Contribution ID: **47** Type: **Invited**

Radioisotope Beam Production at TRIUMF in the ARIEL Era

Friday 9 December 2016 11:00 (25 minutes)

As the only ISOL facility worldwide, ISAC-TRIUMF is routinely operating targets under particle irradiation in the high-power regime in excess of 10 kW. TRIUMF's current flagship project ARIEL, Advanced Rare IsotopE Laboratory, will add three new target stations providing isotopes to the existing experimental stations in ISAC, to a dedicated collection station as well as for chemical post-processing and subsequent use for medical imaging and treatment. In addition to the existing 500 MeV, 50 kW proton driver from TRIUMF's cyclotron, ARIEL will make use of a 35 MeV, 100 kW electron beam from a newly installed superconducting linear accelerator. Together with additional 200 m of RIB beamlines within the radioisotope distribution complex, this will put TRIUMF in the unprecedented capability of delivering three RIB beams to different experiments, while producing radioisotopes for medical applications simultaneously –enhancing the scientific output of the laboratory significantly. General characteristics of the high-power target and beam delivery technology at ISAC and ARIEL will be presented, showing the opportunities and limitations. Moreover, the current status of the facility as well as the path to completion and ramp-up will be discussed.

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Session Classification: Fundamental Interactions & Results From Other Laboratories