BIOENGINEERING SEMINAR


Thursday – August 22, 2013 – 02:30 p.m.
EPFL – room SV1717a

Ahmed A. Busnaina, Ph.D.
William Lincoln Smith Chair Professor
Director, NSF Nanoscale Science and Engineering Center (NSEC) for High-rate Nanomanufacturing (CHN)
Northeastern University, Boston, MA (USA)

host: Prof. H. Altug

Abstract

The NSF Center for High-rate Nanomanufacturing (CHN) has developed a novel reconfigurable manufacturing technology (Nanoscale Offset Printing) platform that operates at ambient temperature and pressure, is water-based, material-independent and low energy, and requires small capital investment. It has been used to make structures and devices across length scales. The center has developed templates with nanoscale features to assemble and print structures down to 20 nm in a short time and over a large area. Recently, a rapid and scalable manufacturing process for 3D nanoscale features was developed to fabricate interconnects and plasmonic devices using nanoparticles. Nonvolatile memory switches using CNTs or molecules assembled at wafer level is one application. Another application is a new biosensor chip (0.02 mm²) capable of simultaneously detecting multiple biomarkers. The biosensor can be in vitro or in vivo with a detection limit that is 200 times lower than current technology. The center also developed several CNT and MoS2 based electronic devices. The center develops the fundamental science and engineering necessary to manufacture a wide array of applications ranging from electronics, energy, sensors and materials to biotechnology. A directed assembly-based nanomanufacturing factory could be built for as low as $50 million, a fraction of today’s cost, making nanotechnology accessible to millions of new innovators and entrepreneurs and unleashing a wave of creativity in the same way as the advent of the PC did for computing.

See current Bioengineering seminar calendar at http://bioengineering.epfl.ch/seminars