



PHYSICS AND ASTRONOMY SEMINAR

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The Origin of the Heavy Elements: What We Can Learn from Metal-Poor Stars

The astrophysical origins of the heaviest elements found both inside and outside the Solar System are unknown, though neutron star mergers (NSMs) have been confirmed as one of their cosmic factories. Studying post-merger signals in the electromagnetic spectrum is invaluable for understanding the production of these elements at both the microscopic and macroscopic scales. However, with the current low detection rates of these signals, we invoke a different kind of resource for observational data: metal-poor stars. Long after merger, metal-poor stars can host in their spectra signatures of the historical explosive events that produced the heavy elements. Like unique fingerprints, the elemental patterns in each spectrum unveil distinct conditions by which the elements were synthesized. This talk will discuss how stellar spectra can not only act as useful resources for studying the microscopic mechanism by which the heaviest elements are made, but also how they have the potential to constrain physical properties of ancestral NSMs themselves. Investigating the production site(s) of the heaviest elements by combining observation with theory is a step towards understanding both the cosmic evolution of the elements as well as the fundamental nature of dense matter.

Monday, March 29, 2021

2:00 p.m.

Zoom link: <https://uvic.zoom.us/j/82203756592>