

Workshops and Forums

Transmission and Switching Techniques for Data Centers

Workshop Time: 09:00–12:30, Friday, 10 November

Venue: *The Garden Hotel, Orchid Room*

Organizers: **Yikai Su**, *Shanghai Jiao Tong Univ., China* and **Zhaohui Li**, *Sun Yat-Sen Univ., China*

Description: Data center traffic is growing rapidly at an yearly rate of ~25%. Photonic technologies for transmission and switching can provide solutions to deal with this fast growth with high capacity, compact footprint and low power consumption. Optical interconnects within and between the data centers are key technologies. High data rate and low cost are desired in designing and implementation of transmission systems. Modulation and multiplexing techniques will be discussed and explored. Furthermore, the back planes of the electronic switches seem to impose limitations on data transfer speed and interconnect density. Optical switching may be able to handle large traffic of coarse granularities if combined with electronic switches for fine granularities. At the device level, in addition to VESELs and other III-V components, silicon photonics has penetrated into data centers with PSM4 and WDM.

Speakers:

09:00–09:20 Jian Wu, *Beijing Univ. of Post and Telecommunications, China*

Topic: Scalable Optical Interconnect Network Based on Small World Topology for Data Centers

09:20–09:40 Xiaolu Song, *Huawei Technologies, China*

Topic: High-density Optical Interconnects

9:40–10:00 Tao Chu, *Zhejiang Univ. China*

Topic: Large scale Silicon Photonic Switches

10:00–10:20 Lin Yang, *Institute of Semiconductor, CAS, China*

Topic: Silicon Optical Modulators for Data Centers

10:20–10:40 Coffee Break

10:40–11:00 Xiangjun Xin, *Beijing Univ. of Post and Telecommunications, China*

Topic: Title to be Announced

11:00–11:20 Ciyuan Qiu, *Shanghai Jiao Tong Univ. China*

Topic: Optical Switching Based on Silicon Microrings with Wavelength Alignment

11:20–11:40 Bo Liu, *Beijing Univ. of Post and Telecommunications, China*

Topic: High speed optical transmission system based on probabilistic shaping and geometric shaping

International Workshop on Visible Light Communications at ACP 2017

Workshop Time: 09:00–12:30, Friday, 10 November

Venue: *The Garden Hotel, Magnolia Room*

Organizers: **Gong-ru Lin**, *National Taiwan University, China*; **Nan Chi**, *Fudan University, China*; and **Lilin Liu**, *Sun Yat-Sen University, China*

Description: With the increasingly scarce of wireless spectrum resources and the urgent demands of high speed, safe, environmentally friendly means of communication in nowadays, visible light communication emerges at a historic moment. In recent ten years, VLC technology has been developed rapidly. Governments worldwide have paid great attentions on it. By using a LED as the signal transmitter, VLC is expected to integrate communication functions on the existing lighting facilities, which can provide a new wireless communication access to make full usage of resources. VLC can be used for many applications and areas, such as indoor and outdoor information network, indoor positioning systems, and security network systems.

The goal of this workshop is to provide a technical forum to present the latest research in in VLC and exchange ideas in this emerging green post-radio frequency technology. We welcome contributions from both academic and industry covering a range of topics in VLC including but not limited to the following:

- Indoor and outdoor optical channel modeling and characterization
- Enabling technologies on the physical layer: new LED and detectors, advanced modulation methods, equalization and estimation, new signal processing algorithms, etc.
- Topology control, routing and VLC network architecture
- Integration of VLC with PLC, Ethernet, WiFi and Mobile Communication
- Versatile applications of VLC systems/networks: Optical Camera Communications, under water wireless communication, navigation and localization, application in vehicular communications, etc.

