

**ARIEL: TRIUMF's ADVANCED RARE ISOTOPE LABORATORY**

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*Abstract*

TRIUMF has recently embarked on the construction of ARIEL, the Advanced Rare Isotope Laboratory, with the goal to significantly expand the Rare Isotope Beam (RIB) program for Nuclear Physics and Astrophysics, Nuclear Medicine and Materials Science. ARIEL will use proton-induced spallation and electron-driven photo-fission of ISOL targets for the production of short-lived rare isotopes that are delivered to experiments at the existing ISAC facility. Combined with ISAC, ARIEL will support delivery of three simultaneous RIBs, up to two accelerated, new beam species and increased beam development capabilities. The ARIEL complex comprises a new SRF 50 MeV 10 mA CW electron linac photo-fission driver and beamline to the targets; one new proton beamline from the 500 MeV cyclotron to the targets; two new high power target stations; mass separators and ion transport to the ISAC-I and ISAC-II accelerator complexes; a new building to house the target stations, remote handling, chemistry labs, front-end and a tunnel for the proton and electron beamlines. This report will include overview of ARIEL, its technical challenges and solutions identified, and status of design activities.

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