Invites you to a seminar by

Dr. Pawel Keblinski
Professor and Department Head
Department of Materials Science and Engineering
Rensselaer Polytechnic Institute

Friday, October 30, 2015
Institute of Materials Science Building, Room 20, at 9:05 a.m.
Refreshments will be served at 8:45 a.m.

“Multiple Phonon Scattering at Proximal Interfaces”

Abstract: An interface scatters phonons and thus poses resistance to the heat flow, in addition to the bulk resistance of the material. The associated interfacial thermal resistance can dominate the overall heat flow when the density of the interfaces is high, such as in nanoscale and interfacial materials. When two (or more) interfaces or junctions are at a distance smaller than the phonon mean path, the interfacial resistances of each interface are not independent. Using molecular dynamics simulations and phonon scattering based analysis we will study heat flow mechanisms across proximal interfaces in various systems including self-assembled organic monolayers between two solids, nanoscopic solid adlayer on a substrate and molecular junctions. We will demonstrate the presence and role of multiple phonon scattering and interference effects on individual phonons and overall interfacial thermal transport.

Bio: Professor Keblinski is using atomic-level computational methods, including classical molecular dynamics and Monte-Carlo simulations, and atomic vibration analysis, to study structure-property relationships, most notably in interfacial materials. His main research focus is on modeling thermal transport at interfaces and in nano-structured materials, including carbon nanomaterials, polymer nanocomposites, and suspensions of solid particles in liquids. His atomic-level simulations and calculations are augmented with continuum-level modeling and homogenization analysis to provide information on system behavior and properties at larger scales. His recent educational focus is on graduate student professional development. In particular, jointly with the RPI School of Management, he teaches “Energy, Economy and Environment” course with a focus on development (by students) of fundable proposals and projects. His work to date led to over 100 invited presentations and over 175 publications in peer-reviewed journals. He is a recipient of a National Science Foundation Career Award, a Humboldt Fellowship, 3 RPI School of Engineering Research Awards, and he is a Fellow of the American Physical Society.

This seminar is mandatory for ALL MSE Full-time Graduate Students.