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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

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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

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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