ABSTRACT

Christophe Adami
Laboratoire d'Astrophysique de Marseille (FR)

A brand new vision of an old cluster: untangling Coma Berenices

Environmental effects are known to have an important influence on cluster galaxies and cluster formation history. Based on a large amount of deep multiwavelength imaging and spectroscopic data collected at CFHT and ESO-VLT, we present a comprehensive study of the Coma cluster formation history linked with the surrounding large scale structures. In particular, we will present our studies of the contact nodes of the known connecting filaments. We will also describe recently new detected filaments linking the Coma cluster and the SDSS great wall.

ABSTRACT

Magda Arnaboldi
ESO-Garching

BCGs + ICL - observations

Abstract missing.

ABSTRACT

Ralf Bender
MPI für extraterrestrische Physik, Garching / Universitäts-Sternwarte München (DE)

Galaxies and their black holes

Abstract missing.

ABSTRACT

Alessandro Boselli
Laboratoire d'Astrophysique de Marseille (FR)

GUViCS: the GALEX UV Virgo Cluster Survey

The GALEX Ultraviolet Virgo Cluster Survey (GUViCS) is a complete blind survey of the Virgo cluster covering 40 sq. deg. in the far UV (FUV, 1539 A) and 120 sq. deg. in the near UV (NUV, 2316 A). The goal of the survey is to study the ultraviolet (UV) properties of galaxies in a rich cluster environment, spanning a wide luminosity range from giants to dwarfs, and regardless of prior knowledge of their star formation activity. The UV data will be combined with those in other bands (optical: NGVS; far-nfrared - submm: HeViCS; HI: ALFALFA) and with our multizone chemo-spectrophotometric models of galaxy evolution to ake a complete and exhaustive study of the effects of the environment on the evolution of galaxies in high density regions. We present here the scientific objectives of the survey and some of the results already obtained using this unique set of UV data.

ABSTRACT

Michele Cappellari
University of Oxford, Astrophysics (UK)

Inner dynamics and dynamical scaling relations of massive galaxies

I review our knowledge of the inner (~1Re) dynamics and of the dynamical scaling relations of massive nearby galaxies. I summarize the dynamical evidence on the relative contribution of stars and dark matter in the luminous central parts of galaxies. I show how large local surveys, especially using integral-field spectroscopy, are revolutionizing our view of the inner galaxy structure and are placing tight constraints to galaxy formation models.

ABSTRACT

David Carter
Liverpool John Moores University (UK)

Results from Coma ACS imaging survey (invited talk)

I will review initial results from, and outline future plans for the data from the HST/ACS Coma Cluster Treasury Survey. The survey currently covers 240 sq. arcmin of the cluster in F475W and F814W filters, and reaches a point source depth equivalent to g=27.55 and I=26.65. Science highlights include the detection of a populous system of Intergalactic Globular Clusters; the detection of rich populations of compact elliptical and ultracompact dwarf galaxies; the extension of the fundamental plane and photometric plane into the dwarf regime in Coma; confirmation that colour gradients are ubiquitous amongst galaxies of all luminosities, and isolation of nuclear clusters in many dwarf galaxies which are bluer than the inward extrapolation of the colour profile. I will also report on a detailed isophotal analysis of a sample of Coma cluster members, and a first attempt to characterise missing or extra light in the galaxy profiles in the dense Coma environment.

ABSTRACT

Santi Cassisi
INAF-Osservatorio Astronomico di Teramo (IT)

Stellar evolution and issues related to post turn off evolution

In this talk, we show the level of agreement between state-of-the-art stellar models and empirical constraints. Current shortcomings in stellar models computations will be discussed. The most relevant issues related with the advanced evolutionary stages will be pointed out.

ABSTRACT

Eugene Churazov
MPI für Astrophysik, Garching (DE)

X-rays in massive galaxies: how good are mass estimates based on X-ray measurements and hydrostatic equilibrium?

X-ray emission of the hot gas in massive galaxies provides a useful probe of their gravitational potential well, provided that the gas is in hydrostatic equilibrium. The main advantage of using the gas as a tracer of the potential is the isotropy of the gas pressure and the ability of modern X-ray observatories to derive accurate estimates of the gas density and temperature. The main concern is the contribution of "invisible" components of the pressure - differential gas motions, cosmic rays and magnetic fields. The accuracy of the final mass/potential estimates, based on X-ray data is discussed.

ABSTRACT

Matthew Colless
Australian Astronomical Observatory (AAO) (AU)

What nearby clusters can teach us about galaxy formation and evolution

Nearby clusters are ideal laboratories for exploring the formation and evolution of galaxies, providing a wide range of environments and morphologies, and convenient samples of galaxies all at the same distance. I will review what has been learnt about galaxy formation and evolution from studies of nearby clusters in the past, and look at prospects for new avenues of research in future.

