

Photonics Asia

2019

TECHNICAL PROGRAM

20-23 October 2019

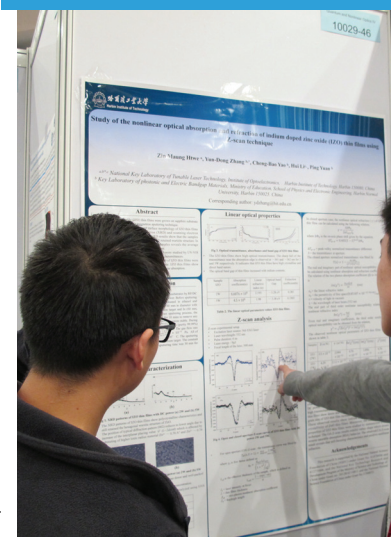
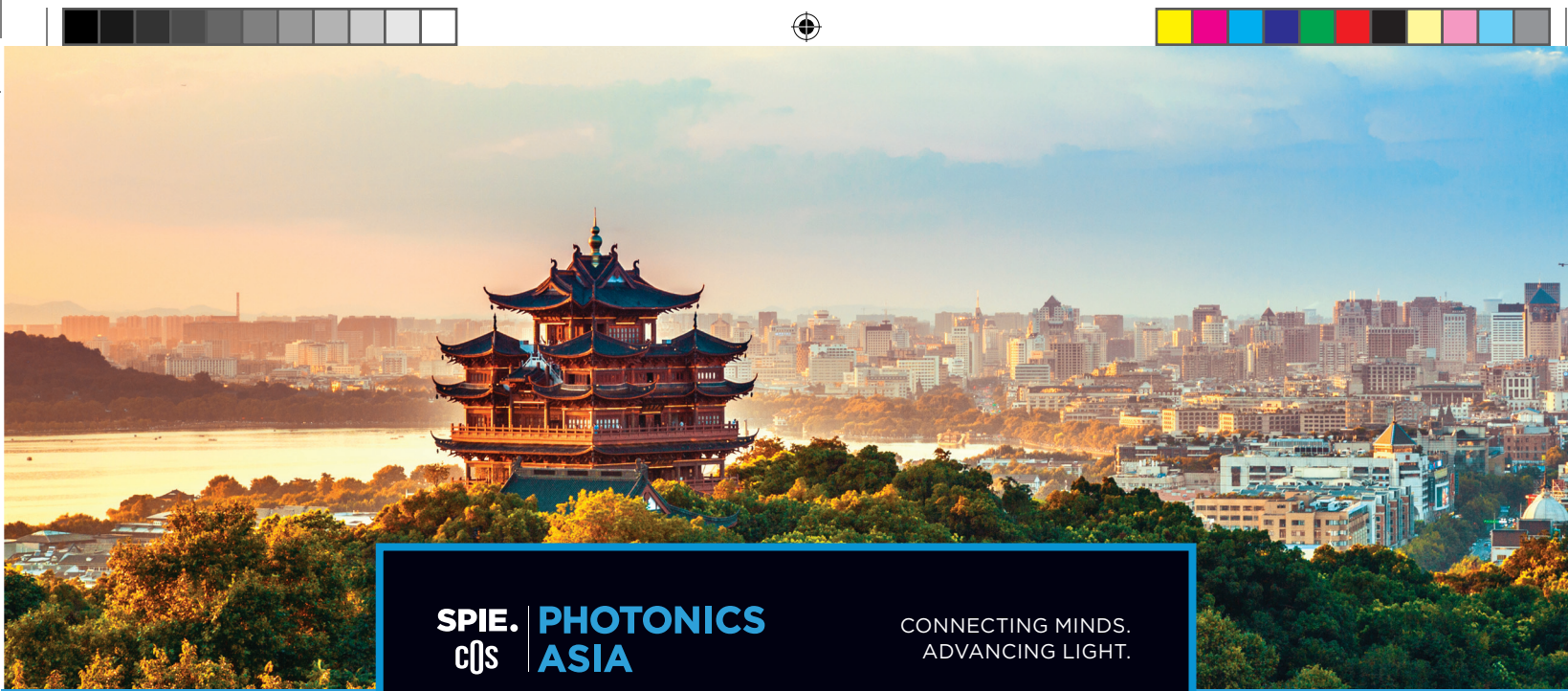
Hangzhou International Expo Center
Hangzhou, China

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Photonics Asia

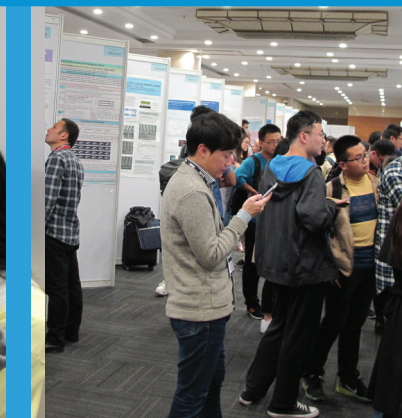
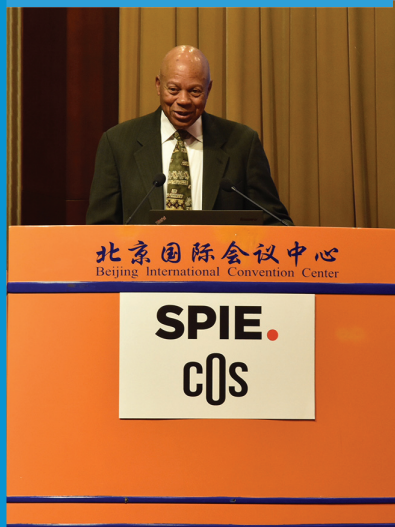
ASIA'S ANNUAL SYMPOSIUM FOR THE
DISCUSSION OF NEW DEVELOPMENTS
IN ADVANCED OPTICS AND PHOTONICS
TECHNOLOGIES

20-23 October 2019
Hangzhou International Expo Center
Hangzhou, China

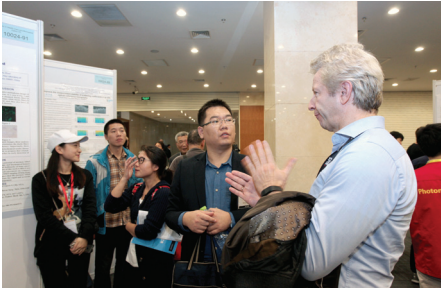
Welcome to Hangzhou

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Contents



HANGZHOU INTERNATIONAL EXPO CENTER FLOOR PLANS	4-6
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Special Events	7-10
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These important sessions will provide valuable information and networking opportunities.

Conferences

11181	High-Power Lasers and Applications X (Li, Singh, Jiang)	14
11182	Semiconductor Lasers and Applications IX (Zhu, Hofmann, He)	16
11183	Advanced Laser Processing and Manufacturing III (Xiao, Hong, Liu, Yao, Sano)	18
11184	Optoelectronic Devices and Integration VIII (Zhang, Li, Yu, Zhang, Dai)	20
11185	Optical Design and Testing IX (Wang, Benítez, Matoba)	22
11186	Advanced Optical Imaging Technologies II (Yuan, Carney, Shi, Somekh)	24
11187	Optoelectronic Imaging and Multimedia Technology VI (Dai, Shimura, Zheng)	27
11188	Holography, Diffractive Optics, and Applications IX (Sheng, Zhou, Cao)	30
11189	Optical Metrology and Inspection for Industrial Applications VI (Han, Yoshizawa, Zhang, Chen)	34
11190	Optics in Health Care and Biomedical Optics IX (Luo, Li, Gu, Tang, Zhu)	37
11191	Advanced Sensor Systems and Applications IX (Liu, Peng, He)	42
11192	Real-time Photonic Measurements, Data Management, and Processing IV (Li, Jalali, Asghari)	44
11193	Nanophotonics and Micro/Nano Optics V (Zhou, Wada, Tong)	46
11194	Plasmonics IV (Xu, Kawata, Qiu)	49
11195	Quantum and Nonlinear Optics VI (Gong, Guo, Ham)	51
11196	Infrared, Millimeter-Wave, and Terahertz Technologies VI (Zhang, Zhang, Tani)	53



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DAILY CONFERENCE SCHEDULE	12-13
PROCEEDINGS	68
GENERAL INFORMATION	70-71
SPIE POLICIES	72-73



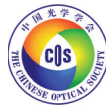
SPIE is the international society for optics and photonics, an educational not-for-profit organization founded in 1955 to advance light-based science and technology. The Society serves nearly 264,000 constituents from approximately 166 countries, offering conferences and their published proceedings, continuing education, books, journals, and the SPIE Digital Library in support of interdisciplinary information exchange, professional networking, and patent precedent. SPIE provided more than \$4 million in support of education and outreach programs in 2018.

For more information, visit www.SPIE.org.

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Yuguo Tang, Suzhou Institute of Biomedical Engineering and Technology (China)

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Peking University
(China)

Welcome

SPIE/COS Photonics Asia has established itself as the premier international symposium for optics and photonics technologies in China. These conferences and proceedings now play a critical role in scientific research development for a range of optical engineering professionals. In order to meet the needs of the international research community, COS and SPIE are pleased to announce that Photonics Asia will now convene every year in October to explore advanced optical technologies and enable future scientific discovery.

With important research and development projects underway in Asia and around the world, there is a growing demand for international exchange and collaboration. Local industry growth means that China is the center of rapid technology advancements and some significant breakthroughs in fundamental research science. This symposium is an international forum for the reporting and review of new developments in optics and photonics and showcases advancements in quantum and nonlinear optics, high-power lasers, optics in health care, advanced optical design and imaging, nanophotonics, plasmonics, infrared/terahertz, sensor systems, and more.

Cutting-edge technologies, applications, product announcements and demonstrations will be discussed in conference sessions and product exhibitions. The technical program includes a plenary session with visionary speakers, parallel technical sessions on critical technologies, a networking banquet, and an interactive poster session. This year's event will be held at Hangzhou International Expo Center in Hangzhou, one of the most beautiful and historic cities in China.

SPIE/COS Photonics Asia is a pivotal technical event for the optics and photonics technical community. Welcome to Hangzhou, we are excited to share what is happening in this exciting environment.



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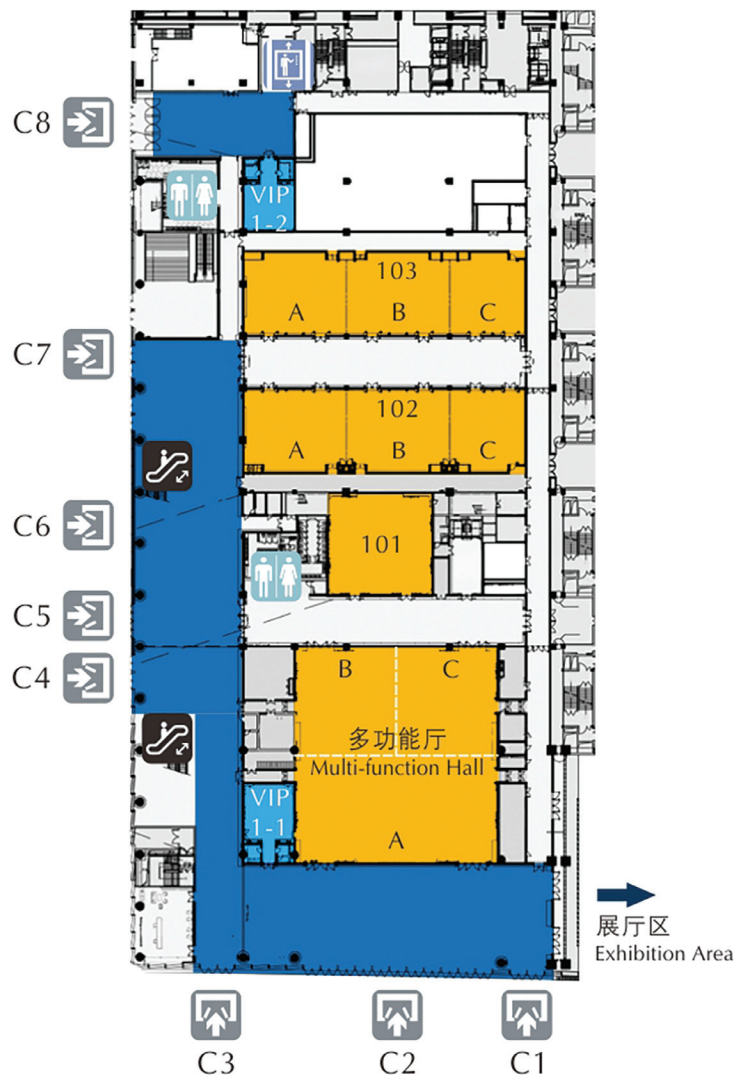
1F 会议区

Conference Area

HANGZHOU INTERNATIONAL EXPO CENTER

会议区平面图
conference Area Floor Plan

- 会议室
Conference Rooms
- VIP室
VIP Room
- 序厅
Lobby
- 入口
Entrance
- 自动扶梯
Escalator
- 电梯厅
Elevator
- 卫生间
Restroom



CONF #	CONF TITLE	ROOM ASSIGNMENT
	OPENING CEREMONY AND PLENARY SESSION	Press Conference Room
11181	High-Power Lasers and Applications X	Conv. Ctr. Room 206
11182	Semiconductor Lasers and Applications IX	Conv. Ctr. Room 207
11183	Advanced Laser Processing and Manufacturing III	Conv. Ctr. Room 404
11184	Optoelectronic Devices and Integration VIII	Conv. Ctr. Room 101
11185	Optical Design and Testing IX	Conv. Ctr. Room 402
11186	Advanced Optical Imaging Technologies II	Conv. Ctr. Room 103B
11187	Optoelectronic Imaging and Multimedia Technology VI	Conv. Ctr. Room 102A
11188	Holography, Diffractive Optics, and Applications IX	Multi-Function Hall B and Conv. Ctr. Room 101
11189	Optical Metrology and Inspection for Industrial Applications VI	Conv. Ctr. Room 102B
11190	Optics in Health Care and Biomedical Optics IX	Multi-Function Hall C
11191	Advanced Sensor Systems and Applications IX	Conv. Ctr. Room 206
11192	Real-time Photonic Measurements, Data Management, and Processing IV	Conv. Ctr. Room 102C
11193	Nanophotonics and Micro/Nano Optics V	Conv. Ctr. Room 403
11194	Plasmonics IV	Conv. Ctr. Room 103C
11195	Quantum and Nonlinear Optics VI	Conv. Ctr. Room 401
11196	Infrared, Millimeter-Wave, and Terahertz Technologies VI	Conv. Ctr. Room 103A

2F 会议区

Conference Area

会议区平面图
conference Area Floor Plan

会议室
Conference Rooms

VIP室
VIP Room

序厅
Lobby

入口
Entrance

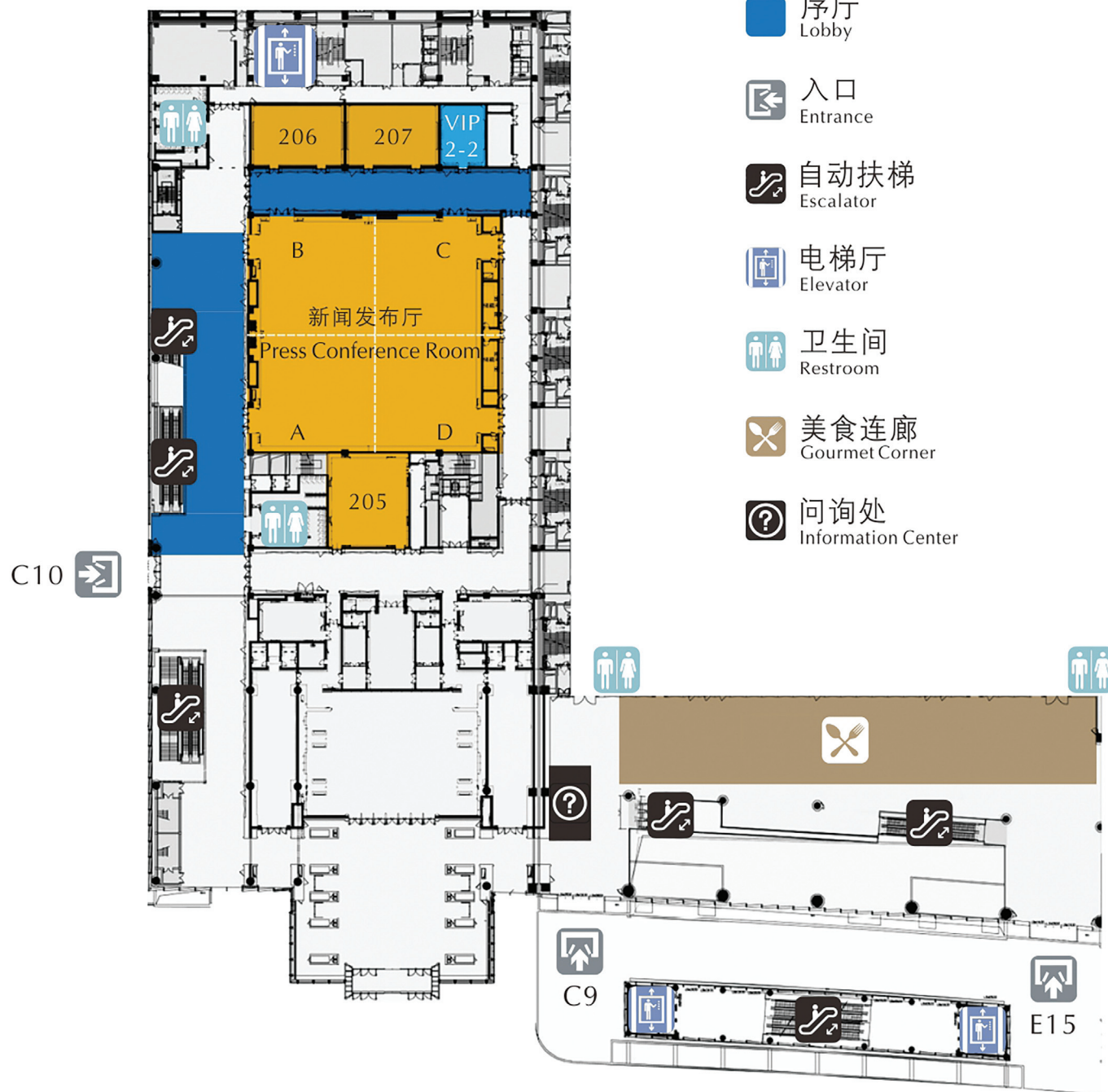
自动扶梯
Escalator

电梯厅
Elevator

卫生间
Restroom

美食连廊
Gourmet Corner

问询处
Information Center



HANGZHOU INTERNATIONAL EXPO CENTER

4F 会议区 Conference Area

会议区平面图
conference Area Floor Plan

会议室
Conference Rooms

VIP室
VIP Room

序厅
Lobby

入口
Entrance

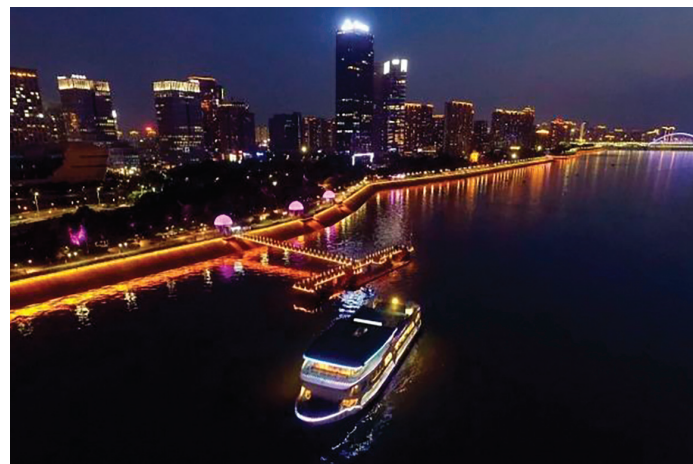
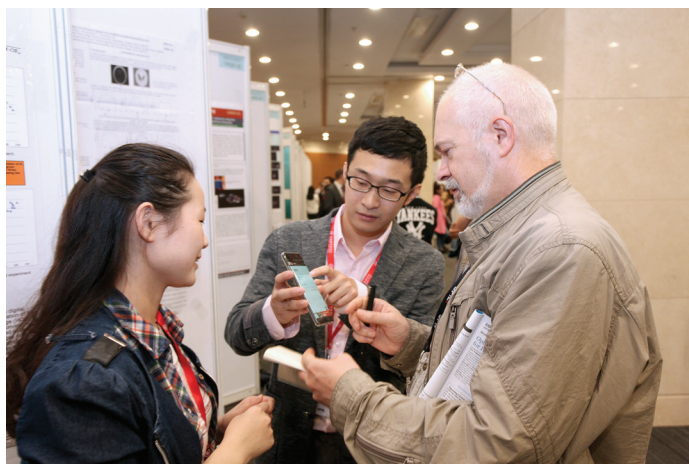
自动扶梯
Escalator

电梯厅
Elevator

卫生间
Restroom



SPECIAL EVENTS



Poster Session

Tuesday 22 October 2019 • 13:00 - 14:30
Location: First Floor Lobby

Conference attendees are invited to attend the poster session on Tuesday afternoon. Come view the posters, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster session.

Poster authors can set up presentations between 10:00 and 13:00. Posters that are not set up by 13:00 will be considered a No-Show and will not be published on the SPIE Digital Library. Poster presentation guidelines and setup instructions can be viewed at <http://spie.org/PAPosterGuidelines>.

Photonics Asia Banquet Cruise

Tuesday 22 October 2019 • 18:00 - 20:30
Total cruise time: 90 minutes
Location: Wulinmen Wharf

Join us for the official SPIE/COS Photonics Asia Dinner Cruise Banquet on the Qiantang River. Banquet Tickets are \$75 (USD) and must be purchased separately. The "Qiantang River Night Tour", a luxury cruise on a double-decker boat to explore the Qiantang River. The cruise will go south from Wulinmen Wharf to the Qiantang River and pass the fantastic Grand Canal and Sanbao Navigation Lock. When you arrive Sanbao Navigation Lock, you can experience the river rising, as the boat floats high. Then the cruise will pass Qiantang New Town which keeps changing, and Fuxing Bridge with bright and dazzling lights. Along the way, you can enjoy the new look of the ancient Grand Canal and the most beautiful and magnificent night view of the Qiantang River.

Gathering place: at the C2 gate of Hangzhou International Expo Center.

Transportation: Shuttle bus will transport guests from the Expo Center to Wulinmen Wharf and then back to the hotel by about 20:30.

THE CRUISE ITINERARY IS AS FOLLOWS:

- 17:45: Gathering time: 17:45
- 18:00: Bus departs from Hangzhou International Expo Center to Wulinmen Wharf
- 19:00: Cruise ship departs
- 19:00-19:30: Enjoy a delicious dinner on the cruise ship
- 19:30-20:20: Night view of Qiantang River; Enjoy the light show
- 20:20: Cruise ship lands. Bus transportation returns to Hangzhou International Expo Center.

SPECIAL EVENTS



Hear world-class speakers describe the latest advancements and most promising breakthroughs.

Opening Ceremony and Plenary Session

Monday 21 October 2019 • 9:00 - 12:00

Location: Press Conference Room

9:00: **Opening Ceremony**

9:20: **Awards and Recognition**

9:30: **Ultra-high peak power lasers: 10PW and beyond**



Ruxin Li

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

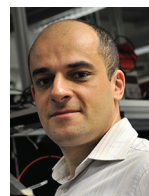
Abstract: Ultra-high peak power femtosecond ultrafast lasers with peak powers at the level of petawatt or even higher have led to the generation of unprecedented extreme physical conditions in laboratories, which pave new ways to the long standing pursuit of fundamental

science and the promising applications for the better life of humanbeing. In this presentation, we will report the latest progress of the Shanghai Super-intense Ultrafast Laser Facility (SLUF). The SULF project was started in the beginning of 2016 and would deliver a 10PW laser beam for users in 2019, which is located in Zhangjiang comprehensive national scientific center in Shanghai. The 100 PW laser will be in the Station of Extreme Light (SEL), as one of the stations at Shanghai High repetition rate XFEL and Extreme light facility (SHINE). Finally, we will outline some potential applications by using the 10 PW and 100 PW lasers.

Biography: **Ruxin Li** is a Professor of Shanghai Institute of Optics and Fine Mechanics (SIOM), Chinese Academy of Sciences. He was elected as the OSA Fellow in 2014 and elected as the academican of Chinese Academy of Sciences in 2017. He is the vice chairman of the Chinese Optical Society and he was the chairman of the Asian Intense Laser Network during 2010-2014. He is the committee member of the International Committee on Ultra-Intense Lasers (ICUIL). His research interests lie in the development of petawatt level high peak power ultrafast lasers, laser wakefield acceleration of electrons, high-order harmonic generation in atoms and molecules, and femtosecond laser filamentation nonlinear optics

10:10: **Tea/Coffee Break**

10:40: **Multispectral optoacoustic tomography: a paradigm shift in biomedical research and clinical diagnostics**



Daniel Razansky

Univ. of Zurich (Switzerland) and ETH Zurich (Switzerland)

Abstract: Optoacoustic imaging is transforming biological discovery by offering non-invasive observations of the versatile endogenous and exogenous optical absorption contrast combined with excellent spatial and temporal resolution and centimeter scale penetration

into living tissues. Our state-of-the-art implementations of multi-spectral optoacoustic tomography (MSOT) are based on multi-wavelength excitation of tissues to visualize specific molecules within opaque living tissues, thus simultaneously delivering structural, functional, metabolic, and molecular information with a single imaging modality. Biomedical applications are explored in the areas of functional neuro-imaging, fast tracking of agent kinetics and biodistribution, cardiovascular research, monitoring of therapies and drug efficacy as well as targeted molecular imaging studies. Handheld MSOT systems are further transforming optical imaging by offering new level of precision for clinical diagnostics of patients with e.g. breast and skin lesions, lymph node metastases, thyroid conditions and inflammatory bowel disease.

Biography: **Daniel Razansky** is Full Professor of Biomedical Imaging with appointments at the Faculty of Medicine, University of Zurich (UZH) and Department of Information Technologies and Electrical Engineering, ETH Zurich. He is also the Director of the joint Animal Imaging Center of the ETH and UZH. He was previously the Director of Multi-Scale Functional and Molecular Imaging Laboratory and Professor of Molecular Imaging Engineering at the Technical University of Munich and Helmholtz Center Munich. He earned PhD in Biomedical Engineering and MSc in Electrical Engineering from the Technion - Israel Institute of Technology and completed postdoctoral training in bio-optics at the Harvard Medical School. Dr. Razansky's Lab has pioneered and clinically translated a number of functional and molecular imaging technologies successfully commercialized worldwide, among them the multispectral optoacoustic tomography (MSOT) and hybrid optoacoustic ultrasound (OPUS). He has authored over 200 peer-review journal articles and holds 15 patented inventions in bio-imaging and sensing. He has delivered more than 150 invited, keynote, and plenary lectures worldwide. Among his recognitions are the German Innovation Prize and multiple awards from the ERC, NIH, DFG and HFSP. Dr. Razansky serves on Editorial Boards of a number of journals published by the Nature Publishing Group, IEEE and AAPM. He is an elected Council Member of the European Society for Molecular Imaging (ESMI), serves on the IEEE Technical Committee on Biomedical Imaging and Image Processing and has chaired numerous international conferences of the OSA, WMIS, ESMI, and IFMBE. He is also an elected Fellow of the OSA and SPIE.

11:20: **Nanomaterials and light for sustainability and societal impact**



Naomi Halas
Rice Univ. (USA)

Abstract: When excited by light, metallic nanoparticles undergo a coherent oscillation of their conduction electrons, known as a plasmon, responsible for their strong light-matter interactions. While the scientific foundation of this field has been built on noble and coinage metals, Aluminum, the most abundant metal on

our planet, can also support high-quality plasmonic properties spanning the UV-to-IR region of the spectrum. Coupling a plasmonic nanoantenna directly to catalytic nanoparticles transforms the complex into an efficient photocatalyst capable of driving chemical reactions under surprisingly mild, low-temperature conditions. This new type of light-based catalyst can be utilized for remediating greenhouse gases and converting them to useful molecules for industry, or benign molecules for a cleaner planet. We previously introduced photothermal effects for biomedical therapeutics; now, years after their initial demonstration, this approach is being utilized in human trials for the precise and highly localized ablation of cancerous regions of the prostate, eliminating the highly deleterious side-effects characteristic of conventional prostate cancer therapies. Photothermal effects can also be harvested for sustainability applications, like an off-grid solar thermal desalination system that transforms membrane distillation into a scalable water purification process.

Biography: **Naomi J. Halas** is the Stanley C. Moore Professor of Electrical and Computer Engineering at Rice University, where she also holds faculty appointments in the Departments of Physics and Astronomy, Chemistry, Materials Science and Nanoengineering, and Bioengineering. She is best known as the first person to demonstrate that controlling the geometry of metallic nanoparticles determines their color. She pursues studies of plasmonic and nanophotonic systems and their applications. She is author of more than 300 refereed publications, has more than 20 issued patents, and has presented more than 500 invited talks. She has been awarded the APS Frank Isakson Prize and Julius Lilienfeld Prize, the R. W. Wood Prize of the OSA, the ACS Award in Colloid Chemistry, and the Spiers Medal of the Royal Society of Chemistry. Halas has been elected to the National Academies of Sciences and Engineering (U. S.), and the American Academy of Arts and Sciences.

INDUSTRY EVENTS

Industry Summit Forums

BIOMEDICAL PHOTONICS RESEARCH SUMMIT FORUM

Monday 21 October 2019 • 13:30 - 18:00

Location: Conv. Ctr. Room 102C

Attend this SPIE/COS Photonics Asia Industry Summit Forum on Biomedical Photonics Research. This is one of three Industry Summit Forums in conjunction with the technical program of Photonics Asia.

OPTICAL FIBER SENSING TECHNOLOGY AND ITS APPLICATION IN POWER MONITORING SUMMIT FORUM

Monday 21 October 2019 • 13:30 - 18:00

Location: Conv. Ctr. Room 103C

Attend this SPIE/COS Photonics Asia Industry Summit Forum on Optical Fiber Sensing Technology And Its Application In Power Monitoring. This is one of three Industry Summit Forums in conjunction with the technical program of Photonics Asia

LIGHTING TECHNOLOGY AND INNOVATION IN ASIA SUMMIT FORUM

Tuesday 22 October 2019 • 8:00 - 12:00

Location: Conv. Ctr. Room 103C

Attend this SPIE/COS Photonics Asia Industry Summit Forum on Lighting Technology and Innovation in Asia. This is one of three Industry Summit Forums in conjunction with the technical program of Photonics Asia.

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THIS PROGRAM IS CURRENT AS OF 16 SEPTEMBER 2019. FIND THE LATEST ON THE SPIE CONFERENCE APP.

TECHNICAL WORKSHOPS

Sunday 20 October 2019 • 13:30 - 17:30

Location: Conv. Ctr. Rooms 102A,B,C and 103A,C

SPIE/COS Photonics Asia is pleased to announce five technical workshops running on Sunday afternoon. The technical workshops run concurrently from 13:30-17:30. Access to the technical workshops is free and open to the public, but registration at the COS desk will be required for access. Attendees are required to wear a workshop or official conference registration badge to attend the workshops.

1) Workshop on Super-Resolution Imaging

WORKSHOP CHAIRS:

Cuifang Kuang, Zhejiang Univ. (China); **Renjie Zhou**, Chinese Univ. of Hong Kong (Hong Kong, China); **Xiang Hao**, Zhejiang Univ. (China)

This workshop explores recent progress in optical microscopy-based imaging techniques and their applications in biology and material metrology. Typical topics include, but are not limited to:

- super-resolution microscopy (STED, STORM, PALM, SIM, etc)
- label-free imaging and nonlinear effect-based imaging
- optical coherence tomography and photoacoustic imaging
- quantitative phase microscopy, digital holographic microscopy, and optical diffraction tomography
- lens-less imaging, computation imaging, and machine-learning based imaging
- multiphoton microscopy, second harmonic microscopy, and polarization microscopy
- inverse scattering and 3D imaging
- high-speed imaging techniques
- digital micromirror device (DMD) based microscopy techniques.

2) Workshop on Optical Trapping and Manipulation

WORKSHOP CHAIRS:

Jiancheng Fang, Beihang Univ. (China); **Min Qiu**, West Lake Univ. (China); **Huizhu Hu**, Zhejiang Univ. (China)

This workshop celebrates the legacy of last year's Nobel Prize winner, Arthur Ashkin, whose early work on optical trapping has spawned enormous productivity and enhancement of fundamental knowledge across the sciences.

Optical tweezers technology has made great achievements in the field of biology. Vacuum optical tweezers technology and its application in the field of sensing and precision measurement are in the ascendant. New technologies like levitated optomechanics are now providing unusual and powerful systems to manipulate with optical traps. Fundamental studies investigating the nature of the momentum of light offer tantalizing possibilities for harnessing counter-intuitive properties of light-matter interactions. Levitated optomechanics provides a new quantum method to control and measure micro-nanoscale mechanical oscillators. This method has unprecedented observational accuracy, can approach or even break through the standard limit, and has broad prospects for development and application. At present, this type of system has been used to measure the force, torque, displacement, acceleration, and other physical parameters with extremely high sensitivity at room temperature. This workshop explores new progresses in optical trapping and manipulation and their applications. Typical topics include but not limited to:

- optomechanical theory
- optical tweezer systems
- high-sensitivity sensors based on optomechanics
- fundamental research using optomechanics
- radiation pressure, tractor beams, and solar sails
- optofluidic biological studies
- interrogating single biomolecules and nano-components
- optical manipulation of matter through non-liquid media
- novel manipulation, sorting, and active matter
- micromechanics: stretching and compression.

3) Workshop on Oceanic and Atmospheric Optics

WORKSHOP CHAIRS:

Zhongping Lee, Univ. of Massachusetts Boston (USA) and **Dong Liu**, Zhejiang Univ. (China)

This workshop will include the science of optics across all oceanic and atmospheric environments, research, and applications, including (but not limited to):

- adaptive optics
- turbulent and nonlinear optical phenomena
- spectroscopy of atmospheric gases
- scattering and transfer of optical waves
- active and passive remote sensing
- underwater optical communication
- environmental monitoring of the atmosphere and ocean
- cross-cutting and integrated observations of the atmosphere and ocean
- in situ optical techniques and methods
- the middle and upper atmosphere observations
- development of computer programs and databases for optical studies
- other techniques or applications related to oceanic and atmospheric optics.

4) Workshop on Microcavities

WORKSHOP CHAIRS:

Liang Feng, The Univ. of Pennsylvania (USA); **Qinghai Song**, Harbin Institute of Technology (China); **Wei Fang**, Zhejiang Univ. (China)

This workshop explores recent progress in optical microcavities, including new physics, fabrication methods, and applications. Typical topics include, but are not limited to:

- microcavity sensors
- microlasers
- micro/nanofibers and cavities
- asymmetric microcavities and wave chaos
- parity-time symmetric microcavities
- coupled cavities and topological photonics
- light-matter interaction in microcavities.

5) Workshop on Metasurfaces

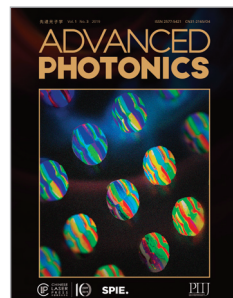
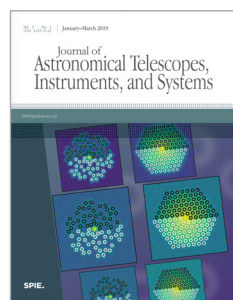
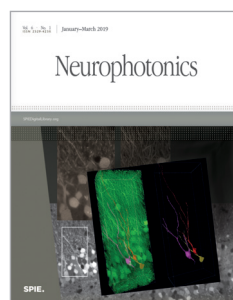
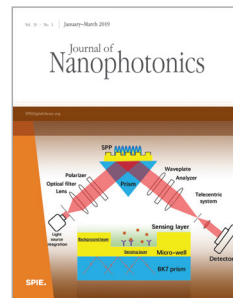
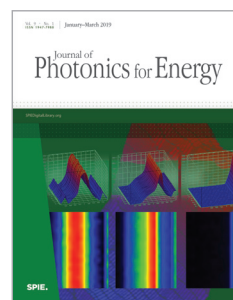
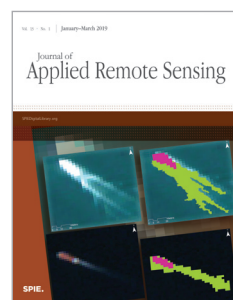
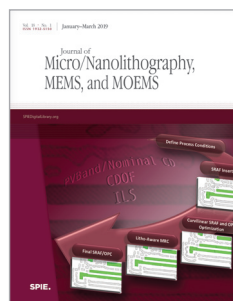
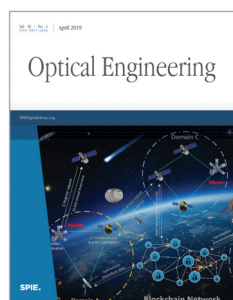
WORKSHOP CHAIRS:

Baile Zhang, Nanyang Technological Univ. of Singapore (Singapore); **Yungui Ma**, Zhejiang Univ. (China); **Hongsheng Chen**, Zhejiang Univ. (China)

Metasurfaces, a two-dimensional artificial structure consisting of sub-wavelength meta-atoms, could have strong capabilities in manipulating electromagnetic waves or light by interacting on their magnitude, phase, polarization or even time/space frequency. Various promising applications could be anticipated. Recent major advances in this field will be reported and deeply discussed in this workshop regarding on their novelties, challenges, and future development. Topics are covered as follows:

- new theory, design, and fabrication of metasurfaces
- metasurfaces for imaging and beam steering
- tunable metasurfaces
- programmable metasurfaces
- nonlinear metasurfaces
- topological metasurfaces
- metasurfaces for other novel applications.

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DAILY EVENTS SCHEDULE

TIME	MONDAY • 21 OCTOBER 2019							
9:00 - 12:00	OPENING CEREMONY AND PLENARY SESSION							
12:00 - 13:30	Lunch/Exhibition Break							
	CONF. 11181 High-Power Lasers and Applications X	CONF. 11182 Semiconductor Lasers and Applications IX	CONF. 11183 Advanced Laser Processing and Manufacturing III	CONF. 11184 Optoelectronic Devices and Integration VIII	CONF. 11185 Optical Design and Testing IX	CONF. 11186 Advanced Optical Imaging Technologies II	CONF. 11187 Optoelectronic Imaging and Multimedia Technology VI	CONF. 11188 Holography, Diffractive Optics, and Applications IX
Afternoon		SESSION 1 Integrated Optoelectronic Devices I, p. 16	SESSION 1 Laser Micro/ Nanofabrication and Ultrafast Laser Processing I, p. 18		SESSION 1 Freeform Illumination, p. 22	SESSION 1 Super-Resolution Imaging I, p. 24	SESSION 1 Depth and Light Field, p. 27	concurrent sessions SESSION 1 Artificial Intelligence in Digital Holography I, p. 30 SESSION 3 3D Imaging and Display I, p. 30
		SESSION 2 Integrated Optoelectronic Devices II, p. 16	SESSION 2 Laser Micro/ Nanofabrication and Ultrafast Laser Processing II, p. 18		SESSION 2 Diffractive Optics and Holography, p. 22	SESSION 2 Label-Free Imaging I, p. 24	SESSION 2 Computer Vision, p. 27	concurrent sessions SESSION 2 Artificial Intelligence in Digital Holography II, p. 31 SESSION 4 3D Imaging and Display II, p. 31
TUESDAY • 22 OCTOBER 2019								
Morning		SESSION 3 Subsystems Using Laser Diodes, p. 16	SESSION 3 Laser Macro Processing, p. 18	SESSION 1 Optoelectronic Devices and Integration I, p. 20	SESSION 3 Novel Imaging Techniques, p. 22	SESSION 3 Tomographic Imaging, p. 24	SESSION 3 Computational Optics, p. 27	SESSION 5 Computer-Generated Holography I, p. 31
		SESSION 4 Applications of Laser Diodes I, p. 17	SESSION 4 Laser Additive Manufacturing and Laser Peening I, p. 19	SESSION 2 Optoelectronic Devices and Integration II, p. 20	SESSION 4 Freeform Imaging, p. 23	SESSION 4 Super-Resolution Imaging II, p. 25	SESSION 4 Computational Acquisition and Analysis I, p. 28	SESSION 6 Computer-Generated Holography II, p. 31
Lunch/Exhibition Break								
13:00 to 14:30	POSTER SESSION							
Afternoon		SESSION 5 Applications of Laser Diodes II, p. 17	SESSION 5 Laser Additive Manufacturing and Laser Peening II, p. 19	SESSION 3 Optoelectronic Devices and Integration III, p. 21	SESSION 5 Optical Design and Testing, p. 23	SESSION 5 Label-Free Imaging II, p. 25	SESSION 5 Computational Acquisition and Analysis II,p. 28	SESSION 7 Diffractive Element, Grating Design, and Fabrication, p. 32
		SESSION 6 Semiconductor Lasers, p. 17						
WEDNESDAY • 23 OCTOBER 2019								
Morning	SESSION 1 High Peak Power Lasers, p. 15	SESSION 7 VCSELs I, p. 17		SESSION 4 Optoelectronic Devices and Integration IV, p. 21		SESSION 6 Imaging Technologies I, p. 26	SESSION 6 Computer Vision I, p. 29	SESSION 8 Novel Applications, p. 33
	SESSION 2 Laser Materials and Properties, p. 15	SESSION 8 VCSELs II, p. 17		SESSION 5 Optoelectronic Devices and Integration V, p. 21		SESSION 7 Imaging Technologies II, p. 26	SESSION 7 Computer Vision II, p. 29	SESSION 9 Digital Holographic Microscopy I, p. 33
Lunch/Exhibition Break								
Afternoon	SESSION 3 Fiber Lasers, p. 15			SESSION 6 Optoelectronic Devices and Integration VI, p. 21			SESSION 8 Image Processing, p. 29	SESSION 10 Holographic Metrology, p. 33
	SESSION 4 Fiber Nonlinearity and Sources, p. 15			SESSION 7 Optoelectronic Devices and Integration VII, p. 21				SESSION 11 Digital Holographic Microscopy II, p. 33

DAILY EVENTS SCHEDULE

TIME	MONDAY • 21 OCTOBER 2019							
9:00 - 12:00	OPENING CEREMONY AND PLENARY SESSION							
12:00 to 13:30	Lunch/Exhibition Break							
	CONF. 11189 Optical Metrology and Inspection for Industrial Applications VI	CONF. 11190 Optics in Health Care and Biomedical Optics IX	CONF. 11191 Advanced Sensor Systems and Applications IX	CONF. 11192 Real-time Photonic Measurements, Data Management, and Processing IV	CONF. 11193 Nanophotonics and Micro/Nano Optics V	CONF. 11194 Plasmonics IV	CONF. 11195 Quantum and Nonlinear Optics VI	CONF. 11196 Infrared, Millimeter-Wave, and Terahertz Technologies VI
Afternoon	SESSION 1 Optical Metrology Methods I, p. 34	SESSION 1 Translational Optical Techniques for Clinical Medicine I, p. 37	SESSION 1 Biochemical and Environmental Sensors, p. 42		SESSION 1 Micro/Nano Light Emitting Devices, p. 46		SESSION 1 Quantum Nonlinear Optics I, p. 51	SESSION 1 Devices, p. 53
	SESSION 2 Optical Metrology Methods II, p. 34	SESSION 2 Translational Optical Techniques for Clinical Medicine II, p. 37	SESSION 2 Distributed and Multiplexed Sensors, p. 42		SESSION 2 Micro/Nano Optoelectronic Integration, p. 46		SESSION 2 Quantum Nonlinear Optics II, p. 51	SESSION 2 Physics, p. 53
TUESDAY • 22 OCTOBER 2019								
Morning	SESSION 3 Optical Metrology Methods III, p. 35	SESSION 3 Nanobio-photonics and Sensors, p. 38	SESSION 3 Micro/ Nanostructure Sensors I, p. 42	SESSION 1 Optoelectronic Devices and Applications, p. 44	SESSION 3 Nanobio-photonics Sensors, p. 46		SESSION 3 Advanced Quantum Technologies I, p. 51	SESSION 3 Spectroscopy, p. 53
	SESSION 4 Optical Metrology Methods IV, p. 35	SESSION 4 Biomedical Spectroscopy, p. 38	SESSION 4 Micro/ Nanostructure Sensors II, p. 43		SESSION 4 Nanostructures and Nanomaterials, p. 46		SESSION 4 Advanced Quantum Technologies II, p. 52	SESSION 4 Imaging, p. 54
Lunch/Exhibition Break								
13:00 to 14:30	POSTER SESSION							
Afternoon	SESSION 5 Optical Metrology Methods V, p. 36	SESSION 5 Advanced Optical Imaging Techniques, p. 40	SESSION 5 New Sensor Devices and Applications I, p. 43	SESSION 2 Microwave Photonics for Measurement, p. 45	SESSION 5 Optical Manipulation, p. 47	SESSION 1 Plasmonic-Enhanced Sensing and Light Harvesting I, p. 49	SESSION 5 Integrated Photonic Quantum Technologies, p. 52	SESSION 5 Generation and Detection, p. 55
	SESSION 6 Optical Metrology Methods VI, p. 36		SESSION 6 New Sensor Devices and Applications II, p. 43			SESSION 2 Plasmonic-Enhanced Sensing and Light Harvesting II, p. 49		
WEDNESDAY • 23 OCTOBER 2019								
Morning	SESSION 7 Optical Metrology Methods VII, p. 36	SESSION 6 Optical Theranostics I, p. 40		SESSION 3 Fiber Optic Sensing and Measurement, p. 45	SESSION 6 Nonlinear Nanophotonics, p. 47	SESSION 3 Hot Carrier Dynamics, Photocatalysis, and Photothermal Effects in Plasmonic Nanostructures I, p. 49		
	SESSION 8 Optical Metrology Applications I, p. 36	SESSION 7 Optical Theranostics II, p. 40			SESSION 7 Micro/Nano Photodetectors, p. 48	SESSION 4 Hot Carrier Dynamics, Photocatalysis, and Photothermal Effects in Plasmonic Nanostructures II, p. 50		
Lunch/Exhibition Break								
Afternoon	SESSION 9 Optical Metrology Applications II, p. 36	SESSION 8 Tissue Optics/ Laser-Tissue Interaction, p. 41		SESSION 4 Ultrafast Optical Spectroscopy and Measurement, p. 45		SESSION 5 Graphene, Active, and Multidisciplinary Plasmonics I, p. 50		
		SESSION 9 Multimodal Biomedical Imaging, p. 41				SESSION 6 Graphene, Active, and Multidisciplinary Plasmonics II, p. 50		

CONFERENCE 11181

LOCATION: CONV. CTR. ROOM 206

Tuesday–Wednesday 22–23 October 2019 • Proceedings of SPIE Vol. 11181

High-Power Lasers and Applications X

Conference Chairs: **Ruxin Li**, Shanghai Institute of Optics and Fine Mechanics (China); **Upendra N. Singh**, NASA Langley Research Ctr. (United States); **Shibin Jiang**, AdValue Photonics, Inc. (United States)

Program Committee: **Willy L. Bohn**, BohnLaser Consult (Germany); **Dianyan Fan**, Shanghai Institute of Optics and Fine Mechanics (China); **Mali Gong**, Tsinghua Univ. (China); **Do-Kyeong Ko**, Gwangju Institute of Science and Technology (Korea, Republic of); **Chong Liu**, Zhejiang Univ. (China); **Zejin Liu**, National Univ. of Defense Technology (China); **DeYuan Shen**, Fudan Univ. (China); **Robert F. Walter**, Schafer Corp. (United States); **Shuangchun Wen**, Shenzhen Univ. (China); **Zuyan Xu**, Technical Institute of Physics and Chemistry (China); **Jianquan Yao**, Tianjin Univ. (China); **Tai Hyun Yoon**, Korea Univ. (Korea, Republic of); **Jirong Yu**, NASA Langley Research Ctr. (United States); **Heping Zeng**, East China Normal Univ. (China); **Xiaomin Zhang**, China Academy of Engineering Physics (China); **Shou-huan Zhou**, Sichuan Univ. (China)

MONDAY 21 OCTOBER

OPENING CEREMONY AND PLENARY SESSION

LOCATION: PRESS CONFERENCE ROOM 9:00 TO 12:00

9:00: **Opening Ceremony**

9:20: **Awards and Recognition**

9:30: **Ultra-high peak power lasers: 10PW and beyond (Plenary)**,
Ruxin Li, Shanghai Institute of Optics and Fine Mechanics,
Chinese Academy of Sciences (China)

Tea/Coffee Break Mon 10:10 to 10:40

10:40: **Multispectral optoacoustic tomography: a paradigm shift
in biomedical research and clinical diagnostics (Plenary)**
Daniel Razansky, Univ. of Zurich (Switzerland) and ETH Zurich
(Switzerland)

11:20: **Nanomaterials and light for sustainability and societal
impact (Plenary)**

Naomi J. Halas, Rice Univ. (United States)

See details pages 8–9

**Optimization of the pulse detection mechanism of the active ranging
optical system with high-power pulse laser**, Jinsuk Hong, Hanwha Systems
Co., Ltd. (Korea, Republic of) [11181-26]

**Coupling efficiency of large mode area double-clad photonic crystal
fiber based on Zemax and Tracepro software**, Zong Zhaoyu, Junpu Zhao,
Dangpeng Xu, Xiaocheng Tian, China Academy of Engineering Physics
(China) [11181-27]

**Comparison of bacteria production using laser etching and acid etching
technique enamel in bonding orthodontic ceramic brackets**,
Sibel Sofuoğlu, Bogaziçi Univ. (Turkey) [11181-28]

**Effective mitigation of mode instability by deuterium loading in Yb-doped
fiber oscillator**, Yisha Chen, Haozhen Xu, Yingbin Xin, Gui Chen, Ruiting Cao,
Yibo Wang, Haiqing Li, Jinggang Peng, Lvjun Yang, Nengli Dai, Jinyan Li,
Huazhong Univ. of Science and Technology (China) [11181-29]

**Analysis of beam direction detection errors in solid-state slab laser beam
clean-up systems**, Shouhu Ma, Institute of Photoelectric Technology
(China) [11181-30]

**Suppression effect of the spectral dispersion of sinusoidal phase
modulation light on formation of hot images**, Youwen Wang, Xiaohui Ling,
Zhiping Dai, Liezun Chen, Shizhuan Lu, Zhiteng Wang, Hengyang Normal Univ.
(China) [11181-31]

**Investigation on the reconstruction algorithm for spatial-spectral
interference**, Jie Mu, Xiao Wang, Yanlei Zuo, Kainan Zhou, Bilong Hu,
Xiaoming Zeng, Xiaodong Wang, Dongbin Jiang, Na Xie, Xiaojun Huang,
Jingqin Su, China Academy of Engineering Physics (China) [11181-32]

The target back-reflected laser pulse isolation for the PW lasers,
Long Jiao, China Academy of Engineering Physics (China) [11181-33]

20W 0.2mJ nanosecond fiber laser in all-fiber structure, Dandan Zhou,
Tian Xiaocheng, Fang Mengqiu, Xu Dangpeng, China Academy of Engineering
Physics (China) [11181-34]

**Development of fiber-based yellow laser for dermatological
applications**, Shuzhen Cui, Shanghai Institute of Optics and Fine Mechanics
(China) [11181-35]

**Selection of LP01 and LP11 modes in multimode graded-index fiber
Raman laser by special FBGs**, Sergey A. Babin, Institute of Automation
and Electrometry (Russian Federation) and Novosibirsk State Univ. (Russian
Federation); Alexey G. Kuznetsov, Institute of Automation and Electrometry
(Russian Federation); Alexey A. Wolf, Institute of Automation and Electrometry
(Russian Federation) and Novosibirsk State Univ. (Russian Federation);
Alexandr V. Dostovalov, Institute of Automation and Electrometry
(Russian Federation) and Novosibirsk State Univ. (Russian Federation);
Sergey I. Kablukov, Institute of Automation and Electrometry (Russian
Federation) [11181-36]

**Impact of ASE and pumping direction on mode instability threshold in
a bidirectional-pumped fiber amplifier**, Yinzhong Sun, China Academy of
Engineering Physics (China) [11181-37]

**Shannon entropy method for small-scale self-focusing assessment in
high-power laser systems**, Xiaoxia Huang, China Academy of Engineering
Physics (China) [11181-38]

TUESDAY 22 OCTOBER

TUESDAY POSTER SESSION

LOCATION: FIRST FLOOR LOBBY TUE 13:00 TO 14:30

*Conference attendees are invited to attend the poster session on
Tuesday afternoon. Come view the posters, ask questions, and network
with colleagues in your field. Authors of poster papers will be present to
answer questions concerning their papers. Attendees are required to
wear their conference registration badges to the poster session.*

Poster Setup: Tuesday 10:00 to 13:00

View poster presentation guidelines and set-up instructions at
<http://spie.org/PAPosterGuidelines>

**All-optical arbitrary temporal shaping technology of broadband low-
coherence light based on saturable absorption effect**, Daipeng Sui,
Rao Li, Xiaochao Wang, Shanghai Institute of Optics and Fine Mechanics,
Chinese Academy of Sciences (China) [11181-21]

**Process-oriented adaptive optics control method in the multi-pass
amplifiers**, Qiao Xue, China Academy of Engineering Physics (China) [11181-22]

**Beam and target alignment at the ICF laser device using a new grid
target**, Xiaolu Zhang, China Academy of Engineering Physics (China) [11181-23]

**Numerical modeling of passively-Q quasi-three level Ho³⁺-doped
fluorotellurite fiber lasers**, Cheng Zhou, Xing-yu Li, Peng SONG, Tao CHEN,
Ya-ping ZHANG, Wei XIA, Univ. of Jinan (China) [11181-24]

**Analysis of the signal wavefront evolution in the OPCPA amplifier of
Petawatt laser facility**, Xiao Liang, Meizhi Sun, Xinglong Xie, Jianqiang Zhu,
Shanghai Institute of Optics and Fine Mechanics (China) [11181-25]

CONFERENCE 11181

WEDNESDAY 23 OCTOBER

SESSION 1

LOCATION: CONV. CTR. ROOM 206 WED 8:00 TO 10:10

High Peak Power Lasers

Session Chair: Shibin Jiang, AdValue Photonics, Inc. (United States)

8:00: **Improvement of focused intensity for SULF-10PW laser at high repetition-rate**, Franck Falcoz, Stephane Branly, Pierrick Leroy, Amplitude Laser Group (France) [11181-1]

8:30: **Latest developments at Amplitude in the frame of the PW laser**, Amplitude Laser Group (France) [11181-2]

8:50: **Electron-nuclear correlated dynamics of molecules in strong laser fields** (*Invited Paper*), Jian Wu, East China Normal Univ. (China) [11181-3]

9:20: **Influence of spatial profile for high-energy femtosecond laser pulse on XPW generation**, Shunhua Yang, Shanghai Institute of Optics and Fine Mechanics (China) and Univ. of Chinese Academy of Sciences (China); Qingwei Yang, Shanghai Institute of Optics and Fine Mechanics (China); Xiao Liang, Ziruo Cui, Shanghai Institute of Optics and Fine Mechanics (China) and Univ. of Chinese Academy of Sciences (China); Ping Zhu, Shanghai Institute of Optics and Fine Mechanics (China); Cheng Zhang, Dongjun Zhang, Shanghai Institute of Optics and Fine Mechanics (China) and Univ. of Chinese Academy of Sciences (China); Meizhi Sun, Xinglong Xie, Jianqiang Zhu, Shanghai Institute of Optics and Fine Mechanics (China) [11181-4]

9:40: **Femtosecond optical frequency combs and dual-comb spectroscopy** (*Invited Paper*), Wenxue Li, East China Normal Univ. (China) [11181-5]

Tea/Coffee Break Wed 10:10 to 10:30

SESSION 2

LOCATION: CONV. CTR. ROOM 206 WED 10:30 TO 12:00

Laser Materials and Properties

Session Chair: Upendra N. Singh, NASA Langley Research Ctr. (United States)

10:30: **High efficient Ho:Y₂O₃ laser ceramic fabrication and high-power 2μm ceramic lasers** (*Invited Paper*), Dingyuan Tang, Nanyang Technological Univ. (Singapore) [11181-6]

11:00: **Pump-induced scattering in high-power Ti: Sapphire lasers**, Aleksandr A. Tarasov, Hong Chu, Laseroptek (Korea, Republic of) . . . [11181-7]

11:20: **The laser induced damage by micro-nano particles on optics surfaces**, Yilan Jiang, Guorui Zhou, Haibing Lv, Hao Liu, Longfei Niu, Caizhen Yao, Xinxiang Miao, China Academy of Engineering Physics (China) [11181-8]

11:40: **Applicability of the discrete-dipole approximation to high-power laser scattering simulations of haze particles**, Qiang Xu, Xidian Univ. (China) [11181-9]

Lunch Break Wed 12:00 to 13:15

SESSION 3

LOCATION: CONV. CTR. ROOM 206 WED 13:15 TO 15:05

Fiber Lasers

Session Chair: Ruxin Li,

Shanghai Institute of Optics and Fine Mechanics (China)

13:15: **Coherent pulse staking: problems and perspective** (*Invited Paper*), Zhigang Zhang, Peking Univ. (China) [11181-10]

13:45: **2.9-μm passively Q-switched fiber laser using Au-nanocages as saturable absorber**, Chen Wei, Univ. of Electronic Science and Technology of China (China); Qingru Li, Univ. of Electronic Science and Technology of China (China) and Sichuan Univ. (China); Hao Chi, Univ. of Electronic Science and Technology of China (China); Liqiang Zhou, Han Zhang, Hua Huang, Sichuan Univ. (China); Yong Liu, Univ. of Electronic Science and Technology of China (China) [11181-11]

14:05: **Power scaling analysis of cladding-annular-doped ultra-low NA single-mode fiber amplifiers**, Rumao Tao, Lianghua Xie, Haokun Li, Yu Liu, Benjian Shen, Min Li, Shan Huang, Xi Feng, Jianjun Wang, Feng Jing, China Academy of Engineering Physics (China) [11181-12]

14:25: **Influence of Ce doping on optical performances of Yb-doped fiber under γ-radiation**, Yuying Wang, China Academy of Engineering Physics (China) [11181-13]

14:45: **2kW, 22GHz narrow linewidth polarization maintaining fiber amplifier with near-diffraction-limited beam quality**, Yanshan Wang, Institute of Applied Electronics (China); Zhe Chang, Institute of Applied Electronics, China Academy of Engineering Physics (China); Yi Ma, Wanjiang Peng, Institute of Applied Electronics (China); Weiwei Ke, Institute of Applied Physics and Computational Mathematics (China); Yinhong Sun, Institute of Applied Electronics (China); Rihong Zhu, MIIT Key Laboratory of Advanced Solid Laser, Nanjing University of Science and Technology (China); Chun Tang, Institute of Applied Electronics (China) [11181-14]

Tea/Coffee Break Wed 15:05 to 15:20

SESSION 4

LOCATION: CONV. CTR. ROOM 206 WED 15:20 TO 17:30

Fiber Nonlinearity and Sources

Session Chair: Shibin Jiang, AdValue Photonics, Inc. (United States)

15:20: **Soft glass highly nonlinear fibers and applications** (*Invited Paper*), Yasutake Ohishi, Toyota Technological Institute (Japan) [11181-15]

15:50: **Temporal frequency study on stimulated Raman-scattering-induced mode instability in high-power fiber lasers**, Qiang Shu, China Academy of Engineering Physics (China); Zeng Chen, National Key Lab. of Science and Technology on Blind Signal Processing (China); Qiuhui Chu, Rumao Tao, Chao Guo, Honghuan Lin, Jianjun Wang, China Academy of Engineering Physics (China) [11181-16]

16:10: **Suppressing stimulated Raman scattering effect by filtering the seed in high-power fiber amplifier**, Qiuhui Chu, China Academy of Engineering Physics (China) and Tsinghua Univ. (China); Rumao Tao, China Academy of Engineering Physics (China); Zeng Chen, National Key Lab. of Science and Technology on Blind Signal Processing (China); Qiang Shu, Chao Guo, Honghuan Lin, Jianjun Wang, China Academy of Engineering Physics (China); Chuanxiang Tang, Accelerator Lab. (China); Feng Jing, China Academy of Engineering Physics (China) [11181-17]

16:30: **1.7 μm fiber gas Raman laser source**, Wei Huang, Yulong Cui, Zhixian Li, Zhiyue Zhou, Zefeng Wang, National Univ. of Defense Technology (China) [11181-18]

16:50: **Pulsed generation of multimode diode-pumped graded-index fiber Raman laser**, Sergey A. Babin, Alexey G. Kuznetsov, Ilya N. Nemov, Institute of Automation and Electrometry (Russian Federation); Alexey A. Wolf, Novosibirsk State Univ. (Russian Federation); Sergey I. Kablukov, Institute of Automation and Electrometry (Russian Federation) [11181-19]

17:10: **Investigation of shortwave edge in high-power supercontinuum with different peak power**, Yue Li, Kegong Dong, Donglin Yan, Honghuan Lin, Jianjun Wang, China Academy of Engineering Physics (China); Haoyu Zhang, Institute of Engineering Physics (China) [11181-20]

CONFERENCE 11182

LOCATION: CONV. CTR. ROOM 207

Monday–Wednesday 21–23 October 2019 • Proceedings of SPIE Vol. 11182

Semiconductor Lasers and Applications IX

Conference Chairs: **Ning Hua Zhu**, Institute of Semiconductors (China); **Werner H. Hofmann**, Technische Univ. Berlin (Germany); **Jian-Jun He**, Zhejiang Univ. (China)

Program Committee: **Minghua Chen**, Tsinghua Univ. (China); **Xiangfei Chen**, Nanjing Univ. (China); **Nan Chi**, Fudan Univ. (China); **Brian Corbett**, Tyndall National Institute (Ireland); **Dawei Di**, Zhejiang Univ. (China); **Qianggao Hu**, Accelink Technologies Co., Ltd. (China); **Weisheng Hu**, Shanghai Jiao Tong Univ. (China); **Yongzhen Huang**, Beijing Univ. of Posts and Telecommunications (China); **Jimin Li**, Institute of Semiconductors (China); **Ming Li**, Institute of Semiconductors (China); **Wei Li**, Institute of Semiconductors (China); **Xianjie Li**, China Electronics Technology Group Corp. (China); **Ning Liu**, Huawei Technologies Co., Ltd. (China); **Wenhan Liu**, Univ. of Science and Technology of China (China); **Yong Liu**, Univ. of Electronic Science and Technology of China (China); **Xiaoyu Ma**, Institute of Optics and Electronics (China); **Frank Hudson Peters**, Tyndall National Institute (Ireland); **Edwin Y. Pun**, City Univ. of Hong Kong (Hong Kong, China); **Hong-Bo Sun**, Jilin Univ. (China); **Ji Wang**, Changchun Institute of Optics, Fine Mechanics and Physics (China); **Shawn Wang**, Luxtera, Inc. (United States); **Yixin Wang**, Institute for Infocomm Research (Singapore); **Guang-Qiong Xia**, Southwest Univ. (China); **Kun Xu**, Beijing Univ. of Posts and Telecommunications (China); **Zhaowen Xu**, Institute for Infocomm Research (Singapore); **Lianshan Yan**, Southwest Jiaotong Univ. (China); **Jinlong Yu**, Tianjin Univ. (China); **Siyuan Yu**, Univ. of Bristol (United Kingdom); **Li Zeng**, Huawei Technologies Co., Ltd. (China); **Baoping Zhang**, Xiamen Univ. (China); **Guo-yi Zhang**, Peking Univ. (China); **Shangjian Zhang**, Univ. of Electronic Science and Technology of China (China); **Xinliang Zhang**, Wuhan National Lab. for Optoelectronics (China); **Zhiping Zhou**, Peking Univ. (China); **Xihua Zou**, Southwest Jiaotong Univ. (China)

MONDAY 21 OCTOBER

OPENING CEREMONY AND PLENARY SESSION

LOCATION: PRESS CONFERENCE ROOM 9:00 TO 12:00

9:00: **Opening Ceremony**

9:20: **Awards and Recognition**

9:30: **Ultra-high peak power lasers: 10PW and beyond (Plenary)**,
Ruxin Li, Shanghai Institute of Optics and Fine Mechanics,
Chinese Academy of Sciences (China)

Tea/Coffee Break Mon 10:10 to 10:40

10:40: **Multispectral optoacoustic tomography: a paradigm shift
in biomedical research and clinical diagnostics (Plenary)**
Daniel Razansky, Univ. of Zurich (Switzerland) and ETH Zurich
(Switzerland)

11:20: **Nanomaterials and light for sustainability and societal
impact (Plenary)**
Naomi J. Halas, Rice Univ. (United States)

See details pages 8–9

Lunch Break Mon 12:00 to 13:30

SESSION 1

LOCATION: CONV. CTR. ROOM 207 MON 13:30 TO 14:50

Integrated Optoelectronic Devices I

Session Chair: **Jian Wang**,
Huazhong Univ. of Science and Technology (China)

13:30: **Electro-absorption modulated tunable V-cavity laser (Invited Paper)**,
Jianjun He, **Sen Zhang**, **Yimin Xia**, Zhejiang Univ. (China); **Qi Chen**, Zhejiang
Univ (China); **Qiaoli Li**, **Kun Yu**, Zhejiang Univ. (China); **Jianjun Meng**, **Xiaobo**
Xia, **Xizhong Guo**, **Jiasheng Zhao**, Lightip Technologies Co., Ltd.
(China) [11182-1]

14:00: **Fully-integrated CMOS-compatible polarization analyzer (Invited
Paper)**, **Yu Yu**, Huazhong Univ. of Science and Technology (China) [11182-2]

14:30: **Design and simulation of an anti-symmetric Bragg grating silicon
modulator**, **Chunliang Ma**, **Yuechun Shi**, Nanjing Univ. (China) [11182-3]

Tea/Coffee Break Mon 14:50 to 15:20

SESSION 2

LOCATION: CONV. CTR. ROOM 207 MON 15:20 TO 17:00

Integrated Optoelectronic Devices II

Session Chair: **Jian-Jun He**, Zhejiang Univ. (China)

15:20: **Structuring light on silicon platform (Invited Paper)**, **Jian Wang**,
Huazhong Univ. of Science and Technology (China) [11182-4]

15:50: **Silicon-plus photonic devices for on-chip light-manipulation and
photodetection (Invited Paper)**, **Daixin Dai**, Zhejiang Univ. (China) ... [11182-5]

16:20: **1550nm monolithic MOPA diode laser for lidar applications**,
Monder Liang, QPC Lasers Co., Ltd. (China) [11182-6]

16:40: **Optically-pumped InAs/GaAs quantum-dot microdisk lasers
monolithically grown on on-axis Si (001) substrate**, **Taojie Zhou**, The
Chinese Univ. of Hong Kong, Shenzhen (China); **Mingchu Tang**, Univ. College
London (United Kingdom); **Guohong Xiang**, The Chinese Univ. of Hong Kong,
Shenzhen (China); **Siming Chen**, **Huiyun Liu**, Univ. College London (United
Kingdom); **Zhaoyu Zhang**, The Chinese Univ. of Hong Kong, Shenzhen
(China) [11182-7]

TUESDAY 22 OCTOBER

SESSION 3

LOCATION: CONV. CTR. ROOM 207 TUE 8:10 TO 10:20

Subsystems Using Laser Diodes

Session Chair: **Haohai Yu**, Shandong Univ. (China)

8:10: **High Q-factor equivalent filter with optical delay line in OEO
(Invited Paper)**, **Yitang Dai**, **Shanhong Guan**, **Feifei Yin**, **Kun Xu**, Beijing Univ. of
Posts and Telecommunications (China) [11182-8]

8:40: **Microwave photonic signal generation and processing technology
based on spectral manipulation (Invited Paper)**, **Wenhui Sun**, Institute of
Semiconductors (China) [11182-9]

9:10: **Photonic generation and transmission of phase-modulated
microwave signals (Invited Paper)**, **Sha Zhu**, **Ming Li**, **Ninghua Zhu**, **Wei Li**,
Institute of Semiconductors (China) [11182-10]

9:40: **Development of a 780nm narrow line width semiconductor
laser device**, **Fei Wu**, Central China Normal Univ. (China); **Haocheng Sun**,
Chensheng Wang, Huazhong Institute of Electro-Optics (China) [11182-11]

10:00: **Influence of optical feedback on lasing characteristics for hybrid-
cavity semiconductor lasers**, **You-Zeng Hao**, Institute of Semiconductors
(China); **Fu-Li Wang**, Institute of Semiconductors (China) [11182-12]

Tea/Coffee Break Tue 10:20 to 10:50

CONFERENCE 11182

SESSION 4

LOCATION: CONV. CTR. ROOM 207 TUE 10:50 TO 12:00

Applications of Laser Diodes I

Session Chair: **Yitang Dai**, Beijing Univ. of Posts and Telecommunications (China)

10:50: **Blue semiconductor-pumped praseodymium ion-doped crystal lasers in the visible range** (*Invited Paper*), Haohai Yu, Shandong Univ. (China) [11182-13]

11:20: **High-power low-smile vertically-stacked laser diode based on microchannel cooling**, Hongyou Zhang, Focuslight Technologies, Inc. (China) [11182-14]

11:40: **Realization of beam shaping using VCSEL incorporating a high-contrast subwavelength grating**, Pingping Qiu, Ming Li, Institute of Semiconductors (China) and Univ. of Chinese Academy of Sciences (China); Yiyang Xie, Beijing Univ. of Technology (China); Qiang Kan, Institute of Semiconductors (China) and Univ. of Chinese Academy of Sciences (China) [11182-19]

Lunch Break Tue 12:00 to 13:30

TUESDAY POSTER SESSION

LOCATION: FIRST FLOOR LOBBY TUE 13:00 TO 14:30

Conference attendees are invited to attend the poster session on Tuesday afternoon. Come view the posters, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster session.

