Title:
Nanoelectromechanical Switches using Self-Assembled Molecular Layers

Farnaz Niroui
UC Berkeley, Chemistry

Abstract
Strong surface adhesive forces between neighboring surfaces in nanoelectromechanical (NEM) switches have presented a continuous challenge to the fabrication and operation of these devices. Stiction, which becomes ever more prominent with switch miniaturization, leads to hysteresis in switching. This results in increased active power consumption, limiting the energy efficiency of the device. Concurrently, the dominant surface adhesive forces challenge device miniaturization which is necessary to reduce their operating voltage but can lead to device failure. Therefore, controlling surface adhesive forces is important for achieving energy efficient yet stable NEM switches. In this talk, we will discuss our approach to achieving such nanoscale force control through use of self-assembled molecular layers in our designs of NEM switches.

Biography
Farnaz Niroui is a Miller Postdoctoral Fellow at University of California, Berkeley. She completed her PhD and SM degrees at the Department of Electrical Engineering and Computer Science at Massachusetts Institute of Technology and her BASc degree at University of Waterloo in Nanotechnology Engineering. During her graduate studies, she was a recipient of the Engineering Research Council of Canada Scholarship, and was selected to the Rising Stars for Electrical Engineering and Computer Science program in 2015 and 2016. Farnaz will join MIT as an Assistant Professor of Electrical Engineering in 2018. Her research interest lies at the interface of device physics, nanofabrication, and materials science to study, manipulate and engineer devices and systems with unique functionalities at the nanoscale.