Friday, April 24, 2020

FRIB Theory Alliance participation in First Experiments: Proposal Preparation Workshop

Monday: Decay Station; Fundamental Symmetries; Stopped Beams

Jon Engel and Witek Nazarewicz

Experimental sessions about ground-state properties (beta decay, masses, radii, g.s. moments) and fundamental symmetries which for early FRIB is closely connected to ground-state properties (octupole deformation and Schiff moments for EDMs, precise shape of beta spectrum, …)

Tuesday: Equation of State (joint session with JINA)

Sanjay Reddy (JINA), Diego Lonardoni, and Pawel Danielewicz

Wednesday: Structure and reactions with S800, GRETINA or both

Alex Brown and Ragnar Stroberg

Bound excited-state properties with fast-beam reactions (energies in very exotic systems, electromagnetic transition strength, spectroscopic factors, and B(GT)). JINA takes on the science topics relevant to SECAR.

Thursday: MoNA

Kevin Fossez and Simin Wang

Properties of unbound states - resonance energies and widths, correlations in the continuum.

Friday: SOLARIS and ReA3

Gregory Potel and Jutta Escher

Low-energy reactions at ReA. The non-astro side will probably include fusion, all sorts of nucleon adding and subtracting transfer reactions, proton resonant scattering, and low-energy Coulex to get shapes and higher-lying collective structures. The astro side will probably be taken care of by JINA ...

Friday, April 24, 2020

Stopped Beams:

Dear Colleagues,

We would like to invite you to the Stopped Beam Working Group that takes place from 4:00 p.m. to 5:00 p.m. on Monday,

May 4th, as part of the online FRIB First Experiments: Proposal Writing Workshop. The focus of this working group is experiments that will make use of the low-energy (~ 30 keV) stable and rare-isotope beams delivered by the gas stopping facility at FRIB. Multiple experimental devices are present on site and are available for collaborative experiments. In addition, there are locations available on the beam line to install external devices.

The format consists of a brief presentation that will highlight the experimental devices currently available, delivered beam properties, and other considerations for running a stopped beam experiment. The remainder of the session will be dedicated to a question-and-answer session. Since the stopped-beam program is comprised of a wide range of experimental techniques and topics of interest, there is great potential for collaborative synergies involving multiple groups and devices. There could also be a wide range of requirements for delivered beams, and a thorough discussion of these needs will help to drive future developments of the program so that everyone can benefit from FRIB's full potential.

If there are any topics that you would specifically like covered in the presentation or discussion, please reach out to one the conveners, listed below, and we'll do our best to accommodate your request. We can also schedule follow-up discussions for interested parties if the time proves insufficient, or if topics emerge that are of interest to a subset of community. We look forward to the stimulating discussions that will emerge as we all prepare for the beginning of the FRIB era!

Sincerely,
Ryan Ringle (ringle@nscl.msu.edu)
Matt Redshaw (redsh1m@cmich.edu)
Maxime Brodeur (mbrodeur@nd.edu)

Friday, April 24, 2020

SOLARIS and ReA Experiments at the General Purpose Beamlines

Dear Colleagues,

We would like to invite you to the ReA3/6 Working Group that takes place from 2:00 p.m. to 3:20 p.m. on Friday, May 8th, as part of the online FRIB First Experiments: Proposal Writing Workshop. The focus of this working group is experiments that will make use of SOLARIS, the AT-TPC, and the general purpose beamlines in ReA3 and ReA6.
The format consists of a short presentation highlighting the experimental devices currently available and information on delivered beam properties, followed by time for questions and discussion. Since the ReA program is broad, spanning multiple subfields, we anticipate that there may be follow-on discussions at a later date.

If there are specific devices, beams, or topics which you would like to see covered, please let one of the conveners know, and don't forget to register online if you haven't already. We look forward to "seeing" you!

Sincerely,
Ben Kay
Kelly Chipps
Daniel Bazin

Friday, April 24, 2020

RIB Decay Station mission:

Investigate nuclei through the complete measurement of the decay properties of their ground and isomeric states.

It provides experimental information on decay modes, binding energies, lifetimes, decay branching ratios, and level energies for the nuclei near and at the FRIB discovery limits. The role of the decay studies at FRIB will be exploratory. It will search for new phenomena near the boundaries of the nuclear chart which may not be revealed or are impossible closer to stability.

We expect that modern nuclear theory will be able to connect the specific decay observables with nuclear models based on fully microscopic foundations. The phenomenological models will break down far from stability or will be non-relevant.

(1) Provide the microscopic calculations for nuclear masses that will form a basis to understand decay energies and particle separation energies. Predict the decay modes for all nuclei. This is essential data to plan measurements and evaluate results from experiments.

(2) Predict or explain exotic decay modes near the proton dripline, proton, two-proton emission. Address mechanism for alpha-particle clusterization, spontaneous or beta delayed-fission with most modern models with fully microscopic description at every stage of the decay process.

(3) Provide calculations of beta decay strengths distribution for allowed and forbidden transitions. Explain the Gamow-Teller quenching mechanism for a wide range of isotopes. Describe the impact of decay strengths on measured gross nuclear properties such as half-lives and particle emission branching ratios.

(4) Explain the role of the nuclear structure on the mechanism on particle and gamma emission in multistep decay processes, which dominate decays far from stability.

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Explain the mechanism of competition between particle and gamma emission and energy and angular correlations between particles in the single and multistep decay processes.

(5) Predict and explain level schemes in exotic nuclei (energies and transition rates). Help to identify a conventional or new types of collective excitations.