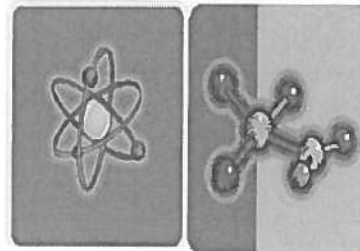




Department of Physics and Astronomy  
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Baton Rouge, Louisiana 70803-4001

## WEEKLY CALENDAR

January 22, 2007



Tel: 225-578-2261/Fax: 225-578-5855  
<http://www.phys.lsu.edu>

### General Seminar

"Investigating Quantum Criticality in CeMIn5 (M=Co,Rh,Ir)"

3:40PM / Thursday, 25 January 2007 / Room 109

[Refreshments served at 3:15 PM in Room 229 Nicholson]

Host: Dr. Philip Adams

Cigdem Capan, Ph.D.

Physics and Astronomy, LSU

There has been a recent resurgence of interest in the so-called "heavy fermion" compounds, rare-earth materials exhibiting large effective masses. In fact the mass of the charge carriers in these systems can be as high as 2 to 3 orders of magnitude larger than the free electron mass. The mass renormalization is a result of the resonant coupling between the f-electrons and the conduction band. It was S. Doniach who first proposed a general approach for these compounds in terms of a competing tendency for conduction electrons to screen or to mediate a magnetic coupling among the f-electrons. Despite its overall success, Doniach's idea often proves to be far too simplistic and fails to capture the richness of experimental phase diagrams. The complexity inherent to heavy fermion physics has so far defied all attempts for unification. In this context, quantum criticality - the universal critical behavior associated with a  $T=0$  thermodynamic singularity - opens a new chapter and may even bridge the gap between heavy fermions and other strongly correlated electron systems such as transition metal perovskites. Following a broad introduction to heavy fermions and to the notion of quantum phase transitions, I will focus on a particular heavy fermion family: CeMIn5 with M=Co,Rh,Ir. These were recently discovered and their unusual quantum critical behavior illustrates well the shortcomings of the current theoretical approaches as well as the challenges and exciting new results that lay ahead.

### Special Seminar

"TBA"

3:40PM / Monday, 29 January 2007 / Room 109

[Refreshments served at 3:15 PM in Room 229 Nicholson]

Host: Dr. John DiTusa

Maxim Dzero, Ph.D.

Rutgers University

### Materials Science & Engineering Seminar

"Neutron Diffraction for Engineering Strains/Stresses and Exploring Material Deformation at the Grain to Grain Level"

3:40PM / Wednesday, 24 January 2007 / Room 109 Nicholson

Host: Dr. Les Butler, Chemistry

Camden Hubbard, Ph.D.

Oak Ridge National Laboratory, Oak Ridge, TN

### Welcome To:

Dr. Asoka Sekharan, a Postdoctoral Researcher with Dr. Phillip Sprunger. Dr. Sekharan is in Room 217-A, 334-2031.