

Seminar: Modeling and Simulation of Nanoscale Transport

Speaker: Dr. Nicolas Hadjiconstantinou

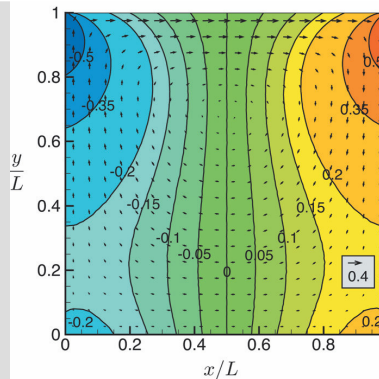
Professor, Department of Mechanical Engineering, MIT
Director, Computation for Design and Optimization, MIT

Time and Date: 10am, Wednesday, 25th of July, 2012

Location: Kitiou Kyprianou 36, Ground Floor, Cyprus University of Technology

Abstract

In this talk we discuss the scientific challenges arising from the breakdown of the macroscopic Navier-Stokes-Fourier description of transport processes as characteristic lengthscales become on the order of, or smaller, than the carrier mean free path. We will discuss both modeling and simulation approaches with particular emphasis on a new class of simulation methods that enable the solution of problems that are otherwise intractable. The new simulation method will be illustrated in the context of applications to nanoscale problems of practical interest, such as nanoscale gas flow and nanoscale solid-state heat transfer as mediated by phonons.



About the Speaker

Professor Hadjiconstantinou holds a BA in Engineering from Cambridge University, U.K., and a PhD in Mechanical Engineering from the Massachusetts Institute of Technology, USA. After spending a year at Lawrence Livermore National Laboratory as Lawrence Livermore Fellow, he joined the faculty at the Department of Mechanical Engineering at MIT, where he is now a Professor. His research focuses on theoretical investigations of small scale transport for which traditional continuum descriptions, such as Navier-Stokes, no longer hold. Significant part of this effort is devoted to the development of efficient methods for solving the kinetic equations governing transport at small scales.



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