Quantum Sensing and Nano Electronics and Photonics XIX (OE301)

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This conference aims to provide a broad overview of the current state-of-the-art and future prospects in quantum sensing, nano-electronics, and photonics. This exciting program will cover different areas to address the challenges and progress in advanced topics such as, photonic materials and devices, artificial intelligence, neuromorphic devices, optoelectronics, quantum information, spintronics, medical science and technology, space and satellite programs, and related areas. Future advances in these areas are inspired by the use of quantum-sized effects to achieve higher efficiency and multi-functionality. By bringing together experts in physics, chemistry, materials science, engineering, national labs, and industry we will have a well-rounded view of how science has progressed towards developing integrated and versatile detection systems at the nanoscale.

Addressing many of the challenges in the fast-paced technological world, require continued scientific and technological advances in materials, optics, and photonics; therefore, the diversity of topics listed here has been chosen to encourage the exchange of ideas between the different relevant disciplines.

Contributions for this conference are solicited in the following areas:

- Quantum devices, including solar cells, LED lasers, detectors, pin, avalanche photodiodes, QWIP, BIB, UV, visible, IR, FET, etc.
- Applications (quantum spectroscopy, imaging, communications, cryptography)
- Nano quantum structures (quantum wells, wires, dots)
- Nonlinear and ultrafast optical phenomena
- Hyperbolic metamaterials
- Characterization (optical, electrical, structural, etc.)
- Micro- and nano-fabrication technologies (e-beam lithography, deep-UV, etching, passivation, contacts, etc.)
- Semiconductor quantum detectors, FPAs and ROICs for UV, visible, Type-II, MWIR, LWIR, VLWIR, THz, and applications
- Nanophotonics, metamaterials, graphene, active plasmonics

- THz emitters and receivers (quantum-cascade lasers, narrow band-gap, III-nitride, etc.)
- Single-photon counting detectors, FPAs and their applications
- Biosensing
- Terahertz nano-photonics and nanoelectronics
- Graphene and other 2D materials
- Near-field optics and scanning probe microscopy, and flat optics
- Bio-electronics and biophotonics
- Light-matter interaction at the nanoscale
- Nanostructured and functionalized surfaces
- Photonic bandgap structures and their applications
- Neuromorphic devices, circuits, and systems
- Unconventional computing, including stochastic and probabilistic methods
- High-speed and low-power memory and data storage technologies
- Spin waves, magnonics, magnonic bandgap structures and their applications
- Spintronic GHz to THz sources and detectors, including spin-transfer and spin-orbit torque oscillators, spin torque diodes and magnetic tunnel junctions
- Topological devices and materials, including skyrmion-based devices, topological insulators and Weyl semimetals
- Magneto-optical devices.
INNOVATION AWARD IN QUANTUM SENSING AND NANO ELECTRONICS AND PHOTONICS

SPIE announces the Innovation Award in Quantum Sensing and Nano Electronics and Photonics at SPIE Photonics West OPTO 2023 initiated by Prof Manijeh Razeghi. These awards will recognize the outstanding scientific contribution of students and outstanding scientists who present the most notable recent discoveries with broad impact in the areas of quantum sensing and nano electronics and photonics. These discoveries should be innovative in that they represent a new paradigm or way of thinking which will have a broad impact in their respective field. Participants will be required to give a 15-minute presentation at the evening technical event on Tuesday 31 January 2023. The winners will be announced at the end of the Tuesday evening event. Winners will be awarded a commemorative plaque as well as a cash prize.

To submit your work for consideration in this awards session, contact Prof. Manijeh Razeghi with a two-page abstract (containing working title, author(s)/affiliation(s), description, and references) by 19 December 2022.
Present your research at SPIE Photonics West

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**

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<th>Event</th>
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<tr>
<td>Abstracts due</td>
<td>20 July 2022</td>
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<tr>
<td>Registration</td>
<td>October 2022</td>
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<tr>
<td>Authors notified and program posts online</td>
<td>10 October 2022</td>
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<td>Submission system opens for manuscripts and poster PDFs*</td>
<td>28 November 2022</td>
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<tr>
<td>Post-deadline abstracts due: Submit via conference listings</td>
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<td>Poster PDFs due for spie.org preview and publication</td>
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<td>Manuscripts due</td>
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<td>Advance upload deadline for oral presentation slides**</td>
<td>26 January 2023</td>
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*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**
- **250-word abstract for technical review**
- **100-word summary for 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 2-3-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/oe301call](http://www.spie.org/oe301call)
- 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.
- If your submission is related to an application track below, indicate the appropriate track when prompted during the submission process.

### Application track

- **Brain:** Papers that describe the development of innovative technologies that will increase our understanding of brain function
- **Translational Research:** Papers that showcase the latest photonics technologies, tools, and techniques with high potential to impact healthcare
- **3D Printing:** Papers that showcase innovative ways to apply this multidimensional/multidisciplinary technology
- **AI/ML:** Papers that showcase the use of artificial intelligence, machine learning, and deep learning to create and implement intelligent systems
- **Net Zero:** Papers that feature solutions to achieving net zero energy consumption, waste, and carbon emissions within optics and photonics

### 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 and optional preview video 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.
- Submit a 2-page minimum manuscript, by the advertised due date, for publication in the Proceedings of SPIE in the SPIE Digital Library.
- Obtain funding for registration, travel, and accommodations.
- Ensure that all clearances, including government and company clearance, have been obtained to present and publish. If you are a DoD contractor in the USA, allow at least 60 days for clearance.
- 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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Contact the coordinator listed in your spie.org account.

For questions about your presentation, submitting an abstract post-deadline, or the meeting, contact your conference program coordinator.

For questions about publication or the SPIE Digital Library, contact your proceedings coordinator.