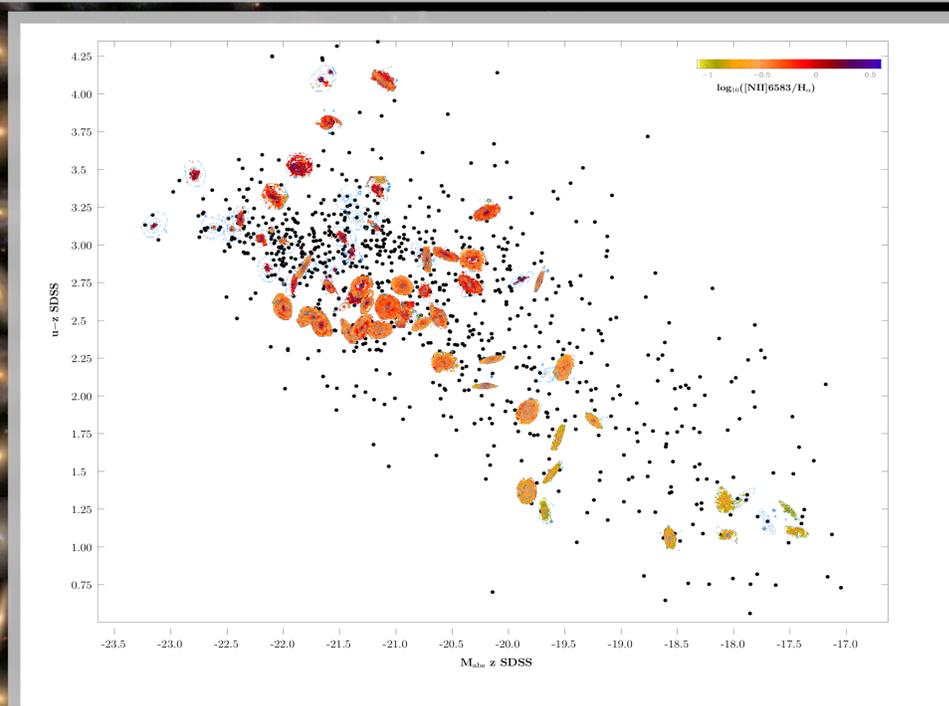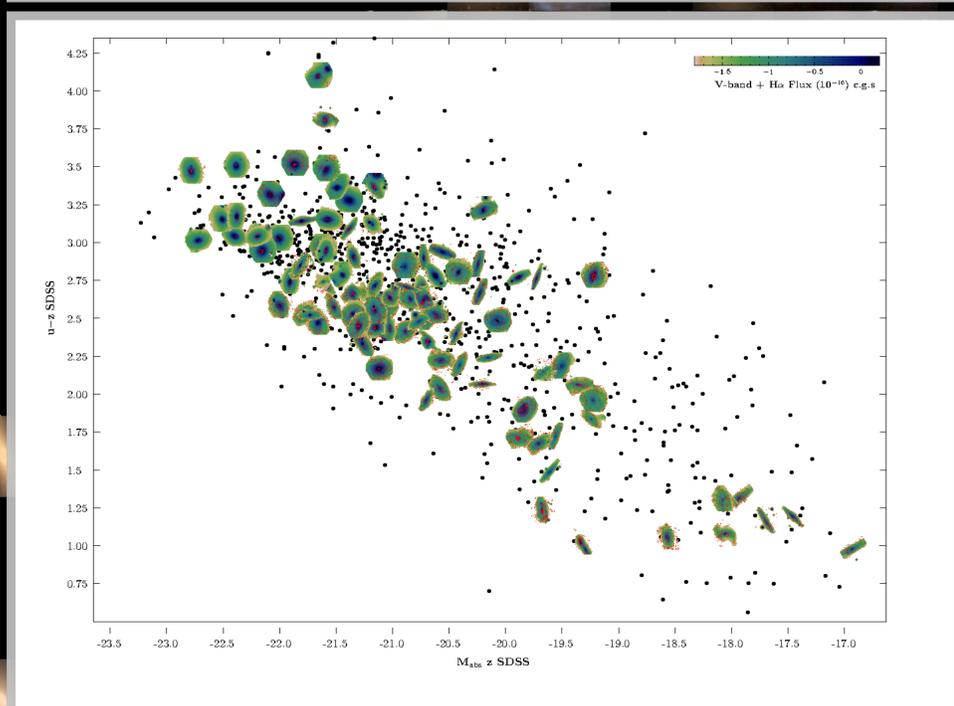# CALIFA
Calar Alto Legacy Integral Field Area survey

