

2pm, **March 27th**, Room 1201

Molecular and Polymer Nanodevices

Dr. Nikolai Zhitenev

Center for Nanoscale Science and Technology, NIST

The smallest research devices demonstrating useful electronic functionality are bistable resistive switches. The switching behavior has been observed in very different material systems such as oxides, solid-state electrolytes, phase-change memory materials and organic films. The bistability is usually not a purely electronic phenomenon. Rather, a motion of heavier constituents such as atoms or ions is involved that in turn changes the electronic properties. I will illustrate some common physical principles and issues of fabrication, patterning and characterization discussing binary switches based on monolayers of self-assembled molecules and macromolecules. In the first case, the electronic functionality is to be provided by the backbones and conformational changes of short molecules. In the second approach, the electronic properties are determined by the composition, the chemical conversions and electric-field-induced chemical reactions of the side groups.

Host: Min Ouyang