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Origin of r-process elements

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Astrophysical sites for the r-process are still unknown. Recent observations indicate that there is a scatter of the r-process elements to iron ratios in metal-poor stars. In addition, there is a scatter of light r-process elements (Sr, Y, Zr) to heavy r-process elements (heavier than Ba) ratios. Those results imply that there are at least two different r-processes, main r-process and weak r-process. As the candidates of main r-process site, Type II supernovae and neutron star mergers have been discussed by several authors. I will show new nucleosynthesis calculations in high entropy environments (Type II SNe) and low entropy environments (neutron star merger). Our results suggest that it is difficult to reproduce observed abundance distribution with r-process in low entropy environments. On the other hand, the mass range of progenitor of r-process supernovae is also a point of issue. Two different authors support main r-process in light mass progenitor supernovae based on their Galactic chemical evolution models. However, there are uncertainties related to models. I will discuss the possibilities of main r-process in massive Type II supernovae.