Poster Setup: Tuesday 10:00 to 13:00

View poster presentation guidelines and set-up instructions at <http://spie.org/PAPosterGuidelines>

Synchronized random bit-generation based on vertical-cavity surface-emitting lasers with optical injection and polarization-rotated feedback, Xue-Han Wang, Tao Deng, Southwest Univ. (China); Wen-Long Huang, China Telecom Corporation Limited Shaoxing Branch (China); Guang-Qiong Xia, Xi Tang, Zheng-Mao Wu, Southwest Univ. (China) [11182-15]

Monolithic integration of tunable V-coupled-cavity laser and Mach-Zehnder modulator on generic InP platform, Qi Chen, Zhejiang Univ. (China); Yuqing Jiao, Technische Univ. Eindhoven (Netherlands); Zhongwen Wang, Jianjun He, Zhejiang Univ. (China) [11182-31]

High-power 685nm laser diode array with 300W output power and 40% conversion efficiency, Wei Xia, Zhen Zhu, Beichao Kai, Shuang Yao, Xiangang Xu, Shandong Huaguang Optoelectronics Co., Ltd. (China) [11182-32]

Multiple gas detection using V-cavity coupled diode laser, Hanting Yang, Jianjun He, Zhejiang Univ. (China) [11182-33]

Analysis of the nearfield stability of the midwave infrared quantum cascade lasers, Sensen Li, Harbin Institute of Technology (China) . . [11182-34]

Blue laser-diode light for underwater optical vision guidance in AUV docking, Shaomeng Wang, Xinwei Wang, Pingshun Lei, Jianan Chen, Zhongke Xu, Yuqing Yang, Liang Sun, Jun He, Yan Zhou, Institute of Semiconductors (China) [11182-35]

Sagnac effect of the optical frequency comb, Ruyu Ma, Haoyang Yu, Kai Ni, Qian Zhou, Xinghui Li, Guanhao Wu, Graduate School at Shenzhen, Tsinghua Univ. (China) [11182-36]

SESSION 5

LOCATION: CONV. CTR. ROOM 207 TUE 14:30 TO 15:50

Applications of Laser Diodes II

Session Chair: **Yali Zhang**, Univ. of Electronic Science and Technology of China (China)

14:30: **Optical behavior analysis of negative wavelength detuning in SMFP-LD and its application on RF generation** (*Invited Paper*), Shilong Pan, Hao Chen, Bikash Nakarmi, Nanjing Univ. of Aeronautics and Astronautics (China) [11182-16]

15:00: **3D NIR laser night vision based on gated range-intensity correlation imaging** (*Invited Paper*), Xinwei Wang Sr., Liang Sun, Pingshun Lei, Han Dong, Songtao Fan, Jianan Chen, Yuqing Yang, Xin Zhong, Jun He, Yan Zhou, Institute of Semiconductors (China); Huang Pan, Maozhong Li, Yunnan KIRO-CH Photonics Co., Ltd. (China) [11182-17]

15:30: **Simultaneous idler-free frequency conversion and filtering based on polarization-multiplexed low-coherence interferometry**, Jun Wen, Institute of Semiconductors (China) [11182-18]

Tea/Coffee Break Tue 15:50 to 16:00

SESSION 6

LOCATION: CONV. CTR. ROOM 207 TUE 16:00 TO 17:30

Semiconductor Lasers

Session Chair: **Shilong Pan**, Nanjing Univ. of Aeronautics and Astronautics (China)

16:00: **Self-recirculating modulation-enhanced optical frequency comb generation pumped by optical injection** (*Invited Paper*), Yali Zhang, Mingfei Ge, Zhiyao Zhang, Shangjian Zhang Sr., Yong Liu, Univ. of Electronic Science and Technology of China (China) [11182-20]

16:30: **Performance of high-power diode lasers operated at cryogenic temperature**, Pu Zhang, Mingpei Wang, Zhiqiang Nie, Wuhaio Yang, Xi'an Institute of Optics and Precision Mechanics (China) [11182-21]

16:50: **On-chip optical narrowband reflector based on anti-symmetric Bragg grating**, Yitao Wu, Yuechun Shi, Yong Zhao, Nanjing Univ. (China) [11182-22]

17:10: **Narrow linewidth parallel hybrid integrated injection locking DFB laser**, Zuye Lu, Jie Zeng, Linjie Zou, Yuke Zhou, Nanjing Univ. (China); Yunshan Zhang, Nanjing Univ. of Posts and Telecommunications (China) [11182-23]

WEDNESDAY 23 OCTOBER

SESSION 7

LOCATION: CONV. CTR. ROOM 207 WED 9:00 TO 10:20

VCSELs I

Session Chair: **Hui Li**, Qingdao Univ. of Science and Technology (China)

9:00: **Design of 940-nm VCSEL with metastructure** (*Invited Paper*), Anjin Liu, Bo Yang, Institute of Semiconductors (China) [11182-24]

9:30: **100 Gb/s VCSEL-based optical interconnects enabled by multimode full-link optimization** (*Invited Paper*), Wenjia Zhang, Chenyu Liang, Yao Lu, Zuyuan He, Shanghai Jiao Tong Univ. (China) [11182-25]

10:00: **The modulation characteristics of vertical external-cavity surface-emitting laser under high frequency**, Qiong Wu, Tao Wang, Renjiang Zhu, Chongqing Normal Univ. (China); Hongwei Yang, Yanzhao Wang, Hongtai Chen, No. 13 Research Institute of China Electronics Technology Group Corp. (China); Peng Zhang, Chongqing Normal Univ. (China) [11182-27]

Tea/Coffee Break Wed 10:20 to 10:50

SESSION 8

LOCATION: CONV. CTR. ROOM 207 WED 10:50 TO 12:00

VCSELs II

Session Chair: **Anjin Liu**, Institute of Semiconductors, Chinese Academy of Sciences (China)

10:50: **Investigation of thermal performance of small oxide-aperture vertical-cavity surface-emitting lasers** (*Invited Paper*), Hui Li, Xiaowei Jia, Qingdao Univ. of Science and Technology (China) [11182-28]

11:20: **Third harmonic generation in a 976nm vertical external-cavity surface-emitting laser**, Xiaolang Qiu, Xiaojian Zhang, Qiong Wu, Renjiang Zhu, Tao Wang, Chongqing Normal Univ. (China); Hongwei Yang, Yanzhao Wang, Hongtai Chen, No. 13 Research Institute of China Electronics Technology Group Corp. (China); Peng Zhang, Chongqing Normal Univ. (China) [11182-29]

11:40: **CVD diamond-based heatsink used in a high-power external-cavity surface-emitting laser**, Xiaojian Zhang, Renjiang Zhu, Xiaolang Qiu, Qiong Wu, Tao Wang, Peng Zhang, Chongqing Normal Univ. (China) . [11182-30]

CONFERENCE 11183

LOCATION: CONV. CTR. ROOM 404

Monday–Tuesday 21–22 October 2019 • Proceedings of SPIE Vol. 11183

Advanced Laser Processing and Manufacturing III

Conference Chairs: **Rongshi Xiao**, Beijing Univ. of Technology (China); **Minghui Hong**, National Univ. of Singapore (Singapore); **Jian Liu**, PolarOnyx, Inc. (United States); **Jianhua Yao**, Zhejiang Univ. of Technology (China)

Conference Co-Chair: **Yuji Sano**, Institute for Molecular Science (Japan)

Program Committee: **Anming Hu**, The Univ. of Tennessee Knoxville (United States); **Ting Huang**, Beijing Univ. of Technology (China); **Shibin Jiang**, AdValue Photonics, Inc. (United States); **Jonathan Lawrence**, Univ. of Chester (United Kingdom); **Yaoguang Ma**, Zhejiang Univ. (China); **Akira Watanabe**, Tohoku Univ. (Japan); **Haibin Zhang**, ESI, Inc. (United States); **Wenwu Zhang**, Ningbo Institute of Materials Technology & Engineering (China); **Jianzhong Zhou**, Jiangsu Univ. (China)

MONDAY 21 OCTOBER

OPENING CEREMONY AND PLENARY SESSION

LOCATION: PRESS CONFERENCE ROOM 9:00 TO 12:00

9:00: **Opening Ceremony**

9:20: **Awards and Recognition**

9:30: **Ultra-high peak power lasers: 10PW and beyond (Plenary)**,
Ruxin Li, Shanghai Institute of Optics and Fine Mechanics,
Chinese Academy of Sciences (China)

Tea/Coffee Break Mon 10:10 to 10:40

10:40: **Multispectral optoacoustic tomography: a paradigm shift
in biomedical research and clinical diagnostics (Plenary)**
Daniel Razansky, Univ. of Zurich (Switzerland) and ETH Zurich
(Switzerland)

11:20: **Nanomaterials and light for sustainability and societal
impact (Plenary)**

Naomi J. Halas, Rice Univ. (United States)

See details pages 8–9

Lunch Break Mon 12:00 to 13:30

SESSION 1

LOCATION: CONV. CTR. ROOM 404 MON 13:30 TO 15:20

Laser Micro/Nanofabrication and Ultrafast Laser Processing I

Session Chair: **Xiaohui Ye**,
Shaanxi Univ. of Science & Technology (China)

13:30: **Laser-based microprocessing systems for microelectronic
manufacturing (Invited Paper)**, **Haibin Zhang**, ESI, Inc. (United States) [11183-1]

14:00: **Ablation on dielectric and metal materials using femtosecond laser
for micro/nanofabrication**, **Jianfeng Yan**, Tsinghua Univ. (China) ... [11183-2]

14:20: **An application of laser-material interaction: Time-of-flight mass
spectrometry study of co-sputtered Ga-Sb-Se amorphous thin films**,
Petr Nemec, **Ravi Mawale**, **Tomas Halenkovic**, **Marek Bouska**, **Jan Gutwirth**,
Univ. Pardubice (Czech Republic); **Virginie Nazabal**, Univ. Pardubice (Czech
Republic) and Univ. de Rennes 1 (France); **Pankaj Lochan Bora**, **Masaryk Univ.**
(Czech Republic) and CEITEC - Central European Institute of Technology
(Czech Republic); **Lukas Pecinka**, **Lubomir Prokes**, **Josef Havel**, **Masaryk Univ.**
(Czech Republic) ... [11183-3]

14:40: **Investigation on UV solid-state nanosecond laser micromachining
of microstructures on sapphire wafer**, **Litao Qi**, Heilongjiang Univ. of Science
and Technology (China); **Yasheng Liu**, Heilongjiang Institute of Technology
(China) ... [11183-4]

15:00: **Fabrication of porous copper current collector by laser alloying
and dealloying**, **QingWei Zhang**, **Rongshi Xiao**, **Ting Huang**, Beijing Univ. of
Technology (China) ... [11183-5]

Tea/Coffee Break Mon 15:20 to 15:50

SESSION 2

LOCATION: CONV. CTR. ROOM 404 MON 15:50 TO 17:20

Laser Micro/Nanofabrication and Ultrafast Laser Processing II

Session Chair: **Jin Yang**, Shanghai Univ. of Engineering Science (China)

15:50: **Laser-induced backside wet/dry etching microstructures on
transparent and brittle materials (Invited Paper)**, **Xiaozhu Xie**, **Miaoni Li**,
Jiangyou Long, **Jianguo Li**, **Caixia Zhou**, **Zhisheng Zou**, Guangdong Univ. of
Technology (China) ... [11183-6]

16:20: **Ultrafast laser fabrication of patterned graphene-based sensors**,
Xiaohui Ye, **Ming Qi**, **Kai Yang**, **Xincheng Yao**, **Qiyu Liu**, **Yifan Yang**, Shaanxi
Univ. of Science & Technology (China) ... [11183-7]

16:40: **Laser-induced hierarchically-structured materials from block
copolymer self-assembly**, **Kwan Wee Tan**, Nanyang Technological Univ.
(Singapore) ... [11183-10]

17:00: **Fabrication and testing of the smallest flute on syringe needles**,
Shenghan Gao, **Zeqing Jin**, **Yiwen E.**, **Xi-Cheng Zhang**, Univ. of Rochester
(United States) ... [11183-9]

TUESDAY 22 OCTOBER

SESSION 3

LOCATION: CONV. CTR. ROOM 404 TUE 8:10 TO 10:30

Laser Macro Processing

Session Chair: **Ting Huang**, Beijing Univ. of Technology (China)

8:10: **Fabrication of high strength and lightweight dissimilar material
joints by laser (Invited Paper)**, **Jin Yang**, Shanghai Univ. of Engineering
Science (China) ... [11183-11]

8:40: **Progress in water-assisted laser machining (Invited Paper)**,
Wenwu Zhang, **Yufeng Wang**, **Guangyi Zhang**, Ningbo Institute of Industrial
Technology (China) ... [11183-12]

9:10: **Simulation of fiber-laser-cutting carbon-fiber-reinforced plastics**,
Litao Qi, Heilongjiang Univ. of Science and Technology (China); **Ai Chun Fan**,
Heilongjiang Univ. of Science and Technology (United States) ... [11183-13]

9:30: **Numerical simulation and experimental verification on impact
behavior of Ti₆Al₄V particles during supersonic laser deposition process**,
Weilin Wang, Zhejiang Univ. of Technology (China) and Zhejiang Provincial
Collaborative Innovation Ctr. of High-end Laser Manufacturing Equipment
(China); **Bo Li**, **Jianhua Yao**, Zhejiang Univ. of Technology (China) ... [11183-14]

9:50: **Research on the effect of microtexturing pretreatment on laser
welding of CFRTP and aluminum alloy**, **Shaohui Jia**, **Junke Jiao**, **Wentai
Ouyang**, **Zifa Xu**, **Yiyun Ye**, **Mina Zhang**, **Wenwu Zhang**, Ningbo Institute of
Industrial Technology (China) ... [11183-15]

10:10: **Effect of laser spot size on the hardened layer shape via laser
deep-layer quenching on 42CrMo steel**, **Wenhua Tong**, **Qunli Zhang**,
Jianhua Yao, **Zhijun Chen**, Zhejiang Univ. of Technology (China); **S. Kovalenko
Volodymyr**, National Technical Univ. of Ukraine (Ukraine) ... [11183-16]

Tea/Coffee Break Tue 10:30 to 11:00

SESSION 4

LOCATION: CONV. CTR. ROOM 404 TUE 11:00 TO 12:10

Laser Additive Manufacturing and Laser Peening I

Session Chair: **Yuji Sano**, Institute for Molecular Science (Japan)

11:00: **Monitoring 3D strain distribution in additive-manufacturing applications with embedded optical fiber sensors** (*Invited Paper*), Ran Zou, Xuan Liang, Univ. of Pittsburgh (United States); Paul Ohodnicki Jr., Benjamin Chorpene, National Energy Technology Lab. (United States); Hui Lan, Jiangnan Univ. (China); Albert To, Kevin Chen, Univ. of Pittsburgh (United States) [11183-17]

11:30: **Investigation on 30CrMnSiNi₂A repair by adding graphene and using laser-additive-manufacturing technology**, Wentai Ouyang, Yiyun Ye, Zifa Xu, Mina Zhang, Shaohui Jia, Junke Jiao, Wenwu Zhang, Ningbo Institute of Industrial Technology (China) [11183-18]

11:50: **Development of large-scale metal-additive-manufacturing system with high-speed laser DED unit**, Shimpei Fujimaki, Masato Takeuchi, Hisanori Fuwa, Yasushi Fukase, Toshiba Machine Co., Ltd. (Japan); Yasutomo Shiomi, Naotada Okada, Toshiba Corp. (Japan) [11183-19]

Lunch Break Tue 12:10 to 13:30

TUESDAY POSTER SESSION

LOCATION: FIRST FLOOR LOBBY TUE 13:00 TO 14:30

Conference attendees are invited to attend the poster session on Tuesday afternoon. Come view the posters, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster session.

Poster Setup: Tuesday 10:00 to 13:00

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Research on picosecond laser processing technology of ceramic materials involving incident angle, Heng Wang, Xiaoxiao Chen, Wenwu Zhang, Ningbo Institute of Industrial Technology (China) [11183-8]

Dy₂O₃-doped glass system for laser sealing using 808nm laser diode, So Young Kim, Ju Hyeon Choi, Jong Hyeob Baek, June Park, Korea Photonics Technology Institute (Korea, Republic of); Jin Hyeok Kim, Chonnam National Univ. (Korea, Republic of) [11183-27]

Anti-icing characteristics of stainless-steel micro-nano structure surface prepared by femtosecond laser, Ziyuan Liu, Jingquan Lin, Haiyan Tao, Changchun Univ. of Science and Technology (China) [11183-28]

Fast formation of hybrid periodic surface structures on Hf thin-film by focused femtosecond laser beam, Alexandr V. Dostovalov, Institute of Automation and Electrometry (Russian Federation) and Novosibirsk State Univ. (Russian Federation); Kirill A. Bronnikov, Dmitrii A. Belousov, Institute of Automation and Electrometry (Russian Federation); Victor P. Korolkov, Sergey A. Babin, Institute of Automation and Electrometry (Russian Federation) and Novosibirsk State Univ. (Russian Federation) [11183-29]

Laser direct-part marking of 2D code on the aviation aluminum alloy parts, Lingling Zhang, Shanghai Institute of Laser Technology (China) [11183-30]

Laser and electrochemical hybrid machining via internal total reflection, Yufeng Wang, Chinese Academy of Sciences (China); Feng Yang, Wenwu Zhang, Ningbo Institute of Industrial Technology (China) [11183-31]

Simulation and experimental verification of water-guided laser processing by water-air contraction flow method, Guangyi Zhang, Zheng Zhang, Wenwu Zhang, Ningbo Institute of Industrial Technology (China) [11183-32]

Microstructure and hardness of laser welding AISi₁₀Mg parts produced by selective laser melting, Yaoqing Chang, Li Cui, Dingyong He, Tianye Yang, Beijing Univ. of Technology (China) [11183-33]

Measurement of transient electron temperature and density of characteristic plasmas based on spectrometer, Ming Guo, Jilin Engineering Normal Univ. (China); Yongxiang Zhang, Changchun Institute of Optics, Fine Mechanics and Physics (China); Siqi Zhang, Yueshu Feng, Jilin Engineering Normal Univ. (China) [11183-34]

SESSION 5

LOCATION: CONV. CTR. ROOM 404 TUE 14:30 TO 17:00

Laser Additive Manufacturing and Laser Peening II

Session Chair: **Yuji Sano**, Institute for Molecular Science (Japan)

14:30: **Application of laser peening to thermomechanical processing for grain boundary engineering of 304 austenitic stainless steel** (*Invited Paper*), Hiroyuki Kokawa, Shanghai Jiao Tong Univ. (China); Shun Tokita, Osaka Univ. (Japan); Shohei Kodama, Yutaka S. Sato, Tohoku Univ. (Japan); Yuji Sano, Institute for Molecular Science (Japan); Zhuguo Li, Kai Feng, Shanghai Jiao Tong Univ. (China) [11183-20]

15:00: **High strength and ductility AlCrFeNiV high-entropy alloy with hierarchically heterogeneous microstructure prepared by selective laser melting**, Haili Yao, Dingyong He, Zhen Tan, Beijing Univ. of Technology (China) [11183-21]

15:20: **Novel ceramic YAG high energy and 750W average-power laser in pseudo-active mirror configuration delivering 75J at 10Hz for high-throughput laser peening**, Stephane Branly, Florian Mollica, Franck Falcoz, Amplitude Laser Group (France) [11183-22]

15:40: **Laser peening with 10 mJ class pulse energy and its application to life extension of infrastructure**, Yuji Sano, Institute for Molecular Science (Japan); Yoshihiro Sakino, Kindai Univ. (Japan); Kiyotaka Masaki, National Institute of Technology, Okinawa College (Japan); Tomokazu Sano, Osaka Univ. (Japan); Takunori Taira, RIKEN Spring-8 Ctr. (Japan) and Institute for Molecular Science (Japan) [11183-23]

16:00: **Dry laser peening for improving fatigue properties of laser welded 2024-T3 aluminum alloy using femtosecond laser pulses**, Tomokazu Sano, Takayuki Eimura, Akio Hirose, Yosuke Kawahito, Seiji Katayama, Osaka Univ. (Japan); Kazuto Arakawa, Shimane Univ. (Japan); Ayumi Shiro, National Institutes for Quantum and Radiological Science and Technology (Japan); Takahisa Shobu, Japan Atomic Energy Agency (Japan); Kiyotaka Masaki, National Institute of Technology, Okinawa College (Japan); Yuji Sano, Institute for Molecular Science (Japan) [11183-24]

16:20: **Microstructural evolution of multi-pass laser peened AA 2060**, Karthik Dhandapani, Jiang Jiancheng, Yongxiang Hu, Shanghai Jiao Tong Univ. (China) [11183-25]

16:40: **Influence of scanning-path on healing efficacy of laser peening to crack damage**, Han Cheng, Yongxiang Hu, Shanghai Jiao Tong Univ. (China) [11183-26]

CONFERENCE 11184

LOCATION: CONV. CTR. ROOM 101

Tuesday–Wednesday 22–23 October 2019 • Proceedings of SPIE Vol. 11184

Optoelectronic Devices and Integration VIII

Conference Chairs: **Xuping Zhang**, Nanjing Univ. (China); **Baojun Li**, Jinan Univ. (China); **Changyuan Yu**, The Hong Kong Polytechnic Univ. (Hong Kong, China); **Xinliang Zhang**, Wuhan National Lab. for Optoelectronics (China)

Conference Co-Chair: **Daoxin Dai**, Zhejiang Univ. (China)

Program Committee: **Dayan Ban**, Univ. of Waterloo (Canada); **Zhongping Chen**, Beckman Laser Institute and Medical Clinic (United States); **Ho-Pui Ho**, The Chinese Univ. of Hong Kong (Hong Kong, China); **Jan Ingenhoff**, Ionexphotonics Inc. (Canada); **Zhongcheng Liang**, Nanjing Univ. of Posts and Telecommunications (China); **Xuejun Lu**, Univ. of Massachusetts Lowell (United States); **Ali Masoudi**, Univ. of Southampton (United Kingdom); **Hai Ming**, Univ. of Science and Technology of China (China); **Gang-Ding Peng**, The Univ. of New South Wales (Australia); **Yaocheng Shi**, Zhejiang Univ. (China); **Yuan Shi**, Agilecom Photonic Solutions Inc. (United States); **Anna K. Swan**, Boston Univ. (United States); **Frank Vollmer**, Max-Planck-Institut für die Physik des Lichts (Germany); **Daniel M. Wasserman**, The Univ. of Texas at Arlington (United States); **Lixin Xu**, Univ. of Science and Technology of China (China); **Yang Yang**, Zhejiang Univ. of Technology (China); **Ningmu Zou**, Advanced Micro Devices, Inc. (United States)

TUESDAY 22 OCTOBER

SESSION 1

LOCATION: CONV. CTR. ROOM 101 TUE 8:00 TO 10:10

Optoelectronic Devices and Integration I

Session Chairs: **Daoxin Dai**, Zhejiang Univ. (China);
Jianwei Wang, Peking Univ. (China)

8:00: **Silicon nanophotonics for computation, interconnects, and sensing** (*Invited Paper*), Ray T. Chen, The Univ. of Texas at Austin (United States) [11184-1]

8:30: **High-density waveguide superlattices for optical interconnects and optical phased arrays** (*Invited Paper*), Wei Jiang, Nanjing Univ. (China) [11184-2]

9:00: **Smart silicon photonic signal processor** (*Invited Paper*), Jianji Dong, Huazhong Univ. of Science and Technology (China) [11184-3]

9:30: **Two-wavelength x three-mode hybrid multiplexer/demultiplexer based on photonic crystals**, Lianxiang Liu, Nanjing Univ. of Posts and Telecommunications (China) [11184-4]

9:50: **The design of integrated four-channel Mach-Zehnder multi/demultiplexer based on LNOI platform**, Xia Liang, Wuhan National Lab. for Optoelectronics (China) [11184-5]

Tea/Coffee Break Tue 10:10 to 10:40

SESSION 2

LOCATION: CONV. CTR. ROOM 101 TUE 10:40 TO 12:10

Optoelectronic Devices and Integration II

Session Chairs: **Daoxin Dai**, Zhejiang Univ. (China);
Wei Jiang, Nanjing Univ. (China)

10:40: **Quantum information processing with integrated photonics** (*Invited Paper*), Jianwei Wang, Peking Univ. (China) [11184-6]

11:10: **Large-scale wavelength multi/demultiplexer in combination with a spatial grating and arrayed waveguide gratings**, Akihisa Ohori, Hiroyuki Tsuda, Keio Univ. (Japan) [11184-7]

11:30: **Comparison of fabrication tolerance of broadband silicon photonic directional couplers**, Qiuyang Jiang, Guangfan Tao, Xiangning Chen, Nanjing Univ. (China) [11184-8]

11:50: **Concave blaze grating with aberration-corrected freeform and variable line spacing for hyperspectral imaging applications**, Cheng-Hao Ko, National Taiwan Univ. of Science and Technology (Taiwan, China, China); Jih-Run Tsai, Bang-Ji Wang, National Space Organization (Taiwan, China); Shin-Fa Lin, National Space Organization Hsinchu (Taiwan, China); Chiu-Der Hsiao, National Space Organization (Taiwan, China); ChiTsung Hong, Wei-Huai Chiu, National Taiwan Univ. of Science and Technology (Taiwan, China) [11184-9]

Lunch Break Tue 12:10 to 13:30

TUESDAY POSTER SESSION

LOCATION: FIRST FLOOR LOBBY TUE 13:00 TO 14:30

Conference attendees are invited to attend the poster session on Tuesday afternoon. Come view the posters, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster session.

Poster Setup: Tuesday 10:00 to 13:00

View poster presentation guidelines and set-up instructions at <http://spie.org/PAPosterGuidelines>

Compact confinement of radially polarized light in graphene cylindrical hybrid plasmonic waveguide, Sicheng Zhang, Kang Li, Xinyi Lu, Ji Xu, Nanjing Univ. of Posts and Telecommunications (China) [11184-34]

The systematic analysis of epitaxial self-assembled GaN/AlN QDs in S-K method by MOCVD, Zhiqiang Qi, Haocheng Sun, Wenliang Hu, Huazhong Institute of Electro-Optics (China) [11184-35]

Image restoration for multi-sub-mirror synthetic aperture system, Xiaoyao Liu, Zhongcheng Liang, Weiqian Hao, Rui Zhao, Meimei Kong, Tao Chen, Nanjing Univ. of Posts and Telecommunications (China); Yue Zhang, Beijing Institute of Space Mechanics and Electricity (China) [11184-36]

Nearly arbitrary pulse-shaping in mode-locked gain-modulated SOA-fibre laser, Sergey M. Kobtsev, Novosibirsk State Univ. (Russian Federation); Boris Nyushkov, Novosibirsk State Univ. (Russian Federation) and Novosibirsk State Technical Univ. (Russian Federation); Alexey Ivanenko, Sergey Smirnov, Novosibirsk State Univ. (Russian Federation) [11184-37]

Numerical simulation of the effects of InAlSb barrier layers on the InSb mid-infrared photodetectors on a mismatched substrate, Zhi Qin Zhao, Xu Qian, Bo Wen Wang, Bo Wen Jia, Wuhan Univ. of Technology (China) [11184-38]

A SOI waveguide grating coupler enhanced by additional silicon nitride layer, Xiaotao Shan, Zan Zhang, Chang'an Univ. (China); Beiju Huang, Institute of Semiconductors (China); Zanyun Zhang, Tianjin Polytechnic Univ. (China); Chuantong Cheng, Institute of Semiconductors (China); Bing Bai, Tianxi Gao, Xiaobo Xu, Chang'an Univ. (China); Hongda Chen, Institute of Semiconductors (China) [11184-39]

Research on 1x4 polarization-independent beam splitter based on silicon waveguides, Zhengman Zhang, Nanjing Univ. of Posts and Telecommunications (China); He-Ming Chen, Nanjing Univ. of Science and Technology (China) [11184-40]

New method of wavelength stabilisation in CPT atomic clocks, Sergey M. Kobtsev, Daba Radnatarov, Sergey Khripunov, Valerii Andryushkov, Novosibirsk State Univ. (Russian Federation); Yuri Zarudnev, Novosibirsk State Univ. (Russian Federation) and Tekhnoscan-Lab (Russian Federation) [11184-41]

LIBS underwater precision positioning system, Shuang Xu, Kai Cheng, Jun Liu, Ocean Univ. of China (China) [11184-42]

Resistive switching memory devices based on quantum dots, Zhiliang Chen, Yating Zhang, Yu Yu, Lufan Jin, Yifan Li, Jianquan Yao, Tianjin Univ. (China) [11184-43]

Transparent nanostructured ZnS films by low-temperature sputtering for flexible optoelectronic devices, Yuanjie Li, Shoaib Muhammad, Xuan Zhu, Xi'an Jiaotong Univ. (China); Chao Wu, Frontier Institute of Science and Technology, Xi'an Jiaotong University (China) [11184-44]

Microring lasers based on Si₃N₄ optical waveguides clad with perovskite quantum-dot composite film, Erhu Liu, Zhejiang Univ. (China); Linghai Meng, Beijing Institute of Technology (China); Yuluan Xiang, Daoxin Dai, Zhejiang Univ. (China); Haizheng Zhong, Beijing Institute of Technology (China) [11184-45]

High-speed active components R&D on 200mm CMOS-compatible silicon photonics platform, Bo Tang, Peng Zhang, Bin Li, Yan Yang, Ruonan Liu, Junfeng Li, Zhihua Li, Institute of Microelectronics (China) [11184-46]

CONFERENCE 11184

SESSION 3

LOCATION: CONV. CTR. ROOM 101TUE 14:30 TO 17:10

Optoelectronic Devices and Integration III

Session Chairs: **Baojun Li**, Jinan Univ. (China); **Vilson Rosa Almeida**, Instituto Tecnológico de Aeronáutica (Brazil)

- 14:30: **Si-GST hybrid integration for non-volatile photonic devices** (*Invited Paper*), Linjie Zhou, Hanyu Zhang, Hao Hu, Ningning Wang, Liangjun Lu, Jianping Chen, Shanghai Jiao Tong Univ. (China). [11184-10]
- 15:00: **High performance and CMOS-compatible photonic switches based on phase change materials** (*Invited Paper*), Rajesh Kumar, Nadir Ali, Shubham Singh, Indian Institute of Technology Roorkee (India) [11184-11]
- 15:30: **From optical space switching to optical mode switching** (*Invited Paper*), Lin Yang, Institute of Semiconductors (China) [11184-12]
- 16:00: **Temperature-controlled Si ring modulators** (*Invited Paper*), Woo-Young Choi, Yonsei Univ. (Korea, Republic of). [11184-13]
- 16:30: **Design of a hybrid wavelength selective switch using silica and silicon waveguides**, Kunio Kobayashi, Hiroyuki Tsuda, Keio Univ. (Japan). [11184-14]
- 16:50: **Limited propagation and nanofocusing of radially polarized light through hybrid plasmonic waveguide**, Jin Bu, Kang Li, Lu Ma, Yi Zhou, Ji Xu, Nanjing Univ. of Posts and Telecommunications (China) [11184-15]

WEDNESDAY 23 OCTOBER

SESSION 4

LOCATION: CONV. CTR. ROOM 101WED 8:00 TO 9:50

Optoelectronic Devices and Integration IV

Session Chairs: **Xinliang Zhang**, Wuhan National Lab. for Optoelectronics (China); **Di D. Liang**, Hewlett Packard Enterprise (United States)

- 8:00: **Chip-scale nonlinear photonics and its applications** (*Invited Paper*), Mengjie Yu, Harvard Univ. (United States) [11184-16]
- 8:30: **Recent advances in dispersion engineering for mid-infrared photonics** (*Invited Paper*), Lin Zhang, Yuhao Guo, Lijuan Xu, Jing Wang, Minghui Yang, Tianjin Univ. (China); Zeinab Jafari, Tecnológico de Monterrey (Mexico). [11184-17]
- 9:00: **Optical and dispersion forces in silicon nano-optomechanical devices** (*Invited Paper*), Janderson R. Rodrigues, Instituto Tecnológico de Aeronáutica (Brazil) and Columbia Univ. (United States); Vilson R. Almeida, Instituto Tecnológico de Aeronáutica (Brazil) and Univ. Brasil (Brazil). [11184-18]
- 9:30: **A silicon-graphene hybrid waveguide photodetector with a 3dB-bandwidth of 17 GHz**, Jiang Li, Yanlong Yin, Jingshu Guo, Chaoyue Liu, Daoxin Dai, Zhejiang Univ. (China). [11184-19]
- Tea/Coffee Break Wed 9:50 to 10:20

SESSION 5

LOCATION: CONV. CTR. ROOM 101WED 10:20 TO 12:00

Optoelectronic Devices and Integration V

Session Chairs: **Xinliang Zhang**, Wuhan National Lab. for Optoelectronics (China); **Lin Zhang**, Tianjin Univ. (United States)

- 10:20: **Silicon photonic devices and circuits based on hybrid integration** (*Invited Paper*), Liu Liu, South China Normal Univ. (China). [11184-25]
- 10:50: **Analysis of red-shift in SMFP-LD with positive and negative wavelength detuning**, Limin Zhang, Hao Chen, Snehi Bassi, Bikash Nakarmi, Shilong Pan, Nanjing Univ. of Aeronautics and Astronautics (China). . [11184-22]
- 11:10: **AlInGaAs MQWs photonic integration device with directional coupler for multifunction of light emission/detection in infrared range**, Xin Li, Shuyu Ni, Yan Jiang, Jialei Yuan, Wei Wang, Yongjin Wang, Nanjing Univ. of Posts and Telecommunications (China) [11184-23]
- 11:30: **A bonded template-assisted monolithic integration platform** (*Invited Paper*), Di Liang, Yingtao Hu, Géza Kurczveil, Raymond G. Beausoleil, Hewlett Packard Enterprise (United States) [11184-20]
- Lunch Break Wed 12:00 to 13:30

SESSION 6

LOCATION: CONV. CTR. ROOM 101WED 13:30 TO 14:40

Optoelectronic Devices and Integration VI

Session Chairs: **Changyuan Yu**, The Hong Kong Polytechnic Univ. (Hong Kong, China); **Lei Bi**, Univ. of Electronic Science and Technology of China (China)

- 13:30: **Novel photonic integrated devices on a double-sided InP membrane** (*Invited Paper*), Yuqing Jiao, Technische Univ. Eindhoven (Netherlands). [11184-24]
- 14:00: **Ultra-broadband photodetector based on three-dimensional graphene**, Yifan Li, Tianjin Univ. (China). [11184-27]
- 14:20: **An ion-ion interaction analysis-based performance estimation of thulium-doped fiber amplifiers in s-band including amplified spontaneous emission**, Mohd Mansoor Khan, Indian Institute of Technology Guwahati (India) and Indian Institute of Information Technology Guwahati (India); Ramesh Kumar Sonkar, Indian Institute of Technology Guwahati (India). [11184-28]
- Tea/Coffee Break Wed 14:40 to 15:10

SESSION 7

LOCATION: CONV. CTR. ROOM 101WED 15:10 TO 17:00

Optoelectronic Devices and Integration VII

Session Chairs: **Changyuan Yu**, The Hong Kong Polytechnic Univ. (Hong Kong, China); **Yuqing Jiao**, Technische Univ. Eindhoven (Netherlands)

- 15:10: **Monolithic integrated magneto-optical isolators on silicon** (*Invited Paper*), Yan Zhang, Shuyuan Liu, Univ. of Electronic Science and Technology of China (China); Qingyang Du, Massachusetts Institute of Technology (United States); Chuangtang Wang, Wei Yan, Jun Qin, Longjiang Deng, Univ. of Electronic Science and Technology of China (China); Juejun Hu, Caroline Ross, Massachusetts Institute of Technology (United States); Lei Bi, Univ. of Electronic Science and Technology of China (China) [11184-29]
- 15:40: **Low-cost high-performance VR delay detection device based on PIN photodiode**, Yang Yang, Shi Yan, Lei Ning, Haibin Niu, China Jiliang Univ. (China) [11184-30]
- 16:00: **RF signal multiplier utilizing optically-modulated signal-injected locking-based optoelectronic oscillator**, Hao Chen, Limin Zhang, Snehi Bassi, Bikash Nakarmi, Shilong Pan, Nanjing Univ. of Aeronautics and Astronautics (China) [11184-31]
- 16:20: **Active multi-wavelength Solc-type filter based on MgO:APLN**, Hang Liu, Yuheng Wang, Changchun Univ. of Science and Technology (China); Lujie Li, Changchun China Optical Science and Technology Museum (China); Yongji Yu, Guangyong Jin, Changchun Univ. of Science and Technology (China) [11184-32]
- 16:40: **The tail in TDOE of the coated MCP-PMT and its suppression**, Lin Chen, Jinling Institute of Technology (China) [11184-33]

CONFERENCE 11185

LOCATION: CONV. CTR. ROOM 402

Monday–Tuesday 21–22 October 2019 • Proceedings of SPIE Vol. 11185

Optical Design and Testing IX

Conference Chairs: **Yongtian Wang**, Beijing Institute of Technology (China); **Pablo Benítez**, Univ. Politécnica de Madrid (Spain); **Osamu Matoba**, Kobe Univ. (Japan)

Program Committee: **Yasuhiro Awatsuji**, Kyoto Institute of Technology (Japan); **Jian Bai**, Zhejiang Univ. (China); **Julie L. Bentley**, Univ. of Rochester (United States); **Dewen Cheng**, Beijing Institute of Technology (China); **Chunlei Du**, Chongqing Institute of Green and Intelligent Technology (China); **Fabian Duerr**, Vrije Univ. Brussel (Belgium); **Yi-Chin Fang**, National Kaohsiung First Univ. of Science and Technology (Taiwan, China); **Qiaoqiang Gan**, Univ. at Buffalo (United States); **Weichuan Gao**, Oculus VR, LLC (United States); **Sen Han**, Univ. of Shanghai for Science and Technology (China); **Hong Hua**, College of Optical Sciences, The Univ. of Arizona (United States); **Jae Young Joo**, Korea Photonics Technology Institute (Korea, Republic of); **Tina E. Kidger**, Kidger Optics Associates (United Kingdom); **Jaisoon Kim**, Myongji Univ. (Korea, Republic of); **Tsuyoshi Konishi**, Osaka Univ. (Japan); **Jaejoong Kwon**, Samsung Display Co., Ltd. (Korea, Republic of); **Yun Woo Lee**, Korea Research Institute of Standards and Science (Korea, Republic of); **Irina L. Livshits**, ITMO Univ. (Russian Federation); **Takanori Nomura**, Wakayama Univ. (Japan); **Sung Chan Park**, Dankook Univ. (Korea, Republic of); **Gilles Pauliat**, Institut d'Optique Graduate School (France); **Xiang Peng**, Shenzhen Univ. (China); **Sandy To**, The Hong Kong Polytechnic Univ. (Hong Kong, China); **H. Paul Urbach**, Technische Univ. Delft (Netherlands); **Daodang Wang**, China Jiliang Univ. (China); **Rengmao Wu**, Zhejiang Univ. (China); **Chunyu Zhao**, Arizona Optical Metrology LLC (United States); **Jun Zhu**, Tsinghua Univ. (China)

MONDAY 21 OCTOBER

OPENING CEREMONY AND PLENARY SESSION

LOCATION: PRESS CONFERENCE ROOM 9:00 TO 12:00

9:00: **Opening Ceremony**

9:20: **Awards and Recognition**

9:30: **Ultra-high peak power lasers: 10PW and beyond** (Plenary),
Ruxin Li, Shanghai Institute of Optics and Fine Mechanics,
Chinese Academy of Sciences (China)

Tea/Coffee Break Mon 10:10 to 10:40

10:40: **Multispectral optoacoustic tomography: a paradigm shift
in biomedical research and clinical diagnostics** (Plenary)
Daniel Razansky, Univ. of Zurich (Switzerland) and ETH Zurich
(Switzerland)

11:20: **Nanomaterials and light for sustainability and societal
impact** (Plenary)
Naomi J. Halas, Rice Univ. (United States)

See details pages 8–9

Lunch Break Mon 12:00 to 13:30

SESSION 1

LOCATION: CONV. CTR. ROOM 402 MON 13:30 TO 15:20

Freeform Illumination

Session Chair: **Osamu Matoba**, Kobe Univ. (Japan)

13:30: **Optimal mass transportation and linear assignment problems in
the design of freeform optical elements generating prescribed irradiance
distributions** (Invited Paper), **Leonid L. Doskolovich**, Dmitry Bykov,
Evgeni Bezus, Image Processing Systems Institute (Russian Federation) and
Samara Univ. (Russian Federation) [11185-1]

14:00: **Multi-channel freeform optics for glare-free lighting** (Invited Paper),
Youri Meuret, Karel Desnijder, Wouter Ryckaert, Peter Hanselaer, KU Leuven
(Belgium) [11185-2]

14:30: **Generalized Monge-Ampere equations for illumination freeform
design** (Invited Paper), **Jan ten Thijs Boonkamp**, Technische Univ. Eindhoven
(Netherlands); **Wilbert L. IJzerman**, Signify Research (Netherlands) ... [11185-3]

15:00: **Heat flux simulation irradiation system design**, **Danyi Wang**,
Shanping Jiang, Pengsong Zhang, Shaopu Wang, Yanhong Xiang, China
Aerospace Science and Technology Corp. (China). [11185-4]

Tea/Coffee Break Mon 15:20 to 15:50

SESSION 2

LOCATION: CONV. CTR. ROOM 402 MON 15:50 TO 17:50

Diffractive Optics and Holography

Session Chair: **Yongtian Wang**, Beijing Institute of Technology (China)

15:50: **Multimodal digital holography for live plant cell imaging**
(Invited Paper), **Osamu Matoba**, Xiangyu Quan, Manoj Kumar, Kobe Univ.
(Japan); **Yasuhiro Awatsuji**, Kyoto Institute of Technology (Japan). [11185-5]

16:20: **Optical correlator using holographic system and its applications**
(Invited Paper), **Kanami Ikeda**, Osaka Prefecture Univ. (Japan); **Eriko Watanabe**,
The Univ. of Electro-Communications (Japan) [11185-6]

16:50: **Novel liquid-crystal computer-generated hologram based on
spatial light modulator interference exposure method**, **Shaopu Wang**,
China Aerospace Science and Technology Corp. (China); **Yao Hu**, Beijing
Institute of Technology (China); **Shanping Jiang**, Danyi Wang, Xiao Han, China
Aerospace Science and Technology Corp. (China). [11185-7]

17:10: **Design of dual-band infrared lens with multilayer diffractive optical
element**, **Zhang Bo**, Changchun Univ. of Science and Technology
(China) [11185-8]

17:30: **Optimal design of multilayer diffractive optical element working
in long-infrared waveband with a large angle of incidence**, **Shan Mao**,
Northwestern Polytechnical Univ. (China); **Lidong Zhao**, Changchun Univ. of
Science and Technology (China); **Jianlin Zhao**, Northwestern Polytechnical
Univ. (China) [11185-9]

TUESDAY 22 OCTOBER

SESSION 3

LOCATION: CONV. CTR. ROOM 402 TUE 8:20 TO 10:10

Novel Imaging Techniques

Session Chair: **Rengmao Wu**, Zhejiang Univ. (China)

8:20: **Tissue diagnosis using nanoscale morphological markers extracted
from quantitative phase images** (Invited Paper), **Masanori Takabayashi**,
Kyushu Institute of Technology (Japan); **Hassan Majeed**, Andre Kajdacsy-
Balla, Gabriel Popescu, Univ. of Illinois (United States) [11185-10]

8:50: **Two-dimensional modeling based on visible and near-IR range
linear variable filter**, **Cheng-Hao Ko**, National Taiwan Univ. of Science and
Technology (Taiwan, China); **Jih-Run Tsai**, Bang-Ji Wang, Shin-Fa Lin, National
Space Organization (Taiwan, China); **ChiTung Hong**, Wei-Huai Chiu, National
Taiwan Univ. of Science and Technology (Taiwan, China) [11185-11]

9:10: **Shared aperture space-based optical system for lidar and
visible light camera**, **Jia Hou**, Shanghai Institute of Technical Physics
(China) [11185-12]

9:30: **Tunable single-polarization bimetal-coated and liquid-filled
photonic crystal fiber filter based on surface plasmon resonance**,
Chao Liu, Liying Wang, Chunhong Xu, Qiang Liu, Wei Liu, Lin Yang, Famei
Wang, Xianli Li, Northeast Petroleum Univ. (China); **Tao Sun**, Cambridge (United
States); **Paul K. Chu**, City Univ. of Hong Kong (China) [11185-13]

9:50: **Sparse aperture imaging analysis for quasi four-mirror structure**,
Bin Chen, Soochow Univ. (China) and Suzhou Univ. of Science and Technology
(China); **Quanying Wu**, Junliu Fan, Suzhou Univ. of Science and Technology
(China); **Baohua Chen**, Soochow Univ. (China); **Haiping Zhang**, Suzhou Univ. of
Science and Technology (China) [11185-14]

Tea/Coffee Break Tue 10:10 to 10:40

SESSION 4

LOCATION: CONV. CTR. ROOM 402TUE 10:40 TO 12:10

Freeform Imaging

Session Chair: **Youri Meuret**, KU Leuven (Belgium)

10:40: **Design of optical see-through head-mounted display systems using freeform optics** (*Invited Paper*), Rengmao Wu, Zhejiang Univ. (China) [11185-15]

11:10: **Concept for enabling industry 4.0 in the context of design and assembly of optical systems**, Marcel Prochnau, RWTH Aachen Univ. (Germany); Sven Scheres, Fraunhofer-Institut für Lasertechnik ILT (Germany); Georg König, Felix Zerbes, RWTH Aachen Univ. (Germany); Jochen Stollenwerk, Peter Loosen, RWTH Aachen Univ. (Germany) and Fraunhofer-Institut für Lasertechnik ILT (Germany) [11185-16]

11:30: **Design and fabrication of freeform display optical system with freeform aluminum mirrors by single-point diamond turning technique**, Jingfei Ye, Zhenzhen Song, Nanjing Univ. of Information Science & Technology (China); Yunfeng Nie, Vrije Univ. Brussel (Belgium); Jun Yu, Tongji Univ. (China); Zhaolou Cao, Nanjing Univ. of Information Science & Technology (China); Qun Yuan, Zhishan Gao, Nanjing Univ. of Science and Technology (China) [11185-17]

11:50: **Application of freeform surface in ultra-short focus projector**, Hongyao Liang, Shi Yan, Tengbiao Song, Haibing Niu, Lei Ning, Yang Yang, China Jiliang Univ. (China) [11185-18]

Lunch Break Tue 12:10 to 13:30

TUESDAY POSTER SESSION

LOCATION: FIRST FLOOR LOBBY TUE 13:00 TO 14:30

Conference attendees are invited to attend the poster session on Tuesday afternoon. Come view the posters, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster session.

Poster Setup: Tuesday 10:00 to 13:00

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Automatic detection device for defects of optic fiber imaging elements, Yonggang Huang, China Building Materials Academy (China) [11185-27]

The optimization of optical system with liquid lenses via hybrid algorithm, Zhengda Li, Shanghai Institute of Technical Physics (China); Haibin Sun, Yejin Li, Jinhong Wei, Jin Zeng, Shanghai Institute of Technical Physics of the Chinese Academy of Science (China) and Key Laboratory of Intelligent Perception, Chinese Academy of Science (China); Hongjun Wei, Shanghai Institute of Technical Physics of the Chinese Academy of Science (China); Shengli Sun, Shanghai Institute of Technical Physics (China) and Shanghai Institute of Technical Physics of the Chinese Academy of Science (China) [11185-28]

The dynamic range of aspheric surfaces by non-null interferometry, Mark Pan, Jing Tang, Jinghui Fang, Nantong Univ. (China) [11185-29]

Control of electromagnetic waves based on multi-layered transparent microwave metasurfaces, Bijun Xu, Xin Tong, Mengyao Yan, Zhichao Sun, Zhejiang Univ. of Science and Technology (China) [11185-30]

Liquid crystal hologram for cylinder lens measurement, Yao Hu, Beijing Institute of Technology (China); Shaopu Wang, Beijing Institute of Spacecraft Environment Engineering (China); Zhen Wang, Beijing Institute of Technology (China); Wanlong Zhang, The Hong Kong Univ. of Science and Technology (China); Qun Hao, Beijing Institute of Technology (China) [11185-31]

A method of real-time analysis for stray light uniformity of optical telescope, Taoran Li, Jianfeng Tian, Xue Yang, Ying Wu, National Astronomical Observatories (China) [11185-32]

Alignment of the wedge scanner prism utilizing second split reflection, Jinsuk Hong, Hanwha Systems Co., Ltd. (Korea, Republic of) [11185-33]

Optimization of the space-borne infrared optical system by sensitivity analysis, Jinsuk Hong, Hanwha Systems Co., Ltd. (Korea, Republic of) [11185-34]

Core mismatching based in-fiber Michelson interferometer for liquid refractive index sensing, Liang Han, Min Shao, Xi'an Shiyu Univ. (China); Haonan Sun, Xi'an Shiyu Univ. (China); Yinggang Liu, Xi'an Shiyu Univ. (China); Xueguang Qiao, Northwest Univ. (China) [11185-35]

Design of infrared optical system based on three germanium lens with low stray radiation, Zeyao Cui, Science and Technology on Electro-Optic Control Lab. (China) and Luoyang Institute of Electro-Optical Equipment (China); Zhifeng Pan, Weifeng Ren, Luoyang Electro-optical Equipment Research Institute (China) [11185-36]

Research on surface fitting based on Gauss Radial Basis function, Junyang Li, Wenqiang Li, Luoyang Electro-optical Equipment Research Institute (China); Ruihua Li, Zeyao Cui, Zhou Liang, Luoyang Institute of Electro-Optical Equipment (China) [11185-37]

The optical system design for a coaxial divergent solar simulator, Shi Su, Changchun Univ. of Science and Technology (China) [11185-38]

Global optimization to improve multi-configuration sensors, Hua Liu, Science and Technology on Electro-Optic Control Lab. (China) [11185-39]

Algorithm of design optics for illumination system with wide beam angle, Igor S. Potemin, Dmitry Zhdanov, Nikolay Bogdanov, Andrey Zhdanov, ITMO Univ. (Russian Federation) [11185-40]

Photorealistic visualization of fluorescent materials with dual surface scattering, Dmitry Zhdanov, Igor S. Potemin, Andrey Zhdanov, Andrew Lemeshev, ITMO Univ. (Russian Federation); Vadim Sokolov, M. V. Keldysh Institute of Applied Mathematics (Russian Federation) [11185-41]

Possibility of vergence disagreement reducing on the base of approximate restoration of the depth map, Andrey Zhdanov, Dmitry Zhdanov, Igor S. Potemin, Nikolay Bogdanov, Sergei Bykovskii, ITMO Univ. (Russian Federation) [11185-42]

Providing the quality control in manufacturing of optical elements, Yan Wang, AW Optics Ltd. (China) and ITMO Univ. (Russian Federation); Andrey Zhdanov, Dmitry Zhdanov, Igor S. Potemin, ITMO Univ. (Russian Federation) [11185-43]

A method to improve the measurement accuracy of oxygen saturation by using triangular wave signal with raised offset, Zhe Zhao, Ge Wu, Tianjin Polytechnic Univ. (China); Gang Li, Tianjin Univ. (China); Jinhai Wang, Guang Han, Huiquan Wang, Tianjin Polytechnic Univ. (China) [11185-44]

Design of the illumination optical systems of the washing floodlight, Lei Xiao, Jun zhang, Xiaojie Zhu, Hang Qu, Bin Gao, Yongli Zhu, Systems Engineering Research Institute (China) [11185-45]

The theoretical research on fundamental mode 20/400-μm fiber laser for directed-energy application, Xuejiao Wang, China Electronics Technology Group Corp. (China); Yusheng Huang, Tsinghua University, Center for Photonics and Electronics, Department of Precision Instruments (China); Dongxian Geng, Analysis and Test Center of Sichuan Province (China) [11185-46]

Injection-seeded optical parametric oscillator at 1645 nm for space-borne remote sensing of CH₄, Xiao Chen, Shanghai Institute of Optics and Fine Mechanics (China) and Univ. of Chinese Academy of Sciences (China); Xiaolei Zhu, Shiguang Li, Xiuhua Ma, Junxuan Zhang, Jiqiao Liu, Weibiao Chen, Shanghai Institute of Optics and Fine Mechanics (China) [11185-47]

An improved photovoltaic agriculture system with groove glass plate, Jianan Zheng, Xinyu Zhang, Xiaolong Ning, Jan Ingenhoff, Wen Liu, Univ. of Science and Technology of China (China) [11185-48]

Inversion algorithm validation of 1.57-μm airborne double-pulse IPDA lidar for atmospheric CO₂ measurement, Yadan Zhu, Jiqiao Liu, Xiaopeng Zhu, Decang Bi, Weibiao Chen, Shanghai Institute of Optics and Fine Mechanics (China) [11185-49]

Wave propagation control in a three-layered slab waveguide with periodic structures, Aysha Bibi, Ya-Xian Fan, Zhi Yong Tao, Harbin Engineering Univ. (China) [11185-50]

Novel local variable magnification imaging optical system based on liquid lens, Dalin Song, Beijing Institute of Technology (China) and The First Research Institute of the Ministry of Public Security (China); Jun Chang, Beijing Institute of Technology (China) [11185-51]

Coaxial near-infrared illumination and imaging optical system design with common aperture, Dalin Song, Beijing Institute of Technology (China) and The First Research Institute of the Ministry of Public Security (China); Jun Chang, Beijing Institute of Technology (China) [11185-52]

The dynamic range of aspheric surface by the non-null interferometry, Mark Pan, Jing Tang, Jinghui Fang, Nantong Univ. (China) [11185-53]

SESSION 5

LOCATION: CONV. CTR. ROOM 402 TUE 14:30 TO 17:20

Optical Design and Testing

Session Chair: **Yao Hu**, Beijing Institute of Technology (China)

14:30: **High-efficiency full-surface defects detection for ICF capsule** (*Invited Paper*), Jun Ma, Jianxin Li, Renhui Guo, Rihong Zhu, Lei Chen, Nanjing Univ. of Science and Technology (China); Dangzhong Gao, Zongwei Wang, China Academy of Engineering Physics (China); Cong Wei, Nanjing Univ. of Science and Technology (China) [11185-19]

15:00: **AI mirrors in vacuum ultraviolet region**, Fengli Wang, Shuangying Li, Zhanshan Wang, Tongji Univ. (China); Hongjun Zhou, Tonglin Huo, Univ. of Science and Technology of China (China) [11185-20]

15:20: **First-order design for focal power compensation zoom system**, Hongtao Cheng Sr., Geer Yang Sr., Hengyu Li Sr., Shanghai Univ. (China) [11185-21]

15:40: **Design method for high magnification midwave infrared continuous zoom lens**, Xuan Du Dang, Dai Cuong Que, Thanh Dat Vu, Minh Anh Hoang, Viettel Research & Development Institute (Viet Nam) [11185-22]

16:00: **The research of axis angle on stability**, Lina Ma, Hangtianwuyuan (China) [11185-23]

16:20: **High-precision centering measurement of large-aperture aspheric mirror**, Jiayi Chen, Beijing Institute of Space Mechanics and Electricity (China) [11185-24]

16:40: **Instantaneous wavefront measurement based on deflectometry**, Zhongming Xie, Daodang Wang, Hanting Gu, Ming Kong, China Jiliang Univ. (China); Rongguang Liang, The Univ. of Arizona (United States); Wentao Zhang, Guilin Univ. of Electronic Technology (China) [11185-25]

17:00: **Transient microscopic testing method based on deflectometry**, Daodang Wang, Hanting Gu, Zhongming Xie, China Jiliang Univ. (China); Rongguang Liang, The Univ. of Arizona (United States); Wentao Zhang, Guilin Univ. of Electronic Technology (China) [11185-26]

CONFERENCE 11186

LOCATION: CONV. CTR. ROOM 103B

Monday–Wednesday 21–23 October 2019 • Proceedings of SPIE Vol. 11186

Advanced Optical Imaging Technologies II

Conference Chairs: **Xiao-Cong Yuan**, Shenzhen Univ. (China); **P. Scott Carney**, Univ. of Rochester (United States); **Kebin Shi**, Peking Univ. (China); **Michael G. Somekh**, Shenzhen Univ. (China)

Program Committee: **Martin J. Booth**, Univ. of Oxford (United Kingdom); **David J. Brady**, Duke Univ. (United States); **Ji-Xin Cheng**, Boston Univ. (United States); **Bruce Z. Gao**, Clemson Univ. (United States); **Xiang Hao**, Zhejiang Univ. (China); **Yoshio Hayasaki**, Utsunomiya Univ. Ctr. for Optical Research & Education (Japan); **Minghui Hong**, National Univ. of Singapore (Singapore); **Zhenli Huang**, Huazhong Univ. of Science and Technology (China); **Cuifang Kuang**, Zhejiang Univ. (China); **Malgorzata Kujawińska**, Warsaw Univ. of Technology (Poland); **Puxiang Lai**, The Hong Kong Polytechnic Univ. (Hong Kong, China); **Byoung-ho Lee**, Seoul National Univ. (Korea, Republic of); **Xu Liu**, Zhejiang Univ. (China); **Zhiwen Liu**, The Pennsylvania State Univ. (United States); **Wolfgang Osten**, Institut für Technische Optik (Germany); **Michelle Y. Sander**, Boston Univ. (United States); **Paul Urbach**, Technische Univ. Delft (Netherlands); **Baoli Yao**, Xi'an Institute of Optics and Precision Mechanics, CAS (China); **Chao Zuo**, Nanjing Univ. of Science and Technology (China)

MONDAY 21 OCTOBER

OPENING CEREMONY AND PLENARY SESSION

LOCATION: PRESS CONFERENCE ROOM 9:00 TO 12:00

9:00: **Opening Ceremony**

9:20: **Awards and Recognition**

9:30: **Ultra-high peak power lasers: 10PW and beyond (Plenary)**,
Ruxin Li, Shanghai Institute of Optics and Fine Mechanics,
Chinese Academy of Sciences (China)

Tea/Coffee Break Mon 10:10 to 10:40

10:40: **Multispectral optoacoustic tomography: a paradigm shift
in biomedical research and clinical diagnostics (Plenary)**
Daniel Razansky, Univ. of Zurich (Switzerland) and ETH Zurich
(Switzerland)

11:20: **Nanomaterials and light for sustainability and societal
impact (Plenary)**

Naomi J. Halas, Rice Univ. (United States)

See details pages 8–9

Lunch Break Mon 12:00 to 13:30

SESSION 1

LOCATION: CONV. CTR. ROOM 103B MON 13:30 TO 15:20

Super-Resolution Imaging I

Session Chair: **Kebin Shi**, Peking Univ. (China)

13:30: **Advances in super-resolution localization microscopy with large
field-of-view (Invited Paper)**, Yujie Wang, Luchang Li, Bo Xin, Zhaoning Zhang,
Mingtao Shang, Zhen-Li Huang, Wuhan National Lab. for Optoelectronics
(China) [11186-1]

14:00: **Fluorescence optical super-resolution imaging of nitrogen-vacancy
centers based on saturated competition microscopy**, Chuankang Li,
Zhejiang Univ. (China) [11186-2]

14:20: **Super-resolution imaging via aperture modulation and intensity
extrapolation**, Biao Xu, Zhiqiang Wang, Jinping He, Nanjing Institute of
Astronomical Optics & Technology, NAO, CAS (China) [11186-3]

14:40: **High-resolution image reconstruction of segmented planar imaging
detector for electro-optical reconnaissance**, Can Ding, Xiangchao Zhang,
Fudan Univ. (China); Xinyue Liu, Changchun Institute of Optics, Fine Mechanics
and Physics (China); Min Xu, Fudan Univ. (China) [11186-4]

15:00: **Improved microsphere-assisted super-resolution imaging by
plasmon coupling**, Yurong Cao, Songlin Yang D.D.S., Yong-Hong Ye,
Nanjing Normal Univ. (China) [11186-31]

Tea/Coffee Break Mon 15:20 to 15:50

SESSION 2

LOCATION: CONV. CTR. ROOM 103B MON 15:50 TO 17:20

Label-Free Imaging I

Session Chair: **Qing Yang**, Zhejiang Univ. (China)

15:50: **Hole-array spatial light modulation for single-pixel imaging
(Invited Paper)**, Yoshio Hayasaki, Ryo Sato, Yujiro Ito, Utsunomiya Univ.
(Japan) [11186-5]

16:20: **Nonlinear functional photoacoustic microscopy of oxygen
saturation**, Chao Liu, Lidai Wang, City Univ. of Hong Kong (Hong Kong, China);
Yizhi Liang, Jinan Univ. (China) [11186-6]

16:40: **High-speed large field-of-view optoacoustic microscopy with
multifocal structured illumination**, Zhenyue Chen, Xosé Luis Deán-Ben,
Univ. Zürich (Switzerland) and ETH Zurich (Switzerland); Ali Özbek, Helmholtz
Zentrum München GmbH (Germany); Johannes Rebling, Univ. Zürich
(Switzerland) and ETH Zurich (Switzerland); Daniel Razansky, Univ. Zurich
(Switzerland) and ETH Zurich (Switzerland) and Helmholtz Zentrum München
GmbH (Germany) [11186-7]

17:00: **Single-shot compressed ultrafast electro-optical deflection
imaging**, Chengshuai Yang, Fengyan Cao, Yilin He, Pengpeng Ding, Dalong Qi,
Shian Zhang, East China Normal Univ. (China) [11186-8]

TUESDAY 22 OCTOBER

SESSION 3

LOCATION: CONV. CTR. ROOM 103B TUE 8:30 TO 10:20

Tomographic Imaging

Session Chair: **Kebin Shi**, Peking Univ. (China)

8:30: **Wide-field high-resolution three-dimensional microscopy with
Fourier ptychographic diffraction tomography (Invited Paper)**, Chao Zuo,
Nanjing Univ. of Science and Technology (China) [11186-9]

9:00: **Label-free color staining of quantitative phase images**, Xin Fan,
National Univ. of Ireland, Maynooth (Ireland); John Healy, Univ. College Dublin
(Ireland); Bryan Hennelly, National Univ. of Ireland, Maynooth (Ireland) [11186-10]

9:20: **A tunable 3D optical diffraction tomography system with high
measurement accuracy**, Xing Lv, Shuo Cao, Mi Li, Guanghui Wang,
Jiabi Chen, Nanjing Univ. (China) [11186-11]

9:40: **Video-rate isotropic quantitative differential phase contrast
microscopy based on color-multiplexed annular illumination**, Yao Fan,
Jiasong Sun, Qian Chen, Xiangpeng Pan, Chao Zuo, Nanjing Univ. of Science
and Technology (China) [11186-12]

10:00: **Label-free superresolution microscopy based on real-time
difference technique**, Yanhong Gan, Minfei He, Zhimin Zhang, Liang Xu,
Xiang Hao, Cuifang Kuang, Liu Xu, Zhejiang Univ. (China) [11186-13]

Tea/Coffee Break Tue 10:20 to 10:50

SESSION 4

LOCATION: CONV. CTR. ROOM 103B TUE 10:50 TO 12:00

Super-Resolution Imaging II

Session Chair: **Ming Lei**, Xi'an Jiaotong Univ. (China)

- 10:50: **Chip-based wide-field far-field super-resolution imaging via tunable frequency shift** (*Invited Paper*), Qing Yang, Zhejiang Univ. (China) [11186-14]
- 11:20: **Superresolution confocal laser scanning microscopy using computational imaging**, Rui Chen, Sun Yat-Sen Univ. (China); Xudong Chen, National Univ. of Singapore (Singapore) [11186-15]
- 11:40: **Speckle in an aberrated imaging system**, Penghuan Liu, China Jiliang Univ. (China) [11186-16]
- Lunch Break Tue 12:00 to 13:30

TUESDAY POSTER SESSION

LOCATION: FIRST FLOOR LOBBY TUE 13:00 TO 14:30

Conference attendees are invited to attend the poster session on Tuesday afternoon. Come view the posters, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster session.

