

From Interstellar Ices to Polycyclic Aromatic Hydrocarbons

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The PAHs and Ices of Young Stellar Objects in the Magellanic Clouds

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The Spitzer SAGE and Herschel HERITAGE photometric surveys of the Large and Small Magellanic Clouds (LMC, SMC, Meixner et al. 2006, Gordon et al. 2011 and Meixner et al. 2013) resulted in the discovery of thousands of massive young stellar objects (YSO). The Spitzer SAGE-spectroscopic project (Kemper et al. 2010) collected 5-35 micron spectra of hundreds of young stellar objects at sub-solar metallicity in the LMC ($\sim 0.5 Z_{\odot}$) and SMC ($\sim 0.2 Z_{\odot}$). These spectra revealed a mix of PAH features, ice features as well as ionized and molecular gas line features. I will review the results on the infrared spectroscopy of the LMC and SMC YSOs. Is the dust content and ice composition of young stellar objects modified by the lower metallicity and high radiation fields found in the Magellanic Clouds? The JWST instruments will have an angular resolution at least 10 times better than Spitzer with hundreds or more times better sensitivity. This new capability in the 0.6 to 28 μm range will allow detailed studies of star formation regions at the 0.05 pc scale size which is comparable to Galactic studies. I will discuss possible programs with JWST MIRI and NIRSpec spectroscopic followup of the dusty environments of YSOs in the Magellanic Clouds. The best regions for JWST followup will have been investigated with Herschel, Spitzer, ALMA, and HST such as 30 Doradus, NGC 602, N159, and NGC 346.

REFERENCES

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