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Presentation Requested: poster
Category: Environment, Large Scale Structure and Galaxy Evolution
Question: How has (or how will) ALMA (with other telescopes) help us better understand the impact of the environment on galaxy evolution? Can ALMA or one of the other new facilities detect the gas in the large scale structure, outside of galaxies? What can we learn from dwarf galaxies or galaxies in clusters and groups in the nearby Universe using ALMA + other facilities & how has this helped us understand galaxy evolution at higher redshifts?

Dusty Starbursts within a z=3 Large Scale Structure

The SSA22 field is known for having a remarkable overdensity of various galaxies at z=3.1 such as Lyman-alpha emitting galaxies (LAEs), Lyman break galaxies (LBGs), and Distant red galaxies (DRGs). In this field, a 1.1 mm imaging survey taken with the AzTEC camera on the Atacama Submillimeter Telescope Experiment (ASTE) was carried out. We imaged a 950 arcmin^2 field down to a $1sigma$ sensitivity of 0.7–1.3 mJy/beam to find 125 submillimeter galaxies (SMGs) with a signal to noise ratio ge 3.5. Counterpart identification using radio and near/mid-infrared data was performed and photometric redshifts of identified objects were estimated. By combining these estimation with estimates from the literature, we found that eight SMGs might lie within the central 12 Mpc $times$ 12 Mpc (co-moving) region of the large-scale structure at $z = 3.1$. These results indicates that the SMGs were formed and evolved selectively in the high dense environment of the high redshift universe. High resolution ($sim0.5^{primeprime}$) and high sensitivity ($1sigma sim 0.1$ mJy) follow-up observations at 1.1 mm have been carried out using ALMA Band 6 for 45 SMGs.