

# NUCLEAR SEMINAR SERIES

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**Prof. Dennis Muecher**

**University of Guelph, Canada**

**Monday, November 11**

**4:00 pm - Rm 184 NSH**

## ***Nucleosynthesis Studies using Reaccelerated Exotic Ion Beams***

The synthesis of heavy elements via the r-process involves extremely neutron-rich nuclei. Compared to light nuclei, our understanding of the properties of heavy, neutron-rich nuclei is sparse. The next-generation radioactive ion beam facilities, like ARIEL (TRIUMF), FAIR (GSI) and FRIB will offer unique possibilities to probe such nuclei.

I will give an overview about our current and future nuclear astrophysics program with reaccelerated beams at TRIUMF. The new TI-STAR silicon tracker detector, under development in an international collaboration at the University of Guelph and TRIUMF, is designed for experiments with heavy, exotic beams at the future ARIEL facility. TI-STAR coupled to the TIGRESS array of HPGe detectors and the new EMMA recoil separator will offer constraining neutron-capture rates in the  $A=130$  key region of r-process nucleosynthesis. First experiments to pin down the origin of the “intermediate” neutron capture process are under way.

In certain r-process scenarios, nuclear fission and fission-recycling influences the abundance distribution of elements in a major way. I will present our experimental program to study fission properties of  $A=200$  neutron-rich nuclei via quasi-free (p,2p) scattering using the R3B experiment at FAIR, Darmstadt, Germany.



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