

An ACS Treasury Survey of the Coma cluster of galaxies

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Scientific Category: UNRESOLVED STELLAR POPULATIONS

Scientific Keywords: CLUSTERS OF GALAXIES, DWARF GALAXIES, GALAXY FORMATION AND EVOLUTION, GALAXY MORPHOLOGY AND STRUCTURE, SURVEY

Instruments: ACS

Proprietary Period: 0

Treasury: Yes

Orbit Request	Prime	Parallel
Cycle 15	164	0

Abstract

We propose to use the unique spatial resolution of HST and ACS to construct a Treasury imaging survey of the core and infall region of the richest local cluster, Coma. We will observe samples of thousands of galaxies down to magnitude $B=27.3$ with the aim of studying in detail the dwarf galaxy population which, according to hierarchical models of galaxy formation, are the earliest galaxies to form in the universe. Our initial scientific objectives are:

- 1) A study of the structure of the dwarf galaxies, including scaling laws, nuclear structure and morphology, to compare with hierarchical and evolutionary models of their formation.
- 2) A study of the stellar populations from colors and color gradients, and how the internal chemical evolution of galaxies is affected by interaction with the cluster gaseous and galaxy environment.
- 3) To determine the effect of the cluster environment upon morphological features, disks, bulges and bars, by comparing these structure in the Coma sample with field galaxy samples.
- 4) Identification of dwarf galaxy samples for further study with the new generation of multi-object and integral-field spectrographs on 8-10 metre class telescopes such as Keck, Subaru, Gemini, and GTC.

This is the first such survey of a nearby rich cluster. It will provide a key database for studies of galaxy formation and evolution, and a very needed reference for comparison with similar galaxy surveys both in lower density environments in the nearby universe, and in high density environments at high redshifts.

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Investigators:

	Investigator	Institution	Country
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Investigator	Institution	Country
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Number of investigators: 32

* ESA investigators: 17

Target Summary:

Target	RA	Dec	Magnitude
COMA-CORE-MOSAIC	12 59 48.7000	+27 57 25.00	
COMA-OUTSKIRTS-1	12 56 19.6000	+27 50 5.00	
COMA-OUTSKIRTS-2	12 56 2.1000	+27 49 49.00	
COMA-OUTSKIRTS-3	12 58 33.5000	+27 49 17.00	
COMA-OUTSKIRTS-4	12 56 59.4000	+27 45 16.00	
COMA-OUTSKIRTS-5	12 58 13.9000	+27 44 46.00	
COMA-OUTSKIRTS-6	12 56 29.4000	+27 42 33.00	
COMA-OUTSKIRTS-7	12 57 57.9000	+27 42 0.00	
COMA-OUTSKIRTS-8	12 58 27.4000	+27 41 11.00	
COMA-OUTSKIRTS-9	12 56 3.0000	+27 39 17.00	
COMA-OUTSKIRTS-10	12 56 55.3000	+27 38 42.00	
COMA-OUTSKIRTS-11	12 57 21.9000	+27 38 14.00	
COMA-OUTSKIRTS-12	12 57 42.6000	+27 37 45.00	
COMA-OUTSKIRTS-13	12 58 26.9000	+27 34 47.00	
COMA-OUTSKIRTS-14	12 58 6.9000	+27 33 41.00	
COMA-OUTSKIRTS-15	12 57 46.3000	+27 33 17.00	
COMA-OUTSKIRTS-16	12 56 37.5000	+27 33 13.00	
COMA-OUTSKIRTS-17	12 57 25.9000	+27 31 47.00	
COMA-OUTSKIRTS-18	12 57 22.5000	+27 28 39.00	
COMA-OUTSKIRTS-19	12 57 55.1000	+27 28 42.00	
COMA-OUTSKIRTS-20	12 58 17.3000	+27 27 0.00	
COMA-OUTSKIRTS-21	12 56 46.7000	+27 26 40.00	
COMA-OUTSKIRTS-22	12 57 39.8000	+27 26 17.00	
COMA-OUTSKIRTS-23	12 56 18.9000	+27 25 50.00	
COMA-OUTSKIRTS-24	12 57 4.8000	+27 23 42.00	
COMA-OUTSKIRTS-25	12 58 29.9000	+27 22 51.00	
COMA-OUTSKIRTS-26	12 58 0.8000	+27 22 17.00	