



**Mechanical  
Engineering**

**SEMINAR**

## **AT THE NANO-BIO INTERFACE**

Haim H. Bau

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Philadelphia, PA

The talk will discuss some of the ongoing work at the Micro-Nano Fluidics Lab at the University of Pennsylvania. In the first part of the talk, I will discuss theoretical predictions of the electrostatic forces acting on nano particles enveloped by thick electric double layers. More specifically, I will describe how we use electrostatic forces to position filaments at pre-determined locations and use statistical mechanics techniques to estimate the filament's mechanical properties, and, such as the electric field-induced apparent tension, from experimental data. I will conclude this part of the talk by describing a novel motility assay that combines electrostatic and optical tweezers to study the trajectories of two-legged walking machines about their actin tracks. In the second part of the talk, I will discuss our recently developed carbon-based nanopipettes with bore diameters ranging from tens to hundreds nanometers, their preliminary applications for cell injection and cell electrophysiology, and their impact on cell viability. If time permits, I will touch briefly on our effort to develop microfluidic systems for the detection of infectious diseases such as HIV at the point of care..



**Haim H. Bau** is a professor of Mechanical Engineering and Applied Mechanics at the University of Pennsylvania. He joined Penn after receiving his PhD degree from Cornell University in 1980. His current research interests include complex flow phenomena on micro and nano scales and the control of flow patterns.

**Friday, February 6, 2009**

**10:00 – 11:00am Seminar in 233 Mudd**

**Breakfast will be served at 9:30am in MECE room 220**