustic-Based Gas and Acceleration Sensing

Abstract: This talk presents recent advances in optical gas and acceleration sensing utilizing photoacoustic spectroscopy and micro-cavity Fabry-Perot interferometric techniques. It also introduces engineered device prototypes and related instruments developed for various application scenarios.

[15:20-15:40] Dr. Nikita Toropov, University of Southampton, UK

Title: High-Q microresonators and microlasers for biosensing

Abstract: Whispering-gallery-mode (WGM) microresonators enable ultrasensitive detection of nanoscale perturbations, down to the single-atom level. Their active counterparts, WGM microlasers based on gain media, have so far shown limited performance. In this talk, we demonstrate cavity-enhanced biosensing using high-Q microresonators and narrow-linewidth microlasers, where molecular interactions are revealed through spectral shifts. These results highlight the potential of WGM microlasers for compact in vivo optical sensing applications.

[15:40-15:55] Coffee Break

[15:55-16:15] Prof. Zhijun Yan, Huazhong University and Science and Technology, China

Title: Research on multi-domain coded array fiber grating technology and applications

Abstract: As a core component of fiber optic sensing, communication, and laser technologies, fiber gratings have propelled these fields to new levels of advancement. Traditional fiber gratings, such as single-point fiber Bragg gratings, have been successfully applied in communication, sensing, and laser technologies. This report systematically presents the latest progress in sensing technology and application research based on UV-transparent coated specialty fiber gratings, with a focus on the integration technology of fiber grating arrays using UV-transparent optical fibers and its application achievements in fiber optic sensing, fiber optic communication, and fiber laser technologies.

[16:15-16:35] Dr. Diana Galiakhmetova, Aston University, UK

Title: Orbital angular momentum for optical sensing in scattering biological tissues

Abstract: Optical diagnostics in biological tissue are fundamentally limited by multiple scattering, which rapidly destroys phase coherence, polarisation contrast, and spatial resolution, restricting most clinical techniques to ballistic photons. We introduce orbital angular momentum (OAM) of light as a fundamentally new photonic degree of freedom that overcomes these constraints through a robust phase-memory effect. Unlike conventional optical observables, OAM encodes global topological information that persists under conditions where intensity and polarisation become fully randomized.

We present an integrated theoretical, computational, and experimental framework demonstrating that OAM phase memory survives propagation through tissue-like scattering media and remains accessible for quantitative sensing. This enables refractive index sensitivity at the 10^{-6} level, three orders of magnitude beyond conventional approaches, with direct implications for label-free metabolic diagnostics. We further show that conical refraction beams generated in biaxial crystals eliminate the rotational degeneracy of canonical Laguerre-Gaussian modes by producing fractional OAM states with unambiguous phase signatures, achieving a 52-fold improvement in phase precision. We also show that OAM-based measurements can discriminate healthy and cancerous tissue via statistically significant phase shifts, establishing a direct optical readout of nanoscale structural changes. The obtained results show that OAM phase remains measurable under strong multiple scattering, enabling label-free optical assessment of tissue structure and refractive index variations with direct relevance to cancer detection and glucose-related metabolic monitoring.

[16:35-16:55] Prof. Zhaowei Zhang, Huazhong University and Science and Technology, China

Title: Optical parametric oscillators for the generation of femtosecond lasers at 0.7-20 μm

Abstract: Femtosecond optical parametric oscillators (OPOs) can generate ultrashort optical pulses in various wavebands. Currently, based on femtosecond OPOs, femtosecond optical pulses have been achieved in the ultraviolet, visible, and near- to mid-infrared wavebands. This report presents our recent progress in femtosecond OPOs, including the physical mechanisms for obtaining broadband chirped pulses and near-transform-limited femtosecond laser pulses from an OPO, and research advances in generating widely tunable femtosecond lasers in the 0.65-18 μm waveband based on OPOs.

[16:55-17:15] Nawal Mohamed, Aston University, UK

Title: Harnessing glucose sensing in tissue-like scattering medium with fractional orbital angular momentum of light

Abstract: This paper presents a comparative experimental study of Laguerre-Gaussian (LG) beams and conical refraction (CR) beams for optical sensing in scattering media. While LG beams are widely used in structured light applications, their performance degrades in highly turbid environments. Facility on recent advances in the phase memory of twisted light in multiple scattering media (Meglinski et al., 2026) and the topological phase structure of conical refraction beams for biosensing (Nanophotonics, 2025), this study provides a rigorous framework for analysing structured

light propagation in complex media. Experimental results demonstrate that a distinct conical refraction beam component exhibits significantly enhanced sensitivity to glucose-induced optical changes, alongside stronger spin-orbital angular momentum (spin-OAM) coupling compared to LG beams. These findings reveal a previously underexplored advantage of CR beams, highlighting their potential for robust optical sensing in biological environments. The work is supported by quantitative phase retrieval and Fourier-domain analysis, ensuring methodological rigour and reproducibility.

[17:15-17:35] Dr. Qi Yu, Anhui university, China

Title: Fabrication of fiber-based whispering gallery mode microcavities and their applications in precision measurement

Abstract: Whispering gallery mode (WGM) optical microcavities, characterized by ultra-high quality factors and small mode volumes, significantly enhance light-matter interactions, establishing them as an exceptional platform for ultra-sensitive optical sensing. In this report, we present the design and fabrication of micro-bottle cavities on optical fiber surfaces using femtosecond laser-enabled surface nanoscale axial photonics (SNAP) technology, achieving precise control over cavity geometry and mode characteristics. Furthermore, we investigate laser emission in active gain-assisted WGM microcavities and demonstrate flexible mode manipulation. Finally, we introduce a self-frequency mapping technique based on controlled mode splitting, which is applied to precision measurements involving weak feedback targets.

Workshop 03: Electronic-Photonic-Interconnects for AI (面向 AI 的光电融合互联)

Organizers:

Min Tan (HUST) · Jianjun Zhang (IOP, CAS)

About the Workshop:

As AI computing power explodes, electronic- photonic interconnects have become the critical backbone for high-bandwidth, low-latency,energyefficient data movement. This POEM 2026 workshop convenes top researchers and industry leaders to tackle key challenges - from quantum-dotlasers and advanced packaging to thermal management and mass productionand to chart the path toward commercial deployment of CPO, NPOand OIO technologies for next -generation AI systems. Each 20-minute talk (15+5) promises deep insights and lively discussion.

Technical Program

Time	Speaker	Affiliation	Presentation Title
13:30-13:35	Tan Min	Huazhong Univ. of Sci. & Tech. (HUST)	Introduction to electronic-photonic interconnects for AI workshop
13:35-13:55	Du Jiangbing	Shanghai Jiao Tong University (SJTU)	High density photonic integration and co-packaged optics for optical interconnection
13:55-14:15	Yang Fenghe	Zhangjiang Laboratory	Advanced silicon photonics manufacturing platform enables electronic-photonic interconnects
14:15-14:35	Zheng Xuqiang	Institute of Microelectronics, CAS	Design of high-speed wireline transceivers-A112G ADC-DSP SerDes and D2D interface
14:35-14:55	Du Yuan	Nanjing University	Crosstalk cancellation techniques for high-density and high-speed parallel interconnects
14:55-15:15	Zhang Jianjun	Institute of Physics, CAS	Quantum dot mode-locked frequency comb laser for optical I/O
15:15-15:35	Coffee Break		Networking & Refreshments
15:35-15:55	Dang Ziyue	National Optoelectronics InformationInnovation Center	A 4x212 Gbps 3.34pJ/bit electronic-photonic co-designed transmitter chipset in 0.18- μ m SiGe BiCMOS and 90nm silicon photonics
15:55-16:15	Dong Wen	Huazhong Univ. of Sci. & Tech. (HUST)	Novel Electro-Optic Modulator Materials: Future and Challenge
16:15-16:35	Zeng Cheng	Huazhong Univ. of Sci. & Tech. (HUST)	Thin-film lithium tantalate photonic chip for mrad/s reset-free polarization tracking
16:35-16:55	Tian Xingyin	Precisionext(普莱信智能)	Application and current status of advanced packaging technologies in the CPO/NPO industry
16:55-17:15	Gui Chengcheng	Huawei Technologies	Trends and research progress in NPO, CPO, and OIO technologies

Plenary

Location: Meeting Room C118	
May 09, 2026	
President: Jianji Dong, Huazhong University of Science and Technology	
08:45-09:00	Opening Ceremony
09:00-09:30	Advancement from VLSIs to integrated photonics for sensing, interconnects and computing with artificial intelligence and machine learning applications Ray Chen University of Texas, Austin
09:30-10:00	Integrated photonic switch fabrics and their applications: From AI datacenters to 6G fronthaul networking Richard Penty Cambridge University
10:00-10:20	Coffee Break
President: Dan Zhu, Huazhong University of Science and Technology	
10:20-10:50	Opportunities in organelle diagnostics and therapy Dayong Jin University of Technology Sydney/Eastern Institute of Technology, Ningbo
10:50-11:20	From nanoimprinted devices to layered thin films designed by AI, a path towards real world applications L. Jay Guo University of Michigan
11:20-11:50	Breakthrough benefits of optical imaging, spectroscopy and treatment thanks to tissue optical clearing Valery V. Tuchin Saratov State University
11:50-14:00	Lunch

Ray Chen

University of Texas, Austin

Advancement from VLSIs to integrated photonics for sensing, interconnects and computing with artificial intelligence and machine learning applications



Abstract:

The advancement of sensing, interconnects and computing is mainly from the R&D works on electrons and photons, which carry drastically different characteristics defining different technology roadmaps. Due to the saturation of the Moore's law, the advantages of photon-based devices provide solutions with the unprecedented performance. In this talk, we will present the integrated photonic devices covering near and mid-IR wavelengths for biosensing, SERS and spectroscopy sensing for Methane, Nitrogen Dioxide, CO, Ethanol, Ammonia, and TEP. Mid-IR Lidar Chip centered at 4.6 micron will also presented.

Today's fabrication of planar photonic circuits is reaching the limits of integration density. The minimum feature sizes are fundamentally limited by the wavelength ($\sim 1 \mu\text{m}$) of light and the refractive index contrast achievable in the optical materials. By utilizing the unique feature of photons, which are Bosons by definition, we can further enhance the interconnectivity physically stacking optical waveguide layers without interference to significantly enhance the number of interconnects on one optical layer.

Silicon photonics for both digital and analog computing will be introduced with low latency, high bandwidth and multi-wavelength operations for AI and ML applications. Multiple photonic circuits were demonstrated to ensure low latency, high bandwidth and low energy consumption without compromising the machine learning accuracy. A myriad of data sets has been explored. And the details will be presented in the plenary talk.

Richard Penty

Cambridge University

Integrated photonic switch fabrics and their applications: From AI datacenters to 6G fronthaul networking



Abstract:

TBD

Dayong Jin

University of Technology Sydney/Eastern Institute of Technology, Ningbo

Opportunities in organelle diagnostics and therapy



Abstract:

My presentation will highlight the opportunities in imaging, sensing, and modulating organelles in live cells. First, I will introduce our recently published work on segmentation of up to 15 distinct organelles structures. I will then present the new progress we made in developing high-speed, high-throughput, and super-resolution imaging system as well as algorithms for organelle segmentation and data analytics of their interconnectivity within organelle networks, offering unprecedented insights into the nanoscale world inside living systems. The research around organelle diagnostics and therapies represents a “blue ocean” for future multidisciplinary research, spanning instrumentation engineering, nanotechnology, data analytics, organelle biology, and clinical therapeutic innovations. In my seminar, I will emphasize several recent breakthroughs we have just made, including the first observation of Insulin Growth Factor 1 transport, the full picture on mitochondrial fission process, and a new finding on organelle homeostasis collapse in melanoma cells following tyrosine treatment, etc.

L. Jay Guo

University of Michigan

From nanoimprinted devices to layered thin films designed by AI, a path towards real world Applications



Abstract:

This talk hopes to introduce a few works related to photonics/optoelectronics. First, nanoimprinted polymer microring resonators are shown to be excellent ultrasound detectors, and were exploited for photoacoustic imaging and tomography to utilize its high bandwidth and sensitive response to acoustic waves. A second work is to seek ITO replacement with an ultrathin and stable silver film as the flexible transparent electrode, and was used in OPV, and in OLED where the waveguide mode responsible for light trapping was shown to be removed, leading to enhanced light extraction efficiency. Such transparent conductors have been commercialized by mature industrial sputtering process and applicable to a wide range of applications. For the design and optimization of this and other thin film structures, we show that deep learning approach (reinforcement learning and GPT) can automatically design sophisticated structures to give the desired optical response, and can facilitate gaining insight on the working mechanism of the AI-produced structure.

Valery V. Tuchin

Saratov State University

Breakthrough benefits of optical Imaging, spectroscopy and treatment thanks to tissue optical clearing



Abstract:

This work summarizes cutting-edge developments in tissue optical clearing (TOC) method using biocompatible immersion optical clearing agents (OCAs) for intravital optical imaging, optical diagnostics, and phototherapy. Multimodality approach based on optical clearing is discussed. It will be shown that the TOC method significantly improves and expands the capabilities of advanced multimodal optical spectroscopy/imaging and phototherapy techniques. The delivery of an OCA to living tissue ensures its transparency over a broad spectral range from deep UV to NIR and to THz, thus increases the imaging depth with enhanced contrast. TOC provides additional markers for monitoring diabetes mellitus complications and cancer cell detection using robust optical measurements of molecular diffusivity and blood microcirculation. This study was supported by the RSF grant no. 24-44-00082.

