

Did binary neutron star mergers produce all the r-process elements in the Universe ?

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The main origin of r-process elements is currently a subject of debate, the candidates being binary neutron star mergers and rare supernovae. While the discovery of GW170817 and the associated kilonova has provided strong support to the former hypothesis, detailed comparison of the predictions of galaxy evolution models with the observed r-process abundances reveal important discrepancies both in low- and high-metallicity environments. In this talk I will show that these discrepancies can be alleviated by including more realistic physical effects, such as a detailed description of the binary neutron star merger rates in low-mass galaxies and turbulent mixing of the freshly synthesized elements in the interstellar medium. These results show that merging binary neutron stars are likely the dominant source of r-process elements.

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