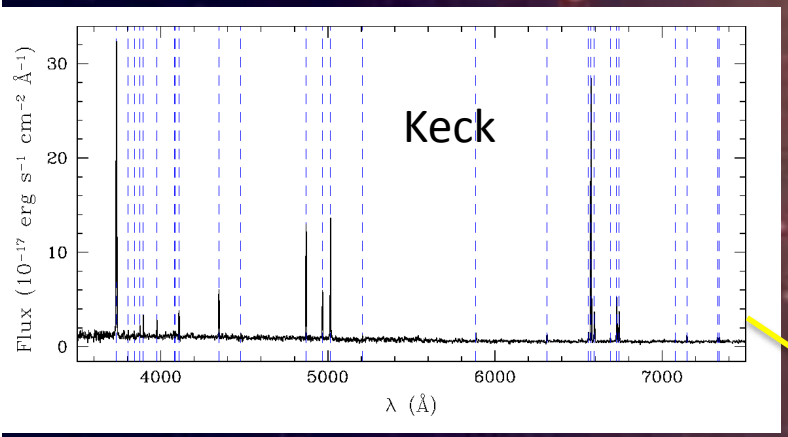
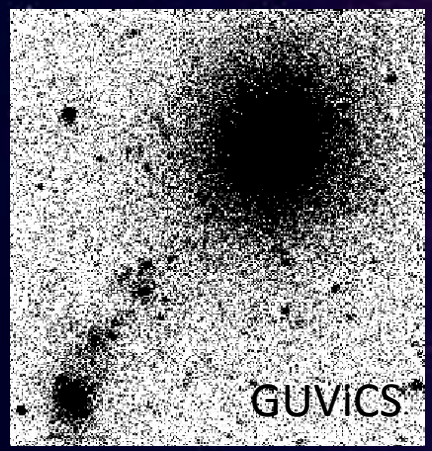
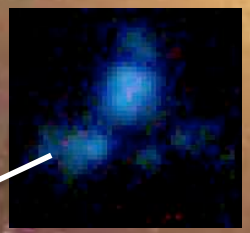
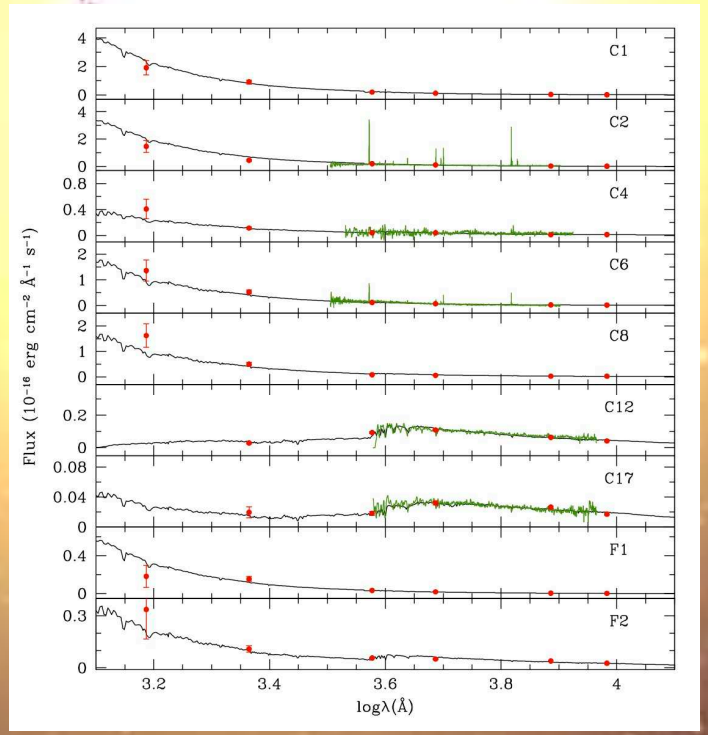
The age of star-forming regions stripped from VCC1249 by VCC1226 (M49)



