Next-Generation Spectroscopic Technologies XVI (DCS101)

Conference Chairs: Richard A. Crocombe, Crocombe Spectroscopic Consulting, LLC (United States); Luisa T. M. Profeta, Rigaku Analytical Devices (United States)

Conference Co-Chair: Steven M. Barnett, Barnett Technical Services, LLC (United States)

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The overall emphasis in this conference is on advanced technologies for spectroscopic instrumentation, particularly for miniature, portable and wearable instruments, but also including novel spectroscopic sources used in the laboratory and process applications (e.g., QCL, ICL, supercontinuum). The scope focuses on the optical region: UV-visible, infrared, near-infrared, terahertz, and Raman molecular techniques. However, it also includes advances enabling miniature and portable spectrometers across the electromagnetic spectrum, including x-ray fluorescence, laser induced fluorescence, laser induced breakdown spectroscopy (LIBS), nuclear magnetic resonance and mass spectrometry.

The conference includes papers describing breakthrough, novel, recently-introduced, and commercial instrumentation; also the rapidly emerging fields of portable and handheld hyperspectral imaging, multispectral sensors incorporated in consumer goods and wearables, smartphone spectroscopy, citizen spectroscopy, with cloud-based collection and processing of data from those instruments.

FOCUS AREAS FOR 2024
• very low-cost, very compact, spectrometers and multispectral sensors (e.g., Si-based sensors using LVFS, mosaic filters, Fabry-Perots, spectrometers based on plasmonic devices, photonic integrated circuits, etc.), and their applications in consumer goods and wearables
• portable spectrometers for consumers and consumer applications (technologies, instruments, applications), including wearables (rings, watches, etc.)
• smartphone spectroscopy, including developments for point-of-care applications
• portable spectrometer algorithms and databases to generate actionable answers in the field
• field applications of portable spectrometers
• portable hyperspectral imaging (technologies, instruments, applications)
• stand-off detection and drone-mounted spectrometers and imagers
• optical food spectroscopy (sorting, freshness, contamination, adulteration, fraud)
• UV-, gated- and stand-off Raman
• Applications of SPAD arrays in spectroscopy
• QCL- and ICL-based spectroscopy
• spectroscopy using supercontinuum and other new sources
• terahertz technologies, instrumentations, and applications
• terahertz plasmonics, metamaterials, and 2D terahertz spectroscopy
• dual- or hyphenated-technology spectroscopy instruments
• new and novel instruments for chemical sensing
• citizen science spectrometers
• machine learning/AI methods for spectroscopy.

A joint session with the Chemical, Biological, Radiological, Nuclear, and Explosives (CBRNE) Sensing conference is planned.

www.spie.org/DCS101call
Present your research at SPIE Defense + Commercial Sensing

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>11 October 2023</td>
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<tr>
<td>Registration opens</td>
<td>8 January 2024</td>
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<tr>
<td>Authors notified and program posts online</td>
<td>15 January 2024</td>
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<tr>
<td>Submission system opens for manuscripts and poster PDFs*</td>
<td>19 February 2024</td>
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<tr>
<td>Poster PDFs due for spie.org preview and publication</td>
<td>27 March 2024</td>
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<td>Manuscripts due</td>
<td>3 April 2024</td>
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<tr>
<td>Advance upload deadline for oral presentation slides**</td>
<td>19 April 2024</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**
- **Speaker biography** (1000-character max including spaces)
- **Abstract for technical review** (200-300 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/DCS101call](http://www.spie.org/DCS101call)
- 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 tracks

- **AI/ML:** Papers that showcase the use of artificial intelligence, machine learning, and deep learning to create and implement intelligent systems
- **Microelectronics:** Papers that highlight advances in materials, design, fabrication, integration and applications of silicon or compound semiconductor microelectronics for use in the security and defense sectors and the commercial marketplace.
- **Sustainability:** 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 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
- Email messaging for the conference series
- Submit a manuscript by the advertised due dates for publication in the Proceedings of SPIE in the SPIE Digital Library; manuscripts may be published 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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- More publication information available on the [SPIE Digital Library](http://www.SPIEDigitalLibrary.org)

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  - AI Assurance Solutions
  - Lead, The MITRE Corporation (USA)
- Doug Droege
  - Sr. Director Technology Integrated Mission Systems, L3Harris (USA)

**Symposium Co-Chairs**

- Ann Marie Raynal
  - Sandia National Labs.
  - (USA)
- Ravi Ravichandran
  - BAE Systems (USA)

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