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# WEEKLY CALENDAR

September 22 - 26, 2014

## DEPARTMENTAL COLLOQUIUM

### "Nuclear Reactions: A Challenge for Few- and Many-Body Theory"

3:30 PM September 25, 2014  
109 Nicholson Hall

**Charlotte Ester**  
Ohio University, Athens

**Host: Kristina Launey**

• *Refreshments served at 3:10 PM in 232 (Library) Nicholson Hall* •

It is a particular exciting time for rare isotope science. As the engineering and construction issues for the new facility for rare isotopes (FRIB) are tackled, the physics community prepares to address the challenging science. A large fraction of the FRIB program will involve direct reactions with rare isotope beams, reactions, which leave a good part of the beam nuclei intact. The reliable prediction of reactions with rare isotopes will have to be a major piece in this effort.

Over the last decade tremendous progress has been made in exact descriptions of the structure of nuclei as well as in reactions involving few nuclei. However the upcoming theoretical challenge for rare isotopes physics will be microscopic descriptions of nuclear reactions for light as well as heavy isotopes and take advantage of the achievements made in the description of the structure of those isotopes.

When in reactions only a few degrees of freedom are active, it is customary to construct effective interactions as forces between the active particles. A specific type of those effective interactions in nuclear physics are optical potentials. Though often those only parameterize data, the need to calculate them ab initio receives renewed interest. In this colloquium I will introduce the basic idea of how to view optical potentials in a multiple scattering expansion, and give an overview of past efforts as well as future suggestions on how they can be systematically constructed.

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### PUBLICATIONS:

1. "Excited states in  $^{82}\text{As}$  studied in the decay of  $^{82}\text{Ge}$ ", E. F. Zganjar with UNIRIB and ORNL colleagues, Physical Review C90, 034311 (2014).