An ACS Treasury Survey of the Coma cluster of galaxies

Principal Investigator: Prof. David Carter

Institution: Liverpool John Moores University

Electronic Mail: dxc@astro.livjm.ac.uk

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.

Investigators:

	Investigator	Institution	Country
PI*	Prof. David Carter	Liverpool John Moores University	UK
CoI*	Dr. Bahram Mobasher	Space Telescope Science Institute - ESA	USA/MD
CoI	Dr. Paul Goudfrooij	Space Telescope Science Institute	USA/MD
CoI*	Dr. Thomas H. Puzia	Space Telescope Science Institute	USA/MD
CoI	Dr. Harry C. Ferguson	Space Telescope Science Institute	USA/MD
CoI	Dr. Rafael Guzman	University of Florida	USA/FL
CoI	Dr. Alister W. Graham	Australian National University	Australia
CoI*	Dr. Neil Trentham	University of Cambridge	UK
CoI	Prof. David Merritt	Rochester Institute of Technology	USA/NY
CoI*	Dr. Dan Batcheldor	Rochester Institute of Technology	USA/NY
CoI	Dr. Shardha Jogee	University of Texas at Austin	USA/TX
CoI*	Dr. John Lucey	University of Durham	UK
CoI*	Dr. Russell Smith	University of Durham	UK
CoI*	Prof. Ray M. Sharples	University of Durham	UK
CoI*	Dr. Mustapha Mouhcine	Liverpool John Moores University	UK
CoI*	Dr. Reynier F. Peletier	Kapteyn Astronomical Institute	Netherlands
CoI*	Dr. Marc Balcells	Instituto de Astrofisica de Canarias	Spain
CoI	Dr. Sadanori Okamura	University of Tokyo, Department of Astronomy	
CoI	Dr. Yutaka Komiyama	National Astronomical Obs of Japan (NAOJ), Subaru Telescope	USA/HI
CoI*	Dr. Jonathan Davies	University of Wales, College of Cardiff (UWCC)	UK
CoI*	Dr. Steve Phillipps	University of Bristol	UK
CoI*	Dr. Bianca Poggianti	Osservatorio Astronomico di Padova	Italy
CoI	Dr. Terry Bridges	Queen's University	Canada
CoI	Dr. Michael J. Hudson	University of Waterloo	Canada
CoI	Dr. Bryan Miller	Gemini Observatory, Southern Operations	Chile
CoI	Dr. Jennifer Lotz	National Optical Astronomy Observatories, AURA	USA/AZ
CoI*	Prof. Edwin Valentijn	Kapteyn Astronomical Institute	Netherlands
CoI	Dr. R. Brent Tully	University of Hawaii	USA/HI
CoI	Dr. Ann Hornschemeier	NASA Goddard Space Flight Center	USA/MD
CoI	Dr. Neal A. Miller	The Johns Hopkins University	USA/MD
CoI*	Dr. Peter Erwin	Max-Planck-Institut fur extraterrestrische Physik	Germany

Investigator	Institution	Country
CoI* Dr. Alfonso Aguerri	Instituto de Astrofisica de Canarias	Spain

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	