

² Gemini South Observatory.

INTERNAL KINEMATICS OF H II GALAXIES

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H II galaxies are dwarf galaxies characterized by high stellar formation rate with spectrum dominated by strong emission lines, superimposed on a weak stellar continuum. The study of internal kinematics of these objects may be realized using the observed emission lines. Based on these lines we obtained monochromatic intensity, velocity dispersion and radial velocity maps.

We have studied the internal kinematics of two H II galaxies: UM 461 and CTS 1020, observed with the Gemini South telescope using the GMOS instrument equipped with an IFU.

We aim to investigate the origin of the line-broadening observed on emission lines from the use of kinematics diagnostic diagrams: I vs σ , I vs V , e V vs σ . The analysis of these diagrams was based on the *Cometary Stirring Model* that allows us to identify, for example, the presence of expanding shells and stellar winds.

We found that radial velocity and velocity dispersion maps, for each galaxy, show a different kinematical pattern, although both are H II galaxies. CTS 1020 shows a velocity gradient consistent with a rotating disc with a velocity amplitude of ~ 40 km s⁻¹. On the other hand UM 461 does not exhibit a typical pattern of a rotating system, despite of the observed velocity gradient in both emission nuclei.

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EMISSION LINE IMAGING SURVEY OF THE ABELL 901/902 SUPERCLUSTER

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It is widely debated whether galaxy evolution is more prone to internal or external effects. Trends to passive and/or more spheroidal populations in dense environments are widely observed and star-formation rate and stellar age and AGN fraction all correlate

with measurements of the local galaxy density. However, in the hierarchical framework of galaxy formation the galaxies in the densest peaks start forming stars and assembling mass earlier making stellar mass one of the key determinants of galaxy properties. Nonetheless environmental effects are still very important and could be separated from the effect of internal galaxy properties. The Abell 901(a,b)/902 multiple cluster system at $z \sim 0.165$ is a unique laboratory for galaxy evolution. Besides three main clusters it includes a few related groups. The field comprises a very broad range of galaxy environments and masses at a single redshift. Therefore by observing this single region one is able to study galaxy evolution decoupling environmental and stellar mass effects from redshift-related ones. We are currently undertaking a survey of the region with the OSIRIS tunable filter imager on the GRANTECAN. We have targeted the H α and [NII] $\lambda 6584$ lines Together, these will provide the urgently needed star formation rate and AGN diagnostics for a full census of such properties in this field. In this talk I will present the first results of the survey on the high density regions A901a and A902 probing AGN and star formation.

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DYNAMICAL ANALYSES OF Z= 0.3, 0.5 GALAXY CLUSTERS FROM THE SOAR GRAVITATIONAL ARCS SURVEY

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We have performed dynamical analyses of galaxy clusters using optical spectroscopic data. These clusters belong to the SOAR Gravitational Arcs Survey (SOGRAS) (Furlanetto et al. 2013) and are among the richest structures in SDSS stripe 82 with redshifts around $z= 0.3$ or $z= 0.5$. For three of those clusters, all with strong lensing features, we carried out individual analysis using Gemini/GMOS data (~ 25 velocities per cluster). We obtained masses in the range of $3-8 \times 10^{14} M_{\odot}$ and signs of substructure in one of them. For the whole SOGRAS sample (47 clusters) we used SDSS spectroscopic data. Given the low number of velocities per clusters, we stacked the data per redshift and/or richness. Our results indicate that the richest half of the clusters, independently of the redshift, tend to be ~ 2.5 times more massive than the poorest half. Also we have found

that the $z=0.3$ and the $z=0.5$ clusters have overall masses statistically consistent with each other: $6.3^{(+3.9)}_{(-2.1)}$ and $8.6^{(+5.2)}_{(-1.6)} \times 10^{14} M_{\odot}$ respectively.

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THE CONNECTION BETWEEN THE ORIGINS OF GLOBULAR CLUSTERS (GCS) AND THE EVOLUTION OF THEIR HOST GALAXY

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Star kinematics is directly connected to the evolution history of their host galaxy. To recover the correct kinematics, though, it is necessary to assign each star to the galaxy component it belongs to: the disk (thin or thick) or the spheroid. Performing a multi-band decomposition of infrared images of NGC 3115, and planetary nebulae (PNe) as tracers of the overall stellar populations, we recovered the velocity and velocity dispersion of the thick disk and of the spheroid. We then studied the GCs population in NGC 3115. Given a GC position and velocity we can estimate its probability of belonging to the disk, to the spheroid and in general to the system. We find that most GCs are consistent of being drawn from the light weighted velocity distribution of NGC 3115 stars. Nearly half of the GCs belongs to the disk and half to the spheroid, but we don't find any trend between their colour (b-r) or calcium triplet abundances and their kinematics.

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STAR FORMING, AGN AND PASSIVE PHASES OF GALAXY EVOLUTION SINCE $Z = 0.5$ AS TOLD BY SDSS DATA

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Our goal is to study the interplay between star forming, AGN and passive phases of galaxy evolution. For that we need a wide database of galaxy spectra, binning the sample into stellar mass and redshift bins to deal with mass-dependent evolution and completeness. We extracted our galaxy sample from de SDSS/DR7 between $0.05 < z < 0.50$. The stellar mass and the emission line measurements were taken from the STARLIGHT database and average values of galaxy properties were obtained for each bin. In order to distinguish star forming and AGN hosts, we first considered the BPT diagram as it is generally used. Higher stellar mass migrates to the right wing as redshift decreases and one can erroneously infer that the importance of AGN versus star formation increases with time for these objects. However the BPT diagram cannot distinguish retired galaxies from AGN hosts. For that purpose, the WHAN diagram can be used. Purely star forming galaxies dominates at low stellar mass bins while as the mass increases the AGN becomes more significant. Retired and lineless galaxies dominate the galaxy population at the highest stellar mass bins.

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GALAXY CONCENTRATION INDEX IN LOW X-RAY LUMINOSITY GALAXY CLUSTERS

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Using a sample of 10 low x-ray luminosity galaxy clusters (Nilo Castellón et al. 2013B), we studied the properties of 146 galaxies classified as members in a redshift range of $0.185 < z < 0.701$.

Following Concelice et al. 2000, we define the galaxy concentration index (C), as the ratio of two circular radii which contain 80 and 20 percent of the total Petrosian flux. Mainly, we observed an increment of C for early-type and lenticular galaxies at redshifts lower than 0.3, that can be related to the presence of giant galaxies in these low redshift clusters ($C > 4$). Contrary to these results, for late-type galaxies we found smaller C values for the lower redshift clusters.