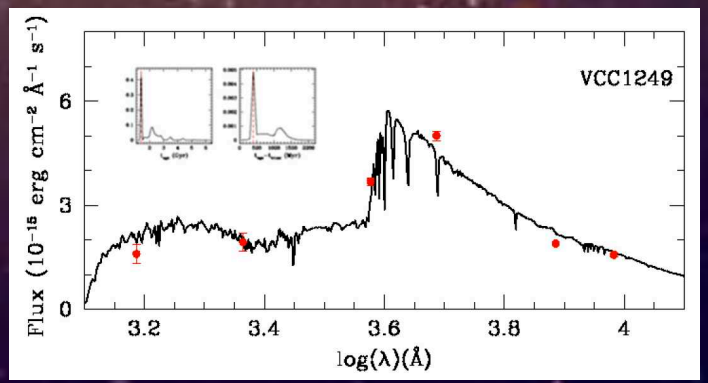






Regions: <Age>≈30 Myr

VCC1249: t_{trunc}≈400 Myr ago

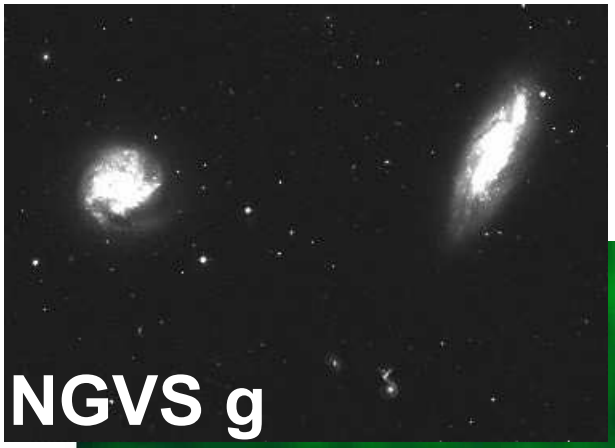


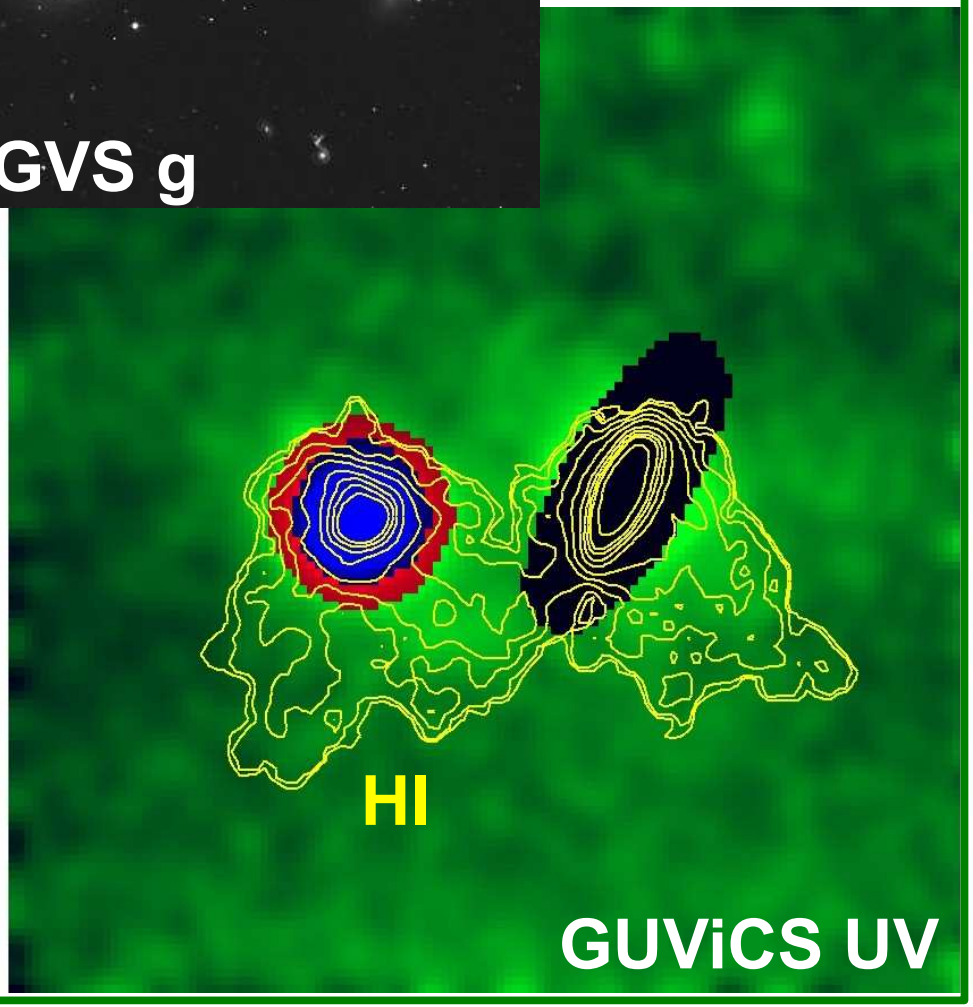
F. Arrigoni Battaia

Deep UV and optical imaging of Virgo galaxies with HI tails

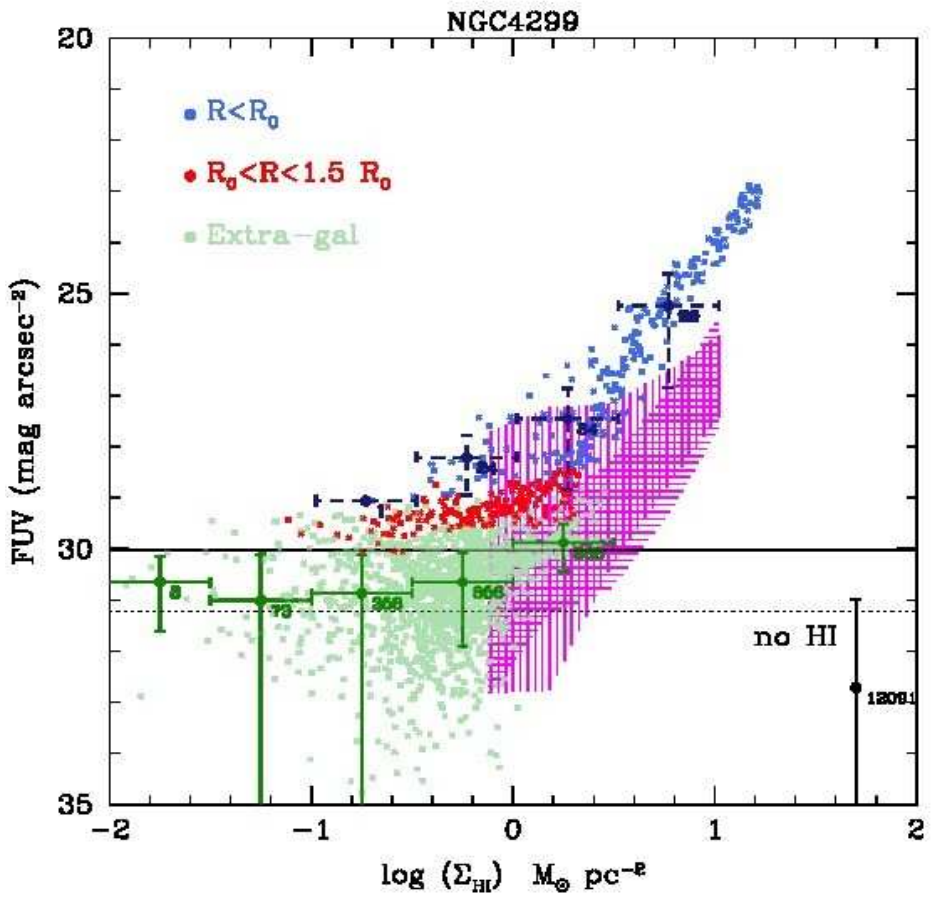
S. Boissier,
A. Boselli, & GUViCS team

Exemple on this slide : NGC4299





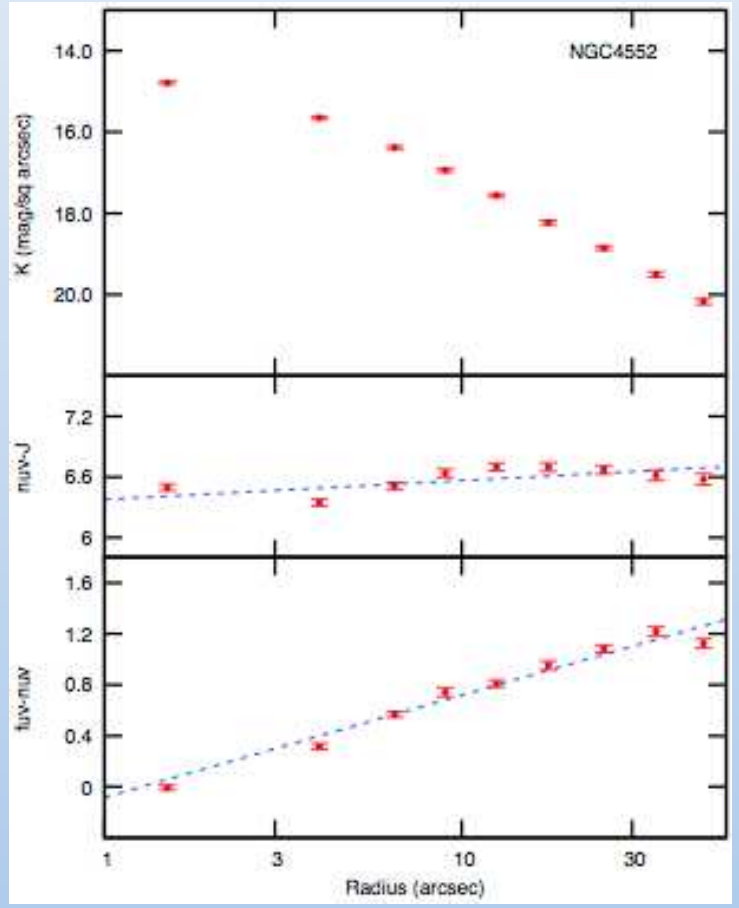
Star Formation Law @ pixel scale



LOW efficiency in external tails (if any star formation)

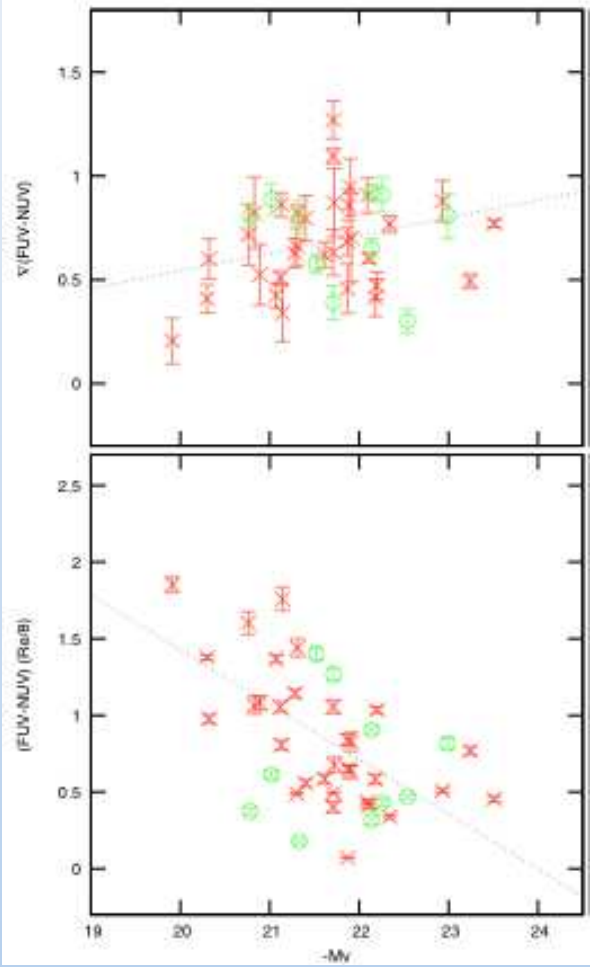
Spatial distribution and origin of the FUV excess

