POSTER

ABSTRACT

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Measuring and understanding star formation in the early universe - An application of the IR-radio relation

Herschel and ALMA will boost our understanding of distant star forming galaxies, in particular by providing important clues as to why basic correlations like the IR-radio relation or the 'galaxy main sequence' - the relation between specific star formation rate and stellar mass - hold over a significant fraction of Hubble time.
We used deep 20 cm VLA imaging of the COSMOS field to study the evolution of the star formation rate of normal galaxies out to z=3. As a result we obtained one of the best measurements of the cosmic star formation history and could also show that the redshift evolution of the specific star formation rate is independent of stellar mass. Combined with an in-depth analysis of the IR-radio relation, we demonstrate that the IR-radio relation is virtually constant out to the highest redshifts probed - both for sources detected individually or when considering population averages in stacking experiments.
Finally, I will discuss how future ALMA, Herschel and EVLA studies of selected star forming galaxies at high redshift can teach us about the evolution of gas reservoirs and star formation efficiency at a time, when most of the baryons appear to be in the form of gas rather than stars.