

A Euclid perspective on Globular Clusters

Extragalactic globular clusters (EGCs) are powerful tracers of the assembly history of galaxies. GCs have been shown to reveal low-surface brightness features, such as streams and the intra-cluster medium. This has particularly been demonstrated in the Andromeda and Centaurus A galaxies for streams, and in the Fornax and Virgo clusters for intra-cluster light. However, studying EGCs in the local universe (within $<100\text{Mpc}$) has historically been limited by the difficulty of distinguishing them from other sources, such as stars and galaxies, and by the lack of homogeneity in existing datasets.

In this presentation, I will showcase our work (Euclid Collaboration: Voggel et al., 2024) on forecasting the detectability of globular clusters (GCs) across the entire Euclid survey. Our estimates suggest that the galaxies within Euclid's survey footprint host almost one million GCs, approximately 350,000 of which should be detectable in the VIS band. Furthermore, we demonstrate that EGCs can be spatially resolved in the Early Release Observations (ERO) Fornax dataset compared to pure point sources. Our analysis of both simulated and ERO data highlights Euclid's potential to set a new standard for Local Universe EGC studies. Euclid is set to increase the number of GCs accessible through high-resolution imaging by an order of magnitude.

Euclid is unique in enabling systematic studies of EGCs in the outskirts of large galaxies where low-surface brightness feature as well as the intra-cluster medium are located. With a complete GC catalogue a systematic understanding of how low-surface brightness features correlate with the position of GCs are within reach. Many of the EGCs detected will also be spatially resolved and have infrared colours in a single photometric system, enabling new large-scale studies of their structural properties and spectral energy distributions, which will help in using them for tracing galaxy assembly. Finally, I will provide an overview of what can be expected for GCs within the Euclid data in future releases.