Optoelectronic Devices and Integration

Location: C117 Meeting Room	
May 09, 2026	
Presider: Peng Chen, Nanjing University	
13:30-13:50	High-performance light field 3D display based on integral imaging (Invited) Qionghua Wang, Yan Xing School of Instrumentation and Optoelectronic Engineering, Beihang University
13:50-14:10	On-chip integrated metasurfaces for complex structured light field generation (Invited) Shulin Sun Fudan University
14:10-14:30	Wavelength- and angle-multiplexed metasurface hologram for naked-eye observation of full-color movie (Invited) Kentaro Iwami Tokyo University of Agriculture and Technology
14:30-14:50	Metasurface enabled multi-information intelligent visual perception (Invited) Yueqiang Hu Hunan University
14:50-15:10	Multidimensional optical interconnection and intelligent optical access based on photonic integration (Invited) Junwen Zhang Fudan University
15:10-15:30	Nonlocal meta-optics: Challenging fundamental physical limits in imaging systems (Invited) Yuanmu Yang Tsinghua University
15:30-15:50	Integrated lithium niobate photonics: From communications to metrology (Invited) Yang Li Sun Yat-sen University
15:50-16:10	Photonic spin Hall effect: Manipulations and applications (Invited) Xinxing Zhou Hunan Normal University
16:10-16:30	Tea Break
Location: C117 Meeting Room	
May 10, 2026	
Presider: Kun Huang, University of Science and Technology of China	
08:30-08:50	Plasmonic manipulation of dark excitons and valley polarization in monolayer semiconductors (Invited) Dangyuan Lei City University of Hong Kong
08:50-09:10	Quantum metasurfaces for advanced photon sources (Invited) Fei Ding University of Southern Denmark; Eastern Institute of Technology, Ningbo
09:10-09:30	Light-matter interactions at interfaces: From radiation control to nanoscale bio-photonics (Invited) Xiaolan Zhong Beihang University

09:30-09:50	Research on photonic reservoir computing (Invited) Xingxing Guo Xidian University
09:50-10:10	Dynamic light control via chiral liquid crystals (Invited) Peng Chen Nanjing University
10:10-10:30	Heterogeneously integrated nonlinear photonic devices and applications (Invited) Bin Zhang Sun Yat-sen University
10:30-10:50	Tea Break
Presider: Danyuan Lei, City University of Hong Kong	
10:50-11:10	High-performance organic single-crystal semiconductors for optoelectronic applications (Invited) Jing Feng Jilin University
11:10-11:30	Low-loss phase-change material assisted optical devices and applications (Invited) Lei Lei Shenzhen University
11:30-11:50	High efficiency active terahertz membrane metasurfaces (Invited) Longqing Cong Southern University of Science and Technology
11:50-12:10	Fabrication, modulation, and applications of advanced semiconductor fibers (Invited) Jing Zhang China University of Geosciences
12:10-13:30	Lunch
Presider: Ping Zhao, Sichuan University	
13:30-13:50	Terahertz metasurfaces for dynamic beam manipulation (Invited) Jierong Cheng Nankai University
13:50-14:10	Advance in metamaterials sensor and AI for metamaterials (Invited) Xiaojing Mu Chongqing University
14:10-14:30	Generalized diffraction intelligent computing (Invited) Chao Wang Beijing University of Posts and Telecommunications
14:30-14:50	A 160°×160° dynamic holographic meta-projector (Invited) Kun Huang University of Science and Technology of China
14:50-15:10	Numerical super-oscillatory filtering for large field-of-view sub-diffraction optical imaging (Invited) Haitang Yang Harbin Institute of Technology
15:10-15:20	A silicon-based photodiode for integrated sensing-and-computing second-order derivative operations (Oral) Kexun He Huazhong University of Science and Technology
15:20-15:40	Tea Break
Presider: Jing Xu, Huazhong University of Science and Technology	
15:40-16:00	Ultra-broadband optical parametric amplification using nonlinear integrated waveguides (Invited) Ping Zhao Sichuan University

16:00-16:20	Optimal design of ultra-compact silicon photonic computing (Invited) Jiagui Wu Southwest University
16:20-16:40	MZI-based photonic matrix computing for intelligence (Invited) Jian Zhao Tianjin University
16:40-16:50	Resonantly enhanced acousto-optic modulation based on suspended AIN platform (Oral) Han Xue Huazhong University of Science and Technology

Optoelectronic Devices and Integration Place: C117 Meeting Room

May 09, 2026

POEM2026-0429-1

13:30-13:50 (Invited)

High-performance light field 3D display based on integral imaging

Qiong-Hua Wang, Yan Xing

School of Instrumentation and Optoelectronic Engineering, Beihang University

Light field 3D display is an important 3D display. This talk will give an overview on light field 3D display technology based on integral imaging, and introduce in detail a desktop light field 3D display and a high-resolution light field 3D display based on integral imaging developed by our team. The former achieves good 3D display effect with 360° horizontal view angle, and the latter achieves good 3D display effect with high resolution. The structure, principle and performance of the light field 3D displays will be elucidated.

POEM2026-0403-2

13:50-14:10 (Invited)

On-chip integrated metasurfaces for complex structured light field generation

Shulin Sun

Fudan University

Here, we present the novel strategy of designing integrated metasurfaces that can serve as the high-efficiency and bidirectional bridge between free-space light and on-chip optical fields.

POEM2026-0429-8

14:10-14:30 (Invited)

Wavelength- and angle-multiplexed metasurface hologram for naked-eye observation of full-color movie

Kentaro Iwami

Tokyo University of Agriculture and Technology

This study demonstrates a high-efficiency silicon-nitride metasurface for full-color 3D holographic movies. By integrating wavelength and angle multiplexing, the system enables crosstalk-free, naked-eye observation, advancing practical applications in next-generation visual displays.

POEM2026-0429-4

14:30-14:50 (Invited)

Metasurface enabled multi-information intelligent visual perception

Yueqiang Hu

Hunan University

Optical computing overcomes high energy use and low power of silicon electronics. Metasurface-enabled planar nanostructured devices control light fields for high-speed, parallel, low-power computing, especially for visual perception. This report covers our team's work on multi-dimensional information multiplexing, spatiotemporal control, and parallel sensing-computing devices.

POEM2026-0429-6

14:50-15:10 (Invited)

Multidimensional optical interconnection and intelligent optical access based on photonic integration

Junwen Zhang

Fudan University

Focusing on the deep integration of next-generation communication networks and artificial intelligence, this paper investigates intelligent photonic integration and system applications. It reviews the latest research progress in high-speed large-capacity optical interconnection, optical computing, and intelligent information processing, presents technological advances and prospects the future development trends of the field.

POEM2026-0426-3

15:10-15:30 (Invited)

Nonlocal meta-optics: Challenging fundamental physical limits in imaging systems

Yuanmu Yang*

Tsinghua University

This talk explores nonlocal meta-optics to bypass traditional imaging size constraints. By engineering momentum-space (k-space), we aim to decouple system thickness from resolution, achieved label-free super-resolution, and enabled high-dimensional sensing. These advancements pave the way for ultra-compact, wafer-scale photonic systems for 3D vision and metrology.

POEM2026-0425-1

15:30-15:50 (Invited)

Integrated lithium niobate photonics: From communications to metrology

Yang Li

Sun Yat-sen University

We demonstrate a dynamic frequency measurement method using integrated lithium niobate electro-optic combs, enabling measuring the frequency of mode-hop lasers with chirp rates up to 2×10^{18} Hz/s.

POEM2026-0426-2

15:50-16:10 (Invited)

Photonic spin Hall effect: Manipulations and applications

Xinxing Zhou

Hunan Normal University

The photonic spin Hall effect (SHE) manifests itself as the spin-dependent splitting of left- and right-handed circularly polarized components when a linearly polarized light beam is reflected or refracted from the media interface. The physical mechanism of this phenomenon is due to spin-orbit interaction of light. Until now, the photonic SHE has been widely investigated in different physical systems such as optical interfaces, metasurfaces/metamaterials, near-field optics, topological and disordered systems, as well as non-Hermitian photonics. Significantly, the photonic SHE provides the unique spin degrees of freedom to flexibly control light, which has enabled tremendous applications in precise metrology, spin-based nanophotonic devices, and mathematical operations. In this talk, we will introduce our recent works about manipulations and applications of photonic SHE.

Optoelectronic Devices and Integration Place: C117 Meeting Room

May 10, 2026

POEM2026-0425-2

08:30-08:50 (Invited)

Plasmonic manipulation of dark excitons and valley polarization in monolayer semiconductors

Dangyuan Lei*

City University of Hong Kong

I will show how to use tailored plasmonic nanocavities to control the radiative properties of spin-forbidden dark excitons in the weak coupling regime and extend the valley polarization lifetime of valley excitons in the strong coupling regime.

POEM2026-0426-5

08:50-09:10 (Invited)

Quantum metasurfaces for advanced photon sources

Fei Ding^{1, 2*}

1.University of Southern Denmark;2.Eastern Institute of Technology, Ningbo

Metasurfaces enable ultrathin control of classical and quantum light. This talk introduces on-chip emitter-coupled quantum metasurfaces for room-temperature single-photon generation with engineered spin, orbital angular momentum, directionality, and polarization.

POEM2026-0308-1

09:10-09:30 (Invited)

Light-matter interactions at interfaces: From radiation control to nanoscale bio-photonics

Xiaolan Zhong*

Beihang University

Interfacial light-matter interactions reshape optical radiation at the nanoscale. This talk presents strategies to engineer and decode radiation patterns via plasmonic emission control, electrochromic spectral encoding, and fluorescence self-interference, enabling far-field probing of nanoscale environments and interfacial dynamics.

POEM2026-0320-1

09:30-09:50 (Invited)

Research on photonic reservoir computing

Xingxing Guo*

Xidian University

This work explores photonic reservoir computing as a low-power, high-speed neuromorphic framework to address von Neumann bottlenecks and meet AI's growing demands for efficient time-series processing.

POEM2026-0425-4

09:50-10:10 (Invited)

Dynamic light control via chiral liquid crystals

Peng Chen

Nanjing University

Our recent progress on chiral-liquid-crystal-mediated dynamic light control will be given, including the manipulation of orbital angular momentum beams, dynamic holographic multiplexing, and multi-functional edge imaging.

POEM2026-0429-5

10:10-10:30 (Invited)

Heterogeneously integrated nonlinear photonic devices and applications

Bin Zhang

Sun Yat-sen University

We present a heterogeneous silicon photonic device enabling multi-spectral, low-power soliton microcombs and reconfigurable non-volatile devices, breaking transmission bandwidth and pump power limits for novel optical interconnects and sensing applications.

POEM2026-0413-2

10:50-11:10 (Invited)

High-performance organic single-crystal semiconductors for optoelectronic applications

Jing Feng

Jilin University

This talk will introduce our systematic investigations on the growth and manipulation of optoelectronic properties for the organic single crystals and their applications in light-emitting devices.

POEM2026-0425-5

11:10-11:30 (Invited)

Low-loss phase-change material assisted optical devices and applications

Lei Lei

Shenzhen University

This report presents low-loss phase-change materials (GST-SL, Sb_2Se_3) integrated with silicon for reconfigurable photonic devices, enabling low absorption and high-contrast phase modulation for energy-efficient optical computing and on-chip sensing.

POEM2026-0425-3

11:30-11:50 (Invited)

High efficiency active terahertz membrane metasurfaces

Longqing Cong*

Southern University of Science and Technology

We introduce a membrane metasurface that merges Kerker's condition with q-BICs. Our experiment demonstrates an absolute beam deflection efficiency exceeding 92%, a 4 GHz linewidth, a 2.8° divergence angle, and a quality factor of 114.

POEM2026-0429-2

11:50-12:10 (Invited)

Fabrication, modulation, and applications of advanced semiconductor fibers

Jing Zhang

China University of Geosciences

As optical-fiber manufacturing merges ever more deeply with materials science, the thermal-drawing technique is becoming a new route for producing multimaterial, multifunctional fibers. By co-drawing silica, semiconductors, and functional polymers, the process can fabricate advanced semiconductor core fibers-such as silicon-core, germanium-core, and piezoelectric fibers-that hold great promise for optics, optoelectronics, and sensing. This talk will first outline the fundamental concepts, representative materials, and fiber architectures of semiconductor fibers. It will then focus on in-fiber post-processing strategies for morphological control and crystal-structure engineering of semiconductor cores, covering microfluidics, interfacial science, and crystal-property optimization. Finally, prospects for multifunctionally coupled devices based on these fibers will be discussed.

POEM2026-0427-3

13:30-13:50 (Invited)

Terahertz metasurfaces for dynamic beam manipulation

Jierong Cheng*

Nankai University

This report presents a series of research results based on bilayer twisted metasurfaces and liquid crystal metasurfaces, which realize THz beam dynamic scanning, wireless communications and imaging.

POEM2026-0427-2

13:50-14:10 (Invited)

Advance in metamaterials sensor and AI for metamaterials

Xiaojing Mu*, Ziwei Chen

Chongqing University

Metamaterials enable ultra-high-sensitivity molecular detection via precise electromagnetic resonance regulation. This work summarizes advanced metamaterial-based biosensing, gas monitoring and chemical detection, and explores AI inverse design to realize intelligent, accurate and efficient multi-scenario sensing.