David Carter, Sally Pass, Joseph Kennedy, Arna M. Karick & Russell J. Smith

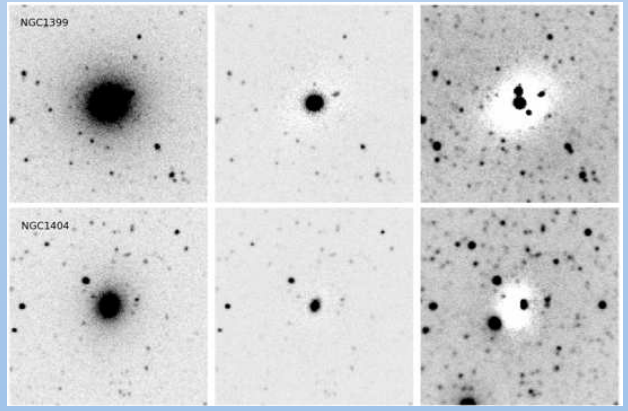


Colour gradients in bright early type galaxies show strong positive gradient in (FUV-NUV)

Brighter, and higher velocity dispersion galaxies have bluer (FUV-NUV) colours and stronger gradients



Galfit residual maps show strong concentration of FUV excess in the cores



We suggest that helium abundance differences and gradients drive the (FUV-NUV) colours and gradients

Disentangling environmental processes in galaxy clusters

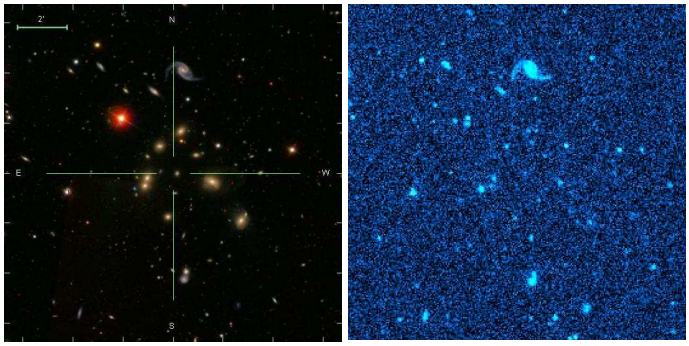
ABSTRACT. We have built a **sample of 16 galaxy clusters** containing galaxies as faint as **M_B∼-18** observed by the Sloan Main Galaxy Sample. The galaxy sample (**>5000 galaxies**) on these clusters is observed up to a **radius of 7 Mpc** from the cluster centre by the main galaxy surveys from **UV to FIR (GALEX, SDSS, 2MASS & IRAS)**. We study the trend of **NUV-r distributions** of **star-forming (SF) galaxies** from the **virial regions** up to the cluster **infall regions** and the **field** in **three luminosity bins**. Using this approach, we propose which **environmental processes** are affecting the galaxies **as a function of** their **luminosity**.

HERNÁNDEZ, J. D.; IGLESIAS-PÁRAMO J. & VÍLCHEZ J. M. / IAA-CSIC

THE SAMPLE.

The cluster sample is composed by 16 galaxy clusters in the Local Universe 0.02<z<0.05 which ranges from less than 200 kms^{-1} to around 800 kms^{-1} in velocity dispersion.

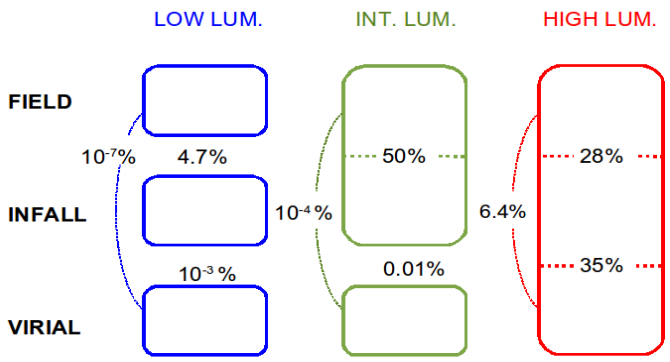
In this contribution, we have made use of this sample of galaxy clusters in order to disentangle the role played by the different environmental mechanisms on star-forming galaxies.



SDSS & GALEX images of central region of ABELL 1213, one of clusters in the sample.

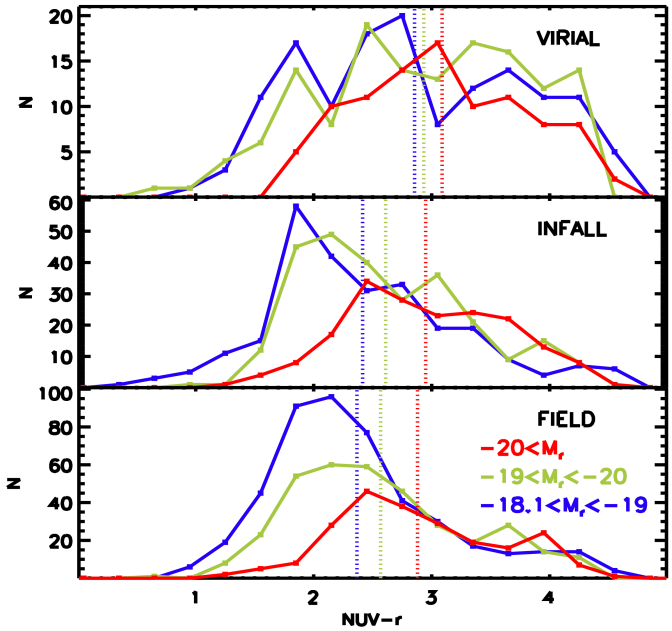
STATISTICAL ANALYSIS.

Analysis of similarity of NUV-r distributions within each luminosity bin along spatial regions. Percentage figures show the Kolmogorov-Smirnov probabilities of two populations coming from the same parent distribution. Joint blocks represent populations with a high similarity on their NUV-r distributions.



RESULTS.

NUV-r distributions of SF galaxies in bins of luminosity (codified by colors) in the spatial regions of clusters (each pannel correspond to each one) discriminated using the scheme proposed by Rines et al. (2001). Vertical lines are fixed to the average of NUV-r distributions.



CONCLUSIONS.

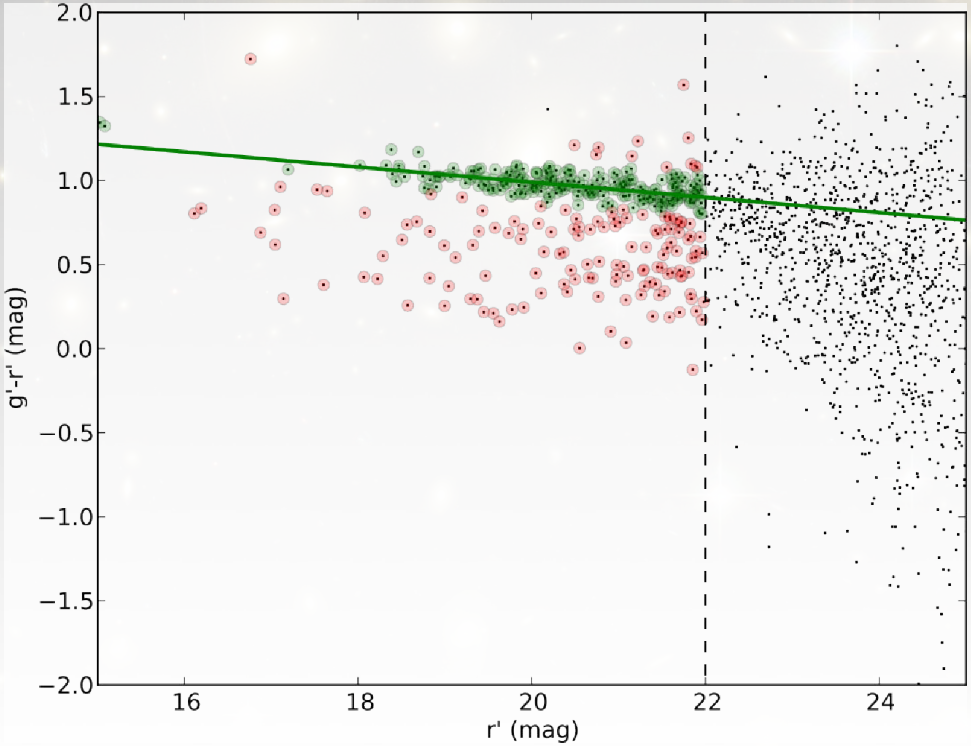
- Any environmental mechanism that affect Mr<-20 SF galaxies, it should work at a small time-scale $\tau \leq 10^8$ yr, e.g. gas stripping.
- -20>Mr>-19 SF galaxies seem to be affected by a long time-scale $\tau \geq 10^8$ yr mechanism and it seems to operate only in virial region. Starvation via tidal interaction with dark matter halo is a candidate.
- -19>Mr>-18 SF galaxies, which show a clear difference in their NUV-r distribution regarding field galaxies even in the infall region, point to be affected by "galaxy harassment" or starvation via phase interaction with the ICM.

