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Presentation Requested: oral
Category: Cosmic Star Formation History
Question: How does the star formation rate density evolve over all redshifts, especially at z > 2? Is there agreement between the measurements from ALMA, JVLA, Herschel, HST, and other instruments? Can the SFR density be dissected showing what is contributing to it at different redshifts or how might we go beyond measuring this relationship. What are the state of the art simulations and how do the observations compare to them?

Linking our understanding of high-z dust attenuation between extreme dusty starbursts and normal L* galaxies

Galaxies rest-frame ultraviolet (UV) properties are often used to directly infer the degree to which dust obscurtion affects the measurement of star formation rates, particularly for galaxies not directly detected at infrared wavelengths. This is particularly pertinent to the measurement of the Universes density of star formation at early epochs. In recent years, large far-IR datasets from Herschel, SCUBA-2 and AzTEC have become available to probe the direct dust and gas emission in galaxies fainter than the nominally extreme, hyper-luminous Submillimeter Galaxy (SMG). While SMGs are known to be significant outliers from most dust extinction and attenuation laws–at either low-z or high-z–here we use the new extensive far-IR datasets and UV datasets in the COSMOS field to explore dust attenuation in dusty starburst galaxies out to z 3.5 and understand how/if they differ from normal 'main sequence' galaxies. We find that attenuation is substantially enhanced as a function of galaxies' star formation rate (and NOT specific star formation rate), whereby galaxies in excess of 50Msun/year deviate significantly from the local dust attenuation curve (Meurer+99, Calzetti+); the deviation itself is a clear function of star formation rate. This observation could have significant implications for predictions of dust obscurations and the cosmic SFRD in the early Universe (z¿4).