Speakers:

09:00–09:20 Gong-Ru Lin, *Graduate Institute of Photonics and Optoelectronics, National Taiwan University, China*

Topic: Advances in Laser Diode White Lighting and Free-Space Communications

09:20–09:40 Nan Chi, *School of Information Science and Engineering, Fudan Univ., China*

Topic: Key Components for High-speed Visible Light Communication

9:40–10:00 Hao-Chung Kuo, *National Chiao-Tung Univ., China*

Topic: Progress of Blue VCSELs and u-LED/LDs

10:00–10:20 Ming Jiang, *School of Electronics and Information Technology, Sun Yat-Sen Univ., China*

Topic: Space-Time-Multiplexed Multi-Image VLP System Exploiting Pseudo-Miller-Coding for Smart Phones

10:20–10:40 Jian Zhang, *Information Engineering Univ., China*

Topic: Under-seawater High Speed Wireless Optical Communication

10:40–11:00 Coffee Break

11:00–11:20 Changyuan Yu, Dept. of Electronic and Information Engineering, The Hong Kong Polytechnic Univ., China

Topic: Data Transmission with Dimming Control in Indoor Visible Light Communication System

11:20–11:40 Chao Shen, KACST-KAUST-UCSB Solid-State Lighting Program & KACST Technology Innovation Center for Solid-State Lighting at KAUST, China

Topic: Semipolar GaN Laser and SLD Enabling High-speed Visible Light Communications

11:40–12:00 Jing Xu, Optical Communications Laboratory, Ocean College, Zhejiang Univ., China

Topic: Underwater Wireless Optical Communication: Recent Development in Ocean College, Zhejiang University

12:00–12:20 Lilin Liu, School of Electronics and Information Technology, Sun Yat-Sen Univ., China

Topic: Novel Mid-power GaN-based Flip-Chip LED for Dual Illumination and High Speed VLC Communications

Joint Research Center of Photonics & Joint Centre of Advanced Photonics Research Combined Workshop 2017 (JORCEP Workshop)

Workshop Time: 09:00–18:00, Friday, 10 November

Venue: The Garden Hotel, Dahlia Room

Organizers: Erik Forsberg, Zhejiang University, China; Lech Wosinski, Royal Institute of Technology, Sweden; Hon Tsang, Chinese University of Hong Kong, China; Liu Liu, South China Normal University, China; and Sailing He, Royal Institute of Technology, Sweden; Zhejiang University, China; South China Normal University, China

Description: The Sino-Swedish Joint Research Center of Photonics (JORCEP) has since 2003 been an ever evolving research and educational collaboration between several Swedish and Chinese universities that annually organizes a multi-disciplinary workshop to promote its joint research. Continuing a new tradition since 2015, the workshop is also this year combined with the annual workshop of that of the Zhejiang University - Chinese University of Hong Kong Joint Centre of Advanced Photonics Research.

Speakers

09:00–09:20 Sailing He, Royal Institute of Technology, Sweden; Zhejiang University, China; South China Normal University, China

Topic: Recent Activity and Progress at COER

09:20–09:40 Lech Wosinski, Royal Institute of Technology, Sweden

Topic: 8 Years of JORCEP Cooperation Project on Silicon Nanophotonics and Plasmonics

09:40 -10:00 Daoxin Dai, Zhejiang University, China

Topic: Multimode Silicon Photonics

10:00–10:20 Zhenzhou Cheng, University of Tokyo, Japan

Topic: Mid-Infrared Germanium Photonic Integrated Circuits

10:20–10:40 Liu Liu, South China Normal University, China

Topic: VCSEL and Silicon Photonics Integrated Circuits

10:40–11:00 Coffee Break

11:00–11:20 Chi-Wai Chow, National Chiao Tung University, China

Topic: Physically Secure Communications Using Visible Light Communications

11:20–11:40 Hon Tsang, Chinese University of Hong Kong, China

Topic: Integrated Mid-infrared HgTe Quantum Dot Photodetector

11:40–12:00 Chester Shu and Caoran Huang, Chinese University of Hong Kong, China

Topic: Raman-enhanced Optical Phase Conjugator in WDM Coherent Transmission Systems

12:00–12:20 Yaojing Zhang, Chinese University of Hong Kong, China

Topic: Forward Stimulated Brillouin Scattering in Silicon Microring Resonators

12:20–13:30 Lunch

13:30–13:50 Lars Thylen, Royal Institute of Technology, Sweden

Topic: Routes to the Further Development of Integrated Nanophotonics and Possible Relations to Novel Compatible Electronics

13:50–14:10 Jiajia Chen, Royal Institute of Technology, Sweden and South China Normal University, China

Topic: Do Children Trust Robots?

