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Radioactive powered transients from compact object mergers

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The origin of the r-process elements remains the biggest unsolved question in our understanding of chemical evolution in the Milky Way. The most likely astrophysical sites for the formation of these nuclei involve dynamical events in the lives of neutron stars: the merger of a neutron star and another compact object. In these environments, nuclear physics plays a paramount role in determining both the evolution of the dense object itself and what nuclei are synthesized in material that is ejected from the system. When the radioactive nuclei produced in these events decay, they can heat material that is unbound during the merger and power optical or infrared transients. In this talk, I will discuss nucleosynthesis and matter ejection in neutron star mergers, with an eye toward electromagnetic observables associated with these events that may give us a direct window into the formation of the r-process elements.