The 20th International Conference on Optical Communications and Networks (ICOCN 2022)

August 12-15 2022

Shenzhen Technology University, Shenzhen, Guangdong, China

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Welcome to the 20 International Conference on Optical Communications and Networks

It is a great pleasure to invite you to participate in the 20th International Conference on Optical Communica- tions and Networks (ICOCN2022) and share the latest news in communications and photonics science, technology and innovations from leading universities, research laboratories and companies throughout the world. ICOCN has been held annually tracing back to 2002. It is now one of the largest international conferences on optical communications, photonics and relevant technologies.

The ICOCN2022 technical conference features a full suite of plenary, invited, and contributed talks given by international academic and industrial researchers who are leaders in their respective fields. This year's conference will feature the following topics: Optical fibers and fiber-based devices; Optical transmission systems, subsystems and technologies; Networks architectures, management and applications; Optoelectronic integration and devices; Optical signal processing and microwave photonics; Optical measurements and imaging; Ultrafast photonics and nonlinear optics; Space communications, navigation & tracking; Optoelectronics based on organic and nanostructured materials; Machine learning for photonics and communications; 2D-materials based photonics; Electronic technologies and communications. With a conference program of broad scope and of the highest technical quality, ICOCN2022 provides an ideal venue to keep up with new research directions and an opportunity to meet and interact with the researchers who are leading these advances. We have over 320 presentations scheduled, including 2 keynotes and 124 invited talks made by many of the world's most prominent researchers from academia and industry. We thank all the contributors and authors for making ICOCN2022 a truly unique, outstanding global event.

There will be 36 regular technical sessions, and one post-deadline paper session. Our conference highlight is the Plenary Session scheduled on the morning of Saturday, 13 August. Two distinguished speakers will give presentations: Prof. Cun-Zheng Ning from Shenzhen Technology University will give a talk on challenges and possible solutions for light sources in optoelectronic chips. Prof. Xiaoping Zheng from Tsinghua University will give a presentation entitled by towards broadband and wide-area intelligent optical-wireless converged network for B5G and 6G.

Young Scientist Awards sponsored by Light: Science & Applications will be given to 2 young researchers with the age no more than 40 by the conference date who made outstanding contributions and present on our conference. In addition, 10 Best Student Paper Awards and 10 Best Poster Awards will be selected by the Technical committee or expert panel during the conference. All these awards will be presented during the conference banquet on the evening of Sundday, 14 August. In addition to the technical program, there will be an impressive range of exhibitions from the relevant industries, publishers and professional organizations.

We have also prepared a rich social program to facilitate meeting and networking with colleagues from so many universities and cities. On the evening of Sunday, 14 August, the Banquet and Awards Ceremony will be held for all conference registrants. Lucky-draw will be carried out for those who help us select the Best Poster Award by submitting the award ticket.

It is an enormous task to organize a conference and it is impossible to succeed without the dedicated efforts of many supporters and volunteers. We are indebted to the entire Technical Program Committee and the Subcommittee Chairs who have worked persistently throughout the whole year to invite speakers, solicit and review papers, organize the technical sessions which results in the excellent technical program. We thank the staff and volunteers from Shenzhen Technology Univ., Guangdong Univ. of Technology and China Jiliang Univ. We also thank the IEEE Photonics Society, IEEE Guangzhou Section, IEEE Photonics Society Guangdong Chapter for sponsoring the event.

Sincerely,

Ping Shum
Southern Univ. Sci. Tech.
General Chair

Shuangchen Ruan
Shenzhen Technol. Univ.
General Chair

Committees

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Subcommittees

Track 1: Optical fibers and fiber-based devices

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Yan'ge Liu, Nankai Univ., China

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Yiping Wang, Shenzhen Univ., China

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Jianzhong Zhang, Harbin Engineering Univ., China

Mingjiang Zhang, Taiyuan Univ. of Tech., China

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Yong Zhao, Northeastern Univ., China

Guiyao Zhou, South China Normal Univ., China

Pu Zhou, National Univ. of Defense Tech., China

Tao Zhu, Chongqing Univ., China

Track 2: Optical transmission systems, subsystems and technologies

Jian Chen, Nanjing Univ. of Posts and Tel., China, Chair

Songnian Fu, Guangdong Univ. of Tech., China, Chair

Jian Wu, Beijing Univ. of Posts and Tel., China, Chair

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Borui Li, Huawei Technologies Co., Ltd., China

Jianqiang Li, Beijing Univ. of Posts and Tel., China

Zhengxuan Li, Shanghai Univ., China

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Yong Liu, Univ. of Electronic Sci. and Tech. of China, China
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Periklis Petropoulos, Univ. of Southampton, UK
Ming Tang, (Huazhong Univ. of Sci. and Tech., China
Jian Wang, Huazhong Univ. of Sci. and Tech., China
Kun Xu, Beijing Univ. of Posts and Tel., China
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Lianshan Yan, Southwest Jiaotong Univ., China
Qi Yang, Huazhong Univ. of Sci. and Tech., China
Xingwen Yi, Sun Yat-sen Univ., China
Yang Yue, Nankai Univ., China
Fan Zhang, Peking Univ., China

Track 3: Networks architectures, management and applications

Jiajia Chen, KTH, Royal Inst. of Tech., Sweden, **Chair**
Gangxiang, Steven Shen, Soochow Univ., China, **Chair**
Jie Zhang, BUPT, China, **Chair**
Zuqing Zhu, Univ. of Sci. and Tech. of China, China, **Chair**
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Kim Khoa Nguyen, École de technologie supérieure, Canada
Wenda Ni, Azure Networking, Microsoft, Canada
Jelena Pesic, Nokia Bell Labs, France
Houman Rastegarfar, Univ. of Arizona, USA
Jesse Simsarian, Nokia Bell Labs, USA
Elaine Wong, Univ. of Melbourne, Australia
Wei Xu, Tsinghua Univ., China
Yongli Zhao, Beijing Univ. of Posts and Tel., China
Min Zhu, Southeast Univ., China

Track 4: Optoelectronic integration and devices

Haoshuo Chen, Nokia, USA, **Chair**
Jianguo Liu, Inst. of Semiconductors, CAS, China, **Chair**
Yaocheng Shi, Zhejiang University, China, **Chair**
Yikai Su, Shanghai Jiao Tong Univ., China, **Chair**
Xinlun Cai, Sun Yat-sen Univ., China
Po Dong, Nokia Bell Lab, USA
Xuetao Gan, Northwestern Polytechnical Univ., China
Wenhua Gu, Nanjing Univ. of Sci. and Tech., China
Ran Hao, Zhejiang Univ., China
Ho Pui Aaron HO, Chinese Univ. of Hong Kong, HK
Yong-Zhen Huang, Chinese Academy of Sci., China
Yuqing Jiao, Eindhoven Univ. of Tech., Netherlands
Mingyu Li, Zhejiang Univ., China
Liu Liu, South China Normal Univ., China
Ting Mei, Northwestern Polytechnical Univ., China
Xiaodong Pi, Zhejiang Univ., China
Minhao Pu, Technical Univ. of Denmark, Denmark
Wei Shi, Laval Univ., Canada
Yaocheng Shi, Zhejiang Univ., China
Junqiang Sun, Huazhong Univ. of Sci. and Tech., China
Xiankai Sun, Chinese Univ. of Hong Kong, Hong Kong China
Yunxu Sun, Harbin Inst. of Tech. Shenzhen Graduate School, China
Jianwei Wang, Peking Univ., China
Jin Wang, Nanjing Univ. of Posts and Tel., China
Qijie Wang, Nanyang Technological Univ., Singapore
Kevin Williams, Eindhoven Univ. of Tech., Netherland
Yang Xu, Zhejiang Univ., China
Lin Yang, Inst. of Semiconductor, CAS, China
Yu Yu, Huazhong Univ. of Sci. and Tech., China
Linjie Zhou, Shanghai Jiao Tong Univ., China
Zhiping Zhou, Peking Univ., China

Track 5: Optical signal processing & microwave photonics

Hongwei Chen, Tsinghua Univ., China, **Chair**
Jianji Dong, Huazhong Univ. of Sci. and Tech., China, **Chair**
Shiming Gao, Zhejiang Univ., China, **Chair**
Shilong Pan, Nanjing Univ. of Aeronautics and Astronautics, China, **Chair**
Amol Choudhary, Univ. of Sydney, Australia
Peucheret Christophe, Univ. of Rennes, France
Xinhuan Feng, Jinan Univ., China
Zhanghua Han, Shandong Normal Univ., China
Chaoran Huang, Princeton Univ., USA
Ming Li, Inst. of Semiconductors, CAS, China
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Christina Lim, Univ. of Melbourne, Australia
Zhixin Liu, Univ. College London, UK
Arnan Mitchell, RMIT Univ., Australia
Tigang Ning, Beijing Jiaotong Univ., China
Chester Shu, The Chinese Univ. of Hong Kong, China
Dawn Tan, Singapore Univ. of Design Tech., Singapore
Chao Wang, Univ. of Kent, England
Jian Wang, Huazhong Univ. of Sci. and Tech., China
Lianshan Yan, Southwest Jiaotong Univ., China
Lin Yang, Chinese Academy of Sci., China
Xiaoke Yi, Univ. of Sydney, Australia

Xiaoguang Zhang, Beijing Univ. of Posts and Tel., China
Xiaoping Zheng, Tsinghua Univ., China
Qunbi Zhuge, Shanghai Jiao Tong Univ., China
Weiwen Zou, Shanghai Jiao Tong Univ., China

Track 6: Optical measurements and imaging
Jun Qian, Zhejiang Univ., China, **Chair**
Junle Qu, Shenzhen Univ., China, **Chair**
Kebin Shi, Beijing Univ., China, **Chair**
Xuping Zhang, Nanjing Univ., China, **Chair**
Haiwen Cai, Shanghai Inst. of Optics and Fine Mechanics, CAS, China
Yongkang Dong, Harbin Inst. of Tech., China
Hao He, Shanghai Jiao Tong Univ., China
Wing-Cheung Law, Hong Kong Polytechnic Univ., China
Peng Li, Zhejiang Univ., China
Bin Liu, National Univ. of Singapore, Singapore
Linbo Liu, NTU Singapore , Singapore
Liwei Liu, Shenzhen Univ., China
Tongyu Liu, Laser Inst. of Shandong Academy of Sci., China
Fake Lu, State Univ. of New York, USA
Yiqing Lu, Macquarie Univ., Australia
Huilian Ma, Zhejiang Univ., China
Keiichi Nakagawa, Univ. of Tokyo, Japan
Tymish Y. Ohulchanskyy, Shenzhen Univ., China
Yingquan Peng, China Jiliang Univ., China
Anna Wang, Zhejiang Univ., China
Dongning Wang, China Jiliang Univ., China
Zhuyuan Wang, Southeast Univ., China
Peng Xi, Peking Univ., China
Xiaobo Xing, South China Normal Univ., China
Qing Yang, Zhejiang Univ., China
Yuanhong Yang, Beihang Univ., China
Baoli Yao, Xi'an Inst. of Optics and Precision Mechanics, CAS, China
Zhen Yuan, Univ. of Macau, China
Wenjun Zhou, Univ. of California Davis, USA

Track 7: Ultrafast photonics and nonlinear optics
Minglie Hu, Tianjin Univ., China, **Chair**
Jianfeng Li, Univ. of Electronic Sci. and Tech. of China, China, **Chair**
Xueming Liu, Zhejiang Univ., China, **Chair**
Jianrong Qiu, Zhejiang Univ., China, **Chair**
Shengping Chen, National Univ. of Defense Tech., China
Xianfeng Chen, Shanghai Jiao Tong Univ., China
Jae-Hoon Han, Korea Inst. of Sci. and Tech., Korea
Wei Ji, National Univ. of Singapore, Singapore
Qian Li, Peking Univ. Shenzhen Graduate School, China
Weiwei Liu, Nankai Univ., China
Xiaofeng Liu, Zhejiang Univ., China
Zhichao Luo, South China Normal Univ., China
Zhongqi Pan, Univ. of Louisiana Lafayette, USA
Mark Pelusi, Univ. of Sydney, Australia
Guanshi Qin, Jilin Univ., China
Sze Y. Set, Univ. of Tokyo, Japan
Zhi Wang, Nankai Univ., China
Fengqiu Wang, Nanjing Univ., China
Jun Wang, Chinese Academy of Sci., China
Xiaoyong Wang, Nanjing Univ., China
Kan Wu, Shanghai Jiao Tong Univ., China
Min Xiao, Nanjing Univ., China
Yun-Feng Xiao, Peking Univ., China
Peiguang Yan, Shenzhen Univ., China
Zhijun Yan, Huazhong Univ. of Sci. and Tech., China
Zuxing Zhang, Nanjing Univ. of Posts and Tel., China
Luming Zhao, Huazhong University of Science and Technology, China
Quanzhong Zhao, Shanghai Inst. of Optics and Fine Mechanics, CAS, China
Haiming Zhu, Zhejiang Univ., China

Track 8: Space communications, navigation & tracking
Nan Chi, Fudan Univ., China, **Chair**
Bo Cong, China Satellite Maritime Tracking and Control Department, China, **Chair**
Tianshu Wang, Changchun Univ. of Sci. and Tech., China, **Chair**
Jing Xu, Zhejiang Univ., China, **Chair**
Xiaoshu Bai, China Satellite Maritime Tracking and Control Department, China
Ming Chen, Beijing Research Inst. of Telemetry, China
Guangxi E, Southwest China Inst. of Electronic Tech., China
Guijun Hu, Jilin Univ., China
Xianqing Jin, Univ. of Sci. and Tech. of China
Deyong Kang, China Satellite Maritime Tracking and Control Department, China
Diqing Li, China Academy of Space Tech., China
Jing Li, Commercial Aircraft Corporation of China, China
Jianfei Liu, Hebei Univ. of Tech., China
Lilin Liu, Sun Yat-Sen Univ., China
Junshan Mu, China Satellite Maritime Tracking and Control Department, China
Chao Wang, China Academy of Space Tech., China
Yan Xia, Hunan Univ., China
Wenge Yang, Equipment Academy, China
Yifei Yang, Jiangsu Univ. of Sci. and Tech., China
Baokang Zhao, National Univ. of Defense Tech., China
Jie Zhong, Zhejiang Univ., China
Weigang Zhu, Equipment Academy, China

Track 9: Quantum photonics and applications
Xianmin Jin, Shanghai Jiao Tong Univ., China, **Chair**

Zhongxiao Man, Qufu Normal Univ., China, **Chair**
Xifeng Ren, Univ. of Sci. and Tech. of China, China, **Chair**
Shengwang Du, Hong Kong Univ. of Sci. and Tech., China
Guoping Guo, Univ. of Sci. and Tech. of China, China
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W. Steve Kolthammer, Imperial College London, UK
Jiaming Li, Shanghai Jiao Tong Univ., China
Tiefu Li, Tsinghua Univ. , China
Yanqing Lu, Nanjing Univ., China
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Lin Tian, Univ. of California Merced, USA
Guoyong Xiang, Univeristy of Sci. and Tech. of China, China
Man-Hong Yung, Southern Univ. of Sci. and Tech., China
Lijian Zhang, Najing Univ., China
Qiang Zhang, Univeristy of Sci. and Tech. of China, China
Wei Zhang, Tsinghua Univ., China

Special session 1: Optoelectronics based on organic and nanostructured materials

Wei Huang, Northwestern Polytechnical Univ., China, **Chair**
Zugang Liu, China Jiliang Univ., China, **Chair**
Michele Muccini, National Research Council, Italy, **Chair**
Pavel Brunkov, Ioffe Inst., Russia
Fred Chen, Shine Materials Technolgy Co., China
Guanglu Ge, National Center for NanoSci. and Tech., China
Xiaojun Guo, Shanghai Jiaotong Univ., China
Yizheng Jin, Zhenjiang Univ., China
Rongyin Kuang, Najing Tech., China
Zhen Li, Wuhan Univ./Tianjin Univ., China
Dongge Ma, South China Univ. of Tech., China
Hong Meng, Peking Univ., China
Junbiao Peng, South China Univ. of Tech., China
Nigel Pickett, Nanoco Technologies, UK
Lei Qian, TCL, China
Xiaowei Sun, Southern Univ. of Sci. and Tech., China
Jinshan Wang, Watrp International, USA
Lei Wang, Huazhong Univ. of Sci. and Tech., China
Guohua Xie, Wuhan Univ., China
Rongjun Xie, Xiamen Univ., China
Xuyong Yang, Shanghai Univ., China
Haibo Zeng, Nanjing Univ. of Sci. and Tech., China
Haizheng Zhong, Beijing Inst. of Tech., China
Fushan Li, Fuzhou Univ., China
Lixiang Wang, Changchun Inst. of Applied Chemistry, China
Changqi Ma, Suzhou Institue of Nano-Tech and Nano-Bionics, China
Yiqiang Zhang, Zhengzhou Univ., China
Tao Song, Soochow Univ., China

Special session 2: Machine learning for photonics and communications

Qunbi Zhuge, Shanghai Jiao Tong Univ., China, **Chair**
Yongli Zhao, Beijing Univ. of Posts and Tel., China, **Chair**
Yanni Ou, Nokia Bell Labs, Germany, **Chair**
Shuangyi Yan, Univ. of Bristol, UK
Zilong Ye, California State Univ., Los Angeles, USA
Sabidur Rahman, UC Davis, USA
Yu Wu, Google, USA
Jianqiang Li, Alibaba Group, USA
Nan Hua, Tsinghua Univ., China
Xiaosong Yu, Beijing Univ. of Posts and Tel., China
Xiaoning Zhang, Univ. of Electronic Sci. and Tech. of China
Danish Rafique, ADVA, Germany

Special session 3: 2D-materials based photonics

Weida Hu, Shanghai Inst. of Technical Physics, CAS, China, **Chair**
Kaihui Liu, Peking Univ., China, **Chair**
Hongtao Lin, Zhejiang Univ., China, **Chair**
Hua Zhang, City Univ. of Hong Kong, China
Juejun Hu, Massachusetts Inst. of Tech., USA
Anlian Pan, Hunan Univ., China
Han Zhang, Shenzhen Univ., China
Deep Jariwala, Univ. of Pennsylvania, USA
Xiaomu Wang, Nanjing Univ., China
Zhipei Sun, Aalto Univ., Finland
Baicheng Yao, Univ. of Electronic Sci. and Tech. of China, China
Yaqing Bie, Sun Yat-Sen Univ., China
Zhengqian Luo, Xiamen Univ., China
Qiaoliang Bao, Monash Univ., Australia

Special session 4: Electronic technologies and communications

Lu Zhang, China Agricultural Univ., China, **Chair**
Xin Chen, Inst. of Electronic Engineering, China Academy of Engineering Physics, China
Yinsheng Chen, Harbin Univ. of Sci. and Tech., China
Dong Guo, Liaoning Univ. of Tech., China
Shujie Mu, Yingkou Inst. of Tech., China
Bin Shen, Heilongjiang Univ. of Sci. and Tech., China
Yongyi Sun, Liaoning police academy, China
Xuemei Zheng, Northeast Electric Power Univ., China

General Information

Conference Venue: Shenzhen Technology University, Shenzhen
会议地点： 深圳技术大学

Address: No. 3002 Lantian Road, Pingshan District
地址：坪山区兰田路 3002 号

Registration

Location: 1034 Hotel, Shenzhen Technology University

Hours:

14: 00-20: 00	Friday, 12 August
08: 00-18: 00	Saturday, 13 August
08: 00-18: 00	Sunday, 14 August
08: 00-11: 00	Monday, 15 August

Speaker Preparation

All oral presenters should check in at the corresponding session room at least ten minutes prior to their scheduled talk to upload and check their presentation. **No shows of the oral presentation will be reported to Conference management and these papers will not be published.**

Poster Preparation

Authors should prepare their poster before the poster session starts. The poster must not exceed the boundaries of the poster board and **A0** (0.9m Width * 1.2m Height) size is recommended. Authors are required to be standing by their poster for the duration of their allocated session to answer questions and further discuss their work with attendees. **No shows will be reports to Conference management and these papers will not be published.**

*Poster Board Size – 1m (Width) * 2m (Height)*
Location: 1F, C-5 Teaching Building in SZTU

Poster Session 1	15:30-16:00, 13 August
Poster Session 2	10:00-10:30, 14 August
Poster Session 3	16:00-16:30, 14 August
Poster Session 4	10:00-10:30, 15 August

Exhibition

The ICOCN2022 Exhibition is open to all attendees.

Location: *Public area, 1F, Shenzhen Technology University*

Hours:

09: 00-18: 00	Saturday, 13 August
09: 00-18: 00	Sunday, 14 August
09: 00-12: 00	Monday, 15 August

Conference Materials

ICOCN2022 Technical Digest will be provided in a USB drive and not available in print form. The ICOCN2022 Technical Digest material is composed of the 3-page summaries of invited and accepted contributed papers. The Technical Digest material is included with a technical conference registration and can be found in your registration bag. The Digest will be available on IEEE Xplore Digital Library (http://www.ieee.org/web/publications/xplore/) after the conference. IEEE Xplore Digital Library is archived and indexed by INSPECR and EI Compendex, where it will be available to the international technical community.

Lunches & Dinner

Three-day buffet lunches and dinner (Aug. 13-15) in 1034 Hotel are included in the registration fee for all registered delegates. And lunch & dinner tickets are provided within the badge.

Location: *1034 Hotel, Shenzhen Technology University*

18:00-20:00	Friday, 12 August
11:00-13:30	Saturday, 13 August
18:00-20:30	Saturday, 13 August
12:00-14:00	Sunday, 14 August
12:00-14:00	Monday, 15 August

Tea & Coffee Breaks

15:30-16:00	Saturday, 13 August
10:00-10:30	Sunday, 14 August
16:00-16:30	Sunday, 14 August
10:00-10:30	Monday, 15 August

Social Events

Welcome reception

All participants are cordially invited to the Welcome Reception. It will be a great opportunity to develop a broad, deep and diverse network of personal connections with participants from all over the world. Complimentary food and beverages will be offered by Organizing Committee of ICOCN'2022. It is free to all the registered participants.

Location: Dining room, 1034 Hotel in SZTU, Shenzhen

Time: 18: 00-20: 30, 12 August

Conference Banquet and Awards Ceremony

All participants are cordially invited to the banquet. We will announce the winners of Young Scientist Awards, Best Student Paper Award and Best Poster Award. The winners will receive their certificates and awards at the ceremony. Participate in our Lucky Draw during the banquet, you may be one of the lucky winners! At the same time, you will enjoy delicacies foods. It will be an unforgettable Banquet that you will always remember with a smile.

The Banquet is included in the registration fee for all register delegates. The ticket is provided within the badge.

