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Structured Light 2019

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The leading event on the technologies and applications of structured light, optical manipulation, and biomedical imaging

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OPTICS & PHOTONICS International Congress 2019

22–26 April 2019

Pacifico Yokohama
Yokohama, Japan

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22–26 April 2019
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Present your work at SPIE Structured Light

SPIE Structured Light 2019 features the latest advances in optical trapping and manipulation, pulse and beam shaping, and the applications of structured optical fields. These novel optical techniques combine with microscopy, spectroscopy, and tomography on next-generation biomedical imaging.

Featuring two major international conferences, The 6th Optical Manipulation and Structured Materials Conference (OMC'19) and The 5th Biomedical Imaging and Sensing Conference (BISC'19).

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Journal of Biomedical Optics Journal of Nanophotonics

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Optics and Photonics International Congress 2019 is a cross-disciplinary symposium on the technologies of structured light and bio-imaging. The event combines important topical areas including structured optical fields, optical trapping, beam shaping, and other novel techniques. Many of these next-generation technologies are applied in the world of biology and biomedicine, so there is a special focus on biomedical imaging and sensing applications.

The sympoisum is organized into two parallel conferences: Optical Manipulation and Structured Materials Conference (OMC) and Biomedical Imaging and Sensing Conference (BISC). These two conferences comprise the full spectrum of structured light technologies and biomedical imaging applications. OMC and BISC join eleven other technical conferences in the Optics and Photonics International Congress in Yokohama, Japan, in April 2019.

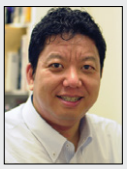
Please review the conference program to see the full range of technology topics covered. The chairs have organized parallel conference programs, including joint sessions that will highlight specific examples of novel structured light techniques for biomedical imaging applications.

Plan to join the industry leaders who are advancing these exciting topics. Please join us in April in Yokohama!

CONFERENCE CHAIRS

Takashige Omatsu
Chiba Univ. (Japan)

Toyohiko Yatagai
Utsunomiya Univ. (Japan)



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Optical Manipulation and Structured Materials Conference (OMC19)

Conference Chair: **Takashige Omatsu,** Chiba Univ. (Japan)

Conference Co-Chairs: **Hajime Ishihara,** Osaka Prefecture Univ. (Japan); **Keiji Sasaki,** Hokkaido Univ. (Japan)

Program Committee: **Ryuji Morita,** Hokkaido Univ. (Japan); **Yasuyuki Tsuboi,** Osaka City Univ. (Japan); **Masaaki Ashida,** Osaka Univ. (Japan); **Satoshi Ashihara,** The Univ. of Tokyo (Japan); **Yung-Fu Chen,** National Chiao Tung Univ. (Taiwan); **Kyoko Kitamura; Kei Murakoshi,** Hokkaido Univ. (Japan); **Hiromi Okamoto,** Institute for Molecular Science (Japan); **Seigo Ohno,** Tohoku Univ. (Japan); **Ichiro Shoji,** Chuo Univ. (Japan); **Síle Nic Chormaic,** Okinawa Institute of Science and Technology Graduate Univ. (Japan); **Yasuhiro Sugawara,** Osaka Univ. (Japan)

Conventional optical tweezers based on optical radiation forces (scattering, absorption and gradient forces) produced by a tightly focused laser beam have been primarily applied to particles with a dimension range from hundreds of nanometers to tens of micrometers. However, they do not always enable us to efficiently trap and manipulate particles at the nanoscale. New technology that significantly reinforces optical radiation at the nanoscale has been strongly desired.

Sub-wavelength structured materials, including metamaterials, metasurfaces, and photonic crystals, provides new research opportunities for optical manipulation and structured optical field generation beyond the capabilities of bulk-optics approaches. Furthermore, interaction between structured optical fields and matters on the sub-wavelength scale will produce new physical effects, such as spin-orbital momentum coupling. The OMC'19 also welcomes fundamental researches, advanced technologies and innovative applications enabled by structured materials.

