



## Single Molecule Spectroscopy and Superresolution Imaging XVII

(BO503)

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In the focus of this conference are all fields of optical single molecule spectroscopy and super resolution imaging, ranging from fundamental physics, technical and methodological questions, towards applications in chemical, biological and biomedical research as well as medical diagnostics. It provides a state-of-the-art interdisciplinary forum for information exchange on new technological developments, advanced applications, and fundamental questions of the field.

Ultra-sensitive spectroscopic techniques have become an important tool in fundamental biological and biomedical research, allowing study of the function and interaction of individual biomolecules. Improving and extending the existing arsenal of techniques for studying specific biophysical and biochemical questions on a single molecule level is of paramount interest for the life-science community.

This conference puts special emphasis on time resolved methods of fluorescence spectroscopy and imaging which allow for investigating not only structural properties but also the function of molecular processes, down to the single molecule level. Therefore, we encourage to submit work related also to Fluorescence Lifetime Imaging (FLIM), Advanced single-molecule techniques such as Fluorescence Correlation Spectroscopy (FCS), Fluorescence Coincidence Analysis or single-molecule burst analysis are also favorite subjects of this conference. In particular Förster resonance energy transfer (FRET) analysis frequently benefits from these time-resolved methods and this conference will be an excellent platform to discuss their application at the molecular level.

A topic of particular interest has become the employment of the single-molecule nature of fluorescence excitation and emission to achieve sub-diffraction superresolution in fluorescence microscopy. It has opened previously unknown opportunities to image live cells in the optical far field with unprecedented optical resolution. This resulted in new microscopy modalities such as Stimulated Emission Depletion (STED) microscopy, single molecule localization microscopy (PALM, STORM, dSTORM, GSD-IM), stochastic optical fluctuation microscopy (SOFI), or structured illumination microscopy (SIM) and imaging scanning microscopy (ISM) techniques. The conference provides an interdisciplinary platform for these new and exciting developments in fluorescence imaging.

The need for ultrasensitive and specific biomedical diagnostics requires development of optical and photonic detection/sensing technologies capable of reaching the single molecule level. The technical challenges to rapidly and specifically detect chemical and biological agents at minimal concentration lev-

els are enormous and largely yet to be realized. All spectroscopic techniques (optical spectroscopy, fluorescence spectroscopy, elastic scattering, Raman scattering, IR spectroscopy, terahertz spectroscopy) as well as the chemical and biological sciences themselves including genetically encoded fluorescent markers and (photoswitchable) labels, are potentially critical components for a multidisciplinary approach to ultrasensitive sensing and diagnostics.

Invited and contributed papers are solicited concerning, but not limited to, the following areas:

- techniques and methods of single molecule (SM) detection
- techniques and methods of SM spectroscopy (such as FCS, FLCS, FLIM, FRET)
- techniques and methods for fluorescence lifetime imaging (FLIM) with one, two, or three photon excitation
- techniques of single molecule manipulation
- superresolution fluorescence imaging (STED, PALM, (d)STORM, GSD-IM, SOFI, SIM and related techniques)
- labels and markers for single molecule techniques like ultrastable organic molecules, photoswitchable molecules/proteins, nanodiamonds, etc.
- advanced fluorescence imaging like (time-resolved) two- and three-photon fluorescence microscopy or (time-resolved) Raman spectroscopy
- multi-modal SM detection such as combining AFM with confocal microscopy
- correlative microscopy such as combining optical and electron microscopy
- fundamental aspects of SM spectroscopy
- biophysical applications of SM spectroscopy and imaging
- medical applications of SM spectroscopy and imaging
- ultrasensitive biomedical diagnostics
- high-throughput screening applications
- chemical and biochemical sensing photonic materials for ultrasensitive optical detection
- microfluidics and capillary devices.

