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Sensitive r-process nuclei production at Notre Dame MAXIME BRODEUR, University of Notre Dame — Abundance calculations of the astrophysical rapid-neutron capture process, which is responsible for the synthesis of about half of the elements heavier than iron requires precise and accurate knowledge of ground state properties of neutron-rich nuclei. These sensitive quantities are often uncertain or unmeasured and must be calculated using phenomenological nuclear models. This lack of data is due to a combination of the minute production of these exotic nuclei and a lack of available experimental time. Indeed, all the relevant experimental efforts currently take place a reduced number of large user facilities where strong experimental time competition put a constraint on the number of measurements that can be performed yearly. To mitigate the situation, we propose the implementation of a dedicated radioactive ion beam facility at the University of Notre Dame. Neutron-rich nuclei will be produced in an element-independent manner by the proton-induced fission of actinide targets following the IG-ISOL method. This new facility will not only provide needed radioactive ion beams for research, but will also help reinforce the development of the future scientific workforce.

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