

Speaker : Nigel Orr

**Low-lying level structure of light neutron-rich nuclei beyond the dripline:
^{7,9}He and ¹⁰Li**

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Abstract

The very neutron-rich, light nuclei provide a fertile testing ground for our understanding of nuclear structure. From an experimental point of view this region is the only one for which nuclei lying at and beyond the neutron dripline may be accessed. Theoretically a wide range of models, including various shell model approaches (eg., the shell model in the continuum, the no-core shell model) and more ab initio type models are capable of providing predictions. In addition, the structure of some unbound systems, such as ¹⁰Li, is key to constructing three-body descriptions of two-neutron halo nuclei.

One of the tools most well adapted to the study of nuclei far from stability is that of “knockout” or breakup of a high-energy radioactive beam. Following a brief description of the technique, two specific topics related to the spectroscopy of light unbound systems will be discussed:

- A search for the putative low-lying $1/2^-$ spin-orbit partner of the ⁷He($3/2^-$) ground state.
- An investigation of the parity inversion in the N=7 isotones ⁹He and ¹⁰Li.

The talk will conclude with some comments on the need to investigate more fully the structure of ⁹He and ¹⁰Li, and possible future low-energy experiments that could be pursued at ISAC.