

UNIVERSITY OF NOTRE DAME
DEPARTMENT OF PHYSICS

NUCLEAR SEMINAR

Monday, March 26

Experimental study of single-particle strength in exotic psd-shell nuclei using transfer reactions

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Nucleon-transfer reactions are a powerful experimental tool to probe the energies and strengths of single-particle excitations, and how these change as nuclei evolve with neutron excess. To this end, we have carried out the $^{11}\text{Be}(d,p)^{12}\text{Be}$, $^{12}\text{B}(d,^3\text{He})^{11}\text{Be}$, and $^{21}\text{F}(d,p)^{22}\text{F}$ reactions using the facilities at the Research Center for Nuclear Physics (RCNP) at Osaka University and at the Argonne Tandem Linear Accelerator System (ATLAS), using the HELIOS spectrometer. The $^{11}\text{Be}(d,p)^{12}\text{Be}$ measurement was carried out at RCNP at approximately 26 MeV per nucleon. The results yield evidence that the ground-state configuration of ^{12}Be is dominated by the d-wave intruder orbital, suggesting a dramatic evolution of the intruder mechanism moving from ^{11}Be to ^{12}Be , and that the $N=8$ shell gap remains diminished in these neutron-rich Be systems. The $^{12}\text{B}(d,^3\text{He})^{11}\text{Be}$ and $^{21}\text{F}(d,p)^{22}\text{F}$ reactions were carried out at a lower incident beam energies at ATLAS. The former study sheds light on the proton p -wave strength in ^{11}Be , a neutron halo nucleus, while the latter allows for the two-body matrix elements to be determined. In each case, the results have been used to assess the accuracy of shell-model calculations in the region.

4 pm – 5 pm
Nuclear Science
Laboratory
124 Nieuwland
Science Hall

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All interested  
persons are  
cordially invited  
to attend

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Refreshments will be
served prior to the
seminar in room 124