Location: The Century Seaview Hotel, Nan'ao

Time: 18: 30-20: 30, 14 August

Conference Highlights

Plenary Presentations

Time: 09:00-11:00, Saturday, 13 August
Venue: Room 106, C-5 Teaching Building, 1F

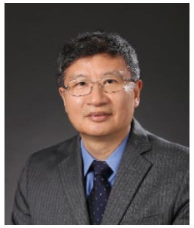
ICOCN2022 will feature three plenary presentations. The presentation will be preceded by an Opening Ceremony from 9:00-9:30. More information appear below.

Challenges and Possible Solutions for Light Sources in Optoelectronic Chips

09:30-10:15, Tuesday, 13 August

Cun-Zheng Ning
Shenzhen Technology University and Tsinghua University, China

Biography: Cun-Zheng Ning is the Director of Center for Integrated Optoelectronics and a Chair Professor at Shenzhen Technology University. He is also a Professor of Electronic Engineering at Tsinghua University. He was a professor of electrical engineering and affiliate professor in physics and materials science and engineering at Arizona State University. He received his Ph.D. in physics from the University of Stuttgart, Germany, followed by a postdoc at the University of Arizona. He was a senior scientist, nanophotonics group leader, and nanotechnology task manager at NASA Ames Research Centre (1997-2007), ISSP Visiting Professor at the University of Tokyo (2006), Visiting Professor at Technical University of Berlin and Tsinghua University (2013). His research interests include semiconductor optoelectronics including materials, physics, and devices, especially how to transition from fundamental physics and new materials to novel devices. His group was one of the first to demonstrate a plasmonic nanolaser, which was considered by the MIT Technology Review as "the first to overcome the wavelength constraints on the size of lasers". He invented and demonstrated the first white lasers which won the Top Ten Engineering Inventions of the Year from the US Magazine Popular Science. He was a winner of several awards including NASA and NASA Contractor Awards, NASA Space Act Patent Awards, CSC Technical Excellence Award, IEEE/Photonics Society Distinguished Lecturer Award, and the Alexander von Humboldt Research Award. Dr. Ning is a Fellow of the Optical Society (OSA), IEEE, and the Electromagnetic Academy. The research results of his group have been widely reported on radio, TV, other news media, and tech magazines worldwide.



Towards Broadband and Wide-Area Intelligent Optical-Wireless Converged Network for B5G and 6G

10:15-11:00, Tuesday, 13 August

Xiaoping Zheng
Tsinghua University, China

Biography: Xiaoping Zheng was born on 06/Aug/1965 at Jiangsu Province. In 1986, 1991 and 1998, He received his B.S., M.S. and Ph. D from Sun Yat-Sen University, Southeast University and Tsinghua University, respectively. Now He is a professor of Tsinghua University working on optical networks and microwave photonics.

He has authored or co-authored more than 100 papers, obtained more than 40 patents, and 3 prizes from the ministry of education, Beijing government, respectively. He is vice director of Society of Optics, Beijing.

Young Scientist Awards

2 recipients, certificate & HUAWEI ultrabook for each

To be eligible for the award, the researchers must be born after Aug.14, 1982 and the first author of the paper and register to give the oral presentation at the conference by himself/herself. The selection will be made by the TPC during the conference. Each awardee will receive a certificate of award and a HUAWEI ultrabook as prize.

Best Student Paper Awards

10 recipients, certificate & HUAWEI Pad for each

Any full-time research student, who is the first and presenting author of a full paper submitted with choosing presentation type of "Oral for Best Student Paper Award" will be eligible for this award competition. Ten winners will be selected by the ICOCN'2022 Technical Program Committee and invited to attend the conference banquet and award ceremony. Each awardee will receive a certificate of award and a HUAWEI Pad as prize.

Best Poster Paper Awards

10 recipients, certificate & HUAWEI cellphone for each

To be eligible for the award, the paper must be submitted with choosing presentation type of "Best Poster Paper Award competition". Pre-conference shortlist will be carried out based on the peer-review results by TPC/invited reviewers. The shortlisted posters will be presented during the assigned time slot and those who win the first fifteen largest number of "Best Poster Paper Award" vote tickets will be given the Best Poster Award. Certificates and prizes (HUAWEI cellphones) will be presented to the winners in the award ceremony during the conference banquet.

Banquet Lucky-draw

Every registered non-student participant will be given a Best Poster Award Voting Ticket at the registration desk when they collect the conference materials. Those who help us select the awardee candidates by writing down the poster numbers on the voting ticket and put it into the ticket collecting box during the first poster session time will get the chance to be lucky guy. Do help us by submitting your choice for the Best Poster.

Explanation of Session Codes

Sa1A.1

Day of the Week
Sa = Saturday
Su = Sunday
M = Monday

Series Number
1=First Series of Sessions
2=Second Series of Sessions

Session Designation (alphabetically)

Number (Presentation order within the session)

The first letter of the code designates the day of the week (Sa = Saturday, Su = Sunday, M = Monday). The second element indicates the session series in that day (for instance, 1would denote the first parallel session in that day). The third element continues alphabetically through a series of parallel sessions. The lettering then restarts with each new series. The number on the end of the code (separated from the session code with a period) signals the position of the talk within the session (first, second, third, etc.). For example, a presentation coded Sa1A.1 indicates that this paper is being presented on Saturday (Sa) in the first series of sessions (1), and is the first parallel session (A) in that series and the first paper (1) presented in that session.

Plenaries are noted with **Plenary**

Invited papers are noted with **Invited**

YSAs are noted with ◆

BSPAs are noted with ☼

BPPAs are noted with ✹

Saturday, 13 August						
	Room 102	**Room 103**	**Room 104**	**Room 105**	**Room 106**	**Exhibition Area**
8:00-18:00	**Registration, 1034 Hotel in SZTU,** *1F*					**Conference Exhibition**
09:00-09:30	**Opening Ceremony,** *Room 106, C-5 Teaching Building of SZTU, 1F*					
9:30-11:00	**Plenary Session,** *Room 106, C-5 Teaching Building of SZTU, 1F*					
11:00-13:30	**Lunch Break,** *1034 Hotel*					
13:30-15:30	Sa2A Fibers & fiber devices I	Sa2B Optical transmission I	Sa2C Optical networks I	Sa2D Measurement & imaging I	Sa2E Optoelectronic integration I	
15:30-16:00	**Poster Session I & Coffee Break, 1F**					
16:00-18:00	Sa3A Fibers & fiber devices II	Sa3B Optical transmission II	Sa3C Optical signal processing I	Sa3D Measurement & imaging II	Sa3E Ultrafast photonics I	
18:00-20:30	**Dinner Break**					

Sunday, 14 August						
	Room 102	**Room 103**	**Room 104**	**Room 105**	**Room 106**	**Exhibition Area**
08:00-18:00	**Registration, Lobby, 1F**					**Conference Exhibition**
08:30-10:00	Su1A Fibers & fiber devices III	Su1B Optical transmission III	Su1C Optical networks II	Su1D Measurement & imaging III	Su1E Ultrafast photonics II	
10:00-10:30	**Poster Session II & Coffee Break, 2F**					
10:30-12:00	Su2A Fibers & fiber devices IV	Su2B YSA & PDP	Su2C Optical networks III	Su2D Measurement & imaging IV	Su2E Optoelectronic integration II	
12:00-14:00	**Lunch Break,** *1034 Hotel*					
14:00-16:00	Su3A 2D-materials photonics I	Su3B Space communication I	Su3C Optical signal processing II	Su3D Organic optoelectronics	Su3E Ultrafast photonics III	
16:00-16:30	**Poster Session III & Coffee Break, 2F**					
16:30-18:00	*Local Social Visit to Nan'ao (深圳南澳)*					
18:30-20:30	**Conference Banquet & Awards Ceremony,** *(The Century Seaview Hotel, Nan'ao/南澳世纪海景酒店)*					

Monday, 15 August						
	Room 102	**Room 103**	**Room 104**	**Room 105**	**Room 106**	**Exhibition Area**
08:00-18:00	**Registration, Lobby, 1F**					**Conference Exhibition**
08:30-10:00	M1A 2D-materials photonics II	M1B Quantum communication	M1C Measurement & imaging V	M1D Machine learning I	M1E Optoelectronic integration III	
10:00-10:30	**Poster Session IV & Coffee Break, 2F**					
10:30-12:00	M2A Fibers & fiber devices V	M2B Optical transmission IV	M2C Optical networks IV	M2D Machine learning II	M2E Optoelectronic integration IV	
12:00-14:00	**Lunch Break,** *1034 Hotel*					

8:00-18:00 Registration, *1034 Hotel*

09:00-09:30 Opening Ceremony, *Room 106, C-5 Teaching Building of SZTU, 1F*

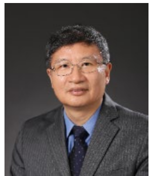
09:30-11:00, Plenary Session, *Room 106, C-5 Teaching Building of SZTU, 1F*

Presider: ***Perry Ping Shum****, Southern University of Science and Technology, China*

Sa1A.1 • 09:30 Plenary

Challenges and Possible Solutions for Light Sources in Optoelectronic Chips, Cun-Zheng Ning; *Shenzhen Technology University, China, and Tsinghua University, China.* As optical communications and networks get more complex, integrated, and to ever smaller scales, we are moving ever closer to the future of optoelectronic chips where key components of an optical system are all integrated on a chip, including especially light sources. This talk will discuss some of the most serious challenges for such on-chip light sources including size, energy efficiency, and silicon integration. More specifically, how to make semiconductor lasers smaller than the diffraction limit and more energy-efficient than 10fJ per bit of information transmitted? How to make light sources compatible with Silicon? We will try to show how potential solutions to these grand challenges could be provided by going small or nano. How one could take advantage of nanoscale semiconductor materials and devices to address these issues. The talk will overview progress made in the last 15 years and provide personal perspectives of the future. Specific materials, structures, and devices to be discussed include: 1) nanolasers based on plasmonic or metallic cavities and 2) nanolasers based on 2D transition metal dichalcogenides (TMCs) as optical gain materials for nanolasers.

Sa1A.2 • 10:15 Plenary



Towards Broadband and Wide-Area Intelligent Optical-Wireless Converged Network for B5G and 6G, Xiaoping Zheng; *Tsinghua University, China.* With the maturity and active deployment of 5G technology, the bandwidth and delay of mobile communication services have made a qualitative leap. However, with the emergence and popularization of new applications such as holographic communication, autonomous driving and high-precision industrial control, it is expected that 5G networks will reach their limits in about a decade. To break through the bottleneck, academia and industry have recently begun to study B5G and 6G technologies, with the goal of realizing the "ubiquitous wireless intelligence" vision by 2030. Optical-wireless converged network technology based on wide-area and full-spectrum perception is becoming a cornerstone of future B5G and 6G networks to meet their stringent requirements for high bandwidth, large coverage, ultra-low latency, while providing unprecedented intelligence and security. This talk will give an overview of the latest development of broadband and wide-area intelligent optical-wireless converged network and introduce some of its key technologies and results.

11:00-13:30 Lunch Break, 1034 Hotel

Room 102, Track 1

13:30-15:30
Sa2A • Fibers & fiber devices I
Presider: Shifeng Zhou, South China University of Technology, China

Sa2A.1 • 13:30 Invited

All-fiber multifunction-integrated optoelectronic devices, Fei Xu; *Nanjing Univ., China*.

Sa2A.2 • 13:50 Invited

Specialty Optical Fibers and their Additive Manufacturing, Jianzhong Zhang; *Harbin Engineering Uni.; China*.

Sa2A.3 • 14:10 Invited

Wideband remote-sensing based on Raman random fiber laser, Zinan Wang; *University of Electronic Sci. and Tech. of China, China*.

Room 103, Track 2

13:30-15:30
Sa2B • Optical transmission I
Presider: Juhao Li, Peking University, China

Sa2B.1 • 13:30 Invited

TBD, Ming Tang; *Huazhong Uni. of Sci. and Tech., China*.

Sa2B.2 • 13:50 Invited

2-D beamforming system based on few-mode fiber, Guijun Hu; *Jilin Univ., China*.

Sa2B.3 • 14:10 Invited

Recent Progress in Long-haul intermodal-MIMO-free MDM transmission Transmission, Juhao Li; *Peking Univ., China*. we present an intermodal-MIMO-free MDM transmission scheme based on weakly coupled multiple-ring-core FMF. 1800-km LP01/LP02 multiplexed transmission and 525-km LP01/LP21/LP02 multiplexed transmission only adopting 2×2 or 4×4 MIMO-DSP are experimentally demonstrated.

Room 104, Track 3

13:30-15:30
Sa2C • Optical networks I
Presider: Zuqing Zhu, University of Science and Technology of China, China

Sa2C.1 • 13:30 Invited

WSS-based all-optical data center networks, Gangxiang Shen; *Soochow Uni., China*.

Sa2C.2 • 13:50 Invited

Edge-cloud Collaborative Computing-Networking Integrated Services Provisioning in Multilayer Elastic Optical Networks, Zeyuan Yang, Rentao Gu and Yuefeng Ji; *Beijing Uni. of Posts and Tel., China*. This paper proposes a matching-based approach integrating the service information and network status, to provide computing and network resources joint allocation for edge-cloud collaboration services in multilayer elastic optical networks.

Sa2C.3 • 14:10 Invited

Physical-Layer Hardware Authentication of Imbalanced Constellation Using Deep Learning, Liuming Zhang, Xinran Huang, Zhi Chai, Zanwei Shen and Xuelin Yang; *Shanghai Jiao Tong Univ. of Tech., China*. An I/Q phase imbalance-based constellation identification scheme for physical layer authentication is proposed, where an identification accuracy of 98% is achieved numerically @SNR=15dB using residual network (ResNet).

Room 105, Track 4

13:30-15:30
Sa2D • Measurement & imaging I
Presider: Liyang Shao, Southern University of Science and Technology, China

Sa2D.1 • 13:30 Invited

Improved long-term bias stability in resonant fiber-optic gyroscope using a novel modulation technique, Huilian Ma; *Zhejiang Uni., China*. A reciprocal modulation and double demodulation technique is reported for reducing the effects of backscattering and modulation imperfections in a resonant fiber-optic gyroscope, leading to achieving a long-term bias stability of 0.2 deg/h for a test time of 45 hours.

Sa2D.2 • 13:50 Invited

Opto-Mechanical Time Domain Analysis for Distributed Measurement of Acoustic Impedance and Fiber Diameter, Yongkang Dong; *Harbin Institute of Tech., China*.

Sa2D.3 • 14:10 Invited

Dynamic strain measurement with UWFBG array based on three-step phase demodulation method, Feng Wang; *Nanjing Uni., China*.

Room 106, Track 4

13:30-15:30
Sa2E • Optoelectronic integration I
Presider: Yang Yue, Xi'an Jiaotong University, China

Sa2E.1 • 13:30 Invited

Optoelectronic design of self-driving and ambipolar nanowire photodetectors, Xiaofeng Li; *Soochow Uni., China*.

Sa2E.2 • 13:50 Invited

Silicon nanobeam cavity devices and spectrometers, Jianji Dong; *Huazhong Uni. of Science and Tech., China*. In this talk, we report silicon nanobeam cavity devices and its appications in miniaturized spectrometers.

Sa2E.3 • 14:10 Invited

Silicon hybrid integrated external cavity lasers, Linjie Zhou; *Shanghai Jiao Tong Uni., China*.

Room 102, Track 1

Sa2A.4 • 14:30 Invited

Long-Period Fiber Gratings Inscribed in the Polarization-maintaining fibers, Yunqi Liu; *Shanghai Uni., China*. We demonstrate the fabrication of long-period gratings (LPFGs) in Polarization-maintaining fibers (PMFs) by using focused carbon dioxide laser. The mode coupling and sensing characteristics of the PMF-LPFGs were investigated experimentally. The generation and conversion of the orbital angular momentum (OAM) modes were achieved by the special designed gratings. The PMF-LPFGs could have promising application as all fiber mode converters for mode-division-multiplexing optical communications and high sensitivity optical sensors.

Sa2A.5 • 14:50 Invited

Specialty Techniques for Anti-Resonant Hollow-Core Fibers, Wei Ding; *Jinan Uni., China*. The ever-increasing interests for high-performance anti-resonant hollow-core fibers (AR-HCFs) have led researchers to develop specialty fiber-optic techniques. In this talk, I will report three techniques of 'low-loss HCF interconnections', 'air-flowing induced thermal insensitivity', and 'non-invasive characterization of AR-HCFs'. The first realizations of '<0.1dB insertion loss in HCF interconnections', '>40-fold thermal sensitivity reduction relative to SSMF', and 'real-time monitoring of micro-structures with <100nm accuracy' explicitly advice that the area of HCF optics, which consists of not only application but also technique innovations, needs to be re-defined.

Sa2A.6 • 15:10 Invited

High order orbital angular momentum generator based on optical fiber device, Zhiyong Bai; *Shenzhen Univ., China*.

Room 103, Track 2

Sa2B.4 • 14:30 Invited

Secure Optical Communication Based on Private Chaotic Spectral Phase Encryption, Ning Jiang; *Uni. of Electronic Sci. and Tech. of China, China*.

Sa2B.5 • 14:50 Invited

Shaped Multi-Dimensional Modulation Formats for Optical Fiber Communication Systems, Bin Chen; *Hefei Uni. of Tech., China*. We review the design of multidimensional modulation by maximizing GMI and compare the maximum transmission reach of the recently introduced 4D formats. A nonlinear-tolerant modulation optimization based on 4D nonlinear interference model is also discussed.

Sa2B.6 • 15:10 Invited

Carrier Recovery by Number-Theoretic Net-based Bayesian Filtering in Coherent Optical, Xinwei Du; *BNU-HKBU United International College, China*. A number-theoretic net (NT-net)-based Bayesian filtering scheme is proposed for carrier recovery in coherent optical communications. The NT-net uniformly generate particles in a high-dimensional space, sampling from NT-net enables the proposed method possesses high accuracy, robustness and efficiency.

Room 104, Track 3

Sa2C.5 • 14:30 Invited

Cross-domain trust architecture: a federated blockchain approach, Hui Yang, Chao Li, Zhengjie Sun, Qiuyan Yao and Jie Zhang; *Beijing Uni. of Posts and Tel., China*. This paper proposes a federated hierarchical trust interaction (FHTI) architecture for the cross-domain IoT. FHTI combines federated learning with blockchain to propose a credible evaluation model which ensures the safety and dependability of blockchain users.

Sa2C.6 • 14:50 Invited

Energy-Efficient Resource Optimization in Collaborative Cloud-Edge Elastic Optical Networks, Shoucui Wang[1], Bowen Chen[1], Ruixin Liang[1], Ling Liu[1], Jinbing Wu[2] and Weiguo Ju[3]; [1]*Soochow University., China;* [2]*Suzhou LZY Technology Co., Ltd., China;* [3] *China Information Consulting & Designing Institute Co., Ltd., China*. We propose energy-efficient resource optimization approaches to reduce energy consumption and blocking probability in collaborative cloud-edge elastic optical networks. Simulation results show the effectiveness of our proposed approaches.

Sa2C.7 • 15:10

Sync-Sequence based Synchronization Scheme in QKD-Secured Access Networks, Aiping Liu, Xiaosong Yu and Yongli Zhao; *Beijing Uni. of Posts and Tel., China*. This paper provides a syn-sequence based synchronization scheme in quantum key distribution secure (QKD-Secured) access network scenario. Simulation shows the proposed algorithm can reduce the probability of encrypted service transmission failure caused by non-synchronization.

15:30-16:00 Poster Session 1 & Coffee Break

Room 105, Track 6

Sa2D.4 • 14:30 Invited

Fast locating of abnormal BFS change based on Edge detection assisted BOTDA, Liang Wang; *Huazhong Uni. of Sci. and Tech., China.*

Sa2D.5 • 14:50 Invited

High spatial resolution distributed sensing technology based on OFDR, Guolu Yin; *Chongqing Uni., China.*

Sa2D.6 • 15:10 Invited

Bend-resistant distributed temperature and strain discriminative sensing based on heavy Germanium-doped few-mode fiber and DPP-BOTDA, Pengbai Xu; *Guangdong Uni. of Tech., China.* Three individual Brillouin gain spectra are found in the 98mol% few-mode fiber, of which the first two show the same strain coefficient, resulting in discrimination measurement of temperature and strain. Besides, the sensor is bending-resistant.

Room 106, Track 4

Sa2E.4 • 14:30 Invited

Silicon photonic filter components for on-chip WDM networks, Yaocheng Shi; *Zhejiang Uni., China.* As silicon photonics has provided a very attractive platform to realize the high integrated intensity and low cost, various silicon-based on-chip photonic filters have been proposed and demonstrated. In this talk, we give a review of recent progresses of silicon photonic filters based on different structures, including Mach-Zehnder interferometers, photonic crystal nanobeam cavities, and waveguide Bragg grating.

Sa2E.5 • 14:50 Invited

Ultra-thin mid-infrared photonic integrated circuits, Zhenzhou Cheng; *Tianjin Uni., China.*

Sa2E.6 • 15:10

Compact and broadband polarization splitter-rotator on thin film lithium niobate with conversion-enhanced adiabatic tapers, Bigeng Chen[1], Yuan Shen[1], Ziliang Ruan[2], Liu Liu[2] and Yunjiang Rao[3]; [1]*Zhejiang Lab, China;* [2] *Zhejiang Uni., China;* [3] *Uni. of Electronic Sci. &Tech. of China, China.* A compact and broadband polarization splitter-rotator on thin film lithium niobate is proposed and experimentally demonstrated. Bandwidth of 160 nanometer covering C+L band is achieved with only 405-micrometer device length.

15:30-16:00 Poster Session 1 & Coffee Break

Poster Session 1 (Best Poster Award, 15:30-16:00)

P1.1
Ultra-broadband mode converter based on dual-resonance helical long-period fiber grating inscribed in a single-mode fiber, Min Zhou[1], Zhe Zhang[2], Laipeng Shao[3], Shen Liu[3], Yu Liu[1], Yu Pang[1], Zhiyong Bai[3] and Yiping Wang[3]; [1]*Chongqing Uni. of Posts and Tel., China;* [2]*Jinan Uni., China*; [3]*Shen Uni., China.* We reported on an oxyhydrogen-flame-induced dual-resonance HLPFG for ultra-broadband (182.0 nm @ -10 dB) OAM mode conversion. The obtained OAM mode conversion bandwidth for a SMF is, as far as we know, the broadest.

P1.2
Improving thermal stability of a closed-loop resonant fiber-optic gyroscope using a double demodulation technique, Lu Liu, Shuang Liu, Junyi Hu, Huilian Ma and Zhonghe Jin; *Zhejiang Uni., China*. This paper presents the thermal stability improvement of a closed-loop resonant fiber-optic gyroscope using a reciprocal modulation and double demodulation technique, showing stable behavior with a bias stability of 0.3 deg/h in a temperature change.

