Contribution ID: **71** Type: **Poster**

Contribution of individual astrophysical events to chemical evolution of dwarf galaxies

Monday 16 September 2024 20:15 (20 minutes)

Stars of different properties produce different elements. For instance, rotating massive stars are supposed to produce trans-iron elements at low metallicities (e.g. Frischknecht et al. 2012, Limongi & Chieffi 2018). Also, in low-mass galaxies, astrophysical events can appear sporadically. Thus, the relative contribution of astrophysical events to the chemical enrichment may not be compared to that in the solar neighbourhood.

Dwarf galaxies provide insights into the chemical enrichment in low-mass and low-metallicity systems. According to the cosmological model, massive galaxies are formed through mergers of less massive galaxies. When a dwarf galaxy is formed from lower-mass galaxies, individual events influence abundances ratios of each building-block galaxy, and the impact may be reflected in the ratios of the merged galaxy.

We investigate the contribution of individual events to the chemical enrichment of a dwarf galaxy in a context of hierarchical galaxy formation. The chemical evolution of building-block galaxies is derived with a numerical model where the stochasticity is introduced into the occurrence of astrophysical events. We discuss that the contribution of r-process events to the chemical enrichment may be large at low metallicities and that rotating massive stars can create part of the dispersion in abundance ratios through the weak s-process.

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Session Classification: Poster Session