



MMAE SEMINAR

**Monday, October 26, 2009
E-1 BUILDING – CRAWFORD AUDITORIUM
3:30 – 4:30 PM**

Surface Effects on the Material Properties of Nanowires

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Abstract

Nanowires are widely studied for integration into nanoscale electrical and mechanical systems. It is well known that size will affect the material properties of nanowires. However, surface effects on the material properties are not well understood. Surface effects from surface stress and surface elasticity on the elastic behavior of nanowires in bending have been modeled with the Euler-Bernoulli beam theory and the Young-Laplace equation. Surface stress, surface elasticity, and boundary conditions are believed to influence the apparent elastic modulus measured for a nanowire with static and resonance bending experiments. The results indicate that surface properties may be a significant source for the apparent scatter in experimental measurements found in literature.

Dr. Lilley is an Assistant Professor in the Department of Mechanical and Industrial Engineering. She joined the department in 2003 after receiving her PhD in Theoretical and Applied Mechanics from Northwestern University. Prof. Lilley's research interest are focused on the characterization and modeling of material properties for nanoscale material structures. The long term goal of the research is to develop stable material systems from reliable design and manufacturing of nanotechnology. She has published several papers in high impact journals such as Journal of Applied Physics, Applied Physics Letter, and Nano Letters. Dr. Lilley recently received the NSF CAREER award (2009), a NASA Summer Faculty Fellowship (2009), and was a selected for the NSF-MEXT US-Japan Young Researchers Exchange in Nanotechnology in 2007.