

Project 15/2014: "**Pinning down the formation and evolution of nuclei in disc galaxies**"

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Abstract:

Black holes (BHs) are ubiquitous at the centres of galaxies and seem to co-evolve with their hosts. Nuclear star clusters (NCs) appear to follow similar scaling relations, but unlike BHs, NCs provide a visible record of the accretion of stars and gas. We can constrain the assembly histories of NCs using a unique observational dataset, but we are lacking numerical simulations to test the proposed fuelling and growing mechanisms.

We are thus proposing here to probe the formation and evolution of nuclei in disc galaxies by simulating high resolution systems from large (30kpc) to small (3pc) scales (and later to sub-parcsec scales) and probe the detailed coupling between the dynamics and star formation in the nucleus. These state-of-the-art hydrodynamical simulations will be conducted on the C2PAP cluster.