14:10–14:30 Elena Vasileva, Royal Institute of Technology, Sweden

Topic: Polymer Photonics...Organic Photonics...Wood Photonics...What Next?

14:30–14:50 Qiuqiang Zhan, South China Normal University, China

Topic: Title to be Announced

14:50–15:10 Kezhang Shi, Zhejiang University, China

Topic: Enhanced Near-Field Thermal Radiation Based on Multilayer Graphene-hBN Heterostructures

15:30–15:50 Tea/Coffee Break

15:50–16:10 Guangyu Zhao, South China Normal University, China

Topic: Inelastic Hyperspectral Lidar for Aquatic Ecosystems Monitoring and Landscape Plant Scanning Test

16:10- 16:30 Chao Fei, Zhejiang University, China

Topic: High-speed Underwater Optical Communication

16:30–16:50 Xuezhi Hong, South China Normal University, China

Topic: Research on Nonlinear Equalization in Visible Light Communication Systems

Exploiting the Space Domain of Electromagnetic Waves: The Ongoing Frontiers Workshop

Jointly hosted by:

China 973 Project 2014CB340000

EU H2020 Project 'ROAM'

China 973 Project 2014CB340100

China NSFC Project 61490710

Part I: Structured Lights and Their Applications

Workshop Time: 09:00–12:30, Friday, 10 November

Venue: The Garden Hotel, Begonia Room

Part II: Space-division Multiplexing (SDM) Communication

Workshop Time: 14:00–18:10, Friday, 10 November

Venue: The Garden Hotel, Begonia Room

Organizers: Xinlun Cai, Sun Yat-sen University, China;

Xiaocong Yuan, Shenzhen University, China

Almost all the applications of electromagnetic waves are about the manipulation of their physical dimensions including frequency/wavelength, complex amplitude, time, polarization, and space. The space domain is considered the only known physical dimension left to exploit in newly emerging applications of electromagnetic waves. As the ongoing frontiers, exploiting the space domain of electromagnetic waves has fueled lots of interesting research fields. For instance, structured lights accessing the spatial amplitude/phase/polarization distributions of lightwaves have given rise to many developments in astronomy, manipulation, trapping, tweezer, microscopy, imaging, sensing, nonlinear interactions and quantum information processing. Very recently, space-division multiplexing (SDM) is known as the only long-term viable path for sustained capacity scalability in optical communication networks, from short-reach data center interconnects and optical access networks to long-haul transport systems.

This workshop will focus on the ongoing frontiers in exploiting the space domain of electromagnetic waves. Two parts (structured lights and their applications, SDM communications) will be covered. Topics of relevance include but are not limited to:

Part I: Structured Lights and Their Applications

- Physics and fundamental properties of structured lights
- Different kinds of structured lights (LG beams, HG beams, Bessel beams, OAM beams, vector beams, accelerating beams, etc.)
- Devices for structured light generation, manipulation and detection
- Structured light enabled applications (astronomy, manipulation, trapping, tweezer, microscopy, imaging, sensing, nonlinear interactions, quantum information processing, etc.)
- Structured electromagnetic waves and their applications (radio wave, microwave, terahertz wave, etc.)

Part II: Space-division Multiplexing (SDM) Communications

- Free-space and fiber-based SDM communications.
- Multi-core fiber (MCF), few-mode fiber (FMF), multi-mode fiber (MMF), ring-core fiber (RCF) and other specialty fibers and photonic integrated devices for SDM communications.
- Efficient (de)multiplexing and amplification techniques for SDM communications.
- Multiple-input multiple-output (MIMO) assisted SDM communications and MIMO free SDM communications.
- Optical switching, optical signal processing and various networking functions in SDM communications.
- Information capacity scalability and limits in SDM communications.

