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**Direct measurements with low-energy, rare isotope beams for nuclear astrophysics<sup>1</sup>**

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Measurements with beams of rare isotopes are now providing data that is helping to improve our understanding of stellar explosions. Beams of exotic proton-rich nuclei at low energies ( $E_{cm} < 2$  MeV/u) are of special interest since they allow cross sections for reactions that are important in novae and X-ray bursts to be directly measured over the energy range relevant in the stellar environment. These are challenging measurements due to small cross sections, but sensitive new techniques are allowing measurements even with weak radioactive ion beams. Measurements with  $^{17}\text{F}$  and  $^{18}\text{F}$  beams at the Holifield Radioactive Ion Beam Facility will be reviewed, focusing on a recent measurement of the  $^{17}\text{F}(p, \gamma)^{18}\text{Ne}$  cross section using the Daresbury Recoil Separator. The exciting future prospects for measurements will also be discussed, including a program with reaccelerated fragmentation beams at the National Superconducting Cyclotron Laboratory and the possibilities with a next-generation Facility for Rare Isotopes Beams now under development by the U.S. Department of Energy.

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