Poster Setup: Tuesday 10:00 to 13:00

View poster presentation guidelines and set-up instructions at <http://spie.org/PAPosterGuidelines>

- Three-dimensional photoacoustic imaging of biopsy needles**, Hang Wang, Songde Liu, Tong Wang, Chenxi Zhang, Chao Tian, Univ. of Science and Technology of China (China) [11186-21]
- Interpretation and mitigation of negativity artifacts in photoacoustic tomography**, Chao Tian, Kang Shen, Univ. of Science and Technology of China (China) [11186-29]
- Detection of living tissue structure based on high-repetition frequency pulse Raman and photoacoustic imaging**, Hongpeng Wang, Shanghai Institute of Technical Physics (China) [11186-32]
- Optimal illumination pattern for quantitative phase microscopy based on transport-of-intensity equation**, Jiaji Li, Qian Chen, Chao Zuo, Nanjing Univ. of Science and Technology (China) [11186-33]
- Research on Infrared polarization properties of targets with rough surface**, Yi Liu, Haodong Shi, Huilin Jiang, Yingchao Li, Chao Wang, Zhuang Liu, Guanglin Li, Changchun Univ. of Science and Technology (China) [11186-34]
- A method of image restoration technology based on parallel phase diversity algorithm**, Minshi Liu, Yupeng Jiang, Shandong Institute of Space Electronic Technology (China); Bin Wang, Changchun Institute of Optics, Fine Mechanics and Physics (China) [11186-35]
- Nonlinear focal modulation microscopy based on interleaved reconstruction**, Yuchen Chen, Chengfeng Zhang, Cuifang Kuang, Zhejiang Univ. (China) [11186-36]
- Propagation of ultrasound-modulated scattered light in biological tissue by using COMSOL multiphysics**, Haiyang Song, Peiliang Qi, Fujian Normal Univ. (China); Dongqing Peng, Jimei Univ. (China); Xiaoman Zhang, Lili Zhu, Fujian Normal Univ. (China) [11186-37]
- Super-resolution hyperspectral compressed sampling imaging by push-broom coded aperture**, Weizheng Wang, Mengzhu Li, Changsha Univ. of Science & Technology (China); Junli Qi, Wusheng Tang, Wenjun Yi, Mengjun Zhu, National Univ. of Defense Technology (China); Yanfang Guo, Changsha Univ. of Science & Technology (China); Jubo Zhu, Xiujian Li, National Univ. of Defense Technology (China) [11186-38]
- A method of Fourier ptychography based on variable aperture scanning**, Wusheng Tang, Yanfang Guo, Wenjun Yi, Junli Qi, Meicheng Fu, Mengjun Zhu, Xiaochun Wang, Jinghan Pan, Jubo Zhu, Xiujian Li, National Univ. of Defense Technology (China) [11186-39]
- Influence of spatial power spectrum pattern gray-level distortion on coherent diffraction imaging reconstruction**, Wei Wang, Yanfang Guo, Changsha Univ. of Science & Technology (China); Wusheng Tang, Wenjun Yi, Mengjun Zhu, National Univ. of Defense Technology (China); Mengzhu Li, Changsha Univ. of Science & Technology (China); Junli Qi, Jubo Zhu, Xiujian Li, National Univ. of Defense Technology (China) [11186-40]
- Lattice light-sheet depletion microscopy**, Chengfeng Zhang, Yuchen Chen, Cuifang Kuang, Xu Liu, Zhejiang Univ. (China) [11186-41]
- Analysis of encoding aperture processing error for optical field modulation of compressed sampling spectrum imaging**, Mengjun Zhu, Xiaochun Wang, Junli Qi, Mengzhu Li, Meicheng Fu, Wusheng Tang, Yanfang Guo, Jinghan Pan, Wen-jun Yi, Jubo Zhu, Xiujian Li, National Univ. of Defense Technology (China) [11186-42]

- Multi-region processing method for single-image deraining**, Huasong Chen, Yasong Zhang, Qin Ding, Qinsheng Feng, Hao Qiang, Huaiyin Institute of Technology (China) [11186-43]
- Spin-induced lateral forces on nanoparticles near a nanowire**, Zhibin Zhang, Shenzhen Univ. (China) [11186-44]
- Optical-phase modulator based on stacked piezoelectric ceramics**, Chen Tao Sr., Wu Chenbin, Feiyan Li, Zhongcheng Liang Sr., Nanjing Univ. of Posts and Telecommunications (China) [11186-45]
- Frequency shifting confocal microscopy via azimuthally polarized Bessel-Gaussian beam**, Yong Liu, Shanghai Univ. of Electric Power (China); Cuifang Kuang, Zhejiang Univ. (China) [11186-47]
- Performance analysis of wavefront aberration using flat-convex liquid lens based on electrowetting**, Rui Zhao, Chen Luonan, Nanjing Univ. of Posts and Telecommunications (China) [11186-47]
- Research progress of coronary artery calcification based on optical coherence tomography**, Na Qin, Qin Li, Beijing Institute of Technology (China) [11186-48]
- Dual-wavelength differential unlabeled rapid imaging**, Xin Yang, Zhejiang Univ. (China) [11186-49]
- Measuring the nanomechanical properties of normal and cancerous prostate cells using atomic force microscopy**, Weiwei Ruan, Fujian Normal Univ. (China); Jinshu Zeng, The First Affiliated Hospital of Fujian Medical Univ. (China); Mengdan Chen, Yuhua Wang, Hongqin Yang, Fujian Normal Univ. (China) [11186-50]
- Methods on adaptive identification with space light modulate**, Hua Liu, Luoyang Electro-optical Equipment Research Institute (China) [11186-51]
- Numerical investigation of photonic nanojets generated from D-shaped dielectric microfibers**, Guoqiang Gu, Xingliang Shen, Zeng Peng, Xinfeng Yang, Sankhyabrata Bandyopadhyay, Jiansong Feng, Dongrui Xiao, Liyang Shao, Southern Univ. of Science and Technology of China (China) [11186-52]
- High-resolution refractive index imaging based on total internal reflection**, Ziqiang Xin, Shenzhen Univ. (China) [11186-53]
- Application of Rodrigues matrix in high-accuracy geolocation for ZY-3 panchromatic imagery**, Xiaoming Gao, Fan Mo, Junfeng Xie, Qijun Li, Land Satellite Remote Sensing Application Ctr. (SASAC) (China) [11186-54]

SESSION 5

LOCATION: CONV. CTR. ROOM 103B TUE 14:30 TO 16:40

Label-Free Imaging II

Session Chair: **Ting Lei**, Shenzhen Univ. (China)

- 14:30: **Generalization of deep-learning-based image reconstruction from speckle patterns with different sampling factors** (*Invited Paper*), Huanhao Li, Zhipeng Yu, Shengfu Cheng, Tianting Zhong, Puxiang Lai, The Hong Kong Polytechnic Univ. (Hong Kong, China) [11186-17]
- 15:00: **Machine-learning enhanced photoacoustic computed tomography in a limited view configuration**, Cheng Ma, Handi Deng, Xuanhao Wang, Chuangjian Cai, Tsinghua Univ. (China) [11186-18]
- 15:20: **Wide-field super-resolution Raman imaging of nanostructures**, Mingqun Wang, Jiawei Deng, Fang Hui, Xiao-Cong Yuan, Shenzhen Univ. (China) [11186-19]
- 15:40: **Waveguide chip-based label-free super-resolution imaging**, Mingwei Tang, Chenlei Pang, Dehao Ye, Qing Yang, Zhejiang Univ. (China) [11186-20]
- 16:00: **Clinical carbon nanoparticle-based photoacoustic sentinel lymph-node imaging in vivo**, Songde Liu, Hang Wang, Chenxi Zhang, Chao Tian, Univ. of Science and Technology of China (China) [11186-55]
- 16:20: **Multicolor stimulated Raman and fluorescence imaging for investigating lipid metabolism**, Jingwen Shou, The Univ. of Tokyo (Japan); Robert Oda, Univ. of Hawai'i (United States); Yasuyuki Ozeki, The Univ. of Tokyo (Japan) [11186-22]



CONFERENCE 11186

WEDNESDAY 23 OCTOBER

SESSION 6

LOCATION: CONV. CTR. ROOM 103B WED 8:30 TO 10:10

Imaging Technologies I

Session Chair: **Kebin Shi**, Peking Univ. (China)

8:30: **Three-dimensional macro-scale micro-structure imaging with deep ultraviolet excitation** (*Invited Paper*), Jiaming Guo, Camille Artur, Jason Eriksen, David Mayerich, Univ. of Houston (United States) . . . [11186-23]

9:00: **Recent progress in fast functional photoacoustic imaging** (*Invited Paper*), Lidai Wang, City Univ. of Hong Kong (Hong Kong, China) . . . [11186-24]

9:30: **Challenges and solutions of position-sensitive silicon photomultiplier for single-photon and transient imaging**, Tianqi Zhao, Shangzhong Jin, Aiming Feng, Chunliu Zhao, Yan Shi, Rui Xu, Yi Chen, Yadong Zhou, China Jiliang Univ. (China); Dejun Han, Beijing Normal Univ. (China) . . . [11186-25]

9:50: **A new photometric correction method of CE-1 IIM images**, Xuesen Xu, China Jiliang Univ. (China) . . . [11186-26]

Tea/Coffee Break Wed 10:10 to 10:40

SESSION 7

LOCATION: CONV. CTR. ROOM 103B WED 10:40 TO 11:50

Imaging Technologies II

Session Chair: **Xiao-Cong Yuan**, Shenzhen Univ. (China)

10:40: **Full-color structured illumination optical sectioning microscopy** (*Invited Paper*), Ming Lei, Xi'an Jiaotong Univ. (China) . . . [11186-27]

11:10: **Fast dual-color super-resolution microscopy based on DMD by patterned illumination**, Jintao Luo, Zhejiang Univ. (China) . . . [11186-28]

11:30: **Image signal-to-noise ratio enhancement of multimode optical fiber based on multiwavelength transmission matrix**, Zhong Wen, Chenlei Pang, Mingwei Tang, Qing Yang, Zhejiang Univ. (China) . . . [11186-30]



CONFERENCE 11187

LOCATION: CONV. CTR. ROOM 102A

Monday-Wednesday 21-23 October 2019 • Proceedings of SPIE Vol. 11187

Optoelectronic Imaging and Multimedia Technology VI

Conference Chairs: **Qionghai Dai**, Tsinghua Univ. (China); **Tsutomu Shimura**, The Univ. of Tokyo (Japan); **Zhenrong Zheng**, Zhejiang Univ. (China)

Program Committee: **Moshe Ben-Ezra**, MIT Media Lab. (United States); **Xudong Chen**, National Univ. of Singapore (Singapore); **Ya Cheng**, Shanghai Institute of Optics and Fine Mechanics (China); **Jingtao Fan**, Tsinghua Univ. (China); **Jinwei Gu**, Huawei Technologies Co., Ltd. (United States); **Yo-Sung Ho**, Gwangju Institute of Science and Technology (Korea, Republic of); **Bormin Huang**, Univ. of Wisconsin-Madison (United States); **Ivo Ihrke**, INRIA Bordeaux (France); **Yoshiaki Kanamori**, Tohoku Univ. (Japan); **C. C. Jay Kuo**, The Univ. of Southern California (United States); **Kyros Kutulakos**, Univ. of Toronto (Canada); **Wanqing Li**, Univ. of Wollongong (Australia); **Xing Lin**, Univ. of California, Los Angeles (United States); **Yuan Luo**, National Taiwan Univ. (Taiwan, China); **Yifan Peng**, Stanford Univ. (United States); **Imari Sato**, National Institute of Informatics (Japan), Tokyo Institute of Technology (Japan); **Yoichi Sato**, The Univ. of Tokyo (Japan); **Yoav Yosef Schechner**, Technion-Israel Institute of Technology (Israel); **John T. Sheridan**, Univ. College Dublin (Ireland); **Guangming Shi**, Xidian Univ. (China); **Guohai Situ**, Shanghai Institute of Optics and Fine Mechanics, Chinese Academy of Sciences (China); **Jinli Suo**, Tsinghua Univ. (China); **Lei Tian**, Boston Univ. (United States); **Gordon Wetzstein**, Stanford Univ. (United States); **Feng Wu**, Univ. of Science and Technology of China (China); **Bo Yang**, Univ. of Shanghai for Science and Technology (China); **Jingyi Yu**, Univ. of Delaware (United States); **Xiaolin Zhang**, Shanghai Institute of Microsystem and Information Technology (China)

MONDAY 21 OCTOBER

OPENING CEREMONY AND PLENARY SESSION

LOCATION: PRESS CONFERENCE ROOM 9:00 TO 12:00

- 9:00: **Opening Ceremony**
- 9:20: **Awards and Recognition**
- 9:30: **Ultra-high peak power lasers: 10PW and beyond (Plenary)**,
Ruxin Li, Shanghai Institute of Optics and Fine Mechanics,
Chinese Academy of Sciences (China)
- Tea/Coffee Break Mon 10:10 to 10:40
- 10:40: **Multispectral optoacoustic tomography: a paradigm shift
in biomedical research and clinical diagnostics (Plenary)**
Daniel Razansky, Univ. of Zurich (Switzerland) and ETH Zurich
(Switzerland)
- 11:20: **Nanomaterials and light for sustainability and societal
impact (Plenary)**
Naomi J. Halas, Rice Univ. (United States)
- See details pages 8-9

Lunch Break Mon 12:00 to 13:30

SESSION 1

LOCATION: CONV. CTR. ROOM 102A MON 13:30 TO 15:20

Depth and Light Field

Session Chair: **Zhiwei Xiong**,
Univ. of Science and Technology of China (China)

- 13:30: **High-resolution and real-time spectral-depth imaging with a
compact system (Invited Paper)**, Mingde Yao, Zhiwei Xiong, Univ. of Science
and Technology of China (China) [11187-1]
- 14:00: **Realizing high angular resolution multi-view and light-field displays
with multi-projection technique**, Xinxing Xia, Xiangyu Zhang, Phil Surman,
Yuanjin Zheng, Nanyang Technological Univ. (Singapore) [11187-2]
- 14:20: **Monocular depth estimation based on unsupervised learning**,
Wan Liu, Zhenrong Zheng, Zhejiang Univ. (China) [11187-3]
- 14:40: **A learning-based method using epipolar geometry for light-field
depth estimation**, Xucheng Wang, Zhenrong Zheng, Zhejiang Univ.
(China) [11187-4]
- 15:00: **Light-field SLAM based on ray-space projection model**, Yaning Li,
Qi Zhang, Xue Wang, Qing Wang, Northwestern Polytechnical Univ.
(China) [11187-5]
- Tea/Coffee Break Mon 15:20 to 15:50

SESSION 2

LOCATION: CONV. CTR. ROOM 102A MON 15:50 TO 17:40

Computer Vision

Session Chair: **Ruiping Wang**, Tianjin Univ. (China)

- 15:50: **Dynamic-stride-net: Deep convolutional neural network with
dynamic stride (Invited Paper)**, Zerui Yang, Yuhui Xu, Wenrui Dai,
Hongkai Xiong, Shanghai Jiao Tong Univ. (China) [11187-6]
- 16:20: **No-reference image quality assessment based on an objective
quality database and deep neural networks**, Xiazhaio Zhang, Peng Yan,
Xuanqin Mou, Xi'an Jiaotong Univ. (China) [11187-7]
- 16:40: **Video quality assessment based on LOG filtering of videos and
spatiotemporal slice images**, Peng Yan, Xuanqin Mou, Xi'an Jiaotong Univ.
(China) [11187-8]
- 17:00: **No-reference video quality assessment with deep neural networks
and spatiotemporal slice images**, Peng Yan, Xuanqin Mou, Xi'an Jiaotong
Univ. (China) [11187-9]
- 17:20: **An efficient semi-global stereo matching based on superpixel
segmentation**, Haichao Li, Liang Chen, Feng Li, China Academy of Space
Technology (China) [11187-10]

TUESDAY 22 OCTOBER

SESSION 3

LOCATION: CONV. CTR. ROOM 102A TUE 8:00 TO 10:10

Computational Optics

Session Chair: **Jingtao Fan**, Tsinghua Univ. (China)

- 8:00: **Single-shot wide-field structured illumination microscopy
(Invited Paper)**, Daoyu Li, Liheng Bian, Jun Zhang, Beijing Institute of
Technology (China) [11187-11]
- 8:30: **Scattering imaging through dynamic turbid liquid medium**,
Xueying Sun, Ting Ji, Yuxiang Wu, Jietao Liu, Lixian Liu, Lei Zhang,
Xiaopeng Shao, Xidian Univ. (China) [11187-12]
- 8:50: **Compressive depth and transient imaging with optically coded
SPAD camera**, Qilin Sun, Xiong Dun, King Abdullah Univ. of Science and
Technology (Saudi Arabia); Yi-fan Peng, Stanford Univ. (United
States) [11187-13]
- 9:10: **Wide-field imaging and depth sensing through a strong diffuser by
round-trip field estimation technology and a monochromatic camera**,
Wei Li, Yuxiang Wu, Tengfei Wu, Jietao Liu, Ting Ji, Jinjin Zhu, Xiaopeng Shao,
Xidian Univ. (China) [11187-14]
- 9:30: **Wide FOV hawk-eye video acquisition system**, Xiaoming Sun,
Qi Zhang, Qing Wang, Northwestern Polytechnical Univ. (China) [11187-15]
- 9:50: **Single-pixel depth imaging**, Huayi Wang, Liheng Bian, Jun Zhang,
Beijing Institute of Technology (China) [11187-16]
- Tea/Coffee Break Tue 10:10 to 10:40

CONFERENCE 11187

SESSION 4

LOCATION: CONV. CTR. ROOM 102A TUE 10:40 TO 12:10

Computational Acquisition and Analysis I

Session Chair: **Liheng Bian**, Beijing Institute of Technology (China)

10:40: **Joint-designed achromatic diffractive optical element for full-spectrum computational imaging** (*Invited Paper*), Xiong Dun, Tongji Univ. (China); King Abdullah Univ. of Science and Technology (Saudi Arabia); Yi-fan Peng, Stanford Univ. (United States) [11187-17]

11:10: **Deep-tissue imaging by combining reflection matrix measurement with wide-field heterodyne-detection-based optical coherence tomography**, Qiang Yang, Beijing Information Science & Technology Univ. (China); Yusi Miao, Jing Cao, Beckman Laser Institute and Medical Clinic (United States); Jiang Zhu, Beijing Information Science & Technology Univ. (China); Zhongping Chen, Beckman Laser Institute and Medical Clinic (United States) [11187-18]

11:30: **Hole-filling algorithm for image array of one-dimensional integrated imaging**, Yixue Han, Shigang Wang, Jian Wei, Chenxi Song, Jilin Univ. (China) [11187-19]

11:50: **Learning from simulation: An end-to-end deep learning approach for computational ghost imaging**, Fei Wang, Hao Wang, Haichao Wang, Guowei Li, Guohai Situ, Chinese Academy of Sciences (China) [11187-20]

Lunch Break Tue 12:10 to 13:30

TUESDAY POSTER SESSION

LOCATION: FIRST FLOOR LOBBY TUE 13:00 TO 14:30

Conference attendees are invited to attend the poster session on Tuesday afternoon. Come view the posters, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster session.

Poster Setup: Tuesday 10:00 to 13:00

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Facial action units recognition by de-expression residue learning, Xiaocui Yu, Jun He, Yongkang Xiao, Bo Sun, Lejun Yu, Beijing Normal Univ. (China) [11187-42]

Effect of defocus blur on the signal distribution of camera-based remote photoplethysmography, Shuang Yang, Yudong Zhu, Sailing He, Zhejiang Univ. (China) [11187-44]

Optical hash function based on the interaction between multiple scattering media and coherent radiation, Lianbin Zhang, Wenqi He, Meihua Liao, Daijiang Lu, Chenggong Zhang, Xiang Peng, Shenzhen Univ. (China) [11187-45]

Binocular camera trap for wildlife detection, Zhongke Xu, Liang Sun, Xinwei Wang, Han Dong, Pingshun Lei, Yan Zhou, Institute of Semiconductors (China) [11187-46]

Video super-resolution using deep attention generative adversarial networks, Meng Dong, Hong Yu Cao, Changchun Univ. of Science and Technology (China) [11187-47]

Image instance segmentation based on generative adversarial network, Nan Jing, Wuhan National Lab. for Optoelectronics, Huazhong Univ. of Science and Technology (China) [11187-48]

Single fringe pattern analysis algorithm based on deep learning, Haibin Niu, Shi Yan, Hongyao Liang, Tengbiao Song, Lei Ning, Yang Yang, China Jiliang Univ. (China) [11187-49]

Spectral sensitivity estimation of color digital cameras based on color checker, Hanyi Yuan, Junsheng Shi, Siyu Ning, Yunnan Normal Univ. (China) [11187-50]

A L0 regularized framelet based model for high-density mixed-impulse noise and Gaussian noise removal, Huasong Chen, Yasong Zhang, Qin Ding, Qiansheng Feng, Hao Qiang, Yuanyuan Fan, Huaiyin Institute of Technology (China) [11187-51]

A multi-cropped convolutional neural-network-based method for deep hand pose estimation, Da Li, Haoqian Wang, Graduate School at Shenzhen, Tsinghua Univ. (China) [11187-52]

Stereo matching using convolution neural network and LIDAR support point grid, Sergei Bykovskii, Aleksei Denisov, Andrey Zhdanov, Alexander Belozubov, Alexander Antonov, Elizaveta Kormilitsyna, Dmitry Zhdanov, ITMO Univ. (Russian Federation) [11187-53]

Simultaneous spatial and temporal focusing compact optical system, Yalin Zhang, Tsinghua Univ. (China); Zhenrong Zheng, Yibing Shen, Zhejiang Univ. (China); Wei Chu, Shanghai Institute of Optics and Fine Mechanics (China); Qionghai Dai, Tsinghua Univ. (China) [11187-54]

Measuring the point spread function of a wide-field fluorescence microscope, Yubing Ma, Qionghai Dai, Jingtao Fan, Tsinghua Univ. (China) [11187-55]

Design of an optical sparse aperture for enhanced intermediate frequency response, Jianfei Guan, Tao Chen, Zhongcheng Liang, Nanjing Univ. of Posts and Telecommunications (China) [11187-56]

A competition-based image saliency model, Yang Li, Xuanqin Mou, Xi'an Jiaotong Univ. (China) [11187-57]

Generation of element image array based on photon mapping, Xu Zhengnan, Zhao Yan, Zhang Aijia, Wang Shigang, Jilin Univ. (China) [11187-58]

Brain MRI image classification based on transfer learning and support vector machine, Zimeng Li, Yan Zhao, Shigang Wang, Jilin Univ. (China) [11187-59]

Multifunctional image processor based on rank differences signals weighing-selection processing method and their simulation, Vladimir G. Krasilenko, Vinnytsia Social Economy Institute (Ukraine); Alexander A. Lazarev, Diana V. Nikitovich, Vinnytsia National Technical Univ. (Ukraine) [11187-60]

Fast bundle adjustment using adaptive moment estimation, Tiexin Liu, Liheng Bian, Beijing Institute of Technology (China); Xianbin Cao, Beihang Univ. (China); Jun Zhang, Beijing Institute of Technology (China) [11187-61]

Speckle reduction by modulation of pixel structure based on double-phase hologram, Zhenhao Qin, Zhenrong Zheng, Yuan Chen, Yi Huang, Jinlei Zhang, Zhejiang Univ. (China) [11187-62]

A lite asymmetric DenseNet for effective object detection based on Convolutional Neural Networks (CNN), Long Huang, Kun Ren, Chunqi Fan, Beijing Univ. of Technology (China); Hai Deng, Florida International Univ. (United States) [11187-63]

Image inpainting using hierarchical-fusion and exemplar-based, Keke Wang, Shanghai Univ. (China) [11187-65]

BNU-LCSAD: A video database for classroom student action recognition, Kaijie Zhao, Bo Sun, Yongkang Xiao, Jun He, Lejun Yu, Yong Wu, Huanqing Yan, Beijing Normal Univ. (China) [11187-66]

Improvement of semi-supervised learning in real application scenarios, Huanqing Yan, Jun He, Yongkang Xiao, Bo Sun, Lejun Yu, Kaijie Zhao, Beijing Normal Univ. (China) [11187-67]

Linear spectroscopic confocal system for three-dimensional surface measurement, Yan Sun, Zhejiang Univ. (China) [11187-69]

SESSION 5

LOCATION: CONV. CTR. ROOM 102A TUE 14:30 TO 17:30

Computational Acquisition and Analysis II

Session Chair: **Jiamin Wu**, Tsinghua Univ. (China)

14:30: **High-SNR phase-imaging in the UV-VIS-NIR range** (*Invited Paper*), Meng Li, Liheng Bian, Jun Zhang, Beijing Institute of Technology (China) [11187-21]

15:00: **Underwater image color correction algorithm based on scattering statistical characteristics**, Qichao Shi, Zongju Peng, Fen Chen, Fuhao Yang, Fangming Lan, Ningbo Univ. (China) [11187-22]

15:20: **Effective 3D object reconstruction from densely sampled circular light fields**, Zhengxi Song, Qing Wang, Hao Zhu, Libing Yang, Northwestern Polytechnical Univ. (China) [11187-23]

15:40: **Single-shot imaging through scattering medium using COACH with high resolution and large DOF**, Ting Ji, Xueying Sun, Wei Li, Lei Zhang, Yuxiang Wu, Jietao Liu, Xiaopeng Shao, Xidian Univ. (China) [11187-24]

Tea/Coffee Break Tue 16:00 to 16:10

16:10: **No-reference quality assessment for synthesized images based on local geometric distortions**, Xiaoyan Ma, Fen Chen, Wenhui Zou, Zongju Peng, Ningbo Univ. (China) [11187-25]

16:30: **Single-molecule light field localization microscopy via deep learning**, Xin Chen, Xiaoxu Li, Hui Qiao, Jiamin Wu, Jinli Suo, Qionghai Dai, Tsinghua Univ. (China) [11187-26]

16:50: **Light field planar homography and its application**, Qi Zhang, Xue Wang, Qing Wang, Northwestern Polytechnical Univ. (China) [11187-27]

17:10: **Solving computer vision tasks with diffractive neural networks**, Tao Yan, Jiamin Wu, Tiankuang Zhou, Hao Xie, Lu Fang, Feng Xu, Jingtao Fan, Xing Lin, Qionghai Dai, Tsinghua Univ. (China) [11187-70]

WEDNESDAY 23 OCTOBER

SESSION 6

LOCATION: CONV. CTR. ROOM 102A WED 8:00 TO 10:10

Computer Vision I

Session Chair: **Gangyi Jiang**, Ningbo Univ. (China)

8:00: **Abnormal events detection method for surveillance video using an improved autoencoder with multi-modal input** (*Invited Paper*), Haichun Yue, Shigang Wang, Jian Wei, Yan Zhao, Jilin Univ. (China) [11187-28]

8:30: **Multispectral demosaicing via non-local low-rank regularization**, Yugang Wang, Liheng Bian, Jun Zhang, Beijing Institute of Technology (China) [11187-29]

8:50: **Attention-guided GANs for human pose transfer**, Jinsong Zhang, Tianjin Univ. (China); Kun Li, Tianjin Univ. (China); Yebin Liu, Tsinghua Univ. (China); Jingyu Yang, Tianjin Univ. (China); Qionghai Dai, Tsinghua Univ. (China) [11187-30]

9:10: **Image denoising with non-local adaptive kernel networks**, Haoqian Wang, Zifeng Chai, Yongbing Zhang, Graduate School at Shenzhen, Tsinghua Univ. (China) [11187-31]

9:30: **Supervoxel-based point cloud segmentation for 3D imaging system**, Mei Yu, Fujing Tian, Ken Chen, Hua Chen, Gangyi Jiang, Ningbo Univ. (China) [11187-32]

9:50: **Intermediate deep-feature compression for multitasking**, Weiqian Wang, Ping An, Chao Yang, Xinpeng Huang, Shanghai Univ. (China) [11187-33]

Tea/Coffee Break Wed 10:10 to 10:40

SESSION 7

LOCATION: CONV. CTR. ROOM 102A WED 10:40 TO 12:10

Computer Vision II

Session Chair: **Shigang Wang**, Shanghai Jiao Tong Univ. (China)

10:40: **Interactive gigapixel video streaming via multiscale acceleration** (*Invited Paper*), Qiaojian Qian, Peiyao Guo, Zhan Ma, Nanjing Univ. (China) [11187-34]

11:10: **Data normalization scheme for deep-learning-based compressive sensing**, Peng Wang, Xiangshun Kong, Tao Yue, Xuemei Hu, Nanjing Univ. (China) [11187-35]

11:30: **Semantic image inpainting with dense and dilated convolution in autoencoder adversarial network**, Kun Ren, Chunqi Fan, Lisha Meng, Hong Huang, Beijing Univ. of Technology (China) [11187-36]

11:50: **Multi-object tracking and identification based on speckle correlation**, Gang Wang, Xueying Sun, Shunfu He, Yuxiang Wu, Xiaopeng Shao, Xidian Univ. (China) [11187-37]

Lunch Break Wed 12:10 to 13:40

SESSION 8

LOCATION: CONV. CTR. ROOM 102A WED 13:40 TO 15:30

Image Processing

13:40: **Deep-learning for super-resolution full-waveform LIDAR** (*Invited Paper*), Gangping Liu, Jun Ke, Beijing Institute of Technology (China) [11187-38]

14:10: **Machine-learning-based fast 360-degree video coding for omnidirectional imaging system**, Gangyi Jiang, Baozhen Du, Hua Chen, Haiyong Xu, Song Yang, Ningbo Univ. (China) [11187-39]

14:30: **Viewport-adaptive 360-degree video coding using non-uniform tile for virtual reality communication**, Gangyi Jiang, Yufeng Zhou, Mei Yu, Ken Chen, Hao Jiang, Ningbo Univ. (China) [11187-40]

14:50: **Convolutional neural networks for cloud and snow detection in high-resolution multispectral imagers**, Kun Li, Hongcai Du, Jianhua Guo, Jingyu Yang, Tianjin Univ. (China) [11187-41]

15:10: **Surface defect recognition of varistor based on deep convolutional neural networks**, Tiejun Yang, Lei Xiao, Lin Huang, Guilin Univ. of Technology (China) [11187-43]

CONFERENCE 11188

LOCATION: MULTI-FUNCTION HALL B AND CONV. CTR. ROOM 101

Monday–Wednesday 21–23 October 2019 • Proceedings of SPIE Vol. 11188

Holography, Diffractive Optics, and Applications IX

Conference Chairs: **Yunlong Sheng**, Univ. Laval (Canada); **Changhe Zhou**, Shanghai Institute of Optics and Fine Mechanics (China); **Liangcai Cao**, Tsinghua Univ. (China)

Program Committee: **Linsen Chen**, Soochow Univ. (China); **Chunlei Du**, Chongqing Institute of Green and Intelligent Technology (China); **Min Gu**, RMIT Univ. (Australia); **Byoungcho Lee**, Seoul National Univ. (Korea, Republic of); **Haifeng Li**, Zhejiang Univ. (China); **Junchang Li**, Kunming Univ. of Science and Technology (China); **Ai Qun Liu**, Nanyang Technological Univ. (Singapore); **Hai Ming**, Univ. of Science and Technology of China (China); **Xiang Peng**, Shenzhen Univ. (China); **Ting-Chung Poon**, Virginia Polytechnic Institute and State Univ. (United States); **Ching-Cherng Sun**, National Central Univ. (Taiwan, China); **Xiaodi Tan**, Beijing Institute of Technology (China); **Peter W.M. Tsang**, City Univ. of Hong Kong (Hong Kong, China); **Vladimir Yurievich Venediktov**, Saint Petersburg Electrotechnical Univ. "LETI" (Russian Federation); **Chinhua Wang**, Soochow Univ. (China); **Baoli Yao**, Xi'an Institute of Optics and Precision Mechanics (China); **Toyohiko Yatagai**, Utsunomiya Univ. Ctr. for Optical Research & Education (Japan); **Chongxiu Yu**, Beijing Univ. of Posts and Telecommunications (China); **Xiao-Cong Yuan**, Shenzhen Univ. (China); **Jianlin Zhao**, Northwestern Polytechnical Univ. (China)

MONDAY 21 OCTOBER

OPENING CEREMONY AND PLENARY SESSION

LOCATION: PRESS CONFERENCE ROOM 9:00 TO 12:00

9:00: **Opening Ceremony**

9:20: **Awards and Recognition**

9:30: **Ultra-high peak power lasers: 10PW and beyond (Plenary)**,
Ruxin Li, Shanghai Institute of Optics and Fine Mechanics,
Chinese Academy of Sciences (China)

Tea/Coffee Break Mon 10:10 to 10:40

10:40: **Multispectral optoacoustic tomography: a paradigm shift
in biomedical research and clinical diagnostics (Plenary)**
Daniel Razansky, Univ. of Zurich (Switzerland) and ETH Zurich
(Switzerland)

11:20: **Nanomaterials and light for sustainability and societal
impact (Plenary)**
Naomi J. Halas, Rice Univ. (United States)

See details pages 8–9

Lunch Break Mon 12:00 to 13:30

Sessions 1–2 run concurrently with sessions 3–4

SESSION 1

LOCATION: MULTI-FUNCTION HALL B MON 13:30 TO 15:20

Artificial Intelligence in Digital Holography I

Session Chair: **Yunlong Sheng**, Univ. Laval (Canada)

13:30: **Science and mathematical duality (Invited Paper)**, Francis T. S. Yu,
The Pennsylvania State Univ. (United States) [11188–1]

14:00: **Deep learning for digital holography: Imaging, autofocusing, and
reconstruction (Invited Paper)**, Edmund Y. M. Lam, The Univ. of Hong Kong
(Hong Kong, China) [11188–2]

14:30: **Data-centric approach for miscellaneous optical sensing and
imaging (Invited Paper)**, Jun Tanida, Ryoichi Horisaki, Osaka Univ.
(Japan) [11188–3]

15:00: **Robust phase retrieval from single-distance coherent diffraction
image by combining compressive sensing and deep-learning
approaches**, Chen Bai, Meiling Zhou, Junwei Min, Shipai Dang, Xianghua Yu,
Peng Zhang, Tong Peng, Baoli Yao, Chinese Academy of Sciences
(China) [11188–4]

Tea/Coffee Break Mon 15:20 to 15:50

SESSION 3

LOCATION: CONV. CTR. ROOM 101 MON 13:30 TO 15:00

3D Imaging and Display I

Session Chair: **Changhe Zhou**, Shanghai Institute of Optics and Fine
Mechanics, Chinese Academy of Sciences (China)

13:30: **Continuous-depth head-mounted display for virtual reality
(Invited Paper)**, Byoungcho Lee, Dong-Heon Yoo, Seungjae Lee, Seoul National
Univ. (Korea, Republic of) [11188–10]

14:00: **Glasses-free 3D display with information gradient for enlarged
viewing angle**, Wen Qiao, Soochow Univ. (China) [11188–11]

14:20: **Method to expand the effective viewing area in holographic display
based on spatial light modulator**, Dan Xiao, Sichuan Univ. (China); Di Wang,
Chao Liu, Luo-zhi Zhang, Qiong-Hua Wang, Beihang Univ. (China) .. [11188–12]

14:40: **Performance improvement for computer-generated holographic
stereogram based on integral imaging**, Xu Zhang, Dehua Li, Piao Dai,
Zi Wang, Qibin Feng, Guoqiang Lv, Hefei Univ. of Technology (China) [11188–13]

Tea/Coffee Break Mon 15:00 to 15:30

Sessions 1-2 run concurrently with sessions 3-4

SESSION 2

LOCATION: MULTI-FUNCTION HALL B MON 15:50 TO 18:00

Artificial Intelligence in Digital Holography II

Session Chair: **Liangcai Cao**, Tsinghua Univ. (China)

15:50: **Holotomography and artificial intelligence: from label-free live cells imaging to medical applications exploiting cell phenotypes** (*Invited Paper*), YongKeun Park, KAIST (Korea, Republic of) [11188-5]

16:20: **Speckle noise reduction in digital holograms based on spectral convolutional neural networks (SCNN)** (*Invited Paper*), Wen-Jing Zhou, Shanghai Univ. (China); Shuai Zou, Shanghai Univ. (China) and Waseda Univ. (Japan); Deng-Ke He, Shanghai Univ. (China); Jing-Lu Hu, Waseda Univ. (Japan); Hongbo Zhang, Virginia Military Institute (United States); Ying-Jie Yu, Shanghai Univ. (China); Ting-Chung Poon, Virginia Polytechnic Institute and State Univ. (United States) [11188-6]

16:50: **Fast and accurate classification and identification of mass spectra using hybrid optical-electronic convolutional neural networks**, Si Ma, Huarong Gu, Zheng Ouyang, Tsinghua Univ. (China) [11188-7]

17:10: **Phase retrieval algorithm based on the neural network and the GS**, Hong Cheng II, Yong Liu, Rui Wang V, Quanbing Zhang II, Anhui Univ. (China) [11188-8]

17:30: **Disk misalignment of holographic data storage system eliminated by double frequency grating shearing interferometer** (*Invited Paper*), Yeh-Wei Yu, Shuai Xiao, Ching-Cherng Sun, National Central Univ. (Taiwan, China) [11188-9]

SESSION 4

LOCATION: CONV. CTR. ROOM 101 MON 15:30 TO 18:00

3D Imaging and Display II

Session Chair: **ByoungHo Lee**, Seoul National Univ. (Korea, Republic of)

15:30: **Enhancement on non-diffractive optical scanning holography for hologram acquisition** (*Invited Paper*), Peter W. M. Tsang, City Univ. of Hong Kong (Hong Kong, China); Ting-Chung Poon, Virginia Polytechnic Institute and State Univ. (United States) [11188-54]

16:00: **Fast 3D reconstruction method based on 2D gold matrix**, Chaofeng Miao, Shanghai Institute of Optics and Fine Mechanics (China) and ShanghaiTech Univ. (China) and Univ. of Chinese Academy of Sciences (China); Changhe Zhou, Chao Li, Zhengkun Yin, Junjie Yu, Jing Ye, Shanghai Institute of Optics and Fine Mechanics (China) [11188-15]

16:20: **Three-dimensional reconstruction system of planktonic foraminifera**, Chaoshun Guo, Haiyan Long, Huiping Liu, Buyu Guo, Rui Hou, Ouyang Feng, Ocean Univ. of China (China) [11188-16]

16:40: **Single-shot lensless imaging using Fresnel zone aperture**, Jiachen Wu, Guofan Jin, Liangcai Cao, Tsinghua Univ. (China) [11188-17]

17:00: **Adaptive computational imaging improve architecture methodology**, Hua Liu, Luoyang Electro-optical Equipment Research Institute (China) [11188-18]

17:20: **A novel phase retrieval and reconstruction method in optical diffraction tomography**, Shuo Cao, Xing Lv, Qiang Chen, Guanghui Wang, Jiabi Chen, Nanjing Univ. (China) [11188-19]

17:40: **Research on 3D measurement based on Dammann zone plate**, Zonghao Ye, Changhe Zhou, Ge Jin, Jin Wang, Wei Jia, Yongfang Xie, Dong Zhao, Peng Sun, Changcheng Xiang, Junjie Li, Jinan Univ. (China) [11188-20]

TUESDAY 22 OCTOBER

SESSION 5

LOCATION: MULTI-FUNCTION HALL B TUE 8:30 TO 10:20

Computer-Generated Holography I

Session Chair: **Jun Tanida**, Osaka Univ. (Japan)

8:30: **In-system optimization of hologram for holographic femtosecond laser processing**, Honghao Zhang, Satoshi Hasegawa, Yoshio Hayasaki, Utsunomiya Univ. (Japan) [11188-21]

8:50: **From holography to picooptics**, Changhe Zhou, Shanghai Institute of Optics and Fine Mechanics (China) [11188-22]

9:10: **Novel computer-generated hologram encoding method**, Xinhui Duan, Juan Liu, Zhiqi Zhang, Yu Han, Beijing Institute of Technology (China) [11188-23]

9:30: **Computing and fabrication of high-definition depth-added computer-generated holographic stereogram** (*Invited Paper*), Jung-Ping Liu, Sung-Lin Lu, Chien-Yu Yu, Feng Chia Univ. (Taiwan, China) [11188-24]

10:00: **Optimized random phase for computer generated holographic display**, Zehao He, Xiaomeng Sui, Guofan Jin, Liangcai Cao, Tsinghua Univ. (China) [11188-25]

Tea/Coffee Break Tue 10:20 to 10:50

SESSION 6

LOCATION: MULTI-FUNCTION HALL B TUE 10:50 TO 12:00

Computer-Generated Holography II

Session Chair: **YongKeun Park**, KAIST (Korea, Republic of)

10:50: **Direct laser writing of high-NA computer-generated holograms on metal films of the titanium group** (*Invited Paper*), Victor P. Korolkov, Ruslan K. Nasyrov, Institute of Automation and Electrometry (Russian Federation); Alexandr R. Sametov, Anatoly I. Malyshev, Institute of Automation and Electrometry (Russian Federation); Dmitry A. Belousov, Sergey L. Mikerin, Institute of Automation and Electrometry (Russian Federation) [11188-26]

11:20: **Generalized single-sideband computer-generated holography for high-quality three-dimensional display**, Xiaoyu Wang, Hao Zhang, Liangcai Cao, Guofan Jin, Tsinghua Univ. (China) [11188-27]

11:40: **Multifunctional liquid lens to improve the quality of computer-generated holography**, Chao Liu, Di Wang, Beihang Univ. (China); Dan Xiao, Sichuan Univ. (China); Luo-zhi Zhang, Qiong-Hua Wang, Beihang Univ. (China) [11188-28]

Lunch Break Tue 12:00 to 13:30

CONFERENCE 11188

TUESDAY POSTER SESSION

LOCATION: FIRST FLOOR LOBBY TUE 13:00 TO 14:30

Conference attendees are invited to attend the poster session on Tuesday afternoon. Come view the posters, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster session.

Poster Setup: Tuesday 10:00 to 13:00

View poster presentation guidelines and set-up instructions at <http://spie.org/PAPosterGuidelines>

Incoherent digital holography with four-step phase-shifting interference, Guanglin Yang, Peng Jiang, Yue Sun, Peking Univ. (China); Haiyan Xie, China Science Patent & Trademark Agent Ltd. (China) [11188-58]

Near-field beam-shaping technique based on the coded guided-mode-resonance grating element, Fa Zeng, Qiao Xue, Xiaolu Zhang, Wanjun Dai, China Academy of Engineering Physics (China) [11188-59]

Multiframe digital registration of holographic images, Vitaly Turkin, Vladimir Kamenev, Marina Dvornichenko, Alexey Shubin, Viktor Kuzin, N.L. Dukhov All-Russian Scientific Research Institute of Automatics (VNIIA) (Russian Federation) [11188-60]

Direct measurement of the two-dimensional spatial quantum wavefunction via strong measurements, Chenrui Zhang, Univ. of Science and Technology of China (China) [11188-61]

Quantitative stress measurements and analysis using partial coherent digital holography, Naijie Qi, Cheng Liu, Jiangnan Univ. (China) [11188-62]

Polarimetric imaging using high-density grating pairs, YongFang Xie, Changhe Zhou, Wei Jia, Jin Wang, Changcheng Xiang, Peng Sun, Dong Zhao, Jinan Univ. (China) [11188-63]

High-resolution 3D model reconstruction for light field display, Mengyang Ning, Xinzhu Sang, Beijing Univ. of Posts and Telecommunications (China) [11188-64]

Angular coordinate error testing of circular writing laser system using Fizeau interferometer, Vladimir N. Khomutov, Ruslan K. Nasyrov, Institute of Automation and Electrometry (Russian Federation) [11188-65]

Holographic optical-element-based digital holographic interferometer for label-free imaging of staphylococcus aureus bacteria, Chandra Shakher, Shilpi Agarwal, Vivek Rastogi, Instrument Design and Development Ctr. (India); Rahul Gadkari, Indian Institute of Technology Delhi (India) [11188-66]

Certification of computer-generated holograms using specialized microstructures, Ruslan V. Shimansky, Ruslan K. Nasyrov, Institute of Automation and Electrometry (Russian Federation) [11188-67]

Imaging characteristic optimization of digital holographic microscopy for onion epidermal cells, Rikang Qin, Yanyan Jia, Yiwei Liu, Yibo Wang, Zhuqing Jiang, Beijing Univ. of Technology (China) [11188-68]

Fabrication of high-efficiency multilayer-dielectric spectral-beam-combining gratings, Siyi Tang, Lijang Zeng, Lifeng Li, Tsinghua Univ. (China) [11188-69]

A method of calculating full-parallax computer-generated hologram with occlusion and lighting in real time, Kai Wu, Lingyan Shi, Yun Chen, Jianhong Wu, Soochow Univ. (China) [11188-70]

Research on low-polarization immersed holographic grating, Shuangshuang Huang, Quan Liu, Jinchao Lu, Soochow Univ. (China) [11188-72]

High-quality fast three-dimensional scanning of femtosecond laser pulse based on digital micromirror device, Yu Wang, Wuhan National Lab. for Optoelectronics, Huazhong Univ. of Science and Technology (China); Huaming Li, Wuhan Univ. of Science and Technology (China); Qinglei Hu, Shaoqun Zeng, Wuhan National Lab. for Optoelectronics, Huazhong Univ. of Science and Technology (China) [11188-73]

Weighted iterative algorithm for phase hologram generation with high-quality reconstruction, Lizhi Chen, Hao Zhang, Liangcai Cao, Guofan Jin, Tsinghua Univ. (China) [11188-74]

Three-dimensional measurement module of transverse rotating combination Dammann grating, Dong Zhao, Changhe Zhou, Wei Jia, Jin Wang, Changcheng Xiang, Peng Sun, Yongfang Xie, Zonghao Ye, Ge Jin, Junjie Li, Jinan Univ. (China) [11188-75]

Optimized holographic imaging with the MIM-based metasurface, Chuan Shen, Rulin Xu, Haixiu Yu, Jiaqi Fang, Sui Wei, Anhui Univ. (China) [11188-76]

The method based on PSF analysis of astigmatism formed by plane-grating imaging, Ze Zhang, Quan Lu, Wei Ping Zhang, Guangxi Univ. (China) [11188-77]

A new method for non-destructive measuring of grating parameters, Bilali Muhutijiang, Xinjiang Normal Univ. (China) [11188-78]

A three-dimensional PIV system based on camera array, Ouyang Feng, Jia Yu, Huiping Liu, Wenbin Xu, Shuang Xu, Buyu Guo, Rui Hou, Chaoshun Guo, Ocean Univ. of China (China) [11188-79]

Multichannel fiber-optic detector of optical signals diversification and shape, Yuriy D. Arapov, N.L. Dukhov All-Russian Scientific Research Institute of Automatics (VNIIA) (Russian Federation); Alexander Alexeevich Tikhov, VNIIA (Russian Federation) [11188-80]

Research on slanted trapezoidal surface relief grating, Jin Chao Lu, Soochow Univ. (China); Quan Liu, Soochow Univ. (China); Shuangshuang Huang, Soochow Univ. (Chile) [11188-81]

Imaging laser wakefields by Thomson scattering a co-propagating pulse, Hongjie Liu, Laser Fusion Research Ctr. (China) [11188-82]

Single-shot femtosecond compressive frequency-domain holography, Xiaowei Lu, Jingzhen Li, Qinggang Lin, Shenzhen Univ. (China) [11188-83]

On resizing the reconstructed image in interactive holographic 3D display system, Kai Huang, Yong Li, Yiteng Jiang, Xingcan Zhou, Zhejiang Normal Univ. (China) [11188-84]

Spin momentum driven orbital motion, Shaohui Yan, Xi'an Institute of Optics and Precision Mechanics (China) [11188-85]

Noise reduction method of dual-wavelength digital holography based on a shorter synthetic wavelength, Meng Huang, Yibo Wang, Hongpeng Qin, Zhuqing Jiang, Beijing Univ. of Technology (China) [11188-86]

A new method for removing noise from reconstructed image of three-dimensional computer-generated hologram, Chao Han, Tingting Zhou, Anhui Polytechnic Univ. (China) [11188-87]

Design of binary phase shapers, MingLiang Yao, Soochow Univ. (China) [11188-88]

SESSION 7

LOCATION: MULTI-FUNCTION HALL B TUE 14:30 TO 17:30

Diffraction Element, Grating Design, and Fabrication

Session Chairs: **Vladimir Yurievich Venediktov**, Saint Petersburg Electrotechnical Univ. "LETI" (Russian Federation); **Peter W.M. Tsang**, City Univ. of Hong Kong (Hong Kong, China)

14:30: **Design of reflective ultrabroadband polarization-independent 1x2 beam splitters under normal incidence based on encapsulated metal-dielectric grating**, Zhengkun Yin, Shanghai Institute of Optics and Fine Mechanics (China) and Univ. of Chinese Academy of Sciences (China); Changhe Zhou, Junjie Yu, Yunkai Lu, Shanghai Institute of Optics and Fine Mechanics (China); Chaofeng Miao, Shanghai Institute of Optics and Fine Mechanics (China) and ShanghaiTech Univ. (China); Yu Yan, Shanghai Institute of Optics and Fine Mechanics (China) [11188-29]

14:50: **A 1*5 transmission grating splitter with triangular structure of MgF₂**, Jin Wang, Changhe Zhou, Wei Jia, Changcheng Xiang, Peng Sun, Junjie Li, Jinan Univ. (China) [11188-30]

15:10: **The study on intraocular lens based on Dammann zone plate**, Junjie Li, Changhe Zhou, Zonghao Ye, Ge Jin, Jin Wang, Dong Zhao, Yongfang Xie, Wei Jia, Changcheng Xiang, Peng Sun, Jinan Univ. (China) [11188-31]

15:30: **Improvements of diffractive optical element uniformity and zero order performance using lithographic process parameter optimization method**, Guowei Zhang Sr., Qiang Song Sr., Xiaodong Yin Sr., Kehan Tian Sr., Jiaying Yuguang Technology Development Co., Ltd. (China) [11188-32]

Tea/Coffee Break Tue 15:50 to 16:10

16:10: **Polarization manipulation for fabrication of high-quality two-dimensional grating structures by using an orthogonal two-axis Lloyd's mirror**, Xinghui Li, Haiou Lu, Xiaohao Wang, Qian Zhou, Kai Ni, Gaopeng Xue, Graduate School at Shenzhen, Tsinghua Univ. (China); Hui Lin, Shenzhen Institutes of Advanced Technology (China) [11188-33]

16:30: **Performance improvement of refractive index sensor based on two-dimensional metal-dielectric grating**, Peng Sun, Changhe Zhou, Wei Jia, Jin Wang, Changcheng Xiang, Yongfang Xie, Dong Zhao, Junjie Li, Zonghao Ye, Ge Jin, Jinan Univ. (China) [11188-34]

16:50: **High-efficiency broadband optimization design of gold-plated reflective grating**, Ge Jin, Changhe Zhou, Zonghao Ye, Junjie Li, Jin Wang, Wei Jia, Yongfang Xie, Dong Zhao, Peng Sun, Changcheng Xiang, Jinan Univ. (China) [11188-35]

17:10: **Design of guided mode resonant gratings by modal method**, Changcheng Xiang, Changhe Zhou, Jinan Univ. (China) [11188-36]

CONFERENCE 11188

WEDNESDAY 23 OCTOBER

SESSION 8

LOCATION: MULTI-FUNCTION HALL B WED 8:00 TO 10:20

Novel Applications

Session Chair: **Edmund Y. M. Lam**,
The Univ. of Hong Kong (Hong Kong, China)

8:00: **Digital optical phase conjugation for light focusing and structured light-beam reconstructing via multimode fiber** (*Invited Paper*), Jianlin Zhao, Northwestern Polytechnical Univ. (China) [11188-38]

8:30: **Optical vortices generation by digital "blazed" thin holograms**, Alina V. Gorelaya, Alexander A. Severyugin, Ibrahim M. Tursunov, Saint Petersburg Electrotechnical Univ. "LETI" (Russian Federation); Dmitrii V. Venediktov, Saint Petersburg State Univ. (Russian Federation) and ITMO Univ. (Russian Federation); Vladimir Yurievich Venediktov, Saint Petersburg Electrotechnical Univ. "LETI" (Russian Federation) [11188-39]

8:50: **Formation of coherence vortices using partially coherent light arrays**, Jun Chen, China Jiliang Univ. (China) [11188-40]

9:10: **Topography measurement by normal-incidence reflection ptychography**, Chao Tang, Lu Rong, Dayong Wang, Bing Li, Fangrui Tan, Jie Zhao, Yunxin Wang, Xiaoyu Shi, Beijing Univ. of Technology (China) [11188-41]

9:30: **Broadband achromatic optical imaging with diffractive elements** (*Invited Paper*), Chinhua Wang, Soochow Univ. (China) [11188-42]

10:00: **An advanced ray-tracing model for multi-color holographic optical elements**, Han-Hsiang Cheng, Xiaochaoran Tian, Zemax, LLC (United States) [11188-43]

Tea/Coffee Break Wed 10:20 to 10:50

SESSION 9

LOCATION: MULTI-FUNCTION HALL B WED 10:50 TO 12:10

Digital Holographic Microscopy I

Session Chair: **Jianlin Zhao**, Northwestern Polytechnical Univ. (China)

10:50: **Microscopic urinalysis by digital holographic microscopy**, Chandra Shakher, Vivek Rastogi, Shilpi Agarwal, Satish Dubey, Gufran Khan, Instrument Design and Development Ctr. (India) [11188-44]

11:10: **Inexpensive portable module for digital holographic microscopy**, Xin Fan, Kevin O'Dwyer, Bryan Hennelly, National Univ. of Ireland, Maynooth (Ireland) [11188-45]

11:30: **Tomography by compressive holographic microscope**, Zhenpeng Luo, Ping Su, Jianshe Ma, Graduate School at Shenzhen, Tsinghua Univ. (China) [11188-46]

11:50: **Polarized fringe pattern generation by a digital mirror device used for structure illumination microscopy**, Ziyi Zhu, Minqun Wang, Fang Hui, Xiao-Cong Yuan, Shenzhen Univ. (China) [11188-47]

Lunch Break Wed 12:10 to 13:30

SESSION 10

LOCATION: MULTI-FUNCTION HALL B WED 13:30 TO 15:20

Holographic Metrology

Session Chair: **Chinhua Wang**, Soochow Univ. (China)

13:30: **Visual and quantitative investigation on heat flow performance from heat sinks using digital holographic interferometer** (*Invited Paper*), Varun Kumar, Chandra Shakher, Indian Institute of Technology Delhi (India) [11188-48]

14:00: **Interferometric calibration method for phase-only liquid crystal on silicon spatial light modulator**, Rujia Li, Liangcai Cao, Tsinghua Univ. (China) [11188-49]

14:20: **Holographic wavefront sensing and modal decomposition**, Evgenii Fedorov, Ksenia N. Gavril'eva, Alina V. Gorelaya, Egor V. Shalymov, Saint Petersburg Electrotechnical Univ. "LETI" (Russian Federation); Dmitrii V. Venediktov, Saint Petersburg State Univ. (Russian Federation) and ITMO Univ. (Russian Federation); Vladimir Yurievich Venediktov, Saint Petersburg Electrotechnical Univ. "LETI" (Russian Federation) [11188-50]

14:40: **Holo-shear lens based interferometer for measurement of temperature distribution and fluctuation of temperature in micro flame**, Chandra Shakher, Shilpi Agarwal, Vivek Rastogi, Varun Kumar, Instrument Design and Development Ctr. (India) [11188-51]

15:00: **Faithful reconstruction in orthogonal elliptical polarization holography**, Zhiyun Huang, Youwu He, Tianguai Dai, Xiaodi Tan, Fujian Normal Univ. (China) [11188-52]

Tea/Coffee Break Wed 15:20 to 15:50

SESSION 11

LOCATION: MULTI-FUNCTION HALL B WED 15:50 TO 17:50

Digital Holographic Microscopy II

Session Chair: **Jung-Ping Liu**, Feng Chia Univ. (Taiwan, China)

15:50: **Optical scanning holography: a review of fundamentals with some recent applications** (*Invited Paper*), Yaping Zhang, Kunming Univ. of Science and Technology (China); Ting-Chung Poon, Virginia Polytechnic Institute and State Univ. (United States) [11188-53]

16:20: **Achieving superresolution in three-dimensional quantitative phase imaging for cell observation** (*Invited Paper*), Ping Su, Nanyang Technological Univ. (Singapore) and Graduate School at Shenzhen, Tsinghua Univ. (China); Ruoqia Wang, Graduate School at Shenzhen, Tsinghua Univ. (China); Chao-Mao Hsieh, Quan Liu, Ai Qun Liu, Nanyang Technological Univ. (Singapore) [11188-14]

16:50: **A method to achieve color image encryption by using orthogonal compressive sensing and optical scanning holography**, Luo-zhi Zhang, Di Wang, Chao Liu, Beihang Univ. (China); Dan Xiao, Sichuan Univ. (China); Qiong-Hua Wang, Beihang Univ. (China) [11188-55]

17:10: **Quantitative differential phase microscopy based on structured illumination**, Kai Wen, Juanjuan Zheng, Peng Gao, Xidian Univ. (China) [11188-56]

17:30: **Experimental investigation of water droplet splashing with high-speed digital in-line holography**, Yingchun Wu, Xuecheng Wu, Xiaodan Lin, Zhejiang Univ. (China); Junlin Ma, China Aerodynamics Research and Development Ctr. (China); Longchao Yao, Zhiliang Xue, Zhejiang Univ. (China) [11188-57]

CONFERENCE 11189

LOCATION: CONV. CTR. ROOM 102B

Monday–Wednesday 21–23 October 2019 • Proceedings of SPIE Vol. 11189

Optical Metrology and Inspection for Industrial Applications VI

Conference Chairs: **Sen Han**, Univ. of Shanghai for Science and Technology (China), Suzhou H&L Instruments LLC (China); **Toru Yoshizawa**, Tokyo Univ. of Agriculture and Technology (Japan), 3D Associates (Japan); **Song Zhang**, Purdue Univ. (United States); **Benyong Chen**, Zhejiang Sci-Tech Univ. (China)

Program Committee: **Masato Aketagawa**, Nagaoka Univ. of Technology (Japan); **Yasuhiko Arai**, Kansai Univ. (Japan); **James H. Burge**, College of Optical Sciences, The Univ. of Arizona (United States); **Yuanshen Cao**, National Institute of Measurement and Testing Technology (China); **Jun Chen**, Tokyo Polytechnic Univ. (Japan); **Garrett D. Cole**, Crystalline Mirror Solutions, LLC (United States); **Junfei Dai**, Zhejiang Univ. (China); **Yuegang Fu**, Changchun Univ. of Science and Technology (China); **Ming Jiang**, Suzhou Univ. of Science and Technology (China); **Zhihua Jiang**, Shanghai Institute of Measurement and Testing Technology (China); **Lianhua Jin**, Univ. of Yamanashi (Japan); **Kazuhide Kamiya**, Toyama Prefectural Univ. (Japan); **Malgorzata Kujawska**, Warsaw Univ. of Technology (Poland); **Chao-Wen Liang**, National Central Univ. (Taiwan, China); **Yuxiang Lin**, ASML (United States); **Dong Liu**, Zhejiang Univ. (China); **Yasuhiro Mizutani**, Osaka Univ. (Japan); **Yukitoshi Otani**, Utsunomiya Univ. (Japan); **Giancarlo Pedrini**, Institut für Technische Optik (Germany); **Xiang Peng**, Shenzhen Univ. (China); **Qian Kemao**, Nanyang Technological Univ. (Singapore); **Guohai Situ**, Shanghai Institute of Optics and Fine Mechanics (China); **H. Philip Stahl**, NASA Marshall Space Flight Ctr. (United States); **John C. Stover**, The Scatter Works Inc. (United States); **Takamasa Suzuki**, Niigata Univ. (Japan); **Toshitaka Wakayama**, Saitama Medical Univ. (Japan); **Haoyu Wang**, Univ. of Shanghai for Science and Technology (China); **Xiangzhao Wang**, Shanghai Institute of Optics and Fine Mechanics, Chinese Academy of Sciences (China); **Yajun Wang**, Wuhan Univ. (China); **Quanying Wu**, Suzhou Univ. of Science and Technology (China); **Jiangtao Xi**, Univ. of Wollongong (Australia); **Jing Xu**, Tsinghua Univ. (China); **Lianxiang Yang**, Oakland Univ. (United States); **Dawei Zhang**, Univ. of Shanghai for Science and Technology (China); **Hao Zhang**, Tianjin Univ. (China); **Qican Zhang**, Sichuan Univ. (China); **Zonghua Zhang**, Hebei Univ. of Technology (China); **Ping Zhong**, Donghua Univ. (China); **Ping Zhou**, The Univ. of Arizona (United States); **Weihu Zhou**, Academy of Opto-Electronics (China); **Chao Zuo**, Nanjing Univ. of Science and Technology (China)

MONDAY 21 OCTOBER

OPENING CEREMONY AND PLENARY SESSION

LOCATION: PRESS CONFERENCE ROOM 9:00 TO 12:00

9:00: **Opening Ceremony**

9:20: **Awards and Recognition**

9:30: **Ultra-high peak power lasers: 10PW and beyond (Plenary)**,
Ruxin Li, Shanghai Institute of Optics and Fine Mechanics,
Chinese Academy of Sciences (China)

Tea/Coffee Break Mon 10:10 to 10:40

10:40: **Multispectral optoacoustic tomography: a paradigm shift
in biomedical research and clinical diagnostics (Plenary)**
Daniel Razansky, Univ. of Zurich (Switzerland) and ETH Zurich
(Switzerland)

11:20: **Nanomaterials and light for sustainability and societal
impact (Plenary)**
Naomi J. Halas, Rice Univ. (United States)

See details pages 8-9

Lunch Break Mon 12:00 to 13:30

SESSION 1

LOCATION: CONV. CTR. ROOM 102B MON 13:30 TO 15:30

Optical Metrology Methods I

Session Chairs: **Sen Han**, Univ. of Shanghai for Science and
Technology (China); **Shijie Feng**, Nanjing Univ. of Science and
Technology (China)

13:30: **How can a plenoptic camera be used as a metrology tool? (Invited
Paper)**, **Xiang Peng**, Shenzhen Univ. (China) [11189-1]

14:00: **A spin self-sustaining atomic magnetometer for high-precision
measurements in large magnetic fields**, **Qin Zhao**, **Bolin Fan**, **Shiguang
Wang**, **Lijun Wang**, Tsinghua Univ. (China) [11189-2]

14:20: **In-situ detection and evaluation of wear state of micro-powder
diamond wheel in optics grinding**, **Lian Zhou**, **Nan Zheng**, **Xianhua Chen**,
Qinghua Zhang, **Jian Wang**, **Qiao Xu**, China Academy of Engineering Physics
(China) [11189-3]

14:40: **Interferometric and deflectometric flatness metrology with
nanometre measurement uncertainties for optics up to one metre at
PTB (Invited Paper)**, **Gerd Ehret**, **Heiko Reinsch**, **Michael Schulz**, Physikalisch-
Technische Bundesanstalt (Germany) [11189-4]

15:10: **A high-precision and non-contact dynamic angular displacement
measurement system based on heterodyne interference**, **Dengwei Zhang**,
Zhejiang Univ. (China) [11189-5]

Tea/Coffee Break Mon 15:30 to 16:00

SESSION 2

LOCATION: CONV. CTR. ROOM 102B MON 16:00 TO 18:20

Optical Metrology Methods II

Session Chair: **Jiangtao Xi**, Univ. of Wollongong (Australia)

16:00: **Transmission measurement by using different wavelengths than
designed wavelength (Invited Paper)**, **Sen Han**, Univ. of Shanghai for Science
and Technology (China); **Qiyuan Zhang**, Suzhou H&L Instruments, LLC
(China) [11189-6]

16:30: **Phase unwrapping and range enlargement in phase-shifting dual-
wavelength digital holography**, **Yu Cheng**, **Xiangchao Zhang**, **He Yuan**,
Wei Wang, **Min Xu**, Fudan Univ. (China) [11189-7]

16:50: **Real-time microscopic 3D measurement based on fringe
projection**, **Yan Hu**, **Yichao Liang**, **Tianyang Tao**, **Wei Yin**, **Jiaming Qian**,
Shijie Feng, **Chao Zuo**, **Qian Chen**, Nanjing Univ. of Science and Technology
(China) [11189-8]

17:10: **Learning-based fringe projection profilometry (Invited Paper)**,
Chao Zuo, Nanjing Univ. of Science and Technology (China) [11189-9]

17:40: **High-speed 3D shape measurement with the multi-view system
using deep learning**, **Wei Yin**, **Chao Zuo**, **Shijie Feng**, **Tianyang Tao**,
Qian Chen, Nanjing Univ. of Science and Technology (China) [11189-10]

18:00: **Detect the curing extent of conformal coating using speckle
variance optical coherence tomography**, **Xiwen Wang**, **Jianhua Mo**, **Jie Zhu**,
Jianing Dai, **Qian Wu**, Soochow Univ. (China) [11189-11]

TUESDAY 22 OCTOBER

SESSION 3

LOCATION: CONV. CTR. ROOM 102B TUE 8:50 TO 10:20

Optical Metrology Methods III

Session Chairs: **Song Zhang**, Purdue Univ. (United States);
Yukitoshi Otani, Utsunomiya Univ. (Japan)

8:50: **High-precision 3D shape reconstruction with two-camera measurement fusion** (*Invited Paper*), Yuewen Zhu, Qinghua O. Guo, Jiangtao Xi, Yanguang Yu, Jun Tong, Univ. of Wollongong (Australia). [11189-12]

9:20: **Motion-to-photon latency measurement system for virtual reality head-mounted displays based on photodiode with fast response time**, Lei Ning, China Jiliang Univ. (China) [11189-13]

9:40: **Detection and recognition of water quality based on UV-visible spectroscopy in different living areas of Urumqi**, Chen Chen, Xiaoyi Lv Sr., Xinjiang Univ. (China); ShengYa Feng, Xinjiang Zhonglian Testing Co., Ltd. (China); Jun Tang, Cheng Chen, Xinjiang Univ. (China); Xiangxiang Zheng, Beijing Univ. of Posts and Telecommunications (China). [11189-14]

10:00: **Absolute power responsivities calibration of silicon photodetector based on He-Ne and supercontinuum source**, Nan Xu, Yandong Lin, Haiyong Gan, Wende Liu, Ruoduan Sun, National Institute of Metrology (China) [11189-15]

Tea/Coffee Break Tue 10:20 to 10:50

SESSION 4

LOCATION: CONV. CTR. ROOM 102B TUE 10:50 TO 12:00

Optical Metrology Methods IV

Session Chairs: **Benyong Chen**, Zhejiang Sci-Tech Univ. (China);
Gerd Ehret, Physikalisch-Technische Bundesanstalt (Germany)

10:50: **Research on PGC phase demodulation and its nonlinear error compensation methods** (*Invited Paper*), Liping Yan, Zhejiang Sci-Tech Univ. (China) [11189-16]

11:20: **Two-wavelengths digital holography for erosion measurements inside the ITER Tokamak**, Giancarlo Pedrini, Alejandro Calabuig, Institut für Technische Optik (Germany); Govind Jagannathan, Fircroft Engineering Services (France); Mark Kempenaars, George Vayakis, ITER Organization (France); Wolfgang Osten, Institut für Technische Optik (Germany). . . [11189-73]

11:40: **The application of Ag⁺ detection based on nanoporous silicon SERS substrates**, Chen Chen, Xinjiang Univ. (China); ShengYa Feng, Xinjiang Zhonglian Testing Co., Ltd (China); Xiaoyi Lv, Jun Tang, Cheng Chen, Xinjiang Univ. (China); Xiangxiang Zheng, Beijing Univ. of Posts and Telecommunications (China) [11189-18]

Lunch Break Tue 12:00 to 13:30

TUESDAY POSTER SESSION

LOCATION: FIRST FLOOR LOBBY TUE 13:00 TO 14:30

Conference attendees are invited to attend the poster session on Tuesday afternoon. Come view the posters, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster session.

