



## Optical Manipulation and Structured Materials Conference (OMC 2022)

**Program Committee:** **Masaaki Ashida**, Osaka Univ. (Japan); **Satoshi Ashihara**, The Univ. of Tokyo (Japan); **Yung-Fu Chen**, National Chiao Tung Univ. (Taiwan); **Sile Nic Chormaic**, Okinawa Institute of Science and Technology Graduate Univ. (Japan); **Yasuyuki Kimura**, Kyushu Univ. (Japan); **Kyoko Kitamura**, Kyoto Institute of Technology (Japan); **Yuichi Kozawa**, Tohoku Univ. (Japan); **Yoko Miyamoto**, The Univ. of Electro-Communications (Japan); **Ryuji Morita**, Hokkaido Univ. (Japan); **Kei Murakoshi**, Hokkaido Univ. (Japan); **Kyoko Namura**, Kyoto Univ. (Japan); **Kyunghwan Oh**, Yonsei Univ. (Korea, Republic of); **Seigo Ohno**, Tohoku Univ. (Japan); **Hiromi Okamoto**, Institute for Molecular Science (Japan); **Ichiro Shoji**, Chuo Univ. (Japan); **Yasuhiro Sugawara**, Osaka Univ. (Japan); **Yasuyuki Tsuboi**, Osaka City 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 2022 also welcomes fundamental researches, advanced technologies and innovative applications enabled by structured materials.

The OMC 2022 event is organized and sponsored by the SPIE in cooperation with several academic societies and associations. OMC 2022 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 nanoscale, novel regimes of spin-orbit interaction, and quantum control of molecular dynamics.

### INVITED SPEAKERS

*Micro-3D printed miniaturized systems for optical trapping and manipulation*

**Carlo Liberale**, King Abdullah Univ. of Science and Technology (Saudi Arabia)

*Metasurfaces for energy conversion and optical information processing*

**Stefan Maier**, Ludwig-Maximilians-Univ. München (Germany)

*From paraxial to non-paraxial optical singularities: Shaping the skeleton of structured light in 3D space*

**Eileen Otte**, Stanford Univ. (United States)

*Light guiding through suspensions of red blood cells*  
**Anna Bezryadina**, California State Univ. (United States)

### CONFERENCE CHAIRS



**Takashige Omatsu**  
Chiba Univ. (Japan)



**Kishan Dholakia**  
Univ. of St. Andrews  
(United Kingdom)

Submit your abstract today

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**Submission Deadline: 4 February 2022**