P1.3
An FBG-Based Liquid Pressure Sensor Integrated with Flange Cylinder, Junda Lao, Pengfei Zheng, Yaqi Tang, Ziwen Wang, Liuwei Wan and Chi Chiu Chan; *Shenzhen Tech. Uni., China*. A liquid pressure sensor with sensitivity of 4.417 nm/MPa in the range of 0 to 30m water level is proposed by encapsulating the FBG inside the flanged cylindrical structure with the PDMS elastic material.

P1.4
FlexE Calendar Slot Allocation Algorithm Based on Recurrent Neural Network Prediction, Yong Zhang[1], Hao Zhang[1], Huixuan Wang[1], Rentao Gu[2], Lianlian[2] Yang and Jiansong Miao[2]; [1]*State Grid Shandong Electric Power Company, China*; [2]*Beijing Uni. of Posts and Tel., China* This paper proposes a new FlexE Calendar slot allocation algorithm based on bandwidth prediction and priority weight of each slicing service. Simulations show that the algorithm can effectively improve the utilization rate of Calendar slots.

P1.5
Real-time vibration locating phase-sensitive OTDR based on envelope extraction and undersampling technique, Feihong Yu, Liyang Shao, Shuaiqi Liu, Weijie Xu, Dongrui Xiao, Huanhuan Liu and Perry Ping Shum; *Southern Uni. of Sci. and Tech.,* China. Undersampling technique is utilized to decrease the data volume, also contributing to cost reduction. Digital envelope extraction is applied to locate the vibration, and phase demodulation with undersampled data is also performed for waveform analysis.

P1.6
A method of simultaneously detecting the damage position and degree of wind turbine blades based on OFDR, Junchao Dong, Mingming Luo, Jianfei Liu and Wenrong Yang; *Hebei Uni. of Tech., China*. We proposed a method for detecting damage position and degree of wind turbine blades simultaneously based on OFDR. The spatial resolution of damage localization is 0.01m, the damage degree identification error is less than 3.4%.

P1.7
All-Optical Three-Mode Switch Based on Graphene-Embedded Vertical Directional Couplers, Lixi Zhong, Quandong Huang, Ou Xu and Yuwen Qin; *Guangdong Uni. of Tech., China*. We proposed an all-optical mode switch based on graphene-embedded vertical directional couplers, which can switch the TM10, TM01 and TM00 modes with extinction ratios higher than 16.7 dB and control-light powers lower than 1.84 mW.

P1.8
High senstivity temperature sensor based on an acrylate coated no core fiber structure, Long Yan[1], Dejun Liu[1], Ziyi Huang[1], Ke Tian[2], Changyu Shen[3] and Pengfei Wang[1]; [1]*Shenzhen Uni., China;* [2]*Harbin Engineering Uni., China;* [3]*China Jiliang Uni., China*. A high sensitivity temperature sensor based on an acrylate coated singlemode fiber-no core fiber-singlemode fiber structure (AC-SNCS) is reported.

P1.9
Femtosecond-laser microprinting of fiber-tip clamped-beam probe for high-sensitivity micro-force measurements, Mengqiang Zou, Changrui Liao and Yiping Wang; *Shenzhen Univ., China*. Here, we demonstrate for the first time the microprinting of a novel fiber-tip-polymer clamped-beam probe micro-force sensor for the examination of biological samples. Its force response was measured to be 1.51 nm/μN.

Poster Session 1 (Best Poster Award Session) 15:30-16:00

P1.10

Transmission stealth metasurface based on multilayer frame structures, Siqi Shi, Shuo Sun and Kai Yang; *China Jiliang Uni., China*. We propose a metasurface stealth device with multilayer frame structure with beam differentiation, steering and collection, so that the incident electromagnetic beam is transmitted around the stealth object without scattering, and achieves stealth at 0.9THz.

P1.11

Simple Optical Frequency Comb Generation Based on the Optoelectronic Oscillator, Xin Zhang[1], Jilin Zheng[1], Weifeng Mou[2], Jin Li[1], Tao Pu[1], Qing He[1], Jiaqi Zhao[1], Gengze Wu[1] and Shilin Chen[1]; [1]*Army Engineering Uni. of PLA, China*; [2]*National Uni. of Defense Tech., China*. The simple optical frequency comb (OFC) with tunable free spectra range (FSR) based on the optoelectronic oscillator (OEO) is proposed and experimentally demonstrated.

P1.12

Highly Sensitive Salinity/Refractive Index Sensor based on Fiber Ring Laser with Tapered Fiber, Jie Hu, Liyang Shao, Weihao Lin, Fang Zhao, Dongrui Xiao, Chenlong Xue, Jinna Chen, Huanhuan Liu and Perry Ping Shum; *Southern Univ. of Sci. and Tech., China*. A salinity and refractive index sensor based on fiber laser with tapered fiber was proposed, with sensitivity of 0.627 nm/(g/L) and 3761.2 nm/RIU, showing good potential application values in biochemical analysis and ocean monitoring.

P1.13

Surface-enhanced Raman spectroscopy for detection of nanoplastic particles, Xu Pang, Renqi Yang, Liangqiang Xu, Yang Yang and Huacai Chen; *China Jiliang Uni., China*. This paper demonstrates the detection of PS nanoplastics with a size of 100 nm by using surface-enhanced Raman spectroscopy (SERS) with gold nanoparticles. It provides an efficient method for the detection of nanoplastics.

P1.14

Optical fiber temperature sensor based on liquid crystal permeable side-hole microstructured fiber, Siming Sun, Weihao Lin, Liyang Shao, Shuaiqi Liu, Shangru Li and Perry Ping Shum; *Southern Univ. of Sci. and Tech., China*. A Sagnac interferometer temperature sensor based on liquid crystal filled side hole fiber (SHF) is designed and studied. Liquid crystal's refractive index is sensitive to temperature changes.

P1.15

A Novel Weakly Coupled Few-Mode Racetrack-Type Nested Antiresonant Fiber, Jie Ou, Jianping Li, Weiqin Zheng, Yuwen Qin, Ou Xu, Quandong Huang, Di Peng, Meng Xiang, Yi Xu and Songnian Fu; *Guangdong Uni. of Tech., China*. A weakly-coupled few-mode racetrack-type nested anti-resonant fiber is proposed and numerically studied. The LP01 and LP11 transmission with bandwidth of 800nm with maximal confinement-loss <0.4dB/km and 960nm with mode-purity >30dB has been realized through simulation.

P1.16

A Compressive Sensing Imaging System Using Multimode Fiber, Guoqing Wang[1], Fang Zhao[2], Huanhuan Liu[2], Liyang Shao[2], Chao Wang[3] and Perry Ping Shum[2]; [1]*Shenzhen Institute of Information Tech., China;* [2]*Southern Univ. of Sci. and Tech., China;* [3]*Univ. of Kent, UK.* We present a compressive sensing imaging system employing a multimode fiber. In our proposed system, the result shows a 27 × 27 pixels image is reconstructed within 500 measurements.

P1.17

High speed photonic time-stretched ADC based on dispersion-tunable CFBG, Shangru Li, Dongrui Xiao, Shuaiqi Liu, Feihong Yu, Weijie Xu, Jie Hu, Siming Sun, Liyang Shao and Qingfeng Zhang; *Southern Univ. of Sci. and Tech., China*. A single channel PTS-ADC based on dispersion-tunable CFBG is proposed to realize tunable sampling rate. 7 different sampling rates corresponding to different stretch factors are obtained. The total sampling rate is increased by 16 times.

P1.18

High sensitivity micro-vibration sensor with cascaded optical fiber gratings, Pengfei Zhang, Chao Wang, Fangjun Wang, Pengfei Zheng, Yaqi Tang, Zidan Gong and Chi Chiu Chan; *Shenzhen Tech. Uni., China*. We propose an optical micro-vibration sensor cascaded a long period fiber grating (LPFG) and a fiber Bragg grating (FBG). The sensor is constructed as a cantilever beam, and the top of it discharged to make a microsphere to increase the sensitivity. Its first-order resonant frequency is 15.7 Hz, the sensitivity at 15.7 Hz and 38.0 Hz (flat region) are 126.76 mV/g and 4.87 mV/g, the noise equivalent resolution can reach 5.9 mV.

Poster Session 1（Best Poster Award Session）15:30-16:00

P1.19

Fiber Optic Humidity Sensor Based on Michelson Interferometer Coated with Composite Film, Chenglong Wu[1], Minya Xu[2], Ye Lu[3] and Huaping Gong[3]; [1]*Ningbo Hangzhou Bay Bridge Development Co., Ltd.,* [2]*Hangzhou Bay Sea-Cross Bridge Administration, China;* [3]*China Jiliang Univ., China*. The experimental results show that the interferometer coated with 1:2 HA/PVA has the best performance, and the wavelength sensitivity is 0.1679nm/%RH in the range of 50%RH~80%RH.

P1.20

Integration Extraction Method Aided Linear Optical Sampling System, Junliang Xue, Yongjun Wang, Chao Li, Jingwen Liu, Lu Han, Qi Zhang and Xiangjun Xin; *BUPT, China*. We propose an integration extraction method aided linear optical sampling systems. Moreover, based on the optimum integration time, we demonstrated that the value of EVM can be changed from 15.80% to 14.78%.

P1.21

Fiber optic sensor for temperature and transverse load measurement based on the MZI and FPI hybrid interferometers, Tutao Wang, Bo Liu, Lilong Zhao, Yaya Mao, Jianxin Ren, Jiewen Zheng and Xuanling Liu; *Nanjing Univ. of Information Sci. & Tech., China.* A hybrid interferometer sensor for temperature and transverse load sensing is presented in this paper. Experimental results show that the sensor has the advantages of good robustness, easy to fabricate, and low cost.

P1.22

Analysis for the optimal Raman spectral detection parameter of polyethylene microplastics, Renqi Yang, Xu Pang, Wangquan Li, Yalin Chen, and Huacai Chen; *China Jiliang Uni., China*. This paper collected the Raman spectral characteristics of polyethylene(PE) microplastics under different detection parameters, and extracted the key characteristic data by mathematical model, which provides a quantitative analysis method of PE microplastics.

P1.23

Mechanism analysis and suppression method of mode hopping in high-precision interferometer fiber optic gyroscopes under large angular acceleration, Wenshuai Feng, Xiaojian Cai, Haicheng Yu, Chao Li, Haiyang Shi, Yunfei Ji and Sinan Zhang; *Beijing Aerospace Times Optical-Electronic Technology Co., Ltd China*. The mechanism of mode hopping fault is theoretically analyzed. Subsequently, a number of methods such as the structural optimization to reduce translation-rotating coupling, increasing the response bandwidth and using external reset signal, are proposed.

P1.24

Research on Non-contact Calibration Method of Extensometer Calibrator Indication Error, Bin Mao, Jingfan Wang, Yi Wang, Luqi Huang and Feng Fei; *Shaanxi Inst. of Metrology Sci., China*. A method based on laser interference principle was used to calibrate indication error of the extensometer calibrator. The method is simple and results show that the measurement uncertainty is better than the gauge block method.

P1.25

Design of Plant Light Compensation System based on Bluetooth, Yongming Chen, Shun Zhou, Huihua Ji and Huacai Chen; *China Jiliang Univ., China*. We designed a plant light supplementation system by using multi-LEDs combined with Bluetooth, to achieve adjustable brightness and light quality light source.

P1.26

Research on the Compensation Scheme for Spectral Power Tilt from Stimulated Raman Scattering in Multi-Band transmission system, Yuyan Wu, Feng Tian, Zhuo Lin, Yu Gu, Jue Wang, Qi Zhang, Qinghua Tian and Yongjun Wang; *Beijing Uni. of Posts and Tel., China*. The optimization scheme for compensating spectral power tilt is demonstrated in multi-band System, which using Raman amplifier and Partition Particle Swarm Optimization algorithm. The results show that power offset is decreased from 1.3mW to 0.12mW.

P1.27

A Multi-focus Image Fusion System for LED Detection, Bishen Wang, and Honglin Liu; *China Jiliang Uni., China*. Through collecting multiple micro-LED chip images and fusing them into a sharp image, the problem that the depth of field of microscope is too small to observe micro-LED chip is solved.

Poster Session 1 (Best Poster Award Session) 15:30-16:00

P1.28

Measurement of Longitudinal Resonance Frequency of Photoacoustic Cells, Jialong Zhang, Ziqiang Meng, and Wei Li; *Huazhong Univ. of Sci. and Tech., China*. The resonance frequency of the first-order longitudinal photoacoustic cell in different external environments was measured by resonance acoustic spectroscopy.

P1.29

Research on bandwidth suppression based on dual-channel time-sharing detection, Hanfeng Xu, Hong Zhang and Yueyang Chen; *Hangzhou Institute of Applied Acoustics, China*. A method of bandwidth suppression based on dual-channel time-sharing detection is proposed, which can suppress the back-ground noise of the fiber optic hydrophone system.

P1.30

Energy efficiency optimization of heterogeneous network resources based on OFDMA, Liwei Yang, Boyu Jia, Fang Wang, and Maiyun Zhang; *China Agricultural Uni., China;* An improved bat algorithm is proposed to increase the energy efficiency of macro/femtocell heterogeneous networks based on OFDMA. Simulation results indicate that the algorithm enhances the optimization ability and convergence speed in later stages.

P1.31

Nonlinear Compensation based on Function Link Neural Network in Underwater Visible Light Communicaion System, Ruizhe Jin, Xianhao Lin, Jifan Cai, Guojin Qin and Nan Chi; *Fudan Uni., China*. A UVLC system based on 64APSK constellation using a FLNN as post-equalization is proposed and demonstrated. Compared with LMS equalization, it has a maximum 98% dynamic range of signal Vpp improvement and achieves 2.21Gbps data-rate.

P1.32

Precise Nanoruler for Retrieving Asymmetry of Fano-Resonant Metasurfaces by Second-Harmonic Generation, Yiwen Liu, Lili Gui and Kun Xu; *Beijing Uni. of Posts and Tel., China*. We demonstrate that second-harmonic generation (SHG) can be a very useful tool to quantitatively reflect the structural asymmetry of Fano metasurfaces with high sensitivity.

P1.33

Recent Advances in Power Domain Multiplexing /Access for Flexible Optical Access Network, Yun Shi, Qi Zhang, Xiangjun Xin, Ran Gao, Qinghua Tian, Xishuo Wang, Rongzhen Xie, Feng Tian, Yongjun Wang and Leijing Yang; *Beijing Univ. of Posts and Tel., China*. A phase noise estimation method based on blind phase search is proposed. It is verified in a 40Gbaud CO-OFDM transmission system. Compared with the original algorithm, this algorithm reduces the computational complexity without performance degradation.

P1.34

The Effects of Power Ratios for the Joint NOMA and OFDMA Scheme in IM/DD PON System, Rui Xu, Junjie Si and Zugang Liu; *China Jiliang Uni., China*. we develop a simple method of inserting an insulating layer between the cesium copper halides and the HIL to reduce exciton quenching by the HIL and achieve more balanced charge injection into the emissive layer.

P1.35

Measurement of Carbon Dioxide by Near-infrared Cavity Ring-down Spectroscopy, Pengbing Hu, Sunqiang Pan, Chonghui Cheng, Haiyang Qi, Sumei Liu and Ning Chen; *Zhejiang Institute of Metrology, China*. A compact continuous-wave cavity ring-down spectroscopy sensor was developed for measurement of carbon dioxide. The sensor had a minimum detection limit of 1ppm ranging from 0ppm to 500ppm, with potential application in greenhouse gases monitoring.

Room 102, Track 1

16:00-18:00
Sa3A • Fibers & fiber devices II
Presider: Fei Xu, Nanjing University, China

Sa3A.1 • 16:00 Invited

Active Fibers for Broadband Optical Amplification, Shifeng Zhou; *South China Uni. of Tech., China*.

Sa3A.2 • 16:20 Invited

Advance in high power narrow linewidth fiber lasers, Pu Zhou; *National Uni. of Defense Tech., China*.

Sa3A.3 • 16:40 Invited

All-solid fluorotellurite fibers and their applications, Guanshi Qin; *Jilin Univ., China*.

Room 103, Track 2

16:00-18:00
Sa3B • Optical transmission II
Presider: Ming Tang, Huazhong University of Science and Technology, China

Sa3B.1 • 16:00 Invited

Generation of vector field with prescribed correlation structure, Yangjian Cai; *Shandong Normal Uni. & Soochow Uni., China*. Spatial coherence and polarization are intrinsic properties of a light field and plays crucial roles in determining the light beam propagation and light-matter interaction. By elaborately tailoring the complex spatial coherence structure and polarization state of a partially coherent beam, the desired beam profile and novel propagation feature can be generated. In this talk, we will introduce recent theory and experiment on generation of vector field with prescribed correlation structure.

Sa3B.2 • 16:20 Invited

Beyond 200 Gbps Photonics-enabled Transparent Fiber-THz-Fiber Real-time Transmission System, Min Zhu; *Southeast Uni., China*.

Sa3B.3 • 16:40 Invited

Hardware-Efficient Blind Frequency Offset Estimation for Spectral-efficient Digital Subcarrier Multiplexing Systems, Meng Xiang; *Guangdong Uni. of Tech., China*.

Room 104, Track 5

16:00-18:00
Sa3C • Optical signal processing I
Presider: Pu Li, Taiyuan University of Technology, China

Sa3C.1 • 16:00 Invited

Performance improvement of free-space optical communications based on optical phase conjugation, Shiming Gao; *Zhejiang Uni., China*.

☼Sa3C.2 • 16:20

An Adaptive Diagonal Extended Kalman Filter based on a Residual Decision for RSOP in Coherent Optical Communication System, Xiaoyi Peng, Qinghua Tian, Fangxu Yang, Xiangjun Xin, Zhipei Li, Qi Zhang, Feng Tian and Yongjun Wang; *Beijing Uni. of Posts and Tel., China*. This paper proposes an adaptive diagonal extended Kalman filter scheme based on a residual decision suitable for tracking and compensating the RSOP by adding a residual decision detector and diagonalizing the covariance matrix.

☼Sa3C.3 • 16:35

Direct demodulation of high spatial resolution vibration signals based on ϕ-OTDR by precise signal delay, Peichao Chen, Jianqiao Lei and Xiaopeng Dong; *Xiamen Uni., China*. Rayleigh scattering based phase-sensitive optical time domain reflectometry (ϕ-OTDR) system has an irreplaceable role in long-range vibration monitoring, and how to further achieve low-cost of vibration is of great importance in practical engineering applications.

Room 105, Track 6

16:00-18:00
Sa3D • Measurement & imaging II
Presider: Huilian Ma, Zhejiang University, China

Sa3D.1 • 16:00 Invited

Optical Sensing System Based on Ring-core Fiber, Changyuan Yu; *The Hong Kong Polytechnic Uni., China*. We review our recent work on optical fiber sensing system based on ring-core fiber (RCF), which can be applied for monitoring multiple parameters, including temperature, refractive index (RI), curvature, and human breath.

Sa3D.2 • 16:20 Invited

High stable wavefront shaping multimode fiber imaging and integrated multifunctional sensing, Qing Yang; *Zhejiang Uni., China*. In this presentation, we propose our recent work on high stable multimode fiber imaging. Wavelength modulation, omnidirectional wavevector modulation and disorder tracking were introduced to achieve high stable high resolution imaging.

Sa3D.3 • 16:40 Invited

AI-Driven Distributed Acoustic Sensing Technology and Applications, Liyang Shao; *Southern Uni. of Sci. and Tech., China*.

Room 106, Track 7

16:00-18:00
Sa3E • Ultrafast photonics I
Presider: Hualong Bao, Soochow University, China

Sa3E.1 • 16:00 Invited

Carbon Nanotube Mode-locked Erbium-doped Fiber lasers, Chengbo Mou; *Shanghai Uni., China*.

Sa3E.2 • 16:20 Invited

High-power ultrashort mid-infrared fiber lasers, Chunyu Guo; *Shenzhen Uni., China*.

Sa3E.3 • 16:40 Invited

Experimental and numerical study of all polarization-maintaining high repetition rate linear-cavity fiber lasers, Qian Li; *Peking Uni. Shenzhen Graduate School, China*.

Room 102, Track 1

Sa3A.4 • 17:00 **Invited**

Functional fiber lasers for optical information applications, Weili Zhang; *Uni. of Electronic Sci. and Tech. of China, China.*

Sa3A.5 • 17:20 **Invited**

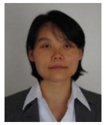
Orbital Angular Momentum (OAM) Recognition with Generative Models, Zuxing Zhang; *Nanjing Univ. of Posts and Tel., China.*

Sa3A.6 • 17:40

Ultra-narrow linewidth Brillouin laser, Hualong Bao, Mingzhao Chen and Zhexin Zhang; *Soochow Univ., China*. The paper demonstrates a stimulated Brillouin scattering laser with ultra-narrow linewidth and high stability assisted by optical injection locking. Our experimental result shows that a spectral width of ~10 Hz is achieved.

Room 103, Track 2

Sa3B.4 • 17:00 **Invited**



Probabilistically Shaped High-order QAM Coherent Optical, Fengchu Cao, Mingyi Gao, Weidong Shao, Xiaodi You and Gangxiang Shen; *Soochow Uni., China*. Probabilistically shaped (PS) high-order QAM coherent optical communication is attractive for large-capacity fiber transmission due to its high spectrum efficiency and sensitivity. In this work, we present its principle and key features in detail.

Sa3B.5 • 17:20 **Invited**

Non-uniformly correlated light and its applications, Jiayi Yu; *Shandong Normal Uni., China*. Coherence is an important property of laser beam. Laser beam with low spatial coherence named partially coherent beam and it with prescribed non-uniform correlation structure exhibits many interesting properties. In this talk, we will introduce recent development on generation and applications of partially coherent beams with prescribed non-uniform correlation structure.

Sa3B.6 • 17:40

Signal processing method for high-speed optical communication system, Qi Zhang; *Beijing Uni. of Posts and Tel., China.*

Room 104, Track 5

Sa3C.4 • 16:50

Fast and multi-band RCS measurement based on a microwave photonic inverse synthetic aperture radar, Chenkai Meng, Xiangchuan Wang, Cong Ma, Jiangtao Zhang, Yue Yang and Shilong Pan; *Nanjing University of Aeronautics and Astronautics, China*. A scheme for fast and multi-band RCS measurement based on microwave photonic ISAR imaging is proposed with measurement precision of 0.5 dBsm and measurement speed of 70 ms per time.

