LSU LOUISIANA STATE UNIVERSITY

PHYSICS & ASTRONOMY WEEKLY CALENDAR

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

WEEKLY CALENDAR

February 9, 2009

DEPARTMENT COLLOQUIUM

"Long Baseline Neutrino Experiments - T2K and Beyond"

3:40 PM, February 12, 2009
109 Nicholson Hall

Norm Buchanan
Colorado State University

Host: William Metcalf

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

Since their discovery in the 1950's neutrinos have presented physicists with many challenges. Not only are neutrinos difficult to detect, but they also have behavior much different from their charged lepton partners. In 1969, it was proposed that neutrinos could oscillate and after many years and experiments the SNO and Super-Kamiokande collaborations presented strong evidence to support neutrino oscillations. Results from K2K (KEK to Kamioka) and MINOS have added to the evidence of neutrino oscillations. The T2K (Tokai to Kamioka) experiment in Japan will be the first of the 2nd generation "super-beam" experiments designed to measure the parameters of the MNS neutrino mixing matrix to high precision, specifically the angle θ13. I will discuss the ideas of neutrino oscillations, and describe the details of the T2K experiment, including plans for its installation, which will take place this summer. I will also present some of the ideas for long baseline neutrino experiments that may be built following the T2K run.

Congratulations To:

Dr. Roy Goodrich, Ball Family Professor Emeritus, for being awarded a 2009 Distinguished Alumni Award from Louisiana Tech University College of Engineering and Science.

Publications:

"Galactic Globular and Open Clusters in the Sloan Digital Sky Survey, I. Crowded-Field Photometry and Cluster Fiducial Sequences in ugriz", by Deokkeun An, Jennifer A. Johnson, **James L. Clem**, and others, 2008, Astrophysical Journal Supplement Series, 179, 326.

"The Diverse Solar Phase Curves of Distant Icy Bodies II. The Cause of the Opposition Surges and their Correlations", by **Bradley E. Schaefer**, David L. Rabinowitz, and Suzanne W. Tourtellotte, 2009, Astronomical Journal, 137, 129.

"A note on computations of angular momentum and its flux in numerical relativity", E. Gallo, **L. Lehner** and O. Moreschi, Class. Quantum Grav. V26, 048002 (2009).

"Thomas Thiemann: Modern canonical quantum general relativity," **Jorge Pullin**, Cambridge University Press, 2007, 846p., GBP75.00, ISBN-13:9780521842631.

CHEM 7800 SEMINAR

Co-Sponsored by LSU's HBCU Visiting Scholar Program in Physics & Astronomy

Location: 210 Choppin Hall

Date: Tuesday, February 10, 2009

Time: 12:10 pm – 1:pm

Title: Bimetallic Nanocatalysts for Water-Gas-Shift Reaction

Speaker: Dr. Naidu V. Seetala

Edward Bouchet Endowed Professor in Physics
Department of Physics
Grambling State University, Grambling, LA 71245
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Abstract: We have prepared bimetallic nanocatalysts supported in mesoporous Al_2O_3 granules for hydrogen production from the Water-Gas-Shift (WGS) reaction of CO and H_2O. The granular catalysts were analyzed by DTA/TGA, PXRD, and BET. Screening of the WGS catalysts and optimization of reaction temperatures were performed using **a** dynamic flow reactor. A gas-phase batch reactor was used to obtain kinetic data and the parameters for maximum CO conversion. Both reactors were connected to a Gas Chromatograph (GC) for product analysis.

Six Low Temperature Shift (LTS) catalysts with optimum temperature between 200-300 °C, and four High Temperature Shift (HTS) catalysts with optimum temperature between 350-400° C were examined for catalytic activities. Ni(10%)Ce(11%) catalyst was found to be the best WGS catalyst among the LTS catalysts, while Ni(5%)Cu(5%)Ce(11%) was found to be the best among HTS catalysts.

The Ce promoter had a significant effect on optimum reaction temperature and catalytic activity of the catalysts. Increasing the Ce composition has a favorable effect by increasing the catalytic activity and decreasing the optimum reaction temperature of the catalyst. Effect of Ni composition at constant Ce also was studied. Lower Ni compositions increased the WGS reaction activity.