



Ultrafast Nonlinear Imaging and Spectroscopy XII (OP410)

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The main theme of this conference is focused on exploiting ultrafast and nonlinear optical techniques for imaging and spectroscopy applications. The merging of ultrafast nonlinear optics and imaging has created exciting opportunities to explore nonlinear susceptibility as contrast mechanisms for label-free imaging. For instance, second harmonic generation (SHG) imaging relies on the difference in second order nonlinear susceptibility to form an image and can be used to probe molecules or structures without inversion symmetry. The introduction of the multi-photon nonlinear excitation technique using femtosecond pulses to fluorescence microscopy has allowed for the use of longer excitation wavelengths hence deeper penetration depth in scattering media, reduced photo-toxicity, and natural optical sectioning capability. By combining nonlinear molecular vibrational spectroscopy (such as coherent anti-Stokes Raman spectroscopy – CARS, and stimulated Raman scattering – SRS) with imaging, coherent Raman microscopy possesses the unique chemical selective imaging capability. Last but not the least, various novel sources generated by ultrafast nonlinear processes (e.g., supercontinuum) also have significant impact on the field of imaging and spectroscopy.

This conference provides an excellent opportunity for researchers working on the field of ultrafast nonlinear imaging and spectroscopy to present their most recent progress. Papers on all related areas are solicited, including novel ultrafast nonlinear optical imaging and spectroscopy techniques, nonlinear imaging contrast mechanisms, applications of ultrafast nonlinear imaging and spectroscopy, nonlinear optical sources, and computational techniques related to ultrafast nonlinear imaging and spectroscopy. The following are a list of exemplary topical areas:

- sum frequency generation (SFG) spectroscopy, SFG and SHG (second harmonic generation) microscopy
- multi-photon excitation fluorescence microscopy
- third harmonic generation (THG) microscopy
- four wave mixing spectroscopy and imaging, coherent Raman spectroscopy and microscopy (e.g., CARS, SRS)
- ultrafast nanoscale nonlinear imaging and spectroscopy
- ultrafast electron diffraction and imaging
- multispectral imaging
- multidimensional spectroscopy
- Brillouin imaging
- holographic nonlinear imaging
- stimulated emission depletion microscopy (STED)
- structured illumination imaging
- nonlinear sources (e.g., supercontinuum, THz) for imaging and spectroscopy
- novel ultrafast and nonlinear imaging and spectroscopy techniques
- computational nonlinear imaging and spectroscopy
- application of machine learning to ultrafast/nonlinear imaging/spectroscopy and photonic systems
- biological and chemical imaging and sensing applications.

Present your research at SPIE Optics + Photonics

Below are abstract submission instructions, the accompanying submission agreement, conference presentation guidelines, and guidelines for publishing in the Proceedings of SPIE on the SPIE Digital Library. Submissions subject to chair approval.

Important dates

Abstracts due	7 February 2024
Registration opens	April 2024
Authors notified and program posts online	29 April 2024
Submission system opens for manuscripts and poster PDFs*	17 June 2024
Poster PDFs due for spie.org preview and publication	24 July 2024
Manuscripts due	31 July 2024
Advance upload deadline for oral presentation slides**	16 August 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

- 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. extended abstract PDF upload for review 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/op410call
- You may submit more than one abstract but submit each abstract only once
- Click 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

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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