Sa3C.5 • 17:05

Multi-access RF transfer with passive phase correction, Chaosheng Huang, Xiangchuan Wang, Xi Liu, Xin Jiang, Shangzhe Xu, Cong Ma and Shilong Pan; *Nanjing Uni. of Aeronautics and Astronautics, China*. A multi-access RF transfer method with passive phase correction is proposed to achieve phase-stable RF signal distribution. A 5-GHz RF signal is transmitted to two nodes with residual phase jitters less than 1.59 ps.

Sa3C.6 • 17:20

Performance enhancement of an optically injected semiconductor laser-based LFM waveform generator by dual-loop optoelectronic feedback, Renheng Zhang, Pei Zhou, Jian Zhu and Nianqiang Li; *Soochow Uni., China*. An approach to enhancing the performance of an optically-injected-semiconductor-laser-based linear frequency-modulated (LFM) waveform generator is demonstrated by dual-loop optoelectronic feedback. Generation of LFM waveforms with large bandwidth, high comb contrast and narrow linewidth are achieved.

Sa3C.7 • 17:35

Wideband phase noise measurement of microwave signals based on all-optical microwave signal processing, Yifeng Xie, Pei Zhou, Zhidong Jiang and Nianqiang Li; *Soochow Uni., China*. A scheme for wideband microwave phase noise measurement is proposed based on all-optical microwave signal processing. In the experiment, accurate, high-sensitivity phase noise measurement is achieved in a frequency range of 10-35 GHz.

18:30-20:30 Conference Dinner

Room 105, Track 6

Sa3D.4 • 17:00 Invited

Humidity and temperature discriminative sensing via dual self-growing polymer microtips on a multicore fiber, Limin Xiao; *Fudan Uni., China*.

Sa3D.5 • 17:20 Invited

Research progress of quantitative phase measurement technology for dynamic visualization measurement of shock wave field, Jianglei Di; *Guangdong Uni. of Tech., China*. This report reviews the basic principles of digital holographic interferometry, discusses its optical path structure characteristics and basic implementation methods, and discusses its application in complex flow field measurement, etc.

Sa3D.6 • 17:40 Invited

Sapphire Fiber Bragg Grating High-Temperature Sensors, Jun He; *Shenzhen Uni., China*.

Room 106, Track 7

Sa3E.4 • 17:00 Invited

Spatiotemporal mode-locked multimode fiber lasers: recent progress and the future trend, Xiaosheng Xiao; *Beijing Uni. of Posts and Tel., China*.

Sa3E.5 • 17:20 Invited

Nonlinear photonics in silicon fibers and waveguides, Li Shen; *Huazhong Uni. of Sci. and Tech., China*.

Sa3E.6 • 17:40 Invited

Diversity of multimode nonlinear optical effects in unconventional fibers, Jinhui Yuan; *Uni. of Sci. & Tech. Beijing, China*. Here we present some peculiar multimode nonlinear effects in unconventional fibers. These effects include spatial multimode solitons in hollow-core fibers, multimode pulse synchronization with noninstantaneous nonlinearity and multimode soliton states in tapered photonic crystal fibers.

18:30-20:30 Conference Dinner

Room 102, Track 1

08:30-10:00
Su1A • Fibers & fiber devices III
Presider: Jianzhong Zhang, Harbin Engineering University, China

Su1A.1 • 08:30 **Invited**

Four core fibers and devices, Lin Ma; *Shanghai Jiao Tong Uni., China*. We demonstrate the design and fabrication of both uncoupled and coupled four core fibers with square lattice structure and compatible fused taper type all-fiber fan-in/fan-out devices with high precision and low insertion loss.

Su1A.2 • 08:50 **Invited**

Fiber gratings integrated with layered materials for optical modulation and sensing applications, Biqiang Jiang; *Northwestern Polytechnical Uni., China*.

☼**Su1A.3 • 09:10**
A Fiber Design Automation Platform Based on Deep Learning, Zhiqin He, Xinyi Chen, Jiangbing Du and Zuyuan He; *Shanghai Jiao Tong Univ., China.* An optical fiber design automation platform based on deep learning is built. It supports the fast, accurate and flexible design of weak-coupling few mode fiber, with arbitrary dispersion single mode fiber and so on.

Room 103, Track 2

08:30-10:00
Su1B • Optical transmission III
Presider: Meng Xiang, Guangdong University of Technology, China

Su1B.1 • 08:30

High order QAM modulation based on constellation optimization with intelligent algorithm, Jianfei Liu; *Hebei Uni. of Tech., China*.

☼**Su1B.2 • 08:50**
Real-Valued Neural Network Nonlinear Equalization with QAM Signal Combined with SSB Modulation., Zhiwei Chen, Wei Wang, Dongdong Zou, Xingwen Yi, Zhaohui Li, Fan Li and Weihao Ni; *Sun Yat-Sen Uni., China*. Real-valued neural network equalization combined with SSB modulation is proposed in order to mitigate fiber nonlinearity in complex-valued signals without increased complexity, which enables a transmission of 80 Gbit/s 16-QAM SSB signal over 560-km SMF.

☼**Su1B.3 • 09:05**
Decision Region Partition Aided Maximum Likelihood Sequence Estimation Enabled O-Band 120Gbit/s PAM-4 Transmission with Severe Bandwidth Constraint., Weihao Ni, Mingzhu Yin, Dongdong Zou, Wei Wang, Xingwen Yi, Zhaohui Li and Fan Li; *Sun Yat-Sen Uni., China*. A simplified MLSE with decision region partition is investigated in a severe bandwidth-limited IM/DD system. Compared to conventional MLSE, the proposed scheme can reduce 93% total computational complexity with negligible ROP penalty at HD-FEC threshold.

Room 104, Track 3

08:30-10:00
Su1C • Optical networks II
Presider: Mingyi Gao, Soochow University, China

Su1C.1 • 08:30 **Invited**

Leveraging Heterogeneous NFV Platforms for QoS-aware Reconfiguration of vNF Service Trees, Tingyu Li and Zuqing Zhu; *Uni. of Sci. and Tech. of China, China*. We study how to realize quality-of-service aware reconfiguration of virtual network function service trees over the heterogeneous NFV platforms that include virtual machines, docker containers, and programmable data-plane switches, and propose an effective heuristic algorithm.

☼**Su1C.2 • 08:50**
A Hybrid Centralized and Distributed Concurrent Signaling Delivery Scheme in Large-Scale Networks of F5G, Aonan Li[1], Yongli Zhao[2], Xin Li[1], Hongzhen Yang[2] and Jiale He[2]; [1]*Beijing Uni. of Posts and Tel., China*; [2]*State Grid Zhejiang Electric Power Corporation Information & Telecommunication Branch, China*. We propose a hybrid centralized and distributed concurrent signaling delivery scheme based on path segmentation. It can reduce signaling delay and signaling overhead of concurrent path construction in F5G.

☼**Su1C.3 • 09:05**
A Parallel Routing Convergence Mechanism Based on Centralized and Distributed Collaboration for F5G Large-Scale Optical Networks, Guanping Shang[1], Yongli Zhao[1], Hongzhen Yang[2] and Jiale He[2]; [1]*Beijing Uni. of Posts and Tel., China*; [2]*State Grid Zhejiang Electric Power Corporation Information & Telecommunication Branch, China.* A parallel routing convergence mechanism based on centralized and distributed collaboration (CDC-PRC) is proposed for F5G large-scale optical network. Simulation results show that CDC-PRC can reduce convergence time under the network with 1080 nodes.

Room 105, Track 6

08:30-10:00
Su1D • Measurement & imaging III
Presider: Feng Wang, Nanjing University, China

Su1D.1 • 08:30 Invited

Chromatic dispersion sensitized ultra sensitive interferometer, Rende Ma; *Qufu Normal Uni., China*. We theoretically and experimentally research into the sensitization of wave front splitting Mach-Zehnder interferometer (MZI) based on chromatic dispersion. It is demonstrated that chromatic dispersion plays key role in improving the refractive index sensitivities (SRI). SRI can reach infinity on either side of a critical point. As an example, a MZI working near the critical point of infinite SRI is realized, achieving an ultra-high sensitivity. Much higher sensitivity can be obtained by matching the RI, thickness and chromatic dispersion of wave front splitter and sample. It is worth noting that chromatic dispersion can also induce SRI to vary nonlinearly with the sample RI.

☼Su1D.2 • 08:50
Bi-directional liquid level fiber optic sensor based on a cascaded hollow core fiber structure, Ziyi Huang[1], Dejun Liu[1], Long Yan[1], Qiang Wu[2], Ke Tian[3], Changyu Shen[4] and Pengfei Wang[1]; [1]*Shenzhen Uni., China*; [2]*Northumbria Uni., UK*; [3]*Harbin Engineering Uni., China*; [4] *China Jiliang Uni., China*. A high sensitivity bi-directional liquid level sensor based on a single mode fiber-hollow core fiber (core diameter of 30 μm)-hollow core fiber (core diameter of 20 μm)-single mode fiber structure is reported.

☼Su1D.3 • 09:05
High resolution fiber optic strain rate sensing based on a differentiating interferometer, Huicong Li, Wenzhu Huang, Wentao Zhang and Jianxiang Zhang; *Institute of Semiconductors, CAS, China*. A high resolution dynamic resolution fiber optic strain rate sensing system is presented. It has a flat response to strain rate, a high resolution of nano-ε/s, and a dynamic range greater than 100 dB.

Room 106, Track 7

08:30-10:00
Su1E • Ultrafast photonics II
Presider: Chengbo Mou, Shanghai University, China

Su1E.1 • 08:30 Invited

Ultrafast pulsed laser generation by nonlinear optical gain modulation, Yan Feng; *Shanghai Institute of Optics and Fine Mechanics, CAS, China*. Femtosecond pulsed laser is generated from CW single frequency laser by nonlinear optical gain modulation in a fiber Raman amplifier. By cascading the process, ultrafast pulses can be produced over wide spectral range.

Su1E.2 • 08:50 Invited

Coherent Brillouin random fiber lasers: recent advances from fundamentals to application, Liang Zhang; *Shanghai Uni., China.*

Su1E.3 • 09:10 Invited

Micro-comb generation based on FD-FWM, Hualong Bao; *Soochow Uni., China.*

Room 102, Track 1

Su1A.4 • 09:25
Thermally Stable Refractometer Using Capillary-Based Structural Long-Period Gratings, Mengxue Tang[1], Yunhe Zhao[1], Ziyang Hua[1], Shiqi Chen[1], Yongsheng Yang[1], Yunqi Liu[2] and Zuyuan He[3]; [1]*Shanghai Maritime Uni., China*; [2]*Shanghai Uni., China;* [3] *Shanghai Jiao Tong Uni., China.* We propose a thermally stable refractometer based on capillary with arc-discharge-induced structural long-period gratings. The measured refractive index (RI) sensitivity could be up to 8409.2 nm/RIU in the RI region of 1.435-1.443.

Su1A.5 • 09:40
Low-Loss and Low-Crosstalk Fan-in/Fan-out Device for Multicore Fiber Using a Femtosecond Laser Direct Inscription Technique, Zixiang Dai, Junjie Xiong, Lin Ma and Zuyuan He; *Shanghai Jiao Tong Uni., China.* We demonstrate a low-loss and low-crosstalk fan-in/fan-out device for three-core fiber using femtosecond laser direct inscription. The fabricated FI/FO device has an averaged insertion loss of 1.33 dB and a crosstalk smaller than -49 dB.

Room 103, Track 2

Su1B.4 • 09:20
Digital Coherent Fronthual Employing Sample Bits Interleaving and Uneven 16-QAM., Xi Chen, Jiaji Li, Yixiao Zhu, Longjie Yin, Qunbi Zhuge and Weisheng Hu; *Shanghai Jiao Tong Uni., China.* We propose and experimentally demonstrate a digital coherent fronthaul system exploiting sample bits interleaving and uneven 16-QAM. The results indicate that 6dB EVM sensitivity enhancement can be achieved compared with standard 16-QAM.

Su1B.5 • 09:35
Number-Theoretic Net-Based Particle Filtering for Linear Phase Noise Tracking in CO-OFDM Systems., Yangfan Xu[1], Xinwei Du[1], Shuai Liu[1] and Changyuan Yu[2]; [1]*BNU-HKBU United International College, China*; [2]*The Hong Kong Polytechnic Uni., China.* A number-theoretic net-based particle filter is proposed to dynamically estimate the linear phase noise for CO-OFDM systems. The dynamic tracking performance, efficiency and robustness of NT-PF is verified in an 89 Gb/s 16-QAM CO-OFDM system.

Su1B.6 • 09:50
3D NLOS VLP by A Single Image Sensor and Two Virtual LEDs, Tianming Huang[1], Bangjiang Lin[2], Ningcong Jiang[1], Qiwei Lai[2], Jiabin Luo[2], Lingfeng Dai[2], Zhuo Huang[2] and Zabih Ghassemlooy[3]; [1]*Fuzhou Uni., China;* [2]*Haixi Institutes, CAS,* China; [3]*Northumbria Uni., UK.* A 3D NLOS VLP using two virtual LEDs and an image sensor is proposed for the first time. Experiments results show that it can achieve 90th percentile accuracies of less than 22 cm.

Room 104, Track 3

Su1C.4 • 09:20
Fault Recovery of Network Slice based on Cloud and Optical Integration, Ke Tian[1], Yongli Zhao[1], Zhuotong Li[1], Liwei Kuang[2] and Jie Zhang[1]; [1]*Beijing Uni. of Posts and Tel., China.* [2]*FiberHome Telecommunication Technologies Co., LTD, China*. This study proposes the joint slice fault recovery (JSFR) algorithm that recovers the fault of cloud and optical with global vision. Compared with traditional algorithms, JSFR algorithm can effectively reduce the blocking rate.

Su1C.5 • 09:35
Link Planning Schemes for Uninterrupted Inter-layer Communication in Dual-layer LEO Optical Satellite Networks, Haorui Dang, Yongli Zhao, Yinji Jing, Hua Wang, Wei Wang and Jie Zhang; *Beijing Uni. of Posts and Tel., China.* We design an inter-layer links planning model in the dual-layer LEO constellation. And we propose two link planning schemes (i.e., the link switching scheme and the permanent link scheme) to achieve uninterrupted inter-layer communication.

Su1C.6 • 09:50
Key Provisioning in QKD-enhanced Internet of Things (IoT), Yueqiao Li, Xiaosong Yu, Qingcheng Zhu, Yongli Zhao and Jie Zhang; *Beijing Uni. of Posts and Tel., China*. In the scenario of QKD enhanced IoT, a novel gateway model and a quantum key resource diversion method are proposed. Simulation shows that it has good performance in key supply on the edge of IoT.

10:00-10:30 Poster Session 2 & Coffee Break

Room 105, Track 6

Su1D.4 • 09:20

High accuracy bend sensing of soft robots based on FBG and ANN, Ziyan Zhao, Minghui Niu, Jiayuan Min, Jie Hu, Muxing Zheng, Huanhuan Liu, Dan Luo, Liyang Shao and Perry Ping Shum; *Southern Uni. of Sci. and Tech., China*. We demonstrated a FBG sensor measuring the bend radius of soft robot with good repeatability, in which ANN is used for data analysis. Our results show that this FBG sensor can provide high-accurate measurement.

Su1D.5 • 09:35

Strain monitoring system of pile foundation in Wharf siltation area based on Fiber Bragg grating, Jingkun Ai, Jiawang Chen, Chunyue Zhang and Kaichuang Wang; *Zhejiang Uni., China*. This paper introduces the design and implementation of a pile foundation strain monitoring system using Fiber Bragg Grating strain sensor. The overall structure, principle, simulation, and calibration results are introduced.

Su1D.6 • 09:50

Closed-loop Resonant Fiber-Optic Gyroscope based on a broadband source, Shuang Liu[1], Junyi Hu[1], Lu Liu[1], Qingwen Liu[2], Huilian Ma[1] and Zuyuan He[2]; [1]*Zhejiang Uni., China*; [2] *Shanghai Jiao Tong Uni., China*. This paper presents a closed-loop resonant fiber- optic gyroscope with a broadband source. In the experiment, a bias stability of 0.008°/h is successfully demonstrated with a 100m-long fiber-optic ring resonator of 7.6 cm diameter.

Room 106, Track 7

Su1E.4 • 09:30

Characteristic extraction of soliton dynamics based on convolutional autoencoder neural network, Congcong Liu, Jiangyong He, Pan Wang, Fengkai Zhou, Jin Li, Kun Chang, Yange Liu and Zhi Wang; *Nankai Uni., UK.* We use CAENN to reduce the data dimensioning to rebuild solitons dynamics. we find there is a strict correspondence between the number of minimum compression parameters and the number of independent parameters of soliton interaction.

Su1E.5 • 09:45

Ultra-low jittering of soliton molecular binding separation towards few hundreds of attoseconds, Defeng Zou, Zeqing Li, Youjian Song and Minglie Hu; *Tianjin Uni., China*. We utilize optical cross-correlation technique to probe intra-soliton-molecular motion with unprecedentedly attosecond resolution. We achieve ultra-low jittering of soliton molecular binding separation of 490 as in a stationary soliton molecule with 0.52 ps pulse separation.

10:00-10:30 Poster Session 2 & Coffee Break

Poster Session 2 (10:00-10:30)

P2.1

Highly-integrated microwave photonic bandpass filter with widely tunable range, Yuhan Yao, Yuhe Zhao, Jianji Dong and Xinliang Zhang; *Huazhong Uni. of Sci. and Tech., China*. We report a highly-integrated microwave photonic filter with wide-frequency tunable range. Both active and passive components are integrated on silicon-on-insulator platform. This marks a solid step towards the implementation of an on-chip microwave signal processor.

P2.2

Modulation Format Identification for Coherent Optical Communication Systems Based on Long Short-Term Memory Networks, Xingle Chang[1], Zhipei Li[2], Qi Zhang[1], Yuan Gao[1], Yongjun Wang[1], Qinghua Tian[1], Feng Tian[1] and Xiangjun Xin[2]; [1]*Beijing Uni. of Posts and Tel., China;* [2]*Beijing Institute of Tech., China*. In this paper, we have proposed a modulation format identification scheme based on LSTM, which directly extracts features from the raw IQ data samples without any other manual feature extraction and data statistics.

P2.3

A PAPR Reduction Scheme for OOFDM System with Optimized Constellation Extension, Jingran Wang[1], Qi Zhang[1], Ran Gao[2], Xishuo Wang[1], Xiangjun Xin[1], Feng Tian[1], Qinghua Tian[1] and Yongjun Wang[1]; [1]*Beijing Uni. of Posts and Tel., China;* [2]*Beijing Institute of Tech., China*. To solve the problem of increasing BER caused by high PAPR, an OOFDM system with OCE is proposed to reduce PAPR. The results show that the PAPR performance and BER performance has improved.

P2.4

A RSA Policy with Failure Probability Based on Reinforcement Learning in Multi-band Optical Network, Ligang Zhao, Shan Yin, Yutong Chai, Yurong Jiao and Shanguo Huang; *Beijing Uni. of Posts and Tel., China*. In this paper, we propose an RSA policy for multi-band elastic optical networks, which is based on reinforcement learning algorithm. The experimental results show it can reduce the failure probability of the multi-band optical network.

P2.5

Theoretical analysis of atmospheric channel refraction in deep space laser communication, Luhe Zhang, Zhenchong Xing, Shaobo Li and Wei Wang; *The 54th research Institute of CETC, China*. We use a polynomial fitting method to optimize the atmospheric refraction model. The error is reduced by an order of magnitude, which can greatly improve the laser alignment efficiency in practical applications.

P2.6

Study on temperature-dependent performance of polarization maintaining fiber used in all-fiber current transformer, Gang Jie Lou and Li Xia; *Huazhong Uni. of Sci. and Tech., China*. Aiming at PMF which are commonly used in FOCT, the influence of temperature on extinction ratio and polarization degree of polarization maintaining fiber is simulated and experimented under the condition of temperature change.

P2.7

A Resnet-based adaptive compensation for orbital angular momentum optical wireless communication, Yiqian Ma[1], Huan Chang[2], Qi Zhang[1], Ran Gao[2], Xiangjun Xin[2], Qinghua Tian[1], Feng Tian[2] and Sitong Zhou[1]; [1]*Beijing Uni. of Posts and Tel., China;* [2]*Beijing Institute of Tech., China*. A Resnet-based adaptive optics (Resnet-AO) technique is proposed for compensating the turbulence-induced distorted OAM beam. Simulation results show that the proposed Resnet-AO technique can compensate the OAM beam with high accuracy.

P2.8

The measurement methods of time code equipment, Xiaoqing Shen; *China Satellite Maritime Tracking and Control Department, China*. Based on time code measuring instrument,the measurement methods of 1PPS, B(DC) code, B(AC) code and other time codes are introduced, and the calibration methods of 1PPS, B(DC) code and B(AC) code are discussed.

P2.9

Design and optimization of mini MIMO antenna, Xuemei Zheng and Long Ma; *Northeast Electric Power Uni., China*. This article designs three MIMO antennas for WLAN and WIMAX. The center resonance frequencies are 2.4 GHz, 3.5 GHz, and 5.2 GHz, respectively

Poster Session 2 (10:00-10:30)

P2.10

Fitness Optimization RWA Algorithm Based on Bee Colony in Optical Satillite Network, Feifan He[1], Dong Chen[2], Qi Zhang[1], Yuanfeng Li[1], Jinxi Qian[2], Ying Tao[2], Feng Tian[2] and Qinghua Tian[1]; [1]*Beijing Univ. of Posts and Tel., China;* [2]*China Academy of Space Tech., China*. To address the problem of degraded communication success rate in low-orbit satellite optical networks, bee colony fitness optimization-based routing and wavelength assignment algorithm for satellite optical networks is proposed.

P2.11

Research on the groove structure of InP-based photodetector electrode, Shaoyu Wang, Yongqing Huang, Xuejie Wang, Jiawei Du, Yushang Chen, Xiaofeng Duan, Kai Liu, Yisu Yang and Xiaomin Ren; *Beijing Univ. of Posts and Tel., China*. In this paper, a novel low-loss photodetector electrode is reported on the basis of optimizing the traditional electrode model. The groove electrode can increase the bandwidth of the photodetector by 8.51GHz than the conventional electrode.

P2.12

A rate-compatible punctured Polar code decoding scheme based on deep learning, Wanqi Li, Qinghua Tian, Yuqing Zhang, Feng Tian, Zhipei Li, Qi Zhang and Yongjun Wang; *Beijing Univ. of Posts and Tel., China*. Aiming at the problem that the traditional decoding performance and efficiency is limited, a rate-compatible punctured Polar code decoding scheme is studied. We use convolutional neural network model as the basic structure.