We sincerely welcome scientists, students and industry representatives of relevant interest to attend and join the workshop.

Speakers Part I: Structured Lights and Their Applications

09:00–09:20 Siddharth Ramachandran, Boston University, USA

Topic: OAM in Fibers: How They are Different from OAM in Free Space and Other Fiber Modes

09:20–09:40 Martin Lavery, University of Glasgow, UK

Topic: Title to be Announced

09:40–10:00 Cheng Wei Qiu, National University of Singapore, Singapore

Topic: High-capacity Vortex Metasurfaces

10:00–10:20 Jin Liu, Sun Yat-Sen University, China

Topic: Deterministic Generation of Single-photonis with Orbital Angular Momentum

10:20–10:40 Guixin Li, Southern University of Science and Technology, China

Topic: Nonlinear Photonic Metasurfaces and Geometric Berry Phase

10:40–11:00 Coffee Break

11:00–11:20 Xianmin Jin, Shanghai Jiao Tong University, China

Topic: Title to be Announced

11:20–11:40 Xilin Wang, University of Science and Technology of China, China

Topic: Photonic Quantum Information Processing with Orbital Angular Momentum

11:40–12:00 Lixiang Chen, Xiamen University, China

Topic: LED-based Twisted Light's Superpositions for Color Image and Audio Transmission

12:00–12:20 Xinlun Cai, Sun Yat-Sen University, China

Topic: Silicon Photonic Optical Vortex Emitters

Speakers Part II: Space-division Multiplexing (SDM) Communications

14:00–14:20 Guifang Li, University of Central Florida, USA and Tianjin University, China

Topic: SDM Is Not Just for Capacity

14:20–14:40 Xiaocong Yuan, Shenzhen University, China

Topic: Singular Optical Beam and its Applications

15:40–15:00 Mirco Scaffardi, CNIT, Italy

Topic: The European Project ROAM “Revolutionizing Optical Fiber Transmission and Networking Using the Orbital Angular Momentum of Light”: Motivations and Recent Outcomes

15:00–15:20 Nicolas Fontaine, Nokia Bell Labs, USA

Topic: High Capacity SDM Transmission

15:20–15:40 Yongmin Jung, University of Southampton, UK

Topic: Recent Progress in SDM Amplifiers and their Related SDM Components

15:40–16:00 Coffee Break

16:00–16:20 Haoshuo Chen, Nokia Bell Labs, USA

Topic: Title to be Announced

16:20–16:40 Jian Wang, Huazhong University of Science and Technology, China

Topic: Recent Advances in Fiber-based OAM Multiplexing Transmission and Amplification

16:40–17:00 Jie Liu, Sun Yat-sen University, China

Topic: Scalable Mode Division Multiplexing Using Orbital Angular Momentum Mode Groups in Ring Core Fibers

17:00–17:20 Ting Lei, Shenzhen University, China

Topic: Multiplexing Devices for Optical Communication Using Singular Beams

17:20–17:40 Antonio Mecozzi, University of L'Aquila, Italy

Topic: Propagation Effects in Multimode Fibers

17:40–18:00 Takemi Hasegawa, Sumitomo, Japan

Topic: Coupled-core MCF for Long-Haul SDM Transmission

Photon-phonon Interaction: Fundamental, Material and Applications

Workshop Time: 14:00–18:10, Friday, 10 November

Venue: The Garden Hotel, Orchi Room

Organizers: Zhaohui Li, Sun Yat-Sen University, China; Lilin Yi, Shanghai Jiao Tong University, China; Ming Li, Institute of Semiconductor, CAS, China; Yang Yue, Juniper Networks in USA

Photon-phonon interaction in highly confined nanoscale waveguides or microfiber through guided-wave stimulated Brillouin scattering (SBS) has recently emerged as an important area of research. Compared with the photon-phonon

interaction in long optical fiber, the enhanced Brillouin nonlinearities caused by the emergence of large radiation pressure-induced couplings provides a means of nonlinear signal processing with reduced footprint and power consumption, which has important applications ranging from microwave photonics to optical memory. On the other hand, Brillouin nonlinearity is harmful because it is the major factor limiting the power of a fiber device. By special design of waveguide, optical fiber or microfiber, the photon-phonon interaction can also be suppressed or even canceled, which is important for high power fiber laser design. This workshop will focus on the challenges and recent advances in the field of photon-phonon interactions, including the fundamentals, materials and applications. The topics include nanoscale waveguide and microfiber based photon-phonon interaction enhancement and suppression, new materials based SBS effect, SBS performance improvement and new applications.