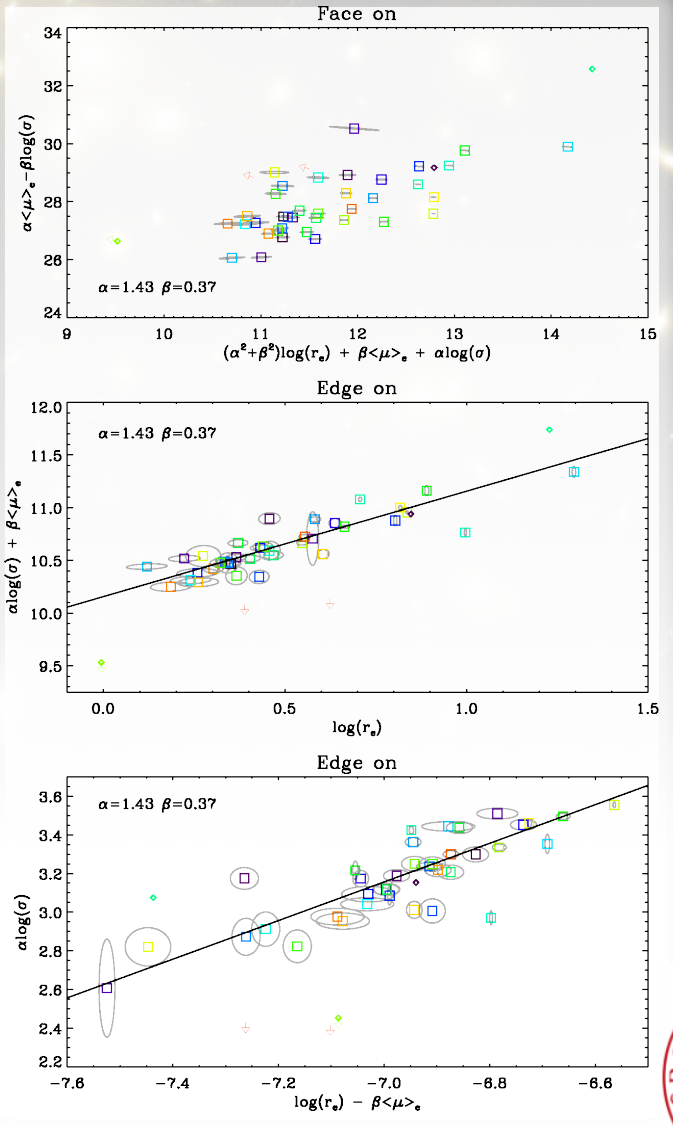
These results are included in a more extended paper submitted to ApJ.

Scaling Relations in Abell 1689

Ryan Houghton[1]

Elena Dalla Bontà[2], Richard Masters[1], Francesco D'Eugenio[1], Roger Davies[1]





- Massive Cluster at z=0.184
- Colour Magnitude Diagram and scatter analysis compared to Coma
- FP and offset analysis compared to Coma

Sample of 49 BCGs with spatially resolved spectroscopy

→ connections between the kinematical, dynamical and stellar population properties

Previously: Spatially resolved kinematics; Central stellar populations; UV-upturn in BCGs (Loubser et al. 2008; 2009; 2011)

Here: we fit Mg_2 absorption index gradients for 21 BCGs with high S/N spatially resolved spectra (arXiv:1104.2376v1)

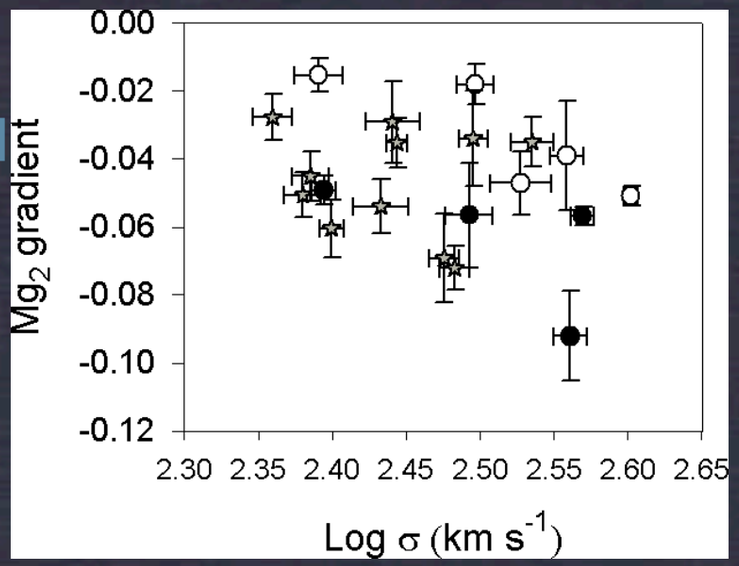
We find:

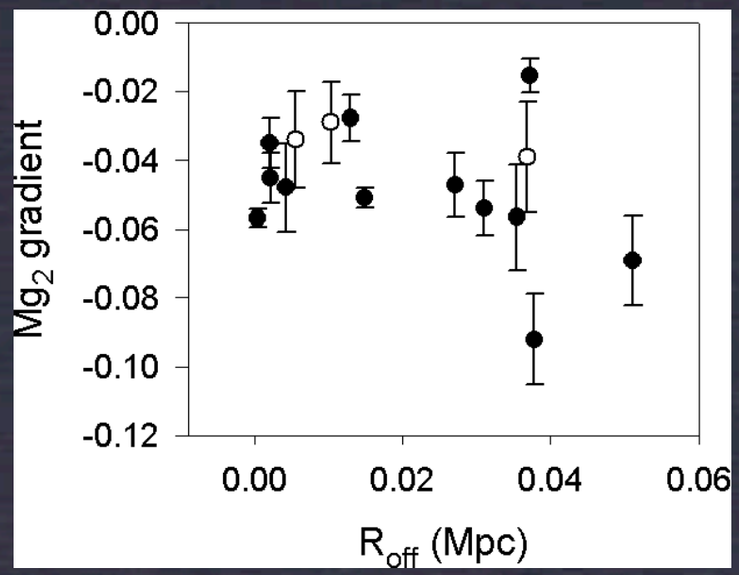
❖ a weak correlation between Mg_2 gradients and central velocity dispersion with gradients becoming steeper with increasing mass

❖ an equivalent correlation for normal ellipticals in the same mass is not seen - suggesting influence by cluster potential well

❖ reinforced by existence of correlation between Mg_2 gradients and the BCG distance to the X-ray peak luminosity of the cluster.

Next: SSP models and more influence from the cluster environment?





