

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

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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

spatial distribution of stellar populations inside galaxies. We are using *ugriz* magnitudes and principal component analysis (PCA) to obtain pixel-by-pixel proxies of the stellar populations and their distributions inside each galaxy. The distribution of these populations are then investigated with a variety of statistical tools, including Gini Indices and the Euler-Poincaré characteristic. Our approach aims to be a step forward with respect to the conventional profile fitting, allowing to obtain quantitative estimates on how the different stellar populations are distributed within a galaxy, bringing hints on how galaxies grow and evolve. The pixel-by-pixel analysis of a small sample of 15 galaxies of different types show that the stellar populations tend to evolve from inside to out in spiral and late spiral galaxies, while elliptical galaxies seem to have young stellar populations in the center. This first results show that this approach is effective and will be explored and improve in future works.

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LOW-REDSHIFT COMPACT UV LUMINOUS STARBURSTS: A DOOR TO UNDERSTAND HIGH-REDSHIFT LYMAN-BREAK GALAXIES

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Lyman-break galaxies (LBGs) are a population of distant objects ($z \sim 3$) selected at rest-frame UV that represent the typical starburst galaxy at a time when the universe was going through its peak in star formation activity. The star formation rates of LBGs suggest that these galaxies may be the progenitors of a large part of the massive galaxies in the local universe, making them important objects of study. However, detailed studies of the morphology and kinematics of these distant galaxies are limited by the sensitivity of current instruments. We study a sample of low-redshift UV-selected supercompact starbursts that share many properties (morphology, surface brightness, luminosity) with high-redshift LBGs and are hence denominated as Lyman-break Analogs (LBAs). These UV luminous galaxies (UVLGs) were recently uncovered by the Galaxy Evolution Explorer (GALEX) satellite. At significantly lower redshifts ($z \sim 0.2$) than LBGs, they provide us with a unique opportunity to draw analogies

with their high-redshift counterparts and study in great detail the astrophysical conditions that lead to the star formation activity we observe in the distant universe. We have undertaken the near-IR photometric analysis of a sample of LBAs based on observations taken with the Fourstar instrument on the 6.5m Baade Telescope (Las Campanas Observatory, Chile). We now extend this work to the wider population of compact UVLGs, with surface brightness one or two orders of magnitude than normal galaxies, but less extreme than supercompact UVLGs. Based on J, H, Ks, and optical photometry for 40 compact and supercompact UVLGs we are in the process of analyzing the spectral energy distribution (SED) of each individual galaxy to derive stellar masses and ages in order to explore the similarities and differences between these two populations relative to normal galaxies in the local universe and to LBGs in the distant universe.

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AN APPROACH TO MEASURING THE DENSITY OF THE ENVIRONMENT OF GALAXIES: RESULTS AND COMPARISONS WITH OTHER MEASUREMENTS

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With the aim of obtaining a homogeneous and reliable measurement of the density of the environment of a large sample of galaxies, we developed a code that counts the number of neighboring galaxies around a target galaxy. As targets, we selected a large sample of 666,387 galaxies from the spectroscopic catalogue of the SDSS-DR7 with redshifts between 0.03 and 0.30 and more luminous than absolute magnitude of -19 in the SDSS *r* band. The photometric catalogue of the SDSS-DR7 was used to extract and count the neighboring galaxies from, including about 24M objects, also more luminous than an *r*-band absolute magnitude of -19, for which a photometric redshift was available to serve as a distance estimate. The code counts all galaxies within an absolute distance of 1.5 Mpc around the target (translated to an apparent radius and a redshift range around that of the target). We avoid galaxies close to the survey edges, leaving 527,074 target galaxies for which we have a measurement of environmental density.