

Observations of r-process enriched stars

Wednesday 11 June 2025 09:00 (30 minutes)

About half the elements heavier than iron in the Universe, like silver and gold, are created in the rapid neutron-capture (r-)process. However, today, almost 70 years after the theoretical prediction of this process, it is still highly debated in what type of stellar explosions it can take place. One of the best places to search for answers is in ancient, metal-poor stars formed from the enriched gas. Their chemical makeup is like a time capsule, a direct fingerprint of the elements produced by the stellar generations that came before them. Since the first r-process enhanced star, CS-22892-052 was discovered more than 30 years ago, multiple projects like the Hamburg/ESO R-process enhanced star survey (HERES), Chemical Evolution of R-process Elements in Stars (CERES), and the R-Process Alliance (RPA) have searched for more r-process enriched stars in the Milky Way. At the same time, numerous r-process enriched stars have been discovered in stellar streams and dwarf galaxies. This talk focuses on recent advances in finding r-process enriched metal-poor stars and what the detailed chemo-dynamical analysis of these stars can tell us about heavy element nucleosynthesis and the astrophysical site(s) of the r-process.

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