



Nondestructive Characterization and Monitoring of Advanced Materials, Aerospace, Civil Infrastructure, and Transportation XIX (SSN07)

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This conference creates an international forum to address the current state-of-the-art technologies in nondestructive characterization and monitoring of advanced materials and aerospace components, as well as technical challenges concerning infrastructure asset management including commercial/public transportation and public utilities. The inspection technologies encompass a cradle-to-grave timeline allowing for the monitoring of the fabrication process (e.g., advanced/additive manufacturing), assessing initial component quality, in-situ monitoring and system health, as well as evaluating repairs/retrofits. The overall theme focuses on identifying and fostering improvements and new innovations regarding theory, hardware, implementation strategies, interpretation of data/results, and automation. This conference will provide a medium for communication and collaborations among engineers and scientists in the following areas:

- SHM/NDE of advanced materials (e.g., refractories, polymer matrix composites, metal matrix composites, ceramic matrix composites, nanocomposites, foams, high-performance alloys)
- development of NDE and SHM tools for automotive and aerospace components/systems
- multifunctional structural composites and energy storage systems for automotive applications
- multi-modal SHM/NDE techniques and applications
- innovative in-line manufacturing of composites enabled by machine learning and artificial intelligence
- life management and system analysis/design methodologies for diagnostics and prognostics of materials and structures
- civil infrastructure management for roads, highways, rail systems, bridges, buildings, water systems, dams, levees, pipelines, tunnels, chimneys, and power generation (e.g., natural gas, coal, nuclear, wind, hydropower, geothermal, solar, etc.)
- SHM/NDE and material characterization of energy infrastructure (electrical grids, power transmission, pipeline distribution systems, nuclear power plants, and/or oil and gas exploration)

- SHM/NDE sensor development, MEMS/NEMS, intelligent transportation systems, complex cyber-physical systems via control, networking, verification, and real-time systems to protect infrastructure including aeronautics, civil, materials, energy, automotive, medical, chemical, manufacturing, and agriculture
- continuous and life-cycle monitoring, predictive modeling, aging mechanisms for aeronautical, civil, mechanical, and manufacturing engineering structures
- novel materials and sensors/networks for structural repair/retrofit for cost mitigation, improving measurement accuracy, reliability, and safety
- SHM and NDE for additive manufacturing processes and finished parts
- modeling, simulation, and technology development at various scales ranging from nano- and micro- scale to super-large structures
- signal/image processing, data fusion, data mining, signal/image denoising, artificial intelligence, and deep learning for SHM/NDE
- augmented reality (AR), Virtual reality (VR), mixed reality (MR), and digital twins for SHM/NDE
- automated and autonomous SHM/NDE using unmanned aerial vehicles/systems (UAV/S) and unmanned underwater vehicles (UUV); urban air mobility systems
- SHM/NDE technologies and applications in homeland security and counterterrorism
- mitigation of man-made and natural hazards in physical infrastructure including buildings, highway infrastructure, bridges, dams, levees, and nuclear power plants
- NDE standards, codes, regulations, and acceptance criteria
- NDE for self-healing, self-sensing materials, structures, and systems
- big data for vehicle health monitoring and redesign of structural components based on sensor data.

Present your research at SPIE Smart Structures + NDE

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	11 September 2024
Registration opens	18 November 2024
Author notified and program posts online	25 November 2024
Submission system opens for manuscripts and poster PDFs*	13 January 2025
Poster PDFs due for spie.org preview and publication	19 February 2025
Manuscripts due	26 February 2025
Advance upload deadline for oral presentation slides**	14 March 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 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/SSN07call
- You may submit more than one abstract, but submit each abstract only once
- Submit by clicking 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

An application track is a grouping of presentations on a topic of interest across all conferences. During submission of the abstract, the submitting author should select an application track if it is relevant to their research.

- **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
- **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

Submission agreement

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

- Register and pay the conference registration fee
- Agree to receive email messaging for the conference series
- Oral presenters: agree to recording and publication of your onsite presentation (slides synched with voice) 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; submit a poster PDF 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 and/or SPIE staff 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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