

## Abstract

Radio continuum provides a unique window for studying **at the same time** the cosmic evolution of star formation and the accretion power of supermassive black holes. I will describe some of the first results of a deep ( $\sim 2.3 \mu\text{Jy rms}$ ) VLA survey at 3 GHz recently completed in the COSMOS field.

The main results of our analysis are:

- Using the multi-wavelength data in the field, the more than 10,000 radio sources have been classified into Star-forming galaxies and AGN (High and Moderate Radiative Luminosity AGN, HLAGN and MLAGN);
- We measured the source counts down to  $\sim 10 \mu\text{Jy}$ , sampling with high statistics the crucial range of faint fluxes where the main population contributing to the counts changes from AGN (at  $S > 200 \mu\text{Jy}$ ) to SFGs (at  $S < 100 \mu\text{Jy}$ )
- HLAGN and MLAGN are shown to have different properties, both for the hosts and the nucleus, suggesting two different mechanisms of AGN activity, probably related to different accretion properties, with different importance of radiative and mechanical energy
- The Star Formation Rate History has been derived from a single survey over a wide redshift range with a good agreement with Herschel-based results up to  $z \sim 3$  and a higher (but only at  $\sim 20\%$  level) estimate of the SFD than UV-based and dust-corrected estimates