

Nuclear and astrophysics aspects for the rapid neutron capture process in the era of multimessenger observations



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Galactic Chemical Evolution of r-Process Elements

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Galactic chemical evolution simulations are powerful tools to reconstruct the evolution of the elements across cosmic time. In this talk, I will present how we can use these simulations to investigate the properties of r-process sites (e.g., frequency and mass ejected). Chemical evolution predictions should not be seen as the final answer, but rather as a complementary piece of puzzle that must be combined with the messages sent by other fields of research. In particular, I will present the connection made between galaxy simulations and the gravitational wave detection GW170817, I will highlight what can we learn about the delay time of neutron star mergers by looking at the chemical evolution trends of r-process elements in the disk of the Milky Way, and how we can use hydrodynamic simulations of the early Universe to address the chemical signatures left by r-process events on the surface of old metal-poor stars during the first billion years of galactic evolution.

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