Poster Setup: Tuesday 10:00 to 13:00

View poster presentation guidelines and set-up instructions at <http://spie.org/PAPosterGuidelines>

A novel processing method for industry inspection based on laser triangulation sensors, Xinghui Li, Jianxiang Li, Qian Zhou, Ruiming Chen, Kai Ni, Graduate School at Shenzhen, Tsinghua Univ. (China). [11189-19]

A planar-pattern-based calibration method for high-precision structured laser triangulation measurement, Xinghui Li, Ruiming Chen, Jianxiang Li, Qian Zhou, Kai Ni, Xiaohao Wang, Graduate School at Shenzhen, Tsinghua Univ. (China) [11189-21]

Fabry-Pérot optic fiber interferometer with high sensitivity for nanoscale displacement measurement, Wei Wang, Tao Jin, Yanfen Le, Univ. of Shanghai for Science and Technology (China) [11189-36]

A novel calibration transfer method of NIR spectra to identify ultra-low concentration of pesticide residues, Chaowei Zhuang, Jingtao Fan, Jing Zhang, Bin Gao, Qionghai Dai, Tsinghua Univ. (China). [11189-43]

Experimental method and error analysis for dynamic angle measurement of machine vision, Hao Wu, Wensheng Li, Shuaitao Han, Luoyang Electronic Equipment Test Ctr. (China); Yong Zhang, Chinese People's Liberation Army (China); Wenqiang Li, Weibo Xu, Luoyang Electronic Equipment Test Ctr. (China) [11189-44]

Method for evaluating strength of photogrammetry network based on attenuation factor, Bolun Zhang, China Academy of Space Technology (China) [11189-45]

Defect detection of optical elements surfaces using curvelet transform, Linfu Li, Guizhou Minzu Univ. (China); Jian-Jun Chen, Xinjiang Medical Univ. (China) [11189-46]

System construction and uncertainty evaluation of absolute measurement of infrared spectral radiance, Shufang He, Yan-Fei Wang, Caihong Dai, Jinyuan Liu, Guojin Feng, National Institute of Metrology (China) [11189-47]

Partial reconstruction of phase of interference pattern based on a generalized discrete Fourier transform, Dong Wei, Nagaoka Univ. of Technology (Japan); MeiYun Chen, Guangdong Univ. of Technology (China) [11189-48]

Inversion algorithm for detection of H₂S gas concentration by differential absorption spectroscopy, Shuwang Chen, Xiaowei Yin, Zhenzhen Wang, Tongtong Song, Shuli A. Song, Hebei Univ. of Science and Technology (China) [11189-49]

Odorous emission monitoring based on differential optical absorption spectroscopy, Rui Xue, China National Environmental Monitoring Ctr. (China); Xiaohong Han, Hangzhou Chunlai Technology Co., Ltd. (China) [11189-50]

Ultra-low flue gas emission monitoring based on differential optical absorption spectroscopy, Jinbao Zhao, China National Environmental Monitoring Ctr. (China); Jie Guo, Hangzhou Chunlai Technology Co., Ltd. (China); Jiatong Shi, Hangzhou Chunlai Technology Co., Ltd (China) . [11189-51]

Fabry-Perot interference technology used in two-dimensional micro-displacement measurement, Xuhui Lan, Xiaoyan Shen, China Jiliang Univ. (China); Henian Zhu, Tsinghua Univ. (China); Jing Yu, Jiayin Yu, Yuan Liu, China Jiliang Univ. (China) [11189-52]

An automatic metrology using the laser displacement sensor for the corrugation height of corrugated plate, Chengxing Wu, Baijin Chen, Chunsheng Ye, Huazhong Univ. of Science and Technology (China) . [11189-53]

Vehicle exhaust detection based on TDLAS, Kexin Zhang, Henan Institute of Meteorological Science (China); Jie Zhao, Beijing Univ. of Technology (China) and Henan Institute of Meteorological Science (China); Weimin Zhu, Henan Institute of Meteorological Science (China). [11189-54]

Phase correction method for dynamic 3D measurement based on fringe projection, Xingcan Zhou, Yong Li, Kai Huang, Yiteng Jiang, Zhejiang Normal Univ. (China) [11189-55]

New calibration approach for 3D measurement system based on the light-source-stepping method, Yiteng Jiang, Yong Li, Kai Huang, Xingcan Zhou, Zhejiang Normal Univ. (China) [11189-56]

Modeling and identification of errors of 3D laser area scanning with the use of segmental self-correction model, Sen Zhou, Chongqing Institute of Metrology and Quality Inspection (China) [11189-57]

Thickness measurement opaque material by swept source optical coherence tomography, Qian Wu, Jianing Dai, Jie Zhu, Xiwen Wang, Xinjian Chen, Jianhua Mo, Soochow Univ. (China) [11189-58]

Colored Ronchi pattern for fringe projection profilometry, Jayson P. Cabanilla, Nathaniel P. Hermosa, National Institute of Physics (Philippines). [11189-59]

Temperature compensation for LED filament standard lamps, Jinyun Yan, Hui Liu, Weiqiang Zhao, Ying Su, Lin Jiang, National Institute of Metrology (China) [11189-60]

The effectiveness of laser angle deception jamming system, Shuai-tao Han, Wen-sheng Li, Xing Wang, Luoyang Electronic Equipment Test Ctr. (China) [11189-61]

Single-shot 3D shape measurement with spatial frequency multiplexing using deep learning, Chen Yang, Wei Yin, Hao Xu, Jiachao Li, Shijie Feng, Tianyang Tao, Qian Chen, Chao Zuo, Nanjing Univ. of Science and Technology (China) [11189-62]

Realization of high-intensity focusing ultrasound pressure and detection of sound field, Jie Zhao, Beijing Univ. of Technology (China) and Henan Institute of Meteorological Science (China); Weimin Zhu, Jinyu Lu, Henan Institute of Meteorological Science (China) [11189-63]

Space-time adaptive: system, resolution, and configuration, Hua Liu, Science and Technology on Electro-Optic Control Lab. (China) [11189-64]

Research on Nondestructive measurement of spectral responsivity of photovoltaic modules, Junchao Zhang, Yangyang Wang, Limin Xiong, Yingwei He, Haifeng Meng, Bifeng Zhang, Chuan Cai, Shuai Man, National Institute of Metrology (China) [11189-65]

Spectral responsivity measurements of monolithic GaInP₂/InGaAs/Ge triple-junction solar cells, Haifeng Meng, National Institute of Metrology (China); Hongdong Yang, Shanghai Institute of Space Power-sources (China); Junchao Zhang, Yingwei He, Bifeng Zhang, Chuan Cai, Shuai Man, Limin Xiong, National Institute of Metrology (China). [11189-66]

Coating of high-temperature annealing material mixed with silica and aluminum trioxide, Xiuhua Fu, Suotao Dong, Changchun Univ. of Science and Technology (China) [11189-67]

Uncertainty evaluation of colour correction factor using Monte Carlo method in LED photometry measurement, Weiqiang Zhao, Hui Liu, Jinyun Yan, Ying Su, Lin Jiang, National Institute of Metrology (China) [11189-68]

CONFERENCE 11189

Moving target detection and tracking system based on FPGA, Kai Xing, Binhua Li, Yong Tao, Jinliang Wang, Chun He, Kunming Univ. of Science and Technology (China). [11189-69]

Research on 24-h forecasting of solar irradiance based on artificial neural network, Bixuan Gao, Xiaoqiao Huang, Junsheng Shi, Yunnan Normal Univ. (China). [11189-70]

Lucky imaging system on FPGA by using ethernet transmission, Chenhao Duan, Binhua Li, Zhen Chen, Chun He, Jinliang Wang, Kunming Univ. of Science and Technology (China). [11189-71]

Research for determination of the clean room suitability of clean robot by ISO Class 1 clean room, Long Li, Suzhou Institute of Metrology (China). [11189-72]

SESSION 5

LOCATION: CONV. CTR. ROOM 102B TUE 14:30 TO 15:40

Optical Metrology Methods V

Session Chairs: **Xiang Peng**, Shenzhen Univ. (China);
Liping Yan, Zhejiang Sci-Tech Univ. (China)

14:30: **Phase-shifting differential interference contrast video microscope using pixelated polarization camera** (*Invited Paper*), Yukitoshi Otani, Utsunomiya Univ. (Japan). [11189-20]

15:00: **Multilateration with laser tracker applied in large-scale coordinate calibration**, Yu Ren, Yunxia Fu, Fangfang Liu, Feng Zhang, Shanghai Institute of Measurement and Testing Technology (China). [11189-22]

15:20: **Exploratory study on rapid identification of arsenic in water based on Raman spectroscopy**, Chen Chen, Xiaoyi Lv, Xinjiang Univ. (China); ShengYa Feng, Xinjiang Zhonglian Testing Co., Ltd. (China); Jun Tang, Cheng Chen, Xinjiang Univ. (China); Xiangxiang Zheng, Beijing Univ. of Posts and Telecommunications (China). [11189-23]

Tea/Coffee Break Tue 15:40 to 16:00

SESSION 6

LOCATION: CONV. CTR. ROOM 102B TUE 16:00 TO 17:10

Optical Metrology Methods VI

Session Chair: **Jun Chen**, Tokyo Polytechnic Univ. (Japan)

16:00: **Development and characterization of nano film thickness standards** (*Invited Paper*), Zhiguo Han, Hebei Semiconductor Research Institute (China). [11189-24]

16:30: **Discontinuity artifact reduction of structured light 3D measurement system based on a deconvolution method**, Yuxiang Wu, Xiaojian Cai, Jinjin Zhu, Xiaopeng Shao, Xidian Univ. (China). [11189-27]

16:50: **Research on full-aperture surface shape in-situ measurement technology for grinding large diameter optics**, Qiancai Wei, Lian Zhou, Xianhua Chen, Nan Zheng, Bo Zhong, Jian Wang, China Academy of Engineering Physics (China). [11189-28]

WEDNESDAY 23 OCTOBER

SESSION 7

LOCATION: CONV. CTR. ROOM 102B WED 8:30 TO 10:10

Optical Metrology Methods VII

Session Chairs: **Benyong Chen**, Zhejiang Sci-Tech Univ. (China);
Sen Han, Univ. of Shanghai for Science and Technology (China)

8:30: **High accurate three-dimensional shape measurement of discontinuous specular surfaces by combining DPMD with stereo deflectometry** (*Invited Paper*), Yumin Wang, Zonghua Zhang, Nan Gao, Zhaozong Meng, Hebei Univ. of Technology (China). [11189-29]

9:00: **Optical design of a virtual reality optical system**, Junliu Fan, Quanying Wu, Baohua Chen, Suzhou Univ. of Science and Technology (China). [11189-30]

9:20: **Optical metrology for the morphological characterisation of surfaces: limitations, innovations, registration, and new directions** (*Invited Paper*), John W. McBride, Univ. of Southampton (United Kingdom); Kevin J. Cross, TaiCaan Technologies Ltd. (United Kingdom). [11189-31]

9:50: **A novel method for the wavefront measurement of image grating in scanning beam interference lithography**, Chunlong Wei, Chinese Academy of Sciences (China). [11189-32]

Tea/Coffee Break Wed 10:10 to 10:40

SESSION 8

LOCATION: CONV. CTR. ROOM 102B WED 10:40 TO 12:10

Optical Metrology Applications I

Session Chairs: **Song Zhang**, Purdue Univ. (United States);
Zonghua Zhang, Hebei Univ. of Technology (China)

10:40: **Phase-shifting interference microscopy for high-precision measurement of small phase objects** (*Invited Paper*), Jun Chen, Mitsunori Toyoda, Tokyo Polytechnic Univ. (Japan); Junji Endo, FK Optics Lab. (Japan). [11189-33]

11:10: **Optical freeform surface manufacturing of progressive addition lens based on slow tool servo**, Baohua Chen, Quanying Wu, Junliu Fan, Suzhou Univ. of Science and Technology (China). [11189-34]

11:30: **Single-frame phase extraction in fringe projection technique based on Lissajous ellipse fitting method and Gabor filter bank**, Jinjin Zhu, Yuxiang Wu, Xiaojian Cai, Xiaopeng Shao, Xidian Univ. (China). [11189-35]

11:50: **A new method for fringe order error correction in fringe projection profilometry**, Yiwei Zhang, Chengpu Duan, Jiangtao Xi, Jun Tong, Yanguang Yu, Qinghua Guo, Univ. of Wollongong (Australia). [11189-40]

Lunch Break Wed 12:10 to 13:30

SESSION 9

LOCATION: CONV. CTR. ROOM 102B WED 13:30 TO 15:30

Optical Metrology Applications II

Session Chairs: **John W. McBride**,
Optoelectronics Research Ctr. (United Kingdom);
Chao Zuo, Nanjing Univ. of Science and Technology (China)

13:30: **High-speed 3D measurements at 20,000Hz with deep convolutional neural networks** (*Invited Paper*), Shijie Feng, Nanjing Univ. of Science and Technology (China). [11189-37]

14:00: **Fringe projection profilometry for the 3D shape measurement of dynamic objects**, Chengpu Duan, Yiwei Zhang, Jiangtao Xi, Jun Tong, Yanguang Yu, Qinghua Guo, Univ. of Wollongong (Australia). [11189-38]

14:20: **Optical cryptosystem with complementary masks: simulation and experiment** (*Invited Paper*), Wenqing Sun, Haiping Zhang, Qiliang Teng, Jun Wang, Quanying Wu, Suzhou Univ. of Science and Technology (China). [11189-39]

14:50: **Experiment study on defect detection method of spherical surface**, Chengrui Li, Institute of Optics and Electronics (China). [11189-41]

15:10: **Prediction of the angle of rotation to be caused by optical rotation phenomenon in optical active materials and observation of resultant changes in visible colors of transmitting light beams**, Seika Tokumitsu, Makoto Hasegawa, Chitose Institute of Science and Technology (Japan). [11189-42]

CONFERENCE 11190

LOCATION: MULTI-FUNCTION HALL C

Monday–Wednesday 21–23 October 2019 • Proceedings of SPIE Vol. 11190

Optics in Health Care and Biomedical Optics IX

Conference Chairs: **Qingming Luo**, Hainan Univ. (China); **Xingde Li**, Johns Hopkins Univ. (United States); **Ying Gu**, Chinese PLA General Hospital (China); **Yuguo Tang**, Suzhou Institute of Biomedical Engineering and Technology (China)

Conference Co-Chair: **Dan Zhu**, Huazhong Univ. of Science and Technology (China)

Program Committee: **Jing Bai**, Tsinghua Univ. (China); **Stephen A. Boppart**, Univ. of Illinois (United States); **Shih-Chi Chen**, The Chinese Univ. of Hong Kong (Hong Kong, China); **Wei R. Chen**, Univ. of Central Oklahoma (United States); **Yu Chen**, Univ. of Maryland, College Park (United States); **Linhong Deng**, Chongqing Univ. (China); **Zhihua Ding**, Zhejiang Univ. (China); **Qiyong Gong**, West China Hospital (China); **Hui Li**, Fujian Normal Univ. (China); **Hong Liu**, The Univ. of Oklahoma (United States); **Huafeng Liu**, Zhejiang Univ. (China); **Hui Ma**, Tsinghua Univ. (China); **Yingtian Pan**, Stony Brook Univ. (United States); **Paras N. Prasad**, Univ. at Buffalo (United States); **Jun Qian**, Zhejiang Univ. (China); **Yuwen Qin**, National Natural Science Foundation (China); **Junle Qu**, Shenzhen Univ. (China); **Kebin Shi**, Peking Univ. (China); **Ke Si**, Zhejiang Univ. (China); **Jie Tian**, Institute of Automation (China); **Valery V. Tuchin**, Saratov State Univ. (Russian Federation); **Lihong V. Wang**, California Institute of Technology (United States), Washington Univ. in St Louis (United States); **Ruikang K. Wang**, Univ. of Washington (United States); **Xueding Wang**, Univ. of Michigan (United States); **Xunbin Wei**, Shanghai Jiao Tong Univ. (China); **Xujie Xia**, Shanghai Jiao Tong Univ. (China); **Da Xing**, South China Normal Univ. (China); **Kexin Xu**, Tianjin Univ. (China); **Xibin Yang**, Suzhou Institute of Biomedical Engineering and Technology (China); **Yudong Zhang**, Institute of Optics and Electronics (China); **Zhenxi Zhang**, Xi'an Jiaotong Univ. (China)

MONDAY 21 OCTOBER

OPENING CEREMONY AND PLENARY SESSION

LOCATION: PRESS CONFERENCE ROOM 9:00 TO 12:00

9:00: **Opening Ceremony**

9:20: **Awards and Recognition**

9:30: **Ultra-high peak power lasers: 10PW and beyond** (Plenary), **Ruxin Li**, Shanghai Institute of Optics and Fine Mechanics, Chinese Academy of Sciences (China)

Tea/Coffee Break Mon 10:10 to 10:40

10:40: **Multispectral optoacoustic tomography: a paradigm shift in biomedical research and clinical diagnostics** (Plenary) **Daniel Razansky**, Univ. of Zurich (Switzerland) and ETH Zurich (Switzerland)

11:20: **Nanomaterials and light for sustainability and societal impact** (Plenary) **Naomi J. Halas**, Rice Univ. (United States)

See details pages 8–9

Lunch Break Mon 12:00 to 13:30

SESSION 1

LOCATION: MULTI-FUNCTION HALL C MON 13:30 TO 15:00

Translational Optical Techniques for Clinical Medicine I

Session Chair: **Ying Gu**, Chinese PLA General Hospital (China)

13:30: **Multi-scale two-photon polymerization for organs-on-chips** (Invited Paper), **Zhongze Gu**, Southeast Univ. (China) [11190-1]

14:00: **SpectroChip IoT Edge with HealthCare Intelligent Cloud applications**, **Cheng-Hao Ko**, National Taiwan Univ. of Science and Technology (Taiwan, China); **ChiTsung Hong**, SpectroChip/Zetta Chip Inc. (Taiwan, China); **Wei-Huai Chiu**, SpectroChip/ZettaChip Inc. (Taiwan, China) [11190-2]

14:15: **Reconfigurable hydrogels with self-reporting properties**, **Sen Li**, Southeast Univ. (China) [11190-3]

14:30: **Ratiometric autofluorescence imaging system standardization and application for head and neck cancer**, **Peter Pellionisz**, **Yong Hu**, **Maie St. John**, Univ. of California, Los Angeles (United States) [11190-4]

14:45: **Classification of atherosclerotic plaques in intravascular optical coherence tomography images**, **Dongyao Bian**, **Yanmei Liang**, **Nankai Univ.** (China) [11190-5]

Tea/Coffee Break Mon 15:00 to 15:30

SESSION 2

LOCATION: MULTI-FUNCTION HALL C MON 15:30 TO 17:30

Translational Optical Techniques for Clinical Medicine II

Session Chair: **Xingde Li**, Johns Hopkins Univ. (United States)

15:30: **Research on automatic identification based on IVOCT images of coronary plaque** (Invited Paper), **Qin Li Sr.**, **Hao Sun**, **Jingbo Wang**, **Na Qin**, **Beijing Institute of Technology** (China) [11190-6]

16:00: **Logitudinal growth and progression studies of in-vivo mouse brain Glioblastoma (GBM) tumor microvasculature using OCT**, **Mounika Rapolu**, **Institute of Physical Chemistry PAS** (Poland); **Hubert Dolezyczek**, **Nencki Institute of Experimental Biology PAS** (Poland); **Paulina Niedzwiedziuk**, **Karol Karnowski**, **Dawid Borycki**, **Institute of Physical Chemistry PAS** (Poland); **Monika Malinowska**, **Grzegorz Wilczynski**, **Nencki Institute of Experimental Biology PAS** (Poland); **Maciej Wojtkowski**, **Institute of Physical Chemistry PAS** (Poland) [11190-8]

16:15: **ID-OCTA: SNR-adaptive OCT angiography enabled by statistical characterization of intensity and decorrelation with multi-variate time series model**, **Peng Li**, **Zhejiang Univ.** (China) [11190-9]

16:30: **Full-field OCT for in vivo high-resolution imaging of human eye**, **Peng Xiao**, **Zhongshan Ophthalmic Ctr.**, **Sun Yat-sen Univ.** (China); **Viacheslav Mazlin**, **Pedro Mecê**, **Mathias Fink**, **A. Claude Boccara**, **Institut Langevin Ondes et Images** (France); **Jin Yuan**, **Zhongshan Ophthalmic Ctr.**, **Sun Yat-sen Univ.** (China) [11190-10]

16:45: **Three-dimensional photoacoustic breast imaging via scanning the handheld linear probe helps the quantitative analysis for clinical diagnosis**, **Tao Han**, **Changhui Li**, **Peking Univ.** (China) [11190-11]

17:00: **Discovery of luminescence of materials during radiation irradiation lower energy than the Cerenkov-light threshold and application for medical physics**, **Seiichi Yamamoto**, **Nagoya Univ. School of Medicine** (Japan) [11190-12]

17:15: **Combining deep learning and label-free coherent anti-stokes Raman scattering (CARS) imaging for real-time automated tissue identification and disease diagnosis**, **Stephen T.C. Wong**, **Jiasong Li**, **The Methodist Hospital Research Institute** (United States); **Jun Liu**, **Shanghai General Hospital** (China) and **Shanghai Jiao Tong Univ.** (China); **Ye Wang**, **Yunjie He**, **Steven Shen**, **The Methodist Hospital Research Institute** (United States) [11190-13]

CONFERENCE 11190

TUESDAY 22 OCTOBER

SESSION 3

LOCATION: MULTI-FUNCTION HALL C TUE 8:45 TO 10:00

Nanobiophotonics and Sensors

Session Chair: **Qingming Luo**, Hainan Univ. (China)

8:45: **A telomerase-responsive DNA icosahedron for precise delivery of platinum nanodrugs to cisplatin-resistant cancer** (*Invited Paper*), Yi Ma, Yueqing Gu, China Pharmaceutical Univ. (China) [11190-14]

9:15: **Mitochondrial biomarkers identification/detection/regulation**, Lin Li, Wei Huang, Northwestern Polytechnical Univ. (China) [11190-15]

9:30: **Multiplexing of distributed temperature sensing achieved by nanoparticle-doped fibers**, Aizhan Issatayeva, Aidana Beisenova, Sultan Sovetov, Nazarbayev Univ. (Kazakhstan); Sanzhar Korganbayev, National Lab. Astana (Kazakhstan); Madina Jelbuldina, Zhannat Ashikbayeva, Nazarbayev Univ. (Kazakhstan); Wilfried Blanc, Univ. Côte d'Azur (France); Emiliano Schena, Univ. Campus Bio-Medico (Italy); Salvador Sales, Univ. Politècnica de València (Spain); Carlo Molardi, Daniele Tosi, Nazarbayev Univ. (Kazakhstan) . [11190-16]

9:45: **Development of robust fiber laser source based on parametric frequency conversion for use in CARS microscopy**, Ekaterina Evmenova, Institute of Automation and Electrometry (Russian Federation); Aleksandr Antropov, Institute of Automation and Electrometry (Russian Federation); Denis S. Kharenko, Institute of Automation and Electrometry (Russian Federation) and Novosibirsk State Univ. (Russian Federation); Alexey Kuznetsov, Institute of Automation and Electrometry (Russian Federation); Sergey Kablukov, Institute of Automation and Electrometry (Russian Federation); Sergey Babin, Institute of Automation and Electrometry (Russian Federation) and Novosibirsk State Univ. (Russian Federation) [11190-17]

Tea/Coffee Break Tue 10:00 to 10:30

SESSION 4

LOCATION: MULTI-FUNCTION HALL C TUE 10:30 TO 12:00

Biomedical Spectroscopy

Session Chair: **Zhongze Gu**, Southeast Univ. (China)

10:30: **Label-free imaging of lymph nodes with stimulated Raman scattering microscopy**, Yuanzhen Suo, Peking Univ. (China); Wenlong Yang, Fake Lu, Harvard Univ. (United States); Xiaoliang S. Xie, Peking Univ. (China) and Harvard Univ. (United States) [11190-18]

10:45: **Single human platelet study using surface-enhanced Raman spectroscopy as a perspective tool for antiplatelet therapy effectiveness prediction**, Andrey Y. Zyubin, Vladimir Rafalskiy, Karina Matveeva, Ekaterina Moiseeva, Viktoria Kolosova, Vladimir Misuk, Alina Tsapkova, Iliia Samusev, Immanuel Kant Baltic Federal Univ. (Russian Federation) [11190-19]

11:00: **Ultrasensitive quantification of biomarkers with SERS nanotags**, Xiangwei Zhao, Southeast Univ. (China) [11190-20]

11:15: **Assessing changes of cellular metabolism and collagen fiber organization in cervical tissues during pregnancy by label-free non-invasive imaging**, Zhiyi Liu, Zhihua Ding, Zhejiang Univ. (China) [11190-21]

11:30: **Surface-enhanced Raman spectroscopy of degranulation response to C48/80 in mast cells**, Mengmeng Zheng, Siqi Gao, Fujian Normal Univ. (China); Yun Yu, Fujian Univ. of Traditional Chinese Medicine (China); Shusen Xie, Juqiang Lin, Fujian Normal Univ. (China) [11190-22]

11:45: **Deep-learning-based programmable hyperspectral microscopy for optical staining**, Jiao Lu, Shanshan Zhu, Northeastern Univ. (China); Wen-Bin Xu, Beijing Institute of Environmental Features (China); Xiaoyu Cui, Shuo Chen, Northeastern Univ. (China); Yu-Dong Yao, Northeastern Univ. (China) and Stevens Institute of Technology (United States) [11190-23]

Lunch Break Tue 12:00 to 13:30

TUESDAY POSTER SESSION

LOCATION: FIRST FLOOR LOBBY TUE 13:00 TO 14:30

Conference attendees are invited to attend the poster session on Tuesday afternoon. Come view the posters, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster session.

Poster Setup: Tuesday 10:00 to 13:00

View poster presentation guidelines and set-up instructions at <http://spie.org/PAPosterGuidelines>

Clinical research on catheter-based intracoronary optical coherence tomography system, Kuiyuan Tao, Tianjin Univ. (China) [11190-59]

Effect of photobiomodulation at 660 nm on fibroblast cell survival in relation to diabetic wound healing, Sandy Jere, Univ. of Johannesburg (South Africa) [11190-60]

Numerical simulation for treatment of cancer by using laser beam, Samia F. Salem, Valery Tuchin, Saratov State Univ. (Russian Federation) ... [11190-61]

Computer-aided classification system for early endometrial cancer of co-registered photoacoustic and ultrasonic signals, Yongping Lin, Xiamen Univ. of Technology (China); Haiyang Song, Zhifang Li, Jianyong Cai, Hui Li, Fujian Normal Univ. (China) [11190-63]

Fluorescence spectroscopy study of protoporphyrin IX in tissue-like phantoms, Huihui Lu, Francesco Floris, Marc Rensing, Stefan Andersson-Engels, Tyndall National Institute (Ireland) [11190-64]

Automatic detection of leukemia cells by 2D light scattering microfluidic cytometry and deep learning, Jing Sun, Lan Wang, Qiao Liu, Xuantao Su, Shandong Univ. (China) [11190-65]

A cost-effective time-gated fluorescence imaging system and its bioimaging applications, Wenzhao Yang, Sung-Liang Chen, Chang-Ching Tu, Lili Jing, Prateek Kumar Srivastava, Shanshan Han, Shanghai Jiao Tong Univ. (China) [11190-66]

High-speed intravascular photoacoustic imaging with blood flushing, Chengyou Shu, Zhihua Xie, Xiaojing Gong, Liang Song, Shenzhen Institutes of Advanced Technology (China) [11190-68]

Model-based back-projection method in photoacoustic tomography for improved tangential resolution, Xiaofei Luo, Jiaying Xiao, Bo Wang, Kuan Peng, Central South Univ. (China) [11190-69]

Continuous infrared light inactivates sodium channel by increased membrane potential, Fanyi Kong, Dalian Univ. of Technology (China) [11190-70]

Wide field and dynamic observations on live cell using compact digital holographic microscopic system, Xi Zhang, Cheng Liu, Jiangnan Univ. (China) [11190-71]

Study on polarization distribution characteristics of polarized light in scattering media, Guang Han, Fang Liu, Ye Tian, Huiquan Wang, Jinhai Wang, Tianjin Polytechnic Univ. (China) [11190-72]

Photodynamic therapy of precancerous and oncological diseases of the cervix, vulva, and vagina, Violeta Purtskhvanidze, Dzhan Rostomyan, MCHT LaserVita (Russian Federation) [11190-73]

Hydrogel microactuators by two-photon polymerization, Haibo Ding, Keliang Liu, Zhongze Gu, Southeast Univ. (China) [11190-74]

Determination of photoacoustic glucose characteristic wavelengths based on synergy interval partial least square algorithm, Zhong Ren, Guodong Liu, Jiangxi Science and Technology Normal Univ. (China) . [11190-75]

A photoacoustic whole-breast three-dimensional imaging prototype: initial results, Guangjie Zhang, Changhui Li, Peking Univ. (China) . . [11190-76]

Label-free discrimination of hepatoma cells based on Raman spectroscopy and multivariate statistical algorithms, Siqi Gao, Mengmeng Zheng, Fujian Normal Univ. (China); Yun Yu, Fujian Univ. of Traditional Chinese Medicine (China); Shusen Xie, Juqiang Lin, Fujian Normal Univ. (China) [11190-77]

Calibration method of spectral domain OCT system based on characteristic wavelength of light source, Hui Li, Pinghe Wang, Univ. of Electronic Science and Technology of China (China) [11190-78]

Swept source polarization-sensitive OCT with fiber-based polarization-diversity detection unit, Yutong Wu, Heping Li, Pinghe Wang, Univ. of Electronic Science and Technology of China (China) [11190-79]

Reactive oxygen species-responsive nanotheranostics for orthotopic hepatocellular carcinoma targeted therapy and NIR/PA imaging, Xiaoxiao Shi, Xiamen Univ. (China) [11190-80]

DDeep3M: Docker powered deep learning for image segmentation of microscopy and MOST, Xinglong Wu, Wuhan Textile Univ. (China); Shangbin Chen, Huazhong Univ. of Science and Technology (China); Jing Huang, Jing Huang, Wuhan Textile Univ. (China) [11190-81]

Design of a multilayer compound eye for multispectral imaging, Jianwei Chen, Britton Chance Ctr. for Biomedical Photonics, Huazhong Univ. of Science and Technology (China) and MoE Key Lab. for Biomedical Photonics, Huazhong Univ. of Science and Technology (China) and HUST-Suzhou Institute for Brainmatics, JITRI Institute for Brainmatics (China); Shih-Chi Chen, The Chinese Univ. of Hong Kong (China) [11190-82]

Label-free light scattering microfluidic cytometer using parallel dual-channel 3D hydrodynamic focusing, Shuyu Zhang, Meilai Lin, Xuantao Su, Shandong Univ. (China) [11190-83]

Determination of cancer cells by secretagogues based on fluorescence resonance energy transfer, Jianshu Xu, Shuzhen Tang, Shusen Xie, Juqiang Lin, Fujian Normal Univ. (China) [11190-84]

Daily fluctuation of circulating tumor cells monitored by in vivo flow cytometry, Xi Zhu, Nan Ding, Shanghai Jiao Tong Univ. (China); Yuanzhen Suo, Peking Univ. (China); Xunbin Wei, Shanghai Jiao Tong Univ. (China) .. [11190-85]

Mathematical simulation of the spatial and temporal distribution of singlet oxygen in vascular targeted photodynamic therapy for port wine stain, LinXin Li, Lina Liu, Fujian Normal Univ. (China); Ying Wang, Chinese PLA General Hospital (China); Ying Gu, Chinese PLA General Hospital (China); Buhong Li, Fujian Normal Univ. (China) [11190-86]

On-site multivariate monitoring and control technology of hidden high-risk factors in aerosol and ballast water, Tengbiao Song, Shi Yan, Hongyao Liang, Haibing Niu, Lei Ning, Yang Yang, China Jiliang Univ. (China) . [11190-87]

Non-invasive 3D real-time observation of physiological traits during the embryonic development of insects using OCT, Hao Tan, Ya Su, Liya Wei, X. Steve Yao, Tongtong Mai, Xu Li, Hebei Univ. (China) [11190-88]

Photoacoustic signal classification for in vivo photoacoustic flow cytometry based on support vector machine, Yuting Fu, Med-X Research Institute, Shanghai Jiao Tong Univ. (China); Quanyu Zhou, Qi Liu, Lechan Tao, Xunbin Wei, Shanghai Jiao Tong Univ. (China) [11190-89]

High-resolution optical coherence elastography of anterior segment with a flexible pressure sensor, Jie Zhu, Jianhua Mo, Jianing Dai, Xiwen Wang, Qian Wu, Soochow Univ. (China) [11190-90]

Processing of infrared thermogram of ankle soft tissue injury with LDA based on DCT transform, Shuwang Chen, Chengwei Zhao, Shengbiao An, Hebei Univ. of Science and Technology (China) [11190-91]

Graphene-oxide-based FRET probe for mast cell degranulation, Shuzhen Tang, Jianshu Xu, Yimei Huang, Shusen Xie, Juqiang Lin, Fujian Normal Univ. (China) [11190-92]

Super-resolution ultrasound imaging implemented by SOFI in radio-frequency domain, Huan Kong, Xin Liu, Ying Liu, Yuexia Shu, Shanghai Univ. (China) [11190-93]

In vitro study of myocardial fiber structure imaging by optical coherence tomography, Dezi Li, Wang Liu, Zhifang Li, Fujian Normal Univ. (China) [11190-94]

Super-resolution x-ray luminescence optical tomography imaging, XueLi Tang, Mengyang Lu, Xin Liu, Shanghai Univ. (China) [11190-95]

Identification of macrophages in breast tumor microenvironment using label-free multiphoton microscopy, Gangqin Xi, Wenjiao Ren, Jiajia He, Lianhuang Li, Liqin Zheng, Fujian Normal Univ. (China); Deyong Kang, Wenhui Guo, Fujian Medical Univ. (China); Jianxin Chen, Fujian Normal Univ. (China) [11190-96]

Multiphoton imaging of normal breast lobules, pleomorphic invasive lobular carcinoma, and classic invasive lobular carcinoma, Jiajia He, Tingfeng Shen, Fujian Normal Univ. (China); Deyong Kang, Fujian Medical Univ. (China); Gangqin Xi, Wenjiao Ren, Zhong Chen, Jianxin Chen, Fujian Normal Univ. (China) [11190-97]

Combined hyperspectral imaging and optical coherence tomography for discriminating benign melanoma, Jianing Dai, Jie Zhu, Xiwen Wang, Qian Wu, Xinhua Chen, Jianhua Mo, Soochow Univ. (China) [11190-98]

Identification of perineural invasion in breast cancer by multiphoton microscopy, Wenjiao Ren, Fujian Normal Univ. (China); Wenhui Guo, Deyong Kang, Chuan Wang, Fujian Medical Univ. (China); Jianxin Chen, Lianhuang Li, Fujian Normal Univ. (China) [11190-99]

Space-time adaptive precision imaging, Hua Liu, Science and Technology on Electro-optic Control Lab. (China) [11190-100]

Spectromics: a spectroscopic method for fast and label-free genotype screening, Shuo Chen, Shanshan Zhu, Xiaoyu Cui, Northeastern Univ. (China); Wei Qian, The Univ. of Texas at El Paso (United States); Fengdi Zhang, Jiao Lu, Han Gao, Northeastern Univ. (China) [11190-101]

In vivo noninvasive photoacoustic imaging of atherosclerosis inflammation in mouse carotid artery, Zhihua Xie, Chengyou Shu, Xiaojing Gong, Liang Song, Shenzhen Institutes of Advanced Technology (China) [11190-102]

Identification and assessment of pulmonary cryptococcus neoformans infection by serum surface-enhanced Raman spectroscopy, Shuo Chen, Hao Lin, Jiaming Chen, He Zhang, Qinke Zhang, Zihui Fan, Northeastern Univ. (China) [11190-103]

Application of fluorescence lifetime imaging in skin cancer diagnosis, Lixin Liu, Qianqian Yang, Meiling Zhang, Zhaoqing Wu, Xidian Univ. (China); Ping Xue, Tsinghua Univ. (China) [11190-104]

The possibility of optical coherence tomography angiography to monitor the murine tumor vessels changes for photodynamic therapy, YiDi Liu, Ying Gu, Haixia Qiu, Chinese PLA General Hospital (China) [11190-105]

Effects of absorption and scattering coefficients on singlet oxygen luminescence in skin phantom based on optical fiber detection, Ying Hu, Lisheng Lin, Lina Liu, Xianglian Liao, Buhong Li, Fujian Normal Univ. (China) [11190-106]

Cervical cytopathology image super-resolution improved by deep-learning-based image registration, Hongtao Kang, Tingwei Quan, Shaoqun Zeng, Huazhong Univ. of Science and Technology (China) [11190-107]

Characterization of human coronary atherosclerosis using spectrum- and time-resolved multiphoton microscopy, Rongli Zhang, Research Lab. for Biomedical Optics and Molecular Imaging, Shenzhen Institutes of Advanced Technology (China); Yueheng Wu, Guangdong General Hospital (China); Hui Li, Jia Yu, Shenzhen Institutes of Advanced Technology (China); Junhai Hao, Guangdong Provincial People's Hospital (China); Shangmin Liu, Zhanyi Lin, Guangdong Academy of Medical Sciences (China); Wei Zheng, Shenzhen Institutes of Advanced Technology (China) [11190-108]

Dual-color three-dimension super-resolution system based on fluorescence emission difference microscopy, Zhang Zhimin, Dong Wanjie, Xu Liang, Cuifang Kuang, Hao Xiang, Liu Xu, Zhejiang Univ. (China) . [11190-109]

A 3D neuron population reconstruction editing tool at brain-wide scale, Hang Zhou, Tingwei Quan, Shiwei Li, Shaoqun Zeng, Wuhan National Lab. for Optoelectronics (China) [11190-110]

Research on ischemia-reperfusion injury of rat kidney using optical coherence tomography, Yuhong Fang, Wei Gong, Zheng Huang, Liqin Zheng, Deyuan Yang, Shusen Xie, Fujian Normal Univ. (China) [11190-111]

Analysis and calibration of linear birefringence orientation parameter derived from Mueller matrix for multi-layered media, Weipeng Li, Honghui He, Tao Sun, Hui Ma, Tsinghua Univ. (China) [11190-112]

Weak neurites segmentation using deep learning for neuron reconstruction, Tingwei Quan, Qing Huang, Yijun Chen, Cheng Xu, Anan Li, Hui Gong, Wuhan National Lab. for Optoelectronics (China); Qingming Luo, Hainan Univ. (China); Shaoqun Zeng, Wuhan National Lab. for Optoelectronics (China) [11190-114]

Detection of human oral-maxillofacial tumor infiltration based on optical coherence tomography images, Zihan Yang, Yanmei Liang, Nankai Univ. (China) [11190-115]

FLIM applications in monitoring PTT process of novel 2D nanomaterials, Yufeng Yuan, Yiwang Song, Zheng Peng, Kaixuan Nie, Xiao Peng, Jun Song, Junle Qu, Shenzhen Univ. (China) [11190-116]

DDeep3M-based neuronal cell counting in 2D large-scale images, Xianghan Kong, Shuai Yan, Enze A. Zhou, Huazhong Univ. of Science and Technology (China); Jin A. Huang, Xinglong Wu, Wuhan Textile Univ. (China); Ping Wang, Shangbin Chen, Huazhong Univ. of Science and Technology (China) [11190-117]

Finite element modeling of mechanical properties of cancer cells, Jiangbing Mao, Weiwei Ruan, Aisi Shi, Hongqin Yang, Fujian Normal Univ. (China) [11190-118]

Nd³⁺/Yb³⁺-doped fluoride nanoparticles for luminescence thermometry of dental adhesives, Artem Yakovliev, Roman Ziniuk, Shenzhen Univ. (China); Anderson Gomes, Univ. Federal de Pernambuco (Brazil); Xin Wang, Guanying Chen, Harbin Institute of Technology (China); Junle Qu, Tymish Y. Ohulchanskyy, Shenzhen Univ. (China) [11190-119]

LED device effectively increases serum levels of 25(OH)D3 in osteoporosis rats, Yunqi Li, Chinese PLA General Hospital (China) [11190-120]

High-resolution femtosecond laser beam shaping via digital holography, Qinglei Hu, Yiming Guo, Yu Wang, Xiaohua Lv, Shaoqun Zeng, Huazhong Univ. of Science and Technology (China) [11190-121]

Laser speckle correlation imaging with optical clearance for blood flows, Jing Hou, Lipeng Song, Nankai Univ. (China) [11190-122]

Tracking of intracellular doxorubicin-Cu complexes with FLIM technique, Kaixuan Nie, Zheng Peng, Yiwang Song, Yufeng Yuan, Chi Liu, Xiao Peng, Jun Song, Junle Qu, Shenzhen Univ. (China) [11190-123]

Compressed sensing with a novel sparse-sampled camera for spectral domain optical coherence tomography, Jui-Cheng Hsieh, Wencho Liao, Tsinghua Univ. (China); Chengming Wang, Nuctech Co. Ltd. (China); Wenxin Zhang, Shengnan Ai, Zhangkai Peng, Zhengyu Chen, Bin He, Tsinghua Univ. (China); Xiao Zhang, Beijing Institute of Technology (China); Ning Zhang, Institute of Forensic Science, Ministry of Public Security (China); Bihua Tang, Southwest Medical Univ. (China); Ping Xue, Tsinghua Univ. (China) . [11190-124]

Evaluation of antioxidant activity and protective effect on ulcerative colitis of er huang pill, Jianping Deng, Guangdong Pharmaceutical Univ. (China); Tong-Sheng Chen, South China Normal Univ. (China); Yi-Fei Wang, Jinan Univ. (China); Zhi-Ping Wang, Guangdong Pharmaceutical Univ. (China) [11190-125]

CONFERENCE 11190

Evaluation of antioxidant activity and protective effect on ulcerative colitis of bai tou weng pill, Jintao Huang, Guangdong Pharmaceutical Univ. (China); Tong-Sheng Chen, South China Normal Univ. (China); Yi-Fei Wang, Jinan Univ. (China); Zhi-Ping Wang, Guangdong Pharmaceutical Univ. (China) [11190-126]

Evaluation of antioxidant activity and protective effect on ulcerative colitis of xiang ai pill, Kang Du, Guangdong Pharmaceutical Univ. (China); Tong-Sheng Chen, South China Normal Univ. (China); Yi-Fei Wang, Jinan Univ. (China); Zhi-Ping Wang, Guangdong Pharmaceutical Univ. (China) . . [11190-127]

Evaluation of antioxidant activity and protective effect on ulcerative colitis of pi pa qing fei decoction, Lian Yang, Guangdong Pharmaceutical Univ. (China); Tong-Sheng Chen, South China Normal Univ. (China); Yi-Fei Wang, Jinan Univ. (China); Zhi-Ping Wang, Guangdong Pharmaceutical Univ. (China) [11190-128]

Evaluation of antioxidant activity and protective effect on ulcerative colitis of qing xin lian zi decoction, Bairong Su, Guangdong Pharmaceutical Univ. (China); Tong-Sheng Chen, South China Normal Univ. (China); Yi-Fei Wang, Jinan Univ. (China); Zhi-Ping Wang, Guangdong Pharmaceutical Univ. (China) [11190-129]

A fast reconstruction method for super-resolution localization microscopy with gOMP, Ma Hehe, Yuxia Shu, Xin Liu, Shanghai Univ. (China) [11190-130]

Characteristic tumor vessel based on speckle variance optical coherence tomography, Shulian Wu, Jiatian Li, Fujian Normal Univ. (China) . . . [11190-131]

Near-infrared (NIR) diffuse correlation spectroscopy (DCS) for the measurement of blood-flow based on medical image analysis, Xin Bai, Yu Shang, North Univ. of China (China) [11190-132]

Polarization distribution characteristics of polarized light in scattering media, Guang Han, Fang Liu, Ye Tian, Huiquan Wang, Jinhai Wang, Tianjin Polytechnic Univ. (China) [11190-133]

SESSION 5

LOCATION: MULTI-FUNCTION HALL C TUE 14:30 TO 18:10

Advanced Optical Imaging Techniques

Session Chairs: **Hui Ma**, Graduate School at Shenzhen, Tsinghua Univ. (China); **Wei Gong**, Fujian Normal Univ. (China)

14:30: **Ultrafast optical clearing method for three-dimensional imaging with cellular resolution** (*Invited Paper*), Wei Gong, Zhejiang Univ. (China) [11190-24]

15:00: **FDISCO: Advanced solvent-based clearing method for imaging whole organs and applications** (*Invited Paper*), Dan Zhu, Huazhong Univ. of Science and Technology (China) [11190-25]

15:30: **Imaging depth extension of OCT by optical clearing method in vitro rabbit eye**, Ruiming Kong, Wenjuan Wu, Hongwei Zhao, Rui Qiu, Shanghai Institute of Technology (China); Guoqiang Li, The Ohio State Univ. (United States); Ailin Liu, Fudan Univ. (China); Xinmin Lu, Shanghai Sixth People's Hospital (China); Cuixia Dai, Shanghai Institute of Technology (China) [11190-26]

15:45: **Deep-tissue focusing through scattering medium based on adaptive optics**, Ke Si, Zhejiang Univ. (China) [11190-27]

16:00: **Super-resolution mosaic imaging of hundreds of cells**, Luchang Li, Bo Xin, Mingtao Shang, Zhen-Li Huang, Wuhan National Lab. for Optoelectronics (China) [11190-28]

Tea/Coffee Break Tue 16:15 to 16:25

16:25: **3D super-resolution localization microscopy using deep-learning method**, Mengyang Lu, Xin Liu, Tianyang Zhou, Shanghai Univ. (China) [11190-29]

16:40: **Speckle noise reduction in OCT imaging with supercontinuum pumped by noise-like pulse laser**, Shengnan Ai, Tsinghua Univ. (China); Chengming Wang, Nuctech Co. Ltd. (China) and Tsinghua Univ. (China); Yi-Jing You, National Tsing Hua Univ. (Taiwan, China); Wenxin Zhang, Wenchao Liao, Tsinghua Univ. (China); Xiao Zhang, Beijing Univ. of Technology (China); Juicheng Hsieh, Tsinghua Univ. (China); Ning Zhang, Ministry of Public Security (China); Bihua Tang, Southwest Medical Univ. (China); Ci-Ling Pan, National Tsing Hua Univ. (Taiwan, China); Ping Xue, Tsinghua Univ. (China) . . . [11190-30]

16:55: **Beam-shifting optical coherence tomography for speckle reduction and flow-rate measurement**, Chaoliang Chen, Weisong Shi, Jamil Jivraj, Ryerson Univ. (Canada); Yuta Dobashi, Univ. of Toronto (Canada); Wanrong Gao, Nanjing Univ. of Science and Technology (China); Victor Yang, Ryerson Univ. (Canada) [11190-31]

17:10: **Simultaneously line scanning imaging multiple axial planes with remote stepwise reflection**, Rui Jin, Britton Chance Ctr. for Biomedical Photonics, Huazhong Univ. of Science and Technology (China) and MoE Key Lab. for Biomedical Photonics, Huazhong Univ. of Science and Technology (China) and Wuhan National Lab. for Optoelectronics (China); Yalan Yu, Dan Shen, Hui Gong, Jing Yuan, Huazhong Univ. of Science and Technology (China) [11190-32]

17:25: **Fan-shaped tracker for particle trajectory reconstruction**, Yingke Xu, Luhong Jin, Fengqiang Zhao, Wannu Lin, Xiaoxu Zhou, Cuifang Kuang, Liu Xu, Zhejiang Univ. (China); Sergey Ablameyko, Belarusian State Univ. (Belarus) and National Academy of Sciences of Belarus (Belarus) [11190-33]

17:40: **Method for motion artifact compensation in dynamic optical contrast imaging**, Yong Hu, Peter Pellionisz, Maie St. John, Univ. of California, Los Angeles (United States) [11190-34]

17:55: **Spatiotemporal organization of genomic DNA during S-phase visualized by super-resolution imaging**, Svitlana M. Levchenko, Wei Zhang, Zhigang Yang, Junle Qu, Shenzhen Univ. (China) [11190-35]

WEDNESDAY 23 OCTOBER

SESSION 6

LOCATION: MULTI-FUNCTION HALL C WED 8:30 TO 10:15

Optical Theranostics I

Session Chair: **Dan Zhu**, Huazhong Univ. of Science and Technology (China)

8:30: **Precisely controllable photodynamic therapy** (*Invited Paper*), Buhong Li, Fujian Normal Univ. (China); Ying Gu, Chinese PLA General Hospital (China) [11190-36]

9:00: **Optical imaging technology assists photodynamic therapy in dermatology** (*Invited Paper*), Haixia Qiu, Ying Gu, Chinese PLA General Hospital (China) [11190-37]

9:30: **Two-photon excitation fluorescence lifetime imaging microscopy and spectroscopy for cancer detection**, Hui Li, Jia Yu, Rongli Zhang, Weiwang Hu, Shenzhen Institutes of Advanced Technology (China); Xi Li, Peking Univ. Shenzhen Hospital (China); Wei Zheng, Shenzhen Institutes of Advanced Technology (China) [11190-38]

9:45: **Improvement of antitumor efficacy for 5-ALA-PDT through modulating mitochondrial morphology**, Hongyou Zhao, Ying Gu, Chinese PLA General Hospital (China) [11190-39]

10:00: **Novel thiadiazolo[3,4-g]quinoxaline derivatives as efficient photosensitizers for photodynamic therapy**, Xianqiang Li, Technical Institute of Physics and Chemistry (China) and Univ. of Chinese Academy of Sciences (China); Lipeng Zhang, Yuxia Zhao, Technical Institute of Physics and Chemistry (China) [11190-40]

Tea/Coffee Break Wed 10:15 to 10:45

SESSION 7

LOCATION: MULTI-FUNCTION HALL C WED 10:45 TO 12:00

Optical Theranostics II

Session Chair: **Haixia Qiu**, Chinese PLA General Hospital (China)

10:45: **Preliminary study of sonodynamic effects of photosensitizer PpIX and YLG-1**, Jie Jiang, Jian Zou, Fujian Normal Univ. (China); Rui Ding, Zhen Han, Guilin Hui-ang Biopharmaceutical Co., Ltd. (China); Yongzeng Li, Weijun Li, Zheng Huang, Fujian Normal Univ. (China) [11190-41]

11:00: **Antimicrobial phototherapy: a new weapon against resistant pathogenic microorganisms**, Ying Wang, Ying Gu, Chinese PLA General Hospital (China) [11190-42]

11:15: **Topological photobiomodulation on tail-suspended model rats of osteoporosis**, Timon Cheng-Yi Liu, Lei Wang, Ling Zhu, Rui Duan, Guang Zhang, South China Normal Univ. (China) [11190-43]

11:30: **Optical regulation of stem-cell differentiation by femtosecond-laser photostimulation**, Wanyi Tang, Hao He, Shanghai Jiao Tong Univ. (China) [11190-44]

11:45: **LED-based portable and adjustable battery-powered light source for photodynamic therapy**, Oksana M. Chepurna, Shenzhen Univ. (China); Yulia Petrushko, SME "Fotonika Plus" (Ukraine); Anna Grebinyk, Technische Hochschule Wildau (Germany); Svitlana Prylutsk, Taras Shevchenko National Univ. of Kyiv (Ukraine); Marcus Frohme, Technische Hochschule Wildau (Germany); Junle Qu, Tymish Y. Ohulchanskyy, Shenzhen Univ. (China) [11190-45]

Lunch Break Wed 12:00 to 13:00

SESSION 8

LOCATION: MULTI-FUNCTION HALL C WED 13:30 TO 15:00

Tissue Optics/Laser-Tissue Interaction

Session Chair: **Buhong Li**, Fujian Normal Univ. (China)

- 13:30: **Decomposition of complex Mueller matrix in biomedical applications** (*Invited Paper*), Pengcheng Li, Conghui Shao, Honghui He, Hui Ma, Tsinghua Univ. (China) [11190-46]
- 14:00: **Simulation of near-infrared light propagation through the thorax of a neonate: addressing the optimisation of source and detector positions for measuring lung oxygen content in preterm infants**, Andrea Liliana Pacheco Tobo, Sanathana Konugolu, Konstantin Grygoryev, Tyndall National Institute (Ireland); Eugene Dempsey, Cork Univ. Maternity Hospital (Ireland); Stefan Andersson-Engels, Tyndall National Institute (Ireland) [11190-47]
- 14:15: **Assessing structural features of tuberculosis using Mueller matrix derived parameters: a quantitative method to distinguish between Crohn's disease and gastrointestinal luminal tuberculosis**, Binguo Chen, Tsinghua Univ. (China); Min Lu, Zhujiang Hospital of the Southern Medical Univ. (China); Teng Liu, Honghui He, Tsinghua Univ. (China); Hua Mao, Zhujiang Hospital of the Southern Medical Univ. (China); Hui Ma, Tsinghua Univ. (China) [11190-48]
- 14:30: **Mathematical modelling of photoplethysmography to obtain accurate heart rate measurements in a zero-gravity environment**, Andrew D. Wang, Ruikang Wang, Univ. of Washington (United States) [11190-49]
- 14:45: **Optical vortex diffusion in dynamic laser speckles from multiple scattering viscoelastic tissue**, Jiaxing Gong, Qi Li, Jing Wang, Huazhong Univ. of Science and Technology (China) and Shenzhen Huazhong Univ. of Science and Technology Research Institute (China). [11190-50]
- Tea/Coffee Break Wed 15:00 to 15:30

SESSION 9

LOCATION: MULTI-FUNCTION HALL C WED 15:30 TO 17:30

Multimodal Biomedical Imaging

Session Chair: **Qin Li Sr.**, Beijing Institute of Technology (China)

- 15:30: **Toward artifact-free reconstruction of photoacoustic computed tomography images**, Chuangjian Cai, Xuanhao Wang, Kexin Deng, Jianwen Luo, Cheng Ma, Tsinghua Univ. (China) [11190-51]
- 15:45: **System parameters investigation in photoacoustic tomography for optimum image quality**, Chao Tian, Kang Shen, Songde Liu, Zhiming Hu, Univ. of Science and Technology of China (China); Ting Feng, Nanjing Univ. of Science and Technology (China) [11190-52]
- 16:00: **Multi-pulse dichroism optical resolution photoacoustic microscopy**, Yingying Zhou, The Hong Kong Polytechnic Univ. (Hong Kong, China); Lidai Wang, City Univ. of Hong Kong (Hong Kong, China); Puxiang Lai, The Hong Kong Polytechnic Univ. (Hong Kong, China) [11190-53]
- 16:15: **In vivo photoacoustic/ultrasonic dual-modality endoscopic imaging of rat uterus**, Jinke Zhang, Huashan Zhao, Wen Zhu, Chaobing Chen, Riqiang Lin, Bingbing Huang, Jian Zhang, Xiaojing Gong, Shenzhen Institutes of Advanced Technology (China) [11190-54]
- 16:30: **Quantitative analysis of mesenteric venous thrombosis with large-field-of-view photoacoustic microscopy**, Wei Qin, Univ. of Electronic Science and Technology of China (China); Lei Xi, Southern Univ. of Science and Technology of China (China) [11190-55]
- 16:45: **Tracking of single-dyed droplets breaking diffraction limit of photoacoustic computed tomography**, Pengfei Zhang, Tianjin Univ. (China) [11190-56]
- 17:00: **Real-time high-resolution imaging of the lymphatic system in living mice/rats using dual-modal NIR/PA polymer dots**, Liqin Xiong, Shanghai Jiao Tong Univ. (China) [11190-57]
- 17:15: **Ultrahigh-resolution stimulation by femtosecond laser reveals existence and regulation mechanism of nuclear Ca^{2+} store**, Xiaoying Tian, Hao He, Shanghai Jiao Tong Univ. (China) [11190-58]

CONFERENCE 11191

LOCATION: CONV. CTR. ROOM 206

Monday–Tuesday 21–22 October 2019 • Proceedings of SPIE Vol. 11191

Advanced Sensor Systems and Applications IX

Conference Chairs: **Tiegen Liu**, Tianjin Univ. (China); **Gang-Ding Peng**, The Univ. of New South Wales (Australia); **Zuyuan He**, Shanghai Jiao Tong Univ. (China)

Program Committee: **Xiaoyi Bao**, Univ. of Ottawa (Canada); **Kin-Seng Chiang**, City Univ. of Hong Kong (Hong Kong, China); **Brian Culshaw**, Univ. of Strathclyde (United Kingdom); **Xudong Fan**, Univ. of Michigan (United States); **Claire Gu**, Univ. of California, Santa Cruz (United States); **Bai-Ou Guan**, Jinan Univ. (China); **Huizhu Hu**, Zhejiang Univ. (China); **Shibin Jiang**, AdValue Photonics, Inc. (United States); **Wei Jin**, Shenzhen Research Institute (China); **Rene Landgraf**, Fraunhofer-Institut für Photonische Mikrosysteme (Germany); **Deming Liu**, Huazhong Univ. of Science and Technology (China); **Niels Neumann**, TU Dresden (Germany); **Li Pei**, Beijing Jiaotong Univ. (China); **Xueguang Qiao**, Northwest Univ. (China); **Yunjiang Rao**, Univ. of Electronic Science and Technology of China (China); **Tobias Schuster**, Technische Univ. Dresden (Germany); **Anbo Wang**, Virginia Polytechnic Institute and State Univ. (United States); **Tingyun Wang**, Shanghai Univ. (China); **Hai Xiao**, Clemson Univ. (United States); **Steve Yao**, General Photonics Corp. (United States); **Paul Kit-Lai Yu**, Univ. of California, San Diego (United States); **Libo Yuan**, Harbin Engineering Univ. (China)

MONDAY 21 OCTOBER

OPENING CEREMONY AND PLENARY SESSION

LOCATION: PRESS CONFERENCE ROOM 9:00 TO 12:00

9:00: **Opening Ceremony**

9:20: **Awards and Recognition**

9:30: **Ultra-high peak power lasers: 10PW and beyond (Plenary)**,
Ruxin Li, Shanghai Institute of Optics and Fine Mechanics,
Chinese Academy of Sciences (China)

Tea/Coffee Break Mon 10:10 to 10:40

10:40: **Multispectral optoacoustic tomography: a paradigm shift
in biomedical research and clinical diagnostics (Plenary)**
Daniel Razansky, Univ. of Zurich (Switzerland) and ETH Zurich
(Switzerland)

11:20: **Nanomaterials and light for sustainability and societal
impact (Plenary)**
Naomi J. Halas, Rice Univ. (United States)

See details pages 8–9

Lunch Break Mon 12:00 to 13:30

SESSION 1

LOCATION: CONV. CTR. ROOM 206 MON 13:30 TO 15:20

Biochemical and Environmental Sensors

Session Chair: **Haiwen Cai**, Shanghai Institute of Optics and Fine
Mechanics, Chinese Academy of Sciences (China)

13:30: **Fiber-optic ultrasonic sensors for photoacoustic/ultrasound
imaging (Invited Paper)**, Long Jin, Jinan Univ. (China) [11191-1]

14:00: **Experimental study on the detection of trace H₂S and H₂O in high-
voltage combination appliances based on TDLAS technology**, Feng Tang,
Shenzhen Power Supply Co., Ltd. (China); Shun-gui Liu, Qi-shen Lv, Shenzhen
Power Supply Co., Ltd. (China); Shu-kai He, Xin-tian Li, Xiao-zhe Zeng, Henan
Relations Co. (China) [11191-3]

14:20: **Development of NO₂ differential absorption lidar technique based
on high-power laser diodes**, Liang Mei, Zheng Kong, Teng Ma, Yuan Cheng,
Dalian Univ. of Technology (China) [11191-4]

14:40: **Artificial neural network for estimating chlorophyll-a concentration
from biconical tapered-microfiber optical sensors**, Yaping Zhang,
Huaqiao Univ. (China); Xining Zhang, Fujian Key Lab. of Light Propagation and
Transformation (China); Hao Dai, Xiamen Univ. (China); Mengjie Li, Zhijun Wu,
Jixiong Pu, Fujian Key Lab. of Light Propagation and Transformation
(China) [11191-5]

15:00: **Development and performance measurement of a SpectroChip
for healthcare, food safety, and life applications**, Cheng-Hao Ko, National
Taiwan Univ. of Science and Technology (Taiwan, China); ChiTung Hong, Wei-
Huai Chiu, SpectroChip Inc. (Taiwan, China) [11191-2]

Tea/Coffee Break Mon 15:20 to 15:50

SESSION 2

LOCATION: CONV. CTR. ROOM 206 MON 15:50 TO 17:20

Distributed and Multiplexed Sensors

Session Chair: **Long Jin**, Jinan Univ. (China)

15:50: **Recent progress in distributed acoustic sensing: from 1D to 3D
(Invited Paper)**, Haiwen Cai, Shanghai Institute of Optics and Fine Mechanics,
Chinese Academy of Sciences (China) [11191-6]

16:20: **Quasi-single mode operated few-mode fiber for distributed
acoustic sensing**, Yuan Mao, Islam Ashry, Tien Khee Ng, Boon S. Ooi, King
Abdullah Univ. of Science and Technology (Saudi Arabia) [11191-7]

16:40: **High-precision FBG strain sensor for slope model monitoring**,
Hongbin Xu, Beijing Jiaotong Univ. (China); Xinyu Zheng, Shandong Univ.
(China) [11191-8]

17:00: **3D shape sensing medical needle based on the multiplexing of
optical backscattering reflectometry**, Carlo Molardi, Aizhan Issatayeva,
Aidana Beisenova, Nazarbayev Univ. (Kazakhstan); Wilfried Blanc, Univ. Côte
d'Azur (France); Daniele Tosi, Nazarbayev Univ. (Kazakhstan) [11191-9]

TUESDAY 22 OCTOBER

SESSION 3

LOCATION: CONV. CTR. ROOM 206 TUE 8:30 TO 10:20

Micro/Nanostructure Sensors I

Session Chair: **Qingwen Liu**, Shanghai Jiao Tong Univ. (China)

8:30: **Flexible fiber sensors for health monitoring (Invited Paper)**, Fei Xu,
Nanjing Univ. (China) [11191-11]

9:00: **Miniaturized fiber optic Fabry-Perot pressure measuring system
used for underwater pressure measurement**, Xiaoguang Qi, Shuang Wang,
Junfeng Jiang, Tianjin Univ. (China); Wenjuan Jia, Yachen Che, National Ocean
Technology Ctr. (China); Renyun Li, Tiegeng Liu, Tianjin Univ. (China) [11191-12]

9:20: **Temperature dependence of a refractive index sensor based on
core-offset in-line fiber Mach-Zehnder interferometer**, Bingcheng Wu,
Fangda Yu, Peng Xue, Jie Zheng, Jilin Univ. (China) [11191-13]

9:40: **Robust air-bubble modified Fabry-Perot interferometers with
photonic crystal fiber for high-temperature sensing**, Feng Gao, China
Jiliang Univ. (China) [11191-14]

10:00: **A liquid refractive index micro-nano fiber sensor based on core-
offset structure Michelson interferometer with evanescent field**, Haitao
Yan, Yanfei Li, Henan Univ. of Science and Technology (China) [11191-15]

Tea/Coffee Break Tue 10:20 to 10:50

SESSION 4

LOCATION: CONV. CTR. ROOM 206 TUE 10:50 TO 12:10

Micro/Nanostructure Sensors II

Session Chair: **Fei Xu**, Nanjing Univ. (China)

- 10:50: **A compact tactile sensor based on optical micro/nanofiber for tissue stiffness detection**, Lei Zhang, Yao Tang, Jing Pan, Zhang Zhang, Yue Xu, Limin Tong, Zhejiang Univ. (China) [11191-16]
- 11:10: **Double-core D-type photonic crystal fiber refractive index sensor based on grid coating**, Liming Fang, Heming Chen, Nanjing Univ. of Posts and Telecommunications (China) [11191-17]
- 11:30: **Photoacoustic excitation of micro asymmetrical cantilevers using optical short pulse**, Fanghao Li, ShangZhong Jin, China Jiliang Univ. (China) [11191-18]
- 11:50: **Measurement of rotation angle by response of nanostructured metasurfaces**, Ekaterina Efremova, Saint Petersburg State Univ. (Russian Federation); Egor Shalymov, Roman Shalymov, Anastasia Venediktova, Vladimir Venediktov, Saint Petersburg Electrotechnical Univ. "LETI" (Russian Federation) [11191-19]
- Lunch Break Tue 12:10 to 13:30

TUESDAY POSTER SESSION

LOCATION: FIRST FLOOR LOBBY TUE 13:00 TO 14:30

Conference attendees are invited to attend the poster session on Tuesday afternoon. Come view the posters, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster session.

