

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



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Tracing the formation of the Milky Way through UMP and EMP stars

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I will present the results of a Bayesian derivation of stellar parameters, distances, and orbits for all ultra metal-poor stars (UMPs, $[\text{Fe}/\text{H}] < -4$) available in the literature, as well as for the extremely metal-poor stars (EMPs, $[\text{Fe}/\text{H}] < -3$) observed by Pristine survey, a unique spectrophotometric survey based on a narrow-band Ca H&K filter that aims to detect and analyse EMPs stars. The Pristine survey allows me to focus on a large and homogeneous EMPs dataset, from which it is possible to better study the spatial distribution and orbits of these stars around the Milky Way, especially when cross-matched with Gaia DR2 data. EMPs and UMPs are extremely rare objects located mainly in the Milky Way halo and because they are extremely metal poor, also relative to their neighbourhood, it is assumed that they formed in the relative pristine Galaxy short after the Big Bang. The inferred distances and orbital parameters are directly linked to the formation stages and building blocks of our Galaxy. I will show that, even though most UMP and EMP stars have properties that link them to the inner halo or the accreted halo, a strikingly large fraction of those stars follow disc-like orbits. I will discuss how this discovery affects the different scenarios of the formation of the proto-MW.

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