ABSTRACT

Luca Cortese
ESO-Garching

The role of the cluster environment on the star formation cycle of Virgo galaxies

Even though it has been known for decades that the properties of galaxies are tightly linked to the environment they inhabit, we still miss a coherent picture about the role played by the cluster environment on galaxy evolution. Until very recently, one of the main problems has been the lack of information about the properties of the different baryonic components (e.g., gas, stars, dust and metals) taking part in the star formation cycle of galaxies and their variation with local density. Now, wide-area multi-wavelength surveys are finally under way, making it possible to investigate separately the effects of the environment on the different constituents of galaxies. In this talk, I will combine new multiwavelength data (e.g., GALEX-UV, SDSS-optical, Arecibo-HI, Herschel-FIR/submm) for the Herschel Reference Survey, a volume-, magnitude-limited sample of nearby galaxies in different environments, to investigate how the star formation cycle changes from high to low density regions.

I will explore how the cold gas, dust and metal content and star formation activity of galaxies vary when moving from the field to the center of Virgo and discuss the implications of these results for galaxy evolution models.

ABSTRACT

Patrick Cote
NRC - Herzberg Institute of Astrophysics (CA)

Stellar Populations and Kinematics of Early-Type Galaxies in the Virgo and Fornax Clusters

I present results from a spectroscopic survey of early-type galaxies in the Virgo and Fornax Clusters. Long-slit spectra from KPNO, Keck and VLT are presented for roughly 100 galaxies that were imaged as part of the ACS Virgo and Fornax Cluster Surveys. I combine the new rotation velocity, velocity dispersion, and line index measurements for these galaxies with data from the literature to explore the variations in the basic properties of early-type galaxies, including stellar populations and kinematics, as a function of mass and environment.

ABSTRACT

Stéphane Courteau
Queen's University, Physics & Astronomy (CA)

The Velocity Function of Virgo Cluster Galaxies

I present the first observed cluster galaxy circular velocity function, N(V), based on our recently acquired uniform catalog of dynamical measurements (resolved rotation curves and velocity dispersions) for disk and spheroidal Virgo cluster galaxies. Our sample probes galaxy dynamics well below the fundamental galaxy transition scale of V~ 120 km/s and enables the closest comparison with the predicted circular velocity function from LCDM models. N(V) is an important prediction, as yet never fully tested, of galaxy formation models.

ABSTRACT

Jonathan Davies
Cardiff University, Physics & Astronomy (UK)

The Herschel Virgo Cluster Survey

The Herschel Virgo Cluster Survey (HeViCS) is an approved open time key project to observe 64 sq deg of the Virgo cluster at 100, 160, 250, 350 and 500um. I will describe first results from the survey which will include: 1. a comparison of the statistical (global) properties of the bright galaxies including luminosity and dust mass functions. 2. a more detailed analysis of a few individual galaxies making use of Herschel's suburb resolution, including evidence for evolution in the cluster environment. 3. a first look at the far infrared properties of cluster dwarf galaxies both star forming and quiescent.

ABSTRACT

Gabriella De Lucia
INAF-Osservatorio Astronomico di Trieste (IT)

BCGs + ICL - simulations

Abstract missing.

ABSTRACT

Mark den Brok
Kapteyn Astronomical Institute (NL)

Colour gradients in giant and dwarf early-type galaxies in the Coma cluster

Using deep, high-spatial resolution imaging from the HST ACS Coma Cluster Treasury Survey, we have determined colour profiles of 142 early-type galaxies in the Coma cluster. We find that almost all colour gradients are negative, both for elliptical and lenticular galaxies. Most likely, earlier studies that report positive colour gradients in dwarf galaxies are affected by the bluer colours of the nuclear clusters, underlining that high resolution data are essential to disentangle the colour properties of the different morphological components in galaxies. Colour gradients of dwarf elliptical galaxies form a continuous sequence with those of elliptical galaxies, becoming shallower toward fainter magnitudes. Interpreting the colours as metallicity tracers, our data suggest that dwarfs as well as giant early-type galaxies in the Coma cluster are less metal rich in their outer parts. We do not find evidence for environmental influence on the gradients, although we note that most of our galaxies are found in the central regions of the cluster. For a subset of galaxies with known morphological types, S0 galaxies have less steep gradients than elliptical galaxies. Time permitting, we will present our most recent findings on nuclear star clusters in early type galaxies in Coma.

