



TEL: 225-578-2261  
FAX: 225-578-5855  
<http://www.phys.lsu.edu>

202 NICHOLSON HALL  
Louisiana State University  
Baton Rouge, Louisiana 70803-4001

## WEEKLY CALENDAR

May 12, 2008

### Special Colloquium

New magnetic materials for spintronics

3:30 pm – Tuesday, May 13, 2008

109 Nicholson Hall

Juana Moreno

University of North Dakota

Host: Dana Browne

Spin-based electronic (spintronic) devices utilize both carrier spin and charge to transmit or store information. Dilute magnetic semiconductors and organic magnets are promising spintronic materials. Research in my group focuses on developing a reliable theory of the magnetic, transport and optical properties of these compounds, with the ultimate goal of guiding experimental efforts in the search for optimal materials for spintronic device applications.

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### Special Colloquium

Protoplanetary Disks and Jets from Young Stellar Objects

3:40 pm – Wednesday, May 14, 2008

109 Nicholson Hall

Frank H. Shu, University Professor  
UC, San Diego

Host: Peter Chen, Computer Science/Joel Tohline, Physics & Astronomy

Magnetization plays an important role in modern theories of the star-formation process. Slippage of neutrals relative to ions tied to magnetic fields in molecular cloud cores leads to a gravomagneto catastrophe in which the central regions formally acquire an infinite density concentration in finite time. In the presence of rotation, inside-out collapse follows to form a star plus disk, but only if the resultant MHD is non-ideal at high densities. The trapping of a finite amount of magnetic flux in the system leads to a global form of magnetorotational instability in the disk that transfers mass inwards and angular momentum outwards. Predictions are made for the resulting distribution of magnetization that are compatible with empirical measurements of the field in protoplanetary disks, but the data set is sparse. The magnetic field automatically achieves a configuration favorable for forming a disk wind, except that the disk rotation is sub-Keplerian by an amount that makes thermal launch difficult. Lightly loaded, magneto-centrifugally driven, disk winds do not possess physical characteristics that look like observed jets in young stellar objects. Such jets are much better explained as the X-winds that result when the accretion disk interacts with a strongly magnetized central star.

The theory of the resultant funnel flows onto the star is generalized to arbitrary superpositions of magnetic multipoles, with the concept of trapped flux at the X-point tested against observations.

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### Special Colloquium

Two Cultures: Higher Education and Science/Technology Planning in the United States and Asia

2:30 pm – Tuesday, May 13, 2008

145 Coates Hall

Frank H. Shu, University Professor  
UC, San Diego

Host: Peter Chen, Computer Science/Joel Tohline, Physics & Astronomy

Central planning and free enterprise broadly characterize the different approaches taken historically by Asia and the United States toward higher education and research funding in knowledge-intensive industries. Based on personal working experience in Taiwan and America, I compare and contrast the strengths and weaknesses of the two systems. I argue that some blend of Eastern and Western approaches is probably

necessary to solve the larger social, economic, and environmental problems that face these two regions. While convergence toward a middle road is happening to some extent, a freer exchange of people and ideas is probably needed to bridge the two cultures and to utilize better all the available resources.

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## ***Saturday Science @ LSU***

**"Asian Soybean Rust: A new disease threat to our crop"**  
***10:00 - 11:15/Saturday, May 17, 2008/Room 130 Nicholson Hall***

Ray Scheider  
Plant Pathology - LSU

***Host: Ravi Rau***