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r-Process Sites, their Ejecta Composition, and their Imprint in Galactic Chemical Evolution

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From low metallicity stars and the presence of radioactive isotopes in deep-sea sediments we know that the main r-process, producing the heaviest elements, is a rare event. The question remains whether neutron star mergers, via GW170817 the only proven r-process site, are the only contributors or also (a rare class of) supernovae, hypernovae/collapsars, as well as neutron star - black hole mergers qualify as candidates. Early galactic evolution as well as variations in nucleosynthesis signatures, e.g. actinide boost stars, might indicate the need for such other sites. We discuss and present the possible options (a) with respect to possible differences in ejecta amount and composition, and (b) in terms of their timing (onset and frequency) during galactic evolution.

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