

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



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Probing the rotation of early massive stars from the abundances of metal-poor stars

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The study of the long-dead early generations of massive stars is crucial in order to obtain a complete picture of the chemical evolution of the Universe. The nature of these stars can be inferred indirectly by investigating the origin of the low-mass extremely metal-poor stars observed in our neighborhood, some of which are almost as old as the Universe. The material forming these low-mass metal-poor stars is generally thought to have been inherited from the ejecta of one or very few previous massive stars, called the source star(s). After introducing how rotation can impact the source star nucleosynthesis, I will discuss how the physics - especially rotation and nucleosynthetic processes - of the early generations of massive stars may be constrained by combining massive source star models including s-process and rotation with observations of metal-poor stars. A new detailed abundance fitting study of about 200 extremely metal-poor stars, carried out using massive stellar models computed at various initial rotation rates will be presented. From this analysis are guessed the characteristics of the best source stars, in particular their initial velocity distribution. It eventually provides hints on the nature of early massive stars.

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