PAP Seminar Announcement

Increasing Thermoelectric Efficiency: Dynamical Models Unveil Microscopic Mechanisms

By

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Date: 2 December 2011, Friday
Time: 2.00pm to 3.00pm
Venue: MAS Executive Classroom 1 (MAS-03-06)
Host: Asst. Prof. Chew Lock Yue

Abstract

Dynamical nonlinear systems provide a new approach to the old problem of increasing the efficiency of thermoelectric machines. Here we discuss stylized models of classical dynamics, including noninteracting complex molecules in an ergodic billiard, a disordered hardpoint gas and systems with broken time-reversal symmetry where the Curzon-Ahlborn limit for efficiency at maximum power can be overcome. The main focus will be on the physical mechanisms, unveiled by these dynamical models, which lead to high thermoelectric efficiency approaching the Carnot limit.

Biography

Prof Giulio Casati is Full Professor of Theoretical Physics and Director of the Centre for Nonlinear and Complex Systems at the University of Insubria in Como, Italy. He graduated in Physics at Milan University. He was the Dean of the Faculty of Science at Milan University, and the Vice Rector of the University of Insubria. He was awarded the Italian Prize for Physics “F. Somaini”, the Enrico Fermi Prize and the International Prize for Physics for 2010 - Accademia Nazionale dei Lincei, for his many important contributions in physics. Prof Casati has published over 250 papers in scientific international journals. He is the Editor and Co-Editor of many books and renowned scientific journals. Prof Casati research interest is in the area of classical and quantum chaos, nonlinear dynamics and complex systems, transport phenomena, quantum computing, statistical physics and theoretical physics.