

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



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## Accurate abundances at the lowest detected iron abundance: SMSS 1605-1443

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We recently announced the discovery of SMSS 1605-1443, which has the lowest detected iron abundance of any star at  $[\text{Fe}/\text{H}] = -6.2$  (1D LTE). It is strongly carbon enhanced with  $[\text{C}/\text{Fe}] \sim 4$ , but otherwise exhibits a perfectly normal halo star abundance pattern with no detection of neutron capture elements. Assuming a single enrichment event, we find good matches to predictions for Population III stars exploding in low-energy fallback-and-mixing supernovae (from Heger & Woosley 2010) assuming the progenitor star was just 10 solar mass.

I shall discuss recent results from follow-up UVES spectroscopy as well as accurate 3D NLTE spectrum synthesis calculations.

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