POEM2026-0429-7

14:10-14:30 (Invited)

Generalized diffraction intelligent computing

Chao Wang

Beijing University of Posts and Telecommunications

Diffraction computing architectures, with their inherent parallelism and highly efficient information processing capabilities, represent a pivotal breakthrough to surmount traditional computing constraints. This report will discuss potential solutions in enhancing dynamic reconfigurability for general-purpose diffractive photonic neural networks, drawing insights from architectural, device, and algorithmic perspectives.

POEM2026-0409-1

14:30-14:50 (Invited)

A 160°×160° dynamic holographic meta-projector

Huang Kun*

University of Science and Technology of China

The presenter report a pixel-interpolation-assisted holographic dynamic meta-projector with a 160°×160° field of view.

POEM2026-0319-7

14:50-15:10 (Invited)

Numerical super-oscillatory filtering for large field-of-view sub-diffraction optical imaging

Yitian Liu¹, George Eleftheriades¹, Haitang Yang^{2*}

1.University of Toronto, Canada;2.Harbin Institute of Technology

Numerical super-oscillatory imaging reconstructs complex fields and applies Fourier-domain filters to achieve sub-diffraction resolution without complex hardware, improving feature sharpness and robustness, enabling practical and flexible imaging in sparse scenes with a larger field of view.

POEM2026-0228-1

15:10-15:20 (Oral)

A silicon-based photodiode for integrated sensing-and-computing second-order derivative operations

Kexun He, Mengyao Xiong, Yanran Chen, Yuhui He*, Xiangshui Miao*

Huazhong University of Science and Technology

A silicon-based photodiode circuit designed for integrated sensing and computation of second-order derivative operations. This circuit enables the measurement of acceleration and the computation of the second-order derivative of illumination.

POEM2026-0429-3

15:40-16:00 (Invited)

Ultra-broadband optical parametric amplification using nonlinear integrated waveguides

Ping Zhao

Sichuan University

Photonic-chip based optical parametric signal processing exhibits ultra-fast temporal response and broadband operation wavelength range, attracting vast interest in recent years. In this talk, I will present our recent progress in ultra-broadband continuous-wave optical parametric amplification based on third-order nonlinear integrated waveguides. Moreover, applications such as high-speed all-optical wavelength conversion will also be included .

POEM2026-0426-1

16:00-16:20 (Invited)

Optimal design of ultra-compact silicon photonic computing

Jiagui Wu

Southwest University

Here, we explore optimization design of small-sized and high-performance silicon photonic computing. We provide a series of multi-channel waveguide cross such as 2×2, 3×3, 4×4 and 8×8, with characteristics of low insertion loss and ultra-compact size.

POEM2026-0426-4

16:20-16:40 (Invited)

MZI-based photonic matrix computing for intelligence

Jian Zhao*, Hang Liu, Rupeng Li

Tianjin University

This talk introduces photonic integrated intelligent computing for energy-efficient AI, focusing on optical matrix computing, Mach-Zehnder interferometer arrays, photonic neural networks, optical-electronic hybrid architectures, and cascaded MZI-based visual intelligence acceleration for future scalable AI hardware.

POEM2026-0320-11

16:40-16:50 (Oral)

Resonantly enhanced acousto-optic modulation based on suspended AIN platform

Han Xue*

Huazhong University of Science and Technology

We demonstrate cavity-enhanced acousto-optic modulators supporting both intramodal and intermodal interactions on a suspended AIN platform, utilizing micro-ring and Bragg grating-based Fabry-Perot resonators. The devices achieve significant enhancement in modulation efficiency and exhibit narrow RF bandwidth within an ultra-compact footprint.

Best Flash Oral Award Competition (OEDI)

Optoelectronic Devices and Integration	
Location: C111 Meeting Room	
May 08, 2026	
15:00-15:10	<p>Capturing arbitrary waveform in lossless systems with synthesis of complex frequencies (Oral) Yadi Niu State Key Laboratory of Artificial Microstructure and Mesoscopic Physics & Department of Physics, Peking University</p>
15:10-15:20	<p>Adiabatic wide-waveguide silicon nitride microring resonators for single-mode operation (Oral) Xiu Yang Wuhan National Laboratory for Optoelectronics & School of Optical and Electronic Information, Huazhong University of Science and Technology</p>
15:20-15:30	<p>Breaking the bandwidth-quality-factor limit in ring modulators with terahertz free spectral range (Oral) Zhihan Sun School of Optical and Electronic Information and Wuhan National Laboratory for Optoelectronics, Huazhong University of Science and Technology; National Engineering Research Center for Next Generation Internet Access System</p>
15:30-15:40	<p>Accurate extraction of a-Si:H thin film refractive index using multi-order mach-zehnder interferometers (Oral) Zhiyuan Zhou School of Optical and Electronic Information and Wuhan National Laboratory for Optoelectronics, Huazhong University of Science and Technology</p>
15:40-15:50	<p>0.55 dB/cm hydrogenated amorphous silicon waveguides for backend CMOS photonic integration (Oral) Qingyun Xian Huazhong University of Science and Technology</p>
15:50-16:00	<p>A circuit-level modeling and training framework for microring-based photonic neural networks (Oral) Weilu Wu State Key Lab of Optical Communication Systems and Networks, Department of Electronic Engineering, Shanghai Jiao Tong University</p>
16:00-16:10	<p>Ultracompact high-Q whispering gallery mode microresonator in a non-closed waveguide path (Oral) Ziyang Xiong Southeast University</p>
16:10-16:20	<p>All-optical in-line phase shifter (based) on iron-oxide-nanoparticle-microfiber platform (Oral) Han Zhou Wuhan National Laboratory for Optoelectronics; Huazhong University of Science and Technology</p>
16:20-16:30	<p>Metasurface-enabled highly integrated two-photon polymerization laser processing system with synchronous imaging (Oral) Binjie Zhang School of Optical and Electronic Information Huazhong University of Science and Technology</p>
16:30-16:40	<p>Compact thermal modeling of photonic integrated circuits via physics-constrained graph structure learning (Oral) Kexin Zhu Tongji University</p>
16:40-16:50	<p>Inverse-designed structural colors with simultaneous optimal purity and brightness (Oral) Moxin Li Huazhong University of Science and Technology</p>

Optoelectronic Devices and Integration Place: C111 Meeting Room

May 08, 2026

POEM2026-0316-1

15:00-15:10 (Oral)

Capturing arbitrary waveform in lossless systems with synthesis of complex frequencies

Zhaohua Tian^{1,2}, Yu Tian^{1,3*}, Yadi Niu¹, Qi Liu^{1,3}, Zihan Mo¹, Haoyang Zhang^{1,4}, Ying Gu^{1,3,4,5*}

1.State Key Laboratory of Artificial Microstructure and Mesoscopic Physics & Department of Physics, Peking University;2.Department of Physics, Zhejiang Sci-Tech University;3.Frontiers Science Center for Nano-optoelectronics & Collaborative Innovation Center of Quantum Matter & Beijing Academy of Quantum Information Sciences, Peking University;4.Hefei National Laboratory;5.Collaborative Innovation Center of Extreme Optics, Shanxi University, Peking University Yangtze Delta Institute of Optoelectronics

We propose that arbitrary waveforms, such as exponentially decaying, Gaussian profiles, can be captured efficiently in a lossless system with multiple scattering matrix zeros.

POEM2026-0319-8

15:10-15:20 (Oral)

Adiabatic wide-waveguide silicon nitride microring resonators for single-mode operation

Xiu Yang, Guojiong Li, Qiaoyin Lu*, Weihua Guo

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

To prevent multi-mode lasing, we propose an adiabatic microring resonator with a mode-filtering taper. It successfully eliminates higher-order modes in low-loss wide waveguides while strictly preserving fundamental mode characteristics for tunable laser applications.

POEM2026-0320-2

15:20-15:30 (Oral)

Breaking the bandwidth-quality-factor limit in ring modulators with terahertz free spectral range

Zhihan Sun^{1,2}, Chenyu Wu^{1,2}, Zhiyuan Zhou^{1,2}, Shuang Zheng^{1,2,3*}, Minming Zhang^{1,2,3*}

1.School of Optical and Electronic Information and Wuhan National Laboratory for Optoelectronics, Huazhong University of Science and Technology;2.National Engineering Research Center for Next Generation Internet Access System;3.Optics Valley Laboratory

We theoretically propose a compact coupling-modulated LTOI ring modulator breaking the bandwidth-Q trade-off. Using a push-pull MZI coupler, it predicts a terahertz FSR, 100-GHz bandwidth, and 0.75-V driving voltage, enabling high-density WDM interconnects.

POEM2026-0320-4

15:30-15:40 (Oral)

Accurate extraction of α -Si:H thin film refractive index using multi-order mach-zehnder interferometers

Zhiyuan Zhou¹, Qingyun Xian¹, Qi Tian¹, Hao Hu², Changyu Hu², Jun Liu², Shuang Zheng^{1*}, Minming Zhang^{1*}

1.School of Optical and Electronic Information and Wuhan National Laboratory for Optoelectronics, Huazhong University of Science and Technology;2.Hubei Jiufengshan Laboratory

Using multi-order MZIs, we extract α -Si:H film refractive index from waveguide effective indices. The method achieves 0.61% accuracy, yielding refractive index of 3.465 ± 0.021 at 1550nm.

POEM2026-0320-5

15:40-15:50 (Oral)

0.55 dB/cm hydrogenated amorphous silicon waveguides for backend CMOS photonic integration

Qingyun Xian¹, Zhiyuan Zhou¹, Qi Tian¹, Hao Hu², Changyu Hu², Jun Liu², Shuang Zheng^{1*}, Mingming Zhang^{1*}

1.Huazhong University of Science and Technology;2.Hubei Jiufengshan Laboratory

We demonstrate 0.55 dB/cm low-loss a-Si:H waveguides for backend CMOS photonic integration with optimized PECVD and etching, enabling high-uniformity wafer-scale passive photonic devices.

POEM2026-0320-7

15:50-16:00 (Oral)

A circuit-level modeling and training framework for microring-based photonic neural networks

Weilu Wu, Jinlong Xiang, Xuhan Guo*, Yikai Su

State Key Lab of Optical Communication Systems and Networks, Department of Electronic Engineering, Shanghai Jiao Tong University

We present a SPICE-based simulation and training framework for microring-based photonic neural networks. By integrating accurate device modeling with Python-driven optimization, the system achieves 100% accuracy on the Iris dataset.

POEM2026-0320-8

16:00-16:10 (Oral)

Ultracompact high-Q whispering gallery mode microresonator in a non-closed waveguide path

Ziyang Xiong, Tong Lin*

Southeast University

We report an ultracompact high-Q silicon photonic whispering-gallery-mode resonator with open-path mode recirculation, enabling small footprint, 1.05 nm FSR, and dense photonic integration.

POEM2026-0320-9

16:10-16:20 (Oral)

All-optical in-line phase shifter (based) on iron-oxide-nanoparticle-microfiber platform

Han Zhou^{1,2}, Lei Shi^{1,2,3*}, Xinliang Zhang^{1,2,3}

1.Wuhan National Laboratory for Optoelectronics;2.Huazhong University of Science and Technology;3.Optics Valley Laboratory

A compact microfiber Mach-Zehnder interferometer with iron-oxide-nanoparticle coating enables all-optical phase shifting via photothermal effects, achieving 2.2π shift and fast response for all-optical modulation, fiber sensing, and optical switching applications.

POEM2026-0415-2

16:20-16:30 (Oral)

Metasurface-enabled highly integrated two-photon polymerization laser processing system with synchronous imaging

Binjie Zhang¹, Yuchao Fen¹, Xinger Wang¹, Anze Li^{1,2}, Hui Gao^{1,2,3*}

1.School of Optical and Electronic Information Huazhong University of Science and Technology;2. Wuhan National Laboratory for Optoelectronics;3.Optics Valley Laboratory

A TiO₂ metasurface-based system integrates beam shaping and synchronous imaging for two-photon polymerization. Bessel beam fabrication and wavelength-multiplexed imaging are achieved simultaneously without additional optical paths, enabling compact and efficient laser micro/nano manufacturing.

POEM2026-0420-23

16:30-16:40 (Oral)

Compact thermal modeling of photonic integrated circuits via physics-constrained graph structure learning

Kexin Zhu, Qing He*

Tongji University

Photonic integrated circuits require fast, accurate thermal simulation due to strong thermal sensitivity. We propose a physics-constrained learning-based method to extract compact thermal models of PICs, enabling accurate simulation and efficient integration into system-level thermal analysis.

POEM2026-0424-1

16:40-16:50 (Oral)

Inverse-designed structural colors with simultaneous optimal purity and brightness

Moxin Li¹, Hao Gao¹, Haozhu Wang², Zhenyu Xing¹, Wang Danyan¹, L. Jay Guo³, Cheng ZHANG¹

1.Huazhong University of Science and Technology;2.University of Michigan, Ann Arbor;3.Department of Electrical Engineering and Computer Science, University of Michigan

A systematic framework for evaluating and optimizing structural colors enables high-purity, high-brightness reflective RGB design using multilayered thin-film structures.