Poster Setup: Tuesday 10:00 to 13:00

View poster presentation guidelines and set-up instructions at <http://spie.org/PAPosterGuidelines>

- The optimization design of a non-scanning focused surface plasmon resonance sensor**, Yatao Yang, Jiandong Hu, Liuzheng Ma, Hao Zhang, Henan Agricultural Univ. (China); Liyang Shao, Southern Univ. of Science and Technology of China (China); Dongxian Li, Henan Agricultural Univ. (China) [11191-24]
- Intensity-modulated thin-core fiber-optic sensor for vibration and strain monitoring**, Na Li, Chuanyi Tao, Chongqing Univ. of Technology (China); Jingke Li, Chongqing Medical and Pharmaceutical College (China); Junhua Cheng, Jing Zhang, Xuhai Jiang, Liming Mao, Jianjun Xiao, Chongqing Univ. of Technology (China) [11191-29]
- Single nested ring resonator and magnetic-fluid-based magnetic field sensing**, Chang Qiu Yu, Hangzhou Dianzi Univ. (China) [11191-30]
- Quintuple fano-like MIM plasmonics structure based on coupling resonators for refractive index nano-sensor**, Shilin Yu, Tonggang Zhao, Jianguo Yu, Beijing Univ. of Posts and Telecommunications (China) [11191-31]
- Experimental study of transversal-stress-induced polarization crosstalk behaviors in polarization maintaining fibers**, Zeheng Zhang, Ting Feng, Hebei Univ. (China); Zhihong Li, Suzhou Optoelectronic Technology Co., Ltd. (China); Junnan Zhou, Peng Hao, X. Steve Yao, Hebei Univ. (China) [11191-32]
- Fabrication of a helical structure on a commercial plastic optical fiber for refractive index sensing**, Jie Zheng, Peng Xue, Fudang Yu, Bingcheng Wu, Jilin Univ. (China) [11191-33]
- Quasi-distributed temperature sensor based on cascaded quantum-dot fiber**, Zixiang Zhuang, Zhigang Cao, Guosheng Zhang, Yan Wang, Anhui Univ. (China) [11191-34]
- A novel distributed fault location detection system for long-haul submarine transmission of hydrophone array using coherent optical time domain reflectometry**, Huan Zheng, Hanfeng Xu, Zhanghai Wang, Zili Zhang, Huiliang Ge, Hangzhou Applied Acoustics Research Institute (China) [11191-35]
- High-sensitivity measurement method of hydrogen-sulfide gas under long optical path**, Shuwang Chen, Tongtong Song, Shuli Song, Xiaowei Yin, Zhenzhen Wang, Hebei Univ. of Science and Technology (China) [11191-36]
- Measurement of Cl₂ emission concentration by differential absorption spectroscopy**, Jiatong Shi, Hangzhou Zetian Technology Co., Ltd (China); Jie Guo, Han Zhang, Hangzhou Zetian Technology Co., Ltd. (China) [11191-37]
- Research on measurement of urban C₆H₈ by open optical path detection system**, Rui Xue, China National Environmental Monitoring Ctr. (China); Xiaohong Han, China Jiliang Univ. (China) [11191-38]
- Compound spatial imaging systems optimized by global synthesis**, Hua Liu, Science and Technology on Electro-Optic Control Lab. (China) [11191-39]
- Embedded fiber Bragg grating strain sensor with enhanced sensitivity**, Li Xiong, Guozhang Jiang, Yongxing Guo, Shuang Xu, Wuhan Univ. of Science and Technology (China) [11191-40]

Miniaturized underwater polarized radiation measuring instrument, Kaipeng Li, Shanghai Institute of Optics and Fine Mechanics (China) and Univ. of Chinese Academy of Sciences (China); Yan He, Shanghai Institute of Optics and Fine Mechanics (China); Peng Chen, The Second Institute of Oceanography (China); Yufei Zhang, Fanghua Liu, Xiaolei Zhu, Weibiao Chen, Shanghai Institute of Optics and Fine Mechanics (China) [11191-41]

Displacement sensor based on a macrobending plastic optical fiber with multi-notched structure, Chuanxin Teng, Guilin Univ. of Electronic Technology (China); Fangda Yu, Beihua Univ. (China); Shijie Deng, Houquan Liu, Guilin Univ. of Electronic Technology (China) [11191-42]

The development of chemical oxygen demand monitoring technology and instrument in seawater based on spectrum analysis, Zongqi Cai, Yantai Institute of Coastal Zone Research (China); Weiwei Feng, Yantai Institute of Coastal Zone Research (China) and Univ. of Chinese Academy of Sciences (China); Yaobin Hou, Yantai Institute of Coastal Zone Research (China) [11191-43]

Research and development of an optical gyrocompass using a three-axis FOG, Maochun Li, Fei Hui, Xiaoming Zhang, Miao Yan, Dongli Deng, Tianjin Navigation Instruments Research Institute (China) [11191-44]

Polarization characteristics of bionic underwater polarized light navigation, Fei Hui, Maochun Li, Tianjin Navigation Instruments Research Institute (China) [11191-45]

Research on visibility detection based on forward scattering technology, Keke Zhang, Institute of Oceanographic Instrumentation, Shandong Academy of Sciences (China); Xueyong Zheng, Qingdao Kernel Spectrum Technology Co., Ltd (China); Xingkui Yan, Shizhe Chen, Xiaozheng Wan, Jiming Zhang, Qiang Zhao, Bo Wang, Huanyu Zhao, Institute of Oceanographic Instrumentation, Shandong Academy of Sciences (China) [11191-46]

SESSION 5

LOCATION: CONV. CTR. ROOM 206 TUE 14:30 TO 16:00

New Sensor Devices and Applications I

Session Chair: **Huilian Ma**, Zhejiang Univ. (China)

- 14:30: **Optical fiber sensor array with ultimate resolution for geophysical observations (Invited Paper)**, Qingwen Liu, Shanghai Jiao Tong Univ. (China) [11191-20]
- 15:00: **Arrayed waveguide grating-based high-frequency ultrasonic sensors**, Jing Zhang, Chuanyi Tao, Chongqing Univ. of Technology (China); Jingke Li, Chongqing Medical and Pharmaceutical College (China); Xuhai Jiang, Junhua Cheng, Na Li, Liming Mao, Rong Chen, Chongqing Univ. of Technology (China) [11191-21]
- 15:20: **Estimation of permissible deviations of geometrical parameters of the ring confocal resonator**, Yuri Filatov, Alina Gorelaya, Alexander Kukaev, Egor Shalymov, Saint Petersburg Electrotechnical Univ. "LETI" (Russian Federation); Dmitriy Venediktov, ITMO Univ. (Russian Federation); Vladimir Venediktov, Saint Petersburg Electrotechnical Univ. "LETI" (Russian Federation) [11191-22]
- 15:40: **Ga-Ge-Sb-S glass thin-films doped with Er³⁺: from plasma diagnostics to luminescence**, Geoffrey Louvet, Institut des Sciences Chimiques de Rennes (France); Damien Thiry, Univ. of Mons (Belgium); Simone Normani, Marek Bouska, Jan Gutwirth, Petr Nemec, Univ. Pardubice (Czech Republic); Florent Starecki, Ctr. de Recherche sur les Ions, les Matériaux et la Photonique (France); Loïc Bodiou, Joël Charrier, Fonctions Optiques pour les Technologies de l'information (France); Yannick Ledemi, Younès Messaddeq, Ctr. d'Optique, Photonique et Laser (Canada); Rony Snyders, Univ. de Mons (Belgium); Virginie Nazabal, Univ. de Rennes 1 (France) [11191-23]
- Tea/Coffee Break Tue 16:00 to 16:10

SESSION 6

LOCATION: CONV. CTR. ROOM 206 TUE 16:10 TO 17:30

New Sensor Devices and Applications II

Session Chair: **Zuyuan He**, Shanghai Jiao Tong Univ. (China)

- 16:10: **Measurement of electric current by the optical current sensor based on magneto-optic crystal**, Lizhen Ning, Penghui Yao, Hao Peng, Hebei Univ. (China); Steve Yao, Hebei Univ. (China) and General Photonics Corp. (United States) [11191-25]
- 16:30: **Fiber-optic water pressure sensor fabricated by a 3D printing technique**, Shi Shen, Huanhuan Liu, Ziming Guo, Junfeng Yang, Zhenyi Chen, Tingyun Wang, Fufei Pang, Shanghai Univ. (China) [11191-26]
- 16:50: **Pulse-dilation x-ray imager with 4 ps resolution**, Houzhi Cai, Jinyuan Liu, Dong Wang, Shenzhen Univ. (China) [11191-27]
- 17:10: **Review on fiber optic sensing technologies applicable for hypersonic wind tunnel experiments**, Huacheng Qiu, Yanguang Yang, China Aerodynamics Research and Development Ctr. (China); Zeng-Ling Ran, Univ. of Electronic Science and Technology of China (China); Dong Wu, China Aerodynamics Research and Development Ctr. (China) [11191-28]

CONFERENCE 11192

LOCATION: CONV. CTR. ROOM 102C

Tuesday–Wednesday 22–23 October 2019 • Proceedings of SPIE Vol. 11192

Real-time Photonic Measurements, Data Management, and Processing IV

Conference Chairs: **Ming Li**, Institute of Semiconductors (China); **Bahram Jalali**, Univ. of California, Los Angeles (United States); **Mohammad Hossein Asghari**, Loyola Marymount Univ. (United States), Tachyonics Inc. (United States)

Program Committee: **Hongwei Chen**, Tsinghua Univ. (China); **Xiangfei Chen**, Nanjing Univ. (China); **Hao Chi**, Zhejiang Univ. (China); **Yitang Dai**, Tsinghua Univ. (China); **Christophe Dorrer**, Univ. of Rochester (United States); **Shiming Gao**, Zhejiang Univ. (China); **Xiaoshun Jiang**, Nanjing Univ. (China); **Chanju Kim**, Advanced Photonics Research Institute (Korea, Republic of); **Yasushi Kondo**, Shimadzu Corp. (Japan); **Hongpu Li**, Shizuoka Univ. (Japan); **Yong Liu**, Univ. of Electronic Science and Technology of China (China); **Asad M. Madni**, Univ. of California, Los Angeles (United States); **Kayvan R. Niazi**, NantWorks, LLC (United States); **Tatsutoshi Shioda**, Saitama Univ. (Japan); **Daniel R. Solli**, OcuNext Inc. (United States); **Yikai Su**, Shanghai Jiao Tong Univ. (China); **Kevin K. Tsia**, The Univ. of Hong Kong (Hong Kong, China); **Sergei K. Turitsyn**, Aston Univ. (United Kingdom); **Chao Wang**, Univ. of Kent (United Kingdom); **Jian Wang**, Huazhong Univ. of Science and Technology (China); **Ming Wang**, Nanjing Normal Univ. (China); **Xu Wang**, Heriot-Watt Univ. (United Kingdom); **Kun Xu**, Beijing Univ. of Posts and Telecommunications (China); **Lianshan Yan**, Southwest Jiaotong Univ. (China); **Akio Yazaki**, Hitachi, Ltd. (Japan); **Changyuan Yu**, The Hong Kong Polytechnic Univ. (Singapore); **Xinliang Zhang**, Wuhan National Lab. for Optoelectronics (China); **Xiaoping Zheng**, Tsinghua Univ. (China); **Xihua Zou**, Southwest Jiaotong Univ. (China)

TUESDAY 22 OCTOBER

SESSION 1

LOCATION: CONV. CTR. ROOM 102C TUE 8:00 TO 12:00

Optoelectronic Devices and Applications

Session Chair: **Pengfei Wang**, Harbin Engineering Univ. (China)

8:00: **Application prospect of whispering-gallery mode optical microcavity in photonic measurements** (*Invited Paper*), Angzhen Li, Harbin Engineering Univ. (China); Yongkang Dong, Harbin Institute of Technology (China); Shunbin Wang, Shijie Jia, Harbin Engineering Univ. (China); Gilberto Brambilla, Univ. of Southampton (United Kingdom); Pengfei Wang, Harbin Engineering Univ. (China) [11192-1]

8:30: **The dual-wavelength DFB laser based on reconstruction-equivalent chirp technology**, Bocheng Yuan, Xuan Long, Lianyan Li, Yunshan Zhang, Hui Zou, Jianping Shen, Ning Xu, Nanjing Univ. of Posts and Telecommunications (China); Xiangfei Chen, Nanjing Univ. (China) [11192-2]

8:50: **High-speed secure optical communication with physical random temporal encryption**, Ning Jiang, Anke Zhao, Shiqin Liu, Kun Qiu, Univ. of Electronic Science and Technology of China (China) [11192-3]

9:10: **Field-programmable disk array signal processor on a silicon photonic chip** (*Invited Paper*), Weifeng Zhang, Univ. of Ottawa (Canada) and Beijing Institute of Technology (China); Jianping Yao, Univ. of Ottawa (Canada) [11192-4]

9:40: **Rapidly wavelength-switching DFB diode laser array integrated with a SOA**, Kanglong Lin, Tao Fang, Nanjing Univ. (China) [11192-6]

Tea/Coffee Break Tue 10:00 to 10:30

10:30: **Realizing Lorentzian, Fano, and EIT resonance lineshapes in a microring resonator** (*Invited Paper*), Xuetao Gan, Northwestern Polytechnical Univ. (China) [11192-5]

11:00: **Electrically driven plasmonic antenna** (*Invited Paper*), Liang Wang, Yingjian Liu, Jin Qin, Univ. of Science and Technology of China (China) [11192-8]

11:30: **A silicon-photonic-integrated microwave photonic filter based on phase-modulation to intensity-modulation in a ring resonator** (*Invited Paper*), Jiejun Zhang, Univ. of Ottawa (Canada) [11192-16]

Lunch Break Tue 12:00 to 13:30

TUESDAY POSTER SESSION

LOCATION: FIRST FLOOR LOBBY TUE 13:00 TO 14:30

Conference attendees are invited to attend the poster session on Tuesday afternoon. Come view the posters, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster session.

Poster Setup: Tuesday 10:00 to 13:00

View poster presentation guidelines and set-up instructions at <http://spie.org/PAPosterGuidelines>

Multilongitudinal-mode fiber-laser sensor using software radio demodulation, Yu Zhou, Shangjing Liu, Dai Pan, Xiangfei Chen, Nanjing Univ. (China) [11192-22]

A robust target recognition and tracking panoramic surveillance system based on deep learning, Qiang Fan, Yin Xu, Gangbo Sun, Huazhong Institute of Electro-Optics (China) [11192-33]

An in-situ monitoring system for nitrate based on ultraviolet absorption spectrum, Yaobin Hou, Weiwei Feng, Yantai Institute of Coastal Zone Research (China) and Univ. of Chinese Academy of Sciences (China); Zongqi Cai, Yantai Institute of Coastal Zone Research (China) [11192-34]

Low-cost test system for silicon photonics testing, Peng Zhang, Bo Tang, Bin Li, Yan Yang, Ruonan Liu, Zhihua Li, Institute of Microelectronics (China); Fujiang Lin, Univ. of Science and Technology of China (China) [11192-35]

A fast-moving object detection method for video surveillance system, Bo Lei, Wuhan National Lab. for Optoelectronics (China) [11192-36]

A microwave mixer with mixing spurs suppression based on a tunable microwave photonic filter, Qingfeng Guo, Enming Xu, Zuxing Zhang, Nanjing Univ. of Posts and Telecommunications (China) [11192-37]

Photonic-assisted microwave spectrum sensing based on optical carrier-suppressed single-sideband modulation and coherent detection, Jialin Liu, Yang Chen, East China Normal Univ. (China) [11192-38]

A tunable dual-frequency optoelectronic oscillator based on stimulated Brillouin scattering, Enming Xu, Qihang Xu, Fan Li, Zuxing Zhang, Nanjing Univ. of Posts and Telecommunications (China) [11192-39]

CONFERENCE 11192

SESSION 2

LOCATION: CONV. CTR. ROOM 102C TUE 14:30 TO 18:00

Microwave Photonics for Measurement

Session Chair: **Hongwei Chen**, Tsinghua Univ. (China)

14:30: **High-resolution quantization schemes for photonic analog-to-digital conversion** (*Invited Paper*), Shuna Yang, Hao Chi, Hangzhou Dianzi Univ. (China); Hongxia He, Zhejiang Univ. (China) [11192-9]

15:00: **Low-error microwave frequency measurement based on a frequency scanning optoelectronic oscillator operating around threshold**, Tengfei Hao, Ming Li, Jian Tang, Nuannuan Shi, Wei Li, Ning Hua Zhu, Institute of Semiconductors (China) [11192-10]

15:20: **Multifunctional microwave signal generation and processing based on equivalent phase modulation** (*Invited Paper*), Yang Chen, Beiyue Weng, East China Normal Univ. (China) [11192-11]

15:50: **Time-frequency analysis of microwave signals based on bandwidth magnification**, Xiangzhi Xie, Jilong Li, Yitang Dai, Zheng Yan, Beijing Univ. of Posts and Telecommunications (China) [11192-12]

Tea/Coffee Break Tue 16:10 to 16:20

16:20: **Broadband-frequency-agile dual-comb interferometer realized with electro-optic frequency combs** (*Invited Paper*), Xinyu Fan, Shuai Wang, Bingxin Xu, Zuyuan He, Shanghai Jiao Tong Univ. (China) [11192-13]

16:50: **High-resolution vehicle SAR/ISAR imaging based on a microwave photonic radar** (*Invited Paper*), Wangzhe Li, Ruoming Li, Jingwen Dong, Institute of Electronics (China) [11192-14]

17:20: **A triple-frequency microwave photonic link based on a polarization-multiplexing dual-parallel Mach-Zehnder modulator**, KeXin Li, Beijing Univ. of Technology (China) [11192-15]

17:40: **Performance analysis of photonic RF self-interference cancellation for full-duplex communication**, Xinxin Su, Xiuyou Han, Mingshan Zhao, Yiyi Gu, Shuo Wang, Hanqiao Wang, Shuanglin Fu, Dalian Univ. of Technology (China); Chao Wang, Univ. of Kent (United Kingdom) . . . [11192-17]

WEDNESDAY 23 OCTOBER

SESSION 3

LOCATION: CONV. CTR. ROOM 102C WED 8:10 TO 12:00

Fiber Optic Sensing and Measurement

Session Chair: **Wangzhe Li**, Institute of Electronics, Chinese Academy of Sciences (China)

8:10: **Amplification of wavelength-shifting soliton in active photonic crystal fibers** (*Invited Paper*), Chuanfei Yao, Zhixu Jia, Qing Li, Guanshi Qin, Jilin Univ. (China); Minglie Hu, Tianjin Univ. (China); Yasutake Ohishi, Toyota Technological Institute (Japan); Weiping Qin, Jilin Univ. (China) [11192-18]

8:40: **Microwave photonics for high-performance fiber-optic sensing** (*Invited Paper*), Yiping Wang, Nanjing Normal Univ. (China) [11192-19]

9:10: **Polarization characterization based on multidimensional Stokes vectors applied in aerosol identification**, Riwei Liao, Nan Zeng, Hui Ma, Graduate School at Shenzhen, Tsinghua Univ. (China) [11192-20]

9:30: **Correlation matrix composed of multidimensional polarization index applied in aerosol recognition in the air**, Fei Chen, Nan Zeng, Hui Ma, Graduate School at Shenzhen, Tsinghua Univ. (China) [11192-21]

Tea/Coffee Break Wed 9:50 to 10:20

10:20: **High-spatial resolution optomechanical time-domain analysis** (*Invited Paper*), Yongkang Dong, Harbin Institute of Technology (China) [11192-23]

10:50: **Deep learning with synthetic photonic lattices for equalization in optical transmission systems**, Artem Pankov, Ilya Vatrik, Oleg Sidelnikov, Dmitry Churkin, Novosibirsk State Univ. (Russian Federation) [11192-24]

11:10: **Accurate locating method of vibration based on ϕ -OTDR and 3D-printed sensor** (*Invited Paper*), Zhen Chen, Huanhuan Liu, Zhichao Liu, Na Chen, Fufei Pang, Shanghai Univ. (China) [11192-25]

11:40: **Detection of airborne molecular contaminants based on a long period microfiber grating with mesoporous coating**, Guorui Zhou, Yilan Jiang, Hao Liu, Longfei Niu, Haibing Lv, Xinxiang Miao, Xiaodong Jiang, Laser Fusion Research Center (China) [11192-40]

Lunch Break Wed 12:00 to 13:30

SESSION 4

LOCATION: CONV. CTR. ROOM 102C WED 13:30 TO 16:50

Ultrafast Optical Spectroscopy and Measurement

Session Chair: **Hao Chi**, Zhejiang Univ. (China)

13:30: **A comparison of image recognition algorithms for cell phenotyping in optofluidic time-stretch microscopy** (*Invited Paper*), Wanyue Zhao, Tsinghua Univ. (China); Cheng Lei, Wuhan Univ. (China); Honghao Huang, Tsinghua Univ. (China); Keisuke Goda, The Univ. of Tokyo (Japan) and Japan Science and Technology Agency (Japan) and Tsinghua Univ. (China); Hongwei Chen, Tsinghua Univ. (China) [11192-26]

14:00: **Single-pixel imaging by using display illumination**, Yunfei Tian, Fei Xu, Nanjing Univ. (China) [11192-27]

14:20: **Ultrafast time-encoded flow imaging for Giardia cysts and Cryptosporidium oocysts detection**, Yingxue Guo, Wanyue Zhao, Xiaohong Zhou, Yun Lu, Minghua Chen, Sigang Yang, Hongwei Chen, Tsinghua Univ. (China) [11192-28]

14:40: **FPGA-based real-time signal triggered storage system for ultrafast imaging flow cytometry**, Honghao Huang, Weizhe Meng, Wanyue Zhao, Minghua Chen, Sigang Yang, Hongwei Chen, Tsinghua Univ. (China) . [11192-29]

Tea/Coffee Break Wed 15:00 to 15:30

15:30: **Optical real-time Fourier transformation using a bidirectional CFBG** (*Invited Paper*), Dan Zhu, Bowen Zhang, Zhongyang Xu, Shilong Pan, Nanjing Univ. of Aeronautics and Astronautics (China) [11192-30]

16:00: **Noise-like pulse generation from a fiber laser passively mode-locked by a femtosecond-laser-inscribed in-fiber polarizing fiber grating** (*Invited Paper*), Chengbo Mou, Zinan Huang, Qianqian Huang, Xi Cheng, Shanghai Univ. (China); Kyriacos Kalli, Cyprus Univ. of Technology (Cyprus); Antreas Theodosiou, Cyprus Univ. of Technology (Cyprus) [11192-31]

16:30: **Ultrafast coherent wavemeter for CW laser based on wavelength-to-time mapping**, Ye Xiao, Ming Li, Institute of Semiconductors (China) [11192-32]

CONFERENCE 11193

LOCATION: CONV. CTR. ROOM 403

Monday–Wednesday 21–23 October 2019 • Proceedings of SPIE Vol. 11193

Nanophotonics and Micro/Nano Optics V

Conference Chairs: **Zhiping Zhou**, Peking Univ. (China); **Kazumi Wada**, Massachusetts Institute of Technology (United States); **Limin Tong**, Zhejiang Univ. (China)

Program Committee: **Eric Cassan**, Ctr. de Nanosciences et de Nanotechnologies (France); **Tao Chu**, Zhejiang Univ. (China); **David S. Citrin**, Georgia Institute of Technology (United States); **Hiroshi Fukuda**, NTT Device Technology Labs. (Japan); **Min Gu**, RMIT Univ. (Australia); **El-Hang Lee**, INHA Univ. (Korea, Republic of); **Ching-Fuh Lin**, National Taiwan Univ. (Taiwan, China); **Gong-Ru Lin**, National Taiwan Univ. (Taiwan, China); **Yan-Qing Lu**, Nanjing Univ. (China); **Jurgen Michel**, Massachusetts Institute of Technology (United States); **Takahiro Nakamura**, Photonics Electronics Technology Research Association (PETRA) (Japan); **Andrew W. Poon**, Hong Kong Univ. of Science and Technology (Hong Kong, China); **Haisheng Rong**, Intel Corp. (United States); **Yikai Su**, Shanghai Jiao Tong Univ. (China); **Hon Ki Tsang**, The Chinese Univ. of Hong Kong (Hong Kong, China); **Yun-Feng Xiao**, Peking Univ. (China); **Dan-Xia Xu**, National Research Council Canada (Canada); **Koji Yamada**, National Institute of Advanced Industrial Science and Technology (Japan); **Qing Yang V**, Zhejiang Univ. (China); **Changhe Zhou**, Jinan Univ. (China); **Weidong Zhou**, The Univ. of Texas at Arlington (United States)

MONDAY 21 OCTOBER

OPENING CEREMONY AND PLENARY SESSION

LOCATION: PRESS CONFERENCE ROOM 9:00 TO 12:00

9:00: **Opening Ceremony**

9:20: **Awards and Recognition**

9:30: **Ultra-high peak power lasers: 10PW and beyond (Plenary)**, **Ruxin Li**, Shanghai Institute of Optics and Fine Mechanics, Chinese Academy of Sciences (China)

Tea/Coffee Break Mon 10:10 to 10:40

10:40: **Multispectral optoacoustic tomography: a paradigm shift in biomedical research and clinical diagnostics (Plenary)** **Daniel Razansky**, Univ. of Zurich (Switzerland) and ETH Zurich (Switzerland)

11:20: **Nanomaterials and light for sustainability and societal impact (Plenary)** **Naomi J. Halas**, Rice Univ. (United States)

See details pages 8–9

Lunch Break Mon 12:00 to 13:30

SESSION 1

LOCATION: CONV. CTR. ROOM 403 MON 13:30 TO 15:30

Micro/Nano Light Emitting Devices

Session Chairs: **Qing Yang**, Zhejiang Univ. (China); **Xin Guo**, Zhejiang Univ. (China)

13:30: **Free-electron light source based on nanostructures (Invited Paper)**, **Fang Liu**, Tsinghua Univ. (China) [11193-1]

14:00: **Several proposals for developing practical nanowire lasers (Invited Paper)**, **Xin Guo**, Zhejiang Univ. (China) [11193-2]

14:30: **Single-mode nanowire lasing by cross-coupling symmetry of two nanowires**, **Ullah Salman**, Minghua Zhuge, Yazhi Zheng, Yaoguang Ma, Qing Yang, Yang Yang, Zhejiang Univ. (China) [11193-3]

14:50: **Ultra-stable phosphor of h-BN white graphene-loaded all-inorganic perovskite nanocrystals for white LEDs**, **Zhenfu Zhao**, Ningbo Univ. (China) [11193-4]

15:10: **On-chip single-mode CdS nanowire laser**, **Qingyang Bao**, Xin Guo, Limin Tong, Zhejiang Univ. (China) [11193-5]

Tea/Coffee Break Mon 15:30 to 16:00

SESSION 2

LOCATION: CONV. CTR. ROOM 403 MON 16:00 TO 17:50

Micro/Nano Optoelectronic Integration

Session Chairs: **Yaocheng Shi**, Zhejiang Univ. (China); **Tawfique Hasan**, Univ. of Cambridge (United Kingdom)

16:00: **One- and two-dimensional materials for photonics and optoelectronics (Invited Paper)**, **Tawfique Hasan**, Univ. of Cambridge (United Kingdom) [11193-6]

16:30: **Si-Ge intermixing induced at mesa sidewalls of Si-capped Ge epitaxial layers on Si for operation wavelength tuning in Ge photonic devices**, **Yasuhiko Ishikawa**, Kazuki Kawashita, Moise Sotto, Toyohashi Univ. of Technology (Japan) [11193-7]

16:50: **Non-volatile quasi-continuously programmable silicon photonics using phase-change materials**, **Peipeng Xu**, Ningbo Univ. (China); **Jiajiu Zheng**, Univ. of Washington (United States); **Jonathan Doylend**, Intel Corp. (United States); **Arka Majumdar**, Univ. of Washington (United States) [11193-8]

17:10: **Analysis of Dirac-cone-mode propagation in SOI photonic crystal slabs**, **Kazuaki Sakoda**, Yuanzhao Yao, Naoki Ikeda, Takashi Kuroda, Takaaki Mano, Hiromi Koyama, Yoshimasa Sugimoto, National Institute for Materials Science (Japan) [11193-9]

17:30: **Grating-assisted MDM-PDM hybrid (de)multiplexer for optical interconnect applications**, **Manoranjan Minz**, Darpan Mishra, Ramesh Kumar Sonkar, Mohd. Mansoor Khan, Indian Institute of Technology Guwahati (India) [11193-10]

TUESDAY 22 OCTOBER

SESSION 3

LOCATION: CONV. CTR. ROOM 403 TUE 8:00 TO 9:10

Nanobiophotonics Sensors

Session Chairs: **Xiang Hao**, Zhejiang Univ. (China); **Chen Yang**, Boston Univ. (United States)

8:00: **Design of nanophotonic interface for photoacoustic brain stimulation (Invited Paper)**, **Chen Yang**, Boston Univ. (United States) [11193-11]

8:30: **Photonic spin-Hall-effect-enabled refractive index sensor**, **Jingjing Sun**, Lijuan Sheng, Sixian Li, Yaodong Wu, Minghui Gao, Zhenrui Feng, Xinxing Zhou, Hunan Normal Univ. (China) [11193-12]

8:50: **On-chip super-resolution imaging with fluorescent polymer films**, **Chenlei Pang**, Mingwei Tang, Qing Yang, Zhejiang Univ. (China) [11193-13]

SESSION 4

LOCATION: CONV. CTR. ROOM 403 TUE 9:10 TO 12:10

Nanostructures and Nanomaterials

Session Chairs: **Yang Yang**, Zhejiang Univ. (China); **Qinghai Song**, Harbin Institute of Technology (China)

9:10: **High-Q TiO₂ microring resonators fabricated by a bottom-up method**, **Meicheng Fu**, Technical Univ. of Denmark (Denmark) and National Univ. of Defense Technology (China); **Yi Zheng**, Gaoyuan Li, Technical Univ. of Denmark (Denmark); **Xiujian Li**, National Univ. of Defense Technology (China); **Lars H. Frandsen**, Xiaowei Guan, Technical Univ. of Denmark (Denmark) [11193-14]

CONFERENCE 11193

9:30: **On-chip non-coherent cascading of Si Bragg filters for maximum rejection**, Dorian Oser, Ctr. de Nanosciences et de Nanotechnologies (France); Florent Mazeas, Univ. Côte d'Azur (France) and Ecole Polytechnique Fédérale de Lausanne (Switzerland) and Institut de Physique de Nice (France); Xavier Le Roux, Ctr. de Nanosciences et de Nanotechnologies (France); Olivier Alibart, Sébastien Tanzilli, Laurent Labonté, Univ. Côte d'Azur (France); Delphine Morini, Laurent Vivien, Eric Cassan, Carlos Alonso-Ramos, Ctr. de Nanosciences et de Nanotechnologies (France) [11193-15]

9:50: **Super-resolution photolithography for fabrication of pixelated micro-polarizer array**, Xinghui Li, Gaopeng Xue, Xiaohao Wang, Yingzuo Wang, Qian Zhou, Kai Ni, Graduate School at Shenzhen, Tsinghua Univ. (China) [11193-16]

Tea/Coffee Break Tue 10:10 to 10:30

10:30: **Lead-halide-perovskite-based nanophotonic devices** (*Invited Paper*), Qinghai Song, Harbin Institute of Technology (China) [11193-17]

11:00: **In situ optical study of single plasmonic resonator coupling with monolayer two-dimensional materials** (*Invited Paper*), Guowei Lu, Aiqin Hu, Te Wen, Weidong Zhang, Jingyi Zhao, Qihuang Gong, Peking Univ. (China) [11193-18]

11:30: **An efficient tunable directional coupler based on micro/nanofiber**, Luqing Shao, Wei Fang, Limin Tong, Zhejiang Univ. (China) [11193-19]

11:50: **Excitation light and fluorescence propagation properties of Rh-B doped polymer microfibers with different doping rates**, Mengjie Li, Xining Zhang, Huaqiao Univ. (China); Hao Dai, Xiamen Univ. (China); Yaping Zhang, Zhijun Wu, Jixiong Pu, Huaqiao Univ. (China) [11193-20]

Lunch Break Tue 12:10 to 13:30

TUESDAY POSTER SESSION

LOCATION: FIRST FLOOR LOBBY TUE 13:00 TO 14:30

Conference attendees are invited to attend the poster session on Tuesday afternoon. Come view the posters, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster session.

Poster Setup: Tuesday 10:00 to 13:00

View poster presentation guidelines and set-up instructions at <http://spie.org/PAPosterGuidelines>

Wideband infrared metal wire grating polarizer using holographic lithography and lift-off process, Qian Zhou, Yinyin Chao, Kai Ni, Xinghui Li, Graduate School at Shenzhen, Tsinghua Univ. (China); Hui Lin, Shenzhen Institutes of Advanced Technology (China) [11193-25]

Plasmon-enhanced fluorescence of nanoparticle-dye-protein complex as perspective approach for increase in fluorescent labeling effectiveness, Andrey Y. Zyubin, Konstantin Alexandrov, Ilia Samusev, Immanuel Kant Baltic Federal Univ. (Russian Federation) [11193-39]

Polarization demultiplexer for silicon-based cross-slot waveguides using a horizontal slot waveguide microring resonator, Shengbao Wu, Zhicheng Zhao, Ting Feng, Peng Hao, X. Steve Yao, Hebei Univ. (China) [11193-40]

200-mm silicon photonics technology development, Bin Li, Bo Tang, Peng Zhang, Ruonan Liu, Yan Yang, Zhihua Li, Institute of Microelectronics (China) [11193-41]

A comparative study of the spin-orbit interactions in Pancharatnam-Berry phase elements and in normal incidence of a light beam at a sharp interface, Huiling Luo, Hengyang Normal Univ. (China) and Hunan Normal Univ. (China); Xiaohui Ling, Hengyang Normal Univ. (China); Xinxing Zhou, Hunan Normal Univ. (China) [11193-42]

Polarization-independent perfect absorber based on guided-mode resonance, Jun Wu, Zhejiang Univ. of Science and Technology (China) [11193-43]

Rutile TiO₂ nanorod arrays grown by solution processed for high-efficiency solid-state perovskite solar cells, Haocheng Sun, Zhiqiang Qi, Wenliang Hu, Huazhong Institute of Electro-Optics (China) [11193-44]

An experimental evaluation method for the performance of scanning probe microscope, Sen Zhou, Jian Xu, Lei Tao, Chongqing Institute of Metrology and Quality Inspection (China) [11193-46]

Quantitative SERS detection of AFP by constructing nanogap, Yunyi Wang, Xueliang Lin, Shangyuan Feng, Xiaozhou Liang, Fujian Normal Univ. (China) [11193-47]

Mode-locked fibre laser with e-controlled cavity length in ultra-wide range, Sergey M. Kobtsev, Alexey Ivanenko, Novosibirsk State Univ. (Russian Federation); Boris Nyushkov, Novosibirsk State Univ. (Russian Federation) and Novosibirsk State Technical Univ. (Russian Federation); Kirill Serebrennikov, Denis Lutsenko, Novosibirsk State Univ. (Russian Federation) [11193-48]

Electronic-induced transparency in a single polydimethylsiloxane-coated whispering gallery mode microbubble resonator, Xianlin Liu, Liang Fu, Xiaogang Chen, Qijing Lu, Shusen Xie, Fujian Normal Univ. (China) . . [11193-49]

Design and application of photonic devices based on photonic crystal near Dirac point, Guoyan Dong, Pengwu Qiao, Shuhui Zheng, Univ. of Chinese Academy of Sciences (China) [11193-50]

Novel hybrid adhesive material based on thiol-ene system for nano-conglutination technology, Man Zhang, Institute of Optics and Electronics (China) and Yangtze Normal Univ. (China); Liangping Xia, Suihu Dang, Chunlei Du, Yangtze Normal Univ. (China) [11193-51]

Simple and efficient metasurface-based optical frequency absorber in ultraviolet regime, Kangyi Zhao, Univ. of Electronic Science and Technology of China (China) [11193-52]

Whispering gallery microcavity laser in Er³⁺-doped ZBYA (ZrF₄-BaF₂-YF₃-AlF₃) glass at 1550nm region, Haiyan Zhao, Pengfei Wang, Harbin Engineering Univ. (China) [11193-53]

A label-free super-resolution waveguide chip based on multi-wavelength evanescent wave illumination, Xuechu Xu, Dehao Ye, Mingwei Tang, Zhejiang Univ. (China) [11193-54]

Raman lasing in a carbon disulfide filled optofluidic microbubble resonator, Liang Fu, Xianlin Liu, Xiaogang Chen, Qijing Lu, Shusen Xie, Fujian Normal Univ. (China) [11193-55]

SESSION 5

LOCATION: CONV. CTR. ROOM 403 TUE 14:30 TO 17:20

Optical Manipulation

Session Chairs: **Xiaoshun Jiang**, Nanjing Univ. (China); **Wei Fang**, Zhejiang Univ. (China)

14:30: **Control of light propagation using microstructures** (*Invited Paper*), Xiaoyong Hu, Peking Univ. (China) [11193-21]

15:00: **Hybrid metamaterial thin-film for controllable radiative cooling application** (*Invited Paper*), Yaoguang Ma, Sijie Pian, Xinhang Liu, Zhenyu Dong, Yitian Liu, Zhejiang Univ. (China) [11193-22]

15:30: **Chip-based optical isolator and nonreciprocal parity-time symmetry induced by stimulated Brillouin scattering**, Jiyang Ma, Nanjing Univ. (China); Jianming Wen, Kennesaw State Univ. (United States); Yong Hu, Shulin Ding, Xiaoshun Jiang, Nanjing Univ. (China); Liang Jiang, Yale Univ. (United States); Min Xiao, Nanjing Univ. (China) [11193-23]

Tea/Coffee Break Tue 15:50 to 16:00

16:00: **Reflection of whispering gallery modes propagating on the optical fiber surface from its facet**, Zhiyong Han, Novosibirsk State Univ. (Russian Federation); Ilya D. Vatrik, Dmitry Churkin, Novosibirsk State Univ. (Russian Federation) and Institute of Automation and Electrometry (Russian Federation) [11193-26]

16:20: **Diffraction and interference of classical spiraling photons in accord with the law of conservation of energy**, Hongrui Li, Shandong Normal Univ. (China) [11193-27]

16:40: **Bandwidth optimization of germanium-doped silicon optical modulator for high-speed applications**, Darpan Mishra, Manoranjan Minz, Ramesh Kumar Sonkar, Indian Institute of Technology Guwahati (India); Mohd. Mansoor Khan, Indian Institute of Information Technology Guwahati (India) [11193-28]

17:00: **Bending-loss reduction in sharply bent optical nanofibers by coupling with Ag nanoparticles**, Yuxin Yang, Xin Guo, Limin Tong, Zhejiang Univ. (China) [11193-29]

WEDNESDAY 23 OCTOBER

SESSION 6

LOCATION: CONV. CTR. ROOM 403 WED 8:20 TO 9:30

Nonlinear Nanophotonics

Session Chairs: **Xiaoyong Hu**, Peking Univ. (China); **Yong Zhang**, Nanjing Univ. (China)

8:20: **Nonlinear generation of orbital-angular-momentum-carrying beam in a periodically poled lithium niobate crystal** (*Invited Paper*), Yong Zhang, Nanjing Univ. (China) [11193-30]

8:50: **Femtosecond-laser-induced surface periodic structure**, Yan Wang, AW Optics Ltd. (China) and ITMO Univ. (Russian Federation); Yuying Wang, AW Optics Ltd. (China) [11193-32]

9:10: **Transverse second-harmonic generation in single CdTe microwires at 2 μ m**, Jianbin Zhang, Xin Guo, Limin Tong, Zhejiang Univ. (China) . [11193-33]

Tea/Coffee Break Wed 9:30 to 10:00



CONFERENCE 11193

SESSION 7

LOCATION: CONV. CTR. ROOM 403 WED 10:00 TO 12:00

Micro/Nano Photodetectors

Session Chair: **Yaoguang Ma**, Zhejiang Univ. (China)

10:00: **Tapered-configuration separated absorber germanium photodiode on silicon-photon platform for high-power input applications**, Yuriko Maegami, Guangwei Cong, Morifumi Ohno, Koji Yamada, National Institute of Advanced Industrial Science and Technology (Japan). . . . [11193-34]

10:20: **High-efficiency coupled single-photon detectors at telecom wavelength**, Ni Yao, Zhejiang Univ. (China); Quan Yao, Mingyang Zheng, Jinan Institute of Quantum Technology (China); Wei Fang, Limin Tong, Zhejiang Univ. (China) [11193-35]

10:40: **Mapping strain/pressure with ZnO nanowire arrays by piezotronic and piezophototronic effect** (*Invited Paper*), Caofeng Pan, Beijing Institute of Nanoenergy and Nanosystems, Chinese Academy of Sciences (China) and Univ. of Chinese Academy of Sciences (China) [11193-36]

11:10: **Recent advances in nanostructured soft-glass/polymer optical fibres** (*Invited Paper*), Xin Jiang, Fehim Babic, Shangran Xie, Jiapeng Huang, Philip St. John Russell, Zheqi Wang, Azim-Onur Yazici, Max-Planck-Institut für die Physik des Lichts (Germany) [11193-37]

11:40: **All-inorganic halide perovskites thin-film self-powered photodetector**, Lufan Jin, Yating Zhang, Yu Yu, Yifan Li, Zhiliang Chen, Jianquan Yao, Tianjin Univ. (China) [11193-38]



CONFERENCE 11194

LOCATION: CONV. CTR. ROOM 103C

Tuesday–Wednesday 22–23 October 2019 • Proceedings of SPIE Vol. 11194

Plasmonics IV

Conference Chairs: **Hongxing Xu**, Wuhan Univ. (China); **Satoshi Kawata**, Osaka Univ. (Japan); **Min Qiu**, Westlake Univ. (China)

Program Committee: **David J. Bergman**, Tel Aviv Univ. (Israel); **Che Ting Chan**, Hong Kong Univ. of Science and Technology (Hong Kong, China); **Hongsheng Chen**, Zhejiang Univ. (China); **Zheyu Fang**, Peking Univ. (China), Rice Univ. (United States); **Francisco Javier García de Abajo**, ICFO - Institut de Ciències Fotòniques (Spain); **Min Gu**, RMIT Univ. (Australia); **Xin Guo**, Zhejiang Univ. (China); **Minghui Hong**, National Univ. of Singapore (Singapore); **Zhi-Yuan Li**, Institute of Physics (China); **Ai Qun Liu**, Nanyang Technological Univ. (Singapore); **Peter Nordlander**, Rice Univ. (United States); **Ruwen Peng**, Nanjing Univ. (China); **Atsushi Taguchi**, Hokkaido Univ. (Japan); **Din Ping Tsai**, Research Ctr. for Applied Sciences - Academia Sinica (Taiwan, China); **Jianfang Wang**, The Chinese Univ. of Hong Kong (Hong Kong, China); **Hong Wei**, Institute of Physics (China); **Jianbin Xu**, The Chinese Univ. of Hong Kong (Hong Kong, China); **Lei Zhou**, Fudan Univ. (China); **Shining Zhu**, Nanjing Univ. (China); **Xing Zhu**, Peking Univ. (China)

TUESDAY 22 OCTOBER

TUESDAY POSTER SESSION

LOCATION: FIRST FLOOR LOBBY TUE 13:00 TO 14:30

Conference attendees are invited to attend the poster session on Tuesday afternoon. Come view the posters, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster session.

Poster Setup: Tuesday 10:00 to 13:00

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Surface-enhanced Raman spectroscopy of organoluminophores adsorbed on quartz surfaces modified by hydrosols of silver and gold nanoparticles, Andrey Y. Zyubin, Karina Matveeva, Ilya Samusev, Immanuel Kant Baltic Federal Univ. (Russian Federation) [11194-20]

Near-field imaging and revealing dynamics of ultrafast surface plasmons using photoemission electron microscopy, Yulu Qin, Boyu Ji, Xiaowei Song, Yang Xu, Jingquan Lin, Changchun Univ. of Science and Technology (China) [11194-21]

Ultrahigh field enhancement and low threshold in a gain-assisted double-pyramid-like gold nanoshell, Gui-Ming Pan, China Jiliang Univ. (China) [11194-22]

Optical transparency in a structured continuous metal film, Yadong Zhou, China Jiliang Univ. (China); Shengli Zou, Univ. of Central Florida (United States); ShangZhong Jin, China Jiliang Univ. (China) [11194-23]

Imaging near-field of plasmonic Fano resonance by photoemission electron microscopy, Guiqi Wang, Boyu Ji, Peng Lang, Yulu Qin, Yang Xu, Jingquan Lin, Changchun Univ. of Science and Technology (China) . . . [11194-24]

Manipulating the dephasing time of the near-field in plasmonic Fano nanostructures, Yang Xu, Boyu Ji, Peng Lang, Guiqi Wang, Yulu Qin, Jingquan Lin, Changchun Univ. of Science and Technology (China) [11194-25]

Dynamically tunable perfect absorbers based on periodic microstructures, Peng Zhou, Nanjing Univ. of Information Science & Technology (China); Gaige Zheng, Nanjing Univ. of Science and Technology (China); Xiujuan Zou, Nanjing Univ. (China) [11194-26]

Characterization of cell dynamics by use of 2D metal nanoparticle substrate for high-resolution fluorescence imaging, Shihomi Masuda, Kyushu Univ. (Japan) [11194-27]

The generation of ellipse vector beam and its interaction with an elliptical metal nanodisc, Libei Xu, Zhang Ying, Fang Hui, Xiao-Cong Yuan, Shenzhen Univ. (China) [11194-28]

Design of metamaterials using neural networks, Naoto Akashi, Mana Toma, Kotaro Kajikawa, Tokyo Institute of Technology (Japan) [11194-29]

Regulating the surface plasmon polaritons transmission by multimode interference on atomic smooth silver triangular waveguide, Tingting Zhang, Shaanxi Normal Univ. (China) [11194-30]

Propagation and directional emission in single upconversion luminescent beveled microtube, Shaozuo Huang, Shaanxi Normal Univ. (China). [11194-31]

Multiple surface plasmon resonance-enhanced nonlinear optical microscopy, Yuyang Wang, Shaanxi Normal Univ. (China) [11194-32]

Multispectral stealth based on microdisc arrays with anti-reflective coatings, Meiyan Pan, Yun Huang, Hao Luo, Huanzheng Zhu, Qiang Li, Zhejiang Univ. (China); Min Qiu, Westlake Univ. (China) and Westlake Institute for Advanced Study (China) [11194-33]

Graphene as a metal without the negative dielectric constant in the designed monolayer graphene waveguide at a chemical potential of 450meV, Swetha S. Bobba, City, Univ. of London (United Kingdom) . [11194-34]

Plasmonics in deep UV: materials and applications, Atsushi Taguchi, Hokkaido Univ. (Japan) and Osaka Univ. (Japan) [11194-35]

SESSION 1

LOCATION: CONV. CTR. ROOM 103C TUE 14:30 TO 15:50

Plasmonic-Enhanced Sensing and Light Harvesting I

Session Chair: **Hongxing Xu**, Wuhan Univ. (China)

14:30: **Nanomaterials and light for sustainability and societal impact** (Keynote Presentation), Naomi J. Halas, Rice Univ. (United States) [11194-1]

15:10: **Metamaterial absorber: using photons as a sensing probe** (Keynote Presentation), Takuo Tanaka, RIKEN (Japan) [11194-2]

Tea/Coffee Break Tue 15:50 to 16:20

SESSION 2

LOCATION: CONV. CTR. ROOM 103C TUE 16:20 TO 17:30

Plasmonic-Enhanced Sensing and Light Harvesting II

Session Chair: **Satoshi Kawata**, Osaka Univ. (Japan)

16:20: **Live cell Raman-based imaging to monitor the molecular signal changes during apoptosis** (Invited Paper), Dong-Kwon Lim, Korea Univ. (Korea, Republic of) [11194-3]

16:50: **Metamaterial absorber-empowered light-harvesting devices**, Peng Yu V, Zhiming Wang, Univ. of Electronic Science and Technology of China (China); Alexander Govorov, Ohio Univ. (United States) [11194-4]

17:10: **Observation of directional scattering in single low-index dielectric nanoparticles by surface plasmon microscopy**, Xinchao Lu, Xuqing Sun, Hongyao Liu, Liwen Jiang, Institute of Microelectronics (China); Ruxue Wei, Chang Wang, Univ. of Chinese Academy of Sciences (China) [11194-5]

WEDNESDAY 23 OCTOBER

SESSION 3

LOCATION: CONV. CTR. ROOM 103C WED 8:00 TO 9:50

Hot Carrier Dynamics, Photocatalysis, and Photothermal Effects in Plasmonic Nanostructures I

Session Chair: **Min Qiu**, Westlake Univ. (China)

8:00: **Plasmon-induced hot-carrier generation, relaxation, and applications** (Keynote Presentation), Peter Nordlander, Rice Univ. (United States) [11194-6]

8:40: **Hot-electron effects in electrically-driven plasmonic nanostructures** (Keynote Presentation), Pan Wang, Alexey Krasavin, Anatoly V. Zayats, King's College London (United Kingdom). . . [11194-7]

9:20: **Plasmonic catalysis on molecule and nanomaterials** (Invited Paper), Zhenglong Zhang, Shaanxi Normal Univ. (China) [11194-8]

Tea/Coffee Break Wed 9:50 to 10:20

CONFERENCE 11194

SESSION 4

LOCATION: CONV. CTR. ROOM 103C WED 10:20 TO 12:10

Hot Carrier Dynamics, Photocatalysis, and Photothermal Effects in Plasmonic Nanostructures II

Session Chair: **Min Qiu**, Westlake Univ. (China)

10:20: **Photocatalytic reaction of p-methyl thiophenol and related molecules induced by a gap mode plasmon** (*Invited Paper*), Masayuki Futamata, Saitama Univ. (Japan) [11194-9]

10:50: **Dynamic and spatial multilevel control over emissivity with phase transition material** (*Invited Paper*), Qiang Li, Zhejiang Univ. (China) . [11194-10]

11:20: **Contactless nanothermometrical imaging of nonequilibrium transporting semiconductor devices** (*Invited Paper*), Zhenghua An, Fudan Univ. (China). [11194-11]

11:50: **Photothermal-induced fabrication of 3D electrical network connections at nanoscale**, Pintu Ghosh, Zhejiang Univ. (China). . . [11194-12]

Lunch Break Wed 12:10 to 13:40

SESSION 5

LOCATION: CONV. CTR. ROOM 103C WED 13:40 TO 15:20

Graphene, Active, and Multidisciplinary Plasmonics I

Session Chair: **Satoshi Kawata**, Osaka Univ. (Japan)

13:40: **Plasmonics in two-dimensional crystals** (*Keynote Presentation*), F. Javier García de Abajo, ICFO - Institut de Ciències Fotòniques (Spain). [11194-13]

14:20: **Optical manipulation based on linear and angular momenta of nanogap plasmon** (*Keynote Presentation*), Keiji Sasaki, Hokkaido Univ. (Japan) [11194-14]

15:00: **Plasmonic metasurface-mediated ultrafast laser pulse generation**, Jiyong Wang, Westlake Univ. (China). [11194-15]

Tea/Coffee Break Wed 15:20 to 15:50

SESSION 6

LOCATION: CONV. CTR. ROOM 103C WED 15:50 TO 17:20

Graphene, Active, and Multidisciplinary Plasmonics II

Session Chair: **Hongxing Xu**, Wuhan Univ. (China)

15:50: **Terahertz plasmonic resonances tuned optically in graphene-based heterostructures** (*Invited Paper*), Lan Ding, Jian Liu, Fangning Zhang, Yunnan Univ. (China) [11194-16]

16:20: **Designing nanoresonators based on quasi-normal modes**, Wei Yan, Min Qiu, Westlake Univ. (China) [11194-17]

16:40: **Plasmon-driven rapid in-situ formation of luminescence single-crystal nanoparticle**, Chengyun Zhang, Shaanxi Normal Univ. (China). [11194-18]

17:00: **Plasmonic enhancement of up-conversion luminescence by aluminum nanocylinder arrays**, Yuan Gao, Shunsuke Murai, Kyoto Univ. (Japan); Sayaka Tamura, Sayaka Tamura, Koji Tomita, Tokai Univ. (Japan); Katsuhisa Tanaka, Kyoto Univ. (Japan) [11194-19]

CONFERENCE 11195

LOCATION: CONV. CTR. ROOM 401

Monday–Tuesday 21–22 October 2019 • Proceedings of SPIE Vol. 11195

Quantum and Nonlinear Optics VI

Conference Chairs: **Qihuang Gong**, Peking Univ. (China); **Guang-Can Guo**, Univ. of Science and Technology of China (China); **Byoung Seung Ham**, Gwangju Institute of Science and Technology (Korea, Republic of)

Program Committee: **Yiping Cui**, Southeast Univ. (China); **Luming Duan**, California Institute of Technology (United States); **Qiongyi He**, Peking Univ. (China); **Osamu Hirota**, Tamagawa Univ. (Japan); **François Kajzar**, Univ. Politehnica of Bucharest (Romania); **Ursula Keller**, ETH Zurich (Switzerland); **Dai-Sik Kim**, Seoul National Univ. (Korea, Republic of); **Jianwei Pan**, Univ. of Science and Technology of China (China); **Kunchi Peng**, China International Science and Technology Cooperation (China); **Kebin Shi**, Peking Univ. (China); **Mankei Tsang**, National Univ. of Singapore (Singapore); **Dawei Wang**, Zhejiang Univ. (China); **Jianwei Wang**, Peking Univ. (China); **Jingjun Xu**, Nankai Univ. (China); **Zuyan Xu**, Technical Institute of Physics and Chemistry (China); **Toyohiko Yatagai**, Utsunomiya Univ. Ctr. for Optical Research & Education (Japan); **Victor N. Zadkov**, M.V. Lomonosov Moscow State Univ. (Russian Federation); **Weiping Zhang**, East China Normal Univ. (China)

MONDAY 21 OCTOBER

OPENING CEREMONY AND PLENARY SESSION

LOCATION: PRESS CONFERENCE ROOM 9:00 TO 12:00

9:00: **Opening Ceremony**

9:20: **Awards and Recognition**

9:30: **Ultra-high peak power lasers: 10PW and beyond (Plenary)**,
Ruxin Li, Shanghai Institute of Optics and Fine Mechanics,
Chinese Academy of Sciences (China)

Tea/Coffee Break Mon 10:10 to 10:40

10:40: **Multispectral optoacoustic tomography: a paradigm shift
in biomedical research and clinical diagnostics (Plenary)**
Daniel Razansky, Univ. of Zurich (Switzerland) and ETH Zurich
(Switzerland)

11:20: **Nanomaterials and light for sustainability and societal
impact (Plenary)**
Naomi J. Halas, Rice Univ. (United States)

See details pages 8–9

Lunch Break Mon 12:00 to 13:30

SESSION 1

LOCATION: CONV. CTR. ROOM 401 MON 13:30 TO 15:45

Quantum Nonlinear Optics I

Session Chair: **Haitan Xu**, Peking Univ. (China)

13:30: **Simulating quantum walks with large-scale silicon photonic
circuitry (Invited Paper)**, Xiaogang Qiang, National Univ. of Defense
Technology (China) [11195-23]

14:00: **Quantum optics with lithium niobate waveguides (Invited Paper)**,
Mirko Lobino, Griffith Univ. (Australia) [11195-2]

14:30: **Supercontinuum generation in amorphous TiO₂ waveguides**,
Gaoyuan Li, Xiaowei Guan, Yi Zheng, Technical Univ. of Denmark (Denmark);
Meicheng Fu, Technical Univ. of Denmark (Denmark) and National Univ. of
Defense Technology (China); **Peter Uhd Jepsen**, Lars Hagedorn Frandsen,
Technical Univ. of Denmark (Denmark) [11195-3]

14:45: **Nonlinear quantum spectroscopy of biological molecules and
structures (Invited Paper)**, Vladislav V. Yakovlev, Texas A&M Univ. (United
States) [11195-4]

15:15: **Schrödinger's cat and his timeless ($t = 0$) quantum worlds (Invited
Paper)**, Francis T. S. Yu, The Pennsylvania State Univ. (United States) [11195-5]

Tea/Coffee Break Mon 15:45 to 16:15

SESSION 2

LOCATION: CONV. CTR. ROOM 401 MON 16:15 TO 17:45

Quantum Nonlinear Optics II

Session Chair: **Mirko Lobino**, Griffith Univ. (Australia)

16:15: **Nonreciprocal dynamics for phonons controlled by photons in an
optomechanical system (Invited Paper)**, Haitan Xu, Peking Univ. (China);
Luyao Jiang, Yale Univ. (United States); **Aashish Clerk**, The Univ. of Chicago
(United States); **Jack Harris**, Yale Univ. (United States) [11195-6]

16:45: **Laminar and turbulent generation states of different parity-time-
symmetry properties in coupled Raman fiber lasers (Invited Paper)**,
Dmitry V. Churkin, Sergey Smirnov, Novosibirsk State Univ. (Russian
Federation) [11195-7]

17:15: **Wavelength-dependent carrier dynamics of monolayer WS₂
investigated by photoemission electron microscopy**, Yaolong Li,
Peking Univ. (China) [11195-8]

17:30: **The nonlinear phenomena of a layered metal-organic framework**,
Min Liu, Shandong Univ. (China); **Yunan Gao**, Peking Univ. (China); **Wei Ji**,
National Univ. of Singapore (Singapore) [11195-9]

TUESDAY 22 OCTOBER

SESSION 3

LOCATION: CONV. CTR. ROOM 401 TUE 8:00 TO 10:00

Advanced Quantum Technologies I

Session Chair: **Joshua W. Silverstone**,
Univ. of Bristol (United Kingdom)

8:00: **Quantum light source engineering towards “quantum supremacy”
(Invited Paper)**, Chao-Yang Lu, Univ. of Science and Technology of China
(China) [11195-11]

8:30: **Harnessing single photons in quantum technology (Invited Paper)**,
Xiaosong Ma, Nanjing Univ. (China) [11195-12]

9:00: **Distributed quantum-enhanced sensing (Invited Paper)**, Zheshen
Zhang, Univ. of Arizona (United States); **Quntao Zhuang**, The Univ. of Arizona
(United States) [11195-13]

9:30: **Synthesis of antisymmetric spin exchange interaction and chiral
spin clusters in superconducting circuits**, Wei Feng, Zhejiang Univ.
(China) [11195-14]

9:45: **Interferometric measurement of wavefunction for biphoton state
with homodyne detection technique**, Yun Zhang, The Univ. of Electro-
Communications (Japan); **Lirong Wang**, Shanxi Univ. (China); **Masayoshi**
Watanabe, The Univ. of Electro-Communications (Japan) [11195-15]

Tea/Coffee Break Tue 10:00 to 10:30

CONFERENCE 11195

SESSION 4

LOCATION: CONV. CTR. ROOM 401 TUE 10:30 TO 12:00

Advanced Quantum Technologies II

Session Chair: **Xifeng Ren**,
Univ. of Science and Technology of China (China)

10:30: **Fibre-based high-dimensional quantum communications** (*Invited Paper*), Davide Bacco, Beatrice Da Lio, Daniele Cozzolino, Yunhong Ding, Michael Galili, Karsten Rottwitt, Leif K. Oxenlowe, Technical Univ. of Denmark (Denmark) [11195-16]

11:00: **A chip of continuous variable quantum key distribution (CV-QKD) for hybrid quantum and optical communication system** (*Invited Paper*), Ai Qun Liu, Nanyang Technological Univ. (Singapore) [11195-17]

11:30: **Experimental observation of momentum-space chiral edge currents in room-temperature atoms**, Han Cai, Jinhong Liu, Jinze Wu, Yanyan He, Shi-Yao Zhu, Jun-Xiang Zhang, Dawei Wang, Zhejiang Univ. (China) [11195-18]

11:45: **Light propagation in two-dimensional cold atomic clouds with positional correlations**, Boxiang Wang, Changying Zhao, Shanghai Jiao Tong Univ. (China) [11195-19]

Lunch Break Tue 12:00 to 13:30

TUESDAY POSTER SESSION

LOCATION: FIRST FLOOR LOBBY TUE 13:00 TO 14:30

Conference attendees are invited to attend the poster session on Tuesday afternoon. Come view the posters, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster session.