P2.13

A modified Model for Sagnac Effect time deviation in long-distance time transfer via fiber link, Weicheng Kong[1], Bo Liu[1], Xinxing Guo[1], Bo Li[2], Tao Liu[2], Ruifang Dong[2] and Shougang Zhang[2]; [1]*University of Chinese Academy of Sci., China;* [2]*National Time Service Center, CAS, China*. We establish a simulation model to investigate the effects of Sagnac Effect time deviation .Based on the real field basic data verify the following conclusions and construct a database of fiber time transfer system.

P2.14

Wavelength Tuned Laser Based on Few-mode Long-period Fiber Grating, Shaokang Bai, Yujin Xiang and Zuxing Zhang; *Nanjing Univ. of Posts and Tel., China*. We constructed a few-mode fiber-based comb filter realized by dislocation splicing a few-mode long-period fiber grating (FM-LPFG) with single-mode fiber.The switchable four-wavelength continuous laser output is realized, and the stable mode-locked pulse output is realized.

P2.15

Selenization Optimization for Efficiency CuInGa(S, Se)2 Solar Cells based on Sulfide Nanoparticles Ink, Wenzhu Wu, Ranran Han and Zugang Liu; *China Jiliang Univ., China*. In this paper, CuInGaS2 nanoparticles were synthesized and used for forming the absorption layer by selenization.

P2.16

Transfer Learning Aided PT-CNN in Coherent Optical Communication Systems, Jingwen Liu, Yongjun Wang, Haifeng Yang, Xingyuan Huang, Qi Zhang and Qinghua Tian; *Beijing Univ. of Posts and Tel., China*. In this paper, we propose a transfer learning aided PT-CNN equalizer. We have experimentally demonstrated that transfer learning process can accelerate the update for flexible communication backbone network.

P2.17

Analysis on noise impact in algorithm-based quantum computing benchmark, Jing Wang, Meng Zhang, Jun-Sen Lai, Wen-Yu Zhao and Hai-Yi Zhang; *China Academy of Information and Communication Tech., China*. Based on IBM Quantum Lab platform, several algorithms have been executed in quantum backend and simulator to verify impact of circuit depth, different quantum noise model and parameters on the fidelity of quantum computing results.

P2.18

Ultra-sensitive detection of Aggregation Induced Emission molecules with microfluid fiber device, Huifang Chen and Minglu Li; *China Jiliang Uni., China*. An ultra-sensitive microfluid fiber device for detecting AIE molecules is demonstrated. The obtained minimum detectable concentration is better than that with a traditional fluorospectro-photometer. It was a label-free technique for all kinds of fluorescence detections.

Poster Session 2（10:00-10:30)

P2.19

Temperature field measurement based on the Chirped Fiber Bragg Grating, Yueming Zhang, Changyu Shen and Zhihao Wang; *China Jiliang Uni., China*. As the temperature varies around the CFBG along the optical fiber Z-axis, the temperature change in the gradient temperature field will lead to the shifting of the CFBG's spectrum.

P2.20

OFDM-based Visible Light and Power Line Communication System, Liwei Yang, Maiyun Zhang, Yuanhao Jiang, Boyu Jia, Jianhui Kang and Xinyu Li; *China Agricultural Uni., China*. In order to realize more efficient information transmission, this paper proposes and simulates an indoor VLC-PLC hybrid system based on OFDM. The simulation results show that the system has good transmission performance.

P2.21

A Multi-Step Prediction Algorithm based on Correlated Traffic and Multi-Head Attention for PON, Zhe Chen, Wencai Xiao, Jiaqi Liang, Baijin Su, Ou Xu and Yuwen Qin; *Guangdong Uni.of Tech., China*. We propose an algorithm considers traffic correlation and realize multi-step prediction based on Multi-head Attention and neural networks，which applied to high speed PON. Simulation results show that proposed algorithm can improve prediction accuracy.

P2.22

Implementation method of reconfigurable all-optical XOR logic gate based on dual-parallel phase modulators, Dongfei Wang, Min Ding and Xianfeng Tang; [1]*Beijing Institute of Graphic Communication, China;* [2]*Beijing satellite manufacturing Co., Ltd, China;* [3]*Beijing Uni. of Posts and Tel., China*. We proposed a new scheme to implement XOR logic operation in optical domain just enabled by dual-parallel phase modulator. Numerical analysis and simulation have been successfully carried out at the speed of 10Gb/s.

P2.23

D Performance Analysis of LDPC Coding under Multiple Scattering in Ultraviolet Communication, Axin Du, Jianguo Liu, Yuehui Wang, Jiwang Peng, Huishi Zhu, Yingkai Zhao and Ning Sun; [1]*Institute of Semiconductors, CAS, China*. Low-density parity-check (LDPC) codes are applied to multi-scattering communication channels based on Monte Carlo (MC) method. An analog ultraviolet (UV) communication system based on binary phase shift keying (BPSK) modulation is developed.

P2.24

High-power mid-infrared supercontinuum generation in germania fiber, Yukun Yang, Linyong Yang, Bin Zhang, Xiran Zhu, Desheng Zhao, Shuailin Liu and Jing Hou; *National Uni. of Defense Tech., China*. A high-power supercontinuum(SC) based on germania-core fiber(GCF) is demonstrated in all-fiber configuration. The maximal output power of the SC laser is up to 35.6 W with a spectral range of 1.9-3.4 μm.

P2.25

A Methane and Hydrogen sensor with Surface Plasmon Resonance-Based Photonic Crystal Fiber, Yutian Zhang, Zhao Yang and Li Xia; *Huazhong Uni. of Sci. and Tech., China*. A photonic crystal fiber sensor based on surface plasmon resonance is designed for simultaneous detection of methane and hydrogen, using sensitive materials of methane and hydrogen namely Pd-WO3 and cryptophane E doped polysiloxane

P2.26

Generation of Fiber-Tip Leaky Mode Resonance for Decoupling Bulk and Surface Properties, Fei Wang, Xianxin Yang and Zhihong Li; *Wenzhou Uni., China*. An ultra-compact all-dielectric fiber-tip configuration is proposed, by which non-polarized leaky mode resonances (LeMRs) are generated for decoupling bulk and surface properties, companied with a minimal cross interference between them.

P2.27

Hybrid Prediction Model for Passive Optical Network Traffic based on CEEMDAN and Machine Learning, Wencai Xiao, Zhe Chen, Jiaqi Liang and Ou Xu; *Guangdong Uni. of Tech., China*. A hybrid prediction model for passive optical network (PON) traffic based on mode decomposition and machine learning is proposed. The experimental results show that the model can improve PON traffic prediction accuracy.

Poster Session 2 (10:00-10:30)

P2.28

Dynamic sound pressure sensor based on Mach–Zehnder interferometer encapsulated by PET diaphragm, Bangtong Zhan, Lijun Li, Mengge Xue, Meiqin Lv, Wenqian Xiu, Xue Yang, Congying Jia, Tianzong Xu and Qian Ma; *Shandong Uni. of Sci. and Tech., China*. We propose an all-fiber dynamic sound pressure sensor composed of an all-fiber Mach-Zehnder interferometer (MZI) encapsulated with a Poly Ethylene Terephthalate (PET) diaphragm, and analyze the diaphragm characteristics theoretically and simulatentically.

P2.29

Manipulating non-Hermitian degeneracy in spiral ring cavities for biosensing applications, Jin Li and Jiawei Wang; *Harbin Institute of Tech. (Shenzhen), China.* We report a route of engineering the non-Hermitian degeneracies in spiral ring microcavities which can be readily obtained through the self-rolling of pre-strained nanomembranes. The sensitivity of the system has been greatly enhanced.

P2.30

A Novel Scheme to Reduce the ONU's DSP Complexity for IMDD-OFDMA-PON, Bin Lian[1], Nan Feng[2] and Zhongcheng Wei[1]; [1]*Hebei Uni. of Engineering, China;* [2]*The 54th research Institute of CETC, China*. This paper investigates a novel scheme for reducing the ONU's DSP complexity for IM-DD-OFDMA-PON. Results can efficiently verifie this scheme with ensuring the transmission performance.

P2.31

Complex Long short-term memory Neural Networks for fiber nonlinearity equalization in Long-Haul Transmission Systems, Kangni Peng, Lixia Xi, Xue Li and Xiaoguang Zhang; *Beijing Uni. of Posts and Tel., China*. We propose a complex Long short-term memory nonlinear equalizer. Compared with linear compensation, Q-factors of single-channel and 7-channel are improved by 0.8dB and 0.6dB. The real multiplications are reduced by 28% compared to real-valued LSTM.

P2.32

Foundry-processed silicon photonic devices for short-wavelength mid-infrared, Dian Wan[1], Weicheng Chen[1], Qi He[1], Tiegen Liu[1], Jiaqi Wang[2] and Zhenzhou Cheng[1]; [1]*Tianjin Uni., China;* [2]*Shenzhen Uni., China*. We demonstrated key components for short-wavelength mid-infrared based on a multi-project wafer service. Specifically, a subwavelength grating coupler with a coupling efficiency of -10 dB/facet and a micro-ring resonator with a quality factor of 25000.

P2.33

I/Q-Combined Encryption and Decryption in Single Carrier QAM Quantum Noise Stream Cipher, Yuang Li, Yajie Li, Kongni Zhu, Chao Lei, Yongli Zhao and Jie Zhang; *Beijing Univ. of Posts and Tel., China*. We propose a QAM/QNSC scheme based on I/Q-combined encryption and decryption, which directly recovers low-order signal phase noise after decryption. The proposed scheme avoids the dependence on ultra-narrow-linewidth lasers and simplify the difficulty of DSP.

P2.34

Modulation characteristics of PZT phase modulator under temperature variation, Shuo Chen[1], Zhanyuan Liu[1], Xiaochen Niu[1] and Wei Li[2]; [1]*Start Grid Smart Grid Research Institute co.Ltd., China;* [2]*Huazhong Uni. of Sci.and Tech., China*. The regulation of modulation voltage and modulation phase under the influence of different ambient temperature is investigated. It provides theoretical and practical data support for solving the impedance matching problem in PZT-FOCT.

Room 102, Track 1

10:30-12:00
Su2A • Fibers & fiber devices III
Presider: Guanshi Qin, Jilin University, China

Su2A.1 • 10:30 Invited

Mechanism of linewidth measurement and experimental verification for single-frequency fiber lasers, Weiqing Gao; *Hefei Uni. of Tech., China*.

Su2A.2 • 10:50 Invited

Erbium-Doped Fiber Amplifier Based on Ring-Core Fiber for Orbital Angular Momentum Modes, Hu Zhang; *Beijing Uni. of Posts and Tel., China*. An in-line OAM fiber amplification technology is a grand challenge to enable long-haul OAM mode transmission. We will report the advances in OAM EDFA and explore design strategies to reduce the differential mode gain.

Su2A.3 • 11:10 Invited

Spectral manipulation of high power Raman fiber laser, Jiangming Xu, *National Uni. of Defense Tech., China*. The history and status of high-power Raman-fiber-laser (RFL) will be reviewed. Especially spectral manipulation of high-power RFL, including purity scalability, wavelength number-interval-amplitude and linewidth tuning, and low-quantum-defect small-frequency-gain achieving, will be discussed.

Room 103, YSA&PDP

10:30-12:00
Su2B • YSA&PDP
Presider: Chi Chiu Chan, Shenzhen Technology University, China

◆Su2B.1 • 10:30
Ultra-high-temperature Sensors Based on Sapphire Fiber Bragg Gratings Created with Femtosecond Laser Direct Writing Technique, Xizhen Xu, Jun He, Jia He, Jiafeng Wu, He Li, Zhuoda Li, Bin Du, Changrui Liao and Yiping Wang; *Shenzhen Uni., China*. We reported on a new method for fabricating sapphire fiber Bragg gratings (SFBGs) using a femtosecond laser direct writing technique,and propsoed an inert gas-sealed packaging method to imporve its high-temperature sensing performance.

◆Su2B.2 • 10:45
Nonlinearity-Tolerant GS-4D 7 bit/4D-Sym Modulation Format based on Adjacent Quadrant Constellations Multiplexing, Jie Ma, Xu Yan, Jianfei Liu and Jia Lu; *Hebei Uni. of Tech., China*. We proposed a novel 7 bit/4D-sym geometrically-shaped four-dimensional (GS-4D) modulation format based on adjacent quadrant constellations multiplexing, which achieved high nonlinearity tolerance while ensuring lower demodulation complexity. Results show that GS-4D outperforms PM-8QAM and 64PRS.

◆Su2B.3 • 11:00
Black Phosphorus: Mid-Infrared Light-Emitting Properties and Devices, Xiaolong Chen; *Southern Uni. of Sci. and Tech., China*. Black phosphorus has attracted great attentions due to its tunable bandgap and decent light-matter interactions. Here, I will review the recent advances in research field of mid-infrared light-emitting properties, devices and applications of black phosphorus.

Room 104, Track 3

10:30-12:00
Su2C • Optical networks III
Presider: Hui Yang, Beijing University of Posts and Telecommunications, China

Su2C.1 • 10:30 Invited

Optical Switch Control: Bridging the Last Mile for Optical Data Centers, Xuwei Xue; *Beijing Uni. of Posts and Tel., China*.

Su2C.2 • 10:50 Invited

Reliable Distributed Model Training in Edge Computing-enabled Optical Networks, Yajie Li; *Beijing Uni. of Posts and Tel., China*.

Su2C.3 • 11:10 Invited

Flexible Multi-Access Coherent Optics for Next-Generation Optical Access Network, Junwen Zhang; *Fudan Uni., China*. We review the advance of coherent optics for next-generation optical access network, with key enabling technologies in future flexible, multi-access, and over 200G Coherent PON.

Room 105, Track 6

10:30-12:00
Su2D• Measurement & imaging IV
Presider: Pengbai Xu, Guangdong University of Technology, China

Su2D.1 • 10:30 Invited 10

Fiber-integrated vector magnetic field sensing technology, Shengli Pu; *Uni. of Shanghai for Sci. and Tech., China*.

Su2D.2 • 10:50 Invited

Spectral demodulation of fiber grating based sensors realized by deep learning methods, Zhengyong Liu; *Sun Yat-sen Uni., China*.

Room 106, Track 4

10:30-12:00
Su2E • Optoelectronic integration II
Presider: Jiangbing Du, Shanghai Jiao Tong University, China

Su2E.1 • 10:30 Invited

Solid-State Integrated Lidar Using Orthogonally Polarized Beams and Wavelength Division Multiplexed Components, Yang Yue[1], Yuxuan He[2], Qiang Wang[3], Zhonghan Wang[2] and Xu Han[2]; [1]*Xi'an Jiaotong Uni., China*; [2] *Nankai Uni., China;* [3] *Angle AI (Tianjin) Technology co. LTD, China*. We design a novel solid-state Lidar utilizing two orthogonal polarizations, which can effectively double the beam-steering angle. Furthermore, a novel low-priced high-resolution Lidar is designed by combining outputs of two grating couplers with orthogonal polarizations.

Su2E.2 • 10:50 Invited

MDM based high efficiency silicon photonic MZM and MRM, Jiangbing Du; *Shanghai Jiao Tong Univ., China*. We present our recent progresses of high efficiency Mach-Zehnder and Micro-Ring modulators based mode division multiplexing using L-shaped PN junction. 0.37-Vcm VpiL and 55-dB extinction ratio were experimentally achieved.

Su2E.3 • 11:10 Invited

InSe: a promising 2d material for optoelectronics, Wenjing Zhang; *Shenzhen Uni., China*.

Room 102, Track 1

Su2A.4 • 11:30

Hybrid dual-wavelength solitons fiber laser manipulated by a 3D rotatable PBS, Renlai Zhou, Ni Feng, Hui Hu and Xiaoxi Liu; *Harbin Engineering Uni., China.* Through finely 3D rotating the PBS to manipulate the polarization of light signal in the cavity, versatile hybrid dual-wavelength mode-locking operations are experimentally demonstrated, and the corresponding output characteristics are investigated in detail.

Su2A.5 • 11:45

Dispersion-managed dual-wavelength fiber laser based on nonlinear polarization evolution, Runmin Liu, Shuang Niu, Defeng Zou, Youjian Song and Minglie Hu; *Tianjin Uni., China.* We report the generation of dual-wavelength dispersion-managed solitons in a Er-doped mode-locked fiber laser. dual-wavelength mode-locking is provided by birefringence filtering effect. Furthermore, coexistence of the soliton and the bound state is also observed.

Room 103, YSA&PDP

Su2B.4 • 11:15

Impairment-reduced Resource Allocation with Full-life-cycle SNR Guarantee in Hybrid C/C+L Band Elastic Optical Networks, Bowen Bao[1], Hui Yang[1], Qiuyan Yao[1], Chao Li[1], Zhengjie Sun[1], Yun Teng[1], Jie Zhang[1], Sheng Liu[2] and Yunbo Li[2]; [1]*Beijing Uni. of Posts and Tel., China*; [2]*China Mobile Research Institute, China*. Focusing on the transition period of band upgrade, this paper proposes an impairment-reduced resource allocation with full-life-cycle SNR guarantee scheme. Simulation results show the proposed scheme can decrease blocking probability, premising on a higher SNR.

Su2B.5 • 11:30

Efficient generation of second to fourth order OAM beams based on long period fiber gratings written by preset twist, Wenzhe Chang, Mao Feng, Baiwei Mao, Pan Wang, Zhi Wang and Yan-Ge Liu; *Nankai Uni., China*. An approach is proposed to generate high-order OAM beams by employing a preset twisted LPFG in a few-mode fiber. The generation of second to fourth order OAM modes were achieved with high conversion efficiencies.

Su2B.6 • 11:45

Experimental Assessments of a AWGR Based Optical Switching Network for Distributed Reinforcement Learning Training, Yuanzhi Guo, Xuwei Xue, Bingli Guo, Daohang Dang, Yisong Zhao, Rui Ding, Jiapeng Zhao, Hangang Zhang, Bin Chen, Chenhui Li and Shanguo Huang; *Beijing Uni. of Posts and Tel., China*. An arrayed waveguide grating router based all-optical switching network is proposed to accelerate the communication phase of distributed reinforcement learning training. Experimental investigations validate 465ns worker-to-server latency with error-free communication at 0.9 traffic load.

Su2B.7 • 12:00

800Gbps Visible Light Communication System Employing WDM and OAM Multiplexing, Jianyang Shi[1], Xinyuan Fang[2], Wenqing Niu[1], Keyao Li[2], Zengyi Xu[1], Weijia Meng[2], Junhui Hu[1], Hang Su[2], Dong Li[1], Yingnan Ma[1], Zhixue He[3], Chao Shen[1], Min Gu[2], Shaohua Yu[3] and Nan Chi[1]; [1]*Fudan Uni., China;* [1]*Uni. of Shanghai for Sci. and Tech., China;* [1]*Peng Cheng Laboratory, China*. We demonstrate a visible light communication (VLC) system based on compact eight-color laser transmitter. A capacity of 805Gbit/s and mean spectral efficiency of 50.3 bits/s/Hz can be achieved utilizing 8-λ WDM and 10-OAM modes multiplexing.

Room 104, Track 3

Su2C.4 • 11:30 Invited

Quantum Key Distribution Optical Networks: A Pratical Security Perspective, Xiaosong Yu; *Beijing Uni. of Posts and Tel., China*.

Su2C.5 • 11:50

Is Light-Trail Worse Than Light-Tree for Multicast Provisioning in Elastic Optical Networks? Tao Liu, Peng Han and Anliang Cai; *Nanjing Uni. of Posts and Tel., China*. The problem of multicast provisioning in EONs considering splitting loss is formulated by integer linear programming for both light-trail and light-tree. Results show that the light-trail with some splitting ratios can outperform the light-tree.

12:00-14:00 Lunch Break, *1034 Hotel*

Room 105, Track 6

Su2D.3 • 11:10 **Invited**

Temporal ghost imaging in the Mid-infrared, Han Wu; *Sichuan Uni., China*. Temporal ghost imaging brings new possibilities for ultrafast temporal object in the MIR region where fast detectors are not available. This talk reviews our experimental results on the temporal ghost imaging in the MIR regions, including two-color and computational temporal ghost imaging based on wavelength conversion.

Su2D.4 • 11:30 **Invited**

Optofluidic biolaser for ultrasensitive biosensing, Chaoyang Gong; *Nanyang Technological Uni., Singapore*. The optofluidic biolasers integrate the biological materials into the liquid gain medium and contain a microcavity. It employs the amplification that occurs during the laser generation to detect the subtle changes in the biological processes.

Su2D.5 • 11:50 **Invited**

Disposable immunosensor based on fiber optofluidic laserg, Xi Yang; *Peking Uni., Singapore*. The unique properties of optical fiber are fused into optofluidic laser for disposable and fast immunosensing, including high reproducibility, low cost, and high aspect ratio. The optical fiber are employed as optical microcavity and microfluidic channel.

Room 106, Track 4

Su2E.4 • 11:30 **Invited**

Four-wave mixing in epitaxial quantum dot lasers on silicon, Jianan Duan; *Harbin Institute of Tech., Shenzhen, China*.

Su2E.5 • 11:50

☼**Universal Photonic Logic-Matrix Unit**, Wenkai Zhang, Wentao Gu, Junwei Cheng, Hailong Zhou and Jianji Dong; *Huazhong Uni. of Sci. and Tech., China*. We propose a universal photonic logic-matrix unit using highly nonlinear fiber and microring matrix array, which realizes programmable two-input logic. And the function of comparator and half-adder has been executed at 10Gb/s.

12:00-14:00 Lunch Break, *1034 Hotel*

Room 102, Track 1

14:00-16:00
Su3A • 2D-materials photonics I
Presider: Nengjie Huo, South China Normal University, China

Su3A.1 • 14:00 Invited

Polarization-sensitive photodetectors based on low-symmetric 2D materials, Nengjie Huo; *South China Normal Uni., China*. We report a polarization-sensitive photodetector with high performance in the short-wave infrared region, that has attracted considerable attention because of their unique and wide application prospects in polarization sensors and remote sensing.

Su3A.2 • 14:20 Invited

Next-generation Photodetectors Beyond Van der Waals Junctions, Fang Wang; *Shanghai Institute of Technical Physics, China*.

Su3A.3 • 14:40 Invited

Measuring the band profiles in 2D photoelectronic devices, Jiamin Xue; *ShanghaiTech. Uni., China*. The properties of photoelectronic devices depend on their band structures. A direct measurement of this band structure is of crucial importance. However, there have been few techniques capable of detecting them. As a result, most of the band structures in literatures are based on assumptions or calculations. We developed a method named contact-mode scanning tunneling microscopy, which works under ambient conditions and is able to detect band profiles in devices with nanometer spatial resolution and ~0.1 eV energy resolution. With this technique, we can directly visualize band profiles in 2D device systems.

