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Abstract for an Invited Paper
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Tom W. Bonner Prize in Nuclear Physics Talk: Hunting the Rarest Isotopes.¹

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Nuclear physics attempts to accurately model and predict the properties of atomic nuclei based on underlying QCD and QED interactions. The goal is to develop sufficiently predictive models so that key nuclear properties and nuclear reaction rates can be calculated rather than having to rely on measurement. Predictive power would have a major impact on astrophysics, on the study of fundamental symmetries, and on applications of nuclear physics in energy, for example. The talk will describe the design and operation of some of the experimental devices, primarily the S800 spectrograph and A1900 fragment separator at the National Superconducting Cyclotron Laboratory, used to produce and study rare isotopes. Rare isotopes are key to reaching the goal of a comprehensive and predictive model of nuclei. With the completion of FRIB, many of the key rare isotopes will be available for the first time. The talk will present an outline the future scientific program with this facility.

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