Poster Setup: Tuesday 10:00 to 13:00

View poster presentation guidelines and set-up instructions at
<http://spie.org/PAPosterGuidelines>

Internal collision induced strong-field nonsequential double ionization in molecules, Aihong Tong, Hubei Univ. of Education (China) [11195-28]

Extracting the returning electron wave packet from the photoelectron momentum distributions based on the different model potential in a short laser pulse, Jianhong Chen, Tianyun Zhang, Xiaoping Zheng, Lanzhou City Univ. (China) [11195-29]

Mid-infrared vector beams in selenide photonic crystal fiber with small hollow core and their application on supercontinuum generation, Xiu Zhang, Wenhui Jiang, Zhengxiong Zhang, Panyun Gao, Liang Chen, Peng Wang, Wei Zhang, Yong Zhou, Hefei Univ. of Technology (China); Meisong Liao, Shanghai Institute of Optics and Fine Mechanics (China); Takenobu Suzuki, Yasutake Ohishi, Toyota Technological Institute (Japan); Weiqing Gao, Hefei Univ. of Technology (China) [11195-30]

On-chip thermo-optical modulation based on Te nanoparticle coated VO₂ photonic crystal nanocavity, Kun Liao, Zhenhuan Liu, Xiaoyong Hu, Qihuang Gong, Peking Univ. (China) [11195-31]

Generation of frequency-bin entangled two-photon state via cascaded second-order nonlinear processes, Zichang Zhang, Ruiming Zhang, Hao Yu, Institute of Fundamental and Frontier Sciences, Univ. of Electronic Science and Technology of China (China); Guangwei Deng, Institute of Fundamental and Frontier Sciences, Univ. of Science and Technology of China (China); Heng Zhou, Institute of Fundamental and Frontier Sciences, Univ. of Electronic Science and Technology of China (China); Haizhi Song, Institute of Fundamental and Frontier Sciences, Univ. of Electronic Science and Technology of China (China) and Southwest Institute of Technical Physics (China); Qiang Zhou, Institute of Fundamental and Frontier Sciences, Univ. of Electronic Science and Technology of China (China); You Wang, Institute of Fundamental and Frontier Sciences, Univ. of Electronic Science and Technology of China (China) and Southwest Institute of Technical Physics (China) [11195-32]

Features of a CPT-based atomic clock with pumping by different-order sidebands of a VCSEL's frequency, Sergey M. Kobtsev, Daba Radnatarov, Sergey Khripunov, Valerii Andryushkov, Novosibirsk State Univ. (Russian Federation) [11195-33]

Surface-state-density-enhanced optical nonlinearity in CdSe/G nanohybrids, Baohua Zhu, Henan Univ. (China); Fangfang Wang, Shanghai Institute of Technical Physics (China); Peng Li, Yuzong Gu, Henan Univ. (China) [11195-34]

Numerical modeling and simulations on splitting of chirped optical pulses in heavily doped thulium fiber amplifiers through modal instability analysis, Mohd Mansoor Khan, Indian Institute of Technology Guwahati (India) and Indian Institute of Information Technology Guwahati (India); Ramesh K. Sonkar, Indian Institute of Technology Guwahati (India) .. [11195-35]

SESSION 5

LOCATION: CONV. CTR. ROOM 401 TUE 14:30 TO 18:10

Integrated Photonic Quantum Technologies

Session Chair: **Jianwei Wang**, Peking Univ. (China)

14:30: **Large-scale quantum photonic processors: quantum photonics for AI and AI for quantum photonics** (*Invited Paper*), Jacques Carolan, Massachusetts Institute of Technology (United States) [11195-20]

15:00: **Quantum-entangled photon sources and logic gates based on Si nanophotonic waveguides** (*Invited Paper*), Xifeng Ren, Lantian Feng, Univ. of Science and Technology of China (China); Ming Zhang, Zhejiang Univ. (China); Zhiyuan Zhou, Guo-Can Guo, Univ. of Science and Technology of China (China); Daoxin Dai, Zhejiang Univ. (China) [11195-21]

15:30: **3D photonic quantum chip and analog quantum computing** (*Invited Paper*), Xianmin Jin, Shanghai Jiao Tong Univ. (China) [11195-22]

Tea/Coffee Break Tue 16:00 to 16:10

16:10: **Nonlinear photonics in integrated lithium niobate devices** (*Invited Paper*), Cheng Wang, City Univ. of Hong Kong (Hong Kong, China) ... [11195-1]

16:40: **Electro-optic modulators for photonic quantum information processing** (*Invited Paper*), Hsin-Pin Lo, Takuya Ikuta, Nobuyuki Matsuda, Toshimori Honjo, Hiroki Takesue, NTT Basic Research Labs. (Japan) [11195-24]

17:10: **Quantum photonics for scale** (*Invited Paper*), Joshua W. Silverstone, Jeremy C. Adcock, Lawrence M. Rosenfeld, Dominic A. Sulway, Caterina Vigliar, Univ. of Bristol (United Kingdom); Yuya Yonezu, Waseda Univ. (Japan); Benjamin D. J. Sayers, Gary F. Sinclair, John G. Rarity, Univ. of Bristol (United Kingdom). [11195-25]

17:40: **On-chip nanomechanical single-photon router**, Xiaoyan Zhou, Camille Papon, Henri Thyrrestrup, Zhe Liu, Søren Stobbe, Niels Bohr Institute (Denmark); Rüdiger Schott, Andreas Wieck, Arne Ludwig, Ruhr-Univ. Bochum (Germany); Peter Lodahl, Leonardo Midolo, Niels Bohr Institute (Denmark) [11195-26]

17:55: **Nonlinear frequency conversion and manipulation of vector beams in a Sagnac loop**, Chen Yang, Zhiyuan Zhou, Bao-Sen Shi, Univ. of Science and Technology of China (China) [11195-27]

CONFERENCE 11196

LOCATION: CONV. CTR. ROOM 103A

Monday–Tuesday 21–22 October 2019 • Proceedings of SPIE Vol. 11196

Infrared, Millimeter-Wave, and Terahertz Technologies VI

Conference Chairs: **Cunlin Zhang**, Capital Normal Univ. (China); **Xi-Cheng Zhang**, Univ. of Rochester (United States); **Masahiko Tani**, Univ. of Fukui (Japan)

Program Committee: **Derek Abbott**, The Univ. of Adelaide (Australia); **Peter A. R. Ade**, Cardiff Univ. (United Kingdom); **Yi Cai**, Kunming Institute of Physics (China); **Jun-Cheng Cao**, Shanghai Institute of Microsystem and Information Technology (China); **Hou-Tong Chen**, The Ctr. for Integrated Nanotechnologies (United States); **Jian Chen**, Nanjing Univ. (China); **Yuping Cui**, Tianjin Jinhang Institute of Technology Physics (China); **Jianming Dai**, Tianjin Univ. (United States); **Haewook Han**, Pohang Univ. of Science and Technology (Korea, Republic of); **Jianguang Han**, Ctr. for Terahertz Waves of Tianjin Univ. (China); **Zhi Hong**, China Jiliang Univ. (China); **Biaobing Jin**, Nanjing Univ. (China); **Weiqi Jin**, Beijing Institute of Technology (China); **Seongsin M. Kim**, The Univ. of Alabama (United States); **Sergei Ark Kozlov**, ITMO Univ. (Russian Federation); **Fengqi Liu**, Institute of Semiconductors, CAS (China); **Jinsong Liu**, Wuhan National Lab. for Optoelectronics (China); **Yungui Ma**, Zhejiang Univ. (China); **Makoto Nakajima**, Osaka Univ. (Japan); **Chiko Otani**, RIKEN (Japan); **Ci-Ling Pan**, National Tsing Hua Univ. (Taiwan, China); **Hua Qin**, Suzhou Institute of Nano-Tech and Nano-Bionics (SINANO) CAS (China); **Jiancheng Shi**, Institute of Remote Sensing and Digital Earth (China); **Sheng-Cai Shi**, Purple Mountain Observatory (China); **Alexander Pavlovich Shkurinov**, M.V. Lomonosov Moscow State Univ. (Russian Federation); **Fei-jun Song**, Daheng New Epoch Technology, Inc. (China); **Chi-Kuang Sun**, National Taiwan Univ. (Taiwan, China); **Xianghong Tang**, Hangzhou Dianzi Univ. (China); **Xiaojun Wu**, Beihang Univ. (China); **Yuping Yang**, Minzu Univ. of China (China); **Jianmin Yuan**, National Univ. of Defense Technology (China); **Chao Zhang**, Univ. of Wollongong (Australia); **LiangLiang Zhang**, Capital Normal Univ. (China); **Weili Zhang**, Oklahoma State Univ. (United States); **Yan Zhang**, Capital Normal Univ. (China); **Zhuoyong Zhang**, Capital Normal Univ. (China); **Kun Zhao**, China Univ. of Petroleum (China); **Zengxiu Zhao**, National Univ. of Defense Technology (China); **Weiguo Zhu**, Institute of Physical Engineering (China); **Yiming Zhu**, Univ. of Shanghai for Science and Technology (China)

MONDAY 21 OCTOBER

OPENING CEREMONY AND PLENARY SESSION

LOCATION: PRESS CONFERENCE ROOM 9:00 TO 12:00

9:00: **Opening Ceremony**

9:20: **Awards and Recognition**

9:30: **Ultra-high peak power lasers: 10PW and beyond (Plenary)**,
Ruxin Li, Shanghai Institute of Optics and Fine Mechanics,
Chinese Academy of Sciences (China)

Tea/Coffee Break Mon 10:10 to 10:40

10:40: **Multispectral optoacoustic tomography: a paradigm shift
in biomedical research and clinical diagnostics (Plenary)**
Daniel Razansky, Univ. of Zurich (Switzerland) and ETH Zurich
(Switzerland)

11:20: **Nanomaterials and light for sustainability and societal
impact (Plenary)**
Naomi J. Halas, Rice Univ. (United States)

See details pages 8–9

Lunch Break Mon 12:00 to 13:30

SESSION 1

LOCATION: CONV. CTR. ROOM 103A MON 13:30 TO 15:05

Devices

Session Chair: **Xi-Cheng Zhang**, Univ. of Rochester (United States)

13:30: **High-sensitivity terahertz electro-optic sampling with metallic
parallel plate waveguide (Invited Paper)**, Masahiko Tani, Univ. of Fukui
(Japan); Hideaki Kitahara, Osaka Univ. (Japan); Masaki Shihara, Akihiro Esaki,
Kohji Yamamoto, Takashi Furuya, Kazuyoshi Kurihara, Univ. of Fukui (Japan);
Elmer Estacio, Univ. of the Philippines Diliman (Philippines); Michael I. Bakunov,
N.I. Lobachevsky State Univ. of Nizhni Novgorod (Russian Federation) [11196-1]

13:55: **Metasurface for THz polarization/phase manipulating and high-
resolution imaging (Invited Paper)**, Yiming Zhu, XiaoFei Zang, Univ. of
Shanghai for Science and Technology (China) [11196-2]

14:20: **Photo active control of plasmon-induced reflection in
complementary terahertz metamaterials**, Yue Yang, Tianjin Univ.
(China) [11196-3]

14:35: **Development of multi-beam Fourier phase grating at 660 GHz**,
Daixi Zhang, Yuan Ren, Dong Liu, Kangmin Zhou, Wei Miao, Wen Zhang,
Sheng-Cai Shi, Purple Mountain Observatory (China) [11196-4]

14:50: **Classification of terahertz pulsed signals from breast tissues using
wavelet packet energy feature extraction and machine learning classifiers**,
Wenquan Liu, Rui Zhang, Yuanfu Lu, Rongbin She, Kai Zhou, Beihua Fang,
Guanglu Wei, Guangyuan Li, Shenzhen Institutes of Advanced Technology
(China) [11196-5]

Tea/Coffee Break Mon 15:05 to 15:35

SESSION 2

LOCATION: CONV. CTR. ROOM 103A MON 15:35 TO 17:00

Physics

Session Chair: **Cunlin Zhang**, Capital Normal Univ. (China)

15:35: **Enhanced emission of terahertz wave from liquid water
(Invited Paper)**, Yiwen E., Qi Jin, Xi-Cheng Zhang, Univ. of Rochester (United
States) [11196-6]

16:00: **Investigation of different liquid properties on emitting terahertz
wave under ultrashort optical excitation**, Shenghan Gao, Qi Jin,
Yiwen E., Xi-Cheng Zhang, Univ. of Rochester (United States) [11196-8]

16:15: **Comparison of various liquids as sources of terahertz radiation
from one-color laser filament**, Anton N. Tsypkin, Evgenia Ponomareva,
Sergei Putlin, ITMO Univ. (Russian Federation); Yiwen E., Univ. of Rochester
(United States); Sergei Kozlov, ITMO Univ. (Russian Federation); Xi-Cheng
Zhang, Univ. of Rochester (United States) [11196-7]

16:30: **A hybrid-algorithm-based region of interest segmentation in THz
imaging**, Zhongcheng Sun, Yuye Wang, Limin Wu, Longhuang Tang,
Degang Xu II, Jianquan Yao, Tianjin Univ. (China) [11196-9]

16:45: **Detection of illegal additives for health products based on
terahertz spectroscopy**, Xial Chen, Yiwen Fu, Xue Wu, China Jiliang Univ.
(China); Piaoyun Chen, Zhejiang Univ. (China); Pingjie Huang, China Jiliang
Univ. (China) [11196-11]

TUESDAY 22 OCTOBER

SESSION 3

LOCATION: CONV. CTR. ROOM 103A TUE 8:00 TO 10:20

Spectroscopy

Session Chair: **Masahiko Tani**, Univ. of Fukui (Japan)

8:00: **A general rule of THz mode assignment for molecular crystals
(Invited Paper)**, Feng Zhang, Kobe Univ. (Japan) [11196-12]

8:25: **Dielectric responses of living glial cell monolayer based on terahertz
ATR spectroscopy (Invited Paper)**, Yuye Wang, Zhihan Jiang, Degang Xu II,
Tianjin Univ. (China); Beike Chen, The First Affiliated Hospital of Chongqing
Medical Univ. (China); Shi Wang, Ning Mu, Army Medical Univ. (China); Tunan
Chen, The First Affiliated Hospital of Chongqing Medical Univ. (China); Hua
Feng, Army Medical Univ. (China); Jianquan Yao, Tianjin Univ. (China) [11196-13]

8:50: **The biosensing of liver cancer cells based on the terahertz
plasmonic metamaterials**, Maosheng Yang, Jiangsu Univ. (China); Zhang
Zhang, Tianjin Univ. (China); Lan-Ju Liang, Xin Yan, Zaozhuang Univ. (China);
Jianquan Yao, Tianjin Univ. (China) [11196-14]

9:05: **Graphene-based terahertz modulations enhanced with hollow
metallic structures**, Liangping Xia, Institute of Optics and Electronics
(China) [11196-15]

CONFERENCE 11196

9:20: **Tunable polarization-independent broadband absorber in the terahertz regime**, Xingzhe Shi, Shenzhen Institutes of Advanced Technology (China) and South China Normal Univ. (China); Yuanfu Lu, Shenzhen Institutes of Advanced Technology (China); Changshui Chen, Songhao Liu, South China Normal Univ. (China); GuangYuan Li, Shenzhen Institutes of Advanced Technology (China) [11196-16]

9:35: **The propagation simulation of terahertz wave in PC materials**, Jiyang Zhang, Lijuan Li, Jiao-jiao Ren, Dandan Zhang, Jian Gu, Changchun Univ. of Science and Technology (China) [11196-17]

9:50: **Great localized field enhancement in terahertz antenna composed of hyperbolic metamaterials**, Cong Cheng, Shenzhen Institutes of Advanced Technology (China) and Guizhou Univ. (China); GuangYuan Li, Yuanfu Lu, Rui Zhang, Shenzhen Institutes of Advanced Technology (China) [11196-18]

10:05: **THz spectroscopy analysis of oxyfluorosilicate glass and a unified dielectric model for silicate oxide glasses in sub-THz region**, Osamu Wada, Kobe Univ. (Japan); Doddoji Ramachari, National Tsing Hua Univ. (Taiwan, China); Chan-Shan Yang, National Taiwan Normal Univ. (Taiwan, China); Takashi Uchino, Kobe Univ. (Japan); Ci-Ling Pan, National Tsing Hua Univ. (Taiwan, China) [11196-69]

Tea/Coffee Break Tue 10:20 to 10:45

SESSION 4

LOCATION: CONV. CTR. ROOM 103A TUE 10:45 TO 12:10

Imaging

Session Chair: **Yiming Zhu**,
Univ. of Shanghai for Science and Technology (China)

10:45: **High-resolution THz imaging based on terajet generation by a dielectric hemisphere** (Invited Paper), Yuping Yang, Minzu Univ. of China (China) [11196-19]

11:10: **An efficient terahertz metamaterial linear polarization converter**, Mengqiang Zou, ZhiYong Tao, YaXian Fan, Yi Gong, Guilin Univ. of Electronic Technology (China); Huan Liu, Harbin Engineering Univ. (China) [11196-20]

11:25: **Effect of the infrared sensor aperture on image quality and resolution**, Zahra Kavehvash, Mosa Aghaeizadeh, Mehdi Fardmanesh, Sharif Univ. of Technology (Iran, Islamic Republic of) [11196-21]

11:40: **Nested anti-resonant hollow core fiber for terahertz propagation**, Xianli Zhu, Degang Xu II, Yuye Wang III, Jining Li, Yixin He, Chao Yan, Longhuang Tang, Jianquan Yao, Tianjin Univ. (China) [11196-22]

11:55: **A low-cost single-pixel terahertz imaging method using near-field photomodulation and compressed sensing**, Rongbin She, Yuanfu Lu, GuangYuan Li, Wenquan Liu, Rui Zhang, Shenzhen Institutes of Advanced Technology (China) [11196-23]

Lunch Break Tue 12:10 to 13:30

TUESDAY POSTER SESSION

LOCATION: FIRST FLOOR LOBBY TUE 13:00 TO 14:30

Conference attendees are invited to attend the poster session on Tuesday afternoon. Come view the posters, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster session.

Poster Setup: Tuesday 10:00 to 13:00

View poster presentation guidelines and set-up instructions at <http://spie.org/PAPosterGuidelines>

A new multi-cross open resonant ring THz wave modulator based on metamaterial and vanadium oxide phase change material, Yu Zheng Li, Wei Wang, Jinhua Jin, Meng Zhou, Yunnan Normal Univ. (China) [11196-31]

Biosensor platforms of the polarization-dependent metamaterials for the detection of cancer-cell concentration, Zhang Zhang, Tianjin Univ. (China); Maosheng Yang Sr., Jiangsu Univ. (China); Lan-Ju Liang Sr., Xin Yan, Zaozhuang Univ. (China); Yuying Lu, Tianjin Univ. (China); Dequan Wei, Zaozhuang Univ. (China); Jianquan Yao, Tianjin Univ. (China) [11196-32]

Transmittance of high-density polyethylene from 0.1 THz to 15 THz, Kangmin Zhou, Wei Miao, Bowen Fan, Purple Mountain Observatory (China); Yan Delorme, Michele Batrunc, Sylvain Caroopen, Observatoire de Paris (France); Sheng-Cai Shi, Purple Mountain Observatory (China) [11196-33]

Characteristics of IF bandwidth of NbN superconducting tunneling junction mixers, Liu Dong, Honghu Li, Boliang Liu, Purple Mountain Observatory (China) [11196-34]

Design optimization and alignment of the tilt mirror for flattening thermal image of the black body unit, Jinsuk Hong, Hanwha Systems Co., Ltd. (Korea, Republic of) [11196-35]

Optimized lens barrel design compensating thermal expansion by athermalization analysis, Jinsuk Hong, Hanwha Systems Co., Ltd. (Korea, Republic of) [11196-36]

An embedded metalens design: Integration with display, Rui Chen, Yi Zhou, Wenjie Chen, Yungui Ma, Zhejiang Univ. (China) [11196-37]

Optical analog computing devices designed by deep neutral network, Yi Zhou, Rui Chen, Wenjie Chen, Zhejiang Univ. (China); Rui-Pin Chen, Zhejiang Sci-Tech Univ. (China); Yungui Ma, Zhejiang Univ. (China) [11196-38]

A design of self-stabilizing infrared sensors for panoramic imaging, Bo Wang, Pu Hong, Huazhong Institute of Electro-Optics (China) [11196-39]

Subwavelength structured sensor in the terahertz region, Jing Liu, Beijing Institute of Technology (China); Cunlin Zhang, Capital Normal Univ. (China); Yuejin Zhao, Beijing Institute of Technology (China) [11196-40]

Reversible composite terahertz modulator based on VO2 phase transition, Ge Li, Qing-li Zhou, Wanlin Liang, Cunlin Zhang, Capital Normal Univ. (China) [11196-41]

Highly sensitive detection of glycerol proportion using asymmetric terahertz metamaterial, Wanlin Liang, Qing-li Zhou, Jian Zuo, Ge Li, Zihan Zhou, Cunlin Zhang, Capital Normal Univ. (China) [11196-42]

Electrical and vibrational properties of hydrogen bonds in glycine-water clusters, Xiumin Wang, Beijing Univ. of Civil Engineering and Architecture (China); Yulei Shi, Qingli Zhou, Capital Normal Univ. (China) [11196-43]

The spectral and polarization properties of split circular terahertz resonators, Nan Jiang, Qing-li Zhou, Yuwang Deng, Wanlin Liang, Cunlin Zhang, Capital Normal Univ. (China) [11196-44]

Establishment and relevant analysis of plant's spectral reflectivity database in the visible and near-infrared band, Siyu Ning, Junsheng Shi, Hanyi Yuan, Yunnan Normal Univ. (China) [11196-45]

Transmission enhancement of air-adsorbed graphene by terahertz spectroscopy, Yuwang Deng, Qing-li Zhou, Nan Jiang, Wanlin Liang, Cunlin Zhang, Capital Normal Univ. (China) [11196-46]

An effective THz modulator with graphene tuned under low voltage with polyethylene oxide-based electrolytes, Qian Ying Zheng, Chongqing Institute of Green and Intelligent Technology (China) [11196-47]

Design of hyperspectral mid-infrared imaging system, Hui Yu, Wuhan National Lab. for Optoelectronics (China); Xiaoyan Yang, Huazhong Institute of Electro-Optics, Wuhan National Lab. for Optoelectronics (China); Chensheng Wang, Wuhan National Lab. for Optoelectronics (China); Zhijie Zhang, Huazhong Institute of Electro-Optics, Wuhan National Lab. for Optoelectronics (China) [11196-48]

simulation of terahertz light field imaging based on microlens array, Lihua Geng, Jingsuo He, Zhichen Bai, Jiaqi Zhang, Bo Su, Cunlin Zhang, Capital Normal Univ. (China) [11196-49]

A comparison of the electromagnetic parameter characterization using VNA and THz-TDS, Wenzhen Luo, Zhenwei Zhang, Haishun Liu, Capital Normal Univ. (China); Xiaoqiang Gao, Yonghong Wu, Beijing Aerospace Institute for Metrology & Measurement Technology (China); Cunlin Zhang, Capital Normal Univ. (China) [11196-50]

Research on depth-of-field depth-of-light field microscopy in the terahertz band, Jiaqi Zhang, Jingsuo He, Lihua Geng, Zhichen Bai, Bo Su, Cunlin Zhang, Capital Normal Univ. (China) [11196-51]

310 GHz communication system based on direct spreading sequence, Xiaolei Wu, Zikang Xiong, Jingsuo He, Bo Su, Cunlin Zhang, Capital Normal Univ. (China) [11196-52]

Harmonic method for noise reduction in subharmonic mixing terahertz communication system, Zikang Xiong, Capital Normal Univ. (China); Dalu Guo, Beijing Institute of Technology (China); Xiaolei Wu, Jingsuo He, Bo Su, Capital Normal Univ. (China); Min Zhang, Beijing Univ. of Posts and Telecommunications (China); Cunlin Zhang, Capital Normal Univ. (China) [11196-53]

Molecular detection of sodium nitrate and sodium nitrite based on THz-TDS system, Jiahui Wang, Bo Su, Yiwei Wen, Yaxiong Wu, Jingsuo He, Cunlin Zhang, Capital Normal Univ. (China) [11196-54]

Light-field imaging technology and its prospects in the terahertz field, Zhichen Bai, Bo Su, Lihua Geng, Jiaqi Zhang, Jingsuo He, Cunlin Zhang, Capital Normal Univ. (China) [11196-55]

Three-dimensional fluorescence of liquors from different materials, Yue Pang, Haiyan Qi, Huacai Chen, China Jiliang Univ. (China) [11196-56]

Electrode of photoconductive antenna in terahertz on chip system, Rui Wu, Bo Su, Yaping Zhao, Jingsuo He, Cunlin Zhang, Capital Normal Univ. (China) [11196-57]

Interface phonon polariton coupling enhances graphene absorption, Zhenyao Chen, Jishu Tan, Qing Xiong, Changhong Chen, Huazhong Univ. of Science and Technology (China) [11196-58]

Terahertz attenuated total reflection imaging of fresh brain tumor, Limin Wu, Degang Xu II, Yuye Wang III, Tianjin Univ. (China) [11196-59]

CONFERENCE 11196

Wideband THz polarization switching between half and quarter wave plates in hybrid dielectric-graphene reflect arrays, Shengnan Guan, Nankai Univ. (China) [11196-60]

Performance analysis of infrared detection system based on near space platform, Li Lu, Shiqiang Yan, Jinqian Zou, Wen Sheng, Air Force Early Warning Academy (China) [11196-61]

Simulation of transmission characteristics of Fabry-Perot filter on silicon substrate, Shaoyu Zhao, China Electronics Technology Group Corp. (China); Jiang Chen, Shanghai Aerospace Equipment Manufacturer Co., Ltd. (China); Weiping Wang, Dongliang Zhang, Xiaoyan Hu, China Electronics Technology Group Corp. (China) [11196-62]

Terahertz emission and optical second harmonic generation from Si surfaces, Quan Guo, National Univ. of Defense Technology (China); Yuan Zhang, Xiangtan Univ. (China); Zhihui Lyu, Dongwen Zhang, National Univ. of Defense Technology (China); Yindong Huang, National Innovation Institute of Defense Technology (China); Meng Chao, Xi'an Research Institute of High Technology (China); Zengxiu Zhao, National Univ. of Defense Technology (China); Jianmin Yuan, Graduate School of China Academy of Engineering Physics (China) and National Univ. of Defense Technology (China) . . . [11196-63]

Terahertz wave transmission and reflection characteristics in plasma, Xingning Geng, Degang Xu II, Jining Li, Kai Chen, Yixin He, Jianquan Yao, Tianjin Univ. (China) [11196-64]

THz time-domain spectroscopic ellipsometry with simultaneous measurements of orthogonal polarizations, Quan Guo, National Univ. of Defense Technology (China); Yuan Zhang, Xiangtan Univ. (China); Zhihui Lyu, Dongwen Zhang, National Univ. of Defense Technology (China); Yindong Huang, National Innovation Institute of Defense Technology (China); Meng Chao, Xi'an Research Institute of High Technology (China); Zengxiu Zhao, National Univ. of Defense Technology (China); Jianmin Yuan, Graduate School of China Academy of Engineering Physics (China) and National Univ. of Defense Technology (China) . . . [11196-65]

Terahertz spectral analysis of DNA based molecule cytosine and its methylated structure 5-methylcytosine, Pingjie Huang, Piaoyun Chen, Zhangwei Huang, Yuqi Cao, Dibo Hou, Guangxin Zhang, Zhejiang Univ. (China) [11196-66]

Optimization of infrared Stokes imaging polarimeter for recognition of camouflaged target, Weichao Du, Huazhong Institute of Electro-Optics, Wuhan National Lab. for Optoelectronics (China) . . . [11196-67]

Temperature drift characteristics and calibration process of external field infrared focal plane detector, Xiaofei Lu, Yi Li, Hui Zhao, Li Zhang, Lanzhou Optical Co. (China) [11196-68]

SESSION 5

LOCATION: CONV. CTR. ROOM 103A TUE 14:30 TO 16:35

Generation and Detection

Session Chairs: **Yuye Wang**, Tianjin Univ. (China);
Feng Zhang, Kobe Univ. (Japan)

14:30: **Room-temperature monolithic quantum-cascade laser sources operating from 1.1 to 1.5 THz** (*Invited Paper*), Kazuue Fujita, Shohei Hayashi, Masahiro Hitaka, Akio Ito, Tatsuo Dougakiuchi, Wei Dong, Hiroyasu Fujiwara, Hamamatsu Photonics K.K. (Japan) [11196-24]

14:55: **Stealth is antidote for radar but not for radiometer** (*Invited Paper*), Alexander G. Denisov, Jinghui Qiu, Harbin Institute of Technology (China) [11196-25]

15:20: **Radiation characteristic measurement of point source targets based on PSF revise**, Hao Wang Sr., Lanjie Guo, Beijing Institute of Space Mechanics and Electricity (China) [11196-26]

15:35: **Characterization of noise and optical response characteristics of an aluminum 64-pixel MKID array**, Qing Shi, Zhi Li, Wei-tao Lv, Bowen Fan, Sheng-Cai Shi, Purple Mountain Observatory (China) [11196-27]

15:50: **De-noising evaluation for terahertz signal based on composite multiscale entropy analysis**, Haishun Liu, Zhenwei Zhang, Cunlin Zhang, Capital Normal Univ. (China) [11196-28]

16:05: **Trf analyzing of THz high-sensitivity superconducting mixers based on SIS tunnel junctions**, Honghu Li, Li Jing, Liu Dong, Yao Ming, Boliang Liu, Sheng-Cai Shi, Purple Mountain Observatory (China) [11196-29]

16:20: **VOX bolometer-based back-illuminated mid-infrared detectors**, Guanglu Wei, GuangYuan Li, Yuanfu Lu, Wenquan Liu, Shenzhen Institutes of Advanced Technology (China) [11196-30]

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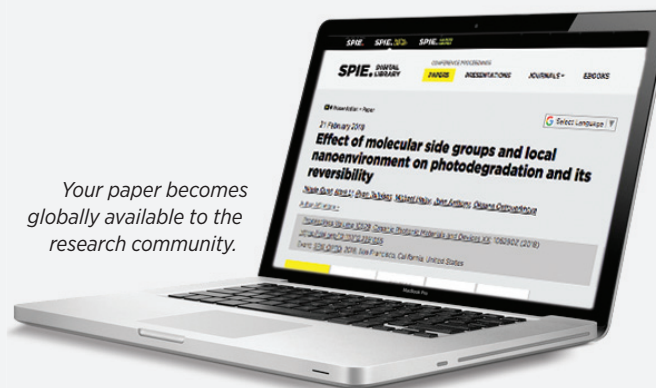
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INDEX OF AUTHORS, CHAIRS, AND COMMITTEE MEMBERS

Bold = SPIE Member

A

Abbott, Derek 11196 Program Committee
Ablameyko, Sergey V. [11190-33] S5
Adcock, Jeremy C. [11195-25] S5
Ade, Peter A. R. 11196 Program Committee
Agarwal, Shilpi [11188-44] S9, [11188-51] S10, [11188-66] SPost
Aghaeizadeh, Mosa [11196-21] S4
Ai, Shengnan [11190-124] SPost, [11190-30] S5
Aijia, Zhang [11187-58] SPost
Akashi, Naoto [11194-29] SPost
Aketagawa, Masato 11189 Program Committee
Alexandrov, Konstantin [11193-39] SPost
Ali, Nadir [11184-11] S3
Alibart, Olivier [11193-15] S4
Almeida, Vilson Rosa 11184 S3 Session Chair, [11184-18] S4
Alonso-Ramos, Carlos A. [11193-15] S4
An, Ping [11187-33] S6
An, Shengbiao [11190-91] SPost
An, Zhenghua [11194-11] S4
Andersson-Engels, Stefan [11190-47] S8, [11190-64] SPost
Andryushkov, Valerii [11184-41] SPost, [11195-33] SPost
Antonov, Alexander [11187-53] SPost
Antropov, Aleksandr [11190-17] S3
Arai, Yasuhiko 11189 Program Committee
Arakawa, Kazuto [11183-24] S5
Arapov, Yuriy D. [11188-80] SPost
Artur, Camille G. [11186-23] S6
Asghari, Mohammad Hossein 11192 Conference Chair
Ashikbayeva, Zhannat [11190-16] S3
Ashry, Islam [11191-7] S2
Awatsuji, Yasuhiro 11185 Program Committee, [11185-5] S2

B

Babic, Fehim [11193-37] S7
Babin, Sergey A. [11181-19] S4, [11181-36] SPost, [11183-29] SPost, [11190-17] S3
Bacco, Davide [11195-16] S4
Baek, Jong Hyeob [11183-27] SPost
Bai, Bing [11184-39] SPost
Bai, Chen [11188-4] S1
Bai, Jian 11185 Program Committee
Bai, Jiao [11189-17] S4
Bai, Jing 11190 Program Committee
Bai, Xin [11190-132] SPost
Bai, Zhichen [11196-49] SPost, [11196-51] SPost, [11196-55] SPost
Bakunov, Michael I. [11196-1] S1
Ban, Dayan 11184 Program Committee
Bandyopadhyay, Sankhyabrata [11186-52] SPost
Bao, Qingyang [11193-5] S1
Bao, Xiaoyi 11191 Program Committee
Bassi, Snehi [11184-22] S5, [11184-31] S7
Batrung, Michele [11196-33] SPost

Beausoleil, Raymond G. [11184-20] S5
Beisenova, Aidana [11190-16] S3, [11191-9] S2
Belousov, Dmitrii A. [11183-29] SPost, [11188-26] S6
Belozubov, Alexander V. [11187-53] SPost
Ben-Ezra, Moshe 11187 Program Committee
Benítez, Pablo 11185 Conference Chair
Bentley, Julie L. 11185 Program Committee
Bergman, David J. 11194 Program Committee
Bezus, Evgeni A. [11185-1] S1
Bi, Decang [11185-49] SPost
Bi, Lei 11184 S6 Session Chair, [11184-29] S7
Bian, Dongyao [11190-5] S1
Bian, Liheng 11187 S4 Session Chair, [11187-11] S3, [11187-16] S3, [11187-21] S5, [11187-29] S6, [11187-61] SPost
Bibi, Aysha [11185-50] SPost
Blanc, Wilfried [11190-16] S3, [11191-9] S2
Bo, Zhang [11185-8] S2
Bobb, Swetha S. [11194-34] SPost
Boccara, Albert Claude [11190-10] S2
Bodiou, Loic [11191-23] S5
Bogdanov, Nikolay [11185-40] SPost, [11185-42] SPost
Bohn, Willy L. 11181 Program Committee
Booth, Martin J. 11186 Program Committee
Boppert, Stephen A. 11190 Program Committee
Bora, Pankaj Lochan [11183-3] S1
Borycki, Dawid [11190-8] S2
Bouska, Marek [11183-3] S1, [11191-23] S5
Brady, David J. 11186 Program Committee
Brambilla, Gilberto [11192-1] S1
Branly, Stephane [11181-2] S1, [11183-22] S5
Bronnikov, Kirill A. [11183-29] SPost
Bu, Jin [11184-15] S3
Buragohain, Swarnav [11188-37] S7
Burge, James H. 11189 Program Committee
Bykov, Dmitry A. [11185-1] S1
Bykovskii, Sergei [11187-53] SPost

C

Cabanilla, Jayson P. [11189-59] SPost
Cai, Chuan [11189-65] SPost, [11189-66] SPost
Cai, Chuangjian [11186-18] S5, [11190-51] S9
Cai, Haiwen 11191 S1 Session Chair, [11191-6] S2
Cai, Han [11195-18] S4
Cai, Houzhi [11191-27] S6
Cai, Jianyong [11190-63] SPost
Cai, Xiaojian [11189-27] S6, [11189-35] S8
Cai, Yi 11196 Program Committee
Cai, Zewei [11189-1] S1
Cai, Zongqi [11191-43] SPost, [11192-34] SPost
Cao, Fengyan [11186-8] S2
Cao, Hong Yu [11187-47] SPost
Cao, Jing [11187-18] S4
Cao, Jun-Cheng 11196 Program Committee
Cao, Liangcai 11188 Conference Chair, 11188 S2 Session Chair, [11188-17] S4, [11188-25] S5,

[11188-27] S6, [11188-49] S10, [11188-74] SPost
Cao, Ruiting [11181-29] SPost
Cao, Shuo [11186-11] S3, [11188-19] S4
Cao, Xianbin [11187-61] SPost
Cao, Yuanshen 11189 Program Committee
Cao, Yuqi [11196-66] SPost
Cao, Yurong [11186-31] S1
Cao, Zhaolou [11185-17] S4
Cao, Zhigang [11191-34] SPost
Carney, P. Scott 11186 Conference Chair
Carolan, Jacques [11195-20] S5
Caroopen, Sylvain [11196-33] SPost
Cassan, Eric 11193 Program Committee, [11193-15] S4
Chai, Zifeng [11187-31] S6
Chan, Che Ting 11194 Program Committee
Chang, Jun [11185-51] SPost, [11185-52] SPost
Chang, Yaoqing [11183-33] SPost
Chang, Zhe [11181-14] S3
Chao, Meng [11196-63] SPost, [11196-65] SPost
Chao, Yinyin [11193-25] SPost
Charrier, Joël [11191-23] S5
Che, Yachen [11191-12] S3
Chen, Baijin [11189-53] SPost
Chen, Baohua [11185-14] S3, [11189-30] S7, [11189-34] S8
Chen, Beike [11196-13] S3
Chen, Benyong 11189 Conference Chair, 11189 S4 Session Chair, 11189 S7 Session Chair
Chen, Bin [11185-14] S3
Chen, Binguo [11190-48] S8
Chen, Changhong [11196-58] SPost
Chen, Changshui [11196-16] S3
Chen, Chaobing [11190-54] S9
Chen, Chaoliang [11190-31] S5
Chen, Chen [11189-14] S3, [11189-18] S4, [11189-23] S5
Chen, Cheng [11189-14] S3, [11189-18] S4, [11189-23] S5
Chen, Fei [11192-21] S3
Chen, Fen [11187-22] S5, [11187-25] S5
Chen, Guanying [11190-119] SPost
Chen, Gui [11181-29] SPost
Chen, Hao [11182-16] S5, [11184-22] S5, [11184-31] S7
Chen, He-Ming [11184-40] SPost, [11191-17] S4
Chen, Hongda [11184-39] SPost
Chen, Hongsheng 11194 Program Committee
Chen, Hongtai [11182-27] S7, [11182-29] S8
Chen, Hongwei 11192 Program Committee, 11192 S2 Session Chair, [11192-26] S4, [11192-28] S4, [11192-29] S4
Chen, Hou-Tong 11196 Program Committee
Chen, Hua [11187-32] S6, [11187-39] S8
Chen, Huacai [11196-56] SPost
Chen, Huasong [11186-43] SPost, [11187-51] SPost
Chen, JiaBi [11186-11] S3
Chen, Jiaming [11190-103] SPost
Chen, Jian 11196 Program Committee
Chen, Jianan [11182-17] S5, [11182-35] SPost
Chen, Jiang [11196-62] SPost

Chen, Jianhong [11195-29] SPost
Chen, Jian-Jun [11189-46] SPost
Chen, Jianping [11184-10] S3
Chen, Jianwei [11190-82] SPost
Chen, Jianxin [11190-96] SPost, [11190-97] SPost, [11190-99] SPost
Chen, Jiayi [11185-24] S5
Chen, Jun 11189 Program Committee, 11189 S6 Session Chair, [11189-33] S8
Chen, Jun [11188-40] S8
Chen, Kai [11196-64] SPost
Chen, Ken [11187-32] S6, [11187-40] S8
Chen, Kevin P. [11183-17] S4
Chen, Lei [11185-19] S5
Chen, Liang [11187-10] S2
Chen, Liang [11195-30] SPost
Chen, Liezun [11181-31] SPost
Chen, Lin [11184-33] S7
Chen, Linsen 11188 Program Committee
Chen, Lizhi [11188-74] SPost
Chen, MeiYun [11189-48] SPost
Chen, Mengdan [11186-50] SPost
Chen, Minghua 11182 Program Committee, [11192-28] S4, [11192-29] S4
Chen, Na [11192-25] S3
Chen, Peng [11191-41] SPost
Chen, Piaoyun [11196-11] S2, [11196-66] SPost
Chen, Qi [11182-1] S1, [11182-31] SPost
Chen, Qian [11186-12] S3, [11186-33] SPost, [11189-10] S2, [11189-62] SPost, [11189-8] S2
Chen, Qiang [11188-19] S4
Chen, Ray T. [11184-1] S1
Chen, Rong [11191-21] S5
Chen, Rui [11186-15] S4
Chen, Rui [11196-37] SPost, [11196-38] SPost
Chen, Ruiming [11189-19] SPost, [11189-21] SPost
Chen, Rui-Pin [11196-38] SPost
Chen, Shangbin [11190-117] SPost, [11190-81] SPost
Chen, Shih-Chi 11190 Program Committee, [11190-82] SPost
Chen, Shizhe [11191-46] SPost
Chen, Shuo [11190-101] SPost, [11190-103] SPost, [11190-23] S4
Chen, Shuwang [11189-49] SPost, [11190-91] SPost, [11191-36] SPost
Chen, Siming [11182-7] S2
Chen, Sung-Liang [11190-66] SPost
Chen, Tao [11184-36] SPost, [11187-56] SPost
Chen, Tao [11181-24] SPost
Chen, Tong-Sheng [11190-125] SPost, [11190-126] SPost, [11190-127] SPost, [11190-128] SPost, [11190-129] SPost
Chen, Tunan [11196-13] S3
Chen, Wei R. 11190 Program Committee
Chen, Weibiao [11185-47] SPost, [11185-49] SPost, [11191-41] SPost
Chen, Wenjie [11196-37] SPost, [11196-38] SPost
Chen, Xiai [11196-11] S2
Chen, Xiangfei 11182 Program Committee, 11192 Program Committee, [11192-2] S1, [11192-22] SPost
Chen, Xiangning [11184-8] S2
Chen, Xianhua [11189-28] S6, [11189-3] S1
Chen, Xiao [11185-47] SPost

Chen, Xiaogang [11193-49] SPost, [11193-55] SPost
Chen, Xiaoxiao [11183-8] SPost
Chen, Xin [11187-26] S5
Chen, Xinhua [11190-98] SPost
Chen, Xinjian [11189-58] SPost
Chen, Xudong [11186-15] S4, 11187 Program Committee
Chen, Yang [11192-11] S2, [11192-38] SPost
Chen, Yi [11186-25] S6
Chen, Yijun [11190-114] SPost
Chen, Yisha [11181-29] SPost
Chen, Yu 11190 Program Committee
Chen, Yuan [11187-62] SPost
Chen, Yuchen [11186-36] SPost, [11186-41] SPost
Chen, Yun [11188-70] SPost
Chen, Zeng [11181-16] S4, [11181-17] S4
Chen, Zhen [11189-71] SPost
Chen, Zhen [11192-25] S3
Chen, Zhengyu [11190-124] SPost
Chen, Zhenyao [11196-58] SPost
Chen, Zhenyi [11191-26] S6
Chen, Zhenyue [11186-7] S2
Chen, Zhijun [11183-16] S3
Chen, Zhiliang [11184-43] SPost, [11193-38] S7
Chen, Zhong [11190-97] SPost
Chen, Zhongping 11184 Program Committee, [11187-18] S4
Chenbin, Wu [11186-45] SPost
Cheng, Chuantong [11184-39] SPost
Cheng, Cong [11196-18] S3
Cheng, Dewen 11185 Program Committee
Cheng, Han [11183-26] S5
Cheng, Han-Hsiang [11188-43] S8
Cheng, Hong [11188-8] S2
Cheng, Hongtao [11185-21] S5
Cheng, Ji-Xin 11186 Program Committee
Cheng, Junhua [11191-21] S5, [11191-29] SPost
Cheng, Kai [11184-42] SPost
Cheng, Shengfu [11186-17] S5
Cheng, Xi [11192-31] S4
Cheng, Ya 11187 Program Committee
Cheng, Yu [11189-7] S2
Cheng, Yuan [11191-4] S1
Chepurna, Oksana M. [11190-45] S7
Chi, Hao 11192 Program Committee, 11192 S4 Session Chair
Chi, Hao [11181-11] S3
Chi, Hao [11192-9] S2
Chi, Nan 11182 Program Committee
Chiang, Kin Seng 11191 Program Committee
Chiu, Wei-Huai [11184-9] S2, [11185-11] S3, [11190-2] S1, [11191-2] S1
Choi, Ju Hyeon [11183-27] SPost
Choi, Woo-Young [11184-13] S3
Chorpening, Benjamin T. [11183-17] S4
Chu, Hong [11181-7] S2
Chu, Paul K. [11185-13] S3
Chu, Qihui [11181-16] S4, [11181-17] S4
Chu, Tao 11193 Program Committee
Chu, Wei [11187-54] SPost
Churkin, Dmitry V. [11192-24] S3, [11193-26] S5, [11195-7] S2
Citrin, David S. 11193 Program Committee

INDEX OF AUTHORS, CHAIRS, AND COMMITTEE MEMBERS

Bold = SPIE Member

Clerk, Aashish [11195-6] S2
Cole, Garrett D. 11189
Program Committee
Collins, Xiao [11184-26] S6
Colonel, Audrey [11183-22] S5
Cong, Guangwei [11193-34]
S7
Corbett, Brian 11182 Program
Committee
Cuzzolino, Daniele [11195-
16] S4
Cross, Kevin J. [11189-31] S7
Cui, Shuzhen [11181-35]
SPost
Cui, Xiaoyu [11190-101]
SPost, [11190-23] S4
Cui, Yiping 11195 Program
Committee
Cui, Yulong [11181-18] S4
Cui, Yuping 11196 Program
Committee
Cui, Zeyao [11185-36] SPost,
[11185-37] SPost
Cui, Ziruo [11181-4] S1
Culshaw, Brian 11191
Program Committee

D
Da Lio, Beatrice [11195-16] S4
Dai, Cai-hong [11189-47]
SPost
Dai, Cuixia [11190-26] S5
Dai, Daoxin [11182-5] S2,
11184 Conference CoChair,
11184 S1 Session Chair,
11184 S2 Session Chair,
[11184-19] S4, [11184-45]
SPost, [11195-21] S5
Dai, Hao [11191-5] S1, [11193-
20] S4
Dai, Jianing [11189-11] S2,
[11189-58] SPost, [11190-
90] SPost, [11190-98]
SPost
Dai, Jianming 11196 Program
Committee
Dai, Junfei 11189 Program
Committee
Dai, Nengli [11181-29] SPost
Dai, Pan [11192-22] SPost
Dai, Piao [11188-13] S3
Dai, Qionghai 11187
Conference Chair, [11187-
26] S5, [11187-30] S6,
[11187-54] SPost, [11187-
55] SPost, [11187-70] S5,
[11189-43] SPost
Dai, Tianguai [11188-52] S10
Dai, Wanjuan [11188-59] SPost
Dai, Wenrui [11187-6] S2
Dai, Yitang 11182 S4 Session
Chair, [11182-8] S3, [11192-
12] S2
Dai, Yitang 11192 Program
Committee
Dai, Zhiping [11181-31] SPost
Dang, Shippei [11188-4] S1
Dang, Suihu [11193-51] SPost
Dang, Xuan Du [11185-22] S5
Dangpeng, Xu [11181-27]
SPost, [11181-34] SPost
Das, Abhijit [11188-37] S7
Deán-Ben, Xosé Luís [11186-
7] S2
Delorme, Yan [11196-33]
SPost
Dempsey, Eugene [11190-
47] S8
Deng, Dongli [11191-44]
SPost
Deng, Guangwei [11195-32]
SPost
Deng, Hai [11187-63] SPost
Deng, Handi [11186-18] S5
Deng, Jianping [11190-125]
SPost
Deng, Jiawei [11186-19] S5
Deng, Kexin [11190-51] S9
Deng, Linhong 11190
Program Committee
Deng, Longjiang [11184-29]
S7
Deng, Shijie [11191-42] SPost
Deng, Tao [11182-15] SPost
Deng, Yuwang [11196-44]

SPost, [11196-46] SPost
Denisov, Aleksei [11187-53]
SPost
Denisov, Alexander G. [11196-
25] S5
Desnider, Karel [11185-2] S1
Dhandapani, Karthik [11183-
25] S5
Di, Dawei 11182 Program
Committee
Ding, Can [11186-4] S1
Ding, Haibo [11190-74] SPost
Ding, Lan [11194-16] S6
Ding, Nan [11190-85] SPost
Ding, Pengpeng [11186-8] S2
Ding, Qin [11186-43] SPost,
[11187-51] SPost
Ding, Rui [11190-41] S7
Ding, Shulin [11193-23] S5
Ding, Yunhong [11195-16] S4
Ding, Zhihua 11190 Program
Committee, [11190-21] S4
Dobashi, Yuta [11190-31] S5
Dolezyczek, Hubert [11190-8]
S2
Dong, Guoyan [11193-50]
SPost
Dong, Han [11182-17] S5,
[11187-46] SPost
Dong, Jianji [11184-3] S1
Dong, Jingwen [11192-14] S2
Dong, Kegong [11181-20] S4
Dong, Liu [11196-29] S5,
[11196-34] SPost
Dong, Meng [11187-47] SPost
Dong, Suotao [11189-67]
SPost
Dong, Wei [11196-24] S5
Dong, Yongkang [11192-1] S1,
[11192-23] S3
Dong, Zhenyu [11193-22] S5
Dorrer, Christophe 11192
Program Committee
Doskolovich, Leonid L.
[11185-1] S1
Dostovalov, Alexandr V.
[11181-36] SPost, [11183-
29] SPost
Dougakiuchi, Tatsuo [11196-
24] S5
Doyle, Jonathan K. [11193-
8] S2
Du, Baozhen [11187-39] S8
Du, Chunlei 11185 Program
Committee, 11188 Program
Committee, [11193-51]
SPost
Du, Hongcai [11187-41] S8
Du, Kang [11190-127] SPost
Du, Qingyang [11184-29] S7
Du, Weichao [11196-67]
SPost
Duan, Chengpu [11189-38]
S9, [11189-40] S8
Duan, Chenhao [11189-71]
SPost
Duan, Luming 11195 Program
Committee
Duan, Xinhui [11188-23] S5
Dubey, Satish [11188-44] S9
Duerr, Fabian 11185 Program
Committee
Dun, Xiong [11187-13] S3
Dun, Xiong [11187-17] S4
Dvornichenko, Marina [11188-
60] SPost

E
E., Yiwen [11183-9] S2,
[11196-6] S2, [11196-7] S2,
[11196-8] S2
Efremova, Ekaterina A.
[11191-19] S4
Ehret, Gerd 11189 S4 Session
Chair, [11189-4] S1
Eimura, Takayuki [11183-24]
S5
Endo, Junji [11189-33] S8
Eriksen, Jason [11186-23] S6
Esaki, Akihiro [11196-1] S1
Estacio, Elmer S. [11196-1] S1
Evmenova, Ekaterina A.
[11190-17] S3

F
Falcoz, Franck [11181-2] S1,
[11183-22] S5
Fan, Ai Chun [11183-13] S3
Fan, Boling [11189-2] S1
Fan, Bowen [11196-27] S5,
[11196-33] SPost
Fan, Chunqi [11187-36] S7,
[11187-63] SPost
Fan, Dianyan 11181 Program
Committee
Fan, Jingtao 11187 Program
Committee, 11187 S3
Session Chair, [11187-55]
SPost, [11187-70] S5,
[11189-43] SPost
Fan, Junliu [11185-14] S3,
[11189-30] S7, [11189-34]
S8
Fan, Qiang [11192-33] SPost
Fan, Songtao [11182-17] S5
Fan, Xin [11186-10] S3,
[11188-45] S9
Fan, Xinyu [11192-13] S2
Fan, Xudong 11191 Program
Committee
Fan, Yao [11186-12] S3
Fan, YaXian [11196-20] S4
Fan, Ya-Xian [11185-50] SPost
Fan, Yuanyuan [11187-51]
SPost
Fan, Zihui [11190-103] SPost
Fang, Beihua [11196-5] S1
Fang, Jiaqi [11188-76] SPost
Fang, Jinghui [11185-29]
SPost, [11185-53] SPost
Fang, Liming [11191-17] S4
Fang, Lu [11187-70] S5
Fang, Tao [11192-6] S1
Fang, Wei 11193 S5 Session
Chair, [11193-19] S4,
[11193-35] S7
Fang, Yi Chin 11185 Program
Committee
Fang, Yuhong [11190-111]
SPost
Fang, Zheyu 11194 Program
Committee
Fardmanesh, Mehdi [11196-
21] S4
Fedorov, Evgenii [11188-50]
S10
Feng, Aiming [11186-25] S6
Feng, Guojin [11189-47] SPost
Feng, Hua [11196-13] S3
Feng, Jiansong [11186-52]
SPost
Feng, Kai [11183-20] S5
Feng, Lantian [11195-21] S5
Feng, Ouyang [11188-16] S4,
[11188-79] SPost
Feng, Qiansheng [11186-43]
SPost, [11187-51] SPost
Feng, Qibin [11188-13] S3
Feng, Shangyuan [11193-47]
SPost
Feng, Shengya [11189-14] S3,
[11189-18] S4, [11189-23]
S5
Feng, Shijie 11189 S1
Session Chair, [11189-10]
S2, [11189-37] S9, [11189-
62] SPost, [11189-8] S2
Feng, Ting [11191-32] SPost,
[11193-40] SPost
Feng, Ting [11190-52] S9
Feng, Wei [11195-14] S3
Feng, Weiwei [11191-43]
SPost, [11192-34] SPost
Feng, Xi [11181-12] S3
Feng, Yueshu [11183-34]
SPost
Feng, Zhenrui [11193-12] S3
Filatov, Yuri Vladimirovich
[11191-22] S5
Fink, Mathias [11190-10] S2
Floris, Francesco [11190-64]
SPost
Frandsen, Lars Hagedorn
[11193-14] S4, [11195-3] S1
Frohme, Marcus [11190-45]
S7
Fu, Liang [11193-49] SPost,
[11193-55] SPost
Fu, Meicheng [11186-39]

SPost, [11186-42] SPost,
[11193-14] S4, [11195-3] S1
Fu, Shuanglin [11192-17] S2
Fu, Xiuhua [11189-67] SPost
Fu, Yiwen [11196-11] S2
Fu, Yuegang 11189 Program
Committee
Fu, Yunxia [11189-22] S5
Fu, Yuting [11190-89] SPost
Fujimaki, Shimpei [11183-
19] S4
Fujita, Kazuue [11196-24] S5
Fujiwara, Hiroyasu [11196-
24] S5
Fukase, Yasushi [11183-19] S4
Fukuda, Hiroshi 11193
Program Committee
Furuya, Takashi [11196-1] S1
Futamata, Masayuki [11194-9]
S4
Fuwa, Hisanori [11183-19] S4

G
Gadkari, Rahul [11188-66]
SPost
Galili, Michael [11195-16] S4
Gan, Haiyong [11189-15] S3
Gan, Qiaoqiang 11185
Program Committee
Gan, Xuetao [11192-5] S1
Gan, Yanhong [11186-13] S3
Gao, Bin [11189-43] SPost
Gao, Bin [11185-45] SPost
Gao, Bixuan [11189-70] SPost
Gao, Bruce Zhi 11186
Program Committee
Gao, Dangzhong [11185-19]
S5
Gao, Feng [11191-14] S3
Gao, Han [11190-101] SPost
Gao, Minghui [11193-12] S3
Gao, Nan [11189-29] S7
Gao, Panyun [11195-30]
SPost
Gao, Peng [11188-56] S11
Gao, Shenghan [11183-9] S2,
[11196-8] S2
Gao, Shiming 11192 Program
Committee
Gao, Siqi [11190-22] S4,
[11190-77] SPost
Gao, Tianxi [11184-39] SPost
Gao, Wanrong [11190-31] S5
Gao, Weichuan 11185
Program Committee
Gao, Weiqing [11195-30]
SPost
Gao, Xiaoming [11186-54]
SPost
Gao, Xiaoqiang [11196-50]
SPost
Gao, Yuan [11194-19] S6
Gao, Yunan [11195-9] S2
Gao, Zhishan [11185-17] S4
García de Abajo, F. Javier
11194 Program Committee,
[11194-13] S5
Gavril'eva, Kseniya N. [11188-
50] S10
Ge, Huiliang [11191-35] SPost
Ge, Mingfei [11182-20] S6
Geng, Dongxian [11185-46]
SPost
Geng, Lihua [11196-49]
SPost, [11196-51] SPost,
[11196-55] SPost
Geng, Xingning [11196-64]
SPost
Ghosh, Pintu [11194-12] S4
Goda, Keisuke [11192-26] S4
Gold, Sharp [11190-32] S5
Gomes, Anderson S. L.
[11190-119] SPost
Gong, Hui [11190-114] SPost,
[11190-32] S5
Gong, Jiaying [11190-50] S8
Gong, Mali 11181 Program
Committee
Gong, Qihuang [11193-18]
S4, 11195 Conference
Chair, [11195-31] SPost
Gong, Qiyong 11190 Program
Committee
Gong, Wei 11190 S5 Session
Chair, [11190-111] SPost

Gong, Wei [11190-24] S5
Gong, Xiaojing [11190-102]
SPost, [11190-54] S9,
[11190-68] SPost
Gong, Yi [11196-20] S4
Gorelaya, Alina V. [11188-39]
S8, [11188-50] S10, [11191-
22] S5
Govorov, Alexander O.
[11194-4] S2
Grebinyk, Anna [11190-45] S7
Grygoryev, Konstantin
[11190-47] S8
Gu, Claire 11191 Program
Committee
Gu, Guoqiang [11186-52]
SPost
Gu, Hanting [11185-25] S5,
[11185-26] S5
Gu, Huarong [11188-7] S2
Gu, Jian [11196-17] S3
Gu, Jinwei 11187 Program
Committee
Gu, Min 11188 Program
Committee, 11193 Program
Committee, 11194 Program
Committee
Gu, Ying 11190 Conference
Chair, 11190 S1 Session
Chair, [11190-105] SPost,
[11190-36] S6, [11190-37]
S6, [11190-39] S6, [11190-
42] S7, [11190-86] SPost
Gu, Yiyi [11192-17] S2
Gu, Yueqing [11190-14] S3
Gu, Yuzong [11195-34] SPost
Gu, Zhongze 11190 S4
Session Chair, [11190-1]
S1, [11190-74] SPost
Guan, Bai-Ou 11191 Program
Committee
Guan, Jianfei [11187-56]
SPost
Guan, Shanhong [11182-8] S3
Guan, Shengnan [11196-60]
SPost
Guan, Xiaowei [11193-14] S4,
[11195-3] S1
Guo, Buyu [11188-16] S4,
[11188-79] SPost
Guo, Chao [11181-16] S4,
[11181-17] S4
Guo, Chaoshun [11188-16]
S4, [11188-79] SPost
Guo, Dalu [11196-53] SPost
Guo, Guang-Can 11195
Conference Chair, [11195-
21] S5
Guo, Jiaming [11186-23] S6
Guo, Jianhua [11187-41] S8
Guo, Jie [11189-51] SPost
Guo, Jie [11191-37] SPost
Guo, Jingshu [11184-19] S4
Guo, Lanjie [11196-26] S5
Guo, Ming [11183-34] SPost
Guo, Peiyao [11187-34] S7
Guo, Qingfeng [11192-37]
SPost
Guo, Qinghua [11189-38] S9,
[11189-40] S8
Guo, Qinghua O. [11189-12]
S3
Guo, Quan [11196-63] SPost,
[11196-65] SPost
Guo, Renhui [11185-19] S5
Guo, Wenhui [11190-96]
SPost, [11190-99] SPost
Guo, Xin 11193 S1 Session
Chair, [11193-2] S1,
[11193-29] S5, [11193-33]
S6, [11193-5] S1, 11194
Program Committee
Guo, Xizhong [11182-1] S1
Guo, Yanfang [11186-38]
SPost, [11186-39] SPost,
[11186-40] SPost, [11186-
42] SPost
Guo, Yiming [11190-121]
SPost
Guo, Yingxue [11192-28] S4
Guo, Yongxing [11191-40]
SPost
Guo, Yuhao [11184-17] S4
Guo, Ziming [11191-26] S6
Gutwirth, Jan [11183-3] S1,
[11191-23] S5

INDEX OF AUTHORS, CHAIRS, AND COMMITTEE MEMBERS

Bold = SPIE Member

H

Haixiu, Yu [11188-76] SPost
Halas, Naomi J. [11193-203] ,
 [11194-1] S1
 Halenkovic, Tomas [11183-3]
 S1
Ham, Byoung Seung 11195
 Conference Chair
 Han, Chao [11188-87] SPost
 Han, Dejun [11186-25] S6
 Han, Guang [11190-133]
 SPost
 Han, Guang [11185-44] SPost,
 [11190-72] SPost
 Han, Haewook 11196
 Program Committee
 Han, Jianguang 11196 Program
 Committee
 Han, Liang [11185-35] SPost
Han, Sen 11185 Program
 Committee, 11189
 Conference Chair, 11189
 S1 Session Chair, 11189 S7
 Session Chair, [11189-6]
 S2
 Han, Shanshan [11190-66]
 SPost
 Han, Shuaitao [11189-44]
 SPost
 Han, Shuai-tao [11189-61]
 SPost
Han, Tao [11190-11] S2
 Han, Xiao [11185-7] S2
 Han, Xiaohong [11189-50]
 SPost, [11191-38] SPost
Han, Xiuyou [11192-17] S2
 Han, Yixue [11187-19] S4
 Han, Yu [11188-23] S5
 Han, Zhen [11190-41] S7
 Han, Zhiguo [11189-24] S6
 Han, Zhiyong [11193-26] S5
 Hanselaer, Peter [11185-2] S1
 Hao, Junhai [11190-108]
 SPost
 Hao, Peng [11191-32] SPost,
 [11193-40] SPost
 Hao, Qun [11185-31] SPost
 Hao, Tengfei [11192-10] S2
 Hao, Weiqian [11184-36]
 SPost
 Hao, Xiang 11186 Program
 Committee, [11186-13] S3,
 11193 S3 Session Chair
 Hao, You-Zeng [11182-12] S3
 Harris, Jack [11195-6] S2
 Hasan, Tawfique 11193 S2
 Session Chair, [11193-6]
 S2
Hasegawa, Makoto [11189-
 42] S9
 Hasegawa, Satoshi [11188-
 21] S5
 Havel, Josef [11183-3] S1
Hayasaki, Yoshio 11186
 Program Committee,
 [11186-5] S2, [11188-21] S5
 Hayashi, Shohei [11196-24]
 S5
 He, Bin [11190-124] SPost
 He, Chun [11189-69] SPost,
 [11189-71] SPost
 He, Deng-Ke [11188-6] S2
 He, Dingyong [11183-21] S5,
 [11183-33] SPost
 He, Hao [11190-44] S7,
 [11190-58] S9
He, Honghui [11190-112]
 SPost, [11190-46] S8,
 [11190-48] S8
 He, Hongxia [11192-9] S2
 He, Jiajia [11190-96] SPost,
 [11190-97] SPost
He, Jian-Jun 11182
 Conference Chair, 11182
 S2 Session Chair, [11182-
 1] S1, [11182-31] SPost,
 [11182-33] SPost
 He, Jingsuo [11196-49] SPost,
 [11196-51] SPost, [11196-
 52] SPost, [11196-53]
 SPost, [11196-54] SPost,
 [11196-55] SPost, [11196-
 57] SPost
 He, Jinping [11186-3] S1
 He, Jun [11182-17] S5, [11182-
 35] SPost

He, Jun [11187-42] S8, [11187-
 66] SPost, [11187-67]
 SPost
 He, Minfei [11186-13] S3
 He, Qiongyi 11195 Program
 Committee
He, Sailing [11187-44] SPost
 He, Shufang [11189-47] SPost
 He, Shu-kai [11191-3] S1
 He, Shunfu [11187-37] S7
 He, Wengqi [11187-45] SPost
 He, Yan [11191-41] SPost
 He, Yanyan [11195-18] S4
 He, Yilin [11186-8] S2
 He, Yingwei [11189-65] SPost,
 [11189-66] SPost
 He, Yixin [11196-22] S4,
 [11196-64] SPost
 He, Youwu [11188-52] S10
 He, Yunjie [11190-13] S2
 He, Zehao [11188-25] S5
 He, Zuyuan [11182-25] S7,
 11191 Conference Chair,
 11191 S6 Session Chair,
 [11192-13] S2
 Healy, John J. [11186-10] S3
 Hehe, Ma [11190-130] SPost
 Hennelly, Bryan M. [11186-10]
 S3, [11188-45] S9
 Hermosa, Nathaniel P. [11189-
 59] SPost
 Hii, King Ung [11189-26] S6
 Hirose, Akio [11183-24] S5
 Hirota, Osamu 11195 Program
 Committee
 Hitaka, Masahiro [11196-24]
 S5
Ho, Ho-Pui 11184 Program
 Committee
 Ho, Yo-Sung 11187 Program
 Committee
 Hoang, Minh Anh [11185-
 22] S5
 Hofmann, Werner H. 11182
 Conference Chair
 Hong, Chi-Tsung [11184-9]
 S2, [11185-11] S3, [11190-2]
 S1, [11191-2] S1
 Hong, Jinsuk [11181-26]
 SPost, [11185-33] SPost,
 [11185-34] SPost, [11196-
 35] SPost, [11196-36]
 SPost
Hong, Minghui 11183
 Conference Chair, 11186
 Program Committee, 11194
 Program Committee
 Hong, Pu [11196-39] SPost
 Hong, Zhi 11196 Program
 Committee
 Honjo, Toshimori [11195-24]
 S5
 Horisaki, Ryoichi [11188-3] S1
 Hou, Dibo [11196-66] SPost
 Hou, Jia [11185-12] S3
 Hou, Jing [11190-122] SPost
 Hou, Rui [11188-16] S4,
 [11188-79] SPost
 Hou, Yaobin [11191-43] SPost,
 [11192-34] SPost
 Hsiao, Chiu-Der [11184-9] S2
 Hsieh, Chao-Mao [11188-
 14] S4
 Hsieh, Juicheng [11190-30]
 S5
 Hsieh, Jui-Cheng [11190-124]
 SPost
 Hu, Aiqin [11193-18] S4
 Hu, Anming 11183 Program
 Committee
 Hu, Bilong [11181-32] SPost
 Hu, Hao [11184-10] S3
 Hu, Huizhu 11191 Program
 Committee
 Hu, Jiandong [11191-24]
 SPost
 Hu, Jing-Lu [11188-6] S2
Hu, Juejun [11184-29] S7
 Hu, Minglie [11192-18] S3
 Hu, Qianggao 11182 Program
 Committee
 Hu, Qinglei [11188-73] SPost,
 [11190-121] SPost
 Hu, Weisheng 11182 Program
 Committee
 Hu, Weiwang [11190-38] S6

