

Abstract Submitted  
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**Developments in precision mass measurements of short-lived  $r$ -process nuclei with CARIBU**<sup>1</sup> S.T. MARLEY, A. APRAHAMIAN, M. MUMPOWER, A. NYSTROM, N. PAUL, K. SIEGL, S. STRAUSS, University of Notre Dame, R. SURMAN, Union College, J.A. CLARK, A. PEREZ GALVAN, G. SAVARD, ANL, G. MORGAN, University of Manitoba, R. ORFORD, McGill University — The confluence of new radioactive beam facilities and modern precision mass spectrometry techniques now make it possible to measure masses of many neutron-rich nuclei important to nuclear structure and astrophysics. A recent mass sensitivity study (S. Brett, *et al.* Eur. Phys. J., A 48, 184 (2012)) identified the nuclear masses that are the most influential to the final rapid-neutron capture process abundance distributions under various astrophysical scenarios. This work motivated a campaign of precision mass measurements using the Canadian Penning Trap (CPT) installed at the Californium Rare Isotope Breeder Upgrade (CARIBU) facility at Argonne National Laboratory. In order to measure the weakest and most short-lived ( $t_{\frac{1}{2}} < 150$  ms) of these influential nuclei, a series of upgrades to the CARIBU and CPT systems have been developed. The implementation of these upgrades, the  $r$ -process mass measurements, and the status of CARIBU facility will be discussed.

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