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25 - 30 January 2025
The Moscone Center
San Francisco, CA, USA

CALL FOR PAPERS

Submit abstracts by
17 July 2024

Optical Interactions with Tissue and Cells XXXVI (BO400)

CONFERENCE CO-SPONSOR

THORLABS

Conference Chairs: **Norbert Linz**, Univ. zu Lübeck (Germany); **Joel N. Bixler**, Air Force Research Lab. (United States)

Conference Co-Chair: **Alex J. Walsh**, Texas A&M Univ. (United States)

Program Committee: **Rainer J. Beck**, Heriot-Watt Univ. (United Kingdom); **Randolph Glickman**, The Univ. of Texas Health Science Ctr. at San Antonio (United States); **Bennett L. Ibey**, Air Force Research Lab. (United States); **Steven L. Jacques**, Univ. of Washington (United States); **Beop-Min Kim**, Korea Univ. (Republic of Korea); **Alexander J. Makowski**, Sciton, Inc. (United States); **Patience T. Mthunzi-Kufa**, CSIR National Laser Ctr. (South Africa)

The Optical Interactions with Tissue and Cells conference addresses the complex interaction of light with biological tissues. The modeling, experimental measurement and validation, and application of both classical and quantum optical interactions to measure unique changes in a biological system is core to this conference. Classical light-tissue interaction, governed by the inherent properties of the light, such as intensity, wavelength, polarization and coherence, already results in complex multiphysical interaction mechanism(s) (photochemical, photothermal, photomechanical, and plasma formation). Mechanisms and applications for laser ablation are of high interest to this conference. In the field of nonclassical interactions, quantum correlations, for example such as those caused by entangled photons, open up exciting new possibilities for the study and optimization of quantum efficiency.

This conference reaches beyond just the optical wavelengths to include lower frequencies in the RF (radio frequency) and THz (terahertz) regions. Investigation of the fundamental mechanisms of laser tissue and cell interactions is gaining further importance for innovative clinical applications due to its increasing use in surgery in combination with optical imaging. The field has expanded to include not only bulk tissue responses, but also cellular and molecular responses to electromagnetic irradiation at the in vitro and in vivo level. In general, novel imaging methods to visualize these processes are of great interest for the conference. With the growing use of artificial intelligence and deep learning, modeling of light propagation can be used at a completely different level to predict or simulate the relevant interaction mechanisms.

Beyond advancing the modeling and measurement of EM interactions, this conference is also focused on innovative methods for teaching biophotonics to the next generation of optical engineers.

Understanding the fundamental mechanisms of interactions between optical radiation, tissue, and cells is the basis for the development of future biomedical optic technologies that include both therapeutic and diagnostic applications. Relevant to this goal, presentations with clinical relevance are especially encouraged.

The presenters of posters will be asked to participate in a speed poster session. This will be a 3-4 minute presentation of your poster at the start of the poster session. This will ensure that all accepted abstracts of this conference will receive an opportunity to present their work.

At the end of the conference awards will be given out for the best oral presentations and best poster. A preliminary list of session topics is listed below. Please include these terms in abstracts for the purpose of organizing sessions.

- novel applications of lasers and light in biomedicine/nanomedicine
- photothermal, photochemical, photo-oxidative, and photomechanical interactions
- mechanisms of pulsed laser ablation
- novel imaging methods to visualizing optical interactions with tissues and cells
- ultrafast laser phenomena in cells and tissue
- optical monitoring of tissue mechanics
- optical properties of tissues and cells
- quantum light tissue interactions
- micro-and nanosurgery in cells and tissues (dissection, tissue welding, ablation)
- biomolecular and biophysical response of cells and tissues to electromagnetic waves
- photonics based diagnostics for communicable and non-communicable diseases
- numerical approaches simulating laser-tissue interactions and response
- advanced numerical methods for modeling light tissue interaction (machine learning/neural networks)
- advanced imaging approaches (IVIS, MRI, CT, etc.) to visualize electromagnetic tissue interaction and resolve in vivo optical properties
- signal modeling as a function of tissue optical properties
- education and training in biophotonics.

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#PhotonicsWest

CONTINUED NEXT PAGE →

SPIE.

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	17 July 2024
Registration opens	October 2024
Authors notified and program posts online	7 October 2024
Submission system opens for manuscripts and poster PDFs*	25 November 2024
Poster PDFs due for spie.org preview and publication	2 January 2025
Manuscripts due	8 January 2025
Advance upload deadline for oral presentation slides**	23 January 2025

*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 (1000-character max including spaces)
- Abstract for technical review (200-300 words; text only)
- Summary of abstract for display in the program (50-150 words; text only)
- Keywords used in search for your paper (optional)
- Check the individual conference call for papers for additional requirements (i.e., special abstract requirements or 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/bo400call
- Choose one conference that most closely matches the topics of your abstract. You may submit more than one abstract, but submit each abstract only once
- Click the title of the conference to view the full description and submit by clicking the "Submit an Abstract" button on that 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
- **Photonic chips:** Papers that highlight advances in materials, design, fabrication, integration, testing and packaging of photonic components at the chip level

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 conference registration fee
- Agree to receive email messaging for the conference series
- 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: one person may not present more than two posters in a poster session; poster presenters may submit an optional poster PDF available for preview in the online program (web and app) and for publication in the Proceedings of SPIE in the SPIE Digital Library
- 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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- Only manuscripts, presentations, and posters presented at the conference and received according to publication guidelines and due dates will be published in the Proceedings of SPIE in the SPIE Digital Library
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