

TITLE: Automated Mining of the ALMA Archive in the COSMOS Field (A<sup>3</sup>COSMOS): Measuring the dust and gas content of thousands of high-redshift star-forming galaxies.

ABSTRACT: ALMA is the most powerful and sensitive (sub)mm interferometer array, but its small field of view (~30") makes dedicated large-area surveys too expensive to be pursued while being needed to better understand galaxy formation. Fortunately, through many individual Principal Investigators observations, ALMA has deeply mapped an increasing area in some of the most popular extra-galactic fields, like COSMOS. The goal of the A<sup>3</sup>COSMOS project is to exploit this growing ALMA science archive to "create" a deep (sub-)millimeter survey covering an ever-increasing fraction of the COSMOS field. This homogeneously reduced database is provided to the COSMOS collaboration and the whole astronomical community, and can be used to best understand formation of galaxies. With this process, which we repeat every 12 months, our database currently covers ~340 square arcmin area and 5% of total galaxies detected in the COSMOS field. In this talk, I will present the details of the A<sup>3</sup>COSMOS project and review past and current scientific studies that were/are pursued with this database, focusing especially on newly obtained constraints on the evolution of the gas content of high-redshift star-forming galaxies.