

Inhomogeneous Galactic Chemical Evolution of r -process Elements

B. Wehmeyer^a, M. Pignatari^b, C. Frohlich^a, and F.-K. Thielemann^c

^aNorth Carolina State University, Raleigh, USA ^bE. A. Milne Centre for Astrophysics, University of Hull, UK ^cUniversität Basel, Switzerland

The origin of the heaviest elements is still a matter of debate. For the rapid neutron capture process (r -process), multiple sites have been proposed, e.g., neutron star mergers and (sub-classes) of supernovae (e.g., [1],[2],[3],[4]). R -process elements have been measured in a large fraction of metal-poor stars [5]. Galactic archaeology studies show that the r -process abundances among these stars vary by over 2 orders of magnitude. On the other hand, abundances in stars with solar-like metallicity do not differ greatly. This leads to two major open questions: 1. What is the reason for such a huge abundance scatter of r -process elements in the early galaxy? 2. While the large scatter at low metallicities might point to a rare production site, why is there barely any scatter at solar metallicities? We use the high resolution (20 parsec/cell) inhomogeneous chemical evolution tool "ICE" to study the role of the contributing source(s) of r -process elements. In this talk, I will discuss chemical evolution scenarios that provide an explanation for the observed abundance features of r -process elements in our Galaxy.

References

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