

## Current Understanding and Unsolved Problems in Thermal Transport at the Nanoscale

David G. Cahill,

Department of Materials Science and Engineering and Materials Research Laboratory, University of Illinois, Urbana, USA

## Thursday July 4, 11:00, Room MXF 1

**Abstract:** Thermal conductivity is a basic and familiar property of materials: silver spoons conduct heat well and plastic does not. In recent years, the combined efforts of materials scientists, engineers, physicists, and chemists have succeeded in pushing-back long-established limits in the thermal conductivity of materials and have made exciting progress on methods for dynamic control of thermal conductivity. In this lecture, I will highlight a three topics that I consider to be important unsolved problems in thermal conduction in materials: 1) ultralow thermal conductivity in hard and soft matter; 2) heat transport by magnetic excitations; and 3) solid-state approaches for thermal regulators and thermal switches.