ABSTRACT

Andrew C. Fabian
Inst. of Astronomy, University of Cambridge (UK)

AGN feedback - how does it work and what has been its impact on the galaxies in the nearby clusters

Abstract missing.

ABSTRACT

Laura Ferrarese
NRC - Herzberg Institute of Astrophysics (CA)

Results from the NGVS

HST/ACS Virgo and Fornax Cluster Surveys" (Cote et al. 2004, Jordan et al. 2007) opened a new era in the characterization of the properties of early type galaxies. To CFHT "Next Generation Virgo Cluster Survey" (NGVS) was designed to extend that characterization to a wider array of baryonic substructures over the entire extent of the Virgo cluster, the dominant mass concentration in the Local Universe and the largest collection of galaxies within 35 Mpc. Over the course of four years, the NGVS will employ over 800 hours of MegaPrime time to survey the Virgo cluster from its core to virial radius (for a total of 104 square degrees) in five bands (u,g,r,i,z) to a point source depth of g=25.7 mag (10 σ) and a surface brightness depth of g=29 mag arcsec^2. I will present a brief overview of the survey and discuss preliminary results on the structural parameters and luminosity function of galaxies in the Virgo core spanning a factor 10 million in luminosity.

ABSTRACT

William R. Forman
Harvard-Smithsonian Center for Astrophysics (US)

X-ray Survey

Abstract missing.

ABSTRACT

Giuseppe Gavazzi
Università di Milano-Bicocca (IT)

H_alpha^3: an H_alpha imaging survey of 21 cm selected galaxies from ALFALFA in the Virgo cluster and surroundings

Using the 2.1m telescope at San Pedro Martir (Mexico) we carried out an H_alpha imaging survey of 411 galaxies (out of 509) HI selected from ALFALFA in a 900 sqdeg region of the local Supercluster including the Virgo cluster and its surroundings (Zc<3000 km/s). For all galaxies we measure the stellar mass (M_* from SDSS i-band photometry), the M_HI mass (from ALFALFA) and the current SFR (from the present H_alpha survey). Using these quantities we study the dependence of the SSFR (specific star formation rate = SFR/M_*) on the HI_gas fraction (M_HI/M_*) and we discuss the impact of the environment (traced by the HI deficiency parameter) on the star formation history of spiral galaxies in the Virgo cluster.

ABSTRACT

Ortwin Gerhard
MPI für extraterrestrische Physik, Garching (DE)

Outer halo dynamics

Abstract missing.

ABSTRACT

Lisa Glass
NRC - Herzberg Institute of Astrophysics (CA)

The Structure and Stellar Populations of the Central Regions of Early-Type Galaxies

The ACS Virgo and Fornax Cluster Surveys (ACSVCS and ACSFCS) are programs that obtained HST/ACS g and z-band imaging of a large, unbiased sample of 143 early-type galaxies, spanning a factor of ~750 in B-band luminosity, which belong to the Virgo or Fornax clusters. One of the most surprising results has been the discovery that the vast majority of the intermediate and low luminosity galaxies contain bright stellar nuclei (sometimes referred to as nuclear star clusters in the fainter systems). Given that both these nuclei and the supermassive black holes found in brighter galaxies contain ~0.2% of the total luminous galaxy mass, there are reasons to believe that similar mechanisms may be responsible for both types of "central massive object". Little is known directly, however, about the formation and evolution of nuclei in early-type galaxies. In order to further our understanding of the history of gas accretion and star formation of these objects, we have carried out a ~200-orbit HST program to image all of the ACSVCS galaxies in the IR (NIC1/F160W) and UV (WFPC2/F300W). I will present the latest results from this survey.

ABSTRACT

William Harris
McMaster University, Physics & Astronomy (CA)

The New Role for Globular Cluster Systems in Giant Galaxies

Emerging evidence points to the intriguing possibility that 20 to 50 percent of all star formation in large galaxies may have happened in protoglobular clusters. In addition, they are found in the largest numbers within the richest environments such as Virgo and Coma. The globular clusters we see now are the dynamically evolved remnants of these sites of early star formation under the densest known conditions. In this talk I will discuss the new role that systems of globular clusters have to play in uncovering the evolutionary history of galaxies, particularly the giant ellipticals that populate rich environments.

