Seminar
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Tuesday, April 1 in 132 Fluor Daniel Bldg.
3:00 – 4:00 p.m.

Seminar Series

Optical Absorbers and Nano-electro-mechanical-systems (NEMS) Enabled by Low-dimensionality Materials

Dr. Anupama B. Kaul
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Abstract

Inspired by the impact new and improved materials have had on society over the centuries, in the “nano” age, it is fascinating to see how nanotechnology is helping address technologically pressing issues such as electronics beyond Moore’s Law, or grand challenge areas such as healthcare and energy. While there are a plethora of nanomaterials each with their unique properties, in this talk I will discuss two areas where we have utilized the remarkable electrical, mechanical, and optical properties of carbon-based nanomaterials to device applications. In the first area, I will highlight our interdisciplinary work in developing high-efficiency optical absorbers that are extremely absorbing into the IR wavelengths and have potential applications in radiometry and energy harnessing. In the second area, motivated by the need for energy efficient electronics, I will describe our work on NEMS devices that are formed using high-throughput nanomanufacturable techniques, where abrupt switching characteristics are observed. Such NEMS structures can also be adapted for high-sensitivity mass sensing applications with possibilities for robust, wide dynamic range sensors. We are also exploring graphene-like van der Waals solids that have immense prospects for exciting device applications in nanoelectronics, sensing, energy harvesting and flexible electronics.

Biography of Speaker

Anupama Kaul is a Program Director at the National Science Foundation where she is serving as an IPA from the Jet Propulsion Laboratory (JPL), California Institute of Technology. Her research interests at JPL-Caltech have revolved around harnessing the properties of novel nanoscale materials and integrating such materials into devices for applications in nanoelectronics, sensors, energy-harnessing and quantum-scale systems. Dr. Kaul obtained her M.S. and Ph.D. degrees from UC Berkeley. She has also held industrial research positions at Motorola Labs and the Hewlett-Packard Company. In 2012, Dr. Kaul was selected to be a participant in the US National Academy of Engineering (NAE) Frontiers of Engineering (FOE) Symposium and the bilateral Indo-US FOE to be held in 2014. Dr. Kaul currently serves as the Associate Editor of the IEEE Sensors Journal, International Advisory Panel Member for Materials Express for IOP, American Editor of Nanoscience and Nanotechnology Letters, Associate Editor of Reviews in Advanced Sciences and Engineering and serves on the Editorial Board of several other journals. Dr. Kaul is also the Editor of Microelectronics to Nanoelectronics: Materials, Devices and Manufacturability, that was recently published by CRC Press.