Open Clusters Chemical Abundances: OCCASO

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Short Abstract: Open clusters (OCs) are groups of stars sharing the same general properties: age, distance, chemical composition. They are the ideal laboratories to investigate a variety of astrophysical topics: from stellar to Galactic evolution. The Gaia mission and the complementary ground-based spectroscopic surveys have led to a revolution in our knowledge of OCs. These surveys need complementary high-resolution, R≥60 000, spectroscopy with a larger wavelength coverage, e.g. 400 to 900 nm. This is the goal of OCCASO survey which using FIES@NOT, HERMES@Mercator, CAFE@CAHA 2.2m (Spain) and FIDEOS@ESO 1m (Chile) is determining accurate radial velocities, with a precision of ~10 m s-1, and chemical abundances, with uncertainties of ~0.05 dex, which are used as calibrators of the larger surveys.

Activities 2023 (by INAF):

- Observing run 4 nights FIES@NOT (La Palma)
- Observing run 10 nights HERMES@Mercator (La Palma)
- Coordination meeting in Barcelona
- Participation workshop "From Cluster to field populations" (Firenze)

Current Status:

- 38 observing runs: > 200 observing nights
- 375 stars belonging to 60 open clusters and Gaia Benchmark Stars.
- Four papers published/ data used in about ten more papers.
- OCCASO V paper (Carbajo-Hijarrrubia et al. under revision).
- One PhD thesis (Casamiquela) and another is going to be presented in 2024 (Carbajo-Hijarrubia).
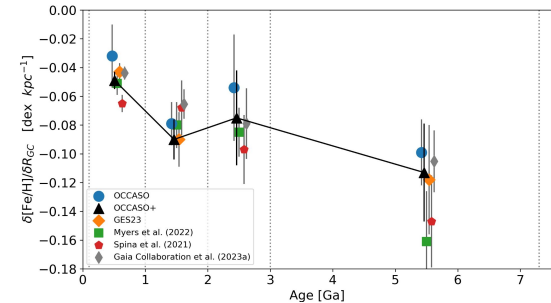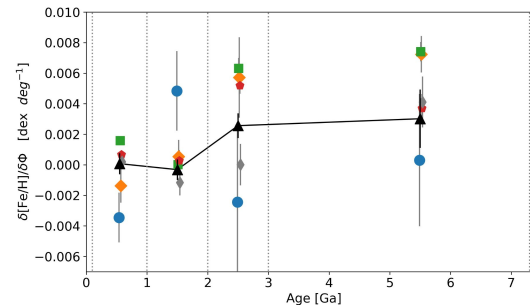
Recent Results:
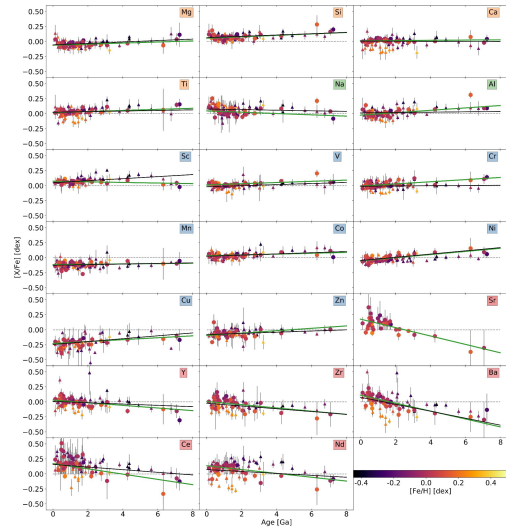
[X/Fe] ratios vs. age as a function of [Fe/H]for OCCASO (circles) and OCCASO+ (triangles).

Evolution of [Fe/H] radial gradient with age.
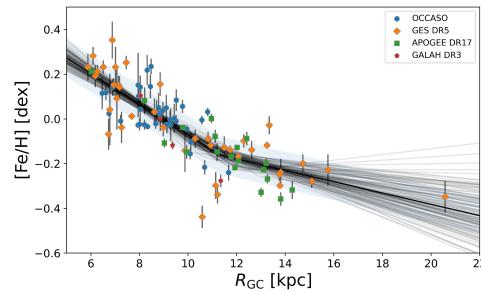
[Fe/H] rations as a function of galactocentric radius.

Evolution of [Fe/H] azimuthal gradient after removing the radial contribution.