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Introduction

The 2013 Micro- and Nanotechnology Sensors, Systems, and Applications V Conference continued its trailblazing approach to showcasing a diverse range of MEMS and Nanotechnology topics that are a testament to the practically limitless applications of these exciting technologies. The sheer breadth of potential MEMS and Nanotechnology applications was also strongly validated by the synergy we were able to establish between our conference and other, equally diverse, and broad set of conferences within the DSS symposium. Successful joint sessions were conducted with the Scanning Microscopies (8729), Energy Harvesting and Storage (8728), Smart Biomedical and Physiological Sensor Technology (8719), Unmanned Systems Technology (8741), Flexible Electronics (8730), Chemical, Biological, Radiological, Nuclear, and Explosives (CBRNE) Sensing (8710) and the Passive and Active Millimeter-Wave Imaging (8715) Conferences. Exciting new sessions that were introduced in 2013 were sessions on Frontiers in Nanoelectronics Research (showcasing Dr. Anupama Kaul’s program at the NSF), Multifunctional and Adaptive Structural Materials, Flexible and Wearable Electronics for Defense Applications, Novel Transparent Conductors and Carbon-based Technologies, Devices, Nano-/Microstructured Materials for Photovoltaic and Photoelectrochemical Energy Harvesting, and Interaction of Semiconductors and High-Energy Particles.

As in previous years, each session was designed by the session chairs to address three “cornerstones” of our conference philosophy namely, describing programmatic investments that set the overall context for the cutting-edge research and development being presented, and the challenges involved in transitioning these exciting concepts to applications in defense, homeland security and space. A wide variety of advanced micro and nanoscale research being conducted by the Defense Advanced Research Projects Agency, Air Force Office of Scientific Research, National Institutes of Health, Department of Energy, Office of Naval Research and the Naval Research Laboratory, Army Research Laboratory, NASA, and the Japanese Atomic Energy Agency was presented.

Thanks to our distinguished contributors, in this proceedings volume, you will find papers covering a breathtaking range of topics from “How adaptive optics may have won the cold war” to “Nano-electro-mechanical-systems (NEMS) and Energy-efficient Electronics and The Emergence of Two-dimensional Layered Materials Beyond Graphene.” Enjoy!

Thomas George
M. Saif Islam
Achyut K. Dutta