

# Physics Colloquium

Michigan Technological University

Thursday, April 3, 2008

11:00 am

Room 135, Fisher Hall

## Biodetection with Semiconducting Nanowires

Mark A. Reed

Department of Electrical Engineering and Applied Physics  
Yale University, New Haven, CT

### Abstract

Nanoscale electronic devices have the potential to achieve exquisite sensitivity as sensors for the detection of molecular interactions. Semiconducting nanowires (NWs) have shown particular promise, though contemporary NW fabrication approaches require hybrid processing, obviating most advantages of microelectronic information technology. This talk will focus on the physics and technology of semiconductor nanowires and nanowire sensors, and a new approach for integration. These devices are highly sensitive to bound charge, enabling specific label-free detection to attomolar concentrations, and the response of live cells.

### Biography

Mark A. Reed received his Ph.D. in Physics from Syracuse University in 1983, and presently holds the Harold Hodgkinson Chair of Engineering and Applied Science at Yale University, and is the Associate Director of the Yale Institute for Nanoscience and Quantum Engineering. His research activities have included the investigation of electronic transport in nanoscale, molecular, and mesoscopic systems. Mark is the author of more than 175 professional publications and 6 books, has given 17 plenary and over 265 invited talks, and holds 25 U.S. and foreign patents. His awards include the Kilby Young Innovator Award (1994), the Fujitsu ISCS Quantum Device Award (2001), Fellow of the American Physical Society (2003), and the IEEE Pioneer Award in Nanotechnology (2007).