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WEEKLY CALENDAR

October 5, 2009

Departmental Colloquium

"Molecule-Based Magnets and Their Molecular Building Blocks"

3:40 PM, October 8, 2009
109 Nicholson Hall

Randy Fishman

Oak Ridge National Laboratory

Host: Juana Moreno

• *Refreshments served at 3:15 PM in 232 (Library) Nicholson Hall* •

Molecule-based magnets are crystalline systems constructed from molecular building blocks. The properties of a molecule-based magnet depend on both the molecular building block and the topology of the resulting structure. Both two- (2D) and three-dimensional (3D) molecule-based magnets can be constructed from oxalate bridges and diruthenium paddle-wheel complexes. Whereas 2D Fe(II)Fe(III) bimetallic oxalates exhibit magnetic compensation for certain cations between the layers, 3D Fe(II)Fe(III) bimetallic oxalates do not exhibit magnetic compensation due to the tetrahedral coordination of the chiral axis. A 3D diruthenium compound with interpenetrating sublattices provides the only known material where the magnetic correlation length directly affects the temperature- and field-dependence of the magnetization. Research sponsored by the Division of Materials Sciences and Engineering, U.S. Department of Energy under contract with UT-Battelle, LLC.

Publications:

- "Algebraic characterization of X-states in quantum information," **A.R.P. Rau**, J. Phys. A: Math. Gen. 42, 412002 (7 pp) (2009).
- "State Transitions in Low-Mass X-ray Binaries," Charles K. Bradley and **Junah Frank**, The Astrophysical Journal, 704:25-37, 2009 October 10.