

# Colloquium Notice

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### *Molecular magnets: spin reversal by quantum tunneling and avalanches*

Molecular Magnets, sometimes referred to as single molecule magnets, are organic materials that contain a very large (Avogadro's) number of molecules that are (nearly) identical nanomagnets, providing ideal laboratories for the study of nanoscale magnetic phenomena. With molecular clusters of large total spin 10, Mn<sub>12</sub>-acetate and Fe-8 are borderline between classical and quantum magnetism. They are magnetically bistable at low temperatures, they exhibit "macroscopic quantum tunneling" between up and down spin orientations, and quantum interference between tunneling paths. Interest in these materials has grown dramatically in the last several years, owing to their possible use for high density storage of information, as well as the possibility that some member of this family of materials could provide qubits for quantum computation.

Following an introductory description of the major features that characterize these interesting materials, this talk will focus on the processes by which the large ( $S=10$ ) magnetization vector of individual molecules in a Mn<sub>12</sub>-acetate crystal reverse direction - by classical over-the-barrier spin reversal, quantum tunneling (under-the-barrier), or as a magnetic avalanche propagating at subsonic speed through the crystal in the form a narrow front.

Monday

**October 26, 2009**

Starts at 12:15 PM

Coffee at 12:00 PM

Physics Conference Room, SB B326