

NUCLEOSYNTHESIS IN THE EJECTA OF NEUTRON STAR MERGERS

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Heavy elements like gold, platinum or uranium are produced in the rapid neutron capture process (r-process), which needs neutron-rich and explosive environments. Although the actual site for the r-process is still unknown, supernova explosions and neutron star mergers are most promising candidates [1]. In particular, neutron star mergers exhibit three kinds of ejecta fulfilling these conditions: dynamical ejecta due to tidal torques, neutrino-driven winds and evaporating matter from the accretion disc by viscous heating as well as recombination of free nucleons into α -particles. To investigate these astrophysical sites, we combined the results of sophisticated hydrodynamical simulations with nucleosynthesis calculations by utilizing a state-of-the-art reaction network. In addition to examining simulated trajectories, we also carried out parametrical studies, in order to capture the impact of the physics input on the outcome of the nucleosynthesis.

[1] *O. Korobkin, S. Rosswog, A. Arcones and C. Winteler, MNRAS 426, 1940 (2012).*