

**FALL 2004 SEMINAR SERIES****NANOSCALE HEAT TRANSFER AND ENERGY CONVERSION**

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Heat transfer in nanostructures differs significantly from that in macrostructures because of classical and quantum size effects on phonons, electrons, and photons. Understanding thermal transport in nanostructures is of fundamental importance to a variety of technologies. For example, low thermal conductivity materials with good electrical properties are required in solid-state refrigerators and power generators for high energy-conversion efficiency. Size effects on phonon transport in nanostructures can be utilized to engineer new devices with improved energy conversion efficiency. This talk will start with a review of various nanoscale heat transfer phenomena, followed by discussion of phonon heat conduction in superlattice systems. Some possible approaches to engineer phonon transport in nanostructures will be illustrated, with application geared towards improving the efficiency of thermoelectric energy conversion devices. Recent work on engineering photon transport for thermophotovoltaic energy conversion will also be briefly introduced.

Dr. Gang Chen received his Ph.D. from UC Berkeley in 1993. He taught at Duke University (1993-1997), UCLA (1997-2001) and is currently a professor at MIT. His research interests are on nanoscale transport phenomena, particularly thermal energy transport, and their applications in energy and information technologies. He is a recipient of the NSF Young Investigator Award and a Guggenheim Fellowship.

This NECP Seminar is jointly sponsored by the Center for Nano-Scale Science and Engineering (CeNSE), and the Departments of Electrical and Computer Engineering and Mechanical Engineering.

Refreshments and pastries will be available before the seminar starts.

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12:15 – 1:30 PM