

## **IV. Materials, Fabrication and Integration for Sensor Architectures**

### **(A1) Engineered Nanoparticles for Enhanced Device & Sensor Functionality**

**Co-Chairs:** Ravi Pandey, Michigan Technological University, [pandey@mtu.edu](mailto:pandey@mtu.edu)  
John Zavada, U.S. ARO, [john.zavada@us.army.mil](mailto:john.zavada@us.army.mil)  
John Mintmire, Oklahoma State University, [john.mintmire@okstate.edu](mailto:john.mintmire@okstate.edu)  
Brigitte Rolfe, MITRE, [brolge@mitre.org](mailto:brolge@mitre.org)

Nanoscale science and technology have emerged over the past decade as the forefront of science and technologies. The intersecting fields of study that create this domain of science and engineering perfectly typify the rapid, multidisciplinary advancement of contemporary science and technology. Of particular interest to this session are engineered nanoparticles, generally 100nm or smaller in size that are designed and developed to exhibit certain physical, chemical and electronic properties. Some examples of engineered nanoparticles are fullerenes, carbon nanotubes, nanowires, layered structures such as quantum dots, and particulates such as gold or silver nanoparticles.

Particles on the nanometer-scale inhabit the quantum realm, and thus exhibit properties and behaviors not generally present on the micron scale. These properties may be harnessed and tuned to provide enhanced capabilities for many device and sensor applications. In recent years nanoparticles have been successfully used as or within electronic devices, sensors, lasers, taggants, and drug-delivery systems. For this session, we would like to invite abstracts of work on the synthesis of individual nanoparticles, integrated systems of nanoparticles, or nanoparticle composites to enhance device and sensor functionality for national defense and security applications. Therefore, this session will emphasize topics describing modification of the chemical and physical structures of nanomaterials geared toward improving their sensing capabilities.