Biomedical Photonics & BRICS Workshop on Biophotonics

Location: ABIF 101 (Biomedical Photonics & BRICS Workshop on Biophotonics)	
May 08, 2026	
08:20-08:30	Opening Ceremony Speaker: Dan Zhu, Huazhong University of Science and Technology
President: Valery V. Tuchin, Saratov State University & Junle Qu, Shenzhen University	
08:30-08:55	Breaking the depth barrier: A synergistic multimodal platform for label-free, high-resolution optical imaging deep within living tissue (Keynote) Vladislav V. Yakovlev Texas A&M University
08:55-09:20	Point-scanning super-resolution: From STED to depletion-free, isotropic, and AI-enhanced (Key-note) Junle Qu Shenzhen University
09:20-09:45	Advanced optical theranostic technologies for intelligent and precision minimally invasive surgery (Keynote) Hongen Liao Shanghai Jiao Tong University
09:45-10:00	Tea Break
10:00-10:20	Towards bidirectional optical brain interfaces (Invited) Lingjie Kong Tsinghua University
10:20-10:40	Development and application of novel two-photon microscopy (Invited) Wei Zheng Shenzhen Institutes of Advanced Technology, CAS
10:40-11:00	Towards mesoscopic All-optical closed-loop neuroscience research in deep brain (Invited) Biqin Dong Fudan University
11:00-11:20	Cross-domain computational imaging for wavefront sensing (Invited) Ke Si Zhejiang University
11:20-11:40	Stokes vector based second harmonic generation microscopy for biomedical applications (Invited) Nirmal Mazumder Manipal Academy of Higher Education
11:40-12:00	Optical techniques for studies of photoinduced processes in biotissues (Invited) Mikhail Kirillin Institute of Applied Physics of the Russian Academy of Sciences
12:00-14:00	Lunch

Location: ABIF 101 (Biomedical Photonics)	
President: Baoqiang Li, Shenzhen Institutes of Advanced Technology, CAS & Xiangwei Zhao, Southeast University	
14:00-14:20	In vivo flow cytometry breaks through the bottleneck of circulating (tumor) cell detection (Invited) Xunbin Wei Peking University
14:20-14:40	Structured illumination in biomedical microscopy: Imaging flow cytometer & optical coherence tomography (Invited) Jingjing Zhao Huazhong University of Science and Technology
14:40-15:00	Structured illumination microscopy for high SNR 3D imaging from millimeter thick tissues to cellular dynamics (Invited) Ming Lei Xi'an Jiaotong University
15:00-15:20	A mathematical framework enables high-throughput super-resolution imaging in live cells (Invited) Haoyu Li Harbin Institute of Technology
15:20-15:40	High-throughput photoacoustic brain imaging (Invited) Lei Xi Southern University of Sci and Tech
15:40-16:00	High imaging speeds and axial resolution three-dimensional live cell imaging (Invited) Xiaoshuai Huang Peking University
16:00-16:20	Deep learning-enhanced super-resolution fluorescence imaging for the study of the correlation between mitochondrial morphology and function (Invited) Bo Peng Northwestern Polytechnical University
16:20-16:30	Super-resolution microscopy for organelle interaction network (Oral) Yubing Han Zhejiang University
16:30-16:40	Multimodal super-resolution and light field imaging reveal blood-brain barrier transport dynamics in Alzheimer's disease (Oral) Xiaohe Tian West China Hospital Sichuan University
17:00-18:00	Post Session & Welcome Reception
Location: ABIF 101 (Biomedical Photonics)	
May 09, 2026	
President: Jing Yang, Peking University & Jing Yuan, Huazhong University of Science and Technology	
14:00-14:20	3D imaging of intact, unsectioned tissues via whole-tissue fluorescence immunolabeling or aggregation-induced emission nanoprobe (Invited) Jing Yang Peking University
14:20-14:40	Real-time in vivo molecular imaging of the hypothalamus-pituitary axis: Observing the central effects of electroacupuncture treatment for PCOS (Invited) Feng Yi Fudan University
14:40-15:00	Whole-mouse immunolabeling at cellular resolution for comprehensive 3D atlases (Invited) Hongcheng Mai Sun Yat-sen University

15:00-15:20	<p>High-speed mapping of whole-mouse peripheral nerves at subcellular resolution (Invited) Cheng Xu University of Science and Technology of China; Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences</p>
15:20-15:40	<p>Confocal airy beam oblique light-sheet tomography for brain-wide neural mapping (Invited) Xiaoli Qi National Institute of Biological Sciences, Beijing</p>
15:40-15:55	Tea Break
15:55-16:15	<p>Engineering optical molecular imaging probes for hepatobiliary theranostics (Invited) Gang Liu Xiamen University</p>
16:15-16:35	<p>Organic semiconductor probes for optical imaging (Invited) Changfeng Wu Southern University of Science and Technology</p>
16:35-16:55	<p>NIR-II fluorescence functional imaging of immune cells in cancer immunotherapy (Invited) Xiaolong Liu Mengchao Hepatobiliary Hospital of Fujian Medical University</p>
16:55-17:15	<p>Optical coherence tomography technology and its applications (Invited) Zhihua Ding Zhejiang University</p>
17:15-17:35	<p>Evaluation of transplant liver viability with optical coherence tomography (Invited) Yu Chen Fujian Normal University</p>
17:35-17:55	<p>Ultrafast photothermal PCR for POCT (Invited) Xiangwei Zhao Southeast University</p>
<p>Location: ABIF 101 (Biomedical Photonics & BRICS Workshop on Biophotonics)</p>	
<p>May 10, 2026</p>	
<p>President: Oxana Semyachkina-Glushkovskaya, Saratov State University & Feifan Zhou, Hainan University</p>	
08:30-08:55	<p>Quantitative analysis of direct and indirect measurements for photosensitized singlet oxygen generation (Keynote) Buhong Li Hainan University</p>
08:55-09:20	<p>High precision femtosecond laser vision correction surgery (Keynote) Shaoqun Zeng Huazhong University of Science and Technology</p>
09:20-09:45	<p>Mesoscale neural recording and analysis (Keynote) Jiamin Wu Tsinghua University</p>
9:45-10:05	<p>Fast, precise generation of mesoscale structured illumination (Invited) Hao Zhang Eastern Institute of Technology, Ningbo</p>
10:05-10:20	Tea Break
10:20-10:40	<p>Age as a limiting factor for photo-stimulation of the brain and its meninges (Invited) Oxana Semyachkina-Glushkovskaya Saratov State University</p>

10:40-11:00	<p>Photo monitoring and modulation of meningeal lymphatic vessels (Invited) Feifan Zhou Hainan University</p>
11:00-11:20	<p>Enhancing diabetic wound care through nanobiomaterials and photobiomodulation (Invited) Sathish Sundar Dhilip Kumar University of Johannesburg</p>
11:20-11:40	<p>Light modulation of central-peripheral immune crosstalk rescues Alzheimer's disease-associated neuroinflammation (Invited) Shen Qi South China Normal University</p>
11:40-12:00	<p>Multifunctional light-activated materials to target multidrug-resistant bacteria and insect vectors (Invited) Anderson Caires Federal University of Mato Grosso do Sul</p>
12:00-14:00	Lunch
<p>President: Anderson Caires, Federal University of Mato Grosso do Sul & Wei Chen, Huazhong University of Science and Technology</p>	
14:00-14:20	<p>High-throughput volumetric mapping of synaptic transmission and microcirculations in the brain in vivo (Invited) Wei Chen Huazhong University of Science and Technology</p>
14:20-14:40	<p>Retroreflective beam multiplexing enables high-throughput two-photon voltage imaging in vivo (Invited) Jianglai Wu Chinese Institute for Brain Research, Beijing</p>
14:40-15:00	<p>INSPIRE: Unified vibrational imaging of metabolic flux in living systems (Invited) Delong Zhang Zhejiang University</p>
15:00-15:10	<p>Photoacoustic tracking of drug clearance In vivo (Oral) Jing Lv Southern Medical University</p>
15:10-15:20	<p>Multiphoton microscopy for investigating morphological changes of cells in nasopharyngeal epithelial squamous metaplasia (Oral) Liqin Zheng Fujian Normal University</p>
15:20-15:40	<p>Advanced SERS-based analytical platforms for biomedical applications (Invited) Rajapandiyar Panneerselvam SRM University</p>
15:40-16:00	<p>Uncovering drug-induced biomolecular alteration in cancer cells using single cell raman spectroscopy (Invited) Rishikesh Pandey Indian Institute of Technology Roorkee</p>
16:00-16:20	<p>Nanoparticles to quantum clusters: Fundamental to applications (Invited) Dheeraj K. Singh University of Delhi</p>
16:20-16:40	<p>Endometriosis detection using blood plasma through data fusion of Fourier transform infrared spectroscopy and high-performance liquid chromatography (Invited) Sanoop Pavithran M Manipal Academy of Higher Education</p>

16:40-17:00	Nanomachines and plasmonic hybrids for SERS application (Invited) Soumik Siddhanta Indian Institute of Technology Delhi
17:00-17:20	Machine learning-assisted raman spectroscopy analysis of blood plasma for cervical cancer detection (Invited) Sreejith K. P. Manipal Academy of Higher Education
17:20-17:40	Chirality-driven biomolecular dynamics in peptide supramolecular structures revealed by IR and THz (Invited) Prasanta Kumar Datta Indian Institute of Technology Kharagpur
17:40-18:00	Biomedical imaging and sensing with random lasers (Invited) C. S. Suchand Sandeep Manipal Academy of Higher Education

Biomedical Photonics & BRICS Workshop on Biophotonics

Location: ABIF 102 (BRICS Workshop on Biophotonics)	
May 08, 2026	
Presider: Sathish Sundar Dhillip Kumar, University of Johannesburg & Jian Ye, Shanghai Jiao Tong University	
14:00-14:20	Surface-enhanced raman spectroscopy for metabolomics (Invited) Jian Ye Shanghai Jiao Tong University
14:20-14:40	In vivo quantification of glycated hemoglobin A1c using real-time transient absorption spectral imaging (Invited) Pu Wang Beihang University
14:40-15:00	Optical coherence elastography: from corneal biomechanics to laser refractive surgery (Invited) Xu Feng Huazhong University of Science and Technology
15:00-15:20	Active-targeting Pheophorbide-a Nanophotosensitizer Phototoxicity in Melanoma Multicellular Tumour Spheroids (Invited) Heidi Abrahamse University of Johannesburg Laser Research Centre
15:20-15:40	Storage effect of human platelets probed by raman tweezers spectroscopy (Invited) Santhosh Chidangil Manipal Academy of Higher Education
15:40-16:00	Study of tribological features of surfaces using out of plane rotations in optical tweezers (Invited) Basudev Roy Indian Institute of Technology Madras
16:00-16:20	Raman spectroscopy and hyperspectral imaging for single-cell metabolomics (Invited) Surya Pratap Singh Indian Institute of Technology Dharwad
16:20-16:40	Optical spectroscopy of biomolecules and living cells with high spatial and temporal resolution (Invited) O.S. Vasyutinskii Ioffe Institute
16:40-17:00	Optical micromanipulation: From in vitro trapping to in vivo actuation (Invited) Hongbao Xin Jinan University
17:00-18:00	Post Session & Welcome Reception
Location: ABIF 102 (BRICS Workshop on Biophotonics)	
May 09, 2026	
Presider: Pavel Subochev, Institute of Applied Physics RAS & Sihua Yang, South China Normal University	
14:00-14:20	Seeing more with optical and acoustic hybrid imaging (Invited) Chengbo Liu Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences

14:20-14:40	<p>Biomedical photoacoustic imaging with customized piezopolymer detectors (Invited) Pavel Subochev Institute of Applied Physics RAS</p>
14:40-15:00	<p>Hyperspectral-photoacoustic imaging for optimization of vascular-targeted photodynamic therapy (Invited) Cuiping Yao Xi'an Jiaotong University</p>
15:00-15:20	<p>High-definition and high-fidelity photoacoustic functional imaging In vivo (Invited) Jiao Li Tianjin University</p>
15:20-15:30	<p>Development and application of intra-tracheal photoacoustic endoscopy (Oral) Jian Zhang Guangzhou Medical University</p>
15:30-15:45	<p>Tea Break</p>
15:45-16:05	<p>Nonlinear response-enabled confocal nanoscopy for deep-tissue sub-40 nm super-resolution imaging (Invited) Fan Wang Beihang University</p>
16:05-16:25	<p>High-performance biomedical photoacoustic tomography (Invited) Chao Tian University of Science and Technology of China</p>
16:25-16:45	<p>Photo/Ultrasound immunotherapy (Invited) Minhuan Lan Central South University</p>
16:45-16:55	<p>Application of photoacoustic imaging in organ function assessment and tumor diagnosis and treatment (Oral) Guojia Huang Guangdong Provincial People's Hospital</p>
16:55-17:15	<p>Atomically precise NIR emitting quantum nanoclusters for simultaneous imaging and therapy of myocardial hypoxia (Invited) R.S. Jayasree Sree Chitra Tirunal Institute for Medical Sciences and Technology</p>
17:15-17:35	<p>Dual-wavelength laser action on blood vessels and a system for its control (Invited) Viktor Chuchin ITMO University</p>
17:35-17:55	<p>Spatiotemporal imaging of cellular mechanosensing (Invited) Bibhu Ranjan Sarangi Indian Institute of Technology Palakkad</p>

Biomedical Photonics & BRICS Workshop on Biophotonics

Place: ABIF 101

May 08, 2026

08:30-09:45 · Keynote

President: Valery V. Tuchin, Saratov State University & Junle Qu, Shenzhen University

POEM2026-0325-1

08:30-08:55 (Keynote)

Breaking the depth barrier: A synergistic multimodal platform for label-free, high-resolution optical imaging deep within living tissue

Vladislav V. Yakovlev

Texas A&M University

Noninvasive, high-resolution optical imaging deep inside biological tissue remains one of the most formidable challenges in biomedical optics, fundamentally constrained by strong light scattering, absorption, and optical aberrations. While a wide range of advanced imaging modalities has been developed, most approaches yield only incremental gains, leaving a critical gap between microscopic resolution and millimeter-scale penetration depth. Here, we introduce a synergy-driven, multimodal imaging platform that overcomes these longstanding limitations by integrating short-wavelength infrared (SWIR) excitation, multiphoton nonlinear microscopy, adaptive wavefront shaping, structured illumination, and machine learning-accelerated computational guidance and reconstruction platform. Rather than relying on a single technological advance, this approach leverages the complementary strengths of multiple physical and computational strategies, enabling a level of performance unattainable by individual techniques alone. By combining physically informed models of light propagation with rapid, adaptive wavefront control and optimized SWIR nonlinear excitation, the system dynamically compensates for scattering-induced distortions while preserving intrinsic, label-free contrast. This integrated framework enables efficient background suppression, enhanced focusing at depth, and substantial improvements in signal-to-noise ratio, collectively enabling optical imaging with subcellular resolution at depths exceeding 5 mm in living tissue. Importantly, the platform operates in real time and is fully compatible with coherent nonlinear contrast mechanisms, including harmonic generation and coherent Raman processes, allowing simultaneous access to structural, biochemical, and functional information without the need for exogenous labels. This synergistic platform establishes a new paradigm for deep-tissue optical imaging, demonstrating that carefully engineered synergy between optical physics and computational intelligence can overcome fundamental barriers in light-tissue interaction. The proposed approach opens transformative opportunities for noninvasive visualization of cellular architecture and dynamics in intact organisms, with far-reaching implications for neuroscience, oncology, and translational medicine.