Mg_2 GRADIENTS IN BRIGHTEST CLUSTER GALAXIES (BCGs)

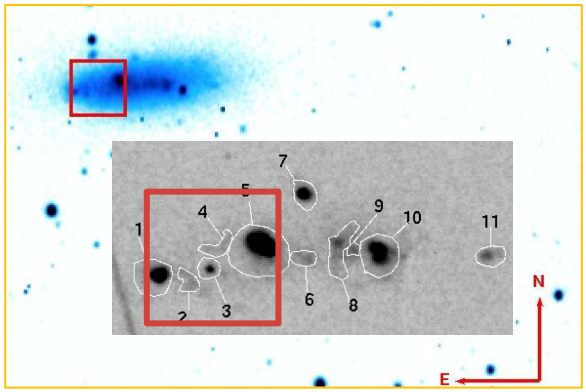
ILANI LOUBSER (NWU, SOUTH AFRICA) & PATRICIA SANCHEZ-BLAZQUEZ (MADRID)

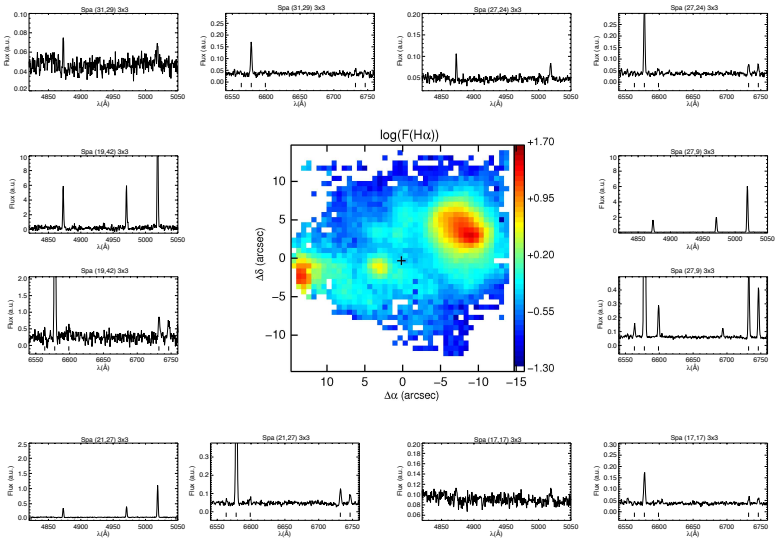
NORTH-WEST UNIVERSITY
YUNIBESITI YA BOKONE-BOPHIRIMA
NOORDWES-UNIVERSITEIT

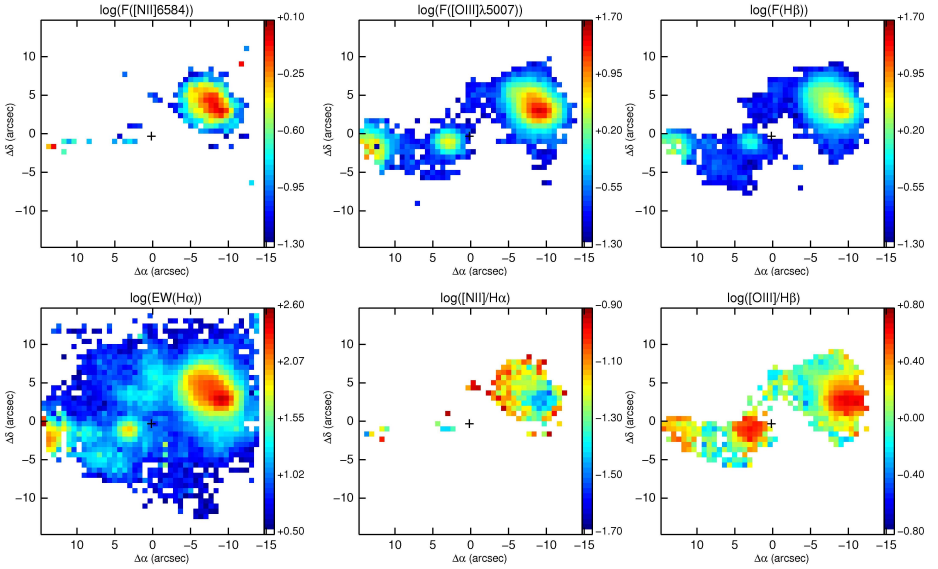
The interplay of gas and stars in nearby groups: the showcase example of ESO 347-G017

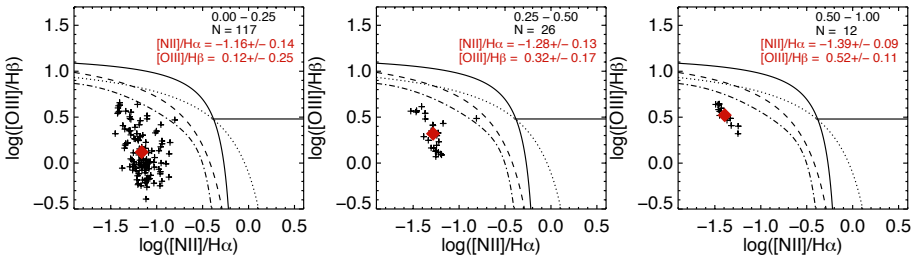
A. Monreal-Ibero[(1)], J. Iglesias[(1)], J. M. Vílchez[(1)], Y. Tsamis[(2)], E. Pérez-Montero[(1)], M. Relaño[(3)], J. Walsh[(2)]

[(1)]IAA-CSIC, [(2)]ESO, [(3)]UGR



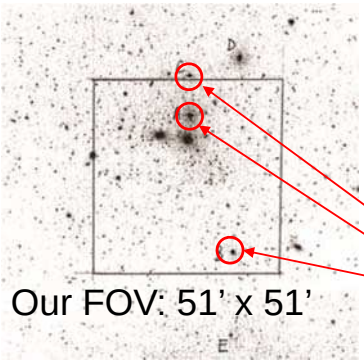






Observation of Diffuse Intracluster Light in the Coma Cluster

Sadanori Okamura, Kimihiko Nakajima, Kazuhiro Shimasaku, Takao Soyano,
Yuki Sarugaku, Yoshikazu Nakada (The Univ. of Tokyo),
Nobunari Itoh (Mie Univ.), and Shingo Nishiura (Tokyo Gakugei Univ.)



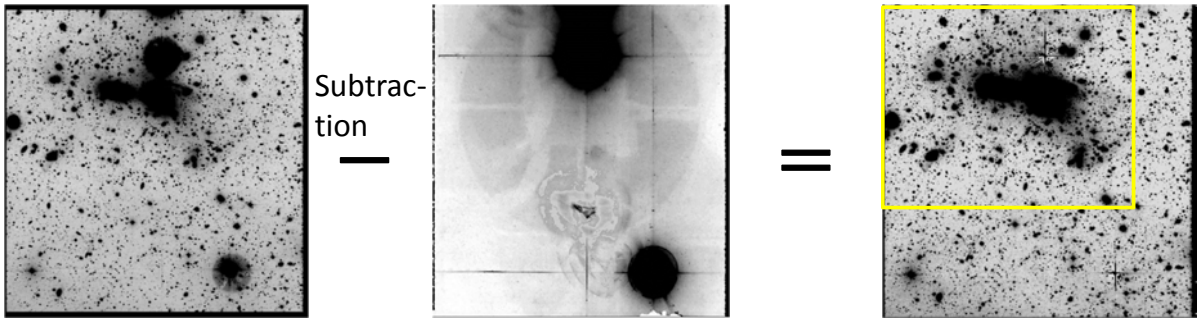
R-band: 11 hours
V-band: 11 hours

careful removal of bright star ghosts

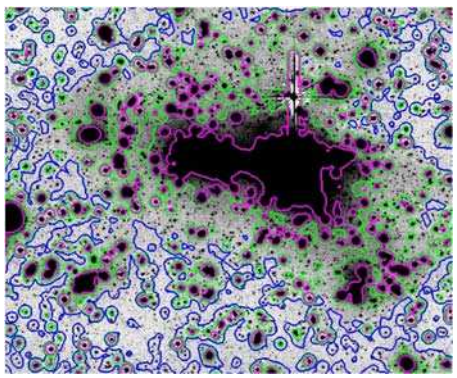
Kiso 105-cm Schmidt

2K-CCD Camera

V: added (11 hours) — Subtrac-tion — V: ghost image = V: final (ghost-sub)

