

Exploring the history of the Galactic halo with Carbon-Enhanced Metal-Poor stars

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Carbon-Enhanced Metal-Poor (CEMP) stars are an important tool to help describe the chemical evolution of the Galaxy and the Universe. Besides having a few different formation channels, the evolutionary stage of these stars also have an impact on the observed carbon (and similarly, nitrogen and oxygen) abundances. During evolution on the upper red-giant branch, carbon from the lower layers of a stellar atmosphere is converted to nitrogen due to the CN cycle, then mixed to the surface of the star, resulting in an increase of the surface nitrogen abundance and reduction in the surface carbon abundance. In this talk I will present a new procedure that takes into account the evolutionary stage of the star to correct the carbon abundances. Proper treatment of the carbon depletion allows for a better assessment of the CEMP stellar fractions as a function of metallicity. These fractions, in turn, provide important constraints for Galactic chemical evolution and population synthesis models, to set initial conditions for the initial mass function (IMF) and constrain the chemical compositions of progenitor stellar populations.

I will also give a brief update on a new “remote fiber-fed high-resolution spectrograph” being commissioned at the Gemini North Observatory, which will allow the observation of additional CEMP stars and open new observing opportunities for U.S. based astronomers.