LSU LOUISIANA STATE UNIVERSITY

PHYSICS & ASTRONOMY
WEEKLY CALENDAR

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

February 28, 2011

Departmental Colloquium

Thursday, 3:40 PM, March 3, 2011
109 Nicholson Hall

"Cosmic Ray Electrons: To the Space Station and Beyond!"

T. Gregory Guzik
Department of Physics and Astronomy - LSU

Host: **Kenneth Matthews**

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

Late in 2008, the Advanced Thin Ionization Calorimeter (ATIC) balloon experiment team published results on a feature in the otherwise smoothly decreasing cosmic ray electron energy spectrum in the 300 to 800 GeV range. This was the first time that a cosmic ray spectrum anomaly had been observed at high energy and the publication generated a considerable amount of scientific interest. The excess is likely generated by a source of energetic particles within a few kiloparsecs of the solar system, and potential sources are discussed. To distinguish between source models requires an accurate understanding of the shape of the spectrum. Other observations from FERMI and HESS claim a much flatter feature than observed by ATIC. These "seemingly conflicting" observations have generated a controversy that may not be resolved until the Japanese-lead CALorimetric Electron Telescope (CALET) experiment begins operation on the International Space Station in 2013-14. CALET is specifically designed to accurately measure high energy cosmic ray electrons, and LSU is the lead institution of the U.S. collaboration involved with CALET. This talk summarizes the ATIC observations, discusses a few of the more important source models, compares the ATIC observations with those from FERMI and HESS, describes CALET, its expected results and the LSU role in this new program and demonstrates how the High Altitude Student Platform (HASP), developed here, can be useful in detector technology investigations for CALET, or future missions.

Publications:

1. "First Results from Fermi GBM Earth Occultation Monitoring: Observations of Soft Gamma-Ray Sources Above 100 keV", **G.L. Case**, **M.L. Cherry**, **J. Rodi** et al., Astrophysical Journal 729, 105 (2011).

2. "Consistent Histories in Quantum Cosmology", David Craig and **Parampreet Singh**, Found Physics (2011) 41: 371-379.