

Workshops and Forums

Photonics Research Workshop: Microcavity Photonics

Workshop Time: 09:00–17:45, Saturday, 2 November
Venue: Furong Room, 2F

Chairs:

Lan Yang, Washington University, St. Louis, USA

Yun-Feng Xiao, Peking University, China

Yunjiang Rao, University of Electronic Science and Technology of China, China

Description: Microcavity Photonics is a fast-growing field thanks to their unique appeals. On the fundamental research side, they offer a convenient and tractable platform for the studies of wave chaos and non-Hermiticity. On the practical side, they can be used for a wide range of applications including lasers, filters, optical diodes, comb generation, and sensing. This workshop aims to provide a glimpse of some exciting developments in this field, with the theoretical and experimental fronts put on an equal footing.

Speakers:

09:00–09:05 Opening **Lan Yang**, Washington University, St. Louis, USA

09:05–09:40 **Frank Vollmer**, University of Exeter, UK
Topic: Single-Molecule Detection with Optoplasmonic Microcavity Sensors

09:40–10:15 **Chaoyang Lu**, University of Science and Technology of China
Topic: Toward “Quantum Supremacy” with Single Photons

10:15–10:50 **Baicheng Yao**, University of Electronic Science and Technology of China, China
Topic: Graphene Enhanced Microresonators for Communication and Sensing

10:50–11:05 Coffee break

11:05–11:40 **Cheng Wang**, City University of Hong Kong, Hong Kong, China
Topic: Ultra-High-Q Lithium Niobate Microcavities

11:40–12:15 **Qiang Lin**, University of Rochester, USA
Topic: Nonlinear and Quantum Photonic Microresonators and Applications

12:15–14:00 Lunch break

14:00–14:35 **Takasumi Tanabe**, Keio University, Japan
Topic: Broad Bandwidth Phase-Matched Four-Wave Mixing in Dispersion-Engineered Microresonators

14:35–15:10 **Qinghai Song**, Harbin Institute of Technology, China
Topic: Mode Interactions in Microsized Lasers

15:10–15:45 **Fei Xu**, Nanjing University, China
Topic: Microfiber Resonators

15:45–16:00 Coffee break

16:00–16:35 **Xiulai Xu**, Institute of Physics, CAS, China
Topic: Solid State CQED with Quantum Dots and Photonic Crystal Cavities

16:35–17:10 **Bumki Min**, KAIST, South Korea
Topic: Highly-Dispersive Time-Variant Metasurfaces for Frequency Conversion

17:10–17:45 **Xiyuan Lu**, Kartik Srinivasan National Institutes of Standards and Technology, USA | University of Maryland College Park, USA
Topic: Nonlinear Optics across Visible and Telecom Bands in Silicon Nitride Microcavities for Classical and Quantum Applications

Roadmap of Integration: Silicon Photonics or Not?

Workshop Time: 08:30–12:00, Saturday, 2 November
Venue: Global Center Grand Ballroom I, 2F

Chairs:

Yikai Su, Shanghai Jiaotong University, China

Zhiping Zhou, Peking University, China

Koji Yamada, National Institute of Advanced Industrial Science and Technology, Japan

Description: This workshop discusses the possible roadmap of photonic integration for the next 10 years or beyond. Photonic integration has been effective to solve the capacity, power consumption and footprint issues with the rapid growth of the information society and new services. The question on the integration roadmap (materials, structures, functions, and timelines...) would be of wide interest to the audience. This workshop attempts to provide a forum to brainstorm some long terms issues, and discuss the potential role of silicon photonics in this roadmap.

