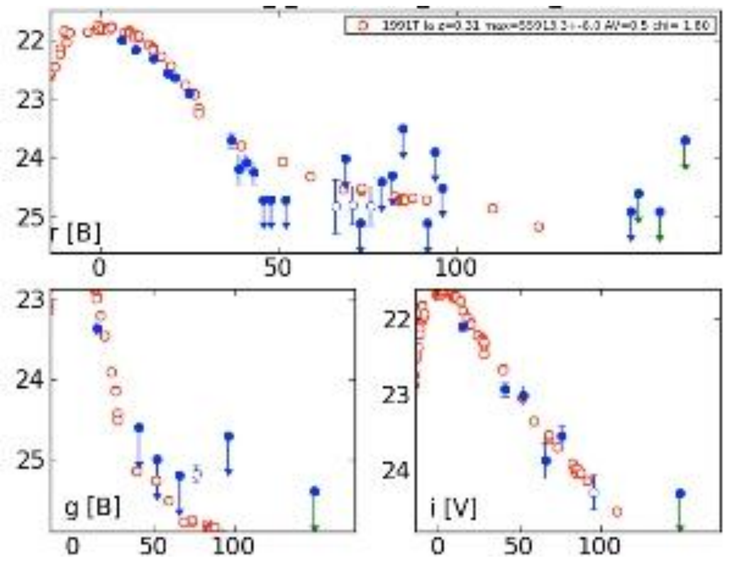
Supernova rates from the SUDARE survey

Giuliano Pignata, on behave of the SUDARE collaborations

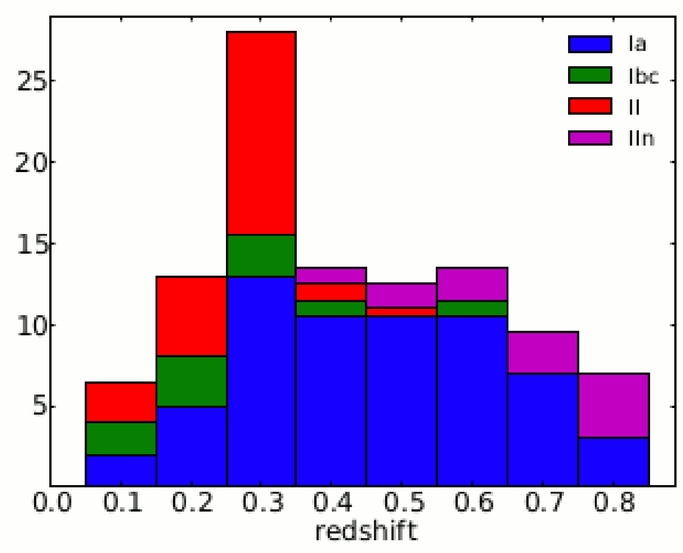
[1]Universidad Andrés Bello, [2] Millenium Institute for Astrophysics

The SUDARE survey monitored the Cosmic Evolution Survey (COSMOS) and Chandra Deep Field South (CDFS) fields for three and four seasons respectively. SUDARE was carried out using the one square degree field of view OMEGACAM camera mounted on the 2.6 meters VLT Survey Telescope (VST) located at ESO Paranal Observatory. Here we present the results of the first three seasons (two in CFS and one in COSMOS).

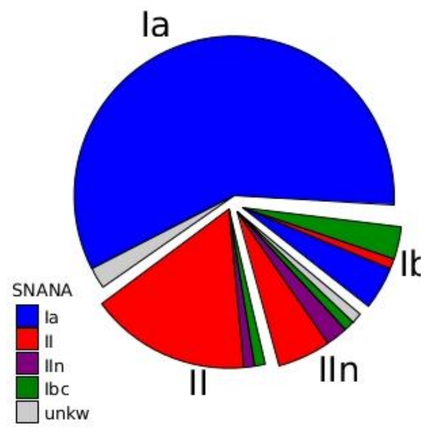


Photometric classification

To classify our discoveries, we developed a simple procedure which assess whether the transient multi-color light curves match a known SN type providing also an estimation of redshift and extinction. Templates were selected to represent the well established SN types, namely Ia, Ib, Ic, IIb, II and IIn. Them for all of those, we constructed a grid of light curves in apparent magnitudes. We then compare the candidate light curve in each filter with all simulated light curves of the grid. Through χ^2 minimization we derive the SN type, average distance and reddening combining measurement for all filters weighted for the number of observed epochs. The result of the classifications is reported in the figure below.

