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



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The Metallicity Gradient in the Outer Halo of the Milky Way

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We present a study of the metallicity gradient in the outer halo component of the Milky Way's dual halo system, using metallicities from SDSS DR15 and several other datasets along with high-precision astrometry from Gaia DR2. It has previously been recognized that the outer halo has one of the most metal-poor stellar populations in our Galaxy (peaking around [Fe/H] = -2.2). In this work, we further explore this unique stellar population by examining variations in its metallicity as a function of kinematic and orbital parameters. Previous predictions have suggested that less massive, more metal-poor dwarf galaxy satellites do not sink very deeply into the potential well of our Galaxy during mergers, rather they remain on the outskirts and form the outermost regions of the halo. On this basis, we look for trends in metallicity in a variety of data samples to better understand the assembly history of the Milky Way. Our work aims to aid future efforts to expand the observational catalogue of [Fe/H] < -2 stars, which serve as important "fossils" of the first generation of stars.

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