

CEMP Stars as Probes of First-Star Nucleosynthesis, the IMF, and Galactic Assembly



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Origin of CEMP-no morphology in the Milky Way halo

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The last 30 years of galactic archaeological studies have provided many lines of evidence that CEMP-no stars are direct descendants of the very first stars. In particular, the last few years have been very thrilling because the recent observational studies have shown that there are likely multiple pathways to form CEMP-no stars based on distinctly different CEMP-no groups exhibited in the $A(C)$ - $[Fe/H]$ diagram (CEMP-no morphology). Also, the recent theoretical simulations have provided various possible mechanisms for the formation of these groups. In this talk, we will discuss the latest observational results regarding both the nucleosynthetic and accretion origins of CEMP-no group morphology in the $A(C)$ - $[Fe/H]$ diagram, based on the inference drawn from the similar $A(C)$ - $[Fe/H]$ morphological pattern from both the halo CEMP-no stars and that of stars found in the Milky Way satellite dwarf galaxies. Further, we present a kinematic analysis of the CEMP groups and carbon-normal stars and an exploration of the early Galactic chemical evolution of carbon for further understanding the origin of the distinct CEMP-no groups.

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