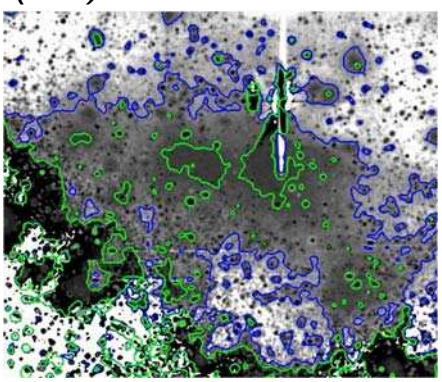


ICL distribution in the V band



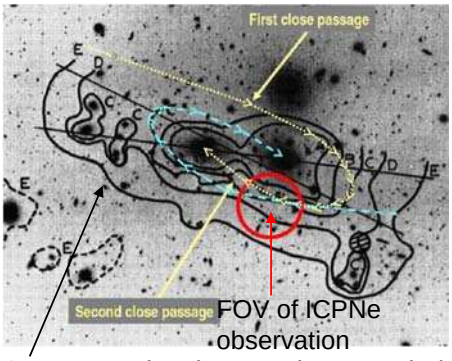
magenta:25.0, green:26.0, blue:27.5 mag/arcsec2

(V-R) color distribution



Blue (V-R)=0.25, Green (V-R)=0.35 mag

Orbits of the two cD's estimated from ICPNe kinematics (Gerhard et al. 2007)



ICL contours by Thuan and Kormendy (1977)

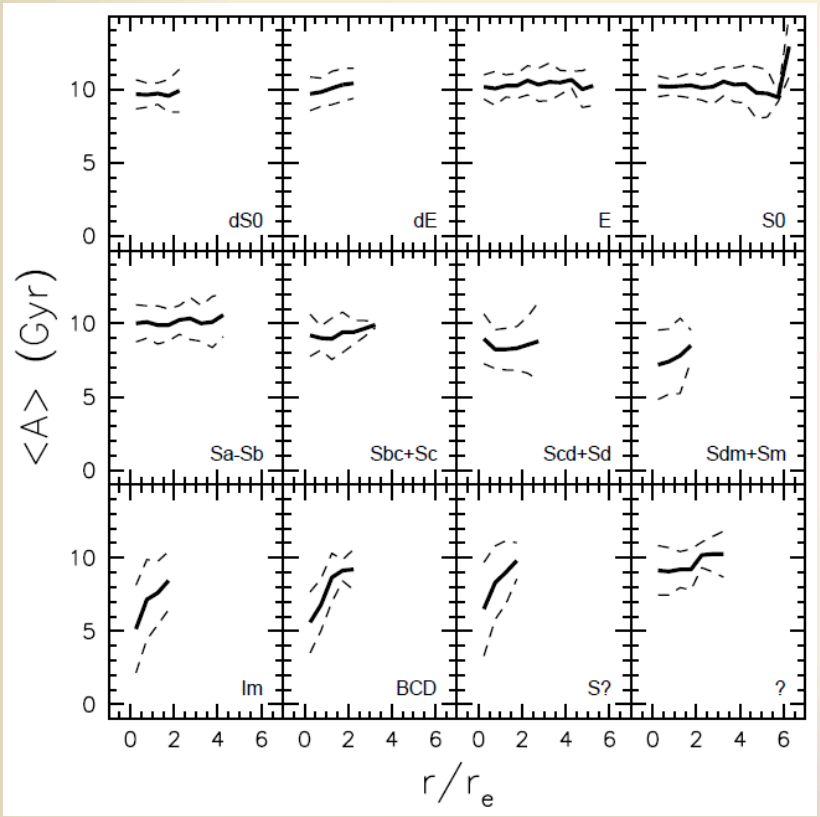
Summary

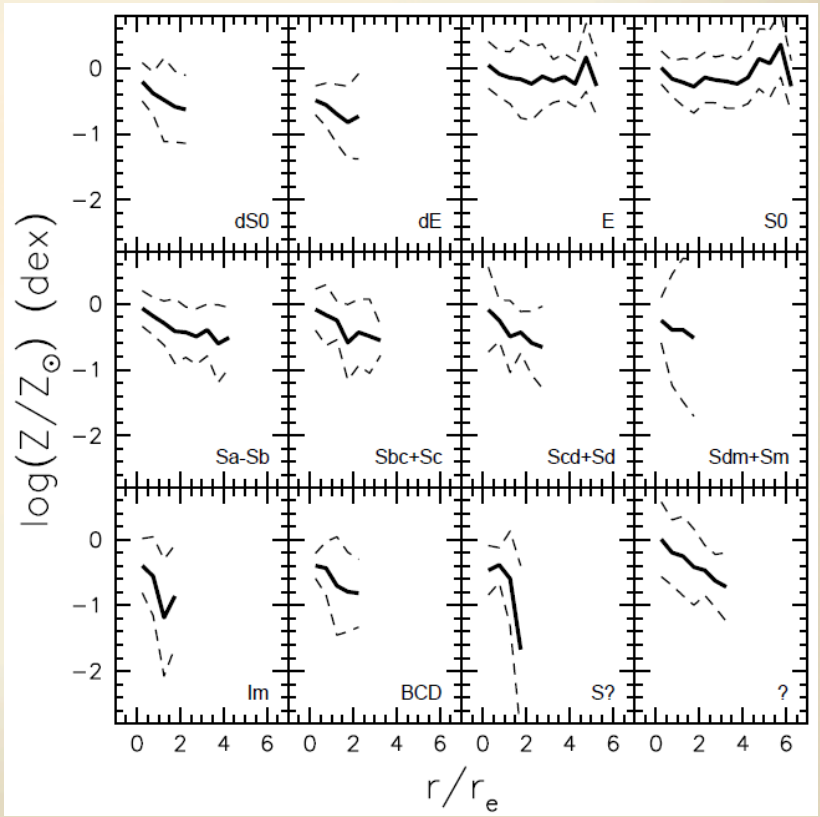
- **Deep images and (V-R) color map of the Coma ICL were obtained (> 1 mag deeper than previous images)**
- **ICL main body is elongated along the direction of the estimated orbits of the two cDs.**
- **Color of the ICL is uniform and similar to that of the two cDs**
- **observed ICL characteristics are consistent with the view that it mostly consists of stars which originally belonged to the cD galaxies and tidally stripped off during the process of cluster formation.**

The Stellar Populations of Virgo Cluster Galaxies

Joel Roediger, Stéphane Courteau (Queen's), Lauren MacArthur (HIA), Michael McDonald (MIT)

Our stellar population analysis uses the resolved *grizH* photometry of Virgo cluster galaxies from McDonald et al (2011); catalogue includes all galaxies down to B_T = 16 and lying within 2 Mpc (projected) of M87. Major findings are:





