

High resolution spectroscopy of open clusters

Mini-Grant 2022 - Angela Bragaglia (INAF-OAS Bologna)

Short abstract: Notwithstanding surveys and smaller studies, only about 10% of the Milky Way open clusters (OCs) have their metallicity and detailed chemistry derived by high-resolution spectroscopy. In an even smaller fraction, stars of all evolutionary phases have been studied. We are remedying this drawback, coupling Gaia to select cluster members with GIARPS and UVES observations, thus obtaining the chemical fingerprints (metallicity and abundances from all nucleosynthetic chains) of about 100 OCs. This permits to get a snapshot of the MW disk both in space and time (with OCs having ages from a few Myr to some Gyr we may follow the Galactic disk evolution). Furthermore, by observing tens of stars in some selected OCs, we can study details fundamental to test and improve stellar evolution models.

Funds: 15000 euro (Hardware: 3000, Travel/Conferences/Workshops/etc 12000)

High resolution spectroscopy of open clusters → “scheda primaria”

WEAVE Project: Galactic Archaeology (WEAVE-1)

Stellar Clusters in 4MOST

The funds were requested mostly for results dissemination and meetings among researchers involved in high-resolution spectroscopy of open clusters.

We postponed the proposed internal all-hands workshop to later, because of the many conferences already in place where participants met/will meet.

Funds were spent or allocated in 2023 for :

-Angela Bragaglia, participation to “STARS (Across the Universe)”, 16-20 October 2023 - where also J. Alonso-Santiago, G. Catanzaro, A. Frasca, S. Lucatello, A. Vallenari were present

[850 euro, TBC]

-Angela Bragaglia, participation to “From star clusters to field populations: survived, destroyed, migrated clusters”, 20-23 November 2023, Arcetri - where also V. D’Orazi, L. Magrini, A. Vallenari will be present

[700 euro, TBC]

-Valentina D’Orazi, participation to same conference

[700 euro, TBC]

-a new, more powerful desktop (Dell Precision 3660 Tower Workstation)

[about 2000 euro, order to be sent early November]

-a new laptop (Dell Notebook Inspiron 15”)

[about 900 euro, order to be sent early November]

Papers related to the Mini-Grant (only published, there are more submitted and in preparation):

- Frasca, A., Alonso-Santiago, J., Catanzaro, G., et al. 2023, A&A, 677, A154. doi:10.1051/0004-6361/202347226
- Frasca, A., Alonso-Santiago, J., Catanzaro, G., et al. 2023, MNRAS, 522, 4894. doi:10.1093/mnras/stad1310
- Jin, S., Trager, S.C., Dalton, G.B., et al. 2023, MNRAS (arXiv:2212.03981) doi:10.1093/mnras/stad557
- Fu, X., Bragaglia, A., Liu, C., et al. 2022, A&A, 668, A4. doi:10.1051/0004-6361/202243590
- Zhang, R., Lucatello, S., Bragaglia, A., et al. 2022, A&A, 667, A103. doi:10.1051/0004-6361/202243593
- Carrera, R., Casamiquela, L., Bragaglia, A., et al. 2022, A&A, 663, A148. doi:10.1051/0004-6361/202243151

Accepted proposals related to the Mini-Grant:

TNG:

- A46TAC_31 PI A. Bragaglia, Metal mixing in the Radcliffe Wave traced by young open clusters, GIARPS, 31.3 h
- A47TAC_6, PI V. D'Orazi, FLUorine abundances in Open cluster cool giants (FLUO), GIARPS, 15 h

ESO:

- P112, PI A. Bragaglia, Deciphering NGC 2509, an intermediate-age open cluster with a large binary population and a narrow turn-off, FLAMES, 3 h

LBT:

- 2023B_1, PI A. Bragaglia, Is M37 the first open cluster with a metallicity spread?, PEPSI, 3.41 h

Finally: No perceived risk or criticality, data are inflowing and are being analysed, collaboration among researchers is in place and new collaboration are starting, papers are being written, presentations are given at conferences.