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Presentation Requested: oral

Category: Evolution of the Interstellar Medium and Star formation over Cosmic Time Question: Is there a common Schmidt-Kennicutt law at all redshifts and all scales? How is this "law" affected by different measurement limitations or conversion factors from tracer molecules or emission / absorption lines to amounts of gas and SFR?

Resolving the star formation in a z=4 starburst

While it is evident that SMGs host the largest starbursts in the known Universe ($\sim 10^3 \text{ M}_{\odot} \text{ yr}^{-1}$), this knowledge is largely based on integrated, not spatially-resolved measurements. Using the PdBI's newly-commissioned Band 4, we have recently obtained high-resolution observations of the rest-frame FIR continuum emission in the unique z=4 submillimeter galaxy GN20. The newly-acquired data resolve the obscured star formation on the same scales as the molecular gas ($\sim 1 \text{ kpc}$), allowing us to determine the detailed morphology, star formation rate surface densities, and spatially-resolved Kennicutt-Schmidt relation in a galaxy just 1.6 Gyr after the Big Bang. By allowing us to directly link the star forming regions to the underlying cold gas reservoir, this unique dataset will help pave the way for future studies of high-z star formation in the ALMA era.