Notre Dame Science
Department of Physics

# WHERE DO THE UNUSUAL METAL-POOR STARS ABUNDANCES COME FROM?

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4:00 P.M. NSH 124

Observations of metal-poor stars provide insights into the nucleosynthesis processes active in the early universe. Among metal-poor stars observed so far, a significant number of them show an anomalous abundance signature that is different than the abundances observed in r-process-enriched stars. Those anomalous stars present a strong overproduction of strontium, yttrium, zirconium and probably also of heavier elements, at least up to silver. The unknown nucleosynthesis process producing these elements has been called stellar "Light Element Primary Process" (LEPP). Although little is known about such process recent nucleosynthesis studies suggest that LEPP elements could be synthesized in at least two astrophysical environments:

- fast rotating massive stars by the s-process, and
- core-collapse supernovae (in an incomplete r-process or in the vp-process).

Although neutrino driven wind nucleosynthesis calculations have traditionally focused on reproducing r-process nuclei, the necessary conditions to produce elements up to the third peak are difficult to obtain in state-of-the-art simulations. In this talk, I will discuss the observational evidence and status of nucleosynthesis studies focusing on the neutrino-wind in core collapse supernovae as the site of the Light Element Primary Process.

Nuclear Seminar

All interested persons are cordially invited to attend.