Globular cluster dynamics in dark matter theories

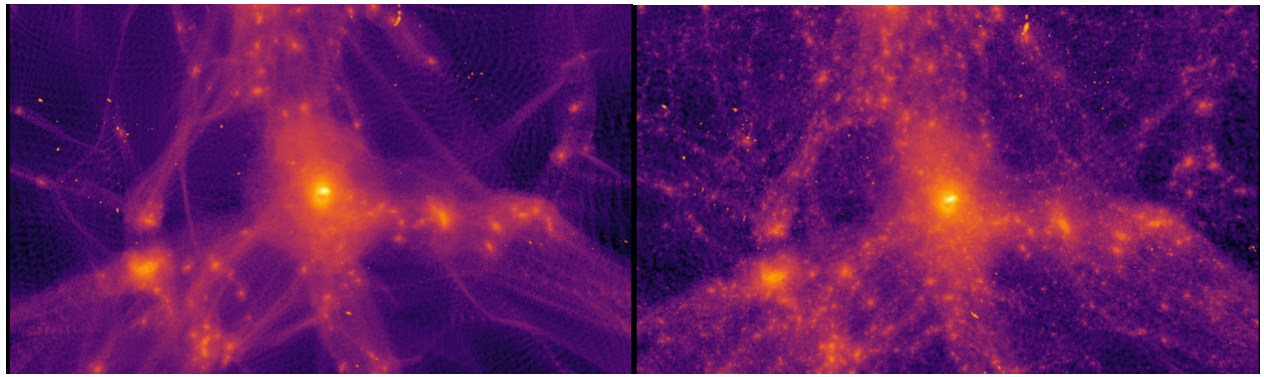
P. Boldrini, P. Di Matteo, C. Laporte - Pôle Etoiles et Galaxies

Scientific questions:

What is the nature of dark matter?

Which dark matter theory is the most plausible?

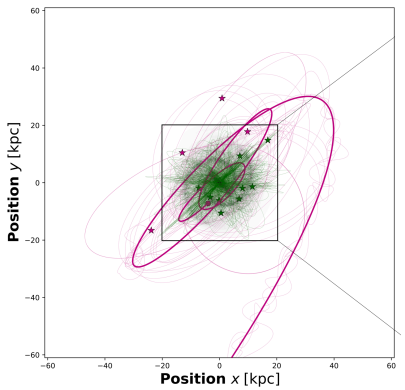
—> **Globular clusters as new probe of dark matter**

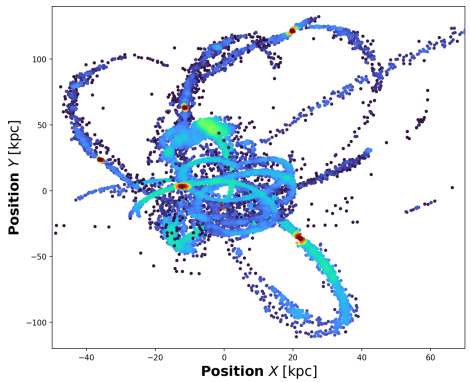


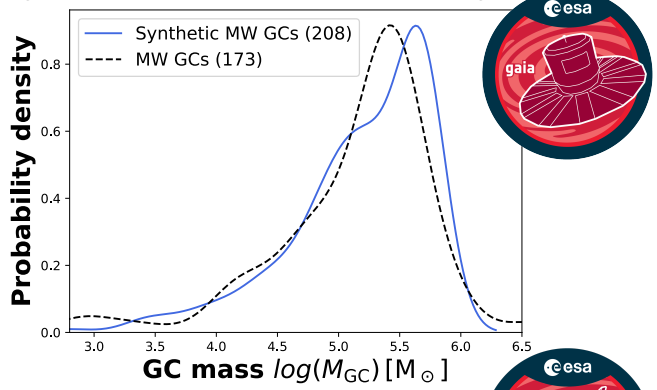
A novel cosmological approach:

a post-processing semi-analytical model for globular clusters, designed to be applied to any cosmological simulation, and including:

- Orbital evolution across cosmological times and environments
- Mass loss
- Dynamical friction
- Stream formation
- Constraints from Gaia data







Boldrini et al. +25, A&A (2510.00927)
Boldrini & Di Matteo +25, A&A (2510.02130)
Szpilfidel et al. +26, A&A (2510.00927)
Boldrini et al, in prep. (Euclid paper)

Futur works:

- Euclid: Half a million extragalactic globular clusters within 100 Mpc
- JWST: ~2000 compact clumps identified over 0.7< z <10