

WEEKLY CALENDAR

January 17, 2011

Departmental Colloquium

Thursday, 3:40 PM, January 20, 2011
109 Nicholson Hall

"Mass Measurements of Exotic Nuclei for Nuclear Astrophysics"

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Host: Jeffrey Blackmon

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

Masses of nuclei are a crucial input to nucleosynthesis models. Around the valley of stability the masses have been known with sufficient precision for several decades. On the contrary, only after the recent development of radioactive beam facilities the first mass measurements of exotic nuclei have been made. Enormous effort at several places around the world has been devoted to obtain new mass values of exotic nuclei using a variety of techniques: the most precise measurements are typically obtained by the Penning trap technique, on the other hand the complimentary time-of-flight (TOF) technique can access even more exotic nuclides. The TOF-Br technique has been recently implemented at the National Superconducting Cyclotron Laboratory and the first experiment, focused on neutron rich isotopes in the region of $Z \sim 20-30$ has been successfully performed. An overview of mass measurements important for nuclear astrophysics, mass measurement techniques and recent mass measurements will be given. Results and details of the NSCL experiment will also be presented.

Publications:

1. "Physicist Considerations for PET-CT and SPECT-CT. Image Wisely Campaign" (Nov. 2010), **Kenneth L Matthews, PhD and Dacian Bonta MD PhD**, <http://www.imagewisely.org> (link: Home > Imaging Professionals > Medical Physicists) or <http://www.imagewisely.org/Imaging-Professionals/Medical-Physicists/Articles/Considerations-for-PET-CT-and-SPECT-CT.aspx>.
2. "When a Standard Candle Flickers", C.A. Wilson-Hodge, **M.L. Cherry, G.L. Case, J. Rodi et al.**, *ApJ* **727**, L40 (2011).
3. "Dimensions, nodes and phases in quantum numbers," **A. R. P. Rau**, *Phys. Scr.* **83**, 018101 (2011).