QPhysics
AT QUEENS COLLEGE

Colloquium Notice

Dima Mozyrsky

Los Alamos National Laboratory

Physics and Applications of Random Telegraph Signals in Field-Effect Transistors

Random Telegraph Signals (RTS) in transport current through a conduction channel of a Metal-Oxide-Semiconductor Field Effect Transistor (MOSFET) are known to be related to charging and discharging of a single impurity due to electron tunneling between the impurity and the channel. The phenomenon provides a unique example where a single electron tunneling can be explicitly monitored. Recent experiments have shown that the RTS in MOSFETs turns out to be strongly dependent on applied magnetic fields, which offers a possibility to manipulate by a spin of a single electron. The latter possibility is of a primary importance for newly developing areas of research such as spintronics and quantum information processing (AKA quantum computing).

In my presentation I will outline our proposal to detect single spin resonance in the system and will present recent experimental results of our colleagues (at UCLA) based on the proposed scheme. I will also discuss certain theoretical results of our research in the field, which include the explanation of unexpectedly large RTS timescales and anomalous magnetic behavior of RTS systems at low temperatures.

Wednesday
February 25, 2004
Starts at 12:15 PM
Coffee at 12:00 PM
Physics Conference Room, SB B326