Speakers

14:00–14:20 Yang Liu, Sydney University, Australia

Topic: Recent Progress in High-performance SBS-based Signal Processing and Fully Integrated Devices

14:20–14:40 Junqiang Sun, Huazhong University of Science and Technology, China

Topic: Stimulated Brillouin Scattering in Silicon-based Integrated Waveguides

14:40–15:00 Thibaut Sylvestre, Institut FEMTO-ST, Université Bourgogne Franche-Comte, France

Topic: Photon-phonon Interactions in Optical Microfibers and Nanofibers

15:00–15:20 Fei Xu, Nanjing University, China

Topic: Opto-mechanical Interaction of Optical Microfibers

15:20–15:40 Duk-yong Choi, Australian National University, Australia

Topic: Chalcogenide Planar Waveguides for High Stimulated Brillouin Scattering Gain

15:40–16:00 Coffee Break

16:00–16:20 Huan Wang, Wiley

Topic: Living in a Materials World

16:20–16:40 Thomas Schneider, TU Braunschweig, Germany

Topic: Noise-free Brillouin based Microwave Photonics Filters

16:40–18:00 Lilin Yi, Shanghai Jiao Tong University, China

Topic: Software-defined Microwave Photonics Filter Based on Stimulated Brillouin Scattering

Silicon Photonics Workshop

Workshop Time: 09:00–12:00, Friday, 10 November

Venue: The Garden Hotel, Bauhinia Room

Organizers: Chairpersons:

Zhiping Zhou, Beijing University, China

Juren Michel, MIT

Zhaohui Li, Sun Yat-Sen University, China

09:00–09:30 Ching-Fuh Lin, National Taiwan University, China

Topic: Ultra-broadband infrared detection based on silicon photonics and plasmonic resonance

09:30–10:00 Pavel Cheben, National Research Council, Canada

Topic: Subwavelength Engineered Metamaterial Silicon Photonic Devices

10:00–10:30 Frederic Gardes, University of Southampton, UK

Topic: Group IV compounds and tunable index silicon nitride for multiplatform integrated photonics

10:30–11:00 Coffee Break

11:00–11:30 Cun-Zheng Ning, Arizona State University, USA

Topic: Nanolasers from a Silicon Nanobeam Integrated with Monolayer Molybdenum Ditelluride

11:30–12:00 Xinlun Cai, Sun-Yat Sen University, China

Topic: Silicon Photonic Devices for Quantum Key Distribution

11:30–12:30 Daoxin Dai, Zhejiang University, China

Topic: Silicon-based on-chip hybrid (de)multiplexers

Advanced Plasma Processing Techniques: Etch, Deposition and Growth for Optimized Device Performance

Workshop Time: 14:00–17:35, Friday, 10 November
Venue: The Garden Hotel, Magnolia Room

Host: Oxford Instruments Plasma Technology

Chair: **Harm Knoops**, *Eindhoven University of Technology, Netherlands*



Plasma processing is an essential tool for making the latest optoelectronic devices. From dry etching of laser facets to high density passivation understanding how the

plasma can affect your device is vital to achieving the highest quality. Oxford Instruments Plasma Technology is at the forefront of plasma processing with a long history of developing innovative solutions to enable device performance to be pushed to the next level. This workshop will detail some of these latest developments with talks on plasma etching, Atomic Layer Deposition (ALD) and ICP CVD of dielectric films. Along side this users will detail their experiences and show how they have used our tools to deliver devices. Experts from the UK and local users will be here to share their knowledge in an open environment so please come along and enjoy the talks but also to ask any questions that you have.

