XIV Latin American Regional IAU Meeting (Florianópolis/SC, Brazil, 25-30 November 2013)
Editors: A. Mateus, J. Gregorio-Hetem & R. Cid Fernandes

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We present the first results of the SOAR Gravitational Arc Survey (SOGRAS). The survey imaged 47 clusters in two redshift intervals centered at $z = 0.27$ and $z = 0.55$, targeting the richest clusters in each interval. Images were obtained in the g', r' and i' bands with a median seeing of 0.83, 0.76 and 0.71 arcsec, respectively, in these filters. Most of the survey clusters are located within the Sloan Digital Sky Survey (SDSS) Stripe-82 region and all of them are in the SDSS footprint. We present the first results of the survey, including the 6 best strong lensing systems, photometric and morphometric catalogs of the galaxy sample, and cross matches of the clusters and galaxies with complementary samples (spectroscopic redshifts, photometry in several bands, X-ray and Sunyaev Zel'dovich clusters, etc.), exploiting the synergy with other surveys in Stripe-82. We apply several methods to characterize the gravitational arc candidates, including the Mediatrix method (Bom et al. 2012) and ArcFitting (Furlanetto et al. 2012), and for the subtraction of galaxy cluster light. Finally, we apply strong lensing inversion techniques to the best systems, providing constraints on their mass distribution. The analyses of a spectral follow-up with Gemini and the derived dynamical masses are presented in a poster submitted to this same meeting (Cibirka et al.).

Deeper follow-up images with Gemini strengthen the case for the strong lensing nature of the candidates found in this survey.

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THE ENVIRONMENTAL PROPERTIES OF GALAXIES PROBED BY MARKED STATISTICS

A. Mateus[1]

Galaxies are generally treated as point particles in clustering analysis. However, these objects have physical and stellar population properties that must be taken into account if one wants to study the environmental effects on galaxy evolution. In this work, we applied a statistical method to investigate the role of environment in driving galaxy properties based on the marked correlation function. This methodology was applied to a galaxy sample drawn from the Sloan Digital Sky Survey Data Release 7, where the clustering of galaxies was weighted by particular galaxy properties, like luminosity and stellar mass, thus more directly quantifying the correlations between these attributes and large-scale environment. We show that marked statistics are powerful to reproduce environmental trends for variables like luminosities and stellar masses, as well as to quantify the relative importance of them with respect to the environment. For low density regions in the local universe, mark correlations relative to the mean are stronger compared to dense regions. This implies that the clustering of stellar mass, for instance, is more sensitive to environments associated to individual halos in close galaxy pairs than to massive halos found in clusters, where the correlations don't show any difference relative to the mean. We conclude that in nearby galaxy clusters, dominated by massive objects, galaxies are equally clustered (marked correlation = average clustering). On the other hand, galaxies in low density regions span a wide range in stellar mass (halo sizes) where the correlations appear more dramatically.

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A NEW CLASS OF GALAXIES (?): ULTRA-COMPACT DWARFS

S. Mieske[1]

I propose to give a review on ultra-compact dwarf galaxies (UCDs), a new class of stellar systems defining the interface between star clusters and dwarf galaxies. UCDs are believed to be either the most massive star clusters in the universe, tidally truncated galaxies, or, both. After a brief overall summary, I will focus in particular on two aspects. 1. The specific frequencies of UCDs - a recently introduced quantity that allows to test whether the luminosity distribution of UCDs follows the bright tail of the globular cluster luminosity function. Can all UCDs

be explained as bright star clusters? 2. The elevated dynamical M/L ratios of UCDs. Are they due to highly clustered dark matter, a variation of the IMF, or maybe, due to massive central black holes that would be fossil relicts of UCD progenitor galaxies?

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SUBMILLIMETER GALAXY NUMBER COUNTS IN A SEMI-ANALYTIC MODEL: THE "COUNT MATCHING" APPROACH

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Recent interferometric observations of the Extended Chandra Deep Field South show that the brightest sub-millimeter galaxies (SMGs) detected by single-dish telescopes are comprised by emission from multiple fainter sources. With the aim of exploring the properties of SMGs, and in analogy to the now-standard abundance matching approach, we perform a "Count Matching" approach through light-cones drawn from a semi-analytic model. We choose various physical galaxy properties given by the model as proxies for their sub-millimeter fluxes, assuming a monotonic relationship so that the combined LABOCA plus bright-end ALMA observed number counts are reproduced. After turning the catalogs of galaxy positions and fluxes given by the different proxies into sub-millimeter maps, we perform a source extraction. With this we study the effects of the observational process in the recovered counts, as well as the galaxy properties derived from the detected sources for each proxy. Comparing the recovered redshift, stellar mass and host halo mass distributions with observational data, the best proxy can be found.

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PROPERTIES OF GALAXIES AND GROUPS AT $Z < 1.4$

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In this work, we analyze a sample of galaxy groups constructed from the fourth data release of the Deep Extragalactic Evolutionary Probe 2 (DEEP2) including the Extended Groth Strip (EGS). This sample was obtained by Gerke et al. (2012) using the Voronoi-Delaunay Method. We selected 105 galaxy groups with at least 8 members in a radius of 4 Mpc. For each group we estimated its properties such as velocity dispersion (σ), physical radius (R_{200}) and mass (M_{200}). We also classify the groups as Gaussian and non-Gaussian (dynamic evolved or not) based on their galaxy velocity distributions. This classification is based on the following statistical tests: Anderson-Darling, Kolmogorov-Smirnov, Shapiro-Wilk, Jarque-Bera, Cramer-von Mises, D'Agostino and Dip test. When the Dip test confirms the hypothesis of the unimodality and all other tests prove the normality of the system, the group is classified as Gaussian. The behavior of gaussianity was checked varying the distance to the center of the group in 2-4 times its physical radius. Our results show that the number of systems classified as non-Gaussian groups grows with the increase of the physical radius.

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THE DISTRIBUTION OF STELLAR POPULATIONS WITHIN GALAXIES

P. M. Novais[1] and L. Sodré Jr.[1]

The study of stellar populations in galaxies is particularly interesting, since they are a fossil record of several physical processes associated with the formation and evolution of galaxies. In this work we present the first results of our approach to study the