Area Seminar

Title	Quantum Transport at Nanoscale: Two Models for Energy and Charge Transfer
Date and Time	12/12/2011 16:00:00
Speaker	Dr. Malaya Banerjee Chemical Physics Dept., University of Toronto, Canada
Area	Theoretical Physics
Venue	Room No. 469
Abstract	In this talk, I will describe two quantum models which are useful for elucidating energy and charge transfer phenomenology innanoscale junctions. We have employed these models for exploring the dynamics of nonequilibrium quantum dissipative systems, comprising a subsystem coupled to more than one reservoir. Besides the basic interest,practically such systems are the heart of nanodevices and crucial for future progress in nanotechnology. In the energy transfer model, we study the role of quantum effects in the thermal conduction of nonlinear systems, using a self-consistent harmonic chain model, by employing an exact numerical technique, to go beyond the linear response regime. The effect of quantum heat rectification in the mass graded system is also analyzed. In the context of charge transfer, we study the effect of an external magnetic flux on the intrinsic coherence between two electron states through a nanoscale double-dot Aharonov-Bohm interferometer. It is found that the relativephase between the two states of the double dot localizes to specific values due to decoherence.