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Nucleosynthesis Near Newly Formed Compact Objects

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The origin of the heavy r-process elements is the biggest unsolved question in our understanding of chemical evolution in the Milky Way. The two most likely scenarios for the formation of the r-process nuclei involve dynamical events in the lives of neutron stars where nuclear physics plays a paramount role: the inner most regions of massive, collapsed stars and the merger of two neutron stars or a neutron star and a stellar mass black hole. In this talk, I will discuss these possible astrophysical sites of the r-process, what theoretical uncertainties exist in these scenarios, and observables that may give us a direct window into the formation of the r-process elements.