Speakers:

08:30–08:45 Opening

08:45–09:00 **Patrick Lo Guo Qiang**, AMF, Singapore
Topic: The Review of Silicon Photonics Commercialization and AMF Development

09:00–09:15 **Arne Leinse**, LioniX International, Netherlands
Topic: Photonic ICs (PICs) in Visible, NIR and IR Applications based on Low Loss SiN (TriPleX) Technology

09:15–09:30 **Xu Wang**, Lumerical, Canada
Topic: Accelerating time-to-market with electronic-photonic design automation

09:30–09:45 **Toru Segawa**, NTT, Japan
Topic: Potential of III-V Photonic Devices on Si Platform

09:45–10:00 **Daoxin Dai**, Zhejiang University, China
Topic: Hybrid Silicon Photonics with 2D Materials

10:00–10:30 Coffee Break

10:30–10:45 Jonathan Klamkin, *University of Santa Barbara, USA*

Topic: III-V Quantum Dot Lasers on Silicon

10:45–11:00 T. Wang, *Institute of Physics, CAS, China*

Topic: III-V Lasers Directly Grown on Silicon

11:00–11:15 Guangwei Cong, *AIST, Japan*

Topic: Silicon Photonics Holds The Key In Ultra-Scale Integration Towards Machine Learning Applications

11:15–11:30 Ton Backx, *Institute for Photonic Integration, The Netherlands*

Topic: Status and Continuation of the Integrated Photonic Systems Roadmap

11:30–12:00 Panel Discussion

Workshop on Special Light Communications: Free-space, Visible, Underwater

Workshop Time: 09:00–11:50, Saturday, 2 November

Venue: Honghu Room, 2F

Chairs:

Gong-Ru Lin, *National Taiwan University, Taiwan, China*

Nan Chi, *Fudan University, China*

Description: As the 5G era comes, more and more research effort has been devoted to the development of special light communication for further enhancing the speed, the quality and the capacity of optical transmission, in particular, new materials, components and devices for LED, LD, PIN and APD, channel modeling and characterization of VLC systems, underwater optical wireless communication network. Meanwhile, the applications for underwater and free-space scenario have been attracting much research interest in communication. But how have they been going? This workshop will provide an overview of some of these application research and development not only in academia but also in industry from submarine to metro network.

Speakers:

09:00–09:30 Gong-Ru Lin, *National Taiwan University, Taiwan, China* (Keynote)

Topic: Tri-Color (RGB or RGV) Laser Diode Based White Lighting Communications

09:40–10:00 Boo. S Ooi, *King Abdullah University of Science and Technology, Saudi Arabia*

Topic: Laser based VLC and Underwater Communications

10:00–10:20 Nan Chi, *Fudan University, China*

Topic: Future VLC based on Machine Learning

10:20–10:40 Jian-Zhang Huang, *National Taiwan University, Taiwan, China*

Topic: 2 Gbit/s Data Rate Transmission of Photonic Crystal Leds Using OFDM Technology

10:40–10:50 Coffee Break

10:50–11:10 Tao Li, *Nanjing University, China*

Topic: Integrated Metalens for Compact Imaging

11:10–11:30 Haiyan Ou, *Technical University of Denmark, Denmark*

Topic: Nanotechnology Engineered Leds for High Speed Visible Light Communication

11:30–11:50 Jianli Zhang, *Nanchang University, China*

Topic: Designing LED for Visible Light Communication

Artificial Intelligence Assisted Photonic Applications

Workshop Time: 09:00–12:00, Saturday, 2 November

Venue: Global Center Grand Ballroom II, 2F

Chairs:

Alan P.K. Lau, *Hong Kong Polytechnic University, Hong Kong, China*

Darko Zibar, *Technical University of Denmark, Denmark*

Shuangyi Yan, *University of Bristol, UK*

Gangxiang Shen, *Soochow University, China*

Description: Artificial Intelligence (AI) and Machine Learning (ML) techniques have come into optical communications and networks recently and are gaining more and more attention in the community. The extent to which ML/AI can advance optical communications and other photonics applications are still not well understood and hotly debated. In this workshop, we will discuss the progress and challenges of ML applications in optical communications including nonlinearity mitigation, monitoring, software defined networks and optical implementation of ML algorithms.