ABSTRACT

Michael Hilker
ESO-Garching

Properties and kinematics of ultra-compact dwarf galaxies in nearby clusters

Ultra-compact dwarf galaxies (UCDs) have first been discovered in the Fornax cluster more than a decade ago. Today we know that dozens of UCDs populate the cores of all so far investigated nearby galaxy clusters (Virgo, Antlia, Hydra I, Centaurus and Coma). With more and more photometric and spectroscopic data becoming available for large samples of UCDs, we are now in the position to study the bulk properties of UCDs with respect to the environment they are living in. In particular, by comparing the properties of UCDs to those of other stellar systems in galaxy clusters, like globular clusters (GCs) and dwarf ellipticals, we can learn more about their origin. The general finding is that the specific frequency of UCDs is closely related to the specific frequency of GCs, i.e. galaxy cluster with a very rich central globular cluster system also possess a large number of UCDs. Despite this close relation between both types of stellar systems, the kinematics of UCDs within some galaxy clusters seems to differ from that of GCs. Also the spatial distribution of UCDs is intermediate between those of GCs and dwarf ellipticals. This all points to UCDs being a heterogenous class of objects. For example, in the colour-magnitude diagram, blue/metal-poor UCDs coincide with the sequence of nuclear star clusters, whereas red/metal-rich UCDs reach to higher masses and might have formed alongside the metal-rich GC population, which is a prominent feature of central giant ellipticals in galaxy clusters.

ABSTRACT

Henk Hoekstra
Leiden Observatory (NL)

Dark halo properties of massive galaxies from weak lensing

Weak gravitational lensing provides a unique tool to study the properties of dark matter halos around galaxies, albeit only for ensembles. Thanks to the advent of wide-field imagers the precision of the measurements has improved dramatically and is expected to continue to improve. In this talk I will review the technique of weak lensing, present some recent results and what we can expect in coming years from projects such as KiDS and Euclid.

ABSTRACT

Arna Karick
Liverpool John Moores University (UK)

The HST/ACS Coma Cluster Treasury Survey: An Isophotal and Structural Parameter analysis of galaxies in heart of Coma

The HST/ACS Coma Cluster Treasury Survey aims to address many outstanding issues concerning galaxy formation and provides a fundamental low-redshift reference and comparison for cluster studies at high redshift. I will present a detailed analysis of the morphology, isophotal parameters and surface brightness profiles of ~200 Coma cluster galaxies. Our sample of cluster members is based on the results of our MMT/Hectospec and Keck/LRIS spectroscopic surveys. The analysis is based on our I- (F814W) and g- (F475W) band ACS images of the cluster core. I will also present the broad scientific results of our published Structural Parameter Catalogue of single Sersic fits, highlighting the benefits and limitations of the analysis, and comparing the results to similar studies of Virgo and Fornax.

ABSTRACT

Yutaka Komiyama
National Astronomical Observatory of Japan

Subaru Halpha Survey for the Coma Cluster: Survey Highlights and Halpha Luminosity Function

We have carried out a wide and deep Halpha imaging survey for the Coma cluster using Subaru Prime Focus Camera, Suprime-Cam, with a dedicated narrow-band filter, NB671. The survey covers ~0.75 deg^2 area down to the limiting magnitude of 26 ABmag in NB671, which is an order of magnitude deeper than the existing surveys. We discovered significant number of extended emission line regions which are just in the gas stripping process. We also derived the Halpha luminosity function to discuss the star formation activity of the less luminous galaxies in the local and dense environment. The luminosity function shows a rise at the faint end, suggesting that the significant fraction of star foriming activity is maintained by these galaxies, which is consistent manner with the down-sizing evolution. We discuss the impact of the star formation activity of such less luminous galaxies on the local universe.

ABSTRACT

John Kormendy
University of Texas at Austin, Dept. of Astronomy (US)

Dwarf and giant galaxies : the big picture

Abstract missing.

ABSTRACT

Davor Krajnovic
ESO-Garching

Kinematic properties of early-type galaxies across environments

Observations with integral-field spectrographs facilitate detailed analysis of kinematic properties of central regions of nearby galaxies. This information can be used to determine their internal structure, angular momentum content and dynamical state. We present kinematic results of the volume-limited Atlas3D survey which targeted 260 nearby early-type galaxies, confirming the pivotal role of the environment on the kinematics. We show the evidence that the majority of early-type galaxies are axisymmetric systems with high angular momentum content, kinematically similar to spirals, while only a small fraction of objects, found predominately in the most dense environments, are triaxial and can be considered true ellipticals. We illustrate the importance of the kinematic classification of early-type galaxies with respect to the morphology-density relation which holds for nearly four orders of magnitude in surface density, and discuss its consequence on galaxy formation and evolution models.