POEM2026-0502-1

08:55-09:20 (Keynote)

Point-scanning super-resolution: From STED to depletion-free, isotropic, and AI-enhanced

Junle Qu

Shenzhen University

In this talk, I will present our recent progress in point-scanning super-resolution microscopy, focusing on three innovative directions: 1) Depletion-free super-resolution imaging that eliminates STED stimulated emission and photodamage. 2) Three-dimensional isotropic super-resolution imaging. 3) Deep learning enhanced super-resolution. Together, these strategies address key bottlenecks of STED and conventional super-resolution microscopy, opening new opportunities for high-performance, long-term, and low-photodamage imaging in complex biological environments.

POEM2026-0502-2

09:20-09:45 (Keynote)

Advanced optical theranostic technologies for intelligent and precision minimally invasive surgery

Hongen Liao

Shanghai Jiao Tong University

This report will present a series of optical theranostic technologies developed for intelligent minimally invasive surgery (MIS), focusing on three interconnected pillars: advanced optical imaging and intelligent diagnosis, integrated theranostic systems, and flexible robotic platforms, aiming to improve intraoperative visualization, real-time lesion identification, and targeted interventions.

10:00-12:00 · Biomedical Photonics & BRICS Workshop on Biophotonics

POEM2026-0410-1

10:00-10:20 (Invited)

Towards bidirectional optical brain interfaces

Lingjie Kong*

Tsinghua University

I will introduce our recent efforts toward bidirectional optical brain interfaces.

POEM2026-0417-1

10:20-10:40 (Invited)

Development and application of novel two-photon microscopy

Wei Zheng*

Shenzhen Institutes of Advanced Technology, CAS

In this talk, I will present several novel TPM systems developed in our lab recently, as well as their application in biological studies.

POEM2026-0420-4

10:40-11:00 (Invited)

Towards mesoscopic all-optical closed-loop neuroscience research in deep brain

Biqin Dong*

Fudan University

Multiphoton microscope with holographic optogenetic stimulation forms mesoscopic all-optical closed-loop neuroscience research in deep brain.

POEM2026-0420-24

11:00-11:20 (Invited)

Cross-domain computational imaging for wavefront sensing

Jiahao Pan, Wei Gong, Ke Si*

Zhejiang University

Complex tissue scattering and spatially varying aberrations limit deep-tissue diffraction-limited imaging. We introduce CoSH, a cross-domain learning framework that reconstructs high-resolution wavefronts from undersampled microlens intensity, achieving robust phase recovery without hardware modifications.

POEM2026-0502-6

11:20-11:40 (Invited)

Stokes vector based second harmonic generation microscopy for biomedical applications

Nirmal Mazumder

Manipal Academy of Higher Education

This report will present a Stokes polarimeter integrated with SHG microscopy and four-channel photon counting detectors for characterizing polarization properties, along with a Stokes-Mueller polarimetry system combined with machine learning to classify ductal carcinoma tissue and analyze microstructure of breast tissue samples.

POEM2026-0502-7

11:40-12:00 (Invited)

Optical techniques for studies of photoinduced processes in biotissues

Mikhail Kirillin

Institute of Applied Physics of the Russian Academy of Sciences

We provide an overview of application of various optical modalities for structural and functional diagnostics in monitoring tissue reactions to both natural and artificial light exposure.

Biomedical Photonics
Place: ABIF 101

May 08, 2026

14:00-16:40 · Biomedical Photonics

Presider: Baoqiang Li, Shenzhen Institutes of Advanced Technology, CAS & Xiangwei Zhao, Southeast University

POEM2026-0502-24

14:00-14:20 (Invited)

In vivo flow cytometry breaks through the bottleneck of circulating (tumor) cell detection

Xunbin Wei

Peking University

The “In vivo optical flow cytometer” uses a cylindrical lens system for real-time, non-destructive detection of circulating cells without blood withdrawal. It enables long-term dynamic monitoring of cells and substances in the same living subject, addressing limitations of existing imaging. Applications include circulating tumor cell detection for early cancer diagnosis, blood cell immunological analysis, and in vivo drug/exosome tracking.

POEM2026-0419-4

14:20-14:40 (Invited)

Structured illumination in biomedical microscopy: Imaging flow cytometer & optical coherence tomography

Jingjing Zhao*, Xiaobo Qin, Linlin Liu, Wankang Zhai

Huazhong University of Science and Technology

Advanced parallel illumination strategies, including needle-shaped beams and Linear Array Spot Excitation (LASE), significantly enhance depth, resolution, and throughput in biomedical microscopy and imaging flow cytometry. These innovations provide high-quality data, empowering AI-driven clinical diagnostics.

POEM2026-0414-3

14:40-15:00 (Invited)

Structured illumination microscopy for high SNR 3D imaging from millimeter thick tissues to cellular dynamics

Ming Lei*

Xi'an Jiaotong University

Structured illumination microscopy for high SNR 3D imaging from millimeter thick tissues to cellular dynamics

POEM2026-0402-1

15:00-15:20 (Invited)

A mathematical framework enables high-throughput super-resolution imaging in live cells

Haoyu Li*

Harbin Institute of Technology

A mathematical framework enables high-throughput super-resolution imaging by reducing frame counts, allowing observation of dynamic processes like mitochondrial fission without complex hardware.

POEM2026-0414-4

15:20-15:40 (Invited)

High-throughput photoacoustic brain imaging

Lei Xi*

Southern University of Sci and Tech

We developed a for investigating the complex spatiotemporal dynamics of the brain, offering new insights into the mechanisms of neurovascular diseases with ultra-high speed and sensitivity.

POEM2026-0502-25

15:40-16:00 (Invited)

High imaging speeds and axial resolution three-dimensional live cell imaging

Xiaoshuai Huang

Peking University

This report will present recent advances in live-cell super-resolution imaging, including isotropic 3D imaging (4Pi-SIM), high-speed multi-plane SIM (3D-MP-SIM), and a dual-modality technique combining fluorescence and label-free tomography, culminating in the discovery of Mitopherogenesis.

POEM2026-0420-11

16:00-16:20 (Invited)

Deep learning-enhanced super-resolution fluorescence imaging for the study of the correlation between mitochondrial morphology and function

Bo Peng*

Northwestern Polytechnical University

We have provided a solution package including the design and construction of mitochondrial super-resolution fluorescence imaging dyes and the analysis algorithm for mitochondrial morphology, achieving long-term imaging of mitochondrial submicroscopic structures, morphological quantification and dynamic analysis, and clarifying the intrinsic relationship between mitochondrial morphology and function.

POEM2026-0502-26

16:20-16:30 (Oral)

Super-resolution microscopy for organelle interaction network

Yubing Han

Zhejiang University

This report presents our integrated strategies in super-resolution microscopy: developing bright, photostable small-molecule probes with low-irradiation imaging to achieve multiplexed, long-term, low-bleaching visualization of organelle dynamics. By integrating genetic editing and other tools, we aim to decode molecular mechanisms

POEM2026-0420-5

16:30-16:40 (Oral)

Multimodal super-resolution and light field imaging reveal blood-brain barrier transport dynamics in Alzheimer's disease

Xiaohu Tian

West China Hospital Sichuan University

We integrate super-resolution and light-field imaging to visualize nanoparticle transport across the blood-brain barrier in Alzheimer's disease, revealing dynamic spatiotemporal features of LRP1-mediated transcytosis and enabling high-throughput in vivo functional imaging.

Biomedical Photonics Place: ABIF 101

May 09, 2026

14:00-15:40 · Biomedical Photonics

President: Jing Yang, Peking University & Jing Yuan, Huazhong University of Science and Technology

POEM2026-0502-28

14:00-14:20 (Invited)

3D imaging of intact, unsectioned tissues via whole-tissue fluorescence immunolabeling or aggregation-induced emission nanoprobes

Jing Yang

Peking University

Conventional histochemical analyses primarily rely on tissue sections, which have intrinsic limitations for accurately assessing three-dimensional (3D) biological structures such as neural fibers and blood vessels. In the past decade, there have been tremendous technical advances that enable the large-scale, rapid 3D imaging of intact, unsectioned tissues. In particular, our research has demonstrated the robust integration of whole-tissue fluorescence immunolabeling or aggregation-induced emission (AIE) nanoprobes with optical clearing and lightsheet microscopy, opening new avenues for comprehensive analysis of neural fibers, vasculature, and rare cell types across various pathophysiological scenarios.

POEM2026-0418-5

14:20-14:40 (Invited)

Real-time in Vivo molecular imaging of the hypothalamus-pituitary axis: Observing the central effects of electroacupuncture treatment for PCOS

Hu Wei, Gao Wenhao, Feng Yi

Fudan University

Real-time In Vivo Molecular Imaging of the Hypothalamus-Pituitary Axis: Observing the Central Effects of Electroacupuncture Treatment for PCOS

POEM2026-0420-16

14:40-15:00 (Invited)

Whole-mouse immunolabeling at cellular resolution for comprehensive 3D atlases

Hongcheng Mai

Sun Yat-sen University

Whole-mouse immunolabeling at cellular resolution for comprehensive 3D atlases

POEM2026-0419-3

15:00-15:20 (Invited)

High-speed mapping of whole-mouse peripheral nerves at subcellular resolution

Cheng Xu^{1,2*}

1.University of Science and Technology of China;2.Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences

Imaging of whole adult mouse at uniform subcellular resolution within 40 h. Reconstruction of 191 Thy1-EGFP spinal neurons and cross-segment projections. Mapping of immunolabeled sympathetic projections and their perivascular patterns. Resolving virus-labeled architecture of vagus nerves and complex single-fiber routes.

POEM2026-0420-21

15:20-15:40 (Invited)

Confocal airy beam oblique light-sheet tomography for brain-wide neural mapping

Xiaoli Qi*

National Institute of Biological Sciences, Beijing

We present CAB-OLST, which combines a confocal Airy beam light sheet with automated mechanical sectioning, achieving subcellular optical resolution ($0.77 \times 0.49 \times 2.61 \mu\text{m}$) for mouse brain-wide cell-type mapping in 10 h and complete single-neuron projectome reconstruction in 58 h.

15:55-17:55 · Biomedical Photonics

POEM2026-0414-2

15:55-16:15 (Invited)

Engineering optical molecular imaging probes for hepatobiliary theranostics

Gang Liu*

Xiamen University

Here, we report carbon dots with tunable emission from the visible to the Near-infrared-II (480-1265 nm), synthesized by constructing extended aniline-based frameworks from *p*-phenylenediamine.

POEM2026-0419-2

16:15-16:35 (Invited)

Organic semiconductor probes for optical imaging

Changfeng Wu

Southern University of Science and Technology

We report that semiconductor polymers form small Pdots that exhibit large absorption cross section, high fluorescence quantum yields, and good biocompatibility for superresolution imaging and high-contrast imaging in vivo.

POEM2026-0420-18

16:35-16:55 (Invited)

NIR-II fluorescence functional imaging of immune cells in cancer immunotherapy

Xiaolong Liu*, Xiaolong Zhang

Mengchao Hepatobiliary Hospital of Fujian Medical University

Our NIR-II fluorescence imaging probes provided a novel and safe noninvasive evaluation approach for cancer immunotherapeutic research in living animals.

POEM2026-0420-6

16:55-17:15 (Invited)

Optical coherence tomography technology and its applications

Zhihua Ding*

Zhejiang University

This report will focus on ultra-deep 3D OCT in turbid media, as well as quantitative fiber-probe based OCT for early detection of cervical cancer.

POEM2026-0420-19

17:15-17:35 (Invited)

Evaluation of transplant liver viability with optical coherence tomography

Feng Yan¹, Qinghao Zhang¹, Yu Chen^{2*}, Chongle Pan^{1*}, Qinggong Tang^{1*}

1.University of Oklahoma;2.Fujian Normal University

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.

POEM2026-0502-27

17:35-17:55 (Invited)

Ultrafast photothermal PCR for POCT

Xiangwei Zhao

Southeast University

In this study, leveraging the efficient photothermal effect of surface plasmons, we designed and fabricated a photothermal fiber with broadband light absorption capability, achieving ultrafast photothermal PCR based on a white LED.