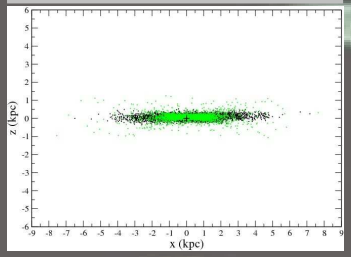
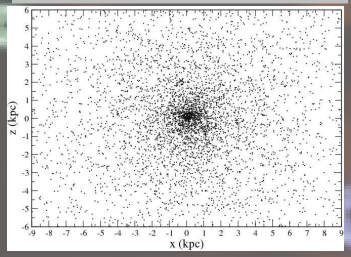
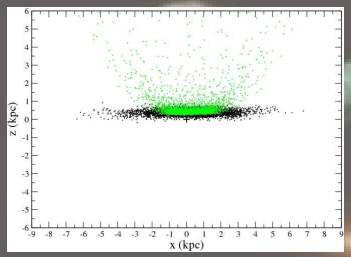
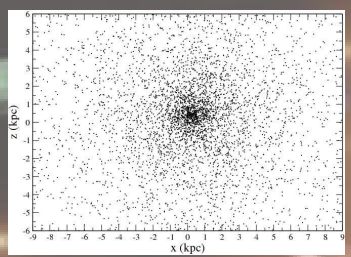
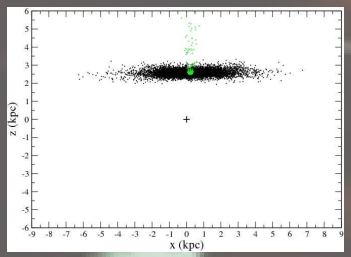
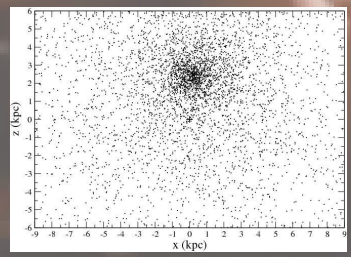
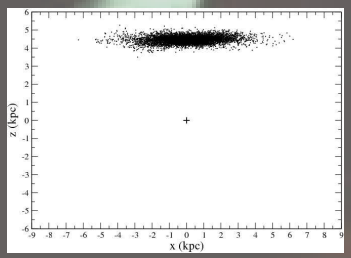
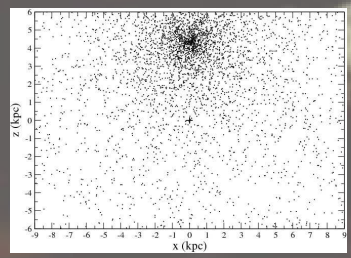
Roediger et al (2011ab)

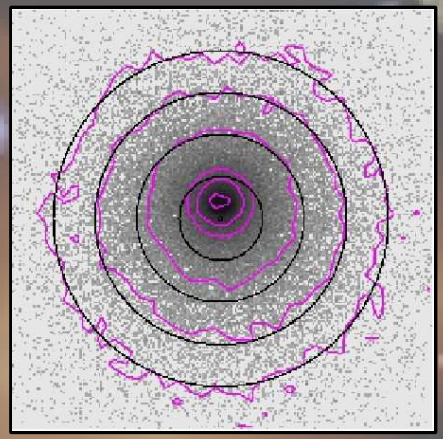
RAM PRESSURE DRAG

Effects of Ram Pressure on Dark Matter and Stellar Dynamics

R.Smith, M. Fellhauer, P. Assmann

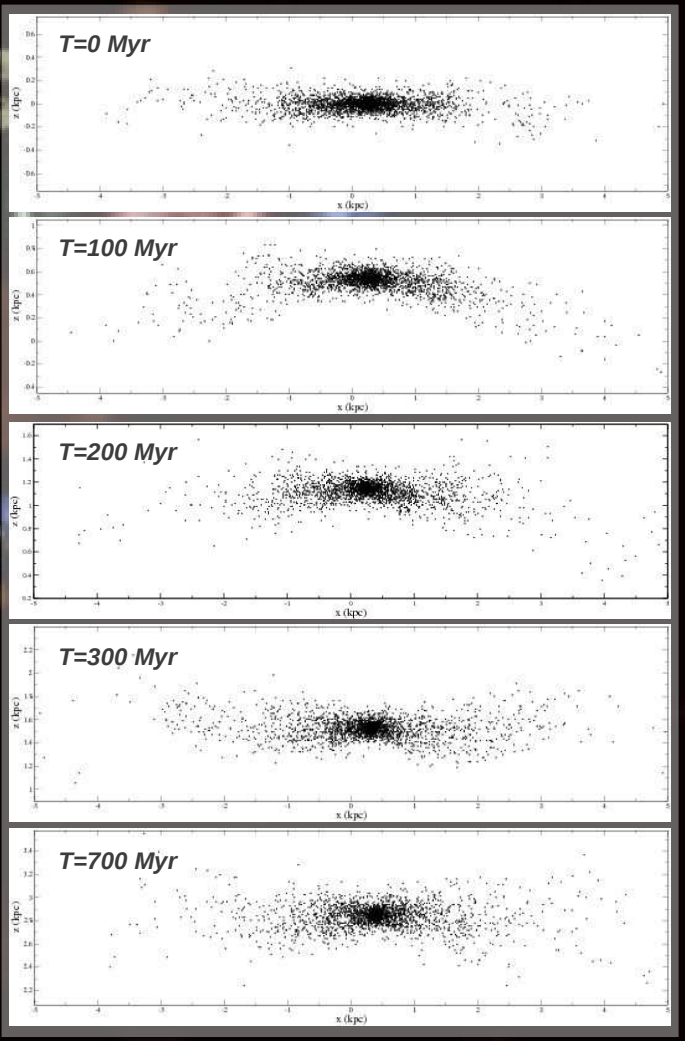
DEPARTAMENTO de ASTRONOMIA
UNIVERSIDAD DE CONCEPCIÓN

	Stars (black), gas (green):	Dark matter halo:
T=0 Gyr		
T=0.5 Gyr		
T=1.4 Gyr		
T=3.0 Gyr		



Surface density contours (pink) of dark matter halo deformed by ram pressure drag in upwards direction

A truncated gas disk presents a cross-sectional area to the ICM. It feels a drag force, that is passed to the stellar disk and central dark matter through their mutual gravity.



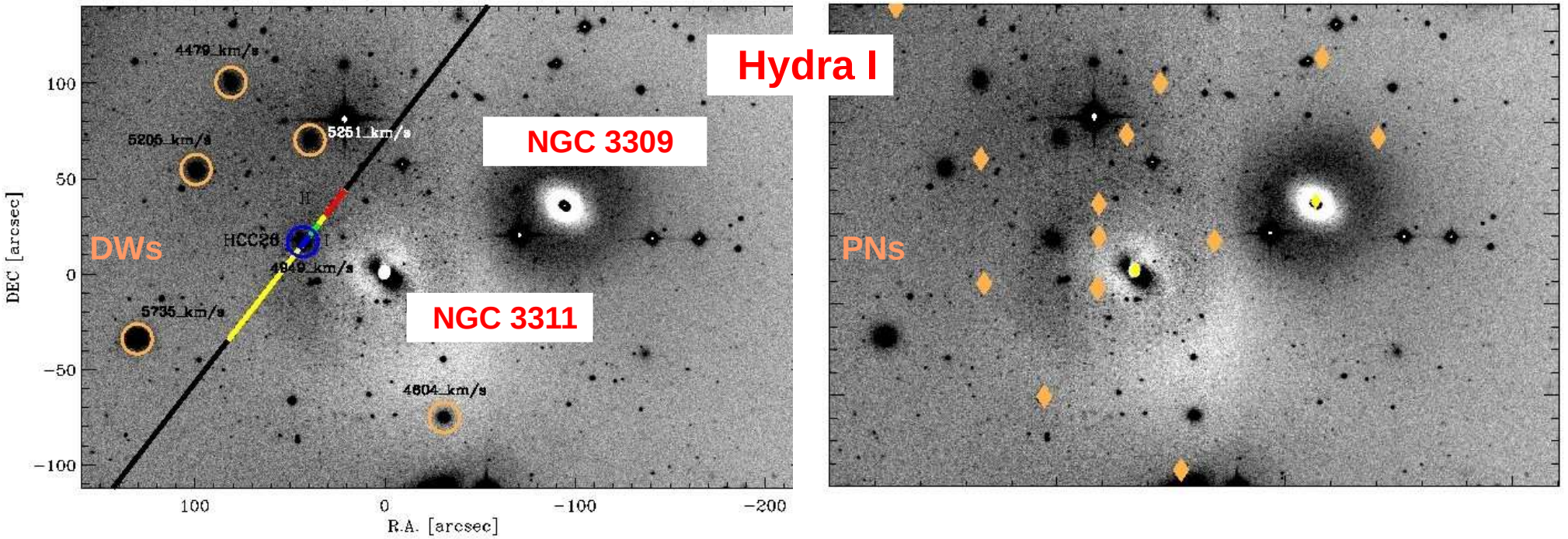
- A gas disk undergoing ram pressure feels a drag force, that is also exerted on the stellar disk and central dark matter
- This drag force can pull the stellar disk and cusp of the halo off-centre by several kiloparsecs
- The stellar disk may be deformed into a conical shape briefly, and is permanently heated & thickened by ram pressure stripping.

