

## 21COE Programme: Mechanical Systems Innovation Open Seminar

21COE Programme: Mechanical System Innovation 13th Open Seminar 2005 will be held as follows. Any participants will be welcome. People from Materials, Electrical engineering and Physics fields may also be interested in the topic.

**Invited Speaker:** Professor David G. Cahill (Department of Materials Science and Frederick Seitz Materials Research Lab, University of Illinois)

**Title:** Thermal conductance of solid-solid and solid-liquid interfaces

**Date & Time:** 9 November 2005 (Wednesday), 14:00~15:30

**Place:** The University of Tokyo, Engineering Building No.8, 2<sup>nd</sup> Floor,  
Conference Room No.226

**Abstract:** The thermal conductance of interfaces is a key factor in controlling thermal conduction in nanostructured materials, composites, and individual nanostructures. We have recently advanced the state-of-the-art of time-domain-thermoreflectance (TDTR) measurements of thermal transport and are using TDTR to study heat transport across individual interfaces with extremely high and low thermal conductance; and heat transport in nanoscale multilayers that circumvent the lower-limits for homogeneous materials imposed by the minimum thermal conductivity. The 3  $\mu\text{m}$  spatial resolution of our TDTR measurements also enables rapid high-resolution imaging of the thermal conductivity of complex microstructures and combinatorial samples. Heat transport in suspension of carbon nanotubes and metal nanoparticles are studied by picosecond transient absorption. Most of the vibrational modes of a carbon nanotube are weakly coupled to their environment; by contrast, the thermal coupling of metal nanoparticles to surrounding water is surprisingly efficient.

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