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Micro (MEMS) and Nanotechnologies for Defense and Security

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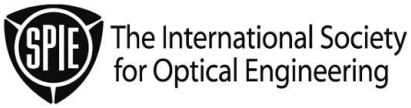

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Introduction

This conference intends to bring together scientists and engineers involved in advancing micro (MEMS) and nanotechnologies, with the focus on applications in space, defense, and homeland security. Given the enormous diversity of MEMS and nanotechnologies, we have selected several cutting-edge topics in fabrication techniques, as well as novel devices and systems, advanced algorithms, and sensor networks. The sessions are organized to facilitate the exchange of ideas and promote the discussion of recent progress in MEMS/nanotechnology research and trends toward system-level development. It is anticipated that this conference will foster cross-fertilization across many disciplines with participants being exposed to the entire range of scientific and engineering problems associated with the concepts-to-systems technology development pipeline.

MEMS and nanotechnologies are disruptive by nature, and address universal requirements for high-capability systems with small mass and size and low power consumption. Among the many issues faced by technologies making the transition from laboratory to commercial production are the demonstration of economical manufacturability and reliability during operation in the application environments. Other system-level considerations include the development of 'smart algorithms' that are required in order to realize the full potential of MEMS and nanosystems. A particular area of interest is the detection of weak signals within noisy backgrounds, arising from the fact that miniaturization, in general, degrades the sensitivity of sensors.

The ultimate benefit of MEMS and nanotechnologies lies in the creation of networks of small mass and low power sensors and actuators for numerous networked applications such as distributed sensing, aircraft/spacecraft health monitoring, biological and chemical monitoring of the environment, and for defense and security applications. Once again, in addition to developing the MEMS and nanotechnology sensing/actuation hardware for each node of the network, advanced algorithms for sensor fusion and sensor interoperability need to be developed in parallel.

The scope of the conference ranges from topics in basic research in MEMS and nanotechnology, to component and subsystem level development for space, defense, and security applications.

Papers are solicited on the following and related topics:

- innovative micro- and nanofabrication, assembly, and manufacturing technologies
- novel micro- and nanotechnology-based physical, chemical, and biological sensor devices and systems

- micro- and nanophotonics
- micro- and nano-actuators
- systems based on micro- and nanotechnologies
- reliability considerations for micro- and nanotechnologies
- advanced algorithms for improving the performance of systems and networks based on micro- and nanotechnologies
- energy storage and generation for micro- and nanodevices and systems
- micro- and nanosensor and actuator networks.

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