A RSVP is required for this workshop. Visit the Workshops page on www.acpconf.org to register.

Speakers:

14:00–14:10 Welcome and Introduction

14:10–14:35 Xin Zhang, *Huawei, China*
Topic: Title to be Announced

14:35–15:00 Lin Liu, *Sun Yat-Sen University, China*
Topic: High Quality Plasma Deposition and Etching Processes for Photonic Materials and Devices

15:00–15:25 Lin Zhang, *Tianjin University*
Topic: Title to be Announced

15:25–15:50 Ligang Deng, *Oxford Instruments Plasma Technology*
Topic: Plasma Dry Etch Processes for III-V Materials Devices

15:50–16:20 Coffee Break

16:20–16:45 Young Huang, *Oxford Instruments Plasma Technology*
Topic: Low Damage Deposition by ICP CVD

16:45–17:10 Harm Knoops, *Oxford Instruments Plasma Technology*
Topic: Atomic Layer Deposition (ALD) for Optoelectronic Devices

17:10–17:35 David Pearson, *Oxford Instruments Plasma Technology*
Topic: Ion Beam Laser Bar Coatings

Industry Forum: Advances and Trends of Photonics Integration

Forum Time: 14:00–17:40, Friday, 10 November
Venue: The Garden Hotel, Bauhinia Room

Chair: **Yates Yao**, *President, Luster LightTech Group Corp, China*

Co-Chairs: **Jianhui Zhou**, *VP, Finisar Corporation, USA* and **Xiang Liu**, *Distinguished Scientist, Huawei Technologies, USA*

The industry forum of ACP is an excellent place where academics can learn the state of the art of the optical communications industry in terms of product, technology and market, and exchange ideas with experts from the industry.

This is the fourth time for Luster LightTech Group Corp to organize the ACP Industry forum. This year's industry forum will focus on photonics integration. Distinguished speakers from the industry will discuss the latest advances and trends of the photonic integration. The following topics will be covered in this forum:

- What are the key drivers for photonic integration in the industry?
- InP, silicon photonics, or hybrid, and why?
- What are the different roles photonic integration plays in long-haul, DCI, and intra-data center applications?

Speakers

14:00–14:20 Tao Chu, *Zhejiang University, China*
Topic: Electro-photonic Integration Technologies

14:20–14:40 Saeid Aramideh, *Ranovus, Canada*
Topic: Multi Terabit Data Center Networking Enabled by Quantum Photonics

14:40–15:00 Akimasa Kaneko, *NTT Lab, Japan*
Topic: Photonic Integration for Digital Coherent Optical Transmission

15:00–15:20 John DeMott, *Finisar, USA*
Topic Integrated Indium Phosphide Optics for Next Generation High Baud Rate Coherent Transceivers

15:30–16:00 Coffee Break

16:00–16:20 Zhiping Zhou, *Peking University, China*
Topic: Why Silicon Photonics?

16:20–16:40 Kansei Shindo, *Fujikura Ltd, Japan*
Topic: Passive Optical Components for Silicon Photonic Integrated Devices

16:40–17:00 Dong Pan, *SiFotonics Technologies Co., Ltd., USA*
Topic: High Performance Ge/Si Devices and Silicon Photonics Integration for 100G/400G Communication

17:00–17:20 Peter J. Winzer, *Nokia Bell Laboratories, USA*
Topic: ON2020 – A Global Industry Effort on Long-term Perspectives in Innovative Optical Networking Solutions

17:20–17:40 Panel Discussion
Moderator: **Yates Yao, Jianhui Zhou, Xiang Liu**

Face to Face with the Editors: To do Better Research and to Write a Better Paper (in Chinese)

Forum Time: 19:30–21:30, Saturday, 11 November
Venue: The Garden Hotel, Dahlia Room

Speakers:

Prof. Zhiping (James) Zhou, Editor-in-chief of *Photonic Research*

Dr. Xiaofeng Wang, Chief Editor of *Chinese Laser Press*