Contribution ID: **34** Type: **not specified**

Multimessenger area: Opportunities for future experiments at ISAC-II, TRIUMF

Wednesday, 3 July 2019 14:30 (35 minutes)

The recent observation of neutron star mergers indicate the presence of the r-process in those events, but the precise elemental composition cannot be deduced from the multimessenger observations. Detailed information about the heavy, neutron-rich nuclei involved are needed in order to pin down the origin of heavy elements in the universe. The next-generation radioactive ion beam facility ARIEL at TRIUMF soon will start delivering intense and clean post-accelerated RIBs.

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 will contain a hydrogen, deuterium or helium gas target to gain a factor 20-100 in luminosity for direct reaction experiments compared to experiments using target foils. One major goal of TI-STAR is constraining neutron-capture rates of r-process nuclei in the key A=130 region around 132Sn. Calculations indicate that uncertainties of neutron capture rates are typically one order of magnitude, and can be responsible for current disagreements between predicted and measured abundance distributions. TI-STAR coupled to the TIGRESS array of HPGe detectors and the new EMMA recoil separator will offer populating the r-process nuclei via one-neutron transfer reactions. Reconstruction of excitation energies and gamma ray decay scheme will allow to determine the neutron capture rates via the Oslo method. I will present the status of our experimental program related to Oslo-type experiments at TRIUMF and will discuss the challenges and opportunities of the ARIEL and TI-STAR projects.

Presenter: MUECHER, Dennis (University of Guelph)

Session Classification: Session