S.F.Sánchez, R.C. Kennicutt, A. Gil de Paz, G. van de Ven, J.M. Vílchez, C.J. Walcher, et al.

CALIFA is one of the largest Integral Field Spectroscopy surveys ever accomplished. It is obtaining spatially resolved spectroscopic information of a diameter selected sample of 600 galaxies in the Local Universe ($0.005< z <0.03$). Galaxies have been selected from the SDSS imaging survey to have a similar projected size, covering any morphological type. The survey has been designed to allow to build two-dimensional maps of the following quantities: (a) stellar populations: ages, metallicities and star formation histories; (b) ionized gas: distribution, excitation mechanism and chemical abundances; and (c) kinematic properties: both from stellar and ionized gas component. CALIFA uses the PPAK Integral Field Unit (IFU), mounted at the Calar Alto 3.5m telescope, with a hexagonal field-of-view of 74"x64", a 100% covering factor by adopting a three-pointing dithering scheme. The optical wavelength range is covered from 3700 to 7000 Å, using two overlapping setups (V500 and V1200), with different resolutions: R850 and R1650, respectively. CALIFA is a legacy survey, granted with 250 dark nights (3 years), intended for the community. The reduced data will be released, once the quality has been guaranteed. We present an example of the data-products derived for the first 139 galaxies observed so far.


CALIFA was designed to sample all the Color-Magnitud diagram, which will allow us to compare any of the spatially resolved spectroscopic properties descrived before between galaxies of any kind. In the Figure we show the distribution across the CM diagram of the V-band and Hα flux intensity maps (dots = unobserved galaxies).