Invited Speakers on Physical Layer:

09:00–09:15 Lilin Yi, *Shanghai Jiao Tong University, China*

09:15–09:30 Takahito Tanimura, *Fujitsu Limited, Japan*

09:30–09:45 Vittorio Curri, *Dipartimento di Elettronica e Telecomunicazioni, Politecnico di Torino, Italy*

09:45–10:00 Shi Li, *Kiel University, Germany*

10:00–10:15 Jochen Schroeder, *Chalmers University of Technology, Sweden*

Invited Speakers on Network Layer:

10:30–10:45 Zuqing Zhu, *University of Science and Technology of China, China*

10:45–11:00 Daniel C. Kilper, *The University of Arizona, USA*

11:00–11:15 Takafumi Tanaka, *NTT, Japan*

11:15–11:30 Yongli Zhao, *Beijing University of Post and Telecommunications, China*

11:30–11:45 Marija Furdek, *Chalmers University of Technology, Sweden*

11:45–12:00 Panel Discussion

Microwave Photonics in Measurements and Sensing

Workshop Time: 13:30–17:30, Saturday, 2 November

Venue: Honghu Room, 2F

Chairs:

Kun Xu, *Beijing University of Posts & Telecommunications, China*

Jianping Yao, *University of Ottawa, Canada*

Description: Microwave photonics is an interdisciplinary field that covers the interactions between microwave and optical waves for the generation, processing, control and distribution of microwave, millimeter wave and THz signals. Over the past few years, microwave photonics technologies have developed rapidly and lead to many important applications such as wireless networks, radar/satellite communications, as well as sensors and warfare systems. In this workshop, the worldwide leading scientists will present and discuss

the latest advances on microwave photonics particularly for measurements and sensing applications. It will be open to all participants of ACP 2019.

Topics to be addressed include but are not limited to:

- Lightwave network analysis
- Fast and precise time-of-flight (TOF) sensing
- Optical wireless communications and radar communications
- Integrated optical signal processing
- Micro- and nanophotonics for novel THz sources

Speakers:

13:30–14:00 Stavros Iezekiel, *University of Cyprus, Cyprus*
Topic: Lightwave Network Analyzers: An Introduction

14:00–14:30 Zheng Zheng, *Beihang University, China*
Topic: Characterization of Broadband RF Signal and Wireless System with Dual Frequency Combs

14:30–15:00 Wei Wei, *Beijing Institute of Technology, China*
Topic: Stable Dissemination of Microwave Signals over Fiber-Optic Links: Principles and Applications

15:00–15:30 Jungwon Kim, *Korea Advanced Institute of Science and Technology (KAIST), South Korea*
Topic: Fast and Precise Time-of-Flight (TOF) Sensing Using Femtosecond Lasers and Microwaves

15:30–16:00 Coffee Break

16:00–16:30 Zizheng Cao, *Eindhoven University of Technology, Netherlands*
Topic: Indoor non-line-of-sight optical wireless communication

16:30–17:00 Minghua Chen, *Tsinghua University, China*
Topic: Integrated Optical Signal Processing Based on Silicon Photonic Technology

17:00–17:30 Lili Gui, *Beijing University of Posts and Telecommunications, China*
Topic: Nanophotonics for Microwave Applications

High-speed Optical Fiber Communication: from Submarine to Metro Network

Organizer: *State Key Laboratory of Optical Fiber and Cable Manufacture Technology, YOFC, China*
Workshop Time: 13:45–17:30, Saturday, 2 November
Venue: *Global Center Grand Ballroom II, 2F*

Chairs:

Liangming (Anshion) Xiong, *State Key Laboratory of Optical Fiber and Cable Manufacture Technology, YOFC, China*
Ping Shum, *Nanyang Technological University, Singapore*

Description: As the 5G era comes and bigger data must be transmitted, high-speed optical fiber communication is becoming more and more important. This workshop will provide an overview of some advanced networking technologies, involving optical fiber, modulation and digital signal processing, optical phase conjugation, high-speed transmission, high order QAM, link optimization, and cloud-network coordination. They are playing key roles in high-speed optical communication from submarine to metro networks. How about the trends in optical fiber communication? There will be also some experts' opinions or suggestions from the industrial institute or academy including telecommunication operators'.

