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## Unveiling New Features in the Exotic Landscape of Light Nuclei with Direct Reactions

*Monday, 29 May 2017 14:00 (25 minutes)*

Radioactive (RI) beams are allowing us to uncover the unknown properties of nuclei at the extremes of nuclear binding. This is leading to revelation of new phenomena associated with exotic structures like nuclear halo and skin that stretch beyond the bounds of our conventional knowledge. The evolution of neutron skin/surface in neutron-rich nuclei can cause mutation of the nuclear shell structure and give rise to exotic excitation modes such as soft dipole resonance states. The new features in exotic nuclei challenge our understanding of the nuclear force. Reaction spectroscopy with both ISOL and in-flight RI beams offer complementary avenues that have different sensitivities to different characteristics of the exotic nuclei.

The presentation will discuss how direct reactions with the low-energy re-accelerated beams at TRIUMF and the IRIS reaction spectroscopy facility with solid H<sub>2</sub>/D<sub>2</sub> targets have opened access for obtaining some precise spectroscopic information of exotic nuclei. Recent explorations of unbound states in light nuclei around the drip-lines will be presented. It will be shown that the low-energy scattering opens a new avenue to constrain the nuclear force with its ability of connecting to the ab initio theory.

The relativistic energy in-flight beams allow us to probe into the nucleon distribution and nuclear radii that characterize the exotic nuclear halo and skin. Recent measurements at the GSI fragment separator FRS will be reported to elucidate the development of neutron skin and evolution of nuclear halo correlations in neutron-rich nuclei.

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