One of the main goals of the survey is to characterize the properties of the ionized gas, to determine both the current SFR (and metallicity) and the relative importance of AGN activity in the overall evolution of galaxies. The Figure shows the [NII]/Hα line ratio maps, together with the Hα flux intensity maps for thos galaxies with detected emission.
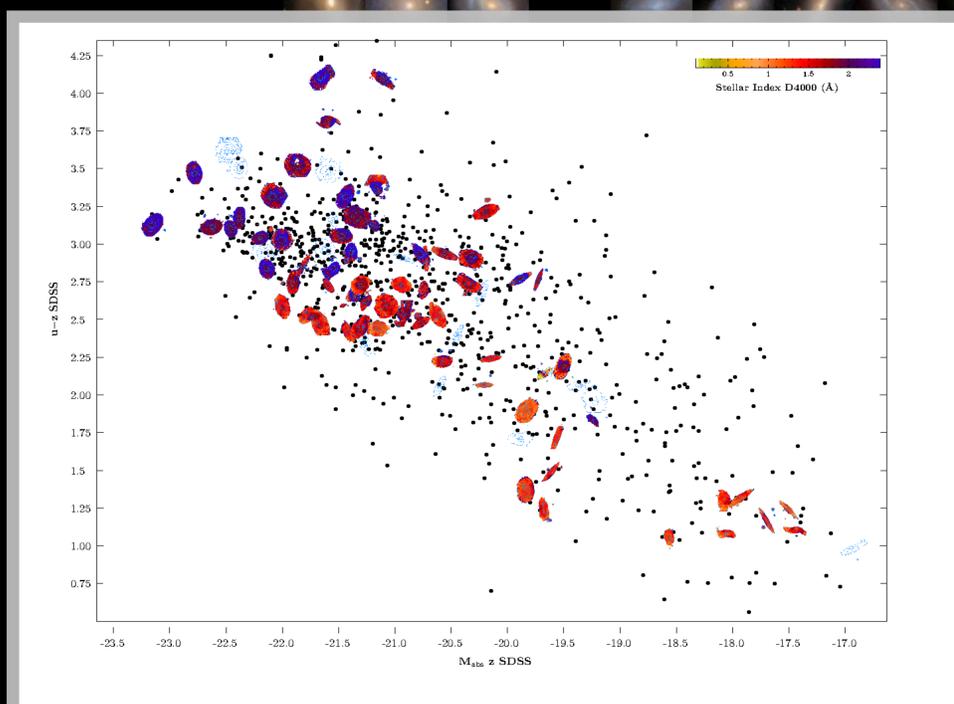
The covered spectral range samples different stellar population features (e.g., D4000, Hδ, Hβ, Mg, Fe...), which will allow us to derive the 2D distribution of the stellar component. The Figure shows the CM distribution of the 2D maps of D4000, a stellar index directly related with the average Age of the stellar population.
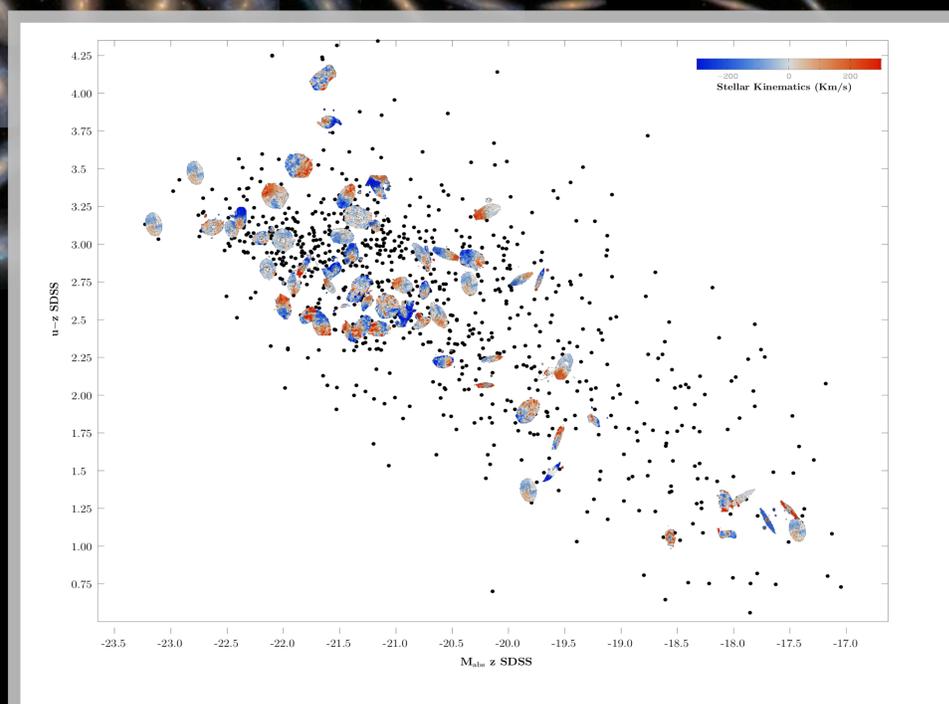
The two spectral setups scheme was adopted to obtain both a wide spectral coverage and a good spectral resolution. We will obtain the gas and stellar velocity (shown in the Figure) and velocity dispersion maps, which will be used to (1) characterize the kinematical stage of the galaxies, and (2) derive their dynamical properties (e.g., Mdyn).

CALIFA is a large collaboration, comprising 83 astronomers of 18 different institutes world-wide (mostly in Europe), covering a wide range of science goals to achive with the same dataset. We have recently published the results of the feasibility study (Mármol-Queraltó et al., 2011, arXiv1106.4183), and recently published presentation and 1st science articles (Sánchez et al., 2012; C. Kehrig et al. 2012). We expect to complete the first 200 galaxies in before summer, and to deliver the first data release late in 2012. If you want to be updated about our activities and results, please visit our webpage: http://www.caha.es/CALIFA/