

ALMA2019: Science Results and Cross-Facility Synergies



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The first large, unbiased ALMA survey of CO at parsec resolution in the Small Magellanic Cloud

Thursday, October 17, 2019 9:40 AM (15 minutes)

Contributed Talk

Abstract:

The Small Magellanic Cloud (SMC) at only 1/5 solar metallicity is the only galaxy near enough to study the effect of a low metallicity environment on the physics of star formation and the ISM on small spatial scales. Understanding the effects of low metallicity is crucial for understanding galaxies in the early universe and the evolution of galaxies over cosmic time. Initial ALMA observations in the SMC show similar compact CO clumps (Jameson et al. 2018), but only small areas targeting specific star-forming regions have been mapped to date and we lack a statistically significant sample of the CO structure throughout the galaxy. We used ALMA in ACA standalone mode to map a 1.0 deg x 0.5 deg (~1 kpc x 500 pc) area of the Southwest Bar of the SMC at ~6.5" resolution and cover an unprecedented range in size scales from ~1.5 pc to 1 kpc. Our new map shows previously undetectable small (~ pc) molecular gas clumps, similar to what is seen in WLM (Rubio et al. 2015) and NGC 6822 (Schruba et al. 2017), but across a much larger scale. I will discuss the properties of the CO-emitting gas and how it compares to the HI gas from our new ATCA HI absorption survey and GASKAP HI map and what that reveals about the atomic-to-molecular transition at low metallicity.

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Session Classification: Galaxies