

\*\*\*\* SEMINAR ANNOUNCEMENT \*\*\*\*

**SPEAKER:** Ms. Katherine Wenjun Liu  
Mechanical Engineering Department and Data Storage System Center  
Carnegie Mellon University  
Pittsburgh, Pennsylvania

**TOPIC:** Nanoscale Thermal Transport in Semiconductor and Data Storage Devices

**DATE:** Tuesday, March 1, 2005

**TIME:** 3:30 p.m.

**PLACE:** 138 DeBartolo Hall

Abstract

Advances in microfabrication processes and increasing demand for faster microprocessors have led to a continuous miniaturization of microelectronic devices. However, as the minimum feature size and design rules for state-of-art silicon-on-insulator and strained-silicon field effect transistors approach sub 100 nm lengthscales, a variety of thermally induced problems such as self-heating and electrostatic discharge (ESD) emerge that need to be addressed. A better understanding of the energy transport at nanoscales requires both simulations and experimental data on thermal transport in transistors and nanostructures, which are not widely available at the present time.

In addition, the magnetic data storage industry has followed a similar density improvement curve as the Moore's Law for the past decade. However, whether the storage densities will continue to increase at this rate is under a near term threat resulting from the fundamental physics upon which the hard disk drives are based. It is expected that novel technological solutions become necessary to overcome limitations, however, many of these technologies rely heavily on energy transport at extremely short time and length scales.

In this presentation, fundamentals of heat transport at nanoscale and diagnostic tools for thermal characterization and thermometry of the nanostructures will be discussed.