

Seminar

by

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The Deep (photometric and spectroscopic) Surveys of the Fornax Cluster

The Fornax cluster provides a uniquely compact laboratory in which to study the detailed history of early-type galaxies and the role played by the environment in driving their evolution and their transformation from late-type galaxies.

In this talk I would like to present the complexity of the nearby Fornax cluster as result from the Fornax Deep Survey (FDS), performed with the VST, and the high-quality integral-field data obtained with MUSE@VLT from the Fornax3D project. Both surveys map the Fornax cluster out to its virial radius.

The analysis of the deep images from FDS suggests that the Fornax cluster is not completely relaxed inside the virial radius. The bulk of the gravitational interactions between galaxies happens in the W-NW core region of the cluster, where most of the bright early-type galaxies are located and where the intra-cluster baryons (diffuse light and globular clusters) are found. We suggest that the W-NW sub-clump of galaxies results from an infalling group onto the cluster, which has modified the structure of the galaxy outskirts (making asymmetric stellar halos) and has produced the intra-cluster baryons (ICL and GCs), concentrated in this region of the cluster.

The Fornax3D project provides the stellar and ionised-gas kinematics for all galaxies in the Fornax3D sample. Furthermore, for the ETGs in Fornax3D we also obtain average stellar population properties from measurements of absorption line-strength indices. The galaxies have been mapped in high resolution from the brightest central regions to the outskirts, where the surface brightness $\mu_B \sim 25 \text{ mag/arcsec}^2$, and out to $2 - 3 R_e$ for the 23 early-type galaxies and $1-2 R_e$ for the 10 late-type galaxies in the sample. The results provide insight into the mass assembly in the high density region of the cluster and on the structure and formation of the Fornax cluster. These studies could be considered as a benchmark for (simulations of) the assembly and evolution of galaxies in a cluster environment.