

Sites of the r-process: supernovae and mergers: Recent Successes and Current Issues

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Many of the heavy elements in the universe are produced through the rapid capture of neutrons onto iron peak elements, the so-called r-process. Sites for this crucial heavy element production are necessarily extreme and leading proposals invoke conditions at the heart of the engines behind supernovae and gamma-ray bursts. These models include neutrino-driven winds, magnetically-contained winds, magnetically-driven outflows, and disk winds around a collapsed star as well as the winds and dynamical ejecta from the merger of two neutron stars or a neutron star and a black hole. Here we review these sites, their successes and problems in an effort to gain a more complete picture of the production of the heavy elements made in the r-process.

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