Hu, Wenliang [11184-35]
 SPost, [11193-44] SPost
 Hu, Xiaoyan [11196-62] SPost
 Hu, Xiaoyong 11193 S6
 Session Chair, [11193-21]
 S5, [11195-31] SPost
 Hu, Xuemei [11187-35] S7
 Hu, Yan [11189-8] S2
 Hu, Yao 11185 S5 Session
 Chair, [11185-31] SPost,
 [11185-7] S2
 Hu, Ying [11190-106] SPost
 Hu, Yingtao [11184-20] S5
 Hu, Yong [11190-4] S1
 Hu, Yong [11190-34] S5
 Hu, Yong [11193-23] S5
 Hu, Yongxiang [11183-25] S5,
 [11183-26] S5
 Hu, Zhiming [11190-52] S9
Hua, Hong 11185 Program
 Committee
 Huang, Beiju [11184-39]
 SPost
 Huang, Bingbing [11190-54]
 S9
 Huang, Bormin 11187
 Program Committee
 Huang, Hong [11187-36] S7,
 [11187-63] SPost
Huang, Honghao [11192-26]
 S4, [11192-29] S4
 Huang, Hua [11181-11] S3
 Huang, Jiapeng [11193-37] S7
 Huang, Jin A. [11190-117]
 SPost
 Huang, Jing [11190-81] SPost
 Huang, Jintao [11190-126]
 SPost
 Huang, Kai [11188-84] SPost,
 [11189-55] SPost, [11189-
 56] SPost
 Huang, Lin [11187-43] S8
 Huang, Meng [11188-86]
 SPost
 Huang, Pingjie [11196-11] S2,
 [11196-66] SPost
 Huang, Qianqian [11192-31]
 S4
 Huang, Qing [11190-114]
 SPost
 Huang, Shan [11181-12] S3
 Huang, Shaozuo [11194-31]
 SPost
 Huang, Shuang [11188-72]
 SPost, [11188-81] SPost
 Huang, Ting 11183 Program
 Committee, 11183 S3
 Session Chair, [11183-5] S1
 Huang, Wei [11190-15] S3
 Huang, Wei [11181-18] S4
 Huang, Wenlong [11182-15]
 SPost
 Huang, Xiaojun [11181-32]
 SPost
 Huang, Xiaoqiao [11189-70]
 SPost
 Huang, Xiaoxia [11181-38]
 SPost
 Huang, Xinpeng [11187-33] S6
Huang, Yi [11187-62] SPost
 Huang, Yimei [11190-92]
 SPost
 Huang, Yindong [11196-63]
 SPost, [11196-65] SPost
 Huang, Yonggang [11185-27]
 SPost
 Huang, Yongzhen 11182
 Program Committee
 Huang, Yun [11194-33] SPost
 Huang, Yusheng [11185-46]
 SPost
 Huang, Zhangwei [11196-66]
 SPost
Huang, Zheng [11190-111]
 SPost, [11190-41] S7
Huang, Zhen-Li 11186
 Program Committee,
 [11186-1] S1, [11190-28] S5
 Huang, Zhiyun [11188-52] S10
 Huang, Zinan [11192-31] S4
 Hui, Fang [11186-19] S5,
 [11188-47] S9, [11194-28]
 SPost
 Hui, Fei [11191-44] SPost,
 [11191-45] SPost
 Huo, Tonglin [11185-20] S5

I

Ihrke, Ivo 11187 Program
 Committee
 IJzerman, Wilbert L. [11185-3]
 S1
Ikeda, Kanami [11185-6] S2
 Ikeda, Naoki [11193-9] S2
 Ikuta, Takuya [11195-24] S5
 Ingenhoff, Jan 11184 Program
 Committee
 Ingenhoff, Jan [11185-48]
 SPost
Ishikawa, Yasuhiko [11193-
 7] S2
 Issatayeva, Aizhan [11190-16]
 S3, [11191-9] S2
 Ito, Akio [11196-24] S5
 Ito, Yujiro [11186-5] S2
 Ivanenko, Aleksey V. [11184-
 37] SPost, [11193-48]
 SPost
J

Jafari, Zeinab [11184-17] S4
Jalali, Bahram 11192
 Conference Chair
 Jelbuldina, Madina [11190-16]
 S3
 Jepsen, Peter Uhd [11195-
 3] S1
 Jere, Sandy [11190-60] SPost
 Ji, Boyu [11194-21] SPost,
 [11194-24] SPost, [11194-
 25] SPost
 Ji, Ting [11187-12] S3, [11187-
 14] S3, [11187-24] S5
 Ji, Wei [11195-9] S2
 Jia, Bo Wen [11184-38] SPost
 Jia, Shaohui [11183-15] S3,
 [11183-18] S4
 Jia, Shijie [11192-1] S1
 Jia, Wei [11188-20] S4,
 [11188-30] S7, [11188-31]
 S7, [11188-34] S7, [11188-
 35] S7, [11188-63] SPost,
 [11188-75] SPost
 Jia, Wenjuan [11191-12] S3
 Jia, Xiaowei [11182-28] S8
 Jia, Yanyan [11188-68] SPost
 Jia, Zhixu [11192-18] S3
 Jiancheng, Jiang [11183-25]
 S5
 Jiang, Dongbin [11181-32]
 SPost
 Jiang, Gangyi 11187 S6
 Session Chair, [11187-32]
 S6, [11187-39] S8, [11187-
 40] S8
 Jiang, Guozhang [11191-40]
 SPost
 Jiang, Hao [11187-40] S8
 Jiang, Huilin [11186-34] SPost
 Jiang, Junfeng [11191-12] S3
Jiang, Liang [11193-23] S5
 Jiang, Lin [11189-60] SPost,
 [11189-68] SPost
 Jiang, Liwen [11194-5] S2
 Jiang, Luyao [11195-6] S2
 Jiang, Ming 11189 Program
 Committee
 Jiang, Nan [11196-44] SPost,
 [11196-46] SPost
 Jiang, Ning [11192-3] S1
 Jiang, Peng [11188-58] SPost
 Jiang, Qiuyang [11184-8] S2
 Jiang, Shanning [11185-4] S1,
 [11185-7] S2
Jiang, Shibin 11181
 Conference Chair, 11183
 Program Committee, 11191
 Program Committee
 Jiang, Wei 11184 S2 Session
 Chair, [11184-2] S1
 Jiang, Wenhui [11195-30]
 SPost
 Jiang, Xiaodong [11192-40]
 S3
 Jiang, Xiaoshun 11192
 Program Committee,
 11193 S5 Session Chair,
 [11193-23] S5
 Jiang, Xin [11193-37] S7
 Jiang, Xuhai [11191-21] S5,
 [11191-29] SPost
 Jiang, Yan [11184-23] S5

Jiang, Yilan [11181-8] S2,
 [11192-40] S3
 Jiang, Yiteng [11188-84]
 SPost, [11189-55] SPost,
 [11189-56] SPost
 Jiang, Yupeng [11186-35]
 SPost
 Jiang, Zhihua 11189 Program
 Committee
 Jiang, Zhinan [11196-13] S3
 Jiang, Zhuqing [11188-68]
 SPost, [11188-86] SPost
 Jiao, Junke [11183-15] S3,
 [11183-18] S4
 Jiao, Long [11181-33] SPost
 Jiao, Yuqing [11182-31] SPost,
 11184 S7 Session Chair,
 [11184-24] S6
 Jie, Jiang [11190-41] S7
 Jin, Biaobing 11196 Program
 Committee
 Jin, Ge [11188-20] S4, [11188-
 31] S7, [11188-34] S7,
 [11188-35] S7, [11188-75]
 SPost
 Jin, Guangyong [11184-32] S7
 Jin, Guofan [11188-17] S4,
 [11188-25] S5, [11188-27]
 S6, [11188-74] SPost
 Jin, Jinhua [11196-31] SPost
Jin, Lianhua 11189 Program
 Committee
 Jin, Long 11191 S2 Session
 Chair, [11191-1] S1
 Jin, Lufan [11184-43] SPost,
 [11193-38] S7
 Jin, Luhong [11190-33] S5
 Jin, Qi [11196-6] S2, [11196-8]
 S2
 Jin, Shangzhong [11186-25]
 S6, [11191-18] S4, [11194-
 23] SPost
 Jin, Tao [11189-36] SPost
 Jin, Wei 11191 Program
 Committee
 Jin, Weiqi 11196 Program
 Committee
 Jin, Xianmin [11195-22] S5
 Jin, Zeqing [11183-9] S2
 Jing, Feng [11181-12] S3,
 [11181-17] S4
 Jing, Lili [11190-66] SPost
 Jing, Nan [11187-48] SPost
 Jivraj, Jamil [11190-31] S5
 Joo, Jae Young 11185
 Program Committee

K

Kablukov, Sergey I. [11181-19]
 S4, [11181-36] SPost,
 [11190-17] S3
 Kai, Beichao [11182-32] SPost
 Kajdacsy-Balla, Andre [11185-
 10] S3
 Kajikawa, Kotaro [11194-29]
 SPost
 Kajzar, François 11195
 Program Committee
 Kalli, Kyriacos [11192-31] S4
 Kamenev, Vladimir [11188-60]
 SPost
 Kamiya, Kazuhide 11189
 Program Committee
 Kan, Qiang [11182-19] S4
Kanamori, Yoshiaki 11187
 Program Committee
 Kang, Deyong [11190-96]
 SPost, [11190-97] SPost,
 [11190-99] SPost
 Kang, Hongtao [11190-107]
 SPost
Karnowski, Karol [11190-
 8] S2
 Katayama, Seiji [11183-24] S5
 Kavehvas, Zahra [11196-
 21] S4
 Kawahito, Yosuke [11183-
 24] S5
 Kawashita, Kazuki [11193-
 7] S2
Kawata, Satoshi 11194
 Conference Chair, 11194
 S2 Session Chair, 11194
 S5 Session Chair
Ke, Jun [11187-38] S8
 Ke, Wei-wei [11181-14] S3

INDEX OF AUTHORS, CHAIRS, AND COMMITTEE MEMBERS

Bold = SPIE Member

Keller, Ursula 11195 Program Committee
Kemao, Qian 11189 Program Committee
Khan, Gufran Sayeed [11188-44] S9
Khan, Mohd Mansoor [11184-28] S6, [11193-10] S2, [11193-28] S5, [11195-35] SPost
Kharenko, Denis S. [11190-17] S3
Khomutov, Vladimir N. [11188-65] SPost
Khripunov, Sergey A. [11184-41] SPost, [11195-33] SPost
Kidger, Tina E. 11185 Program Committee
Kim, Chanju 11192 Program Committee
Kim, Dai-Sik 11195 Program Committee
Kim, Jaisoon 11185 Program Committee
Kim, Jin Hyeok [11183-27] SPost
Kim, Seongsin M. 11196 Program Committee
Kim, So Young [11183-27] SPost
Kitahara, Hideaki [11196-1] S1
Ko, Cheng-Hao [11184-9] S2, [11185-11] S3, [11190-2] S1, [11191-2] S1
Ko, Do-Kyeong 11181 Program Committee
Kobayashi, Kunio [11184-14] S3
Kobtsev, Sergey M. [11184-37] SPost, [11184-41] SPost, [11193-48] SPost, [11195-33] SPost
Kodama, Shohei [11183-20] S5
Kokawa, Hiroyuki [11183-20] S5
Kolosova, Viktoria [11190-19] S4
Kondo, Yasushi 11192 Program Committee
Kong, Fanyi [11190-70] SPost
Kong, Huan [11190-93] SPost
Kong, Meimei [11184-36] SPost
Kong, Ming [11185-25] S5
Kong, Ruiming [11190-26] S5
Kong, Xianghan [11190-117] SPost
Kong, Xiangshun [11187-35] S7
Kong, Zheng [11191-4] S1
König, Hans-Georg [11185-16] S4
Konishi, Tsuyoshi 11185 Program Committee
Konugolu Venkata Sekar, Sanathana [11190-47] S8
Korganbayev, Sanzhar [11190-16] S3
Kormilitsyna, Elizaveta [11187-53] SPost
Korolkov, Victor P. [11183-29] SPost, [11188-26] S6
Koyama, Hiromi [11193-9] S2
Kozlov, Sergei A. 11196 Program Committee, [11196-7] S2
Krasavin, Alexey V. [11194-7] S3
Krasilenko, Vladimir G. [11187-60] SPost
Kuang, Cuifang 11186 Program Committee, [11186-13] S3, [11186-36] SPost, [11186-41] SPost, [11186-46] SPost, [11190-109] SPost, [11190-33] S5
Kujawinska, Malgorzata 11186 Program Committee, 11189 Program Committee
Kukaev, Alexander Sergeevich [11191-22] S5
Kumar, Manoj [11185-5] S2
Kumar, Rajesh [11184-11] S3
Kumar, Varun [11188-48] S10, [11188-51] S10

Kuo, C. C. Jay 11187 Program Committee
Kurczveil, Géza [11184-20] S5
Kurihara, Kazuyoshi [11196-1] S1
Kuroda, Takashi [11193-9] S2
Kutulakos, Kyros 11187 Program Committee
Kuzin, Viktor [11188-60] SPost
Kuznetsov, Alexey G. [11181-19] S4, [11181-36] SPost, [11190-17] S3
Kwon, Jaejoong 11185 Program Committee

L

Labonté, Laurent [11193-15] S4
Lai, Puxiang 11186 Program Committee, [11186-17] S5, [11190-53] S9
Lam, Edmund Y. M. 11188 S8 Session Chair, [11188-2] S1
Lan, Fangming [11187-22] S5
Lan, Hui [11183-17] S4
Lan, Xuhui [11189-52] SPost
Landgraf, Rene 11191 Program Committee
Lang, Peng [11194-24] SPost, [11194-25] SPost
Lawrence, Jonathan 11183 Program Committee
Lazarev, Alexander A. [11187-60] SPost
Le Roux, Xavier [11193-15] S4
Le, Yanfen [11189-36] SPost
Ledemi, Yannick [11191-23] S5
Lee, Byoung-ho 11186 Program Committee, 11188 Program Committee, 11188 S4 Session Chair, [11188-10] S3
Lee, El-Hang 11193 Program Committee
Lee, Seungjae [11188-10] S3
Lee, Yun-Woo 11185 Program Committee
Lei, Bo [11192-36] SPost
Lei, Cheng [11192-26] S4
Lei, Ming 11186 S4 Session Chair, [11186-27] S7
Lei, Pingshun [11182-17] S5, [11182-35] SPost, [11187-46] SPost
Lei, Tao [11193-46] SPost
Lei, Ting 11186 S5 Session Chair
Leroy, Pierrick [11181-2] S1
Levchenko, Svitlana M. [11190-35] S5
Li, Anan [11190-114] SPost
Li, Angzhen [11192-1] S1
Li, Baojun 11184 Conference Chair, 11184 S3 Session Chair
Li, Bin [11184-46] SPost, [11192-35] SPost, [11193-41] SPost
Li, Bing [11188-41] S8
Li, Binhua [11189-69] SPost, [11189-71] SPost
Li, Bo [11183-14] S3
Li, Buhong 11190 S8 Session Chair, [11190-106] SPost, [11190-36] S6, [11190-86] SPost
Li, Changhui [11190-11] S2, [11190-76] SPost
Li, Chao [11188-15] S4
Li, Chengrui [11189-41] S9
Li, Chuankang [11186-2] S1
Li, Cui [11183-33] SPost
Li, Da [11187-52] SPost
Li, Daoyu [11187-11] S3
Li, Dehua [11188-13] S3
Li, Dezi [11190-94] SPost
Li, Dongxian [11191-24] SPost
Li, Fan [11192-39] SPost
Li, Fanghao [11191-18] S4
Li, Feiyan [11186-45] SPost
Li, Feng [11187-10] S2
Li, Gang [11185-44] SPost

Li, Gaoyuan [11193-14] S4, [11195-3] S1
Li, Ge [11196-41] SPost, [11196-42] SPost
Li, Guanglin [11186-34] SPost
Li, Guangyuan [11196-16] S3, [11196-18] S3, [11196-23] S4, [11196-30] S5, [11196-5] S1
Li, Guoqiang [11190-26] S5
Li, Guowei [11187-20] S4
Li, Haichao [11187-10] S2
Li, Haifeng 11188 Program Committee
Li, Haiqing [11181-29] SPost
Li, Haokun [11181-12] S3
Li, Hengyu [11185-21] S5
Li, Heping [11190-79] SPost
Li, Honghu [11196-29] S5, [11196-34] SPost
Li, Hongpu 11192 Program Committee
Li, Hongrui [11193-27] S5
Li, Huaming [11188-73] SPost
Li, Huanhao [11186-17] S5
Li, Hui 11182 S7 Session Chair, [11182-28] S8
Li, Hui 11190 Program Committee, [11190-63] SPost
Li, Hui [11190-108] SPost, [11190-38] S6
Li, Hui [11190-78] SPost
Li, Jiachao [11189-62] SPost
Li, Jiayi [11186-33] SPost
Li, Jiang [11184-19] S4
Li, Jianguo [11183-6] S2
Li, Jianxin [11185-19] S5
Li, Jianxiong [11189-19] SPost, [11189-21] SPost
Li, Jiasong [11190-13] S2
Li, Jiatian [11190-131] SPost
Li, Jilong [11192-12] S2
Li, Jimin 11182 Program Committee
Li, Jing [11196-29] S5
Li, Jingke [11191-21] S5, [11191-29] SPost
Li, Jingzhen [11188-83] SPost
Li, Jining [11196-22] S4, [11196-64] SPost
Li, Jinyan [11181-29] SPost
Li, Junchang 11188 Program Committee
Li, Junfeng [11184-46] SPost
Li, Junjie [11188-20] S4, [11188-30] S7, [11188-31] S7, [11188-34] S7, [11188-35] S7, [11188-75] SPost
Li, Junyang [11185-37] SPost
Li, Kaipeng [11191-41] SPost
Li, Kang [11184-15] S3, [11184-34] SPost
Li, KeXin [11192-15] S2
Li, Kun [11187-30] S6, [11187-41] S8
Li, Lianhuang [11190-96] SPost, [11190-99] SPost
Li, Lianyan [11192-2] S1
Li, Lifeng [11188-69] SPost
Li, Lijuan [11196-17] S3
Li, Lin [11190-15] S3
Li, Linfu [11189-46] SPost
Li, LinXin [11190-86] SPost
Li, Long [11189-72] SPost
Li, Luchang [11186-1] S1
Li, Luchang [11190-28] S5
Li, Lujie [11184-32] S7
Li, Lyla [11193-12] S3
Li, Maochun [11191-44] SPost, [11191-45] SPost
Li, Maozhong [11182-17] S5
Li, Meng [11187-21] S5
Li, Mengjie [11191-5] S1, [11193-20] S4
Li, Mengzhu [11186-38] SPost, [11186-40] SPost, [11186-42] SPost
Li, Mi [11186-11] S3
Li, Miaoqi [11183-6] S2
Li, Min [11181-12] S3
Li, Ming 11182 Program Committee, [11182-10] S3, 11192 Conference Chair, [11192-10] S2, [11192-32] S4

Li, Ming [11182-19] S4
Li, Na [11191-21] S5, [11191-29] SPost
Li, Peng [11190-9] S2
Li, Peng [11195-34] SPost
Li, Pengcheng [11190-46] S8
Li, Qi [11190-50] S8
Li, Qiang [11194-10] S4, [11194-33] SPost
Li, Qiaoli [11182-1] S1
Li, Qijun [11186-54] SPost
Li, Qin [11186-48] SPost, 11190 S9 Session Chair, [11190-6] S2
Li, Qing [11192-18] S3
Li, Qingru [11181-11] S3
Li, Rao [11181-21] SPost
Li, Renyun [11191-12] S3
Li, Ruihua [11185-37] SPost
Li, Ruijia [11188-49] S10
Li, Ruoming [11192-14] S2
Li, Ruxin 11181 Conference Chair, [11181-201]
Li, Sen [11190-3] S1
Li, Sensen [11182-34] SPost
Li, Shiguang [11185-47] SPost
Li, Shiwei [11190-110] SPost
Li, Shuangying [11185-20] S5
Li, Taoran [11185-32] SPost
Li, Wangzhe 11192 S3 Session Chair, [11192-14] S2
Li, Wangqing 11187 Program Committee
Li, Wei 11182 Program Committee, [11182-10] S3, [11192-10] S2
Li, Wei [11187-14] S3, [11187-24] S5
Li, Weijun [11190-41] S7
Li, Weipeng [11190-112] SPost
Li, Wenqiang [11185-37] SPost
Li, Wenqiang [11189-44] SPost
Li, Wen-sheng [11189-44] SPost, [11189-61] SPost
Li, Wenxue [11181-5] S1
Li, Xi [11190-38] S6
Li, Xianjie 11182 Program Committee
Li, Xianli [11185-13] S3
Li, Xianqiang [11190-40] S6
Li, Xiaoxu [11187-26] S5
Li, Xin [11184-23] S5
Li, Xingde 11190 Conference Chair, 11190 S2 Session Chair
Li, Xinghui [11182-36] SPost, [11188-33] S7, [11189-17] S4, [11189-19] SPost, [11189-21] SPost, [11193-16] S4, [11193-25] SPost
Li, Xingyu [11181-24] SPost
Li, Xin-tian [11191-3] S1
Li, Xiujian [11186-38] SPost, [11186-39] SPost, [11186-40] SPost, [11186-42] SPost, [11193-14] S4
Li, Xu [11190-88] SPost
Li, Yanfei [11191-15] S3
Li, Yang [11187-57] SPost
Li, Yaning [11187-5] S1
Li, Yaolong [11195-8] S2
Li, Yejin [11185-28] SPost
Li, Yi [11196-68] SPost
Li, Yifan [11184-27] S6, [11184-43] SPost, [11193-38] S7
Li, Yingchao [11186-34] SPost
Li, Yong [11188-84] SPost, [11189-55] SPost, [11189-56] SPost
Li, Yongzeng [11190-41] S7
Li, Yu Zheng [11196-31] SPost
Li, Yuanjie [11184-44] SPost
Li, Yue [11181-20] S4
Li, Yunqi [11190-120] SPost
Li, Zhengda [11185-28] SPost
Li, Zhi [11196-27] S5
Li, Zhifang [11190-63] SPost, [11190-94] SPost
Li, Zhihong [11191-32] SPost
Li, Zhihua [11184-46] SPost, [11192-35] SPost, [11193-41] SPost

Li, Zhixian [11181-18] S4
Li, Zhi-Yuan 11194 Program Committee
Li, Zhuguo [11183-20] S5
Li, Zimeng [11187-59] SPost
Liang, Chao-Wen 11189 Program Committee
Liang, Chenyu [11182-25] S7
Liang, Di D. 11184 S4 Session Chair, [11184-20] S5
Liang, Hongyao [11185-18] S4, [11187-49] SPost, [11190-87] SPost
Liang, Lan-Ju [11196-14] S3, [11196-32] SPost
Liang, Monder [11182-6] S2
Liang, Rongguang [11185-25] S5, [11185-26] S5
Liang, Wanlin [11196-41] SPost, [11196-42] SPost, [11196-44] SPost, [11196-46] SPost
Liang, Xia [11184-5] S1
Liang, Xiao [11181-25] SPost, [11181-4] S1
Liang, Xiaoyan [11181-1] S1
Liang, Xiaozhou [11193-47] SPost
Liang, Xu [11190-109] SPost
Liang, Xuan [11183-17] S4
Liang, Yanmei [11190-115] SPost, [11190-5] S1
Liang, Yichao [11189-8] S2
Liang, Yizhi [11186-6] S2
Liang, Zhongcheng 11184 Program Committee, [11184-36] SPost, [11186-45] SPost, [11187-56] SPost
Liang, Zhou [11185-37] SPost
Liao, Kun [11195-31] SPost
Liao, Meihua [11187-45] SPost
Liao, Meisong [11195-30] SPost
Liao, Riwei [11192-20] S3
Liao, Wenchao [11190-124] SPost, [11190-30] S5
Liao, Xianglian [11190-106] SPost
Lim, Dong-Kwon [11194-3] S2
Lin, Ching-Fuh 11193 Program Committee
Lin, Fujiang [11192-35] SPost
Lin, Gong-Ru 11193 Program Committee
Lin, Hao [11190-103] SPost
Lin, Honghuan [11181-16] S4, [11181-17] S4, [11181-20] S4
Lin, Hui [11188-33] S7, [11193-25] SPost
Lin, Jingquan [11183-28] SPost, [11194-21] SPost, [11194-24] SPost, [11194-25] SPost
Lin, Jueqian [11190-22] S4, [11190-77] SPost, [11190-84] SPost, [11190-92] SPost
Lin, Kanglong [11192-6] S1
Lin, Lisheng [11190-106] SPost
Lin, Meiai [11190-83] SPost
Lin, Qinggang [11188-83] SPost
Lin, Riqiang [11190-54] S9
Lin, Shin-Fa [11184-9] S2, [11185-11] S3
Lin, Wannan [11190-33] S5
Lin, Xiaodan [11188-57] S11
Lin, Xing 11187 Program Committee
Lin, Xing [11187-70] S5
Lin, Xueliang [11193-47] SPost
Lin, Yandong [11189-15] S3
Lin, Yongping [11190-63] SPost
Lin, Yuxiang 11189 Program Committee
Lin, Zhanyu [11190-108] SPost
Ling, Xiaohui [11181-31] SPost, [11193-42] SPost

INDEX OF AUTHORS, CHAIRS, AND COMMITTEE MEMBERS

Bold = SPIE Member

Liu, Ai Qun 11188 Program Committee, [11188-14] S4, 11194 Program Committee, [11195-17] S4
Liu, Ailin [11190-26] S5
Liu, Anjin 11182 S8 Session Chair, [11182-24] S7
Liu, Boliang [11196-29] S5, [11196-34] SPost
Liu, Chao [11186-6] S2
Liu, Chao [11188-12] S3, [11188-28] S6, [11188-55] S11
Liu, Chao [11185-13] S3
Liu, Chaoyue [11184-19] S4
Liu, Cheng [11188-62] SPost, [11190-71] SPost
Liu, Chi [11190-123] SPost
Liu, Chong 11181 Program Committee
Liu, Deming 11191 Program Committee
Liu, Don [11196-4] S1
Liu, Dong 11189 Program Committee
Liu, Erhu [11184-45] SPost
Liu, Fang [11193-1] S1
Liu, Fang [11190-133] SPost, [11190-72] SPost
Liu, Fangfang [11189-22] S5
Liu, Fanghua [11191-41] SPost
Liu, Fengqi 11196 Program Committee
Liu, Gangping [11187-38] S8
Liu, Guodong [11190-75] SPost
Liu, Haishun [11196-28] S5, [11196-50] SPost
Liu, Hang [11184-32] S7
Liu, Hao [11181-8] S2, [11192-40] S3
Liu, Hong 11190 Program Committee
Liu, Hongjie [11188-82] SPost
Liu, Hongyao [11194-5] S2
Liu, Houquan [11191-42] SPost
Liu, Hua [11185-39] SPost, [11186-51] SPost, [11188-18] S4, [11189-64] SPost, [11190-100] SPost, [11191-39] SPost
Liu, Huafeng 11190 Program Committee
Liu, Huan [11196-20] S4
Liu, Huanhuan [11191-26] S6, [11192-25] S3
Liu, Hui [11189-60] SPost, [11189-68] SPost
Liu, Huiping [11188-16] S4, [11188-79] SPost
Liu, Huiyun [11182-7] S2
Liu, Jialin [11192-38] SPost
Liu, Jian 11183 Conference Chair
Liu, Jian [11194-16] S6
Liu, Jietao [11187-12] S3, [11187-14] S3, [11187-24] S5
Liu, Jing [11196-40] SPost
Liu, Jinhong [11195-18] S4
Liu, Jinsong 11196 Program Committee
Liu, Jinyuan [11191-27] S6
Liu, Jinyuan [11189-47] SPost
Liu, Jiqiao [11185-47] SPost, [11185-49] SPost
Liu, Juan [11188-23] S5
Liu, Jun [11184-42] SPost
Liu, Jun [11190-13] S2
Liu, Jung-Ping 11188 S11 Session Chair, [11188-24] S5
Liu, Kelian [11190-74] SPost
Liu, Lianxiang [11184-4] S1
Liu, Lina [11190-106] SPost, [11190-86] SPost
Liu, Liu [11184-25] S5
Liu, Lixian [11187-12] S3
Liu, Lixin [11190-104] SPost
Liu, Min [11195-9] S2
Liu, Minshi [11186-35] SPost
Liu, Ning 11182 Program Committee
Liu, Penghuan [11186-16] S4
Liu, Qi [11190-89] SPost

Liu, Qiang [11185-13] S3
Liu, Qiaoxi [11190-65] SPost
Liu, Qingwen 11191 S3 Session Chair, [11191-20] S5
Liu, Qiuyu [11183-7] S2
Liu, Quan [11188-14] S4
Liu, Quan [11188-72] SPost, [11188-81] SPost
Liu, Ruonan [11184-46] SPost, [11192-35] SPost, [11193-41] SPost
Liu, Shangjing [11192-22] SPost
Liu, Shangmin [11190-108] SPost
Liu, Shiqin [11192-3] S1
Liu, Shun-gui [11191-3] S1
Liu, Shuyuan [11184-29] S7
Liu, Songde [11186-21] SPost, [11186-55] S5, [11190-52] S9
Liu, Songhao [11196-16] S3
Liu, Teng [11190-48] S8
Liu, Tiegeng 11191 Conference Chair, [11191-12] S3
Liu, Tiexin [11187-61] SPost
Liu, Timon Cheng-Yi [11190-43] S7
Liu, Wan [11187-3] S1
Liu, Wang [11190-94] SPost
Liu, Wei [11185-13] S3
Liu, Wen [11185-48] SPost
Liu, Wende [11189-15] S3
Liu, Wenhao 11182 Program Committee
Liu, Wenquan [11196-23] S4, [11196-30] S5, [11196-5] S1
Liu, Xianlin [11193-49] SPost, [11193-55] SPost
Liu, Xiaoyao [11184-36] SPost
Liu, Xin [11190-130] SPost, [11190-29] S5, [11190-93] SPost, [11190-95] SPost
Liu, Xinhao [11193-22] S5
Liu, Xinyue [11186-4] S1
Liu, Yasheng [11183-4] S1
Liu, Yebin [11187-30] S6
Liu, Yi [11186-34] SPost
Liu, YiDi [11190-105] SPost
Liu, Ying [11190-93] SPost
Liu, Yinggang [11185-35] SPost
Liu, Yingjian [11192-8] S1
Liu, Yitian [11193-22] S5
Liu, Yiwei [11188-68] SPost
Liu, Yong [11181-11] S3, 11182 Program Committee, [11182-20] S6, 11192 Program Committee
Liu, Yong [11186-46] SPost
Liu, Yong [11188-8] S2
Liu, Yu [11181-12] S3
Liu, Yuan [11189-52] SPost
Liu, Zejin 11181 Program Committee
Liu, Zhe [11195-26] S5
Liu, Zhenhuan [11195-31] SPost
Liu, Zhichao [11192-25] S3
Liu, Zhiwen 11186 Program Committee
Liu, Zhiyi [11190-21] S4
Liu, Zhuang [11186-34] SPost
Liu, Ziyuan [11183-28] SPost
Livshits, Irina L. 11185 Program Committee
Lo, Hsin-Pin [11195-24] S5
Lobino, Mirko 11195 S2 Session Chair, [11195-2] S1
Lodahl, Peter [11195-26] S5
Long, Haiyan [11188-16] S4
Long, Jiangyou [11183-6] S2
Long, Xuan [11192-2] S1
Loosen, Peter [11185-16] S4
Louvet, Geoffrey [11191-23] S5
Lu, Chao-Yang [11195-11] S3
Lu, Dajiang [11187-45] SPost
Lu, Fake [11190-18] S4
Lu, Guowei [11193-18] S4
Lu, Haiou [11188-33] S7
Lu, Huihui [11190-64] SPost
Lu, Jiao [11190-101] SPost, [11190-23] S4

Lu, Jin Chao [11188-81] SPost
Lu, Jinchao [11188-72] SPost
Lu, Jinyu [11189-63] SPost
Lu, Li [11196-61] SPost
Lu, Liangjun [11184-10] S3
Lu, Mengyang [11190-29] S5, [11190-95] SPost
Lu, Min [11190-48] S8
Lu, Qijing [11193-49] SPost, [11193-55] SPost
Lu, Quan [11188-77] SPost
Lu, Shizhuan [11181-31] SPost
Lu, Sung-Lin [11188-24] S5
Lu, Xiaofei [11196-68] SPost
Lu, Xiaowei [11188-83] SPost
Lu, Xinchao [11194-5] S2
Lu, Xinmin [11190-26] S5
Lu, Xinyi [11184-34] SPost
Lu, Xuejun 11184 Program Committee
Lu, Yan-Qing 11193 Program Committee
Lu, Yao [11182-25] S7
Lu, Yuanfu [11196-16] S3, [11196-18] S3, [11196-23] S4, [11196-30] S5, [11196-5] S1
Lu, Yun [11192-28] S4
Lu, Yunkai [11188-29] S7
Lu, Yuying [11196-32] SPost
Lu, Zuye [11182-23] S6
Ludwig, Arne [11195-26] S5
Luo, Hao [11194-33] SPost
Luo, Huiling [11193-42] SPost
Luo, Jianwen [11190-51] S9
Luo, Jintao [11186-28] S7
Luo, Qingming 11190 Conference Chair, 11190 S3 Session Chair, [11190-114] SPost
Luo, Wenzhen [11196-50] SPost
Luo, Xiaofei [11190-69] SPost
Luo, Yuan 11187 Program Committee
Luo, Zhenpeng [11188-46] S9
Luonan, Chen [11186-47] SPost
Lutsenko, Denis [11193-48] SPost
Lv, Guoqiang [11188-13] S3
Lv, Haibing [11181-8] S2, [11192-40] S3
Lv, Qi-shen [11191-3] S1
Lv, Wei-tao [11196-27] S5
Lv, Xiaohua [11190-121] SPost
Lv, Xiao-yi [11189-14] S3, [11189-18] S4, [11189-23] S5
Lv, Xing [11186-11] S3, [11188-19] S4
Lyu, Sihui [11196-63] SPost, [11196-65] SPost

M

Ma, Cheng [11186-18] S5, [11190-51] S9
Ma, Chunliang [11182-3] S1
Ma, Hui 11190 Program Committee, 11190 S5 Session Chair, [11190-112] SPost, [11190-46] S8, [11192-20] S3, [11192-21] S3
Ma, Huilian 11191 S5 Session Chair
Ma, Jianshe [11188-46] S9
Ma, Jiyang [11193-23] S5
Ma, Jun [11185-19] S5
Ma, Junlin [11188-57] S11
Ma, Lina [11185-23] S5
Ma, Liuzheng [11191-24] SPost
Ma, Lu [11184-15] S3
Ma, Ruyi [11182-36] SPost
Ma, Shouhu [11181-30] SPost
Ma, Si [11188-7] S2
Ma, Teng [11191-4] S1
Ma, Xiaosong [11195-12] S3
Ma, Xiaoyan [11187-25] S5
Ma, Xiaoyu 11182 Program Committee
Ma, Xiuhua [11185-47] SPost

Ma, Yaoguang 11183 Program Committee, 11193 S7 Session Chair, [11193-22] S5, [11193-3] S1
Ma, Yi [11190-14] S3
Ma, Yi [11181-14] S3
Ma, Yubing [11187-55] SPost
Ma, Yungui 11196 Program Committee, [11196-37] SPost, [11196-38] SPost
Ma, Zhan [11187-34] S7
Madni, Asad M. 11192 Program Committee
Maegami, Yuriko [11193-34] S7
Mai, Tongtong [11190-88] SPost
Majeed, Hassaan [11185-10] S3
Majumdar, Arka [11193-8] S2
Malinowska, Monika [11190-8] S2
Malyshev, Anatoly I. [11188-26] S6
Man, Shuai [11189-65] SPost, [11189-66] SPost
Mano, Takaaki [11193-9] S2
Mao, Hua [11190-48] S8
Mao, Jiangbing [11190-118] SPost
Mao, Liming [11191-21] S5, [11191-29] SPost
Mao, Shan [11185-9] S2
Mao, Yuan [11191-7] S2
Marris-Morini, Delphine [11193-15] S4
Marshall, Andrew R. J. [11184-26] S6
Masaki, Kiyotaka [11183-23] S5, [11183-24] S5
Masoudi, Ali 11184 Program Committee
Masuda, Shihomi [11194-27] SPost
Matoba, Osamu 11185 Conference Chair, 11185 S1 Session Chair, [11185-5] S2
Matsuda, Nobuyuki [11195-24] S5
Matveeva, Karina [11190-19] S4, [11194-20] SPost
Mawale, Ravi [11183-3] S1
Mayerich, David [11186-23] S6
Mazeas, Florent [11193-15] S4
Mazlin, Viacheslav [11190-10] S2
McBride, John W. 11189 S9 Session Chair, [11189-31] S7
Mecé, Pedro [11190-10] S2
Mei, Liang [11191-4] S1
Meng, Haifeng [11189-65] SPost, [11189-66] SPost
Meng, Jianjun [11182-1] S1
Meng, Linghai [11184-45] SPost
Meng, Lisha [11187-36] S7
Meng, Weizhe [11192-29] S4
Meng, Zhaozong [11189-29] S7
Mengqiu, Fang [11181-34] SPost
Messaddeq, Younès [11191-23] S5
Meuret, Youri 11185 S4 Session Chair, [11185-2] S1
Miao, Chaofeng [11188-15] S4, [11188-29] S7
Miao, Wei [11196-33] SPost, [11196-4] S1
Miao, Xinxiang [11181-8] S2, [11192-40] S3
Miao, Yusi [11187-18] S4
Michel, Jurgen 11193 Program Committee
Midolo, Leonardo [11195-26] S5
Mikerin, Sergey L. [11188-26] S6
Min, Junwei [11188-4] S1
Ming, Hai 11184 Program Committee, 11188 Program Committee
Ming, Yao [11196-29] S5

Minz, Manoranjan [11193-10] S2, [11193-28] S5
Mishra, Darpan [11193-10] S2, [11193-28] S5
Misuk, Vladimir [11190-19] S4
Mizutani, Yasuhiro 11189 Program Committee
Mo, Fan [11186-54] SPost
Mo, Jianhua [11189-11] S2, [11189-58] SPost, [11190-90] SPost, [11190-98] SPost
Moiseeva, Ekaterina [11190-19] S4
Molardi, Carlo [11190-16] S3, [11191-9] S2
Mollica, Florian [11183-22] S5
Mou, Chengbo [11192-31] S4
Mou, Xuanqin [11187-57] SPost, [11187-7] S2, [11187-8] S2, [11187-9] S2
Mu, Jie [11184-32] SPost
Mu, Ning [11196-13] S3
Muhammad, Shoaib [11184-44] SPost
Muhutijiang, Bilali [11188-78] SPost
Murai, Shunsuke [11194-19] S6

N

Nakajima, Makoto 11196 Program Committee
Nakamura, Takahiro 11193 Program Committee
Nakarmi, Bikash [11182-16] S5, [11184-22] S5, [11184-31] S7
Nasyrov, Ruslan K. [11188-26] S6, [11188-65] SPost, [11188-67] SPost
Nazabal, Virginie [11183-3] S1, [11191-23] S5
Nemec, Petr [11183-3] S1, [11191-23] S5
Nemov, Ilya N. [11181-19] S4
Neumann, Niels 11191 Program Committee
Ng, Tien Khee [11191-7] S2
Ni, Kai [11182-36] SPost, [11188-33] S7, [11189-17] S4, [11189-19] SPost, [11189-21] SPost, [11193-16] S4, [11193-25] SPost
Ni, Shuyu [11184-23] S5
Niazi, Kayvan Reza 11192 Program Committee
Nie, Kaixuan [11190-116] SPost, [11190-123] SPost
Nie, Yunfeng [11185-17] S4
Nie, Zhiqiang [11182-21] S6
Niedzwiedzki, Paulina [11190-8] S2
Nikitovich, Diana V. [11187-60] SPost
Ning, Lei [11184-30] S7, [11185-18] S4, [11187-49] SPost, [11189-13] S3, [11190-87] SPost
Ning, Lizhen [11191-25] S6
Ning, Mengyang [11188-64] SPost
Ning, Siyu [11187-50] SPost, [11196-45] SPost
Ning, Xiaolong [11185-48] SPost
Niu, Haibin [11184-30] S7, [11187-49] SPost
Niu, Haibing [11185-18] S4, [11190-87] SPost
Niu, Longfei [11181-8] S2, [11192-40] S3
Nomura, Takanori 11185 Program Committee
Nordlander, Peter 11194 Program Committee, [11194-6] S3
Normani, Simone [11191-23] S5
Nunna, Kalyan [11184-26] S6
Nyushkov, Boris N. [11184-37] SPost, [11193-48] SPost

INDEX OF AUTHORS, CHAIRS, AND COMMITTEE MEMBERS

Bold = SPIE Member

O
Oda, Robert [11186-22] S5
O'Dwyer, Kevin [11188-45] S9
Ohishi, Yasutake [11181-15] S4, [11182-18] S3, [11195-30] SPost
Ohno, Morifumi [11193-34] S7
Ohodnicki, Paul R. [11183-17] S4
Oho, Akihisa [11184-7] S2
Ohulchanskyy, Tymish Y. [11190-119] SPost, [11190-45] S7
Okada, Naotada [11183-19] S4
Ooi, Boon S. [11191-7] S2
Oser, Dorian [11193-15] S4
Osten, Wolfgang 11186 Program Committee
Otani, Chiko 11196 Program Committee
Otani, Yukitoshi 11189 Program Committee, 11189 S3 Session Chair, [11189-20] S5
Ouyang, Wentai [11183-15] S3, [11183-18] S4
Ouyang, Zheng [11188-7] S2
Oxenlöwe, Leif K. [11195-16] S4
Özbek, Ali [11186-7] S2
Ozeki, Yasuyuki [11186-22] S5

P
Pacheco Tobo, Andrea Liliana [11190-47] S8
Pan, Cao Feng [11193-36] S7
Pan, Ci-Ling [11190-30] S5, 11196 Program Committee
Pan, Gui-Ming [11194-22] SPost
Pan, Huang [11182-17] S5
Pan, Jian-Wei 11195 Program Committee
Pan, Jing [11191-16] S4
Pan, Jinghan [11186-39] SPost, [11186-42] SPost
Pan, Mark [11185-29] SPost, [11185-53] SPost
Pan, Meiyang [11194-33] SPost
Pan, Shilong 11182 S6 Session Chair, [11182-16] S5, [11184-22] S5, [11184-31] S7, [11192-30] S4
Pan, Xiangpeng [11186-12] S3
Pan, Yingtian 11190 Program Committee
Pan, Zhifeng [11185-36] SPost
Pang, Chenlei [11186-20] S5, [11186-30] S7, [11193-13] S3
Pang, Fufei [11191-26] S6, [11192-25] S3
Pang, Yue [11196-56] SPost
Pankov, Artem [11192-24] S3
Papon, Camille [11195-26] S5
Park, June [11183-27] SPost
Park, Sung Chan 11185 Program Committee
Park, YongKeun 11188 S6 Session Chair, [11188-5] S2
Pauliat, Gilles 11185 Program Committee
Pecinka, Lukas [11183-3] S1
Pedrini, Giancarlo 11189 Program Committee
Pei, Li 11191 Program Committee
Pellionisz, Peter [11190-34] S5, [11190-4] S1
Pelzel, Rodney [11184-26] S6
Peng, Dongqing [11186-37] SPost
Peng, Gangding 11184 Program Committee, 11191 Conference Chair
Peng, Hao [11191-25] S6
Peng, Jinggang [11181-29] SPost
Peng, Kuan [11190-69] SPost
Peng, KunChi 11195 Program Committee

Peng, Ruwen 11194 Program Committee
Peng, Tong [11188-4] S1
Peng, Wanjin [11181-14] S3
Peng, Xiang 11185 Program Committee, [11187-45] SPost, 11188 Program Committee, 11189 Program Committee, 11189 S5 Session Chair, [11189-1] S1
Peng, Xiao [11190-116] SPost, [11190-123] SPost
Peng, Yi-fan 11187 Program Committee, [11187-13] S3, [11187-17] S4
Peng, Zeng [11186-52] SPost
Peng, Zhangkai [11190-124] SPost
Peng, Zheng [11190-116] SPost, [11190-123] SPost
Peng, Zongju [11187-22] S5, [11187-25] S5
Peters, Frank Hudson 11182 Program Committee
Petrushko, Yulia [11190-45] S7
Pian, Sijie [11193-22] S5
Ponomareva, Evgenia A. [11196-7] S2
Poon, Andrew W. 11193 Program Committee
Poon, Ting-Chung 11188 Program Committee, [11188-53] S11, [11188-54] S11, [11188-6] S2
Popescu, Gabriel [11185-10] S3
Potemin, Igor S. [11185-40] SPost, [11185-41] SPost, [11185-42] SPost, [11185-43] SPost
Prasad, Paras N. 11190 Program Committee
Prochnau, Marcel [11185-16] S4
Prokes, Lubomir [11183-3] S1
Prylutska, Svitlana [11190-45] S7
Pu, Jixiong [11191-5] S1, [11193-20] S4
Pun, Edwin Y. 11182 Program Committee
Purtskhvanidze, Violeta [11190-73] SPost
Putilin, Sergey E. [11196-7] S2
Q
Qi, Dalong [11186-8] S2
Qi, Haiyan [11196-56] SPost
Qi, Junli [11186-38] SPost, [11186-39] SPost, [11186-40] SPost, [11186-42] SPost
Qi, Litao [11183-13] S3, [11183-4] S1
Qi, Ming [11183-7] S2
Qi, Naijie [11188-62] SPost
Qi, Peiliang [11186-37] SPost
Qi, Xiaoguang [11191-12] S3
Qi, Zhiqiang [11184-35] SPost, [11193-44] SPost
Qian, Jiaming [11189-8] S2
Qian, Jun 11190 Program Committee
Qian, Qiaojian [11187-34] S7
Qian, Wei [11190-101] SPost
Qian, Xu [11184-38] SPost
Qiang, Hao [11186-43] SPost, [11187-51] SPost
Qiang, Xiaogang [11195-23] S1
Qiao, Hui [11187-26] S5
Qiao, Pengwu [11193-50] SPost
Qiao, Wen [11188-11] S3
Qiao, Xueguang [11185-35] SPost, 11191 Program Committee
Qin, Guanshi [11192-18] S3
Qin, Hongpeng [11188-86] SPost
Qin, Hua 11196 Program Committee
Qin, Jin [11192-8] S1
Qin, Jun [11184-29] S7
Qin, Na [11186-48] SPost

Qin, Na [11190-6] S2
Qin, Rikang [11188-68] SPost
Qin, Wei [11190-55] S9
Qin, Weiping [11192-18] S3
Qin, Yulu [11194-21] SPost, [11194-24] SPost, [11194-25] SPost
Qin, Yuwen 11190 Program Committee
Qin, Zhentao [11187-62] SPost
Qiu, Haixia 11190 S7 Session Chair, [11190-105] SPost, [11190-37] S6
Qiu, Huacheng [11191-28] S6
Qiu, Jinghui [11196-25] S5
Qiu, Kun [11192-3] S1
Qiu, Min 11194 Conference Chair, 11194 S3 Session Chair
Qiu, Min 11194 S4 Session Chair, [11194-17] S6, [11194-33] SPost
Qiu, Pingping [11182-19] S4
Qiu, Rui [11190-26] S5
Qiu, Xiaolang [11182-29] S8, [11182-30] S8
Qu, Hang [11185-45] SPost
Qu, Junle 11190 Program Committee, [11190-116] SPost, [11190-119] SPost, [11190-123] SPost, [11190-35] S5, [11190-45] S7
Quan, Tingwei [11190-107] SPost, [11190-110] SPost, [11190-114] SPost
Quan, Xiangyu [11185-5] S2
Que, Dai Cuong [11185-22] S5

R
Radnatarov, Daba A. [11184-41] SPost, [11195-33] SPost
Rafalskiy, Vladimir [11190-19] S4
Ran, Zeng-Ling [11191-28] S6
Rao, Yunjiang 11191 Program Committee
Rapolu, Mounika [11190-8] S2
Rarity, John G. [11195-25] S5
Rastogi, Vivek [11188-44] S9, [11188-51] S10, [11188-66] SPost
Razansky, Daniel [11186-7] S2, [11190-202]
Rebling, Johannes [11186-7] S2
Reinsch, Heiko [11189-4] S1
Ren, Jiao-jiao [11196-17] S3
Ren, Kun [11187-36] S7, [11187-63] SPost
Ren, Weifeng [11185-36] SPost
Ren, Wenjiao [11190-96] SPost, [11190-97] SPost, [11190-99] SPost
Ren, Xifeng 11195 S4 Session Chair, [11195-21] S5
Ren, Yu [11189-22] S5
Ren, Yuan [11196-4] S1
Ren, Zhong [11190-75] SPost
Rensing, Marc [11190-64] SPost
Rodrigues, Janderson Rocha [11184-18] S4
Rong, Haisheng 11193 Program Committee
Rong, Lu [11188-41] S8
Rosenfeld, Lawrence M. [11195-25] S5
Ross, Caroline A. [11184-29] S7
Rostomyan, Dzhan [11190-73] SPost
Rottwitz, Karsten [11195-16] S4
Ruan, Weiwei [11186-50] SPost, [11190-118] SPost
Rui, Duan [11190-43] S7
Russell, Philip St. John [11193-37] S7
Ryckaert, Wouter R. [11185-2] S1

S
Sakino, Yoshihiro [11183-23] S5
Sakoda, Kazuaki [11193-9] S2
Salem, Samia F. [11190-61] SPost
Sales Maicas, Salvador [11190-16] S3
Salman, Ullah [11193-3] S1
Sametov, Alexander R. [11188-26] S6
Samusev, Ilya G. [11190-19] S4, [11193-39] SPost, [11194-20] SPost
Sander, Michelle Y. 11186 Program Committee
Sang, Xinzhu [11188-64] SPost
Sano, Tomokazu [11183-23] S5, [11183-24] S5
Sano, Yuji 11183 Conference CoChair, 11183 S4 Session Chair, 11183 S5 Session Chair, [11183-20] S5, [11183-23] S5, [11183-24] S5
Sasaki, Keiji [11194-14] S5
Sato, Imari 11187 Program Committee
Sato, Ryo [11186-5] S2
Sato, Yoichi 11187 Program Committee
Sato, Yutaka S. [11183-20] S5
Sayers, Benjamin D.J. [11195-25] S5
Schechner, Yoav Yosef 11187 Program Committee
Scheda, Emiliano [11190-16] S3
Scheres, Sven [11185-16] S4
Schott, Rüdiger [11195-26] S5
Schulz, Michael [11189-4] S1
Schuster, Tobias 11191 Program Committee
Serebrennikov, Kirill [11193-48] SPost
Sevryugin, Alexander A. [11188-39] S8
Shakher, Chandra [11188-44] S9, [11188-48] S10, [11188-51] S10, [11188-66] SPost
Shalymov, Egor V. [11188-50] S10, [11191-19] S4, [11191-22] S5
Shalymov, Roman V. [11191-19] S4
Shan, Xiaotao [11184-39] SPost
Shang, Mingtao [11186-1] S1, [11190-28] S5
Shang, Yu [11190-132] SPost
Shao, Conghui [11190-46] S8
Shao, Liyang [11186-52] SPost, [11191-24] SPost
Shao, Luqing [11193-19] S4
Shao, Min [11185-35] SPost
Shao, Xiaopeng [11187-12] S3, [11187-14] S3, [11187-24] S5, [11187-37] S7, [11189-27] S6, [11189-35] S8
She, Rongbin [11196-23] S4, [11196-5] S1
Shen, Benjian [11181-12] S3
Shen, Chuan [11188-76] SPost
Shen, Dan [11190-32] S5
Shen, Deyuan 11181 Program Committee
Shen, Jianping [11192-2] S1
Shen, Kang [11186-29] SPost, [11190-52] S9
Shen, Shi [11191-26] S6
Shen, Steven [11190-13] S2
Shen, Tingfeng [11190-97] SPost
Shen, Xiaoyan [11189-52] SPost
Shen, Xingliang [11186-52] SPost
Shen, Yibing [11187-54] SPost
Sheng, Lijuan [11193-12] S3
Sheng, Wen [11196-61] SPost
Sheng, Yunlong 11188 Conference Chair, 11188 S1 Session Chair

Sheridan, John T. 11187 Program Committee
Shi, Aisi [11190-118] SPost
Shi, Bao-Sen [11195-27] S5
Shi, Guangming 11187 Program Committee
Shi, Haodong [11186-34] SPost
Shi, Jiancheng 11196 Program Committee
Shi, Jiatong [11189-51] SPost, [11191-37] SPost
Shi, Junsheng [11187-50] SPost, [11189-70] SPost, [11196-45] SPost
Shi, Kebin 11186 Conference Chair, 11186 S1 Session Chair, 11186 S3 Session Chair, 11186 S6 Session Chair, 11190 Program Committee, 11195 Program Committee
Shi, Lingyan [11188-70] SPost
Shi, Nuannuan [11192-10] S2
Shi, Qichao [11187-22] S5
Shi, Qing [11196-27] S5
Shi, Sheng-Cai 11196 Program Committee, [11196-27] S5, [11196-29] S5, [11196-33] SPost, [11196-4] S1
Shi, Weisong [11190-31] S5
Shi, Xiaoxiao [11190-80] SPost
Shi, Xiaoyu [11188-41] S8
Shi, Xingzhe [11196-16] S5
Shi, Yaoheng 11184 Program Committee, 11193 S2 Session Chair
Shi, Yuan 11184 Program Committee
Shi, Yuechun [11182-22] S6, [11182-3] S1
Shi, Yulei [11196-43] SPost
Shigang, Wang [11187-19] S4, [11187-28] S6, [11187-58] SPost, [11187-59] SPost
Shihara, Masaki [11196-1] S1
Shimansky, Ruslan V. [11188-67] SPost
Shimura, Tsutomu 11187 Conference Chair
Shioda, Tatsutoshi 11192 Program Committee
Shiomi, Yasutomo [11183-19] S4
Shiro, Ayumi [11183-24] S5
Shkurinov, Alexander Pavlovich 11196 Program Committee
Shobu, Takahisa [11183-24] S5
Shou, Jingwen [11186-22] S5
Shu, Chengyou [11190-102] SPost, [11190-68] SPost
Shu, Qiang [11181-16] S4, [11181-17] S4
Shu, Yuexia [11190-130] SPost, [11190-93] SPost
Shubin, Alexey [11188-60] SPost
Si, Ke 11190 Program Committee, [11190-27] S5
Sidelnikov, Oleg [11192-24] S3
Silverstone, Joshua W. 11195 S3 Session Chair, [11195-25] S5
Sinclair, Gary F. [11195-25] S5
Singh, Shubham [11184-11] S3
Singh, Upendra N. 11181 Conference Chair
Situ, Guohai 11187 Program Committee, [11187-20] S4, 11189 Program Committee
Smirnov, Sergey V. [11184-37] SPost, [11195-7] S2
Snyders, Rony [11191-23] S5
Sofuoglu, Sibel [11181-28] SPost
Sokolov, Vadim G. [11185-41] SPost
Solli, Daniel R. 11192 Program Committee
Somekh, Michael G. 11186 Conference Chair
Song, Chenxi [11187-19] S4

INDEX OF AUTHORS, CHAIRS, AND COMMITTEE MEMBERS

Bold = SPIE Member

Song, Dalin [11185-51] SPost, [11185-52] SPost
Song, Fei-jun 11196 Program Committee
Song, Haiyang [11186-37] SPost, [11190-63] SPost
 Song, Haizhi [11195-32] SPost
 Song, Jun [11190-116] SPost, [11190-123] SPost
Song, Liang [11190-102] SPost, [11190-68] SPost
 Song, Lipai [11190-122] SPost
 Song, Peng [11181-24] SPost
 Song, Qiang [11188-32] S7
 Song, Qinghai 11193 S4
 Session Chair, [11193-17] S4
 Song, Shuli A. [11189-49] SPost, [11191-36] SPost
 Song, Tengbiao [11185-18] S4, [11187-49] SPost, [11190-87] SPost
 Song, Tongtong [11189-49] SPost, [11191-36] SPost
 Song, Xiaowei [11194-21] SPost
 Song, Yiwan [11190-116] SPost, [11190-123] SPost
 Song, Zhengxi [11187-23] S5
 Song, Zhenzhen [11185-17] S4
Sonkar, Ramesh Kumar [11184-28] S6, [11193-10] S2, [11193-28] S5, [11195-35] SPost
 Sotto, Moïse [11193-7] S2
 Sovetov, Sultan [11190-16] S3
 Srivastava, Prateek Kumar [11190-66] SPost
 St. John, Maie A. [11190-34] S5, [11190-4] S1
Stahl, H. Philip 11189 Program Committee
 Starecki, Florent [11191-23] S5
 Stobbe, Sören [11195-26] S5
 Stollenwerk, Jochen [11185-16] S4
Stover, John C. 11189 Program Committee
 Su, Bairong [11190-129] SPost
 Su, Bo [11196-49] SPost, [11196-51] SPost, [11196-52] SPost, [11196-53] SPost, [11196-54] SPost, [11196-55] SPost, [11196-57] SPost
 Su, Jingqin [11181-32] SPost
 Su, Ping [11188-14] S4, [11188-46] S9
 Su, Shi [11185-38] SPost
 Su, Xinxin [11192-17] S2
Su, Xuantao [11190-65] SPost, [11190-83] SPost
 Su, Ya [11190-88] SPost
Su, Yikai 11192 Program Committee, 11193 Program Committee
 Su, Ying [11189-60] SPost, [11189-68] SPost
 Sugimoto, Yoshimasa [11193-9] S2
 Sui, Daipeng [11181-21] SPost
Sui, Xiaomeng [11188-25] S5
 Sulway, Dominic A. [11195-25] S5
 Sun, Bo [11187-42] S8, [11187-66] SPost, [11187-67] SPost
Sun, Chi-Kuang 11196 Program Committee
Sun, Ching-Cherng 11188 Program Committee, [11188-9] S2
 Sun, Gangbo [11192-33] SPost
 Sun, Haibin [11185-28] SPost
 Sun, Hao [11190-6] S2
 Sun, Haocheng [11182-11] S3, [11184-35] SPost, [11193-44] SPost
 Sun, Haonan [11185-35] SPost
Sun, Hong-Bo 11182 Program Committee
 Sun, Jiasong [11186-12] S3

Sun, Jing [11190-65] SPost
 Sun, Jingjing [11193-12] S3
 Sun, Liang [11182-17] S5, [11182-35] SPost, [11187-46] SPost
 Sun, Meizhi [11181-25] SPost, [11181-4] S1
 Sun, Peng [11188-20] S4, [11188-30] S7, [11188-31] S7, [11188-34] S7, [11188-35] S7, [11188-63] SPost, [11188-75] SPost
 Sun, Qilin [11187-13] S3
 Sun, Ruoduan [11189-15] S3
 Sun, Shengli [11185-28] SPost
 Sun, Tao [11185-13] S3
 Sun, Tao [11190-112] SPost
 Sun, Wenhui [11182-9] S3
 Sun, Wenqing [11189-39] S9
 Sun, Xiaoming [11187-15] S3
 Sun, Xueying [11187-12] S3, [11187-24] S5, [11187-37] S7
 Sun, Xuqing [11194-5] S2
 Sun, Yan [11187-69] SPost
 Sun, Yinhong [11181-14] S3, [11181-37] SPost
 Sun, Yue [11188-58] SPost
 Sun, Zhichao [11185-30] SPost
 Sun, Zhongcheng [11196-9] S2
 Suo, Jinli 11187 Program Committee, [11187-26] S5
 Suo, Yuanzhen [11190-18] S4, [11190-85] SPost
 Surman, Phil [11187-2] S1
Suzuki, Takamasa 11189 Program Committee
 Suzuki, Takenobu [11195-30] SPost
 Swan, Anna K. 11184 Program Committee

T

Taguchi, Atsushi 11194 Program Committee, [11194-35] SPost
Taira, Takunori [11183-23] S5
 Takabayashi, Masanori [11185-10] S3
 Takesue, Hiroki [11195-24] S5
 Takeuchi, Masato [11183-19] S4
 Tamura, Sayaka [11194-19] S6
 Tan, Fangrui [11188-41] S8
 Tan, Hao [11190-88] SPost
 Tan, Jishu [11196-58] SPost
 Tan, Kwan Wee [11183-10] S2
Tan, Xiaodi 11188 Program Committee, [11188-52] S10
 Tan, Zhen [11183-21] S5
 Tanaka, Katsuhisa [11194-19] S6
Tanaka, Takuo [11194-2] S1
 Tang, Bihua [11190-124] SPost, [11190-30] S5
 Tang, Bo [11184-46] SPost, [11192-35] SPost, [11193-41] SPost
 Tang, Chao [11188-41] S8
 Tang, Chuanxiang [11181-17] S4
 Tang, Chun [11181-14] S3
 Tang, Dingyuan [11181-6] S2
 Tang, Feng [11191-3] S1
 Tang, Jian [11192-10] S2
 Tang, Jing [11185-29] SPost, [11185-53] SPost
 Tang, Jun [11189-14] S3, [11189-18] S4, [11189-23] S5
 Tang, Longhuang [11196-22] S4, [11196-9] S2
 Tang, Mingchu [11182-7] S2
 Tang, Mingwei [11186-20] S5, [11186-30] S7, [11193-13] S3, [11193-54] SPost
 Tang, Shuzhen [11190-84] SPost, [11190-92] SPost
 Tang, Siyi [11188-69] SPost
 Tang, Wanyi [11190-44] S7
 Tang, Wusheng [11186-38] SPost, [11186-39] SPost, [11186-40] SPost, [11186-42] SPost

Tang, Xi [11182-15] SPost
 Tang, Xianghong 11196 Program Committee
 Tang, XueLi [11190-95] SPost
 Tang, Yao [11191-16] S4
 Tang, Yuguo 11190 Conference Chair
 Tani, Masahiko 11196 Conference Chair, 11196 S3 Session Chair, [11196-1] S1
Tanida, Jun 11188 S5
 Session Chair, [11188-3] S1
 Tanzilli, Sébastien [11193-15] S4
 Tao, Chen [11186-45] SPost
 Tao, Chuanyi [11191-21] S5, [11191-29] SPost
 Tao, Guangfan [11184-8] S2
 Tao, Haiyan [11183-28] SPost
 Tao, Huyuan [11190-59] SPost
 Tao, Lechan [11190-89] SPost
 Tao, Rumao [11181-12] S3, [11181-16] S4, [11181-17] S4
Tao, Tianyang [11189-10] S2, [11189-62] SPost, [11189-8] S2
 Tao, Yong [11189-69] SPost
 Tao, Zhi Yong [11185-50] SPost
 Tao, ZhiYong [11196-20] S4
 Tarasov, Aleksandr A. [11181-7] S2
 ten Thije Boonkkamp, Jan [11185-3] S1
 Teng, Chuanxin [11191-42] SPost
 Teng, Qiliang [11189-39] S9
Theodosiou, Antreas [11192-31] S4
 Thiry, Damien [11191-23] S5
 Thyrrestrup, Henri N. [11195-26] S5
Tian, Chao [11186-21] SPost, [11186-29] SPost, [11186-55] S5, [11190-52] S9
 Tian, Fujing [11187-32] S6
 Tian, Jianfeng [11185-32] SPost
Tian, Jie 11190 Program Committee
 Tian, Kehan [11188-32] S7
Tian, Lei 11187 Program Committee
 Tian, Xiaochaoran [11188-43] S8
 Tian, Xiaoying [11190-58] S9
 Tian, Ye [11190-133] SPost, [11190-72] SPost
 Tian, Yunfei [11192-27] S4
 To, Albert [11183-17] S4
 To, Sandy 11185 Program Committee
 Tokita, Shun [11183-20] S5
 Tokumitsu, Seika [11189-42] S9
 Toma, Mana [11194-29] SPost
 Tomita, Koji [11194-19] S6
 Tong, Aihong [11195-28] SPost
 Tong, Jun [11189-12] S3, [11189-38] S9, [11189-40] S8
 Tong, Limin [11191-16] S4, 11193 Conference Chair, [11193-19] S4, [11193-29] S5, [11193-33] S6, [11193-35] S7, [11193-5] S1
 Tong, Wenhua [11183-16] S3
 Tong, Xin [11185-30] SPost
 Tosi, Daniele [11190-16] S3, [11191-9] S2
 Toyoda, Mitsunori [11189-33] S8
Tsai, Din Ping 11194 Program Committee
 Tsai, Jin-Run [11184-9] S2, [11185-11] S3
 Tsang, Hon Ki 11193 Program Committee
 Tsang, Mankei 11195 Program Committee
 Tsang, Peter W.M. 11188 Program Committee, 11188 S7 Session Chair, [11188-54] S11

Tsapkova, Alina [11190-19] S4
Tsia, Kevin K. 11192 Program Committee
 Tsuda, Hiroyuki [11184-14] S3, [11184-7] S2
 Tsyppkin, Anton N. [11196-7] S2
 Tu, Chang-Ching [11190-66] SPost
Tuchin, Valery V. 11190 Program Committee, [11190-61] SPost
 Turitsyn, Sergei K. 11192 Program Committee
 Turkin, Vitaly [11188-60] SPost
 Tursunov, Ibragim M. [11188-39] S8

U

Urbach, H. Paul 11185 Program Committee, 11186 Program Committee

V

Vatnik, Ilya D. [11192-24] S3, [11193-26] S5
 Venediktov, Dmitriy V. [11188-39] S8, [11188-50] S10, [11191-22] S5
Venediktov, Vladimir Yurievich 11188 Program Committee, 11188 S7 Session Chair, [11188-39] S8, [11188-50] S10, [11191-19] S4, [11191-22] S5
 Venediktova, Anastasia V. [11191-19] S4
 Vigliar, Caterina [11195-25] S5
Vivien, Laurent [11193-15] S4
Vollmer, Frank 11184 Program Committee
 Volodymyr, S. Kovalenko [11183-16] S3
 Vu, Thanh Dat [11185-22] S5

