



Unconventional Optical Imaging IV (PE107)

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IN MEMORIAM



This year's conference is dedicated to the memory of **Gabriel "Gabi" Popescu**, the William L. Everitt Distinguished Professor in Electrical and Computer Engineering and a faculty researcher at the Beckman Institute, Univ. of Illinois Urbana-Champaign (United States).

Gabi Popescu was a creative leader in biophotonics, with pioneering contributions to quantitative phase imaging and spectroscopy, an engaging collaborator and an inspiration to his friends, colleagues and students.

Gabi served as the 2018-2022 Chair of the SPIE conference on Unconventional Optical Imaging.

In recent years, the field of optical imaging has experienced tremendous technological and conceptual breakthroughs. Advances in system design and novel approaches to information processing have enabled significant progress in a number of areas including, nanoscopy and super-resolution imaging, quantitative phase imaging, 3D imaging, light-field imaging, digital holography, and compressive sensing. This progress has been made possible by the developments in light sources and detectors and the miniaturization and democratization of computing resources. Equally important, progress is driven by cross-disciplinary collaboration between the fields of imaging science, optical design, and signal/image processing as well as the continuing evolution of photonics components development as evidenced by new sensor technologies, light sources, optical materials and optical elements. Modern imaging makes it necessary to have a comprehensive understanding

and control of the full scope of disciplines from optical modeling through optical design to digital image processing and analysis. These innovative imaging techniques are finding many new uses ranging from the fundamental aspects of materials science and the biological sciences to downstream industrial metrology and medical imaging applications.

The area of optical imaging, being more than ever at the crossroads of these fields, drives the need for a topical conference on novel optical imaging to stimulate scientific interaction between international academic and industrial participants in this innovative imaging domain.

Joint sessions with Optics and Photonics for Advanced Dimensional Metrology Conference and Biomedical Spectroscopy, Microscopy, and Imaging Conference will be organized.

Papers from academia, research organizations, industry and government organizations are solicited on the following and related topics:

IMAGING

- co-design optics/processing
- computational imaging
- inverse problems in imaging
- information processing in unconventional imaging including algorithms for blind deconvolution, source separation, de-noising, and detection/classification
- artificial intelligence for imaging applications
- compressed sensing for unconventional imaging
- 3D imaging
- quantitative phase imaging
- label-free tomography
- super-resolution techniques for imaging
- multicomponent imaging
- multimodal imaging and fusion
- multispectral imaging
- tomographic imaging
- synthetic aperture imaging and ptychography
- imaging through scattering media
- nonlinear imaging and advanced microscopy: SHG, THG, CARS, SRS, etc.



- extreme optical imaging: THz, X-ray, and gamma radiation imaging
- lensless imaging techniques
- light field / plenoptic imaging
- interferometric imaging (including digital holography)
- polarimetric imaging
- event-based imagers for unconventional imaging
- ultrafast imaging
- photon counting
- smart CMOS image sensors.

SENSING

- wavefront sensing
- phase restoration and wavefront reconstruction
- non-contact measurement and optical sensing in harsh environments
- hybrid optical sensors and imagers
- advanced image sensors for use in unconventional imaging methods
- advances in materials and material characterization for sensing and unconventional imaging.

APPLICATIONS

- cell biomedical imaging (cell mechanics, subcellular imaging, tissue diagnosis and prognosis, in-vivo imaging, etc.)
- endoscopy
- nanoscopy
- high throughput imaging
- particle imaging and velocimetry
- imaging in harsh environments such as underwater, in hazardous conditions, at high temperature, or in vacuum
- time-of-flight studies
- application in materials science and metrology.

THE CONFERENCE WILL FEATURE THE FOLLOWING SPECIAL PRESENTATIONS

- Keynote Presentation by **Sylvain Gigan**, Ecole Normale Supérieure (France)
- Tribute Session to Gabi Popescu spotlighting invited presentations from a number of his notable colleagues and trainees, including:
 - Mark Anastasio**, University of Illinois at Urbana Champaign (United States)
 - Randy Bartels**, University of Wisconsin-Madison (United States)
 - Catherine Best**, University of Illinois at Urbana Champaign (United States)
 - Catalin Chiritescu**, Phi Optics, Inc (United States)
 - Mustafa Mir**, University of Pennsylvania (United States)
 - Woongyu Jung**, Ulsan National Institute of Science & Technology (Korea)

Present your research at SPIE Photonics Europe

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	30 November 2023
Authors notified and programme posts online	25 January 2024
Registration opens	8 January 2024
Submission system opens for manuscripts and poster videos/PDFs*	5 February 2024
Manuscripts due	20 March 2024

*Contact author or speaker must register prior to uploading

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 programme (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/pe107call
- You may submit more than one abstract, but submit each abstract only once
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- 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

Submission agreement

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

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- 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 programme 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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