Biomedical Photonics & BRICS Workshop on Biophotonics

Place: ABIF 101

May 10, 2026

08:30-10:05 Keynote & Invited

President: Oxana Semyachkina-Glushkovskaya, Saratov State University & Feifan Zhou, Hainan University

POEM2026-0419-9

08:30-08:55 (Keynote)

Quantitative analysis of direct and indirect measurements for photosensitized singlet oxygen generation

Buhong Li*

Hainan University

Photodynamic therapy (PDT) utilizes photosensitizer and light in combination with molecular oxygen to produce singlet oxygen that kill malignant cells by apoptosis and/or necrosis, shut down the tumor microvasculature and stimulate the host immune system. In this talk, the quantitative analysis of direct and indirect measurements for photosensitized singlet oxygen generation will be presented, and the future demands of quantitative measurement for singlet oxygen generation for PDT dosimetry, with particular emphasis on clinical translation will be discussed.

POEM2026-0502-3

08:55-09:20 (Keynote)

High precision femtosecond laser vision correction surgery

Shaoqun Zeng

Huazhong University of Science and Technology

In this study, we identify the root cause of undercorrection as a previously overlooked physical mechanism: the biomechanical response of the cornea. Laser ablation thins the corneal stroma and disrupts its intrinsic mechanical equilibrium, triggering stress redistribution and elastic deformation. This initiates a coupled biomechanics-morphology-optics pathway that leads to unintended refractive shifts beyond what ablation volume alone can explain. We further identify the key mechanical parameters governing this response and develop a method to measure them directly in living eyes. Incorporating these parameters into surgical planning largely eliminates undercorrection, as validated in physical models and in vivo rabbit experiments using femtosecond laser surgery targeting -6.00 D correction. This biomechanically guided approach achieves an 86% reduction in residual refractive error compared with conventional nomogram-based methods, representing a substantial improvement in surgical precision.

POEM2026-0502-4

09:20-09:45 (Keynote)

Mesoscale neural recording and analysis

Jiamin Wu

Tsinghua University

In this work, we present a series of recently developed mesoscale imaging systems and computational frameworks that collectively advance the frontier of neural recording and analysis.

POEM2026-0420-9

09:45-10:05 (Invited)

Fast, precise generation of mesoscale structured illumination

Hao Zhang

Eastern Institute of Technology, Ningbo

Pyramidal lens enables mesoscale generation of structured illumination and large-FoV super-resolution microscopy.

10:20-12:00 · Biomedical Photonics & BRICS Workshop on Biophotonics

POEM2026-0412-1

10:20-10:40 (Invited)

Age as a limiting factor for photo-stimulation of the brain and its meninges

Oxana Semyachkina-Glushkovskaya

Saratov State University

Effects of photobiomodulation on the brain and its meninges depend on age and the integrity of lymphatic pathways of brain drainage and clearance.

POEM2026-0502-30

10:40-11:00 (Invited)

Photo monitoring and modulation of meningeal lymphatic vessels

Feifan Zhou

Hainan University

This report will present how near-infrared light can ameliorate Alzheimer's disease by modulating meningeal lymphatic vessels (mLVs) to enhance A β clearance and restore mLEC function, as well as how dual-contrast functional photoacoustic microscopy enables widefield intravital monitoring of cerebral lymphatic drainage dynamics, revealing impaired mLVs drainage during AD progression.

POEM2026-0413-1

11:00-11:20 (Invited)

Enhancing diabetic wound care through nanobiomaterials and photobiomodulation

Sathish Sundar Dhilip Kumar*

University of Johannesburg

Biopolymer-based nanobiomaterials integrated with nanoparticles enhance photobiomodulation therapy for diabetic wounds, improving antimicrobial activity, cellular proliferation, and healing outcomes in vitro, highlighting a promising strategy for advanced management of chronic diabetic foot ulcers clinical future.

POEM2026-0419-1

11:20-11:40 (Invited)

Light modulation of central-peripheral immune crosstalk rescues Alzheimer's disease-associated neuroinflammation

Shen Qi, Yang Sihua*

South China Normal University

Light modulation improves cognition in Alzheimer's disease mice by inhibiting microglial NLRP3 inflammasomes. This disruption mitigates neurotoxic astrocyte induction and reduces CD8+ T cell brain infiltration, reprogramming immune crosstalk to resolve neuroinflammation and combat neurodegeneration.

POEM2026-0406-1

11:40-12:00 (Invited)

Multifunctional light-activated materials to target multidrug-resistant bacteria and insect vectors

Anderson Caires*

Federal University of Mato Grosso do Sul

Multifunctional light-activated materials using photodynamic and photothermal mechanisms are developed to combat multidrug-resistant bacteria and insect vectors. These nanostructured platforms enable efficient, resistance-independent inactivation with promising biocompatibility for clinical, environmental, and vector-control applications.

14:00-18:00 · Biomedical Photonics & BRICS Workshop on Biophotonics

Presider: Anderson Caires, Federal University of Mato Grosso do Sul & Wei Chen, Huazhong University of Science and Technology

POEM2026-0502-31

14:00-14:20 (Invited)

High-throughput volumetric mapping of synaptic transmission and microcirculations in the brain in vivo

Wei Chen

Huazhong University of Science and Technology

Volumetric imaging of synaptic transmission and microcirculations in the brain in vivo requires high spatial and high temporal resolution. Shaping the wavefront of two-photon fluorescence excitation light, we developed Bessel-droplet foci for high-contrast and high-resolution volumetric imaging of synapses. Applying our method to imaging glutamate release, we demonstrated high-throughput mapping of excitatory inputs at > 1,000 synapses per volume and > 500 dendritic spines per neuron in vivo and unveiled novel features of functional synaptic organization in the mouse primary visual cortex. We also achieved high-resolution volumetric imaging of lymphatic microcirculations in mouse brain in vivo.

POEM2026-0418-2

14:20-14:40 (Invited)

Retroreflective beam multiplexing enables high-throughput two-photon voltage imaging in vivo

Jianglai Wu*

Chinese Institute for Brain Research, Beijing

We developed an all-optical beam multiplexing engine for kilohertz two-photon imaging with 16-fold expanded field-of-view on standard platforms, enabling submillisecond imaging of dendritic voltage dynamics and simultaneous voltage recording from over 200 neurons in vivo.

POEM2026-0421-1

14:40-15:00 (Invited)

INSPIRE: Unified vibrational imaging of metabolic flux in living systems

Delong Zhang

Zhejiang University

Metabolic investigation requires bond-specific imaging in living systems. We develop mid-infrared photothermal and Raman modalities for simultaneous chemical mapping. Deuterium tracking enables quantitative metabolic flux imaging in *C. elegans*, highlighting opportunities for biomedicine and diagnostics.

POEM2026-0318-1

15:00-15:10 (Oral)

Photoacoustic tracking of drug clearance in vivo

Jing Lv

Southern Medical University

We introduce a spatiotemporally resolved photoacoustic method to dynamically track in vivo drug clearance. Utilizing novel synthetic aperture algorithms, this non-ionizing approach accurately visualizes hepatic and renal metabolic pathways in high three-dimensional resolution.

POEM2026-0317-5

15:10-15:20 (Oral)

Multiphoton microscopy for investigating morphological changes of cells in nasopharyngeal epithelial squamous metaplasia

Liqin Zheng^{1*}, Xiaoyan Wang^{2*}, Zhen Lu¹, Yichen Ke¹, Zhanqi Shi¹, Ying Lin³, Hao Zheng², Jiani Huang⁴, Jianping Huang¹, Jianxin Chen¹, Qing Ye³

1. Fujian Normal University; 2. Fuzhou University Affiliated Provincial Hospital; 3. Fuzhou University Affiliated Provincial Hospital, Fuzhou; 4. Shengli Clinical Medical College of Fujian Medical University

MPM can clearly reveal structural features of nasopharyngeal tissue involving the cellular morphological changes at different stages of metaplasia. Quantitative analysis further uncovers the changes in cellular morphology during squamous metaplasia.

POEM2026-0502-21

15:20-15:40 (Invited)

Advanced SERS-based analytical platforms for biomedical applications

Rajapandiyan Panneerselvam

SRM University

This talk will present the fundamentals of SERS and recent advances in plasmonic substrate fabrication, focusing on bioanalysis applications including disease diagnosis via extracellular vesicles, label-free discrimination of bacteriophages, differentiation of antimicrobial-resistant pathogens, and monitoring algal growth dynamics combined with machine learning.

POEM2026-0502-22

15:40-16:00 (Invited)

Uncovering drug-induced biomolecular alteration in cancer cells using single cell raman spectroscopy

Rishikesh Pandey

Indian Institute of Technology Roorkee

This report will present single-cell Raman spectroscopy to study drug-cell interactions, distinguish drug mechanisms, and use D₂O probing to monitor metabolic changes for personalized cancer therapy.

POEM2026-0502-23

16:00-16:20 (Invited)

Nanoparticles to quantum clusters: Fundamental to applications

Dheeraj K. Singh

University of Delhi

This report will discuss the tuning of noble gold quantum clusters from simple nanoparticles, focusing on size-dependent optical properties, water solubility, biocompatibility, and low toxicity.

POEM2026-0502-19

16:20-16:40 (Invited)

Endometriosis detection using blood plasma through data fusion of Fourier transform infrared spectroscopy and high-performance liquid chromatography

Sanoop Pavithran M

Manipal Academy of Higher Education

In this talk, I will introduce our work on the synergetic application of vibrational spectroscopy (ATR-FTIR) and protein profile (HPLC-FLD) analysis of blood plasma samples for the detection of endometriosis.

POEM2026-0406-2

16:40-17:00 (Invited)

Nanomachines and plasmonic hybrids for SERS application

Soumik Siddhanta

Indian Institute of Technology Delhi

This talk will present "active" plasmonic hybrids, nanomachines designed to modulate chemical enhancement through external stimuli.

POEM2026-0502-18

17:00-17:20 (Invited)

Machine learning-assisted raman spectroscopy analysis of blood plasma for cervical cancer detection

Sreejith K. P.

Manipal Academy of Higher Education

This report will present machine learning-assisted Raman spectroscopy analysis of blood plasma for cervical cancer detection. Using SVM, KNN, and shallow neural networks, the approach achieved 66% accuracy. With genetic algorithm-based feature selection, SVM further reached 100% accuracy, sensitivity, and specificity

POEM2026-0502-15

17:20-17:40 (Invited)

Chirality-driven biomolecular dynamics in peptideSupramolecular structures revealed by IR and THz

Prasanta Kumar Datta

Indian Institute of Technology Kharagpur

This report will demonstrate how peptide chirality regulates sub-THz molecular dynamics in fibrillar nanotubes using multiscale spectroscopy (ATR-THz, S-SNOM, O-PTIR, DFT calculations). It shows that heterochiral assemblies exhibit distinct localized vibrational modes (~22 and 38 cm⁻¹) linked to phenyl ring motions, while homochiral ones featureless, revealing chirality-dependent THz fingerprints as probes of biomolecular structure.

POEM2026-0502-8

17:40-18:00 (Invited)

Biomedical imaging and sensing with random lasers

C. S. Suchand Sandeep

Manipal Academy of Higher Education

This report will present random lasers for artefact-free fluorescence bioimaging with sub-micron resolution, and a bimodal system to detect tumor polyps as small as 1 mm² using tissue random lasing for early cancer diagnosis.

BRICS Workshop on Biophotonics
Place: ABIF 102

May 08, 2026

14:00-17:00 · BRICS Workshop on Biophotonics

Presider: Sathish Sundar Dhilip Kumar, University of Johannesburg & Jian Ye, Shanghai Jiao Tong University

POEM2026-0414-1

14:00-14:20 (Invited)

Surface-enhanced raman spectroscopy for metabolomics

Jian Ye*

Shanghai Jiao Tong University

Surface-Enhanced Raman Spectroscopy (SERS) is advancing metabolomics with its high sensitivity and specificity, providing a non-invasive and rapid alternative to traditional metabolite analysis methods. This talk explores SERS's utility in metabolite phenotyping and quantification, showcasing its capabilities in detecting cancer biomarkers and offering insights into disease metabolism. The introduction of digital colloid-enhanced Raman spectroscopy (dCERS) and the "SERSome" concept/technique and addresses the challenge of signal fluctuation and heterogeneity, enhancing SERS's reproducibility and accuracy. SERS's potential extends to single-cell analysis, multi-omics integration, and therapeutic drug monitoring, positioning it as a promising tool in metabolomics research and clinical diagnostics powered by AI.

POEM2026-0420-15

14:20-14:40 (Invited)

In vivo quantification of glycated hemoglobin A1c using real-time transient absorption spectral imaging

Pu Wang*

Beihang University

Real-time transient absorption spectral imaging enables label-free in vivo quantification of glycated hemoglobin (HbA1c) in circulating red blood cells, resolving ultrafast kinetic signatures and revealing cellular heterogeneity with high accuracy in diabetic rat models.

POEM2026-0420-12

14:40-15:00 (Invited)

Optical micromanipulation: from in vitro trapping to in vivo actuation

Hongbao Xin*

Jinan University

I will share our recent work on bio-optical manipulation, from well-controlled in vitro trapping to active in vivo actuation.

