Chelsea Sharon (Cornell University, postdoc)

Dominik Riechers (Cornell University) Andrew Baker (Rutgers University) Amitpal Tagore (Rutgers University) Jesus Rivera (Rutgers University) Charles Keeton (Rutgers University)

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?

Evaluating the Excitation Dependence of the Integrated and Resolved Schmidt-Kennicutt Relations at High Redshift

Comparing the Schmidt-Kennicutt relation for high-redshift galaxies to that for local galaxies has been complicated by several factors including differences in line excitation for the molecular gas tracer and a lack of spatially resolved mapping at high redshift. For high-redshift galaxies, most CO detections are of mid-J lines, which are predicted to produce a flatter index in the Schmidt-Kennicutt relation than the index produced using the low-J CO lines commonly observed in local galaxies. I will present Jansky Very Large Array observations of CO(1–0), the best tracer of the total molecular gas reservoir, in a new larger sample of high-redshift galaxies with existing mid-J CO detections that allows us to examine the potential excitation bias in the integrated Schmidt-Kennicutt relation. In addition, I will present spatially resolved multi-J CO observations of a UV-bright $z \sim 2$ star-forming galaxy (which will also be observed with ALMA) for which we can evaluate the true surface density version of the Schmidt-Kennicutt relation.