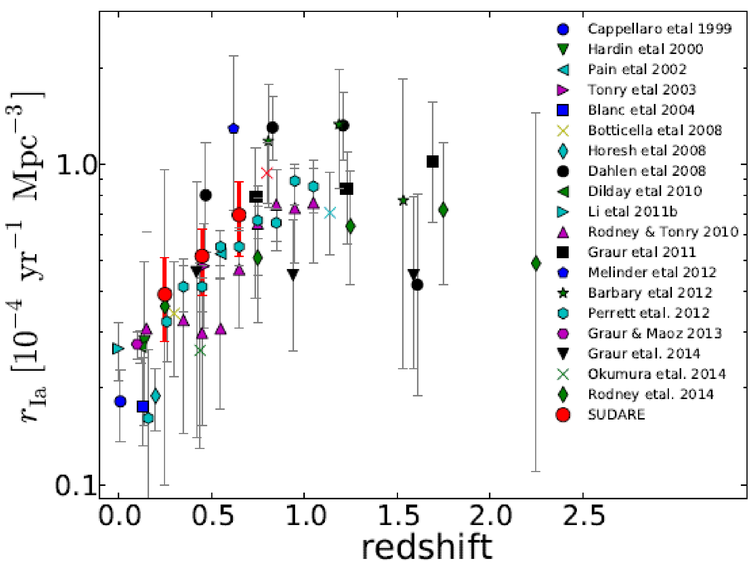


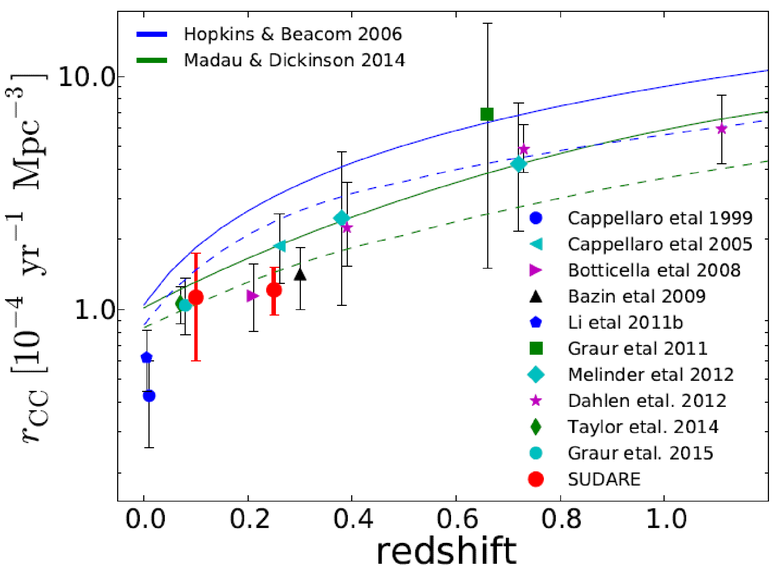
To check the performance of our method, we also classify our discoveries using the public available code SNANA (SuperNova ANAlysis, Kessler et al. 2009) see figure 3 for the result of the comparison. We are now developing a new photometric classification tool base on machine learning technique (see poster Pablo Huijse).



Volumetric rate

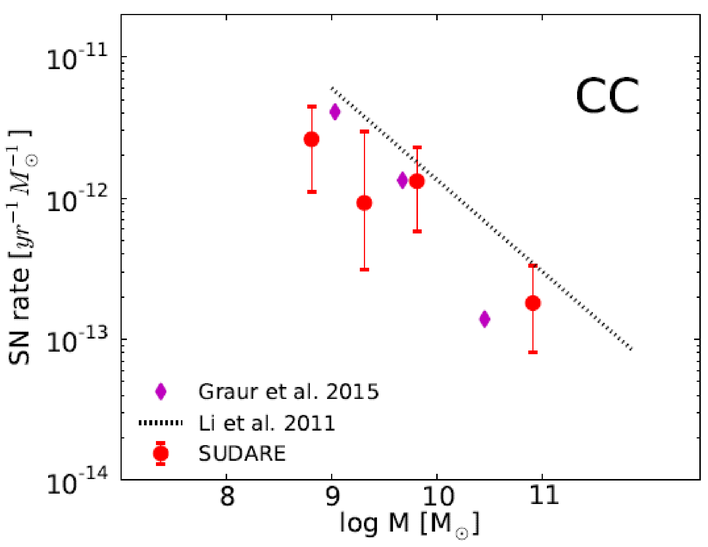
Below we show a comparison of our preliminary estimation of the rate of SN Ia (left side) and CC SNe (right side) with all measurements available in the literature. To obtain the CC SN rate we cumulated type II and Ib/c and IIn events in the redshift range 0:05 < z < 0:35