POEM2026-0419-11

15:00-15:20 (Invited)

Optical coherence elastography: from corneal biomechanics to laser refractive surgery

Xu Feng*, Zhuoyu Zhang, Jionghang Zhang, Bingxi Wang, Yanan Liao, Shichen Sun, Fengchen He, Zimeng Zhou, Honghao Wang, Xiuli Liu, Xiaohua Lv, Shaoqun Zeng

Huazhong University of Science and Technology

We developed high-resolution OCE to measure corneal biomechanics in vivo, and present its application in femtosecond laser refractive surgery for myopia and presbyopia treatment.

POEM2026-0401-1

15:20-15:40 (Invited)

Active-targeting pheophorbide-a nanophotosensitizer phototoxicity in melanoma multicellular tumour spheroids

Heidi Abrahamse

University of Johannesburg Laser Research Centre

Conjugation of Pheophorbide a to AuNPs and FA improves PS delivery, phototoxicity, and tumour selectivity. Ppa-AuNP-FA represents a promising active-targeted nanopatform for enhancing PDT efficacy in aggressive melanoma and further development of nanoparticle-based precision photomedicine.

POEM2026-0502-10

15:40-16:00 (Invited)

Storage effect of human platelets probed by raman tweezers spectroscopy

Santhosh Chidangil

Manipal Academy of Higher Education

This report will present a Raman tweezers spectroscopy study of extended platelet storage effects (up to 8 days). It reveals progressive platelet activation after day 3, with spectral evidence of phospholipid/protein changes, morphological transition to spherical/filopodia forms, and biochemical shifts (glucose decrease, lactate increase, pH drop, extracellular vesicle release), all compromising platelet quality for transfusion.

POEM2026-0502-11

16:00-16:20 (Invited)

Study of tribological features of surfaces using out of plane rotations in optical tweezers

Basudev Roy

Indian Institute of Technology Madras

I will introduce our recent work on detecting out of plane rotation appears. We can now detect "pitch" and "roll" rotation very accurately, thus enabling us to probe surfaces in the "soft probing" regime. We find that this regime is very different from the hard probing regime of AFM. We can find out nanotribological parameters of *Trandescantia Zebrina* plant leaf cells like this.

POEM2026-0502-12

16:20-16:40 (Invited)

Raman spectroscopy and hyperspectral imaging for single-cell metabolomics

Surya Pratap Singh

Indian Institute of Technology Dharwad

In this study, we use Raman spectroscopy and imaging as a lens to spatiotemporally detect, monitor, and visualize metabolites across biological systems ranging from microbes to mammalian cells.

POEM2026-0502-13

16:40-17:00 (Invited)

Optical spectroscopy of biomolecules and living cells with high spatial and temporal resolution

O.S. Vasyutinskii

Ioffe Institute

This report will present an overview of recent advances achieved by Ioffe Institute scientists in using high-resolution optical methods for biomedical diagnostics and treatment.

BRICS Workshop on Biophotonics **Place: ABIF 102**

May 09, 2026

14:00-17:55 · BRICS Workshop on Biophotonics

President: Pavel Subochev, Institute of Applied Physics RAS & Sihua Yang, South China Normal University

POEM2026-0502-34

14:00-14:20 (Invited)

Seeing more with optical and acoustic hybrid imaging

Chengbo Liu

Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences

In this talk, I will focus on how we improve the speed of photoacoustic imaging as well as elevate its capability of acquiring more abundant information.

POEM2026-0324-2

14:20-14:40 (Invited)

Biomedical photoacoustic imaging with customized piezopolymer detectors

Pavel Subochev*

Institute of Applied Physics RAS

Advancing photoacoustic imaging systems, we tailored piezopolymer technologies to specific wavefields, enhancing scanning angiography and real-time functional tomography. These optimized systems deliver superior multispectral microangiography for experimental oncology, neurovascular diagnostics, and human tissue characterization.

POEM2026-0416-1

14:40-15:00 (Invited)

Hyperspectral-photoacoustic imaging for optimization of vascular-targeted photodynamic therapy

Cuiping Yao*, Rongrui Zhang, Qiangzhou Rong

Xi'an Jiaotong University

Therapeutic outcome of Vascular-targeted photodynamic therapy (V-PDT) remains difficult to standardize because current treatment still relies largely on empirical prescriptions. A system was developed to realized real-time quantitative feedback and optimization on key dosimetric parameters.

POEM2026-0420-7

15:00-15:20 (Invited)

High-definition and high-fidelity photoacoustic functional imaging In vivo

Jiao Li

Tianjin University

This presentation explores precise in vivo photoacoustic imaging advancements overcoming current specificity, resolution, and quantification limitations. Key innovations discussed include terahertz fingerprinting for sodium, isotropic 3D imaging, and deep tissue optical reconstruction for tumor evaluation.

POEM2026-0403-1

15:20-15:30 (Oral)

Development and application of intra-tracheal photoacoustic endoscopy

Jian Zhang*

Guangzhou Medical University

Intra-tracheal photoacoustic endoscopy was developed for the diagnosis of chronic obstructive pulmonary disease and drug metabolism assessment of inhaled nanoadjuvants.

15:45-17:55 · BRICS Workshop on Biophotonics

POEM2026-0420-10

15:45-16:05 (Invited)

Nonlinear response-enabled confocal nanoscopy for deep-tissue sub-40 nm super-resolution imaging

Fan Wang*

Beihang University

A nonlinear-response-enabled confocal nanoscopy integrates emission saturation and photon-avalanche decomposition to achieve sub-40 nm resolution at depth, offering a simple, low-artifact strategy for deep-tissue super-resolution imaging.

POEM2026-0420-13

16:05-16:25 (Invited)

High-performance biomedical photoacoustic tomography

Chao Tian*

University of Science and Technology of China

Photoacoustic imaging converts light into sound, combining optical contrast with ultrasound resolution. I will present our recent advances in photoacoustic tomography and microscopy, spanning organelles to whole-body imaging.

POEM2026-0419-12

16:25-16:45 (Invited)

Photo/Ultrasound immunotherapy

Minhuan Lan

Central South University

我们分别设计合成了系列近红外激发的光免疫治疗剂、光免疫治疗剂-化疗药物组装体、H₂O₂ 激活的光免疫治疗剂等，实现了实体肿瘤的免疫激活。

POEM2026-0312-2

16:45-16:55 (Oral)

Application of photoacoustic imaging in organ function assessment and tumor diagnosis and treatment

Guojia Huang

Guangdong Provincial People's Hospital

声光成像在评估组织器官显微结构与功能变化，以及在肿瘤精准诊疗研究中展现出巨大的应用潜力。

POEM2026-0502-16

16:55-17:15 (Invited)

Atomically precise NIR emitting quantum nanoclusters for simultaneous imaging and therapy of myocardial hypoxia

R.S. Jayasree

Sree Chitra Tirunal Institute for Medical Sciences and Technology

This report will introduce atomically precise NIR emitting quantum nanoclusters for simultaneous imaging and therapy of myocardial hypoxia, will cover the synthesis, characterization, in vitro cardioprotective effects under hypoxia, and in vivo imaging/therapeutic validation using *C. elegans*, establishing CuNCs as a platform for integrated bioimaging and redox-based therapy in ischemic pathologies.

POEM2026-0502-17

17:15-17:35 (Invited)

Dual-wavelength laser action on blood vessels and a system for its control

Viktor Chuchin

ITMO University

This report demonstrates that 450 nm pre-irradiation increases blood transmittance at 980 nm, and proposes a dual-wavelength laser system with optical feedback monitoring reflectance at 660, 810, and 532 nm to track hemoglobin transformation, enabling an optimized algorithm for treating deeper skin vessels.

POEM2026-0502-14

17:35-17:55 (Invited)

Spatiotemporal imaging of cellular mechanosensing

Bibhu Ranjan Sarangi

Indian Institute of Technology Palakkad

This report will present engineered stiffness gradient substrates and multimodal optical imaging (fluorescence microscopy + TFM) to study how cells sense and respond to mechanical heterogeneity.

Poster List

Optoelectronic Devices and Integration

Control ID	Content
POEM2026-0310-4	Dual-engineered DPP polymers: Synergistic hydrogen bonding and ring-fusion for high-mobility organic field-effect transistors Rui Li Wuhan National Laboratory for Optoelectronics
POEM2026-0317-4	Two-dimensional tin-based chiral perovskites with a high degree of circularly polarized luminescence Peng Wang, Dehui Li [†] Huazhong University of Science and Technology
POEM2026-0319-3	Hydrogel-functionalized small-period long-period fiber grating sensor for highly sensitive phosphate Ion detection Yuke Zou, Jintao Cai, Lening Sun, Xuewen Shu [*] Wuhan National Laboratory for Optoelectronics & School of Optical and Electronic Information, Huazhong University of Science and Technology
POEM2026-0319-5	Ultra-compact all-fiber spectrometer based on femtosecond laser-inscribed TFBG Yujian Feng, Xuewen Shu [*] Huazhong University of Science and Technology
POEM2026-0410-2	Highly sensitive lab-on-fiber SPR sensor based on gold nanoridge hyperbolic metamaterials Qiwei Guo, Xuewen Shu [*] Wuhan National Laboratory for Optoelectronics & School of Optical and Electronic Information, Huazhong University of Science and Technology
POEM2026-0309-1	A universal hydrogen bond strategy enable highly efficient, mechanically robust, and thermally stable organic solar cells Junfeng Liu Wuhan National Laboratory for Optoelectronics
POEM2026-0310-2	Study on the dispersionless properties and mechanism of single-crystal Al ₂ O ₃ in the terahertz regime Yuehuan Cheng ¹ , Kejia Wang ^{2*} 1.Huazhong University of Science and Technology; 2.Wuhan National Laboratory for Optoelectronics
POEM2026-0310-3	Mechanistic elucidation and synergistic application of ferricyanide-mediated Alkaline fenton-like systems for sustainable pollutant degradation and energy storage Xue Long ¹ , Jiangjiang Duan ^{2*} 1.Wuhan National Laboratory for Optoelectronics, School of Optical and Electronic Information, Huazhong University of Science and Technology; 2.Wuhan National Laboratory for Optoelectronics, Huazhong University of Science and Technology
POEM2026-0317-2	Ultrathin circular polarization filters based on natural van der waals crystals Shuxin Huang, Xianghan Meng, Guanyu Zhang, Guowei Lv [*] Peking University
POEM2026-0318-2	Metasurface-based full-dimensional light-field modulation for vectorial holography Dengji He [*] , Jinwei Zeng Huazhong University of Science and Technology
POEM2026-0319-1	Sensitivity-enhanced electric field sensing based on LNOI platform using fano resonance Ze Zhang, Siqi Yan [*] , Ming Tang School of Optical and Electronic Information, Huazhong University of Science and Technology, Wuhan
POEM2026-0319-10	Hybrid space- and wavelength-division multiplexing in a four-core fiber for 150-km co-fiber QKD with high-power classical signals Rui Sun, Jun Liu, Jinwei Zeng, Jian Wang Huazhong University of Science and Technology

POEM2026-0319-2	Nearfield optical magnetism detection in nanostructures using vectorial optical field induced force Yajuan Dong*, Jinwei Zeng Huazhong University of Science and Technology
POEM2026-0319-9	Resolving the SNR-distortion trade-off in photoinduced force microscopy via atomic-layer-deposited conformal platinum probes Xiaotong Zhu ^{1,2} , Jinwei Zeng ^{1,2*} 1.Wuhan National Laboratory for Optoelectronics and School of Optical and Electronic Information, Huazhong University of Science and Technology; 2.Optics Valley Laboratory
POEM2026-0320-10	Silicon-based shallow-junction ultraviolet photodetectors Siqi Yan ¹ , Chuanqi Yu ¹ , Guoyin Xu ² , Deyuan Wei ² , Chenyang Zhou ³ , Zhengwei Li ³ 1.Huazhong University of Science and Technology; 2.Hubei Jiufengshan Laboratory; 3.Hubei University of Technology
POEM2026-0320-12	Optically tunable terahertz fano resonance in silicon coupled microring resonators induced by photo-generated carriers Yunjie Rui, Xuecou Tu*, Dingxuan Gu, Bingnan Yan, Qingyuan Zhao, Labao Zhang, Xiaoqing Jia, Lin Kang, Jian Chen, Peiheng Wu Nanjing University
POEM2026-0320-13	Development of a broad-spectrum ASE light source based on asymmetric multiple quantum wells and tilted waveguides Rongwang Zeng ¹ , Chun Jiang ² , Yuanhao Zhang ¹ , Quanan Chen ² , Qiaoyin Lu ¹ , Weihua Guo ¹ , Jinlong Xiao ³ , Lirong Huang ^{1*} 1.Wuhan National Laboratory for Optoelectronics & School of Optical and Electronic Information, Huazhong University of Science and Technology; 2.Ningbo Ori-Chip Optoelectronics Technology Co. Ltd.; 3.Institute of Semiconductors, Chinese Academy of Sciences
POEM2026-0320-6	Visualizing chiral near-field distributions around chiral plasmonic nanostructures via photo-induced Force Yu Wang*, Jinwei Zeng Huazhong University of Science and Technology
POEM2026-0407-1	Interface reaction degrades maximum power point output of organic solar cells and a suppressing strategy Ruizhi Wei HUST OEI
POEM2026-0413-3	Performance-enhanced pyroelectric detector of X-cut thin-film LiNbO ₃ on insulator from coplanar electrode antenna and ferroelectric domain walls Xiangyu Gao, Hui Xia, Luo Hao, Chen Changhong* Huazhong University of Science and Technology
POEM2026-0414-5	Ultra-broadband polarization splitter-rotator based on a three-layer taper in a Si-SiN heterogeneous waveguide Hang Liang ^{1,2} , Haibo Kuang ^{1,2} , Shiao Zhao ^{1,2} , Xiaoyang Zhao ^{1,2} , Yu Zhang ^{1,2*} , Wang Jian ^{1,2} 1.Wuhan National Laboratory for Optoelectronics, Huazhong University of Science and Technology; 2.Optics Valley Laboratory
POEM2026-0417-4	Spatially-integrated angular mode enhancement for photoacoustic spectroscopy gas sensors Lin Cheng ¹ , Zhiyu Feng ² , Jinxiao Sun ² , Chaotan Sima ^{2*} 1.Anhui Nari Jiyuan Grid Technology Co., Ltd.; 2.Huazhong University of Science and Technology
POEM2026-0418-4	All-optical speech recognition based on nonlinear diffractive neural network with picosecond latency Hangyu He, Jialong Zhang, Haodong Yang, Wenchan Dong*, Jing Xu*, Jianji Dong* Huazhong University of Science and Technology
POEM2026-0419-5	On-chip heterodyne longwave infrared sensor of complementary high-Q lithium niobate resonators on asymmetric photothermal effect Hui Xia, Hao Luo, Xiangyu Gao, Changhong Chen* Wuhan National Laboratory for Optoelectronics, Huazhong University of Science and Technology
POEM2026-0419-7	Polar-phase synthesized small p-type hgTe quantum dots as hole transport layer for infrared photodetectors Jun Ouyang, Xinzheng Lan* Huazhong University of Science and Technology

