

CALL FOR PAPERS

IEEE Transactions on Nanotechnology

Special issue on

*Device Concepts, Architectural Strategies & Interfacing Methodologies
for Realizing Nanoscale Sensor Systems*

This special issue seeks to survey the leading-edge research work in nanomaterials, nanofabrication, and integration that contributes to bridging the gap between nanoscale concepts and practical sensor systems.

The long-term vision of broadly leveraging fundamental mechanisms at the nanoscale and at the molecular level to realize technologically important advancements in engineering requires unification of many technical elements from an array of multidisciplinary fields. To achieve the vision of nanosensor systems that possess dramatically enhanced functionality, integration levels, and speeds that surpass the incremental state-of-the-art (e.g., nanoscale Si-CMOS technology for data processing) one must investigate, conceptualize, and fabricate systems based on new paradigms. Furthermore, the challenges associated with nanoscale sensor systems can only be adequately addressed when the basic devices, system architectures, and interfaces are considered in a unified fashion. Next-generation sensor systems will therefore be defined through research and development that is not only limited to nanoscale structures and phenomenology, but through interdisciplinary efforts that simultaneously consider and/or address the major challenges related to the: (i) identification of novel functionality derived from nanoscale-dictated electronic and/or photonic processes; (ii) conceptualization of device and system architectures with highly-organized materials structures useful for prescribing and controlling signal/information propagation; and (iii) implementation of interfacing methodologies useful for both integration of fundamental nanoscale building-blocks and for imposing and extracting signals from the system.

This special issue is soliciting papers from all areas that contribute to nanoscale sensor systems. General areas of interest include, but are not limited to:

- Device concepts for nanoscale sensors and systems
 - Quantum-effect based detection and recognition devices
 - Electrical and photonic devices based on properties of molecular complexes
 - Nano-engineered electromagnetic sources/detectors/components for sensor systems
 - Molecular and nanostructure interfaces for signal transduction and extraction
- Nanostructured materials, fabrication and integration processes for devices
 - Materials, devices, and architectural concepts related to powering nanoscale systems.
 - Engineered nanoparticles for enhanced device and sensor functionality
 - Chemically-directed/selective self-assembly of nanoscaffolds
 - Chemically synthesized and biologically-inspired architectures
 - Hybrid molecular and nanoscale CMOS-based architectures
 - Graphene-based devices and sensor concepts
- Science and technology for interfacing at the nanoscale
 - Interface techniques and phenomenology at the nanoscale
 - Concepts for nanoscale-microscale and nanoscale-macroscale interfaces
 - Hierarchical interface issues in 2-D & 3-D nanoscale device and system architectures

- Nanoscale sensor, system, and network applications
 - Analysis and detection methodologies for threat-agents based on nanoscale systems
 - Sensitivity and discrimination enhancement mechanisms/principles for nano-systems
 - Imaging and data processing based on nanoscale systems and networks

Participants at the Annual IEEE NANO Conference (July 23-26, 2009, Genoa, Italy) and other specialty meetings such as the “Nanoelectronic Devices for Defense & Security Conference,” to be held in Fort Lauderdale, Florida, September 27 – October 2, 2009 (see www.nano-dds.com) are especially encouraged to submit their work. All papers will undergo the standard IEEE Transactions on Nanotechnology peer review process. For manuscript preparation and submission, please follow the guidelines in the *Information for Authors* section at the IEEE Transactions on Nanotechnology web page <http://lipari.usc.edu/~requicha/tnano>. All manuscripts must be submitted on-line via the *IEEE Manuscript Central*™ process at the website <http://mc.manuscriptcentral.com/tnano>. Please indicate your Manuscript Type as “other,” and state in the cover letter that the paper is for this Special Issue. Authors are encouraged to **suggest names of potential reviewers** for their manuscripts in the space provided for this purpose at the submission website.

Deadlines:

- Manuscript Submission: December 1, 2009
- Notification of Acceptance: March 1, 2010
- Final Manuscript due: April 1, 2010
- Tentative publication date: July 1, 2010

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