ABSTRACT

Jessica Krick
California Institute of Technology, Pasadena (US)

Spitzer IRAC Low Surface Brightness Observations of the Virgo Cluster

We present 3.6 and 4.5 μm Spitzer IRAC imaging over 0.77 square degrees at the Virgo cluster core for the purpose of understanding the formation mechanisms of the low surface brightness intracluster light features. Instrumental and astrophysical backgrounds that are hundreds of times higher than the signal were carefully characterized and removed. We examine both intracluster light plumes as well as the outer halo of the giant elliptical M87. For two intracluster light plumes, we use optical colors to constrain their ages to be greater than 3 & 5 Gyr, respectively. Upper limits on the IRAC fluxes constrain the upper limits to the masses, and optical detections constrain the lower limits to the masses. In this first measurement of mass of intracluster light plumes we find masses in the range of 5.5×10^{8} -4.5×10^{9} and 2.1×10^{8} -1.5×10^{9} $M\odot$ for the two plumes for which we have coverage. Given their expected short lifetimes, and a constant production rate for these types of streams, integrated over Virgo's lifetime, they can account for the total ICL content of the cluster implying that we do not need to invoke ICL formation mechanisms other than gravitational mechanisms leading to bright plumes. We also examined the outer halo of the giant elliptical M87. The color profile from the inner to outer halo of M87 (160 Kpc) is consistent with either a flat or optically blue gradient, where a blue gradient could be due to younger or lower metallicity stars at larger radii. The similarity of the age predicted by both the infrared and optical colors (> few Gyr) indicates that the optical measurements are not strongly affected by dust extinction.

ABSTRACT

Stefan Lieder
Univ. Heidelberg (DE) / ESO-Chile

New dwarf spheroidals and the luminosity function in the Virgo cluster core

We investigate deep wide field CFHT imaging data of the Virgo cluster core region, revealing 65 yet uncatalogued galaxies which are very likely cluster members. Those galaxies reach M_V=-9 mag. The analysis of the CMR clearly shows a change in slope from dEs to dSphs, implying a different evolution of both types of galaxies. Furthermore, the scatter of the color agnitude relation in the dSph regime does not increase significantly, indicating a short formation time period for that type of galaxies, which results in similar stellar populations. The scaling relations of the dEs are apparently continued by the dSphs, which could imply that they share the same origin. The faint-end slope of the luminosity function is alpha=-1.35, which means a clear lack of dwarf galaxies as compared to theoretical models. Since we observe the dense core region of the cluster, strong tidal interactions might be one reason for the lack of dwarfs.

ABSTRACT

Joe Liske
ESO-Garching

Prospects of studying resolved stellar populations with the E-ELT

A key science goal of the E-ELT is to unravel the formation histories of elliptical galaxies by studying their resolved stellar populations. In this talk I will discuss the prospects for obtaining accurate colour-magnitude diagrams of the dense central regions of ellitpical galaxies out to the distance of the Virgo cluster using the E-ELT.

ABSTRACT

Thorsten Lisker
Astronomisches Rechen-Institut - ZAH, Heidelberg (DE)

The dwarf galaxy content of present-day clusters: semi-analytic models vs reality

The Millennium-II simulation allows semi-analytic models (SAMs) to probe the regime of dwarf galaxies, whose evolution is still not well understood theoretically. We compare the properties and distribution of cluster dwarf galaxies in the Guo et al. (2011) SAM to the nearby clusters Virgo, Fornax, Coma and Perseus. Apart from the systematically higher dwarf-to-giant ratio in the SAM, the dwarf population of the SAM clusters is very similar to the dwarfs in Coma and Perseus, in terms of galaxy colour and distribution. However, there seems to be no Virgo cluster equivalent in the SAM: the Virgo dwarfs are bluer in colour and less dynamically relaxed. This is important, since Virgo is the nearest and most extensively studied cluster, serving as a local universe benchmark. When focusing on the diversity of dwarf galaxy subpopulations, we find that the huge number of elliptical dwarf galaxies in the real universe does not have a counterpart in the SAM clusters, where passive disk-dominated dwarfs are abundant. We interpret this by environmental effects not included in the model, which could transform galaxies morphologically.

ABSTRACT

Lauren MacArthur
NRC - Herzberg Institute of Astrophysics (CA)

Uncovering the Dwarf Galaxy Population in Virgo with the NGVS

The Next Generation Virgo Cluster Survey (NGVS) is a large program using CFHT/MegaCam to image the entire Virgo cluster out to its virial radius from u* to z'-band at depths reaching g'_AB~29 mag/arcsec^2 and at sub-arcsecond resolution. Such a data set provides the ideal hunting ground for a large and complete census of the faint galaxy population, hitherto unexplored beyond the local group. Having a large, multi-wavelength, sample of dwarf galaxies in a given environment, i.e. a massive cluster, will not only probe the evolutionary history of galaxies residing in such an environment, but will also constrain the elusive faint end of the luminosity function, a fundamental constraint for structure formation models. I will discuss techniques we have developed for the automatic detection, measurement of structural parameters, and cluster membership probability assignment for Virgo dwarfs in the NGVS footprint down to absolute magnitudes fainter than g'_AB~-8 mag and effective surface brightnesses of g'_AB~28 mag/arcsec^2.

