

Cyclotron Colloquium, Tuesday, May 15, 2012, at 3:45 pm

Room MIST 102 at the Mitchell Institute

Refreshment will be served at 3:30 pm

New instruments and recent results in the study of transfer reactions at the HRIBF

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Abstract:

Single-nucleon transfer reactions on heavy neutron-rich nuclei are critical to providing an empirical foundation for the determination of the incredibly large neutron fluxes in extreme environments such as exploding stars, internal confinement fusion capsules, and nuclear reactor fuel rods. At the ORNL Holifield Radioactive Ion Beam Facility, beams of fission-fragment nuclei have been used to study a variety of single-nucleon transfer reactions. New instruments such as the SuperORRUBA (Oak Ridge Rutgers University Barrel Array) of silicon-strip detectors and the VANDLE (Versatile Array of Neutron Detectors at Low Energy) have enabled measurements with lower-intensity beams with a greater clarity than earlier devices. Recent results include the completion of (d,p) studies on the even mass Sn isotopes from ^{124}Sn to ^{132}Sn , the verification of single-particle energies in ^{133}Sn from study of the $^{132}\text{Sn}(^9\text{Be},^8\text{Be}\gamma)$ reaction, and the study of single-hole states in ^{131}Sn from a measurement of $^{132}\text{Sn}(d,t)$. Future plans for use of the gas-jet target JENSA (Jet Experiments for Nuclear Structure and Astrophysics) will also be presented.

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