Dwarf galaxy disruption in the Hydra I cluster

Intracluster light (ICL): **stars in clusters not bound to any cluster member galaxy.**

ICL origin: **infalling diffuse light, mergers with the BCG, tidal stripping and disruption.**

Our work in the Hydra I core: **V-band photometry - Long slit data - Planetary Nebulae kinematics**



Results: **1) Excess of light in the halo of NGC 3311 moving at 1200 km/s faster than the galaxy itself. 2) DWs and PNs superposed on the excess and at the same velocity.**

Interpretation: **The excess probably formed from the disruption of the DWs in a recent close passage near NGC 3311.**

Ventimiglia et al. 2008, 2010, 2011 - Arnaboldi et al. 2011

G. Ventimiglia, O. Gerhard, M. Arnaboldi, L. Coccato, E. Iodice

Kinematics and excitation of the ram pressure stripped ionized gas of galaxies in the Coma cluster

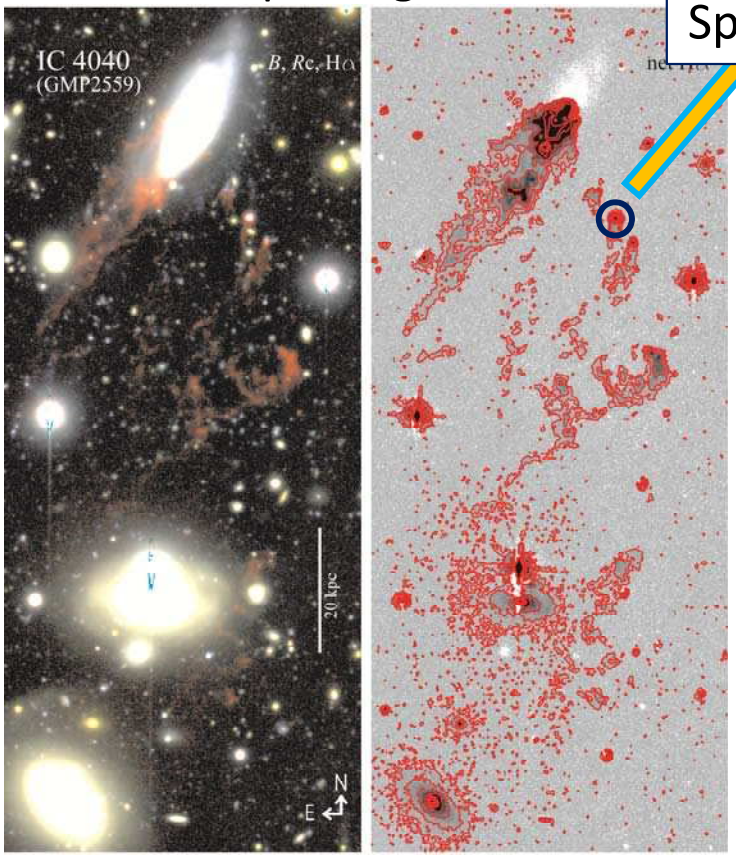
Yoshida, M. et al.

EIGs of the Coma galaxies

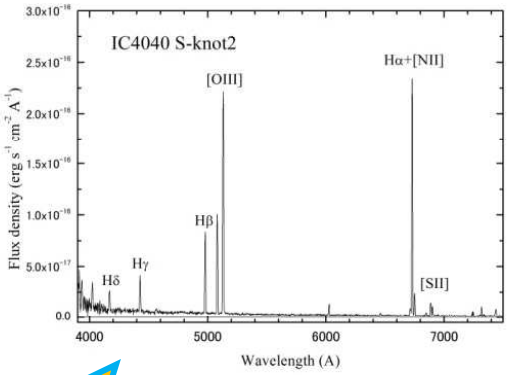
Characteristics of the clouds

- One-sidedness morphology
- Size: ~10 – 100 kpc
- Ionized gas and blue stellar knots
- Distributed further than 0.2 Mpc from the cluster center

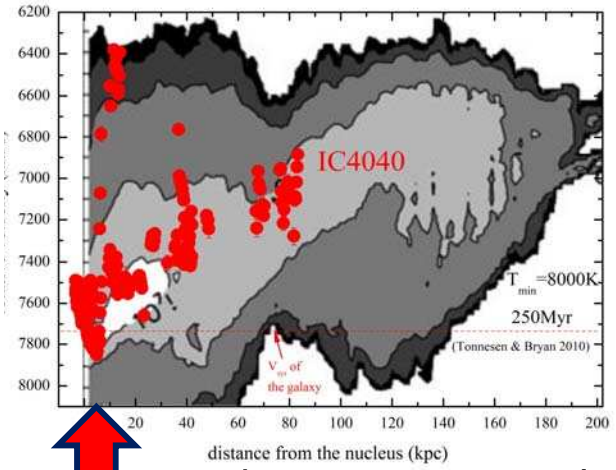
IC4040 80kpc long EIG



Spectrum

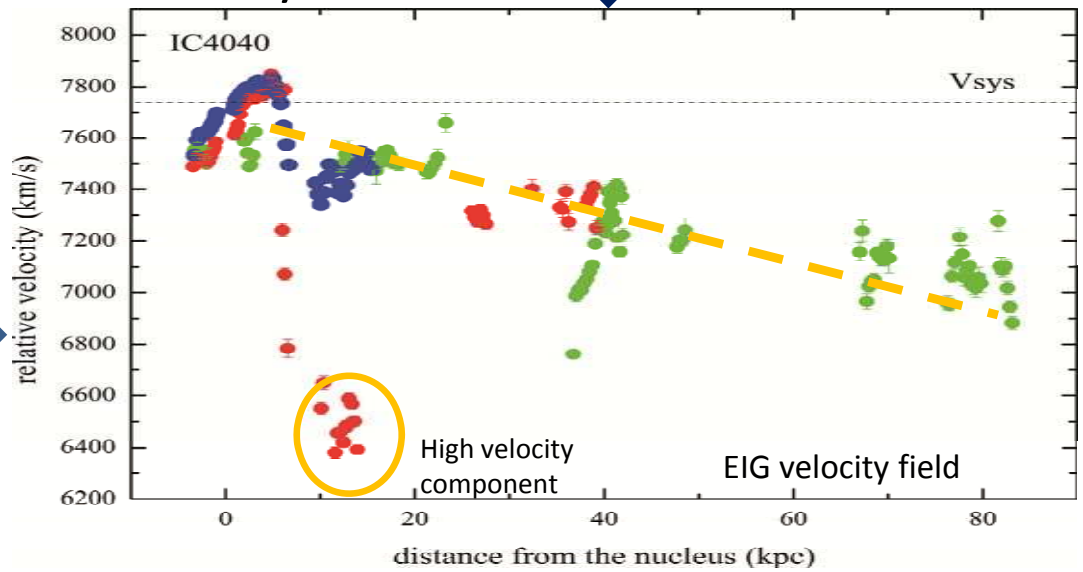


Active Star Formation



good agreement with RPS models

Velocity Field



We first revealed the kinematics and excitation of the EIGs around four galaxies in the Coma.

➔ toward understanding rapid gas removal in cluster