ABSTRACT

Lucio Mayer
University of Zurich, Inst. for Theoretical Physics (CH)

Galaxy transformation in clusters I: the origin of dwarfs and UCDs

I will review the various processes that drive the morphological transformation of low mass galaxies in clusters and groups. I will discuss both detailed models of tidal and hydrodynamical interactions as well as cosmological simulations. Tidal stirring by the primary potential and harassment turn low mass disk galaxies into dwarf spheroidals and dwarf lenticulars, while gas mass loss occurs primarily via ram pressure stripping. UCDs could be the surviving cores of low mass galaxies that were heavily stripped, either starting from progenitors with very high surface brightness or owing to strong gas dissipation that increased the central density of the core during the tidal interaction. While modeling these processes in detail for a representative population of galaxies in clusters formed within a cosmological simulation is still ahead of us, I will show how this has been achieved at the galaxy group scale of $\sim 10^{13}$ M$\odot$. The latter simulations confirm the important role of these environmental mechanisms in driving galaxy transformation

ABSTRACT

Richard McDermid
Gemini Observatory, Hilo (US)

Stellar Populations and Star-Formation Histories of Early-Type Galaxies Inside and Outside of Virgo

We present new results on the stellar populations of a complete sample of nearby early-type galaxies (ETGs) observed as part of the Atlas3D Survey. The K-band selected sample comprises 260 galaxies, including all 60 Virgo ETGs brighter than M_K=-21.5. The centre of the Virgo cluster is two orders of magnitude denser than the least dense environments we probe, allowing a large range of environments to be explored. We extract very high-quality aperture measurements of mean stellar age, metallicity, and abundance ratios from our integral-field spectroscopy, allowing consistent treatment of aperture effects. Thanks to our detailed stellar kinematics, we also control tightly for dependences on galaxy mass. We find significant differences between Virgo and non-Virgo galaxies, showing that environment plays an important role in the star-formation history of ETGs in addition to galaxy mass. We preview empirical star formation histories from fitting our spectra, finding that the differences in mean properties can be traced to subtle differences in the star formation histories of Virgo and non-Virgo galaxies. We compare our findings to recent high-resolution cosmological simulations, and while the general agreement is encouraging, we highlight a number of unknowns that remain, which will be key to explore with future observations and simulations.

ABSTRACT

Simona Mei
Observatoire de Paris-Meudon (FR)

The 3D shape, dynamical state, and mergers of nearby clusters

Abstract missing.

ABSTRACT

Jorge Melnick
ESO-Garching

The Diffuse Intracluster Medium at intermediate redshifts

A substantial fraction of the stellar mass in groups and clusters of galaxies appears to reside in a diffuse intergalactic component, generally known as the ICL (diffuse Intra-Cluster Light). An important number of observations reveal that the ICL emits between 10% and 40% of the total visible light of clusters, and that this fraction seems to depend on cluster richness. Numerical simulations indicate several different possible origins for the ICL: the merging histories of the clusters themselves; tidal interactions at the cluster centers; ram-pressure stripping of interstellar material and subsequent in-situ intergalactic star formation, etc. The relative importance of these mechanisms is still the subject of intense research and debate, for which observational support is relatively weak as multi-color photometry, let aside spectroscopy, of the faint diffuse component poses formidable observational challenges.

In the course of an investigation of the properties of an X-ray cluster at z=0.3, we were able to devote almost 60 hours of VLT time with FORS2 to obtain spectra of the diffuse components. These data allowed us to show that the (blueing) ICL light has spectral properties similar to those of the low-luminosity galaxies in cluster, which typically have post-starburst spectra. We also found indications that the velocity dispersion of the ICL is marginally larger than that of the BCG halos, and comparable to that of the cluster as a whole, as expected. At the conference we will present the results of population synthesis models on the stacked FORS2 spectra of the ICL and the BCG haloes, from which we will determine ages and metallicities thus allowing us to constrain the nature and origin of the ICL at this relatively early epoch.

ABSTRACT

J. Christopher Mihos
Case Western Reserve University, Cleveland OH (US)

Mergers in substructures

Abstract missing.

