TRIUMF Advanced Rare Isotope Laboratory (ARIEL)

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Coupling of TIGRESS and EMMA with Auxiliary Array TIP at TRIUMF

The combination of a germanium detector array, charged particle detector and recoil mass spectrometer with the neutron-rich radioactive beams available upon completion of ARIEL will allow for an entirely new suite of measurements using fusion-evaporation, radiative-capture, and transfer reactions. This presentation will discuss the selectivity achieved by coupling the TIGRESS gamma-ray spectrometer and the EMMA mass spectrometer alongside a suite of auxiliary detectors housed within TIGRESS such as TIP. This combination of apparatus opens up a range of new studies into nuclear structure and astrophysics by enabling high-energy-resolution gamma-ray spectroscopy and reaction measurements of weak fusion-evaporation reactions in the presence of dominant background reactions. The combined capabilities of TIGRESS, EMMA, and TIP in the context of a fusion-evaporation study of the region near doubly magic 56Ni without the requirement of neutron spectroscopy will be the core topic discussed.

Primary author: ASCH, Heinz (Simon Fraser University)

Co-authors: Dr GILLESPIE, Stephen (FRIB); Dr STAROSTA, Krzysztof (SFU); Dr HACKMAN, Greg (TRIUMF); Dr DAVIDS, Barry (TRIUMF); Dr ALCORTA, Martin (TRIUMF); Dr BHATTACHARJEE, Soumendu (TRIUMF); Dr ESKER, Nicholas (TRIUMF); Dr GARNSWORTHY, Adam (TRIUMF); Mr GEORGES, Shaun (TRIUMF); Mr MACHULE, Peter (TRIUMF); Dr MARTIN, Matthew (ANL); Dr OLCHANSKI, Konstantin (TRIUMF); Dr PEARSON, Chris (TRIUMF); Mr REDEY, Andrew (SFU); Dr SVENSSON, Carl (University of Guelph); Mr WOINOSKI, Alex (SFU); Mr VAN WIEREN, Ken (SFU); Dr WILLIAMS, Jonathan (TRIUMF); Dr WILLIAMS, Matthew (University of Surrey); Mr YU, Zu (SFU)

Presenter: ASCH, Heinz (Simon Fraser University)

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