The OMC'19 event is organized and sponsored by the SPIE in cooperation with several academic societies and associations. The OMC'18 was very successful and included over 80 participants. OMC'19 will include the latest research and new technologies for optical radiation forces in the field of optical trappings and manipulations, as well as related topics.

In particular, the conference welcomes research on structured optical fields, plasmon-resonant fields, metamaterials, and other topics related to optical manipulation. This conference will also provide opportunities for scientific and professional networking, and scientific inspiration to the attendees. All abstracts will be peer-reviewed by the program committee.

Topics of interest include the following fields:

- structured optical fields, including beam shaping, polarization control, pulse shaping, frequency extension, and ultrafast laser technologies
- optical trapping and manipulation, including optical tweezer, holographic optical manipulation, plasmon trapping, multi-photon trapping, and atom trapping and cooling
- fundamental researches and advanced technologies enabled by structured materials, such as metamaterials, metasurfaces, and photonic crystals
- advanced devices and instruments, including spatial light modulator, adaptive optics, and near-field optical devices
- applications including structured material processing, single molecule trapping, biophotonics, metamaterials, quantum communications, and selective control of chemical reaction
- novel approaches, including novel interaction between optical fields and materials on nano-scale, novel regimes of spin-orbit interaction, and quantum control of molecular dynamics.

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Biomedical Imaging and Sensing Conference (BISC19)

Conference Chair: **Toyohiko Yatagai,** Utsunomiya Univ. (Japan)

Conference Co-Chairs: **Yoshihisa Aizu,** Muroran Institute of Technology (Japan); **Osamu Matoba,** Kobe Univ. (Japan); **Yasuhiro Awatsuji,** Kyoto Institute of Technology (Japan); **Yuan Luo,** National Taiwan Univ. (Taiwan)

Program Committee: **Barry Cense,** Utsunomiya Univ. (Japan); **Wonshik Choi,** Korea Univ. (Korea, Republic of); **Shi-Wei Chu,** National Taiwan Univ. (Taiwan); **Katsumasa Fujita,** Osaka Univ. (Japan); **Yoshio Hayasaki,** Utsunomiya Univ. Ctr. for Optical Research & Education (Japan); **Masaki Hisaka,** Osaka Electro-Communication Univ. (Japan); **Wataru Inami,** Shizuoka Univ. (Japan); **Ichiro Ishimaru,** Kagawa Univ. (Japan); **Toshiaki Iwai,** Tokyo Univ. of Agriculture and Technology (Japan); **Hsiang-Chieh Lee,** National Taiwan Univ. (Taiwan); **Xingde Li,** Johns Hopkins Univ. (United States); **Takashi Kakue,** Chiba Univ. (Japan); **Myung K. Kim,** Univ. of South Florida (United States); **Robert Magnusson,** The Univ. of Texas at Arlington (United States); **Yuji Matsuura,** Tohoku Univ. (Japan); **Izumi Nishidate,** Tokyo Univ. of Agriculture and Technology (Japan); **Goro Nishimura,** Hokkaido Univ. (Japan); **Yusuke Ogura,** Osaka Univ. (Japan); **Eiji Okada,** Keio Univ. (Japan); **Yukitoshi Otani,** Utsunomiya Univ. (Japan); **Yong-Keun Park,** KAIST (Korea, Republic of); **Xiangyu Quan,** Kobe Univ. (Japan); **Manabu Sato,** Yamagata Univ. (Japan); **Shunichi Sato,** National Defense Medical College (Japan); **Tatsuki Tahara,** Kansai Univ. (Japan); **Enrique Tajahuerce,** Univ. Jaume I (Spain); **Yosuke Tamada,** National Institute for Basic Biology (Japan); **Eriko Watanabe,** The Univ. of Electro-Communications (Japan); **Peng Xia,** AIST (Japan); **Yasui Takeshi,** The Univ. of Tokushima (Japan)