Room 103, Track 8

14:00-16:00
Su3B • Space communications I
Presider: Yongli Zhao, Beijing University of Posts and Telecommunications, China

Su3B.1 • 14:00 Invited

Adaptive Mapping Relationship between Quantum Networks and Classical Networks, Yuhang Liu, Yongli Zhao, Xiaosong Yu, Yongmei Sun and Jie Zhang; *Beijing Uni. of Posts and Tel., China*. We study the adaptive mapping relationship between quantum and classical networks in terms of transmission, switching and networking. Two metrics are introduced to visualize the correlations, which are mutual loss rate and synergistic degree.

Su3B.2 • 14:20 Invited

Research and verification of high-speed data receiving front-end technology of TT&C system based on Microwave Photonics, Haifeng Yang; *Southwest China Institute of Electronic Tech., China*. Aiming at broadband multi band sampling problem faced by the RF front-end of the traditional TT&C system, the principle prototype is developed and tested, the relevant results can provide reference for the development of broadband TT&C system.

Su3B.3 • 14:40

Study of Low-cost LED FSO Communication Link Performance with Fog Mitigation, Sophia Liu, Colleen Lau and Jason Matthew Childers; *California Polytechnic State Uni., US*. This study presents a novel low-cost free space optical communication link and its performance when subjected to fog attenuation. This paper investigates the performance of the communication link using various light sources and double-lens systems.

Room 104, Track 5

14:00-16:00
Su3C • Optical signal processing II
Presider: Shiming Gao, Zhejiang University, China

Su3C.1 • 14:00 Invited

Fractional Fourier Domain Signal Processing with Microwave Photonics, Shangyuan Li; *Tsinghua Uni., China*.

Su3C.2 • 14:20 Invited

Towards Tbps physical random number extraction using all-optical quantization, Pu Li; *Taiyuan Uni. of Tech., China*.

Su3C.3 • 14:40 Invited

Inverse designed Bragg Gratings for microwave photonics signal processing, Ang Li; *Nanjing Uni. of Aeronautics and Astonautics, China*.

Room 105, S1

14:00-16:00
W3D • Organic optoelectronics
Presider: Jin Wang, Nanjing University of Posts and Telecommunications, China

Su3D.1 • 14:00 Invited

Dual-functional ambipolar non-fused ring electron acceptor for ternary organic solar cells, Aung Ko Ko Kyaw; *Southern Uni. of Science and Tech., China*.

Su3D.2 • 14:20 Invited

High-Efficiency Blue Cadmium-Free Quantum Dot Light-Emitting Diodes, Kai Wang; *Southern Uni. of Science and Tech., China*.

Su3D.3 • 14:40 Invited

Efficient and Stable Inverted Perovskite Solar Cells, Xiaodong Li; *East China Normal Uni., China*. We improve the performance of inverted perovskite solar (PSCs) cells from point of in-situ crosslinking strategy, electrode chemical anti-corrosion and interface heterojunction construction. We firstly increase the efficiency of inverted PSCs to over 24% with excellent stability.

Room 106, Track 7

14:00-16:00
W3E • Ultrafast photonics III
Presider: Xiaosheng Xiao, Beijing University of Posts and Telecommunications, China

Su3E.1 • 14:00 Invited

Ultrafast broadband mode locked lasers, Dongmei Huang; *The Hong Kong Polytechnic Uni., China*. We will present our recent work on generating ultrafast broadband mode locked lasers with more than 100 MHz repetition rate and 100 nm spectrum based on intracavity dispersion and nonlinear management or external amplification.

Su3E.2 • 14:20 Invited

Temperature-dependent tunable spectral filters and their applications in fiber lasers, Shumin Zhang, Chaoran Wang, Zhenjun Yang and Xingliang Li; *Hebei Normal Uni., China*. We designed and fabricated a thermal-sensitive tunable spectral filter based on cascaded long-period fiber gratings. Such a multifunctional filter can adopt in a dissipative-soliton fiber laser and a Mamyshev oscillator to explore pulse dynamics.

Su3E.3 • 14:40 Invited

Infrared integrated chalcogenide nonlinear photonics, Bin Zhang; *Sun Yat-sen Uni., China*. Based on our new chalcogenide integrated photonic chips, a bright soliton-based microcomb and a dark-pulse comb with a low pump power and a broadband Kerr-Raman comb have been achieved, respectively.

Room 102, Track 1

Su3A.4 • 15:00 Invited

High-performance perovskite X-ray and photo-detectors for communication and imaging, Liang Shen; *Jilin Uni., China*.

Su3A.5 • 15:20 Invited

Novel Mixed-Dimensional vdW Heterojunction Infrared Photodetectors toward Industrial Applications, Di Wu; *Zhengzhou Uni., China*.

Room 103, Track 8

Su3B.4 • 14:55

LDPC Channel Coding in Coplanar MIMO Ultraviolet Communication System, Junyang Ji, Ping Su, Jianshe Ma, Xingle Xue and Bizhong Xia; *Tsinghua Univ., China*. This paper compares the performance of different receiver combining methods in the coplanar MIMO UV communication system and simulates the performance of the improved LDPC minimum sum decoding algorithm in the UV communication system.

Su3B.5 • 15:10

1.7Gbps visible light transmission over 100m POF employing a 638nm laser and MLP post-equalizer, Ouhan Huang[1], Jianyang Shi[2] and Nan Chi[2]; [1]*hangzhou Dianzi Uni., China*; [2]*Fudan Uni., China*. We successfully achieved a data rate of 1.7 Gbit/s 16QAM-DFT-Spread OFDM modulation transmitted over 100m POF with BER below 3.8E-3. The proposed method improves the Q factor by 1.13 dB compared with the Volterra's results.

Room 104, Track 5

Su3C.4 • 15:00

Low-complexity Forward Error Correction For 800G Unamplified Campus Link, Kai Tao and Zhijun Long; *ZTE Corparation, China*. Aiming at two potential options for FEC bit error ratio threshold, we propose two FEC schemes, respectively based on channel-polarized multilevel coding and bit interleaved coded modulation, with the same inner FEC code.

Su3C.5 • 15:15

An efficient and simple method to deal with PMD effects and ICI, Xiao Zhang, Qinghua Tian, Xiangjun Xin, Feng Tian, Qi Zhang, Zhipei Li, Leijing Yang and Yongjun Wang; *Beijing Uni. of Posts and Tel., China*. In this study, an efficient and simple method to eliminate polarization mode dispersion (PMD) effects and inter-carrier interference (ICI) is proposed. The method is validated on a high-density wavelength division multiplex (WDM) system by simulation.

Su3C.6 • 15:30

High-speed Digital-to-analog Conversion by Fiber-dispersion-based Temporal Compression, Xinyue Dong, Yuewen Zhou, Jiayuan Kong, Fangzheng Zhang and Shilong Pan; *Nanjing Uni. of Aeronautics and Astronautics, China*. A photonics-based digital-to-analog conversion scheme is proposed by applying optical temporal compression to the signal generated by a low-speed electrical digital-to-analog converter (DAC).

16:00-16:30 Poster Session 3 & Coffee Break, 1F

Room 105, SS 1

Su3D.4 • 15:00 **Invited**

Advances in fiber integrated optical devices for ultrafast optics, Bo Guo; *Harbin Engineering Uni., China*.

Su3D.5 • 15:20 **Invited**

Cluster Light-Emitting Diodes, Hui Xu; *Heilongjiang Uni., China*.

Su3D.6 • 15:40 **Invited**

Optically Anisotropic Polymer Materials based on MOF Nano-confined Channels, Jin Wang, Shuli Wei, Lele Wang, Shuangshuang Liu, Xinhui Zhou and Yunqing Lu; *Nanjing Uni. of Posts and Tel., China*. We review our contributions in obtaining optically anisotropic polymer materials, where the polymer chains are encapsulated and orientated in highly regular and ordered nano-confined channels of metal-organic frameworks, thus their anisotropic properties are greatly enhanced.

Room 106, Track 7

Su3E.4 • 15:00 **Invited**

Dynamic characteristics of multi-soliton interaction in optical nonlocal media, Zhenjun Yang, Jie Li, Xingliang Li and Shumin Zhang; *Hebei Normal Uni., China*. We study the propagation dynamics of generalized soliton interaction in optical nonlocal media. The transmission evolution formula is given, and the mode transformation of soliton is illustrated.

Su3E.5 • 15:20 **Invited**

Noise-like pulse fiber laser, Xingliang Li, Shumin Zhang and Zhenjun Yang; *Hebei Normal Uni., China*. The research contents mainly include the influence of reverse saturable absorption on the formation of noise-like pulses (NLPs), the generation of broad spectrum NLP, the splitting of NLP, and the controllable generation of NLPs.

Su3E.6 • 15:40 **Invited**

Intelligent Single-cavity Dual-comb Source with Fast Locking, Guoqing Pu; *Shanghai Jiao Tong Univ., China*. We implement an intelligent single-cavity dual-comb source (DCS) enable by the real-time control module and the memory-aided intelligent searching algorithm. As a result, the intelligent DCS can lock onto the dual-comb regime within 2.48 seconds.

16:00-16:30 Poster Session 3 & Coffee Break, 1F

Poster Session 3 (16:00-16:30)

P3.1

A Novel Tri-Band Antenna Based on defective ground teminal and Polygon Resonant Ring of metamaterial, Fugang Song, Shoulin Wang, Lin Zhang, Weihua Gong and Zhaowei Wang; *Qilu Uni. of Tech., China*. This paper presents a tri-band antenna that can be used for WLAN and 5G. The experiment shows that the antenna can cover 3 bands of 2.27GHz-2.62GHz, 4.4GHz-4.8GHz and 5.3GHz-6.8GHz.

P3.2

Design of dual band microstrip antenna based on electromagnetic band gap structure, Xuemei Zheng and Longfei Tang; *Northeast Electric Power Uni., China*. In this paper, a dual band microstrip antenna based on EBG structure is designed, which improves the gain of the antenna, and the resonant frequencies are 2.4 GHz and 3.5 GHz.

P3.3

Optical fiber curvature sensor based on polydimethylsiloxane encapsulated Mach–Zehnder interferometer, Meiqin Lv, Lijun Li, Wenqian Xiu, Mengge Xue, Xue Yang, Paulino Mba Ndong Mangue, Congying Jia, Bangtong Zhan, Tianzong Xu and Qian Ma; *Shandong Uni. of Sci. and Tech., China.* An all-optical fiber curvature sensor is proposed, which is composed of a polydimethylsiloxane(PDMS) elastic material encapsulated all-optical fiber Mach–Zehnder interferometer(MZI), which is worn to different fingers can produce different wavelength drift phenomenon.

P3.4

Frequency offset estimation for NFDM Optical Communication Systems With continuous spectrum modulation, Yonghua He, Jianping Li, Jianqing He, Xinkuo Yu, Yuwen Qin, Gai Zhou, Meng Xiang, Ou Xu, Di Peng and Songnian Fu; *Guangdong Uni. of Tech., China*. A frequency offset estimation (FOE) method is proposed for the continuous spectrum modulated nonlinear frequency division multiplexing (CS-NFDM) system. The FOE error is < 3MHz after the 56Gbaud-16QAM CS-NFDM signal transmitted over 1600km through simulation.

P3.5

Split-step Crosstalk Analysis in weakly Multicore Fiber based on coupled nonlinear Schrodinger equation, Haoyu Rui, Wencheng Li, Shulin Jin, Hongfeng Pan and Lian Xiang; *Soochow Uni., China*. We propose a general method for inter-core crosstalk analysis in weakly coupled multicore fiber. Results show that chromatic dispersion and Kerr nonlinearity can both mitigate the power of crosstalk effectively.

P3.6

A bidirectional WRC-FPLDs chaotic communication system with wavelength switchable chaotic carrier, Chunxia Hu, Xianzhi Lu and Jianguo Tang; *Chongqing Colloge of Electronic Engineering, China*. We proposed and demonstrate theoretically a bidirectional chaotic communication system with switchable chaotic carrier wavelength based on weak resonant-cavity Fabry-Perot laser diodes (WRC-FPLDs).

P3.7

Computing Task Migrating Scheme Considering Inter-Core Crosstalk for MEC Servers in SDM-MONs, Tao Luo, Shan Yin, Wenchao Zhang and Shanguo Huang; *Beijing Uni. of Posts and Tel., China.* Aiming to decrease the blocking probability of computation-intensive tasks, this paper proposes a computing task migrating scheme considering inter-core crosstalk. Simulation shows that the proposed scheme has lower blocking probability compared with benchmark scheme.

P3.8

Efficient Dynamic Wavelength and Bandwidth Allocation Algorithms in 50G NG-EPON with Dual Wavelengths, Jiaqi Liang, Zhe Chen, Wencai Xiao and Ou Xu; *Guangdong Uni. of Tech., China*. This paper proposes two dynamic wavelength and bandwidth allocation algorithms for multi-type ONUs in 50G NG-EPON with channel bonding. The proposed DWBA algorithms can achieve an uplink bandwidth utilization of 95.71%.

P3.9

Photonics-aided 0.3-THz Wireless Transmission using DSCM-OFDM modulation and Heterodyne detection, Weidong Tong[1], Bingchang Hua[2], Weiliang Xu[1], Jiao Zhang[1], Xiang Liu[1], Jiahua Gu[1], Yunwu Wang[1], Yuancheng Cai[2], Mingzheng Lei[2], Yucong Zou[2] and Min Zhu[1]; [1]*Southeast Uni., China;* [2]*Purple Mountain Laboratories, China*. We have proposed a photonics-aided 0.3 THz wireless transmission system based on DSCM-OFDM which has low requirements for ADC bandwidth.The results show that the performance of DSCM-OFDM system is similar to that of OFDM system.

Poster Session 3 (16:00-16:30)

P3.10

LSTM-DFE equalizer for 25 Gbit/s/λ IM/DD Super-PON, Qianwu Zhang[1], Xuzhuang Zhi[1], Shucheng Zhan[1], Jing Zhang[2], Yating Wu[1], Zhengxuan Li[1] and Bingyao Cao[1]; [1]*Shanghai Uni., China;* [2] *Uni. of Electronic Sci. and Tech. of China, China*. A long short-term memory-DFE equalizer for 25 Gbit/s/λ IM/DD Super-PON is proposed. Simulation results show that a 7 dB sensitivity improvement is obtained, compared with long short-term memory and Volterra nonlinear equalizer.

P3.11

High-throughput Trapping of Nanoparticles Based on a Copper-Coin-Shaped Nanotweezer, Jinzhi Wang, Zhe Han, Tongyu Nie, Chao Wang and Huiping Tian; *Beijing Univ. Posts and Tel., China*. We propose an all-dielectric copper-coin-shaped nanotweezer for the high-throughput trapping of the 60 nm nanoparticles. The nanotweezer can provide multiple optical hotspots for multiplexed trapping of nanoparticles, which shows excellent potential in biomedicine.

P3.12

Dual-stage gain-clamped erbium-doped fiber amplifier based on ring cavity, Manbing Lin and Xinyong Dong; *Guangdong Uni. of Tech., China*. A dual-stage gain-clamped L-band erbium-doped fiber amplifier based on a ring cavity is demonstrated.The gain varing no more than 0.3dB when the input signal power varing form -38 to -7dBm.

P3.13

Multiway Polarization Beam Splitter Based on Dielectric Metasurface in Optical Communication Band, Kai Wang, Zhifan Zhu, Jing Li, Yu Wang, Hui Niu, Han Ye and Yumin Liu; *Beijing Uni. of Posts and Tel., China*. We propose a design method of polarization beam splitter based on metasurface. Multiple beam splitting modes of linearly polarized light can be realized by arranging and combining metasurface nanoantenna in different ways.

P3.14

All-optical nonlinear activation function based on Germanium Silicon composite waveguide, Hengkang Li, Bo Wu and Jianji Dong; *Huazhong Uni. of Sci. and Tech., China*. We propose and experimentally demonstrate an all-optical implementation of optical activation function.It realizes two different nonlinear activation functions. This proves that germanium has a great potential for optical activation functions.

P3.15

Influence of length of erbium-doped fiber on gain spectrum, Jinlian Mo and Xinyong Dong; *Guangdong Uni. of Tech., China*. The EDF amplification is investigated in order to understand its behavior and identify the relevant parameters that are used for formulating the amplification process related to spontaneous and stimulated emission.

P3.16

Measurement and Analysis of Brillouin Scattering Spectra with Multiple Peaks in Single Mode Fibers, Donghe Sheng, Shuo Chen, Zanyang Qiao and Huiping Tian; *Beijing Univ. Posts and Tel., China*. We experimentally demonstrate the properties of the Brillouin scattering spectra with multi-peak in the ultra-low-loss G.654 fiber and the G.655 fiber, and show the influence of optical fiber length on the stimulated Brillouin threshold.

P3.17

Probabilistically shaped CAP based on group-level labeling and graphene-shaped constellation, Yibin Wan, Bo Liu, Yaya Mao, Jianxin Ren, Shuaidong Chen, Xiangyu Wu and Xuanling Liu; *Nanjing Uni. of Information Sci. and Tech., China*. We presents a probabilistically shaped carrier-less amplitude phase modulation based on group-level labeling and graphene-shaped constellation. A 9.8 Gb/s PS-CAP-24 transmission is demonstrated. Results validates the proposed scheme can obtain a significant performance gain.

P3.18

MZM Nonlinearity Enabled Uneven PAM-4 for EVM Reduction in Digital Mobile Fronthaul, Jiaji Li, Xi Chen, Jiaohao Wu, Yixiao Zhu and Weisheng Hu; *Shanghai Jiao Tong Uni., China*. We propose and experimentally demonstrate a digital mobile fronthaul scheme utilizing the non-linearity of MZM. The EVM can be reduced by 6.17% and 2.19% at -9dBm ROP for BtB and after 10km SSMF transmission, respectively.

Poster Session 3（16:00-16:30)

P3.19

Reconfigurable Radar Waveform Generation Based on Optical Frequency Comb Line Selected Modulation, Xiaoxiao Yao, Shuang Wang, Simin Li and Shilong Pan; *Nanjing Uni. of Aeronautics and Astronautics, China*. An approach to generate the reconfigurable radar signal based on an optical frequency comb (OFC) and an OFC line selected modulator is proposed and demonstrated by simulating.

P3.20

Calibration of Fiber Bragg Grating Acceleration Sensor, Jiakai Xu, Kai Ni, Huaping Gong and Chunliu Zhao; *China Jiliang Uni., China*. The experimental results show that FBG vibration sensor is calibrated with a sensitivity of 1.3489 pm/g by cantilever beam vibration platform, and the correlation coefficient is 0.93.

P3.21

Comparative study on two modulation principles of fiber optic current sensors, Junchang Huang[1], Li Xia[2] and Bin Liu[1]; [1]*CEPRI, China;* [2]*Huazhong Uni. of Sci. and Tech., China*. We select products of different technology routes from the above two suppliers, and carry out comparative research from different aspects such as modulation principle, overall design, condition monitoring parameters and so on.

P3.22

A Novel High-temperature Sensor Based on Fiber Bragg Grating, Xian Zhao[1], Yong-jie Wang[2] and Deng-Pan Zhang[1]; [1]*Henan Polytechnic Uni., China;* [2]*Institute of Semiconductors, CAS, China*. A novel high-temperature sensor based on Fiber Bragg Grating is proposed to suitable for the radiation environments. The temperature measurement from 0 to 500 ℃ can be achieved with an accuracy of ± 0.5 ℃.

P3.23

Research and design of dual band microstrip filter, Xuemei Zheng and Zhenxing Zhou; *Northeast Electric Power Uni., China*. Based on the traditional stepped impedance resonator, a microstrip multifrequency filter based on open branch loaded stepped impedance resonator is designed and implemented in this paper.

P3.24

Research on the novel hybrid amplifier based on Raman and ZBLAN-TDFA, Zhuo Lin, Feng Tian, Yuyan Wu, Qi Zhang, Qinghua Tian, Yongjun Wang and Leijing Yang; *Beijing Uni. of Posts and Tel., China*. We introduce a scheme of hybrid optical amplifier (HOA) using Raman assisted TDFA, and analyze the effect of the variation parameters on the gain. The results show that the average gain of 28.42dB is achieved.

P3.25

2.5 Gb/s/ch secure optical communication scheme with WDM based on multi-longitudinal mode chaos synchronization, Zehao Chen, Sile Wu, Wenfu Gu, Biao Su, Xinyong Dong and Zhensen Gao; *Guangdong Uni. of Tech., China*. We propose and demonstrate a novel secure optical communication scheme based on wavelength division multiplexing with 2.5 Gb/s/ch and transmission distance of 50 km based on multi-longitudinal mode chaos synchronization.

P3.26

Design of heterogeneous few-mode multi-core fiber based on refractive index multilayer ring structure, Haozhe Wang, Feng Tian, Jianke Qing, Jue Wang, Yu Gu and Leijing Yang; *Beijing Uni. of Posts and Tel., China*. A 3-LP mode 19-core optical fiber with a multilayer ring structure based on refractive index distribution is designed. Through numerical simulation, its critical bending radius and crosstalk have been improved compared with the conventional method.

P3.27

Efficient Inverted Quantum Light-emitting Diodes with Yttrium-doped ZnO, Qianqing Hu, Junjie Si and Zugang Liu; *China Jiliang Uni., China*. The performance of QLEDs is optimized via controlling doping concentration of yttrium acetate in the ZnO precursor and annealing temperature.

18:30-20:30 Conference Banquet & Awards Ceremony (The Century Seaview Hotel, Nan’ao/南澳世纪海景酒店)

Poster Session 3（16:00-16:30)

P3.28

Performance Analysis of Amplified Spontaneous Emission Noise in Quantum Noise Stream Cipher Transmission System, Chaofeng Cheng, Yajie Li, Yuang Li, Kongni Zhu, Haokun Song, Yongli Zhao and Jie Zhang; *Beijing Uni. of Posts and Tel., China*. We simulate and analyze the impact of amplified spontaneous emission noise with different noise figures of erbium-doped fiber amplifier on the quantum noise stream cipher system from the perspective of transmission and security performance.

P3.29

Design and implementation of a network management system for bidirectional VLC networking, Jing Zhao[1] and Min Zhang[2]; [1]*China Telecom Research Institute, China;* [2]*Beijing Uni. of Posts and Tel., China.* A network management system for bidirectional VLC networking is proposed, which is essential for the management of LiFi networks. We complete the design of the entire system, and implement it based on software programming.

