Contribution ID: **72** Type: **Oral (in presence)**

Beyond Iron: Numerical models of s- and r-processes elements distribution

Friday, 24 June 2022 12:25 (25 minutes)

We present here the results of high resolution (M_gas= 2.4x10^4 M_sun) Galactic Chemical Evolution (GCE) models of Milky-Way type galaxies. We restrict ourselves to "monolithic" models where the galaxy forms and evolves in isolation, i.e. we do not include any mergers nor tidal fields from neighboring galaxies. All our models start from redshift z=8 and we assume a flat CDM cosmology (Omega_lambda=0.71, Omega:m=0.29, h=0.69)
Using the results of more recent calculations of the enrichment of neutron-capture elements in low and intermediate mass stars, we predict the evolution of the distribution of s- and r-processes elements, particularly Barium and Europium.
We use a customized version of GIZMO, a very stable, numerically sophisticated code which has been recently tested in a wide variety of GCE projects. We discuss our customization of the public version of the code, which has mostly touched the inclusion of the yields for elements heavier than Fe, and of the contributions from Type II SNe's and neutron stars merging. Few critical issues have emerged from the treatment of the initial enrichment, a phase for which input from direct observations are absent.
We select two types of envionments from the numerical experiments: solar-neighborhood sites and open clusters, the latter using an algorithm which selects regions based on local clustering inof disk stellar particles. We show that the final slope of the Eu and Ba distributions, like that of lighter species like Oxygen and Fe, is consistent with observations from surveys (APOGEE and Gaia), but the normalization is highly dependent on the initial enrichment. The enrichment history for solar neighborhood regions is highly affected by radial migration of stellar particles, up to redshift z~0.35, after which it tends to get stable.

Session

Galactic Chemical Evolution

Primary authors: BUSSO, Maurizio Maria (Istituto Nazionale di Fisica Nucleare); PALMERINI, Sara (Istituto Nazionale di Fisica Nucleare); ANTONUCCIO-DELOGU, Vincenzo (INAF-Catania Astrophysical Observatory)

Presenter: ANTONUCCIO-DELOGU, Vincenzo (INAF-Catania Astrophysical Observatory)

Session Classification: Galactic Chemical Evolution