Argonne NATIONAL LABORATORY

PHY Seminar

Physics Division Seminar

Gregory Potel

FRIB/NSCL, Michigan State University

From Neutron-Nucleus Interactions to (d,p) Cross Sections: Structure and Reactions of ^{11}Be

Host: Calem Hoffman

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Deuteron-induced reactions have a long and fruitful tradition in nuclear physics as an experimental tool for spectroscopy. They have been extensively used to study in detail the single-particle nature of the low-lying spectrum of the nuclear quantum many-body system. Standard reaction theory describing the direct population of sharp bound states have been very successful in extracting detailed structural information from the experimental data, in the form of spin, parities, spectroscopic factors, etc., of the populated bound states. The advent of high intensity exotic beams have granted experimental access to weakly bound systems with a Fermi energy close to the neutron-emission threshold, where the role of the continuum becomes important. Within this context, new theoretical developments are called for, such as a reaction framework able to account for the population of resonant and non-resonant states of the continuum, adapted to the associated structure description of the target-neutron interaction. We present a unified descrition of (d,p) reactions within an integrated structure+reactions framework, showing recent results obtained with exotic nuclei such as ^{11}Be.