P3.30

The research on a low phase noise self-oscillating multicarrier light source, JinXin Jiang[1], ZhaoYing Wang[1], Quan Yuan[2], XinRui Ban[1], JiaXin Zhou[1], ChunFeng Ge[1], LiPei Song[3] and TianXin Yang[1]; [1]*Tianjin Uni., China;* [2]*College of Tianjin Renai, China;* [3]*Nankai Uni., China*. A novel low phase noise self-oscillating multicarrier light source with large number of subcarriers and high flatness is proposed in this paper by using the recirculating frequency shift loop incorporated with an optoelectronic loop

P3.31

Chaos synchronization based on common signal optical injection, Sile Wu, Zhensen Gao, Zhitao Deng, Chuyun Huang, Xinyong Dong and Zehao Che; *Guangdong Uni. of Tech., China*. We propose and demonstrate a novel chaotic synchronization scheme over 40 km fiber based on common signal optical injection. Meanwhile, the bandwidth of synchronized chaos is greatly enhanced.

P3.32

Simultaneous Temperature and Strain Sensing in the Dual-mode Fiber Based on the Intermodal SBS, Zanyang Qiao, Shuo Chen, Donghe Sheng and Huiping Tian; *Beijing Univ. Posts and Tel., China*. We propose a two-layer-core dual-mode fiber (TLC-DMF) sensor based on the intermodal (LP01-LP11) stimulated Brillouin scattering (SBS) for simultaneous temperature and strain measurement. It can improve temperature and strain sensitivity and reduce measurement errors.

P3.33

Lightning Induced Tempral-Spectral Evolution Polarization Effect Model in Optical Communication Fiber Links, Mengrong Liu, Nan Cui, Qi Zhang and Xiaoguang Zhang; *Beijing Uni. of Posts and Tel. Univ., China*. We propose a lightning-induced polarization effect model in optical communication fiber links, which reflects the temporal and spectral evolution of polarization effects, and the influence of lightning strikes in fiber communication systems is analyzed.

P3.34

A Hierarchical Probabilistic Shaping Scheme for Optical Fiber System, Yuhang Liu[1], Qi Zhang[1], Xiangjun Xin[2], Ran Gao[2], Jinkun Jiang[1], Feng Tian[1], Qinghua Tian[1], Yongjun Wang[1] and Leijing Yang[1]; [1]*Beijing Univ. of Posts and Tel., China;* [2]*Beijing Institute of Tech., China.* A hierarchical probabilistic shaping scheme is proposed to avoid the incompatibility problem of hierarchical modulation and probabilistic shaping. This algorithm effectively reduces the nonlinear effect and improves the bit error rate according to computer simulations.

P3.35

Research on high resolution distributed optical fiber dynamic strain detection system, Huichun Bian; *Hangzhou Institute of Applied Acoustics, China.* A high resolution distributed optical fiber dynamic strain detection system is proposed, and it has high strain sensitivity and linear response.

18:30-20:30 Conference Banquet & Awards Ceremony (The Century Seaview Hotel, Nan'ao/南澳世纪海景酒店)

Room 102, S3

08:30-10:00
M1A • 2D-materials photonics II
Presider: Baicheng Yao, University of Electronic Science and Technology of China, China

M1A.1 • 08:30 Invited

Graphene functionalized microcomb devices, Baicheng Yao; *Uni. of Electronic Sci. and Tech. of China, China*.

M1A.2 • 08:50 Invited

On-chip integration of 2D materials for silicon photonics, Lan Li; *Westlake Uni., China*.

M1A.3 • 09:10 Invited

Hierarchical assembly of quantum dot nanoparticles into macroscopic phase, Wenhan Cao; *ShanghaiTech Uni., China*. Nanoscopic semiconductor quantum dot provides myriad possibilities for novel optoelectronic devices and applications. The assembly mechanism of colloidal quantum dots in the presence of electric fields is studied and macroscopic cellular phase is formed.

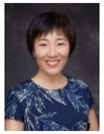
Room 103, Track 8

08:30-10:00
M1B • Quantum communication
Presider: Dong Wang, Anhui University, China

M1B.1 • 08:30 Invited

Uncertainty relations for multiple incompatible measurements, Dong Wang; *Anhui Uni., China*.

M1B.2 • 08:50 Invited



The vailid measurement of the fluorescence quantum efficiency of quininesulfate and its certified reference material, Lingling Ren; *National Institute of Metrology, China*. The fluorenscence quantum efficiency is one of important parameters for optical materials. In this paper, relative and absolute measurement methods are both introduced. Moreover, the certified reference material used in the relative method is studied.

M1B.3 • 09:10 Invited

Distribution of Gaussian quantum steering in noisy channels, Xiaolong Su; *Shanxi Uni., China*.

Room 104

08:30-10:00
M1C • Measurement & imaging V
Presider: Bing Sun, Nanjing University of Posts and Telecommunications, China

M1C.1 • 08:30 Invited

Artificial magnetic-based material for the detection of small magnetic field, Bing Sun[1], Kaiming Zhou[2], Zuxing Zhang[1] and Lin Zhang[2]; [1]*Nanjing Uni. of Posts and Tel., China*; [2]*Aston Uni., UK*. The preparation of a magnetic-based system, i.e., the incorporation of Mn3O4 nanocrystals into PDMS have been implemented. The magnetic-based material could be developed into magnetic field sensors through assembling with various fibre-optic structures.

M1C.2 • 08:50 Invited

Tailoring dynamic optical speckle pattern through a multimode fiber, Yi Xu; *Guangdong Uni. of Tech., China*. In general, an optical speckle pattern will appear at the distal end of a multimode fiber because of modal dispersion. Becasue beam propagation in the multimode fiber is a deterministic linear process, the input and output fields of a multimode fiber can be bridged utilizing a transmission matrix. Although the static generation of arbitrary optical intensity at the distal end of a multimode fiber has been accomplished, the possibility of dynamical version is still yet to be demonstrated, which relies on very precise measurement of the transmission matrix. In this presentation, we show the dynamical generation of arbitrary optical speckle patterns through a multimode fiber.

Room 105, SS 1

08:30-10:00
M1D • Machine learning I
Presider: Nianqiang Li, Soochow University, China

M1D.1 • 08:30 Invited

Intelligent Encoding Method and Implementation for FPGA-based PDAC, Kangqi Zhu, Nan Hua, Jinghan Yu, Xiaoping Zheng and Bingkun Zhou; *Tsinghua Uni., China*. The distortion of high-speed signals from FPGA deteriorates the output waveform quality of the FPGA-based PDAC, such as vertical resolution. We propose a machine learning-assisted encoding method to mitigate the negative effects of such distortion.

M1D.2 • 08:50 Invited

Deep learning based decoding Techniques of Forward correction codes, Qinghua Tian; *Beijing Uni. of Posts and Tel., China*. Forward Error Correction code can effectively reduce the impact of error information and improve the transmission efficiency. Deep learning is used to optimize the decoding method to improve the system performance and reduce the complexity.

M1D.3 • 09:10

An Optoelectronic Joint Equalization Scheme Based on Photonic Reservoir Computing and TDNN for CD and Nonlinearity Compensation in IM/DD Link, An Yan, Penghao Luo, Aolong Sun, Guoqiang Li, Sizhe Xing, Jianyang Shi, Ziwei Li, Chao Shen, Nan Chi and Junwen Zhang; *Fudan Univ., China*. We propose and numerically study a joint equalization scheme combining neuromorphic photonic reservoir computing with time-delay neural-network for chromatic dispersion compensation and nonlinear compensation in IM/DD system, achieving bitrate-distance product up to 11,200Gps·km in C-band.

Room 106, Track 4

08:30-10:00
M1E • Optoelectronic integration III
Presider: Jianji Dong, Huazhong University of Science and Technology, China

M1E.1 • 08:30 Invited

A high-linearity and fast-response direct-modulated DFB laser for low-cost FMCW LiDAR, Wenhua Gu; *Nanjing Univ. of Posts and Tel., China*. We proposed a double-section DFB laser for FMCW lidar system. The measured nonlinearity of up-ramp and down-ramp at 200KHz modulation rate was 1.25% and 5.02% ,and the response time was 100ns and 150ns respectively

M1E.2 • 08:50 Invited

Non-reciprocal transmission and electromagnetically induced transparency with on-chip optomechanical microresonators, Lei Shi; *Huazhong Uni. of Sci. and Tech., China*.

M1E.3 • 09:10 Invited

Ultra-low-power tuning on hybrid integrated silicon platform, Yong Zhang; *Shanghai Jiao Tong Uni., China*. Power consumption of photonic integrated circuits becomes a critical consideration. We propose a new platform for ultra-low-power tuning in silicon photonics.

Room 102, Track 1

M1A.4 • 09:30 Invited

Graphene film enabled all-optical tunable fiber microcavity filter, Bo Dong, Zongyu Chen, Liu Yang, Sengpeng Zhang, Yunji Yi and Wobin Huang; *Shenzhen Tech. Uni., China*. Graphene film enabled all-optical tunable fiber microcavity filter is presented. The filter shows the excellent all-optical tunability.

M1A.5 • 09:50

Mode-locked fiber laser based on the broadband germanene saturable absorber, Qingbo Wang[1], Jianlong Kang[2], Pan Wang[1], Jiangyong He[1], Zhi Wang[1], Han Zhang[1] and Yan-Ge Liu[1]; [1]*Nankai Uni., China;* [2]*Shenzhen Uni.,* China. The broadband saturable absorption properties of germanene ranging from 1.0 to 2.0 μm were studied, and ultrashort pulses were respectively obtained in mode-locked Yb, Er, and Tm fiber lasers based on the germanene-SA.

Room 103, Track 8

M1B.4 • 09:30 Invited

Towards standard pluggable quantum key distribution moudle via silicon, III-V and other materials, Yi Qian; *National Information Optoelectronics Innovation Center, China*. Recent progress of silicon photonics chip and III-V device for quantum key distribution (QKD) in NOEIC will be presented. And the feasibility of pluggable QKD moudle formed by silicon, III-V and other materials will be discussed.

M1B.5 • 09:50

Study of the Rydberg atom cell sensitivity on the incoherent detection method, Ruijian Rao, Jinyun Wu, He Xuan and Yang Pei; *National Uni. of Defense Tech., China*. The Rydberg atom cell sensitivity on the incoherent detection microwave is analyzed. The simulation suggests that increasing the input probe laser signal noise ratio and decreasing the coupling laser Rabi frequency can improve this sensitivity.

Room 104

M1C.3 • 09:10

Fiber-Optic Extrinsic Fabry-Perot Interferometer Inspired Microwave Device: A Novel Ultra-Sensitive Sensing Platform, Chen Zhu; *Zhejiang Laboratory, China*. Inspired by the fiber-optic extrinsic Fabry-Perot interferometer, a novel and universal ultra-sensitive microwave Fabry-Perot sensing platform based on an open-ended hollow coaxial cable resonator (OE-HCCR) for sub-nanometer displacement sensing is reported.

M1C.4 • 09:25

Intensity-Modulated Refractometer with Long-Period Fiber Gratings Near Turn-Around Point for Low Refractive Index Detection, Ziyang Hua[1], Yunhe Zhao[1], Wei Wang[1], Mengxue Tang[1], Yunqi Liu[2] and Zuyuan He[3]; [1]*Shanghai Maritime Univ., China*; [2]*Shanghai Univ., China*; [3]*Shanghai Jiao Tong Univ., China*. We demonstrate an intensity-modulated refractometer with long-period fiber gratings in thin core fiber near turn-around point. Gratings with the index modulation of 0.00045 could achieve high sensitivity of -163.32 dB/RIU in RI region of 1.24-1.30.

M1C.5 • 09:40

Sensitive enhanced refractive index sensor based on series tapered thin-core microfiber with Vernier effect, Huiji Chen, Binbin Luo, Decao Wu, Shenghui Shi, Yujie Li, Xue Zou and Mingfu Zhao; *Chongqing Uni. of Tech., China*. We reported a refractive index optical fiber sensor using series tapered thin-core microfiber based on the optical Vernier effect. An ultra-high RI sensitivity of –15,053.411 nm/RIU was obtained by using the series structure.

M1C.6 • 09:55

A reliable remote monitoring system of optical fiber time transfer, Xinxing Guo, Bo Liu, Weicheng Kong, Jie Liu, Tao Liu, Ruifang Dong and Shougang Zhang; *National Time Service Centre, China*. This paper proposes a reliable remote monitoring system with an encryption function. The system can monitor the operation of multiple optical fiber time transfer equipment at the same time.

10:00-10:30 Poster Session 4 & Coffee Break, 1F

Room 105, SS 2

M1D.4 • 09:25
Analysis for Joint Algorithm in Coherent Optical Fiber Communication Systems, Yongming Zhang, Yongjun Wang, Chao Li, Junliang Xue, Qi Zhang and Qinghua Tian; *Beijing Uni. of Posts and Tel., China*. We propose a joint algorithm for nonlinear channel equalization in coherent optical communication system. We have experimentally demonstrated its performance and complexity, and analyzed the data pseudo-random problem.

M1D.5 • 09:40
A Loss-aware Continuous Hopfield Neural Network (CHNN)-based Mapping Algorithm in Optical Network-on-Chip (ONoC), Yuxiang Niu1, Hui Li[1] and Feiyang Liu[2]; [1]*Xidian Uni., China*; [2]*Xi'an Aeronautics Computing Technique Research Institute, AVIC, China.* This work proposes a Continuous Hopfield Neural Network (CHNN)-based mapping algorithm in ONoC to reduce the loss of communications, thus improving power efficiency and reliability.

Room 106, Track 4

M1E.4 • 09:30 Invited

Highly efficient acousto-optic modulation using nonsuspended thin-film lithium niobate-chalcogenide hybrid waveguides, Lei Wan; *Jinan Uni., China*.

M1E.5 • 09:50
Investigation and optimization of thin-film-lithium-niobate array-waveguide-grating with the influence of fabrication tolerance, Jiaxi Yuan, Jiangbing Du, Jiacheng Liu and Zuyuan He; *Shanghai Jiao Tong Uni., China*. Design and optimization of a four channel CWDM thin-film lithium niobate AWG is reported. Simulated crosstalk is better than -26 dB. The effect of the fabrication error on the device performance is analyzed.

10:00-10:30 Poster Session 4 & Coffee Break, 1F

Poster Session 4 (10:00-10:30)

P4.1

Design of LED intelligent insect situation monitoring device based on STM32, Yunsong Hu[1], Xia Cai[2], Huihua Ji[2], Zhouhong Zhu[1] and Huacai Chen[1]; [1]*China Jiliang Uni., China;* [2]*Hangzhou Yeehar Agricultural Technology Co., LTD, China*. To improve efficiency of target insect trapping, we designed an intelligent insect monitoring system using STM32 microcontroller and LED combination light source.

P4.2

Reliability-Oriented RSA Combined with Reinforcement Learning in Elastic Optical Networks, Yurong Jiao, Shan Yin, Tianyu Jin, Lihao Liu, Ligang Zhao and Shanguo Huang; *Beijing Uni. of Posts and Tel., China*. This paper proposes a reliability-oriented RSA scheme combined with reinforcement learning in elastic optical networks. The results show that the scheme can effectively improve the network performance such as average failure probability and blocking probability.

P4.3

On-line detection and life evaluation of light source on cigarette production line, Jun Zhang[1], Kanghua Yu[2], Wei Ying[1], Zhouhong Zhu[2], Yuhang Shen[1], Neng Wang[1] and Huacai Chen[2]; [1]*China Tobacco Zhejiang Industrial CO., LTD, China;* [2]*China Jiliang Uni., China*. We designs an online detector for light source detection on the cigarette production line. The detector is composed of spectrum probe and control display terminal which collects, analyzes and displays the the light source spectra.

P4.4

Joint Resource Management for Visible Light Communication Heterogeneous Networks, Liwei Yang, Xiangyuan Peng, Jianhui Kang, Maiyun Zhang, Xinyu Li and Lin Li; *China Agricultural Uni., China*. An improved Modified-Largest Weighted Delay First algorithm is proposed to improve the performance of VLC-WiFi heterogeneous networks. Simulation results show that the algorithm has better fairness and higher throughput than the existing algorithms.

P4.5

Tunable Gain-Clamped Double-Pass L-band Erbium-Doped Fiber Amplifier, Haoxian Lao and Xinyong Dong; *Guangdong Uni. of Tech., China*. Tunable Gain-Clamped Double-Pass L-band Erbium-Doped Fiber Amplifier is proposed.The gain is clamped at 14.13 dB with a variation of 0.3 dB from input signal power of −35 to −5dBm for 1580nm.

P4.6

Microfiber acoustic sensor based on diaphragm structure, Xue Zou, Kaijun Liu, Junhao Fan, Xiangwen Yang, Yilin Guo and Binbin Luo; *Chongqing Uni. of Tech., China.* A microfiber acoustic sensor based on diaphragm structure is proposed. The detection of 60-1000 Hz acoustic signal was realized. The proposed acoustic sensor can respond to acoustic signals in the range of 324°-36° and 144°-216°.

P4.7

Optical Fiber Fabry-Perot Interferometers for Highly Sensitivity Temperature Sensing Based on Vernier Effect, Fang Zhao[1], Jie Hu[1], Weihao Lin[1], Dongrui Xiao[1], Shuaiqi Liu[1], Feihong Yu[1], Guomeng Zuo[1], Guoqing Wang[2], Liyang Shao[1] and Perry Ping Shum[1]; [1]*Southern Uni. of Sci. and Tech., China;* [2]*Shenzhen Institute of Information Tech., China*. An optical FPI temperature sensor based micro-structured fiber composed of HCF and MMF is proposed and demonstrated. The temperature sensitivity of 69.2 pm/℃ can be obtained by tracking the envelope of the spectrum.

P4.8

A Novel Optical Microcavity Based on Nonperiodic High Index Contrast Subwavelength Gratings, Yushang Chen, Yongqing Huang, Kai Liu, Zicheng Wang, Yisu Yang, Xiaofeng Duan and Xiaomin Ren; *Beijing Uni. of Posts and Tel., China*. We report a novel optical microcavity based on nonperiodic high index contrast subwavelength gratings. The proposed microcavity has high quality factor and small effective mode volume, which can be widely used in optoelectronic devices.

P4.9

Optic frequency transfer via fiber based on digital phase unwrap technology, Dan Wang[1], Xue Deng[2], Jie Liu[2], Dongdong Jiao[2], Jing Gao[2], Qi Zang[2], Xiang Zhang[2], Qian Zhou[2], Guanjun Xu[2], Ruifang Dong[2], Tao Liu[2] and Shougang Zhang[2]; [1]*Uni. of Chinese Academy of Sciences, China*; [2]*National Time Service Center, China*. This paper provides FPGA-based phase unwrapping technique for demonstrating long-distance optical frequency transfer link with large noise level. And it is used in a 550 km spooled fiber with an instability of 4.3E-20@10000s.

Poster Session 4 (10:00-10:30)

P4.10

Data Matching Methods for FBG Dynamic Strain Signal, Ye Lu, Huaping Gong, Jingyi Cai, Yiting Liu and Chunliu Zhao; *China Jiliang Uni., China*. Cross-correlation, wavelet cross-correlation and dynamic time warping algorithm are used to perform data matching.The experimental results show that the matching coefficients of the dynamic time warping algorithm is 0.9960.

P4.11

JHM-NC: a Joint Hierarchical Modulation and Network Coding Approach for Improving the System Performance in OFDM PON, Nan Feng, Shaobo Li and Qingsong Luo; *The 54th research Institute of CETC, China*. This paper joints hierarchical modulation and network coding in OFDM PON by adjusting the electrical power in ONU and the optical power between ONUs. The simulation results validate the scheme comes at no additional complexity

P4.12

Polarization Effects of Holographic Penetrating Imaging Radar, Yunhua Ding; *National Uni. of Defense Tech., China*. In this paper,through experiments, some rules of radar polarization mode pair and target detection ability are summarized, which have guiding significance for the design and use of holographic penetrating imaging radar system.

P4.13

OFDM-based algorithm for peak average power ratio suppressing in underwater wireless optical communications, Liwei Yang, Boyu Jia, Fang Wang, Xiangyuan Peng and Yuanhao Jiang; *China Agricultural Uni., China*. An improved SLM algorithm is proposed to improve the PAPR reduction capability of OFDM-based UWOC. In order to reduce data correlation, chaotic sequences are employed. Simulation findings demonstrate the effectiveness of the algorithm.

P4.14

L-band double-pass erbium-doped fiber amplifier with high gain and low noise, Jiyu Ruan, Jinlian Mo and Xinyong Dong; *Guangdong Uni. of Tech., China*. This paper presents an efficient pumping scheme for L-band erbium-doped fiber (EDFA) amplifier to reach high gain and low noise performance in a double-pass configuration.

P4.15

Optimized 25Gb/s Electroabsorption Modulated Tunable Lasers for O-band DWDM Systems near Fiber for All-Optical Binary Pattern Matching System, Hao Liu[1], Zhenxing Sun[2], Lei Wang[3], Rulei Xiao[2], Anxu Zhang[1], Kai Lv[1], Lipeng Feng[1], Ji Deng[3] and Xiaoli Huo[1]; [1]*Research Institute of China Telecom Co., Ltd., China;* [2]*Nanjing Uni., China;* [3]*Wuxi Taclink Optoelectronics Technology Co., Ltd., China*. We propose and experimentally demonstrate an O-band electroabsorption modulated tunable in-series DFB laser array (EMTL) for DWDM application, which can be applied in the next-generation fronthaul networks and passive optical networks.

P4.16

Research on the Pilot-Aided Kalman filter Carrier Phase Recovery algorithm for PS-64QAM, Yiqing Ji, Feng Tian, Tianze Wu, Qi Zhang and Xiangjun Xin; *Beijing Uni. of Posts and Tel., China.* We proposed a pilot-aided Kalman filter CPR scheme for PS-64QAM. The result shows the complexity of the PA-KF is reduced by 99% and the GMI of PA-KF CPR increases by ~1.18 bit/symbol compared with BPS.

P4.17

A PAPR Reduction scheme Based on Nonlinear Companding Transform and LDPC-coded for a Coherent Optical GFDM system, Xiangyu Liu, Qi Zhang, Xiangjun Xin, Ran Gao, Yongjun Wang, Feng Tian, Qinghua Tian and Leijing Yang; *Beijing Uni. of Posts and Tel., China*. A PAPR reduction method using nonlinear-companding-transform and LDPC-coded is proposed to reduce high PAPR of GFDM signals. Simulation results show that the proposed scheme has better performances in reducing the PAPR and BER.

