Connecting Nuclear Astrophysics to Cosmological Structure Formation

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Galactic chemical evolution (GCE) is a multidisciplinary topic that involves nuclear physics, stellar evolution, galaxy evolution, and cosmology. Observations, experiments, and theories need to work together in order to build a comprehensive understanding of how the chemical elements synthesized in astronomical events are spread inside and around galaxies and recycled into new generations of stars. In this talk, I will present our efforts to create permanent connections between the different fields of research involved in GCE, highlight the impact of nuclear physics uncertainties on GCE predictions, and describe the challenges of using chemical abundances to trace the formation and evolution of dwarf galaxies in the early universe. I will also discuss the implication of the first gravitational wave detection of a neutron star merger event (GW170817, Abbott et al. 2017) on the evolution of r-process elements in the Milky Way from a GCE perspective.

References

[1] B.P. Abbott *et al.*, 2017, PhRvL, 119, 161101