Physics AT QUEENS COLLEGE

Colloquium Notice

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Electron transport and nonequilibrium fluctuations in nanoelectromechanical systems

Interplay of electronic and mechanical properties of nanoelectromechanical systems (NEMS) has been in the focal point of research interest in recent years. In this talk, after brief overview of experimental realizations of such systems, I will present our analysis of two NEMS structures, a mechanical oscillator coupled to an electrical tunnel junction and a quantum shuttle. The explicit expressions for the oscillator (shuttle) damping/decoherence rate, fluctuations of the oscillator (shuttle) position, and for nonlinear conductance of these NEMS have been obtained on the microscopic basis and their voltage and temperature dependencies have been determined. I will also discuss the applications of these models to description of the tunneling in long molecules and electron transport in manganites. Finally, I will describe the directions of our future projects in this field.

Monday
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Starts at 12:15 PM
Physics Conference Room, SB B326