ABSTRACT

Thorsten Naab
MPI für Astrophysik, Garching (DE)

Merger processes: when, what kind, and how frequent, and the impact on the rotation properties of the merger remnants

We present a sample of high-resolution cosmological zoom simulations of massive galaxies. For the assumed modeling the galaxies form during an early dissipative phase ($z > 2$) followed by a growth phase dominated by merging of stellar systems. Based on recent high and low redshift observations of photometric and kinematic properties of massive galaxies we argue that the assembly of these galaxies is dominated by mergers with moderate mass-ratios of 5:1 to 10:1, usually termed 'minor mergers'. The predicted cosmological evolution of sizes and kinematical properties in this scenario meets the observational constraints.

ABSTRACT

Eric Peng
Beijing University, Astronomy Department

A Panoramic View of Globular Cluster Systems in the Virgo, Fornax and Coma Clusters

Studies of nearby galaxy clusters have greatly advanced our understanding of globular cluster systems. Recent wide field surveys, such as the Next Generation Virgo Cluster Survey (NGVS), are now giving us a more complete picture of globular clusters both inside and outside galaxies. I will review recent results from HST surveys of the Virgo, Fornax, and Coma clusters, and will discuss new results both from imaging and our campaign of spectroscopic followup.

ABSTRACT

Thomas H. Puzia
Univ. Catolica Chile

Fornax - Imaging

Abstract missing.

ABSTRACT

Somak Raychaudhury
Univ. of Birmingham, Astrophysics & Space Research (UK)

Galaxy evolution: transformation in the suburbs of clusters

Giant galaxies in the cores of clusters generally have very little ongoing star formation, while dwarf galaxies in the field are almost invariably forming stars. Clearly, the large-scale environment has a profound effect on galaxy evolution. There have been several recent sightings of galaxies with unusually high star formation on the outskirts of clusters. This talk will summarize observational evidence of how the star formation properties of galaxies change as they fall into clusters along supercluster filaments, and the insight this gives into the physical processes that are involved. In particular, we will look at the transformation of galaxies in the Coma Supercluster, and on the cluster outskirts in the core of the Shapley Supercluster.

ABSTRACT

Craig Rudick
ETH Zürich, Institut für Astronomie (CH)

Intracluster Light in the Virgo Cluster

We have performed a deep optical photometric survey of the Virgo cluster, down to surface brightnesses of ~29 mag/sq. arcsec in the V and B bands, in order to discover and study the diffuse stellar luminosity, referred to as intracluser light or ICL, in this cluster. We find that the cluster core is permeated by tidal tails, streams, and plumes which are the direct product of dynamical interactions between the cluster galaxies. In particular, the cluster's central galaxy, M87, appears to be actively building its extended stellar envelope through the stripping of smaller cluster galaxies. Additionally, the tidal debris found in different environments within the cluster show distinct features, related to their varying dynamical histories. In order to better understand the formation of these ICL features, we use a suite of N-body simulations to constrain the dynamical processes which give rise to the ICL. While much of the ICL is initially generated in dynamically cold streams and plumes, these discrete structures are quickly destroyed by tidal fields within the cluster, giving rise to a more exteneded diffuse stellar envelope.

ABSTRACT

Russell Smith
Durham University, Physics (UK)

The Coma 3-degree Survey: stripping and quenching of infalling dwarfs

I will present results from multi-wavelength observing campaigns associated with the HST/ACS Treasury Survey of Coma but covering a much wider angular scale. I will focus on the evidence for **ongoing** gaseous stripping of infalling dwarf galaxies, from UV and Halpha observations, and the imprint of **recent** environment-driven quenching, as revealed by spectroscopic signatures of young stellar populations. I will combine these observations to present a comprehensive picture of the late-epoch build-up of the faint end of the Red Sequence.

ABSTRACT

Daniel Thomas
University of Portsmouth, Institute of Cosmology and Gravitation (UK)

Integrated spectra of bright galaxies: successes and problems

Integrated spectra of galaxies carry a wealth of information about gas and stellar population properties. Emission lines are used to derive gas kinematics, star formation activity and black hole accretion. The absorption line and stellar continuum component of the spectrum discloses stellar population properties that act as fossil record and can be used to derive ages, formation epochs, star formation histories, and element abundances. I will review recent developments in the field for the nearby population and will discuss future prospects in addressing redshift evolution and environmental dependence with new spectroscopic galaxy surveys such as SDSS-III/BOSS and GAMA.