Speakers:

13:45-13:50 Welcome from the ACP2019 TPC Co-Chair Dr. Jie Luo, *State Key Laboratory of Optical Fiber and Cable Manufacture Technology, YOFC, China*

13:50-14:15 Junjie Li, *China Telecom Research Institute, China*
Topic: AON2.0: Optical Networking for Cloud-Network

14:15-14:40 Wenyu Zhao, *China Academy of Information and Communications Technology (CAICT), China*
Topic: Discussion on Several Application Focuses and Development Trends of Optical Transport Technology

14:40-15:05 Raadj Matai, *State Key Laboratory of Optical Fiber and Cable Manufacture Technology (YOFC), China*
Topic: Advanced Optical Fibers for High-Speed Transmission Networks

15:05-15:30 Qunbi Zhuge, *Shanghai Jiao Tong University, China*

Topic: Advanced Modulation and Digital Signal Processing Techniques for Capacity-Approaching Coherent Optical Transmission Systems

15:30-15:40 Coffee Break

15:40-16:05 Fan Zhang, *Peking University, China*
Topic: High-speed Optical Transmission for Metro Networks

16:05-16:30 Ming Tang, *Huazhong University of Science and Technology, China*
Topic: Link Optimization for Unrepeated Large Capacity Coherent Optical Fiber Communications

16:30-16:55 Xi Chen, *Nokia Bell Labs, USA*
Topic: High Order QAM for High-Speed Fiber Communications

16:55-17:20 Periklis Petropoulos, *Optoelectronics Research Centre (ORC), University of Southampton, UK*
Topic: Transmission experiments on the UK's National Dark Fibre research infrastructure

17:20-17:30 Closing Speech by Dr. Anshion LM XIONG, *State Key Laboratory of Optical Fiber and Cable Manufacture Technology, YOFC, China*

Industry Forum

Time: 13:30–18:00, Saturday, 2 November
Venue: *Global Center Grand Ballroom I, 2F*

Session A: Technological Advances in Optical Transport and Access

Organizer: *Huawei Technologies Co. Ltd.*

Chairs:

Chao Lu, *Hong Kong Polytechnic University, Hong Kong, China*
Liangchuan Li, *Huawei, China*

Description: The workshop will focus on "Technological Advances in Optical Transport and Access". In the workshop, we will discuss key technology advances that shall enable us to cope with the huge capacity demand of future networks.

Speakers:

13:30–13:50 William Shieh, *The University of Melbourne, Australia*

13:50–14:10 Frank Chang, *Source Photonics, USA*

14:10–14:30 Nicolas Fontaine, *Nokia Bell Labs, USA*

14:30–14:50 Vittorio Curri, *Dipartimento di Elettronica e Telecomunicazioni, Italy*

14:50–15:10 Liu Liu, *South China Normal University, China*

15:10–15:30 Panel Discussion

Session B: Next-Generation Optical Transport Networks - Emerging Applications, Technologies, and Standards

Chairs:

Peter Winzer, *Bell Labs, USA*

Xiang Liu, *Futurewei Technologies, USA*

Description: Facing the new challenges and opportunities presented by emerging services such as 5G, DCI and 4K/8K, optical transport network (OTN) is currently undergoing a transformation to better support these services. This Industry Forum aims to provide an overview on the emerging applications, technologies, and standards of next-generation OTN. An interactive panel discussion with leading industry experts will be held at the end of this Industry Forum.

Speakers:

16:00–16:15 Opening Remark

16:15–16:30 Junjie Li, *China Telecom Research Institute, China*

16:30–16:45 Xiongyan Tang, *China Unicom, China*

16:45–17:00 Wenyu Zhao, *China Academy of Information and Communications Technology (CAICT), China*

17:00–17:15 Xiaohong Zhang, *Nokia Shanghai Bell, China*

17:15–17:30 Qiuyou Wu, *Huawei Technologies, China*

17:30–18:00 Panel Discussion