W

Wada, Kazumi 11193 Conference Chair
Wakayama, Toshitaka 11189 Program Committee
 Walter, Robert F. 11181 Program Committee
 Wan, Xiaozheng [11191-46] SPost
Wang, Anbo 11191 Program Committee
Wang, Andrew D. [11190-49] S8
 Wang, Bang-Ji [11184-9] S2, [11185-11] S3
 Wang, Bin [11186-35] SPost
 Wang, Bo [11196-39] SPost
 Wang, Bo [11190-69] SPost
 Wang, Bo [11191-46] SPost
 Wang, Bo Wen [11184-38] SPost
Wang, Boxiang [11195-19] S4
 Wang, Chang [11194-5] S2
 Wang, Chao 11192 Program Committee, [11192-17] S2
 Wang, Chao [11186-34] SPost
 Wang, Cheng [11195-1] S5
 Wang, Chengming [11190-124] SPost, [11190-30] S5
 Wang, Chensheng [11182-11] S3, [11196-48] SPost
 Wang, Chinhua 11188 Program Committee, 11188 S10 Session Chair, [11188-42] S8
 Wang, Chuan [11190-99] SPost
 Wang, Chuangtang [11184-29] S7
 Wang, Danyi [11185-4] S1, [11185-7] S2
Wang, Daodang 11185 Program Committee, [11185-25] S5, [11185-26] S5
 Wang, Dawei 11195 Program Committee, [11195-18] S4
Wang, Dayong [11188-41] S8

Wang, Di [11188-12] S3, [11188-28] S6, [11188-55] S11
 Wang, Dong [11191-27] S6
 Wang, Famei [11185-13] S3
 Wang, Fangfang [11195-34] SPost
 Wang, Fei [11187-20] S4
 Wang, Fengli [11185-20] S5
 Wang, Fu-Li [11182-12] S3
 Wang, Gang [11187-37] S7
 Wang, Guanghui [11186-11] S3, [11188-19] S4
 Wang, Guiqi [11194-24] SPost, [11194-25] SPost
 Wang, Haichao [11187-20] S4
 Wang, Hang [11186-21] SPost, [11186-55] S5
 Wang, Hanqiao [11192-17] S2
 Wang, Hao [11187-20] S4
 Wang, Hao [11196-26] S5
 Wang, Haoqian [11187-31] S6, [11187-52] SPost
 Wang, Haoyu 11189 Program Committee
 Wang, Heng [11183-8] SPost
 Wang, Hongpeng [11186-32] SPost
 Wang, Huayi [11187-16] S3
Wang, Huiquan [11185-44] SPost, [11190-133] SPost, [11190-72] SPost
Wang, Jiahui [11196-54] SPost
Wang, Jian 11182 S1 Session Chair, [11182-4] S2, 11192 Program Committee
 Wang, Jian [11189-28] S6, [11189-3] S1
 Wang, Jianfang 11194 Program Committee
 Wang, Jianjun [11181-12] S3, [11181-16] S4, [11181-17] S4, [11181-20] S4
 Wang, Jianwei 11184 S1 Session Chair, [11184-6] S2, 11195 Program Committee, 11195 S5 Session Chair
 Wang, Jin [11188-20] S4, [11188-30] S7, [11188-31] S7, [11188-34] S7, [11188-35] S7, [11188-63] SPost, [11188-75] SPost
 Wang, Jing [11190-50] S8
 Wang, Jing [11184-17] S4
 Wang, Jingbo [11190-6] S2
 Wang, Jinhai [11185-44] SPost
 Wang, Jinhai [11190-133] SPost, [11190-72] SPost
 Wang, Jinliang [11189-69] SPost, [11189-71] SPost
 Wang, Jiyong [11194-15] S5
 Wang, Jun [11189-39] S9
 Wang, Keke [11187-65] SPost
 Wang, Lan [11190-65] SPost
 Wang, Lei [11190-43] S7
 Wang, Liang [11192-8] S1
 Wang, Lidai [11186-24] S6, [11186-6] S2, [11190-53] S9
Wang, Lihong V. 11190 Program Committee
 Wang, Lijun 11182 Program Committee
 Wang, Lijun [11189-2] S1
 Wang, Lirong [11195-15] S3
 Wang, Liying [11185-13] S3
 Wang, Ming 11192 Program Committee
 Wang, Mingpei [11182-21] S6
 Wang, Mingqun [11186-19] S5
 Wang, Minqun [11188-47] S9
 Wang, Ningning [11184-10] S3
 Wang, Pan [11194-7] S3
 Wang, Peng [11195-30] SPost
 Wang, Peng [11187-35] S7
 Wang, Pengfei 11192 S1 Session Chair, [11192-1] S1, [11193-53] SPost
 Wang, Ping [11190-117] SPost
 Wang, Pinghe [11190-78] SPost, [11190-79] SPost
 Wang, Qing [11187-15] S3, [11187-23] S5, [11187-27] S5, [11187-5] S1

INDEX OF AUTHORS, CHAIRS, AND COMMITTEE MEMBERS

Bold = SPIE Member

Wang, Qiong-Hua [11188-12] S3, [11188-28] S6, [11188-55] S11
Wang, Rui [11188-8] S2
Wang, Ruikang K. 11190 Program Committee, [11190-49] S8
Wang, Ruiping 11187 S2 Session Chair
Wang, Ruojia [11188-14] S4
Wang, Shaomeng [11182-35] SPost
Wang, Shaopu [11185-31] SPost, [11185-4] S1, [11185-7] S2
Wang, Shawn 11182 Program Committee
Wang, Shi [11196-13] S3
Wang, Shigang 11187 S7 Session Chair
Wang, Shiguang [11189-2] S1
Wang, Shuai [11192-13] S2
Wang, Shuang [11191-12] S3
Wang, Shunbin [11192-1] S1
Wang, Shuo [11192-17] S2
Wang, Tao [11182-27] S7, [11182-29] S8, [11182-30] S8
Wang, Tingyun 11191 Program Committee, [11191-26] S6
Wang, Tong [11186-21] SPost
Wang, Wei [11189-7] S2
Wang, Wei [11189-36] SPost
Wang, Wei [11186-40] SPost
Wang, Wei [11196-31] SPost
Wang, Wei [11184-23] S5
Wang, Weilin [11183-14] S3
Wang, Weiping [11196-62] SPost
Wang, Weiqian [11187-33] S6
Wang, Weizheng [11186-38] SPost
Wang, Xiangzhao 11189 Program Committee
Wang, Xiao [11181-32] SPost
Wang, Xiaochao [11181-21] SPost
Wang, Xiaochun [11186-39] SPost, [11186-42] SPost
Wang, Xiaodong [11181-32] SPost
Wang, Xiaohao [11188-33] S7, [11189-17] S4, [11189-21] SPost, [11193-16] S4
Wang, Xiaoyu [11188-27] S6
Wang, Xin [11190-119] SPost
Wang, Xing [11189-61] SPost
Wang, Xinwei [11182-17] S5, [11182-35] SPost, [11187-46] SPost
Wang, Xiumin [11196-43] SPost
Wang, Xiwen [11189-11] S2, [11189-58] SPost, [11190-90] SPost, [11190-98] SPost
Wang, Xu 11192 Program Committee
Wang, Xuanhao [11186-18] S5, [11190-51] S9
Wang, Xucheng [11187-4] S1
Wang, Xue [11187-27] S5, [11187-5] S1
Wang, Xueding 11190 Program Committee
Wang, Xue-Han [11182-15] SPost
Wang, Xuejiao [11185-46] SPost
Wang, Yajun 11189 Program Committee
Wang, Yan [11185-43] SPost, [11193-32] S6
Wang, Yan [11191-34] SPost
Wang, Yan-Fei [11189-47] SPost
Wang, Yangyang [11189-65] SPost
Wang, Yanshan [11181-14] S3
Wang, Yanzhao [11182-27] S7, [11182-29] S8
Wang, Ye [11190-13] S2
Wang, Yibo [11181-29] SPost
Wang, Yibo [11188-68] SPost, [11188-86] SPost

Wang, Yi-Fei [11190-125] SPost, [11190-126] SPost, [11190-127] SPost, [11190-128] SPost, [11190-129] SPost
Wang, Ying [11190-42] S7, [11190-86] SPost
Wang, Yingzuo [11193-16] S4
Wang, Yiping [11192-19] S3
Wang, Yixin 11182 Program Committee
Wang, Yongjin [11184-23] S5
Wang, Yongtian 11185 Conference Chair, 11185 S2 Session Chair
Wang, You [11195-32] SPost
Wang, Youwen [11181-31] SPost
Wang, Yu [11190-121] SPost
Wang, Yu [11188-73] SPost
Wang, Yumin [11189-29] S7
Wang, Yufeng [11183-12] S3, [11183-31] SPost
Wang, Yugang [11187-29] S6
Wang, Yuheng [11184-32] S7
Wang, Yuhua [11186-50] SPost
Wang, Yujie [11186-1] S1
Wang, Yunxin [11188-41] S8
Wang, Yunyi [11193-47] SPost
Wang, Yuyang [11194-32] SPost
Wang, Yuye 11196 S5 Session Chair, [11196-13] S3, [11196-22] S4, [11196-59] SPost, [11196-9] S2
Wang, Yuying [11193-32] S6
Wang, Yuying [11181-13] S3
Wang, Zefeng [11181-18] S4
Wang, Zhanghai [11191-35] SPost
Wang, Zhanshan [11185-20] S5
Wang, Zhen [11185-31] SPost
Wang, Zhenzhen [11189-49] SPost, [11191-36] SPost
Wang, Zheqi [11193-37] S7
Wang, Zhiming [11194-4] S2
Wang, Zhi-Ping [11190-125] SPost, [11190-126] SPost, [11190-127] SPost, [11190-128] SPost, [11190-129] SPost
Wang, Zhiqiang [11186-3] S1
Wang, Zhiteng [11181-31] SPost
Wang, Zhongwen [11182-31] SPost
Wang, Zi [11188-13] S3
Wang, Zongwei [11185-19] S5
Wanjie, Dong [11190-109] SPost
Wasserman, Daniel M. 11184 Program Committee
Watanabe, Akira 11183 Program Committee
Watanabe, Eriko [11185-6] S2
Watanabe, Masayoshi [11195-15] S3
Wei, Chen [11181-11] S3
Wei, Chunlong [11189-32] S7
Wei, Cong [11185-19] S5
Wei, Dequan [11196-32] SPost
Wei, Dong [11189-48] SPost
Wei, Guanglu [11196-30] S5, [11196-5] S1
Wei, Hong 11194 Program Committee
Wei, Hongjun [11185-28] SPost
Wei, Jian [11187-19] S4, [11187-28] S6
Wei, Jinhong [11185-28] SPost
Wei, Liya [11190-88] SPost
Wei, Qiancai [11189-28] S6
Wei, Ruxue [11194-5] S2
Wei, Sui [11188-76] SPost
Wei, Xunbin 11190 Program Committee, [11190-85] SPost, [11190-89] SPost
Wen, Jianming [11193-23] S5
Wen, Jun [11182-18] S5
Wen, Kai [11188-56] S11

Wen, Shuangchun 11181 Program Committee
Wen, Te [11193-18] S4
Wen, Yiwei [11196-54] SPost
Wen, Zhong [11186-30] S7
Weng, Beiyue [11192-11] S2
Wetzstein, Gordon 11187 Program Committee
Wieck, Andreas Dirk [11195-26] S5
Wilczynski, Grzegorz [11190-8] S2
Wojtkowski, Maciej [11190-8] S2
Wolf, Alexey A. [11181-19] S4, [11181-36] SPost
Wong, Stephen T.C. [11190-13] S2
Wu, Bingcheng [11191-13] S3, [11191-33] SPost
Wu, Chengxing [11189-53] SPost
Wu, Fei [11182-11] S3
Wu, Feng 11187 Program Committee
Wu, Ge [11185-44] SPost
Wu, Guanhao [11182-36] SPost
Wu, Hao [11189-44] SPost
Wu, Jiachen [11188-17] S4
Wu, Jiamin 11187 S5 Session Chair, [11187-26] S5, [11187-70] S5
Wu, Jian [11181-3] S1
Wu, Jianhong [11188-70] SPost
Wu, Jinze [11195-18] S4
Wu, Jun [11193-43] SPost
Wu, Kai [11188-70] SPost
Wu, Limin [11196-59] SPost
Wu, Limin [11196-9] S2
Wu, Qian [11189-11] S2, [11189-58] SPost, [11190-98] SPost
Wu, Qiong [11182-27] S7, [11182-29] S8, [11182-30] S8
Wu, Quanying [11185-14] S3, 11189 Program Committee, [11189-30] S7, [11189-34] S8, [11189-39] S9
Wu, Rengmao 11185 Program Committee, 11185 S3 Session Chair, [11185-15] S4
Wu, Rui [11196-57] SPost
Wu, Shengbao [11193-40] SPost
Wu, Shulian [11190-131] SPost
Wu, Tengfei [11187-14] S3
Wu, Wenjuan [11190-26] S5
Wu, Xiaojun 11196 Program Committee
Wu, Xiaolei [11196-52] SPost, [11196-53] SPost
Wu, Xinglong [11190-117] SPost, [11190-81] SPost
Wu, Xue [11196-11] S2
Wu, Xuecheng [11188-57] S11
Wu, Yaodong [11193-12] S3
Wu, Yaxiong [11196-54] SPost
Wu, Ying [11185-32] SPost
Wu, Yingchun [11188-57] S11
Wu, Yitao [11182-22] S6
Wu, Yong [11187-66] SPost
Wu, Yonghong [11196-50] SPost
Wu, Yueheng [11190-108] SPost
Wu, Yutong [11190-79] SPost
Wu, Yuxiang [11189-27] S6
Wu, Yuxiang [11187-12] S3, [11187-14] S3, [11187-24] S5, [11187-37] S7, [11189-35] S8
Wu, Zhaoqing [11190-104] SPost
Wu, Zheng-Mao [11182-15] SPost
Wu, Zhijun [11191-5] S1, [11193-20] S4

X
Xi, Gangqin [11190-96] SPost, [11190-97] SPost
Xi, Jiangtao 11189 Program Committee, 11189 S2 Session Chair, [11189-12] S3, [11189-38] S9, [11189-40] S8
Xi, Lei [11190-55] S9
Xia, Guang-Qiong 11182 Program Committee, [11182-15] SPost
Xia, Liangping [11196-15] S3
Xia, Liangping [11193-51] SPost
Xia, Wei [11181-24] SPost, [11182-32] SPost
Xia, Xiaobo [11182-1] S1
Xia, Xinxing [11187-2] S1
Xia, Xujie 11190 Program Committee
Xia, Yimin [11182-1] S1
Xiang, Changcheng [11188-20] S4, [11188-30] S7, [11188-31] S7, [11188-34] S7, [11188-35] S7, [11188-36] S7, [11188-63] SPost, [11188-75] SPost
Xiang, Guohong [11182-7] S2
Xiang, Hao [11190-109] SPost
Xiang, Yanhong [11185-4] S1
Xiang, Yuluan [11184-45] SPost
Xiao, Dan [11188-12] S3, [11188-28] S6, [11188-55] S11
Xiao, Dongrui [11186-52] SPost
Xiao, Hai 11191 Program Committee
Xiao, Jianjun [11191-29] SPost
Xiao, Jiaying [11190-69] SPost
Xiao, Lei [11185-45] SPost
Xiao, Lei [11187-43] S8
Xiao, Min [11193-23] S5
Xiao, Peng [11190-10] S2
Xiao, Rongshi 11183 Conference Chair, [11183-5] S1
Xiao, Shuai [11188-9] S2
Xiao, Ye [11192-32] S4
Xiao, Yongkang [11187-42] S8, [11187-66] SPost, [11187-67] SPost
Xiao, Yun-Feng 11193 Program Committee
Xiaocheng, Tian [11181-27] SPost, [11181-34] SPost
Xie, Haiyan [11188-58] SPost
Xie, Hao [11187-70] S5
Xie, Junfeng [11186-54] SPost
Xie, Lianghua [11181-12] S3
Xie, Na [11181-32] SPost
Xie, Shangran [11193-37] S7
Xie, Shusen [11190-111] SPost, [11190-22] S4, [11190-77] SPost, [11190-84] SPost, [11190-92] SPost, [11193-49] SPost, [11193-55] SPost
Xie, Xiangzhi [11192-12] S2
Xie, Xiaoliang S. [11190-18] S4
Xie, Xiaozhu [11183-6] S2
Xie, Xinglong [11181-25] SPost, [11181-4] S1
Xie, Yiyang [11182-19] S4
Xie, YongFang [11188-20] S4, [11188-31] S7, [11188-34] S7, [11188-35] S7, [11188-63] SPost, [11188-75] SPost
Xie, Zhihua [11190-102] SPost, [11190-68] SPost
Xie, Zhongming [11185-25] S5, [11185-26] S5
Xin, Bo [11186-1] S1, [11190-28] S5
Xin, Ziqiang [11186-53] SPost
Xing, Da 11190 Program Committee
Xing, Kai [11189-69] SPost, [11189-71] SPost
Xing, Yingbin [11181-29] SPost
Xiong, Hongkai [11187-6] S2

Xiong, Li [11191-40] SPost
Xiong, Limin [11189-65] SPost, [11189-66] SPost
Xiong, Liqin [11190-57] S9
Xiong, Qing [11196-58] SPost
Xiong, Zhiwei 11187 S1 Session Chair, [11187-1] S1
Xiong, Zikang [11196-52] SPost, [11196-53] SPost
Xu, Biao [11186-3] S1
Xu, Bijun [11185-30] SPost
Xu, Bingxin [11192-13] S2
Xu, Cheng [11190-114] SPost
Xu, Chunhong [11185-13] S3
Xu, Dan-Xia 11193 Program Committee
Xu, Degang [11196-13] S3, [11196-22] S4, [11196-59] SPost, [11196-64] SPost, [11196-9] S2
Xu, Enming [11192-37] SPost, [11192-39] SPost
Xu, Fei 11191 S4 Session Chair, [11191-11] S3, [11192-27] S4
Xu, Feng [11187-70] S5
Xu, Haitan 11195 S1 Session Chair, [11195-6] S2
Xu, Haiyong [11187-39] S8
Xu, Hanfeng [11191-35] SPost
Xu, Hao [11189-62] SPost
Xu, Haozhen [11181-29] SPost
Xu, Hongbin [11191-8] S2
Xu, Hongxing 11194 Conference Chair, 11194 S1 Session Chair, 11194 S6 Session Chair
Xu, Ji [11184-15] S3, [11184-34] SPost
Xu, Jian [11193-46] SPost
Xu, Jianbin 11194 Program Committee
Xu, Jianshu [11190-84] SPost, [11190-92] SPost
Xu, Jing 11189 Program Committee
Xu, Jingjun 11195 Program Committee
Xu, Kexin 11190 Program Committee
Xu, Kun 11182 Program Committee, [11182-8] S3, 11192 Program Committee
Xu, Li xin 11184 Program Committee
Xu, Liang [11186-13] S3
Xu, Libei [11194-28] SPost
Xu, Lijuan [11184-17] S4
Xu, Liu 11186 Program Committee, [11186-13] S3, [11186-41] SPost, [11190-109] SPost, [11190-33] S5
Xu, Min [11186-4] S1, [11189-7] S2
Xu, Nan [11189-15] S3
Xu, Ning [11192-2] S1
Xu, Peipeng [11193-8] S2
Xu, Qiang [11181-9] S2
Xu, Qiao [11189-3] S1
Xu, Qihang [11192-39] SPost
Xu, Rui [11186-25] S6
Xu, Rulin [11188-76] SPost
Xu, Shuang [11191-40] SPost
Xu, Shuang [11184-42] SPost, [11188-79] SPost
Xu, WeiBo [11189-44] SPost
Xu, Wenbin [11188-79] SPost
Xu, Wen-Bin [11190-23] S4
Xu, Xiangang [11182-32] SPost
Xu, Xiaobo [11184-39] SPost
Xu, Xuechu [11193-54] SPost
Xu, Xuesen [11186-26] S6
Xu, Yang [11194-21] SPost, [11194-25] SPost
Xu, Yin [11192-33] SPost
Xu, Yingke [11190-33] S5
Xu, Yue [11191-16] S4
Xu, Yuhui [11187-6] S2
Xu, Zhaowen 11182 Program Committee
Xu, Zhongke [11182-35] SPost, [11187-46] SPost
Xu, Zhongyang [11192-30] S4

INDEX OF AUTHORS, CHAIRS, AND COMMITTEE MEMBERS

Bold = SPIE Member

Xu, Zifa [11183-15] S3, [11183-18] S4
 Xu, Zuyan 11181 Program Committee, 11195 Program Committee
 Xue, Gaopeng [11188-33] S7, [11193-16] S4
 Xue, Peng [11191-13] S3, [11191-33] SPost
 Xue, Ping [11190-104] SPost, [11190-124] SPost, [11190-30] S5
 Xue, Qiao [11181-22] SPost, [11188-59] SPost
 Xue, Rui [11189-50] SPost, [11191-38] SPost
 Xue, Zhiliang [11188-57] S11

Y

Yakovlev, Vladislav V. [11195-4] S1
Yakovlev, Artem [11190-119] SPost
 Yamada, Koji 11193 Program Committee, [11193-34] S7
 Yamamoto, Kohji [11196-1] S1
Yamamoto, Seiichi [11190-12] S2
 Yan, Chao [11196-22] S4
 Yan, Donglin [11181-20] S4
 Yan, Haitao [11191-15] S3
 Yan, Huangjing [11187-66] SPost, [11187-67] SPost
 Yan, Jianfeng [11183-2] S1
 Yan, Jinyun [11189-60] SPost, [11189-68] SPost
 Yan, Lianshan 11182 Program Committee, 11192 Program Committee
 Yan, Liping 11189 S5 Session Chair, [11189-16] S4
 Yan, Mengyao [11185-30] SPost
 Yan, Miao [11191-44] SPost
 Yan, Peng [11187-7] S2, [11187-8] S2, [11187-9] S2
 Yan, Shaohui [11188-85] SPost
 Yan, Shi [11185-18] S4, [11186-25] S6, [11187-49] SPost, [11190-87] SPost
 Yan, Shi [11184-30] S7
 Yan, Shiqiang [11196-61] SPost
 Yan, Shuai [11190-117] SPost
 Yan, Tao [11187-70] S5
 Yan, Wei [11194-17] S6
 Yan, Wei [11184-29] S7
 Yan, Xin [11196-14] S3, [11196-32] SPost
 Yan, Xingkui [11191-46] SPost
 Yan, Yu [11188-29] S7
 Yan, Zhao [11187-28] S6, [11187-58] SPost, [11187-59] SPost
 Yan, Zheng [11192-12] S2
 Yang, Bo 11187 Program Committee
 Yang, Bo [11182-24] S7
 Yang, Chao [11187-33] S6
Yang, Chen 11193 S3 Session Chair, [11193-11] S3
 Yang, Chen [11189-62] SPost
 Yang, Chen [11195-27] S5
 Yang, Chengshuai [11186-8] S2
 Yang, Deyuan [11190-111] SPost
 Yang, Feng [11183-31] SPost
 Yang, Fuhao [11187-22] S5
 Yang, Geer [11185-21] S5
 Yang, Guanglin [11188-58] SPost
 Yang, Hanting [11182-33] SPost
 Yang, Hongdong [11189-66] SPost
 Yang, Hongqin [11186-50] SPost, [11190-118] SPost
 Yang, Hongwei [11182-27] S7, [11182-29] S8
 Yang, Jin 11183 S2 Session Chair, [11183-11] S3

Yang, Jingyu [11187-30] S6, [11187-41] S8
 Yang, Junfeng [11191-26] S6
 Yang, Kai [11183-7] S2
 Yang, Lian [11190-128] SPost
Yang, Lianxiang 11189 Program Committee
 Yang, Libing [11187-23] S5
Yang, Lin [11184-12] S3
 Yang, Lin [11185-13] S3
 Yang, Luyun [11181-29] SPost
 Yang, Maosheng [11196-14] S3, [11196-32] SPost
 Yang, Minghui [11184-17] S4
 Yang, Qiang [11187-18] S4
 Yang, Qianqian [11190-104] SPost
 Yang, Qing 11186 S2 Session Chair, [11186-14] S4, [11186-20] S5, [11186-30] S7, 11193 Program Committee, 11193 S1 Session Chair, [11193-13] S3, [11193-3] S1
 Yang, Qingwei [11181-4] S1
 Yang, Shuang [11187-44] SPost
 Yang, Shuna [11192-9] S2
 Yang, Shunhua [11181-4] S1
Yang, Sigang [11192-28] S4, [11192-29] S4
 Yang, Song [11187-39] S8
 Yang, Songlin [11186-31] S1
 Yang, Tianye [11183-33] SPost
 Yang, Tie-Jun [11187-43] S8
Yang, Victor X. D. [11190-31] S5
 Yang, Wenlong [11190-18] S4
 Yang, Wenzhao [11190-66] SPost
 Yang, Wuhaio [11182-21] S6
 Yang, Xiaoyan [11196-48] SPost
 Yang, Xibin 11190 Program Committee
 Yang, Xin [11186-49] SPost
 Yang, Xinfeng [11186-52] SPost
 Yang, Xue [11185-32] SPost
 Yang, Yan [11184-46] SPost, [11192-35] SPost
 Yang, Yan [11193-41] SPost
 Yang, Yang 11184 Program Committee
 Yang, Yang [11184-30] S7, [11185-18] S4, [11187-49] SPost, [11190-87] SPost
 Yang, Yang 11193 S4 Session Chair, [11193-3] S1
 Yang, Yanguang [11191-28] S6
 Yang, Yatao [11191-24] SPost
 Yang, Yifan [11183-7] S2
 Yang, Yue [11196-3] S1
 Yang, Yuping 11196 Program Committee, [11196-19] S4
 Yang, Yuqing [11182-17] S5, [11182-35] SPost
 Yang, Yuxin [11193-29] S5
 Yang, Zerui [11187-6] S2
 Yang, Zhigang [11190-35] S5
 Yang, Zihan [11190-115] SPost
 Yanka, Robert [11184-26] S6
 Yao, Baoli 11186 Program Committee, 11188 Program Committee, [11188-4] S1
 Yao, Caizhen [11181-8] S2
 Yao, Chuanfei [11192-18] S3
 Yao, Haili [11183-21] S5
 Yao, Jianhua 11183 Conference Chair, [11183-14] S3, [11183-16] S3
Yao, Jianping [11192-4] S1
 Yao, Jianquan 11181 Program Committee, [11184-43] SPost, [11193-38] S7, [11196-13] S3, [11196-14] S3, [11196-22] S4, [11196-32] SPost, [11196-64] SPost, [11196-9] S2
 Yao, Longchao [11188-57] S11
 Yao, Mingde [11187-1] S1
 Yao, Mingliang [11188-88] SPost
 Yao, Ni [11193-35] S7
 Yao, Penghui [11191-25] S6

Yao, Quan [11193-35] S7
 Yao, Shuang [11182-32] SPost
 Yao, Xiaotian Steve [11190-88] SPost, 11191 Program Committee, [11191-25] S6, [11191-32] SPost, [11193-40] SPost
 Yao, Xincheng [11183-7] S2
 Yao, Yuanzhao [11193-9] S2
 Yao, Yu-Dong [11190-23] S4
Yatagai, Toyohiko 11188 Program Committee, 11195 Program Committee
 Yazaki, Akio 11192 Program Committee
 Yazici, Azim-Onur [11193-37] S7
 Ye, Chunsheng [11189-53] SPost
 Ye, Dehao [11186-20] S5, [11193-54] SPost
 Ye, Jing [11188-15] S4
Ye, Jingfei [11185-17] S4
 Ye, Xiaohui 11183 S1 Session Chair, [11183-7] S2
 Ye, Yiyun [11183-15] S3, [11183-18] S4
 Ye, Yong-Hong [11186-31] S1
 Ye, Zonghao [11188-20] S4, [11188-31] S7, [11188-34] S7, [11188-35] S7, [11188-75] SPost
 Yi, Wen-jun [11186-38] SPost, [11186-39] SPost, [11186-40] SPost, [11186-42] SPost
 Yin, Feifei [11182-8] S3
Yin, Wei [11189-10] S2, [11189-62] SPost, [11189-8] S2
 Yin, Xiaodong [11188-32] S7
 Yin, Xiaowei [11189-49] SPost, [11191-36] SPost
 Yin, Yanlong [11184-19] S4
 Yin, Zhengkun [11188-15] S4, [11188-29] S7
 Ying, Zhang [11194-28] SPost
 Yonezu, Yuya [11195-25] S5
Yoo, Dong-Heon [11188-10] S3
 Yoon, Tai Hyun 11181 Program Committee
Yoshizawa, Toru 11189 Conference Chair
 You, Yi-Jing [11190-30] S5
 Yu, Chang Qiu [11191-30] SPost
 Yu, Changyuan 11184 Conference Chair, 11184 S6 Session Chair, 11184 S7 Session Chair, 11192 Program Committee
 Yu, Chen Yu [11188-24] S5
 Yu, Chongxiu 11188 Program Committee
 Yu, Fangda [11191-13] S3, [11191-33] SPost, [11191-42] SPost
Yu, Francis T. S. [11188-1] S1, [11195-5] S1
 Yu, Hao [11195-32] SPost
 Yu, Hao Hai 11182 S3 Session Chair, [11182-13] S4
 Yu, Haoyang [11182-36] SPost
 Yu, Hui [11196-48] SPost
 Yu, Jia [11188-79] SPost
 Yu, Jia [11190-108] SPost, [11190-38] S6
 Yu, Jianguo [11191-31] SPost
 Yu, Jiayin [11189-52] SPost
 Yu, Jing [11189-52] SPost
 Yu, Jingyi 11187 Program Committee
 Yu, Jinlong 11182 Program Committee
 Yu, Jirong 11181 Program Committee
 Yu, Jun [11185-17] S4
 Yu, Junjie [11188-15] S4, [11188-29] S7
 Yu, Kun [11182-1] S1
 Yu, Lejun [11187-42] S8, [11187-66] SPost, [11187-67] SPost
 Yu, Mei [11187-32] S6, [11187-40] S8

Yu, Mengjie [11184-16] S4
Yu, Paul Kit-Lai 11191 Program Committee
 Yu, Peng [11194-4] S2
 Yu, Shilin [11191-31] SPost
 Yu, Siyuan 11182 Program Committee
 Yu, Xianghua [11188-4] S1
 Yu, Xiaocui [11187-42] S8
 Yu, Yalan [11190-32] S5
 Yu, Yanguang [11189-12] S3, [11189-38] S9, [11189-40] S8
Yu, Yeh-Wei [11188-9] S2
 Yu, Ying-Jie [11188-6] S2
 Yu, Yongji [11184-32] S7
Yu, Yu [11182-2] S1
Yu, Yu [11184-43] SPost, [11193-38] S7
 Yu, Yun [11190-22] S4, [11190-77] SPost
 Yu, Zhipeng [11186-17] S5
 Yuan, Bochong [11192-2] S1
 Yuan, Hanyi [11187-50] SPost, [11196-45] SPost
 Yuan, He [11189-7] S2
 Yuan, Jialei [11184-23] S5
 Yuan, Jianmin 11196 Program Committee, [11196-63] SPost, [11196-65] SPost
 Yuan, Jin [11190-10] S2
 Yuan, Jing [11190-32] S5
 Yuan, Libo 11191 Program Committee
 Yuan, Qun [11185-17] S4
Yuan, Xiao-Cong 11186 Conference Chair, 11186 S7 Session Chair, [11186-19] S5, 11188 Program Committee, [11188-47] S9, [11194-28] SPost
 Yuan, Yufeng [11190-116] SPost, [11190-123] SPost
 Yue, Haichun [11187-28] S6
 Yue, Tao [11187-35] S7

Z

Zadkov, Victor N. 11195 Program Committee
 Zang, XiaoFei [11196-2] S1
 Zarudnev, Yuri [11184-41] SPost
Zayats, Anatoly V. [11194-7] S3
 Zeng, Fa [11188-59] SPost
 Zeng, Heping 11181 Program Committee
 Zeng, Jie [11182-23] S6
 Zeng, Jin [11185-28] SPost
 Zeng, Jinshu [11186-50] SPost
 Zeng, Li 11182 Program Committee
 Zeng, Lijiang [11188-69] SPost
Zeng, Nan [11192-20] S3, [11192-21] S3
 Zeng, Shaoqun [11188-73] SPost, [11190-107] SPost, [11190-110] SPost, [11190-114] SPost, [11190-121] SPost
 Zeng, Xiaoming [11181-32] SPost
 Zeng, Xiao-zhe [11191-3] S1
 Zerbis, Felix [11185-16] S4
 Zhang, Baoping 11182 Program Committee
 Zhang, Bifeng [11189-65] SPost, [11189-66] SPost
 Zhang, Bolun [11189-45] SPost
Zhang, Bowen [11192-30] S4
 Zhang, Chao 11196 Program Committee
 Zhang, Cheng [11181-4] S1
 Zhang, Chengfeng [11186-36] SPost, [11186-41] SPost
 Zhang, Chenggong [11187-45] SPost
 Zhang, Chengyun [11194-18] S6
 Zhang, Chenrui [11188-61] SPost
 Zhang, Chenxi [11186-21] SPost, [11186-55] S5

Zhang, Cunlin 11196 Conference Chair, 11196 S2 Session Chair, [11196-28] S5, [11196-40] SPost, [11196-41] SPost, [11196-42] SPost, [11196-44] SPost, [11196-46] SPost, [11196-49] SPost, [11196-50] SPost, [11196-51] SPost, [11196-52] SPost, [11196-53] SPost, [11196-54] SPost, [11196-55] SPost, [11196-57] SPost
 Zhang, Daixi [11196-4] S1
 Zhang, Dandan [11196-17] S3
Zhang, Dawei 11189 Program Committee
Zhang, Dengwei [11189-5] S1
 Zhang, Dongjun [11181-4] S1
 Zhang, Dongliang [11196-62] SPost
 Zhang, Dongwen [11196-63] SPost, [11196-65] SPost
 Zhang, Fangning [11194-16] S6
 Zhang, Feng 11196 S5 Session Chair, [11196-12] S3
 Zhang, Feng [11189-22] S5
 Zhang, Fengdi [11190-101] SPost
Zhang, Guangjie [11190-76] SPost
 Zhang, Guangxin [11196-66] SPost
 Zhang, Guangyi [11183-12] S3, [11183-32] SPost
 Zhang, Guosheng [11191-34] SPost
 Zhang, Guowei [11188-32] S7
 Zhang, Guo-yi 11182 Program Committee
 Zhang, Haibin 11183 Program Committee, [11183-1] S1
 Zhang, Haiping [11185-14] S3, [11189-39] S9
 Zhang, Han [11181-11] S3
 Zhang, Han [11191-37] SPost
 Zhang, Hanyu [11184-10] S3
 Zhang, Hao 11189 Program Committee
 Zhang, Hao [11188-27] S6, [11188-74] SPost
 Zhang, Hao [11191-24] SPost
 Zhang, Haoyu [11181-20] S4
 Zhang, He [11190-103] SPost
 Zhang, Hongbo [11188-6] S2
 Zhang, Honghao [11188-21] S5
 Zhang, Hongyou [11182-14] S4
 Zhang, Jian [11190-54] S9
 Zhang, Jianbin [11193-33] S6
 Zhang, Jiaqi [11196-49] SPost, [11196-51] SPost, [11196-55] SPost
 Zhang, Jiejun [11192-16] S1
 Zhang, Jiming [11191-46] SPost
 Zhang, Jing [11189-43] SPost
 Zhang, Jing [11191-21] S5, [11191-29] SPost
 Zhang, Jinke [11190-54] S9
 Zhang, Jinlei [11187-62] SPost
 Zhang, Jinsong [11187-30] S6
 Zhang, Jiyang [11196-17] S3
 Zhang, Jun [11187-11] S3, [11187-16] S3, [11187-21] S5, [11187-29] S6, [11187-61] SPost
 Zhang, Jun [11185-45] SPost
 Zhang, Junchao [11189-65] SPost, [11189-66] SPost
 Zhang, Jun-Xiang [11195-18] S4
 Zhang, Junxuan [11185-47] SPost
 Zhang, Keke [11191-46] SPost
 Zhang, Kexin [11189-54] SPost
 Zhang, Lei [11187-12] S3, [11187-24] S5
 Zhang, Lei [11191-16] S4
 Zhang, Li [11196-68] SPost
Zhang, Lianbin [11187-45] SPost

INDEX OF AUTHORS, CHAIRS, AND COMMITTEE MEMBERS

Bold = SPIE Member

Zhang, LiangLiang 11196 Program Committee
Zhang, Limin [11184-22] S5, [11184-31] S7
Zhang, Lin 11184 S5 Session Chair, [11184-17] S4
Zhang, Lingling [11183-30] SPost
Zhang, Lipeng [11190-40] S6
Zhang, Luo-zhi [11188-12] S3, [11188-28] S6, [11188-55] S11
Zhang, Man [11193-51] SPost
Zhang, Meiling [11190-104] SPost
Zhang, Min [11196-53] SPost
Zhang, Mina [11183-15] S3, [11183-18] S4
Zhang, Ming [11195-21] S5
Zhang, Ning [11190-124] SPost, [11190-30] S5
Zhang, Peng [11182-27] S7, [11182-29] S8, [11182-30] S8
Zhang, Peng [11184-46] SPost, [11192-35] SPost, [11193-41] SPost
Zhang, Peng [11188-4] S1
Zhang, Pengfei [11190-56] S9
Zhang, Pengsong [11185-4] S1
Zhang, Pu [11182-21] S6
Zhang, Qi [11187-15] S3, [11187-27] S5, [11187-5] S1
Zhang, Qican 11189 Program Committee
Zhang, Qinghua [11189-3] S1
Zhang, Qingwei [11183-5] S1
Zhang, Qinke [11190-103] SPost
Zhang, Qiyuan [11189-6] S2
Zhang, Quanbing [11188-8] S2
Zhang, Quan-Guang [11190-43] S7
Zhang, Qunli [11183-16] S3
Zhang, Rongli [11190-38] S6
Zhang, Rongli [11190-108] SPost
Zhang, Rui [11196-18] S3, [11196-23] S4, [11196-5] S1
Zhang, Ruiming [11195-32] SPost
Zhang, Sen [11182-1] S1
Zhang, Shangjian 11182 Program Committee, [11182-20] S6
Zhang, Shian [11186-8] S2
Zhang, Shuyu [11190-83] SPost
Zhang, Sicheng [11184-34] SPost
Zhang, Siqi [11183-34] SPost
Zhang, Song 11189 Conference Chair, 11189 S3 Session Chair, 11189 S8 Session Chair
Zhang, Tianyun [11195-29] SPost
Zhang, Tingting [11194-30] SPost
Zhang, Wanlong [11185-31] SPost
Zhang, Wei [11190-35] S5
Zhang, Wei [11195-30] SPost
Zhang, Wei Ping [11188-77] SPost
Zhang, Weidong [11193-18] S4
Zhang, Weifeng [11192-4] S1
Zhang, Weili 11196 Program Committee
Zhang, Weiping 11195 Program Committee
Zhang, Wen [11196-4] S1
Zhang, Wenjia [11182-25] S7
Zhang, Wentao [11185-25] S5, [11185-26] S5
Zhang, Wenwu 11183 Program Committee, [11183-12] S3, [11183-15] S3, [11183-18] S4, [11183-31] SPost, [11183-32] SPost, [11183-8] SPost
Zhang, Wenxin [11190-124] SPost, [11190-30] S5

Zhang, Xi [11190-71] SPost
Zhang, Xiangchao [11186-4] S1, [11189-7] S2
Zhang, Xiangyu [11187-2] S1
Zhang, Xiao [11190-124] SPost, [11190-30] S5
Zhang, Xiaojian [11182-29] S8, [11182-30] S8
Zhang, Xiaolin 11187 Program Committee
Zhang, Xiaolu [11181-23] SPost, [11188-59] SPost
Zhang, Xiaoman [11186-37] SPost
Zhang, Xiaomin 11181 Program Committee
Zhang, Xiaoming [11191-44] SPost
Zhang, Xiazhao [11187-7] S2
Zhang, Xi-Cheng [11183-9] S2, 11196 Conference Chair, 11196 S1 Session Chair, [11196-6] S2, [11196-7] S2, [11196-8] S2
Zhang, Xining [11191-5] S1, [11193-20] S4
Zhang, Xinliang 11182 Program Committee, 11184 Conference Chair, 11184 S4 Session Chair, 11184 S5 Session Chair, 11192 Program Committee
Zhang, Xinyu [11185-48] SPost
Zhang, Xiu [11195-30] SPost
Zhang, Xu [11188-13] S3
Zhang, Xuping 11184 Conference Chair
Zhang, Yali 11182 S5 Session Chair, [11182-20] S6
Zhang, Yalin [11187-54] SPost
Zhang, Yan 11196 Program Committee
Zhang, Yan [11184-29] S7
Zhang, Yaping [11188-53] S11
Zhang, Yaping [11191-5] S1, [11193-20] S4
Zhang, Ya-ping [11181-24] SPost
Zhang, Yasong [11186-43] SPost, [11187-51] SPost
Zhang, Yating [11184-43] SPost, [11193-38] S7
Zhang, Yiwei [11189-38] S9, [11189-40] S8
Zhang, Yong [11189-44] SPost
Zhang, Yong 11193 S6 Session Chair, [11193-30] S6
Zhang, Yongbing [11187-31] S6
Zhang, Yongxiang [11183-34] SPost
Zhang, Yuan [11196-63] SPost, [11196-65] SPost
Zhang, Yudong 11190 Program Committee
Zhang, Yue [11184-36] SPost
Zhang, Yufei [11191-41] SPost
Zhang, Yun [11195-15] S3
Zhang, Yunshan [11182-23] S6, [11192-2] S1
Zhang, Zan [11184-39] SPost
Zhang, Zanyun [11184-39] SPost
Zhang, Ze [11188-77] SPost
Zhang, Zeheng [11191-32] SPost
Zhang, Zhang [11196-14] S3, [11196-32] SPost
Zhang, Zhang [11191-16] S4
Zhang, Zhaoan [11186-1] S1
Zhang, Zhaoyu [11182-7] S2
Zhang, Zheng [11183-32] SPost
Zhang, Zhenglong [11194-8] S3
Zhang, Zhengman [11184-40] SPost
Zhang, Zhengxiong [11195-30] SPost
Zhang, Zhenwei [11196-28] S5, [11196-50] SPost
Zhang, Zhenxi 11190 Program Committee
Zhang, Zheshen [11195-13] S3

Zhang, Zhibin [11186-44] SPost
Zhang, Zhigang [11181-10] S3
Zhang, Zhijie [11196-48] SPost
Zhang, Zhimin [11186-13] S3
Zhang, Zhiqi [11188-23] S5
Zhang, Zhiyao [11182-20] S6
Zhang, Zhuoyong 11196 Program Committee
Zhang, Zichang [11195-32] SPost
Zhang, Zili [11191-35] SPost
Zhang, Zonghua 11189 Program Committee, 11189 S8 Session Chair, [11189-29] S7
Zhang, Zuxing [11192-37] SPost, [11192-39] SPost
Zhao, Anke [11192-3] S1
Zhao, Changying [11195-19] S4
Zhao, Chengwei [11190-91] SPost
Zhao, Chunliu [11186-25] S6
Zhao, Chunyu 11185 Program Committee
Zhao, Dong [11188-20] S4, [11188-31] S7, [11188-34] S7, [11188-35] S7, [11188-63] SPost, [11188-75] SPost
Zhao, Fenqiang [11190-33] S5
Zhao, Haiyan [11193-53] SPost
Zhao, Hongwei [11190-26] S5
Zhao, Hongyou [11190-39] S6
Zhao, Huanyu [11191-46] SPost
Zhao, Huashan [11190-54] S9
Zhao, Hui [11196-68] SPost
Zhao, Jianlin [11185-9] S2, 11188 Program Committee, 11188 S9 Session Chair, [11188-38] S8
Zhao, Jiasheng [11182-1] S1
Zhao, Jie [11188-41] S8, [11189-54] SPost, [11189-63] SPost
Zhao, Jinbao [11189-51] SPost
Zhao, Jingyi [11193-18] S4
Zhao, Junpu [11181-27] SPost
Zhao, Kaijie [11187-66] SPost, [11187-67] SPost
Zhao, Kangyi [11193-52] SPost
Zhao, Kun 11196 Program Committee
Zhao, Lidong [11185-9] S2
Zhao, Mingshan [11192-17] S2
Zhao, Qiang [11191-46] SPost
Zhao, Qin [11189-2] S1
Zhao, Rui [11184-36] SPost, [11186-47] SPost
Zhao, Shaoyu [11196-62] SPost
Zhao, Tianqi [11186-25] S6
Zhao, Tonggang [11191-31] SPost
Zhao, Wanyue [11192-26] S4, [11192-28] S4, [11192-29] S4
Zhao, Weiqiang [11189-60] SPost, [11189-68] SPost
Zhao, Xiangwei [11190-20] S4
Zhao, Yaping [11196-57] SPost
Zhao, Yong [11182-22] S6
Zhao, Yuejin [11196-40] SPost
Zhao, Yuxia [11190-40] S6
Zhao, Zengxiu 11196 Program Committee, [11196-63] SPost, [11196-65] SPost
Zhao, Zhe [11185-44] SPost
Zhao, Zhenfu [11193-4] S1
Zhao, Zhi Qin [11184-38] SPost
Zhao, Zhicheng [11193-40] SPost
Zhdanov, Andrey D. [11185-40] SPost, [11185-41] SPost, [11185-42] SPost, [11185-43] SPost, [11187-53] SPost

Zhdanov, Dmitry D. [11185-40] SPost, [11185-41] SPost, [11185-42] SPost, [11185-43] SPost
Zheng, Gaige [11194-26] SPost
Zheng, Huan [11191-35] SPost
Zheng, Jiajiu [11193-8] S2
Zheng, Jianan [11185-48] SPost
Zheng, Jie [11191-13] S3, [11191-33] SPost
Zheng, Juanjuan [11188-56] S11
Zheng, Liqin [11190-111] SPost, [11190-96] SPost
Zheng, Mengmeng [11190-22] S4, [11190-77] SPost
Zheng, Mingyang [11193-35] S7
Zheng, Nan [11189-28] S6, [11189-3] S1
Zheng, Qian Ying [11196-47] SPost
Zheng, Shuhui [11193-50] SPost
Zheng, Wei [11190-108] SPost, [11190-38] S6
Zheng, Xiangxiang [11189-14] S3, [11189-18] S4, [11189-23] S5
Zheng, Xiaoping 11192 Program Committee
Zheng, Xiaoping [11195-29] SPost
Zheng, Xinyu [11191-8] S2
Zheng, Xueyong [11191-46] SPost
Zheng, Yazhi [11193-3] S1
Zheng, Yi [11193-14] S4, [11195-3] S1
Zheng, Yuanjin [11187-2] S1
Zheng, Zhenrong 11187 Conference Chair, [11187-3] S1, [11187-4] S1, [11187-54] SPost, [11187-62] SPost
Zhengnan, Xu [11187-58] SPost
Zhimin, Zhang [11190-109] SPost
Zhong, Bo [11189-28] S6
Zhong, Haizheng [11184-45] SPost
Zhong, Ping 11189 Program Committee
Zhong, Tianting [11186-17] S5
Zhong, Xin [11182-17] S5
Zhong, Caixia [11183-6] S2
Zhou, Changhe 11188 Conference Chair, 11188 S3 Session Chair, [11188-15] S4, [11188-20] S4, [11188-22] S5, [11188-29] S7, [11188-30] S7, [11188-31] S7, [11188-34] S7, [11188-35] S7, [11188-36] S7, [11188-63] SPost, [11188-75] SPost, 11193 Program Committee
Zhou, Cheng [11181-24] SPost
Zhou, Dandan [11181-34] SPost
Zhou, Enze A. [11190-117] SPost
Zhou, Guorui [11181-8] S2
Zhou, Guorui [11192-40] S3
Zhou, Hang [11190-110] SPost
Zhou, Heng [11195-32] SPost
Zhou, Hongjun [11185-20] S5
Zhou, Jianzhong 11183 Program Committee
Zhou, Junnan [11191-32] SPost
Zhou, Kai [11196-5] S1
Zhou, Kainan [11181-32] SPost
Zhou, Kangmin [11196-33] SPost, [11196-4] S1
Zhou, Lei 11194 Program Committee
Zhou, Lian [11189-28] S6, [11189-3] S1
Zhou, Linjie [11184-10] S3
Zhou, Liqiang [11181-11] S3
Zhou, Meiling [11188-4] S1

Zhou, Meng [11196-31] SPost
Zhou, Mengxin [11190-67] SPost
Zhou, Peng [11194-26] SPost
Zhou, Ping 11189 Program Committee
Zhou, Qian [11182-36] SPost, [11188-33] S7, [11189-17] S4, [11189-19] SPost, [11189-21] SPost, [11193-16] S4, [11193-25] SPost
Zhou, Qiang [11195-32] SPost
Zhou, Qingli [11196-41] SPost, [11196-42] SPost, [11196-43] SPost, [11196-44] SPost, [11196-46] SPost
Zhou, Quanyu [11190-89] SPost
Zhou, Sen [11189-57] SPost, [11193-46] SPost
Zhou, Shou-huan 11181 Program Committee
Zhou, Taojie [11182-7] S2
Zhou, Tiankuang [11187-70] S5
Zhou, Tianyang [11190-29] S5
Zhou, Tingting [11188-87] SPost
Zhou, Weidong 11193 Program Committee
Zhou, Weihu 11189 Program Committee
Zhou, Wen-Jing [11188-6] S2
Zhou, Xiaohong [11192-28] S4
Zhou, Xiaoxu [11190-33] S5
Zhou, Xiaoyan [11195-26] S5
Zhou, Xingcan [11188-84] SPost, [11189-55] SPost, [11189-56] SPost
Zhou, Xinxing [11193-12] S3, [11193-42] SPost
Zhou, Yadong [11186-25] S6, [11194-23] SPost
Zhou, Yan [11182-17] S5, [11182-35] SPost, [11187-46] SPost
Zhou, Yi [11196-37] SPost, [11196-38] SPost
Zhou, Yi [11184-15] S3
Zhou, Yingying [11190-53] S9
Zhou, Yong [11195-30] SPost
Zhou, Yu [11192-22] SPost
Zhou, Yufeng [11187-40] S8
Zhou, Yuke [11182-23] S6
Zhou, Zhiping 11182 Program Committee, 11193 Conference Chair
Zhou, Zhiyuan [11195-21] S5, [11195-27] S5
Zhou, Zhiyue [11181-18] S4
Zhou, Zihan [11196-42] SPost
Zhu, Baohua [11195-34] SPost
Zhu, Dan [11192-30] S4
Zhu, Dan 11190 Conference CoChair, 11190 S6 Session Chair, [11190-25] S5
Zhu, Daqing [11190-67] SPost
Zhu, Hao [11187-23] S5
Zhu, Henian [11189-52] SPost
Zhu, Huanzheng [11194-33] SPost
Zhu, Jiang [11187-18] S4
Zhu, Jianqiang [11181-25] SPost, [11181-4] S1
Zhu, Jie [11189-11] S2, [11189-58] SPost, [11190-90] SPost, [11190-98] SPost
Zhu, Jinjin [11187-14] S3, [11189-27] S6
Zhu, Jinjin [11189-35] S8
Zhu, Juba [11186-38] SPost, [11186-39] SPost, [11186-40] SPost, [11186-42] SPost
Zhu, Jun 11185 Program Committee
Zhu, Lili [11186-37] SPost
Zhu, Ling [11190-43] S7
Zhu, Mengjun [11186-42] SPost
Zhu, Mengjun [11186-38] SPost, [11186-39] SPost, [11186-40] SPost

INDEX OF AUTHORS, CHAIRS, AND COMMITTEE MEMBERS

Bold = SPIE Member

Zhu, Ning Hua 11182
Conference Chair, [11182-10] S3, [11192-10] S2
Zhu, Ping [11181-4] S1
Zhu, Renjiang [11182-27] S7, [11182-29] S8, [11182-30] S8
Zhu, Rihong [11181-14] S3, [11185-19] S5
Zhu, Sha [11182-10] S3
Zhu, Shanshan [11190-101] SPost, [11190-23] S4
Zhu, Shining 11194 Program Committee
Zhu, Shi-Yao [11195-18] S4
Zhu, Weiguo 11196 Program Committee

Zhu, Weimin [11189-54] SPost, [11189-63] SPost
Zhu, Wen [11190-54] S9
Zhu, Xi [11190-85] SPost
Zhu, Xianli [11196-22] S4
Zhu, Xiaojie [11185-45] SPost
Zhu, Xiaolei [11185-47] SPost, [11191-41] SPost
Zhu, Xiaopeng [11185-49] SPost
Zhu, Xing 11194 Program Committee
Zhu, Xuan [11184-44] SPost
Zhu, Yadan [11185-49] SPost
Zhu, Yiming 11196 Program Committee, 11196 S4 Session Chair, [11196-2] S1

Zhu, Yongli [11185-45] SPost
Zhu, Yudong [11187-44] SPost
Zhu, Yuewen [11189-12] S3
Zhu, Zhen [11182-32] SPost
Zhu, Ziye [11188-47] S9
Zhuang, Chaowei [11189-43] SPost
Zhuang, Quntao [11195-13] S3
Zhuang, Zixiang [11191-34] SPost
Zhuge, Minghua [11193-3] S1
Ziniuk, Roman [11190-119] SPost
Zong, Zhaoyu [11181-27] SPost
Zou, Hui [11192-2] S1

Zou, Jian [11190-41] S7
Zou, Jinqian [11196-61] SPost
Zou, Linjie [11182-23] S6
Zou, Mengqiang [11196-20] S4
Zou, Ningmu 11184 Program Committee
Zou, Ran [11183-17] S4
Zou, Shengli [11194-23] SPost
Zou, Shuai [11188-6] S2
Zou, Wenhui [11187-25] S5
Zou, Xihua 11182 Program Committee, 11192 Program Committee
Zou, Xiujuan [11194-26] SPost
Zou, Zhisheng [11183-6] S2

Zuo, Chao 11186 Program Committee, [11186-12] S3, [11186-33] SPost, [11186-9] S3, 11189 Program Committee, 11189 S9 Session Chair, [11189-10] S2, [11189-62] SPost, [11189-8] S2, [11189-9] S2
Zuo, Jian [11196-42] SPost
Zuo, Yanlei [11181-32] SPost
Zyubin, Andrey Y. [11190-19] S4, [11193-39] SPost, [11194-20] SPost



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Wednesday 23 October	07:30 to 12:00

CONFERENCE REGISTRATION

Includes admission to all conference sessions, plenaries, industry forums, technical workshops, and poster sessions, tea/coffee breaks and daily lunches, the Opening Ceremony and a choice of online proceedings collection.

SPIE MEMBER, SPIE STUDENT MEMBER, AND STUDENT PRICING

- SPIE Members receive conference and course registration discounts. Discounts are applied at the time of registration.
- SPIE Student Members receive a 50% discount on all courses.
- Student registration rates are available only to undergraduate and graduate students who are enrolled full time and have not yet received their Ph.D. Post-docs may not register as students. A student ID number or proof of student status is required with your registration.

PRESS REGISTRATION

For credentialed press and media representatives only. Please email contact information, title, and organization to media@spie.org.

SPIE CASHIER

Registration Area

Open during registration hours

REGISTRATION PAYMENTS

If you are paying by cash or check as part of your onsite registration, wish to add a Special Event requiring payment, or have questions regarding your registration, visit the SPIE Cashier.

RECEIPT AND CERTIFICATE OF ATTENDANCE

Preregistered attendees who did not receive a receipt or attendees who need a Certificate of Attendance may obtain those from the SPIE Cashier.

BADGE CORRECTIONS

Badge corrections can be made by the SPIE Cashier. Please have your badge removed from the badge holder and marked with your changes before approaching the counter.

REFUND INFORMATION

There is a US\$50 service charge for processing refunds. Requests for refunds must be received by 10 October 2019; all registration fees will be forfeited after this date. Membership dues, SPIE Digital Library subscriptions, or Special Events purchased are not refundable.

Author / Presenter Information

SPEAKER CHECK-IN AND PREVIEW CONFERENCE ROOMS

Monday through Wednesday. during registration hours

All conference rooms have a computer workstation, projector, screen, lapel microphone, and laser pointer. All presenters are requested to test their presentations in the conference room where they will be presenting in the morning, before the conference begins, or during one of the session breaks

Oral Presentation Guidelines: <http://spie.org/PAOralGuidelines>

POSTER SESSION

Tuesday 22 October

Poster Author Setup: 10:00 to 13:00

Poster Session 13:00 pm to 14:30

POSTER SETUP INSTRUCTIONS

Poster authors can set up presentations between 10:00 and 13:00 on the day of the Poster Session. Posters that are not set up by 13:00 will be considered a No-Show and the corresponding paper will not be published in the Conference Proceedings.

View the Poster Presentation Guidelines:

<http://spie.org/PAPosterGuidelines>

Onsite Services

INTERNET ACCESS

Complimentary wifi access is available in the conference center; instructions will be posted onsite.

SPIE CONFERENCE AND EXHIBITION APP

Search and browse the program, special events, participants, and build your conference schedule. Free Conference App available for iPhone and Android phones.

HOUSING DESK

Northstar Hangzhou International Expo Center Hotel

Open 24 hours a day

LOST AND FOUND

Registration Desk

Found items will be kept at the registration desk until the end of the conference and then turned over to HIEC security.

RESTAURANT INFORMATION

HIEC 2nd Floor

Several restaurant vendors offer meals for purchase during conference center hours. The conference hotel also has two restaurants (Western and Chinese), as well as 24-hour room service.



GENERAL INFORMATION

Food and Beverage Services

TEA/COFFEE BREAKS

Complimentary coffee/tea will be served twice daily, at 10:00 and 15:00. Check individual conference listings for exact times and locations.

FOOD & REFRESHMENTS FOR PURCHASE

2nd Floor—Gourmet Corner

Hot and cold snacks, hot entrees, sandwiches, salads are available for purchase. Cash and credit cards accepted.

COS/SPIE-HOSTED LUNCHES

2nd Floor

Registration includes lunch tickets for each conference day and seating is available on the 2nd floor, near Gourmet Corner vendors.

Hotel

NORTH STAR HANGZHOU INTERNATIONAL EXPO CENTER HOTEL

No. 353, Benjing Avenue

311215 Hangzhou, Zhejiang China

Phone: [86] 571 8290 88

Learn more about the hotel and all that it offers www.expocenterhotel.cn

HANGZHOU INTERNATIONAL EXPO CENTER

353 Benjing Ave, Qianjiang Century City,

Xiaoshan District, Hangzhou, China

See all transportation options online: www.spie.org/pa



SPIE Event Policies

Acceptance of Policies and Registration Conditions

The following Policies and Conditions apply to all SPIE Events. As a condition of registration, you will be required to acknowledge and accept the SPIE Policies and Conditions contained herein.

Agreement to Hold Harmless

Attendee agrees to release and hold harmless SPIE from any and all claims, demands, and causes of action arising out of or relating to your participation in the event you are registering to participate in and use of any associated facilities or hotels.

Anti-Harassment Policy

It is SPIE policy that all employees, volunteers, and participants are entitled to respectful treatment. Any form of bullying, discrimination, harassment, sexual or otherwise, is unacceptable and will not be tolerated. This policy applies to all locations and situations where SPIE business is conducted and to all SPIE-sponsored activities and events.

Read complete policy: <http://spie.org/harassment>

Attendee Registration and Admission Policies

SPIE, or their officially designated event management, in their sole discretion, reserves the right to accept or decline an individual's registration for an event. Further, SPIE, or event management, reserves the right to prohibit entry of or to remove any individual whether registered or not, be they attendees, exhibitors, representatives, or vendors, whose conduct is not in keeping with the character and purpose of the event. Without limiting the foregoing, SPIE and event management reserve the right to remove or refuse entry to anyone who has registered or gained access under false pretenses, provided false information, or for any other reason whatsoever that they deem is cause under the circumstances.

Capture and Use of a Person's Image

By registering for an SPIE event, you grant full permission to SPIE to capture, store, use, and/or reproduce your image or likeness by any audio and/or visual recording technique and create derivative works of these images and recordings in any SPIE media now known or later developed, for any legitimate SPIE marketing or promotional purpose. By registering for an SPIE event, you waive any right to inspect or approve the use of the images or recordings or of any written copy. You also waive any right to royalties or other compensation arising from or related to the use of the images, recordings, or materials. By registering, you release, defend, indemnify and hold harmless SPIE from and against any claims, damages or liability arising from or related to the use of the images, recordings or materials, including but not limited to claims of defamation, invasion of privacy, or rights of publicity or copyright infringement, or any misuse, distortion, blurring, alteration, optical illusion or use in composite form that may occur or be produced in taking, processing, reduction or production of the finished product, its publication or distribution.

Code of Conduct

SPIE is committed to providing a harassment- and discrimination-free experience for everyone at our events, an experience that embraces the richness of diversity where participants may exchange ideas, learn, network, and socialize in the company of colleagues in an environment of mutual respect.

Read complete Code: <http://spie.org/conduct>

Event Cancellation Policy

If for some unforeseen reason SPIE should have to cancel an event, processed registration fees will be refunded to registrants. Registrants will be responsible for cancellation of travel arrangements or housing reservations and the applicable fees.

Family-Friendly Policy

Conference Events: All conference technical and networking events require a badge for admission. Registered attendees may bring children with them if they have been issued a badge. Registration badges for children under 18 are free and available at the SPIE registration desk onsite. Children under 14 years of age must be accompanied by an adult at all times, and guardians are asked to help maintain a professional, disturbance-free conference environment.

Exhibition Hall: Everyone who attends the exhibition must be registered and have a badge. Badges for children are free and available onsite at the registration desk. Children under 14 years of age must be accompanied by an adult at all times. Guardians are asked to help maintain a professional, disturbance-free exhibition environment. Children under 18 are not allowed in the exhibition area during exhibition move-in and move-out.

Identification Requirement

To verify registered participants and provide a measure of security, SPIE will ask attendees to present a government-issued photo identification at registration to collect registration materials. Individuals are not allowed to pick up badges for other attendees. Further, attendees may not have some other person participate in their place at any conference-related activity. Such other individuals will be required to register on their own behalf to participate.

Laser Pointer Safety Policy

SPIE supplies tested and safety-approved laser pointers for all conference meeting rooms. For safety reasons, SPIE requests that presenters use provided laser pointers. Use of a personal laser pointer represents the user's acceptance of liability for use of a non-SPIE-supplied laser pointer. If you choose to use your own laser pointer, it must be tested to ensure

No-Smoking Policy

Attendees will observe all non-smoking regulations that are publicly posted by the facilities used by the event.

Payment Policy

Registrations must be fully paid before access to the conference is allowed. SPIE accepts VISA, MasterCard, American Express, Discover, Diner's Club, checks and wire transfers. Onsite registrations can also be paid with cash.

SPIE Event Policies

Recording Policy

Conferences, courses, and poster sessions: For copyright reasons, recordings of any kind are prohibited without prior written consent of the presenter or instructor. Attendees may not capture or use materials presented in any meeting/course room or in course notes on display without written permission. Consent forms are available at Speaker Check-In or SPIE Registration. Individuals not complying with this policy will be asked to leave a given session and/or asked to surrender their recording media. Refusal to comply with such requests is grounds for expulsion from the event. Exhibition Hall: Recordings of any kind are prohibited without explicit permission from on-site company representatives. Individuals not complying with this policy will be asked to surrender their recording media and to leave the exhibition hall. Refusal to comply with such requests is grounds for expulsion from the event.

Reporting of Unethical or Inappropriate Behavior

Onsite at an SPIE meeting, contact any SPIE Staff with concerns or questions. If you feel in immediate danger, please dial the local emergency number for police intervention. SPIE has established a confidential reporting system for staff and all meeting participants to raise concerns about possible unethical or inappropriate behavior within our community. Complaints may be filed by phoning toll-free to +1-888-818-6898 from within the United States and Canada or online at www.SPIE.ethicspoint.com and may be made anonymously.

Unauthorized Solicitation

Unauthorized solicitation in the Exhibition Hall is prohibited. Any non-exhibiting manufacturer or supplier observed to be distributing information or soliciting business in the aisles, or in another company's booth, will be asked to leave immediately.

Unsecured Items

Personal belongings should not be left unattended in meeting rooms or public areas. Unattended items are subject to removal by security. SPIE is not responsible for items left unattended.

Wireless Internet Service

At most events, SPIE provides wireless access for attendees. Properly secure your computer before accessing the public wireless network. SPIE is not responsible for computer viruses or other kinds of computer damage.

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CONFERENCE PROCEEDINGS

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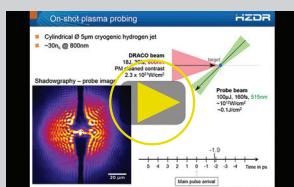
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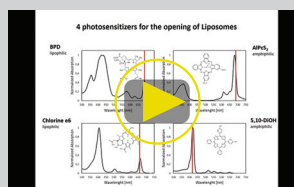
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16 August 2019

**Frontiers of
applications
of petawatt
laser physics
(Conference
Presentation)**

Ulrich Schramm



23 August 2019

**Light-induced
permeabilization
of liposomes**

Paula Enzian, et al.



22 April 2019

**Chromatic
line confocal
technology in
high-speed 3D
surface-imaging
applications**

Karri Niemelä

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