ABSTRACT

Elisa Toloba
Universidad Complutense de Madrid (ES)

The kinematic properties of dwarf early-type galaxies

With a sample of 21 dwarf early-type galaxies mainly located in the Virgo cluster, we have conducted a systematic analysis to understand the origin of these dominant population in clusters. The results of this analysis show that there are dEs that are rotationally supported and pressure supported. We have found that the rotationally supported dEs show disky underlying structures, are mostly located in the outer parts of the Virgo cluster or in the field, and are younger, on average, than pressure supported dEs that do not show any underlying structure and are located in the center of the cluster. This joint to the fact that the shape of the rotation curves of the rotationally supported dEs are similar to those late-type galaxies of the same luminosity and they also follow the Tully-Fisher relation has led us to interpret these results as dEs being transformed late-type galaxies. From the analysis of the scaling relations of this sample of galaxies we have also found that their location in these diagrams is linked to their kinematic behaviour, which also agrees with this transformation scenario. The mechanisms that could lead to this transformation are ram-pressure stripping alone for those in the outskirts of the cluster and/or harassment for those in the center.

ABSTRACT

Stephanie Tonnesen
Princeton University, Astrophysics (US)

The Impact of Ram Pressure Stripping on Star Formation Inside and Outside of Galaxies

We have performed a set of high-resolution adaptive mesh refinement simulations of a galaxy undergoing ram pressure stripping in which we include star formation to determine whether and where ram pressure stripping induces and/or quenches star formation in an infalling galaxy. We have also considered whether the amount of star formation in the stripped tail of gas can be a substantial component of the intracluster light in a cluster.

ABSTRACT

Ignacio Trujillo
IAC - Instituto de Astrofisica de Canarias (ES)

How have the massive galaxies evolved over cosmic time

In the last five years there has been cumulative evidence showing that massive galaxies have dramatically change their structural properties, growing a substantial factor, since z~3. This result has remained very controversial as it seems at odd with our previous knowledge based on the detailed analysis of the stellar populations of nearby massive spheroids which shows that their stars were form very early on and over a short time interval. In this talk, I will summarize what we have learned since the discovery of these high-z massive compact objects, the mechanisms proposed to explain their origin and size increase and the pending questions still to solve.

ABSTRACT

Remco van den Bosch
MPI für Astronomie, Heidelberg (DE)

A Survey of Nearby Massive Galaxies

Massive galaxies represent the extreme of galaxy formation and contain the most massive black holes. Only six black holes bigger than a billion solar masses have been directly detected so far. Direct black hole mass measurements of massive galaxies are rare because there are very few galaxies close enough that their nucleus can be resolved (with AO or HST). We have undertaken a spectroscopic survey of 300+ galaxies with the Hobby-Eberely Telescope, VLT/VIMOS and Magellan to find the massive galaxies that are nearby enough so that their black hole mass could be measured. The survey consists of nearly all massive galaxies within 130 Megaparsec. Most of the galaxies are in the nearby clusters like Coma, Centaurus, Hydra, Perseus, etc. The obtained stellar kinematics, gaseous emission lines and stellar population information provides the ideal basis for studying the population of massive galaxies in nearby clusters. For example, in one nearby cluster we found several huge dispersion galaxies, which are extremely compact and without a bulge. These galaxies are unusual in the present-day universe, but they are, interestingly enough, quantitatively similar to the typical red, massive galaxy at much earlier times (z – 2).

ABSTRACT

Jacqueline van Gorkom
Columbia University, Astronomy, New York (US)

Gas morphology and ram pressure stripping in nearby clusters

Virgo, as the nearest cluster, has been the subject of several HI imaging surveys. I will present and discuss the results of the most recent of these surveys, the VIVA survey, VLA imaging of Virgo spirals in Atomic gas. These data, combined with detailed optical spectroscopy and simulations provide constraints on the environmental impact on selected galaxies. I will briefly compare these with results on other nearby clusters and discuss the implications for the global properties of these galaxies.

ABSTRACT

Simon White
MPI für Astrophysik, Garching (DE)

What were the local clusters like at high z?

Abstract missing.

ABSTRACT

Joo Heon Yoon
Columbia University, Astronomy, New York (US)

Gas Flow in the Virgo Cluster

Galaxy clusters are thought to be fed by filaments of gas and galaxies. We also predict that gas interacts with the existing intracluster medium, which may seed the presence of warm clouds in the cluster. In order to probe gas flow in a galaxy cluster, we perform UV spectrograph observations with COS onboard HST to trace warm gas with Lya absorption lines in the Virgo cluster. As a result, we find 25 Lya absorbers. Deep observations of HI emission lines with EVLA are also performed, in order to find extended HI disks. We then combine the COS data with the detailed kinematic and spatial information on galaxies available from the EVLA observations, together with recent HI survey data. We find possible filamentary structures around the Virgo cluster, revealed by coherent structure of galaxies and HI survey. We exmine Lya absorbers and HI-rich galaxies in theses regions and investigate gas flow along a filament.