Abstract Submitted
for the HAW14 Meeting of
The American Physical Society

^{94}Mo(γ,n) and ^{90}Zr(γ,n) cross-section measurements towards understanding the origin of *p*-nuclei[1] E. MEEKINS, A. BANU, James Madison University, H. KARWOWSKI, J. SILANO, W. ZIMMERMAN, J. MULLER, G. RICH, M. BHIKE, W. TORNOW, Triangle Universities Nuclear Laboratory, M. MCCLESKY, University of Maryland School of Medicine, C. TRAVAGLIO, INAF-Astronomical Observatory Teramo, Italy — The nucleosynthesis beyond iron of the rarest stable isotopes in the cosmos, the so-called *p*-nuclei, is one of the forefront topics in nuclear astrophysics. Recently, a stellar source was found that, for the first time, was able to produce both light and heavy *p*-nuclei almost at the same level as ^{56}Fe, including the most debated ^{92,94}Mo and ^{96,98}Ru; it was also found that there is an important contribution from the *p*-process nucleosynthesis to the neutron magic nucleus ^{90}Zr [1]. We focus here on constraining the origin of *p*-nuclei through nuclear physics by studying two key astrophysical photoneutron reaction cross sections for ^{94}Mo(γ,n) and ^{90}Zr(γ,n). Their energy dependencies were measured using quasi-monochromatic photon beams from Duke University's High Intensity Gamma-ray Source facility at the respective neutron threshold energies up to 18 MeV. Preliminary results of these experimental cross sections will be presented along with their comparison to predictions by a statistical model based on the Hauser-Feshbach formalism implemented in codes like TALYS and SMARAGD.

[1] C. Travaglio, *et. al.*, ApJ 739 (2011) 93.

[1]This research was supported by the Research Corporation for Science Advancement.

Evan Meekins
James Madison Univ

Date submitted: 26 Jun 2014 Electronic form version 1.4