



PHYSICS & ASTRONOMY WEEKLY CALENDAR

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Louisiana State University
Baton Rouge, Louisiana 70803-4001

WEEKLY CALENDAR

February 4, 2008

GENERAL SEMINAR

“Novel Types of orders and excitations in geometrically frustrated spinels”

3:40 PM – Thursday, February 7, 2008
109 Nicholson Hall

Natalia Perkins

University of Wisconsin-Madison

Host – Ilya Vekhter

•Refreshments served at 3:15 PM in 201 Nicholson Hall•

In recent decades, there has been a lot of interest in geometrically frustrated systems. The term "geometrical frustrations" refers to situations where local order, as determined by local interactions, cannot freely propagate throughout the space, and the long-range order cannot be established. Instead, a highly degenerate ground state is formed. Interest in these systems stems from (i) the richness of their novel properties: the unexpected variety of ordered states and transitions between them; (ii) the complexity of the underlying physics: the close coupling and correlations among spin, orbital, charge and lattice degrees of freedom; (iii) the presence of frustration that makes the systems highly sensitive to any internal or external perturbations.

The pyrochlore lattice, which is composed by corner sharing tetrahedra is a typical example of a highly frustrated three dimensional structure. It is believed that Heisenberg antiferromagnet on a pyrochlore structure does not support a magnetically ordered ground state. Often in real systems, for example, in spinels, with the general formula AB_2X_4 , a magnetic ion can also possess an orbital degeneracy in addition to the spin one. The physical behavior of such systems may be drastically different from that of pure spin models, as the occurrence of an orbital ordering can lift the geometrical degeneracy of the underlying lattice. As an example, I will discuss three compounds with such properties: the B-spinels LiV_2O_4 , $MgTi_2O_4$, and ZnV_2O_4 .

Material Science and Engineering

“Geometry and Optimization in Disordered Materials”

11:30 am – Wednesday, February 8, 2008
338 Johnston Hall

Alan Middleton
Syracuse University
Host: Shantenu Zha

ANNOUNCEMENT:

The University will be closed on Tuesday, February 5 due to the Mardi Gras Holiday. There will be no classes beginning Monday, February 4-6, 2008. Classes resumes Thursday, February 7, 2008 at 7:30 am.

Publications:

“Relational Physics with Real Rods and Clocks and the Measurement Problem of Quantum Mechanics,” Rodolfo Gambini and Jorge Pullin, Foundations of Physics, Vol. 37, No. 7, July 2007.

“General linear-optical quantum state generation scheme: Applications to maximally path-entangled states,” N.M. VanMeter, P. Lougovski, D.B. Uskov, K. Kieling, J. Eisert, and Jonathan P. Dowling, Physical Review A 76, 063808 (2007).

"Experimental sub-Rayleigh resolution by an unseeded high-gain optical parametric amplifier for quantum lithography," Fabio Sciarrino, Chiara Vitelli, Francesco De Martini, **Ryan Glasser**, **Hugo Cable**, and **Jonathan P. Dowling**, Physical Review A 77, 012324 (2008).

"Surface state influence on the surface lattice structure in Be(1010)," S.-J. Tang, H.-T. Jeng, Chen-Shiung Hsue, Ismail, P. T. Sprunger, and E. W. Plummer, PHYSICAL REVIEW B 77, 045405 2008.

"Blackbody Radiation: Rosetta Stone of Heat Bath Models," **R. F. O'Connell**, Fluctuation and Noise Letters (FNL), Volume 7, Number 4, December 2007.