Galaxy clusters in MOND: the case of ultra diffuse galaxies in the Coma cluster

Speaker: Srikanth T. Nagesh
Supervisors: Benoit Famaey & Jonathan Freundlich
Observatoire Astronomique de Strasbourg, France
srikanth.togere@astro.unistra.fr

Ultra diffuse galaxies (UDG), low-surface brightness objects with large effective radii, inside galaxy clusters have very low internal gravity which renders them ideal candidates for testing the Modified Newtonian Dynamics (MOND) paradigm as a possible alternative to dark matter. Freundlich et. al. (2022) studied the velocity dispersions of several UDGs in the Coma cluster and compared them with the predictions of MOND. While the agreement would have been excellent if these galaxies were isolated, there seems to be an apparent disagreement because of the so-called 'external field effect' (EFE) related to the gravitational influence of the cluster. The authors have proposed several scenarios that could possibly explain this discrepancy. Building on this work, I will be presenting results of numerical simulations of UDGs orbiting around the Coma cluster, in MOND. We look at some of their dynamical properties and compare them with observations and subsequently try to explain whether the UDGs are within the realm of reconciliation or beyond.