This conference will provide an international forum for reporting recent progress in imaging and sensing in biology and medicine, as well as related areas. In biomedical optics and photonics, optical tools are employed for the understanding and treatment of diseases, from the cellular level to macroscopic applications. At the cellular level, highly precise laser applications allow the manipulation, operation or stimulation of cells, even in living organisms or animals. Optical microscopy has been revolutionized by a thorough understanding of the different markers and their switching behavior. Marker-free microscopy technologies, like CARS, SHG or THG-microscopy, Digital Holographic Microscopy, are spreading into multiple biological and clinical imaging applications. OCT is continuously broadening its clinical applicability by becoming even higher resolution, higher speed and more compact. Computational imaging including compressive sensing and deep learning is a rapidly growing field to create powerful applications such as imaging, sensing, and diagnosis. In the broader field of optics and photonics, biomedical imaging and sensing are the most quickly progressing and expanding areas. Techniques developed in these areas could greatly advance physical, engineering and biological knowledge as well as optics and photonics technology.

This conference will include basic research at cellular level through clinical applications of various optical technologies.

Both invited papers and regular contributions will be presented. All abstracts will be reviewed by the program committee for originality and merit. Topics of the conference are listed below, but other topics related to biomedical imaging are also welcome.

Topics:
- medical and biological imaging instrumentation and techniques
- optogenetics
- advanced microscopy
- advanced endoscopy
- super resolution in biomedical imaging and sensing
- computational imaging in biomedical imaging and sensing
- adaptive optics in biomedical imaging and sensing
- structured illumination in biomedical imaging and sensing
- interferometry and holography in biology and medicine
- optical coherence tomography
- diffuse optical tomography
- digital holography
- quantitative phase imaging
- photoacoustic imaging
- multimodal imaging and sensing
- optical biopsy
- spectroscopic imaging and sensing
- multispectral imaging and sensing
- scattering imaging
- fluorescence imaging
- molecular imaging
- terahertz sensing
- optical fibers and sensors for biomedicine
- multimodality optical diagnostic systems.

ABSTRACT SUBMISSION GUIDELINES

By submitting an abstract, I agree to the following conditions:

AN AUTHOR OR COAUTHOR WILL:

- Register at the author registration rate.
- Attend the meeting.
- Make the presentation as scheduled in the program.
- Obtain funding for their registration fees, travel, and accommodations, independent of SPIE, through their sponsoring organizations.
- Ensure that all clearances, including government and company clearance, have been obtained to present and publish. If you are a DoD contractor in the USA, allow at least 60 days for clearance.

SUBMIT A 100-WORD ABSTRACT AND 2-PAGE (MINIMUM) EXTENDED ABSTRACT

- Please submit a **100-word text abstract** suitable for early release. If accepted, the 100-word abstract will be published prior to the meeting in the online or printed programs promoting the conference.
- Please also submit a **2-page (minimum) extended abstract** for technical review purposes that is also suitable for publication. Extended abstracts must be at least 2-pages, but may be longer if desired. SPIE is authorized to circulate your abstract to conference committee members for review and selection purposes and to publish accepted extended abstracts on the SPIE Digital Library.
- Only original material should be submitted.
- Abstracts should contain enough detail to clearly convey the approach and the results of the research.
- Commercial papers, papers with no new research/development content, and papers where supporting data or a technical description cannot be given for proprietary reasons will not be accepted for presentation in this conference.

REVIEW, NOTIFICATION, AND PROGRAM PLACEMENT INFORMATION

- To ensure a high-quality conference, all submissions will be assessed by the Conference Chair/Editor for technical merit and suitability of content.
- Conference Chair/Editors reserve the right to reject for presentation any paper that does not meet content or presentation expectations.
- Final placement in an oral or poster session is subject to the Chairs' discretion.

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