P4.18

Non-invasive Sleep-Wake Discrimination Using LS-CPC Algorithm Based on MZI-BCG Sensor, Yifei Feng[1], Wei Xu[2], Qinggang Ge[3], Yilong Yang[4] and Ying He[1]; [1]*Naval Specialty Medical Center, China*; [2]*State Key Laboratory of Transient Optics and Photonics, China;* [3]*Peking Uni. Third Hospital, China;* [4] *Uni. of Shanghai for Sci. and Tech., China.* A non-invasive sleep-wake discrimination algorithm based on Mach-Zehnder interferometer assisted ballistocardiogram sensor is proposed. According to the Lomb-Scargle periodogram and cardiopulmonary coupling algorithm using heart rate variability and respiratory.

Poster Session 4（10:00-10:30)

P4.19

Extended Kalman Filter Scheme for Polarization Demultiplexing in PDM-PCS-64QAM Communication System, Qingmin Lu, Peng Sun, Lixia Xi, Xiaoguang Zhang, Nan Cui and Wenbo Zhang; *Beijing Uni. of Posts and Tel., China*. Extended Kalman filter (EKF) algorithm is optimized for PCS-64QAM signals polarization demultiplexing. It can achieve excellent demultiplexing performance with 8ps DGD and 1Mrad/s RSOP while MMA and original EKF both fail to work.

P4.20

Phase-stabilized frequency transfer with arbitrary phase shift via optical fiber links, Yawei Zhang[1], Xiaodong Liang[2], Dongjie Wang[3], Zhongyang Xu[1], Bowen Qiu[1] and Shilong Pan[1]; [1]*Nanjing Uni. of Aeronautics and Astronautics, China;* [2]*The 54th Research Institute of CETC, China;* [3]*Hebei Key Laboratory of Photonic Information Tech. and Application, China*. Phase-stabilized frequency transfer is achieved using a tunable auxiliary RF signal, in which the phase shift between two sites can be arbitrary tuned. The Allan variances at all phase shifts meet well with each other.

P4.21

High Resolution Isar Imaging Method Based on Spectrum Estimation Theory, Tianyun Wang[1], Bing Liu[1], Yani Cao[2], Gang Wang[1], Xianchun Xu[1] and Kai Kang[1]; [1]*China Satellite Maritime Tracking and Control Department, China;* [2]*China Xi'an Satellite Control Center, China*. This paper puts forward a high resolution ISAR imaging method based on modern spectrum estimation theory, which can break through imaging limitation, and obtain satisfactory imaging results compared with classical RD and sparse algorithms.

P4.22

Joint Modulation OCDM Optical Communication with High Security and Large Capacity, Jiajia Shen, Bo Liu, Jianxin Ren, Rahat Ullah, Yaya Mao, Suiyao Zhu, Shuaidong Chen, Xiangyu Wu, Tingting Sun, Yonfeng Wu and Lilong Zhao; *Nanjing Uni. of Inforamtion Sci. and Tech., China*. Utilizing the idle subcarriers of OCMD signal, joint modulate OCDM and OFDM signal to enhancing the system capacity. Based on SLM algorithm, improved chaotic model generates random sequence to reduce the joint modulation system PAPR.

P4.23

Design and implementation of laser TT&C system based on QPSK digital coherence system, Haifeng Yang; *The 10th Research Institute of China Electronics Tech. Corporation, China.* The traditional microwave TT&C system is difficult to further improve the measurement accuracy and transmission rate, a high-precision ranging, velocity measurement and communication integration method based on the system under the optical carrier is proposed.

P4.24

The High Capacity and Elastic Optical Access Network Key Technologies, Nan Feng, Shaobo Li and Qingsong Luo; *The 54th research Institute of CETC, China*. This paper summarizes the flexible metro-access convergence passive optical network (PON) architecture-elastic software defined optical access network (ESDAN) and reviews the possible technologies from the physical layer (PHY) and the media access control (MAC) layer

P4.25

Thulium-doped fiber random laser based on interval random Bragg grating array, Fengjiao Li, Decai Zhu and Xinyong Dong; *Guangdong Uni. of Tech., China*. In this paper, a thulium-doped fiber random laser based on interval random Bragg grating array is proposed. A random laser is formed at 1944.9 nm with a threshold of 0.69 w.

P4.26

Secure OCDM short-range optical communication based on High dimensional Constellation disturbance, Suiyao Zhu, Bo Liu, Jianxin Ren, Jiajia Shen, Xiangyu Wu, Yaya Mao, Yu Bai, Haojing Zhang, Lingzhi Yuan, Mengting Zhang and Xu Zhu; *Nanjing Uni. of Information Sci. and Tech., China*. In this paper, we propose a secure orthogonal chirped divisionmultiplex-ing short-range optical communication based on high-dimensional constellation disturbance, which improves the security of the transmission system and reduces its bit error rate.

P4.27

Achieving OPD super-resolution of the fiber-optic white light interferometer, Chengcheng Hou, Guangjin Zheng, Yao Zhao, Zhengying Han, Xiangliang Zheng, Fuzhou Shang, Zihan Wang and Yesheng Gao; *The 41st Institute of China Electronics Tech. Group Corporation, China*. A numerical method of processing data obtained by the fiber-optic white light interferometer to achieve Optical path difference (OPD) super-resolution is presented.

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Poster Session 4 (10:00-10:30)

P4.28

Performance analysis of distributed acoustic sensing systems based on Rayleigh-backscattering and wFBG-reflecting, Xin Mao[1] and Xinlan Xu[2]; *Yangtze [1]Optical Fibre and Cable joint stock limited company, China; [2]Wuhan Uni. of Tech., China*. This work illustrates the potential for wFBGs in the proposed DAS system, which can demodulate external disturbance signal with good linearity and wide frequency response range, and immune to interference fading and polarization fading.

P4.29

Three-wavelength Thulium-Doped Fiber Random Laser Based on Grating Feedback Technology, Lewen Zhou, Yaozong Hu and Xinyong Dong; *Guangdong Uni. of Tech., China*. A thulium-doped fiber random laser based on fiber random grating and superimposed fiber bragg grating is studied,and studied and analyzed its output spectral changes.

P4.30

Broadband ultrashort pulse modulation of zeolite based the single wall carbon nanotube, Dalin Sun, Xintong Xu and Shuangchen Ruan; *Shenzhen Tech. Uni., China*. We report a wide-band SWCNT@AFI SA, which can achieve stable Q-switched pulses in the 1.0 micron and 2.0 micron wavebands, and the modulation depth was 5.5 % and 13.0 %, respectively.

P4.31

Weight-based Re-grouped Dynamic Resource Allocation Algorithm in Visible Light Communication and WiFi Heterogeneous Network, Liwei Yang, Boyu Jia, Fang Wang and Xiangyuan Peng; *China Agricultural Uni., China*. A weight-based re-grouped resource allocation algorithm is proposed to improve the fairness of the system. Simulation results show that the algorithm improves the fairness index and throughput of the system, and has good practicality.

P4.32

Joint Modeling Based on The First-Order Perturbation Theory and Neural Network, Haifeng Yang, Yongjun Wang, Chao Li, Xianda Ren and Qi Zhang; *Beijing Uni. of Posts and Tel., China*. In this paper, we use the first-order perturbation theory and neural network to jointly model the intra-channel nonlinearity. The 120 Gb/s signal of dual-polarization 64-quadrature-amplitude-modulation (64-QAM) is used to verify.

P4.33

Landslide Displacement Prediction Based on Variational Mode Decomposition and LSTM, Xu Chunying, Huang Kaibin, Wei Chuliang and Lin Yiwen; *Shantou Uni., China*. In this paper, a hybrid model based on VMD and LSTM is proposed to predict landslide displacement. The VMD is used to decompose the data of landslides, and use the LSTM model for prediction.

P4.34

Research on the VSS-FDLMS MIMO Equalization algorithm for the Spatial-Division Multiplexing Transmission System, Jianke Qin, Feng Tian, Tianze Wu, Yu Gu, Qi Zhang, Yongjun Wang and Qinghua Tian; *Beijing Uni. of Posts and Tel., China*. A VSS-FDLMS algorithm is proposed in this paper, whose performance is demonstrated in the 6-mode 7-core fiber transmission system, the BER can be achieved 3e-3 across the whole 42 spatial channels.

P4.35

An improved spectral demodulation algorithm based on cross correlation for chirped fiber Bragg Gratings, Zhihao Wang, Yueming Zhang, Changyu Shen and Zhaokun Wang; *China Jiliang Uni., China*. In this letter, we propose a simple and precise spectral demodulation algorithm for chirped fiber Bragg grating (CFBG). This algorithm relies on mutual correlation.

Room 102, Track 1

10:30-12:00
M2A • Fibers & fiber devices V
Presider: Dejun Liu, Shenzhen University, China

M2A.1 • 10:30 Invited

Anti-resonant Hollow Core Fiber Structures for Sensing Applications, Dejun Liu; *Shenzhen Univ., China*. Hollow core fiber (HCF) which guides light through Anti-resonant guiding mechanim has been attracting considerable interest for sensing applications. In this talk I will give a introduciton on how to construction of HCF basd fiber sensor structures and their sensing applications.

M2A.2 • 10:50 Invited

Mode coupling in multicore fiber with long-period gratings, Yunhe Zhao; *Shanghai Maritime Uni., China*;

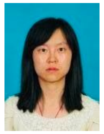
Room 103, Track 2

10:30-12:00
M2B • Optical transmission IV
Presider: Min Zhu, Southeast University, China

M2B.1 • 10:30 Invited

Performance Enhanced Gerchberg-Saxton Algorithm Based Electrical Dispersion Pre-compensation for Intensity-Modulation and Direct-Detection System, Fan Li[1, 2], Dongdong Zou[1, 2], Qi Sui[3], Xingwen Yi[1, 2], and Zhaohui Li[1, 2, 3]; [1]*Sun Yat-sen Uni., China;* [2]*Guangdong Provincial Key Laboratory of Optoelectronic Information Processing Chips and Systems, China;* [3]*Southern Laboratory of Ocean Science and Engineering, China*. Two performance-enhanced iterative electrical dispersion pre-compensation schemes, called interleaved Gerchberg-Saxton (GS) and bipolar GS, are proposed for IM-DD systems. The experimental results show that 28-Gbaud PAM-4 signal is successfully transmitted over 80-km SMF in C-band enabled by the interleaved GS. The bipolar GS scheme is verified by system simulation, and the results show that 56-Gbaud PAM-4 signal can be delivered over 400-km SMF with BER below the 7% HD-FEC threshold of 3.8×10-3.

M2B.2 • 10:50 Invited



High speed IM-DD transmissions for Intra-DCIs, Jing Zhang; *Uni. of Electronic Sci. and Tech. of China, China*.

M2B.3 • 11:10

Global Power and OSNR Analyses for Super C band Optical Transmission Systems, Xiao Chen, Jitao Gao, Hongya Wang, Zhenhua Feng, Yuting Du and Hu Shi; *ZTE Corp., China*. Broadband optical transmission with 6-THz super C band is achieved with cost-effective classical-physics-model-based global power and OSNR analyses (GPOA). The end to end GPOA estimation error over 8-span SMF link is less than 1.5 dB.

Room 104, Track 3

10:30-12:00
M2C • Optical networks IV
Presider: Yanni Ou, Beijing University of Posts and Telecommunications, China

M2C.1 • 10:30 Invited

Towards Next Generation Optical Networks and Enabling Technologies, Yanni Ou; *Beijing Uni. of Posts and Tel., China.*

M2C.2 • 10:50

Improved Fairness of Multicast Blocking in Elastic Optical Networks, Peiqi Li[1], Yida Feng[1], Jingru Wang1, Xiao Yu[1], Yongcheng Li[2] and Anliang Cai[1]; [1]*Nanjing Uni. of Posts and Tel., China*; [1]*Soochow Uni., China*. We re-investigate the problem of RSA in EONs but for the blocking fairness of multicast with different destination counts. An efficient heuristic algorithm is proposed for a lower blocking probability and improved fairness.

M2C.3 • 11:05

Two-layer Optical label for Operation, Administration and Maintenance of Optical Network, Junpeng Liang; *ZTE Corparation, China*. We propose a two-layer optical label scheme for operation, administration and maintenance (OAM) of optical network. The proposed optical label can transmit abundant OAM information and provide a series of monitor functions.

M2C.4 • 11:20

K-Optimal Grouping Distributed Steiner Sub-Tree Scheme for All-Optical Multicast in Elastic Optical Datacenter Networks, Mengfei Guo, Junling Yuan, Xuhong Li, Qikun Zhang and Siyu Nan; *Zhengzhou Uni. of Light Industry, China*. This paper proposes a K-optimal grouping distributed steiner sub-tree (K-OG-DSST) algorithm in elastic optical datacenter networks (EODN) for all-optical multicast services. Simulation results show that the proposed algorithm can significantly reduce the blocking probability.

Room 105, SS 2

10:30-12:00
M2D • Machine learning II
Presider: Qinghua Tian, Beijing University of Posts and Telecommunications, China

M2D.1 • 10:30 Invited

High-speed reservoir computing based on laser dynamics, Nianqiang Li; *Soochow Uni., China*.

M2D.2 • 10:50 Invited

Signal processing challenges and solutions for underground safety monitoring of communication optical cables with DAS, Huijuan Wu; *Uni. of Electronic Sci. and Tech. of China, China*. This speech will address the vibration signal processing challenges for underground safety monitoring of communication optical cables with fiber-optic distributed acoustic sensor (DAS), and present several methods related to the multi-source separation, vibration recognition and localization.

M2D.3 • 11:10
A Hardware-Friendly Nonlinearity Equalizer via Random Forest Model, Gang Feng, Yongjun Wang, Chao Li, Jinwang Bai, Qi Zhang and Feng Tian; *Beijing Uni. of Posts and Tel., China*. In this paper, a random forest model based nonlinearity equalizer for coherent optical communication system is proposed. The experimental results show that this is a hardware-friendly equalizer.

Room 106, Track 4

10:30-12:00
M2E • Optoelectronic integration IV
Presider: Lei Shi, Huazhong University of Science and Technology, China

M2E.1 • 10:30 Invited

Load restoration in distribution network by electric vehicles, Lu Zhang; *China Agricultural Uni., China*.

M2E.2 • 10:50 Invited

High-Efficient and Polarization-Insensitive Metalens Using Sub-Wavelength Circular Slot Elements, Yong-Qiang Liu; *Science and Technology on Electromagnetic Scattering Laboratory, China*. In this paper, an annular slot element-type metallic metasurface is proposed for the design of high efficient metalens in the microwave band.

M2E.3 • 11:10
Integrated Subwavelength Gratings on a Lithium Niobate on Insulator Platform for Mode and Polarization Manipulation, Xu Han and Yonghui Tian; *Lanzhou Uni., China*. This presentation aims to introduce a novel compact subwavelength grating waveguide on a lithium niobate on insulator platform, including its inherent advantages, fabrication processes and relevant integrated photonic devices for mode and polarization manipulation.

Room 102, Track 1

M2A.3 • 11:10
Reduced diameter fiber with ultra-low bending loss, Liubo Yang, Lei Shen, Lei Zhang and Ruichun Wang; *Yangtze Optical Fibre and Cable Joint Stock Limited Company*, China. This paper introduces two kinds of reduced diameter ultra-low bending loss fibers,tests show that two kinds of fibers have a wide application prospects in micro cable and high density optical devices.

M2A.4 • 11:25
Low Coupling-loss Three-dimensional Waveguide Fan-in/Fan-out Devices for Multi-core Fibe, Jun Chu, Ying Li, Lei Zhang, Jiahui Zhou and Ruichui Wang; *Yangtze Optical Fiber and Cable Joint Stock Limited Company, China*. We report the coupling and measurement of fan-in/fan-out for 8-core multicore fiber applicable using three-dimensional waveguide. The average coupling loss of multi-core fiber or single-mode fiber array with three-dimensional waveguide is less than 0.31dB.

M2A.5 • 11:40
Experimental characterization of a simple one-stage Er-doped optical fiber amplifier in the L-band, Yujia Li[1], Ke Zhang[2], Chao Wang[1], Dongmei Huang[1], Shifeng Zhou[2], Feng Li[1] and P. K. A. Wai[3]; [1]*The Hong Kong Polytechnic Uni., China*; [2]*South China Uni. of Tech., China;* [3]*Hong Kong Baptist Uni., China.* A simple one-stage L band Er-doped fiber amplifier (EDFA) is proposed. Amplified spontaneous emission (ASE), gain and noise figure of the amplifier are characterized, indicating an excellent amplified properties of the EDFA in L band.

Room 103, Track 2

M2B.4 • 11:25
Improved accuracy of PMD measurement based on spectral periodic interference, Chuanwei Gao[1], Hongbing Huang[2], Yi Zhang[2], Yinyi Li[2], Hongyan Wang[3], Peng Zhan[4], Ning An[5] and Xianfeng[1]; [1]*Beijing Uni. of Posts and Tel., China*; [2]*State Grid Zhejiang Electric Power Corporation Information & Tel. Branch, China*; [3] *Anhui Jiyuan Software Co. Ltd, China.* [4] *Information and Communication Branch of Hubei Electric Power Company, China.* [5] *Northeast Branch of State Grid Corporation of China, China*. An estimation method is proposed to calculates interference period from the optical spectrum of fixed analyzer method and extends number of extreme points to decimal fraction, which increases the accuracy of measurement of mean DGD.

M2B.5 • 11:40
Transceiver IQ Skew Compensation and Estimation By Widely Linear Equalizer, Junpeng Liang; *ZTE Corparation, China.* We propose a transceiver IQ skew monitoring method by using filter coefficients of widely linear equalizer, which can monitor both transmitter (Tx) and receiver (Rx) IQ skew simultaneously with the monitor error within sub-ps.

M2B.6 • 11:55
Dispersion Compensation Optimization Algorithm Based on Neural Network, Dengpan Chang[1], Xiatao Huang[1], Jing Zhang[1], Bo Xu[1], Xingwen Yi[2] and Kun Qiu[1]; [1] *Uni. of Electronic Sci. and Tech. of China, China*; [2] *Sun Yat-sen Uni., China* In this paper, a dispersion compensation algorithm based on neural network is proposed. We conduct a simulation to transmit a 120-Gb/s 16-QAM signal over 400-km SSMF in coherent optical systems to prove the effectiveness.

Room 104, Track 3

M2C.5 • 11:35
Link Recovery with Spectrum Overlap (LR-wSO) in Elastic Optical Networks (EONs), Mengxuan Ma[1], Peiyi Li[2], Feng Wang[3], Xiaolong Li[3], Xiaosong Yu[2] and Yongli Zhao[2]; [1]*State Grid Ningxia Electric Power Co., Ltd, China*; [2]*Beijing Uni. of Posts and Tel., China*; [3] *State Grid Electric Power Technical Research Institute, China*. In this paper, a link recovery algorithm with spectrum overlap in elastic optical networks is proposed. Simulation results indicate that the designed algorithm has better performance in terms of recovery success ratio.

M2C.6 • 11:50
Multi-Agent Deep Reinforced Virtual Network Embedding in Elastic Optical Networks, Gong Li[1], Chao Xi[2] and Ruijie Zhu[1]; [1]*Zhengzhou Uni., China*; [2]*Space Star Technology CO., LTD., China*. We propose a multi-agent deep reinforced virtual network embedding algorithm (MADRVNE). Simulation results demonstrate that the MADRVNE algorithm outperforms the other three algorithms in terms of average resource utilization and acceptance rate.

M2C.7 • 12:05
Scheduling Strategy for Multi-Stage Ultra-Low Loss Fiber Deployment in an Elastic Optical Network, Yuhang Liu, Jingxiang Hu, Yu Zhao, Jiatong Wang, Jun Li and Yongcheng Li; *Soochow Uni., China*. We studied the multi-stage ULL fiber deployment problem in elastic optical networks and developed a strategy to schedule the link order of ULL deployment in each stage. Results verify the efficiency of the proposed strategy.

M2C.8 • 12:20
Security-aware Service Mapping in Physical-layer Secured Optical Transport Networks, Tianhe Liu, Wei Wang, Kongni Zhu, Jingjing Li, Yajie Li, Yongli Zhao and Jie Zhang; *Beijing Uni. of Posts and Tel., China*. This paper proposes a security-aware algorithm for mapping services with heterogeneous security demands over lightpaths in optical transport networks with physical-layer encryption. Simulation results show the algorithm can manage the security-constraint properly.

12:00-14:00 Lunch Break, *1034 Hotel*

Room 105, SS 2

M2D.4 • 11:30

Fast and accurate optical performance monitoring based on multi-task learning with small-scale datasets, Xiaorong Zhu, Bo Liu, Jianxin Ren, Xu Zhu, Yaya Mao, Siliang Lei, Suiyao Zhu and Xiangyu Wu; *Nanjing Uni. of Information Sci. & Tech., China*. We analysis the requirements of optical performance monitoring(OPM) in Elastic optical networks based on coherent optical transmission systems. A multi-task learning scheme is adopted and demonstrated with small-scale datasets to realize fast and accurate OPM.

M2D.5 • 11:45

Optical performance monitoring based on multi-source domatation adaptation with capsule network for elastic optical network, Xu Zhu, Bo Liu, Jianxin Ren, Xiaorong Zhu, Suiyao Zhu and Xinyu Zhang; *Nanjing Uni. of Information Sci. & Tech., China*. A novel capsule network for optical performance monitoring approach in elastic optical network was proposed. Multi-source domain adaptation was used for data argument via narrow the loss between multiple source domains and target domain.

M2D.6 • 12:00

Dynamic malicious code detection technology based on deep learning, Lizhuo Wei, Fengkai Xu, Ni Zhang and Wei Yan; *The 6th Research Institute of China Electronice Corporation, China*. Run malicious code in a safe and controllable sandbox environment, use the idea of the longest common subsequence to deduplicate and analyze the API sequence, and improve the detection rate of malicious code.

Room 106, Track 4

M2E.4 • 11:25

An Adaptive Routing Method Based on Fuzzy Logic System in Optical Network-on-Chip (ONoC), Jiahe Zhao[1], Hui Li[1] and Feiyang Liu[2]; [1]*Xidian Uni., China*; [2]*Xi'an Aeronautics Computing Technique Research Institute, AVIC, China.* This work proposes an adaptive routing method based on fuzzy logic system, which comprehensively considers multiple factors to achieve multi-objective optimization and adaptively make routing decisions according to network statement information, without extra training.

M2E.5 • 11:40

High-speed and low dark current InGaAs/InAlAs Avalanche Photodiodes with gradually-doped p-type absorption layers, Ke Li, Xiaofeng Duan, Weifang Yuan, Yu Li, Kai Liu and Yongqing Huang; *Beijing University of Posts and Telecommunications, China*. A gradually-doped p-type absorption layer is employed in the InGaAs/InAlAs avalanche photodiode to reduce dark current and improve bandwidth. The proposed APD has a 28.5 GHz bandwidth and a dark current at the picoampere level

12:00-14:00 Lunch Break, *1034 Hotel*

Key to Authors and Presiders

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