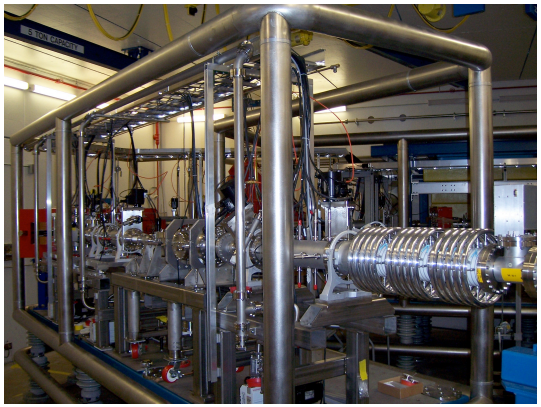
Injector for Radioactive Ion Species 2 (IRIS2)

The principal mission of the Holifield Radioactive Ion Beam Facility (HRIBF) at ORNL is the production of high quality beams of short-lived radioactive isotopes to support research in nuclear structure physics and nuclear astrophysics. HRIBF is currently unique worldwide in its ability to provide neutron-rich fission fragment beams post-accelerated to energies above the Coulomb barrier for reactions. HRIBF produces radioactive ion beams (RIBs) by the isotope separator on-line (ISOL) method. Light ion beams from the Oak Ridge Isochronous Cyclotron (ORIC) are used to bombard thick targets in a target/ion source assembly. Radioactive atoms that diffuse from the target material are ionized, mass selected, and post-accelerated by the 25MV tandem electrostatic accelerator prior to delivery to an experimental end station. The target/ion source assembly, beam optics components, and mass analysis system are located on a high voltage platform system that collectively comprises a RIB production system. HRIBF presently utilizes a single RIB production system known as the Injector for Radioactive Ion Species 1 (IRIS1).



The purpose of the IRIS2 Project is to implement a fully functional second production station for HRIBF. IRIS2 will duplicate all capabilities of IRIS1, thus providing needed redundancy that will substantially improve facility reliability and efficiency. It will also provide scope for implementation of many new features unavailable at IRIS1 such as the use of lasers for purification of RIBs. IRIS2 will increase the number, intensity, and quality of RIB beams available at HRIBF and increase the number of beam hours on target for the experimental program. This dramatic impact on facility operations will significantly extend the physics reach of the facility. It will also give HRIBF staff members the opportunity to advance the state of the art of ISOL RIB production effectively and efficiently without negative impact on the research program. In addition to important benefits as a stand-alone project, IRIS2 forms step two of a comprehensive upgrade plan for the HRIBF that will significantly improve the reliability and productivity of the facility.

The IRIS2 Project began in FY2006 and is scheduled for completion by the end of FY2009. Total project cost is $4,735,000.