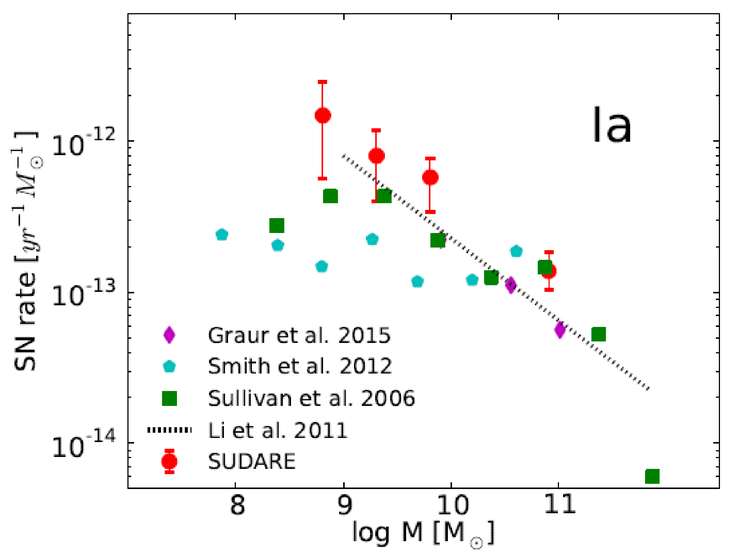




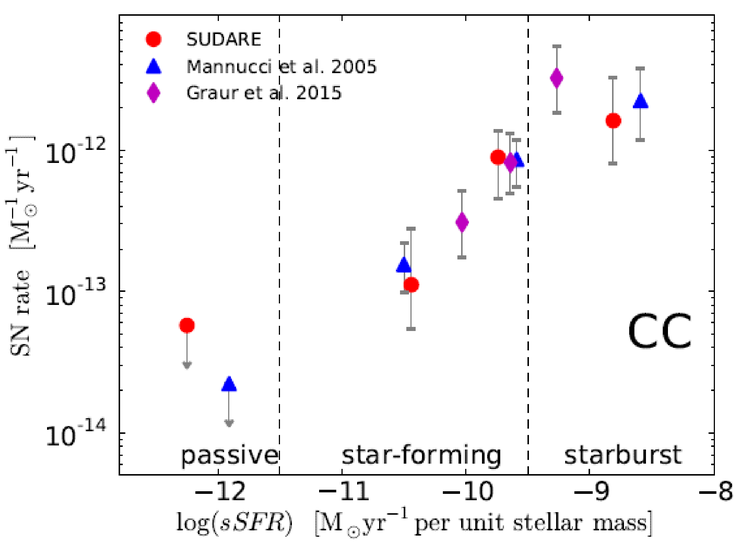
Correlations with galaxies parameters

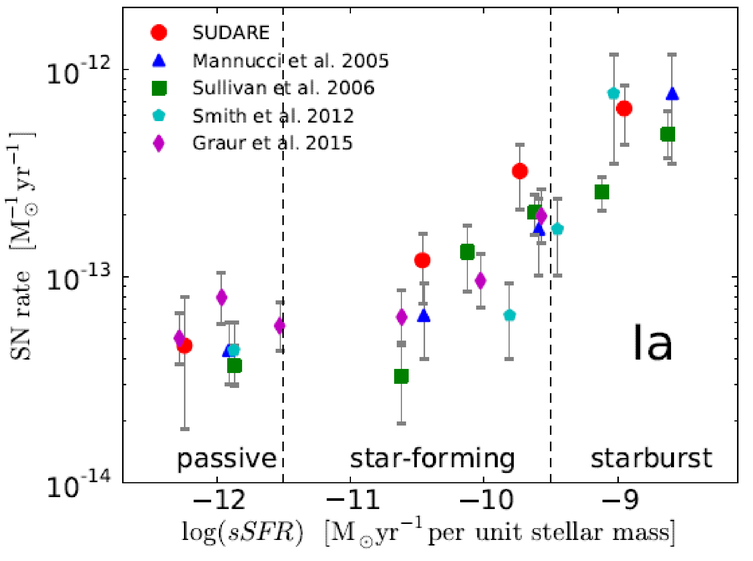
The wealth of photometric information available for the in our fields allows us to apply the spectral energy distribution (SED) fitting technique to estimate the stellar mass and specific star formation rate (sFSR) using the FAST code (Kriek et al. 2009). Below we correlate the SN rates with the galaxy stellar mass.





We also correlate the SN rates with the specific star formation rate (see figure below)





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