### PICOQUANT YOUNG INVESTIGATOR AWARD

Young scientists (age 30 or below and not yet full faculty members) are encouraged to participate in this best paper competition, which offers a \$750 USD cash award. Participants must be both the primary author and presenter of an accepted abstract to be eligible. Please select "PicoQuant Young Investigator Award" as the last Topic in the abstract submission wizard in order to be considered. This award is sponsored by PicoQuant GmbH Berlin and presented Sunday afternoon.

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#PhotonicsWest

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# Present your research at SPIE Photonics West

Follow the instructions below to develop a successful abstract for submission to a conference and review policies for publication in the Proceedings of SPIE in the SPIE Digital Library. Submissions subject to chair approval.

## Important dates

Abstracts due	19 July 2023
Registration opens	October 2023
Authors notified and program posts online	9 October 2023
Submission system opens for manuscripts and poster PDFs*	27 November 2023
Poster PDFs due for spie.org preview and publication	3 January 2024
Manuscripts due	10 January 2024
Advance upload deadline for oral presentation slides**	25 January 2024

\*Contact author or speaker must register prior to uploading

\*\*After this date slides must be uploaded onsite at Speaker Check-in

## What you will need to submit

- Presentation title
- Author(s) information
- Speaker biography
- 250-word abstract for technical review
- 100-word summary of abstract for display in the program
- Keywords used in search for your paper (optional)
- Check the individual conference call for papers for additional requirements (for example, some conferences require 2- to 3-page extended summary for technical review, or have instructions for award competitions)

Note: Only original material should be submitted. Commercial papers, papers with no new research/development content, and papers with proprietary restrictions will not be accepted for presentation.

## How to submit your abstract

- Visit the conference page: [www.spie.org/BO503call](http://www.spie.org/BO503call)
- You may submit more than one abstract, but submit each abstract only once
- Submit by clicking the “Submit an Abstract” button on the conference page
- Sign in to your SPIE account, or create an account if you do not already have one
- Follow the steps in the submission wizard until the submission process is completed
- If your submission is related to an application track below, indicate the appropriate track when prompted during the submission process

## Application track

Listed below are the application tracks available for this meeting. Application tracks aggregate presentations and focus on emerging technical and societal needs that require a multidisciplinary approach.

- **AI/ML:** Papers that highlight the use of artificial intelligence, machine learning, and deep learning to create and implement intelligent systems across multiple sectors, technologies, and applications
- **Sustainability:** Papers that highlight the use of optics and photonics for renewable energy, natural resource management, sustainable manufacturing, and greenhouse gas mitigation in support of the UN Sustainable Development Goals
- **Brain function:** Papers that highlight the development of innovative optics and photonics technologies that increase our understanding of brain physiology and function
- **Translational research:** Papers that highlight the transition from bench to bedside using the latest photonics technologies, tools, and techniques for healthcare
- **3D printing:** Papers that highlight the innovative use of optics and photonics in multidisciplinary applications for multidimensional manufacturing

## Submission agreement

All presenting authors, including keynote, invited, oral, and poster presenters, agree to the following conditions by submitting an abstract:

- Register and pay the author registration fee.
- Oral presenters: recording and publication of your onsite presentation (slides synched with voice) for publication in the Proceedings of SPIE in the SPIE Digital Library
- Poster presenters: submit a poster PDF by the advertised due dates for publication in the Proceedings of SPIE in the SPIE Digital Library; poster PDFs may also be published and viewable in the spie.org program during and immediately after the event. Each poster must have a unique presenter; one person may not present more than one poster per session
- Email messaging for the conference series
- Submit a manuscript by the advertised due date for publication in the Proceedings of SPIE in the SPIE Digital Library
- Obtain funding for registration fees, travel, and accommodations
- Attend the meeting
- Present at the scheduled time

## Review and program placement

- To ensure a high-quality conference, all submissions will be assessed by the conference chair/editor for technical merit and suitability of content
- Conference chairs/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 chair discretion

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### QUESTIONS?

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