POEM2026-0419-8	Photoacid generator for TeO ₂ defect suppression in hgTe QD infrared detectors Mohan Yuan, Xinzhen Lan* Huazhong University of Science and Technology
POEM2026-0420-22	Small-molecule ice micro/nano fibers Rusi Lu, Bowen Cui, Peizhen Xu, Xin Guo*, Limin Tong* State Key Laboratory of Extreme Photonics and Instrumentation, College of Optical Science and Engineering, Zhejiang University
POEM2026-0420-3	Full set of three-input canonical logic units generation based on silicon-silicon nitride heterogeneous integrated chip Haodong Yang, Xiaoyan Gao, Wenchan Dong*, Jing Xu* Huazhong University of Science and Technology
POEM2026-0420-8	Terahertz polymer waveguide functional device Yu Lu, Jia Luo, Shuang Zheng* Huazhong University of Science and Technology
POEM2026-0427-1	Fiber-tip cascaded spherical Fabry-Pérot temperature sensor with enhanced harmonic Vernier effect Zihan Li ¹ , Hongbin Yu ^{1,2,3*} 1.Huazhong University of Science and Technology; 2.Optics Valley Laboratory; 3.Wuhan National Laboratory for Optoelectronics
POEM2026-0427-4	Wide band full-stokes polarimetry based on optical metasurface Yuhui Hu Huazhong University of Science and Technology

Laser Science and Technology

Control ID	Content
POEM2026-0301-1	Single-frequency terahertz coherent diffraction imaging based on diffusion model accelerated by knowledge distillation Ziwei Ming [*] Huazhong University of Science and Technology
POEM2026-0304-1	SPP-based thermal stress-induced integral peeling strategy for optimized laser cleaning on gold, silver, and copper cultural relics Jiamin Liu [*] , Chenyuan Yuan, Jie Wu, Haibing Yuan, Guoying Feng Sichuan University - Wangjiang Campus: Sichuan University
POEM2026-0310-1	Terahertz mueller matrix ellipsometry for measuring thin film thickness and optical constants Haoming Yang [*] School of Optical and Electronic Information, Huazhong University of Science and Technology
POEM2026-0317-1	Polar-assisted baud-rate timing recovery scheme for optical PAM4 interconnection Shiyang Chen, Ming Jun, Yujia Mu, Liu Shaonan, Yongxing Geng, Dong Ze [*] Beijing Institute of Technology
POEM2026-0317-3	Dynamics of long-lived carriers in molybdenum carbide nanosheets Xiangyu Zhu ^{1,2} , Wenxi Liang ^{1,2*} 1.Wuhan National Laboratory for Optoelectronics, Huazhong University of Science and Technology; 2.Advanced Biomedical Imaging Facility, Huazhong University of Science and Technology
POEM2026-0317-6	Performance evaluation of optical non-line-of-sight imaging algorithms Yuxuan Liu, Zhongyang Xu [*] , Hewu Li, Cheng Wang National Key Laboratory of Microwave Photonics, Nanjing University of Aeronautics and Astronautics
POEM2026-0319-4	High-precision solution of terahertz enhanced polarization spectrum based on machine learning non-linear regression Yang Yue Huazhong University of Science and Technology
POEM2026-0319-6	Non-binary LDPC coded hierarchical modulation for bandwidth efficient coherent optical interconnection Rui Wang, Junyuan Song, Yucui Tian, Yujia Mu, Jun Ming, Yuyao Wen, Ze Dong [*] Beijing Institute of Technology
POEM2026-0327-1	High-repetition-rate coherent XUV generation via fiber-laser-driven high-harmonic generation Yuexi Li Huazhong University of Science and Technology
POEM2026-0401-2	All-fiber high-power mid-infrared pulsed lasers and supercontinuum sources Peilong Yang Ningbo University
POEM2026-0419-10	High-accuracy and high-efficiency manufacturing of circuits based on aerosol jet printing combined with laser micro-cladding technology Jinhang Wang, Li Meng [*] , Shuhuan Zhang, Pan Chen, Xiaoyan Zeng Huazhong University of Science and Technology

Biomedical Photonics

Control ID	Content
POEM2026-0314-2	Multiphoton imaging-based tumor detection and collagen feature analysis in sentinel lymph nodes Yaqi Chen ¹ , Zhonghua Han ² , Deyong Kang ² , Yanbin Wu ¹ , Jianxin Chen ¹ , Lianhuang Li ^{1*} 1.Fujian Normal University; 2.Fujian Medical University Union Hospital
POEM2026-0320-3	Physics-guided deep learning for high-fidelity image restoration in graded-index endoscopic imaging systems Yang Yang ^{1*} , Han Chang ¹ , Yunzheng Yang ¹ , Lequan Bao ¹ , Jinwei Zeng ² , Jian Wang ² 1.Huazhon University of Science and Technology; 2.Huazhong University of Science and Technology
POEM2026-0324-1	Ultrawideband high density polymer-based spherical array for real-time functional optoacoustic micro-angiography Pavel Subochev [*] IAP RAS
POEM2026-0324-3	Photoacoustic angiography with extended imaging depth employing ring-segment piezopolymer detector Alexey Kurnikov [*] Institute of Applied Physics RAS, Russia
POEM2026-0414-6	Multiscale imaging and optomechanical simulation of femtosecond laser modification towards presbyopia in ageing Eye Zhuoyu Zhang, Jionghang Zhang, Yujie Liu, Jiale Li, Honghao Wang, Yaping Shi, Xiaohua Lv, Xu Feng, Shaoqun Zeng Huazhong University of Science and Technology
POEM2026-0415-3	A rotational correction method for suppressing decentration-induced aberrations in keratorefractive lenticule extraction Jiakang Wang ^{1,2} , Zhenzhen Zhao ^{1,2} , Yuchen Dai ¹ , Honghao Wang ^{1,2} , Bingxi Wang ^{1,2} , Xiuli Liu ^{1,2} , Shaoqun Zeng ^{1,2} , Xiaohua Lv ^{1,2*} 1.Huazhong University of Science and Technology; 2.Britton Chance Center for Biomedical Photonics, Wuhan National Laboratory for Optoelectronics
POEM2026-0417-2	In situ astrocyte-to-neuron conversion facilitates functional recovery following spinal cord injury Kunxing Liu ¹ , Jianyi Xu ² , Xiaomei Liu ² , Yuening He ² , Xizhi Meng ² , Tingting Yu ² , Dan Zhu ^{2*} 1.Huazhong University of Science and Technology; 2.Huazhong University of Science and Technology
POEM2026-0417-3	Real-time measurement of pulse-to-pulse femtosecond energy via time-domain pulse-width encoding Junwen Lu, Shaoqun Zeng Huazhong University of Science and Technology
POEM2026-0417-5	Optical coherence tomography-based steady-state non-contact intraocular pressure measurement via corneal displacement gradient Ruonan Bian, Shaoqun Zeng Huazhong University of Science and Technology
POEM2026-0417-6	Biomechanical influence on postoperative corneal shape following refractive surgery Bingxi Wang ^{1,2} , Shichen Sun ^{1,2} , Yinan Liao ^{1,2} , Jiakang Wang ^{1,2} , Fengchen He ^{1,2} , Zhuoyu Zhang ^{1,2} , Zuwei Wang ^{1,2} , Xiaohua Lv ^{1,2} , Shaoqun Zeng ^{1,2} , Xu Feng ^{1,2*} 1.Britton Chance Center for Biomedical Photonics, Wuhan National Laboratory for Optoelectronics-Huazhong University of Science and Technology; 2.MOE Key Laboratory for Biomedical Photonics, Collaborative Innovation Center for Biomedical Engineering, School of Engineering Sciences, Huazhong University of Science and Technology
POEM2026-0417-7	Deep learning-based restoration for non-invasive in vivo observation of cortical vasculature through the intact skull Yuwei Du, Zhengwu Hu, Shaojun Liu, Qing Xia, Tingting Yu, Dan Zhu [*] MOE Key Laboratory for Biomedical Photonics, Wuhan National Laboratory for Optoelectronics -Advanced Biomedical Imaging Facility, Huazhong University of Science and Technology

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REVIEW ARTICLE

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RESEARCH ARTICLE

260 fs, 403 W coherently combined fiber laser with precise high-order dispersion management

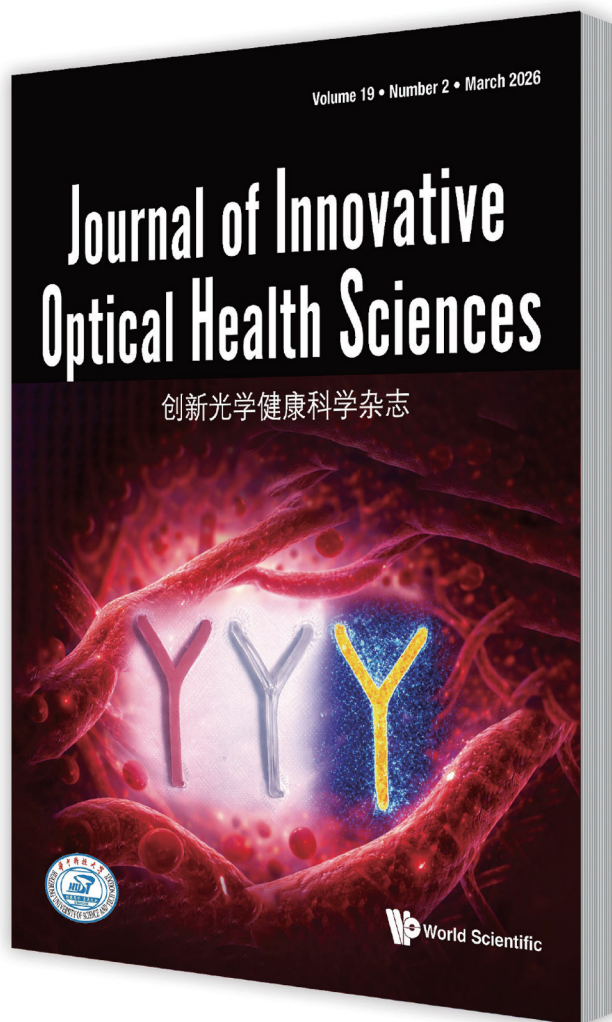
Shuangxi Peng, Zhihao Wang, Feilong Hu, Zhengyan Li, Qingbin Zhang, Peixiang Lu



RESEARCH ARTICLE

White light emission in 0D halide perovskite $[(\text{CH}_3)_3\text{S}]_2\text{SnCl}_6 \cdot \text{H}_2\text{O}$ crystals through variation of doping ns^2 ions

Yitong Lin, Yu Zhong, Yangpeng Lin, Jiawei Lin, Lei Pang, Zhilong Zhang, Yi Zhao, Xiao-Ying Huang, Ke-Zhao Du



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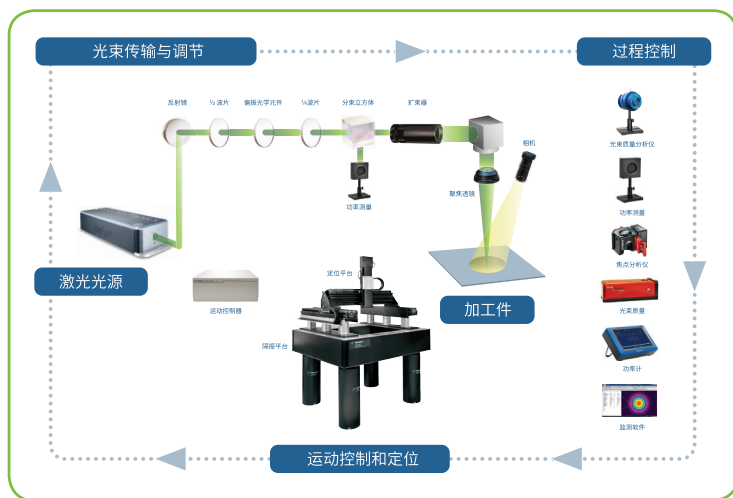
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