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The Nuclear Frontier: Rare Isotope Facilities for Nuclear Physics and Astrophysics

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Rare isotope facilities make rich opportunities available for nuclear structure research as well as for nuclear astrophysics and applied physics. These facilities drive the increasing understanding in nuclear physics research. Rare-isotope accelerators play such a significant role for future research and development and provide the impetus for moving forward in many scientific disciplines. Existing ISOL and projectile fragmentation facilities like ISAC at TRIUMF, ISOLDE at CERN, and RIBF at RIKEN represent first generation facilities, where basic developments are being performed which pave the way to new facilities. Such facilities like FRIB, FAIR and EURISOL will provide unprecedented intensities of short lived isotopes. A review of present facilities and new projects on the horizon is presented with emphasis on new designs in accelerator physics.