



PHYSICS & ASTRONOMY WEEKLY CALENDAR

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WEEKLY CALENDAR

April 21, 2008

Departmental Colloquium

“Of Common Envelopes and Planetary Nebulae”

3:40 PM – Thursday, April 24, 2008

109 Nicholson Hall

Orsola de Marco

American Museum of Natural History

Host – Jeffrey Clayton

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

It is likely that many more short period binaries reside in the middle of planetary nebulae (PN) than is currently known. In fact, PN formation and shaping theories recently shifted to predicting that most if not all PNe derive from binary interactions, in particular common envelopes (CE). I will describe population synthesis work that agrees with this hypothesis as well as on-going observational tests which are being carried out. In addition, post-CE central star binaries are the start point for the evolution of cataclysmic variables, and are fundamental to understand the presence, numbers and characteristics of systems such as novae, dwarf novae and, possibly, the progenitors of Type Ia supernovae. For this reason we are carrying out hydrodynamic CE simulations to determine the type of systems that can emerge from this interaction and the final periods.

Special Colloquium

“Modeling Black Hole Binary Mergers ”

3:40 pm – Tuesday, April 22, 2008

109 Nicholson Hall

Erik Schnetter

CCT-LSU

Host: Ed Seidel

Binary black hole systems and their merger are one of the most promising sources of gravitational radiation which is expected to be detected by experiments like LIGO, GEO600, or LISA. About two years ago it became possible to simulate these systems numerically with high accuracy. Since these simulations require very expensive numerical calculations, it is of advantage to derive analytic approximations describing the merger process from such full numerical calculations.

I will give an overview over some general properties of binary black hole systems and our numerical simulation methods, and I will present recent results on analytic approximations predicting the final state of black hole binary mergers.

Materials Science and Engineering Seminar

“Wigner-Mott Scenario for the 2D-MIT”

3:40 pm – Wednesday, April 23, 2008

109 Nicholson Hall

Vladimir Dobrosavljevic

Florida State University & National High Magnetic Field Laboratory

Host: Ilya Vekhter

Significant experimental advances over the past ten years have provided beautiful and convincing evidence for the existence of a sharp metal-insulator transition (MIT) in the two-dimensional 2D electron gases (2DEG). The best evidence for a sharp MIT is found in the cleanest samples, suggesting that key experimental features can all be understood by deliberately disregarding disorder, and focusing on interaction effects alone: viewing the quantum melting of a Wigner crystal as the fundamental mechanism for the MIT in a sufficiently

clean 2DEG. A theory describing this phenomenon will be presented, which provides a natural explanation of several puzzling experimental features, including the large effective mass enhancement, the large resistivity drop on the metallic side, and the giant magneto-resistance in presence of a parallel magnetic field.

Saturday Science @ LSU

"Restoration of Wetlands"

10:00 - 11:15/Saturday, April 19, 2008/Room 130 Nicholson Hall

**Michael Materne
Agronomy - LSU**

Host: Ravi Rau

Announcement:

Physics and Astronomy faculty were successful on seven separate Enhancement, Research Competitiveness, and Graduate Fellows awards recently announced by the Louisiana Board of Regents:

- P. Adams, J. DiTusa, D. Young, "Upgrade of the LSU Helium Liquefier Facility".
 - J. Blackmon, " Development of a Novel Prototype Detector of Low Energy Neutrinos".
 - D. Browne, M. Cherry, G. Gonzalez, B. Schaefer, "Graduate Fellows in Physics and Astronomy".
 - S. Guo (Mech. Eng.), D. Young et al., "A Quantum-Design Physical Property Measurement System (PPMS) for Novel Thermoelectric Material Studies".
 - R. Kurtz, P. Sprunger et al., "Acquisition of a Variable-Temperature SPM for Multidisciplinary Materials Research and Education".
 - J. Madden (Math), M. Cherry at al., "Professional Master's Degree Programs for K-12 STEM Teachers".
 - D. Sheehy, "Superfluidity and Strong Correlations in Ultracold Atomic Gases".
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Publication:

"Dose Rates from a Cobalt-60 Pool Irradiator Measured with Fricke Dosimeters" **Wei-Hsung Wang, Kenneth L. Matthews II**, and Richard E. Teague. Health Physics 94(Supplement 2):544-550; 2008.

"Learning about compact binary merger: The interplay between numerical relativity and gravitational wave astronomy," T. Baumgarte, P. Brady, J. Creighton, **L. Lehner**, F. Pretorius and R. DeVoe, Phys. Rev. D, 77, 083507 (2008).