

# Frist International Conference on Sensing and Imaging through Scattering and Fluctuating Field in Biology, Telecommunication, and Astronomy (SI-Thru)



Date: 20-21 April, 2022

Hybrid: In-person in Pacifico Yokohama, Japan and online

Submission deadline: 4 February, 2022

<http://si-thru.opicon.jp/>

Optics and related imaging technologies have played an indispensable role in the development of natural science. However, one of the fundamental problems that cannot be overcome even with the most advanced optical technology is scattering and fluctuations that disturb light propagation. Scattering theories determined by wavelength and particle size have already been established. Adaptive optics is also established to compensate the light distortion in astronomy. However, no comprehensive theory has been established to deal with scattering and fluctuations in four dimensions (three-dimensional space and time), which are ubiquitous in the real world in air, water, and living organisms.

The purpose of this conference is to present and discuss the latest techniques, theories, and results for comprehensively understanding and overcoming scattering and fluctuation phenomena that are ubiquitous in multi-scale 3D space, ranging from nanometer to kilometer size. Applications include bioimaging, spatial information communication, astronomy, and other areas related to scattering and fluctuations. Topics covered in the conference are appeared below. You are very welcome to join this conference for presentations and exchange of ideas.

## Chairs:

Osamu Matoba, Kobe University, Japan

Sylvain Gigan, Sorbonne Université, France

## Co-chairs:

Yasuhiro Awatsuji, Kyoto Institute of Technology, Japan

Enrique Tajahuerce, Universitat Jaume I, Spain

Yosuke Tamada, Utsunomiya University, Japan

## Program Chair

Yasuhiro Kamei, National Institute for Basic Biology, Japan

## Program co-chairs

Kenjiro Kimura, Kobe University, Japan

Eriko Watanabe, The University of Electro-Communications, Japan

Yoshihisa Takayama, Tokai University, Japan

Yutaka Hayano, National Astronomical Observatory of Japan



O. Matoba



S. Gigan



Y. Awatsuji



E. Tajahuerce



Y. Tamada



Y. Kamei



K. Kimura



E. Watanabe



Y. Takayama



Y. Hayano

## Topics:

- Imaging through scattering media
- Imaging through fluctuating media
- Wavefront sensing
- Wavefront shaping
- Digital phase conjugation
- Transmission/reflection matrix approaches
- Scattering and fluctuation theory
- Scattering and fluctuation modeling
- Diffuse optical imaging
- Computational imaging
- Single-pixel imaging
- Ghost imaging
- Deep learning and machine learning
- Non-line-of-sight imaging
- Deep live-cell imaging
- Deep optical cell manipulation
- Live brain imaging
- Ultrasound imaging
- Photoacoustic imaging
- Nondestructive testing
- Adaptive optics
- Observational astronomy
- High-contrast imaging of exoplanet
- Spatial light modulation and deep biometry
- Next-generation communications
- Telecommunication
- Spatial information communication
- Modulation and coding
- Pointing, acquisition, and tracking
- Atmospheric propagation
- Transmitters and receivers for communication
- Terrestrial networks
- Quantum communication
- Other related areas