

Heavy Metals from the First Stars to Today



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NASA's Cosmic Origins program aims to address the question, "How did we get here?" My work addresses this question through three broad themes: the nature of the first stars, the formation and evolution of the Milky Way and Local Group, and the origin of the elements. I study dwarf galaxies, globular clusters, and stars in the halo using optical and ultraviolet high-resolution spectroscopic data from the various telescopes on the ground and the Hubble Space Telescope. I will present observations of heavy elements that change our understanding of when and how they were first produced in the early Universe, including perhaps by the first stars. Observations of heavy elements in a recently-discovered low-luminosity galaxy, Reticulum II, reveal that the r-process--one of the fundamental ways that stars produce heavy elements--may occur in mergers of neutron stars. At Notre Dame, my group would have access to facilities that provide critical spectroscopic followup of new stellar systems discovered by the Dark Energy Survey, Pan-STARRS Telescope, and Large Synoptic Survey Telescope in the next decade. These data can guide our interpretation of observations from the Advanced LIGO/Virgo experiment and the James Webb Space Telescope, and these research directions would present new opportunities for collaboration with the nuclear astrophysics community.

Wednesday

February 1

4:00 P.M.

Rm 118 NSH

Refreshments
in Rm 202 NSH
@ 3:30 pm