

Abstract Submitted
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Neutron Star Mergers and the R process¹ RONALD JONIAK, CLAUDIO UGALDE, Univ of Illinois - Chicago — About half of the elements of the periodic table that are present today in the Solar System were synthesized before the formation of the Sun via a rapid neutron capture process (r process). However, the astrophysical site of the r process is a longstanding problem that has captivated both experimental and theoretical astrophysicists. Up to date, two possible scenarios for the site of the r process have been suggested: the first involves the high entropy wind of core collapse supernovae, and the second corresponds to the merger of two compact stellar objects such as neutron stars. We will study the robustness of the nucleosynthesis abundance pattern between the second and third r process peaks as produced by neutron star mergers with r process-like neutron exposures. First, we will vary parameters to obtain an understanding of the astrophysical mechanisms that create the r process. Next, we will create a program to obtain the best possible parameters based on a chi-squared test. Once we have the best fits, we will test the effect of fission in the overall isotope abundance pattern distribution. Later on, we will vary the ratio of masses of the two fission fragments and study its effect on elemental abundances.

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