



Physics & Astronomy Department Colloquium

4:30 pm on Thursday, October 13, 2011
218 Hackman Hall

Physics at the Neutron Dripline



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Interesting nuclear structure physics exists near the neutron dripline; extremely neutron-rich nuclei can even have different magic numbers than their more stable peers. Studies of these exotic nuclei at the National Superconducting Cyclotron Laboratory (NSCL) at Michigan State University demand knowledge of the complete reaction kinematics and require high detector efficiency as well as the capability for multiple neutron detection and discrimination. The NSCL's Modular Neutron Array (MoNA) has been successful at meeting these demands and has led to furthering our understanding of the nuclear structure for a number of exotic nuclei such as ^{12}Li , ^{15}Be , ^{28}F , and ^{18}B . The first decay energy spectrum for neutron unbound states in ^{24}O was observed by this array, and data suggest ^{24}O is a doubly magic nucleus.

This summer the MoNA was used with the LISA (Large multi-Institutional Scintillator Array) for a higher-resolution measurement of the first two excited states of ^{24}O with possible confirmation of a newly found excited state at 7.5 MeV. A MoNA-LISA study of ^{20}C in an effort to better understand how the sd shell evolves with neutron number is also in preparation.