Investigating the Properties of the Interstellar Medium Near Massive Star Forming Regions

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We are conducting a survey of several regions of high-mass star formation to assess their content and structure (Allen et al. 2005). The observations include Spitzer observations, ground-based optical and near-IR imaging surveys, and optical and IR spectra of objects and locations in the molecular clouds. The goal of the survey is to gain a better understanding of the processes involved in high mass star formation by determining the characteristics of the stars detected in these regions, and investigating the properties of the interstellar medium (ISM) environment in which these stars form. The ISM in massive star forming regions contains different dust populations and states of gas (molecular, neutral, and ionized).

We present IRS spectra of several locations in the molecular cloud surrounding AFGL 4029. Strong emission from the PAH bands at 6.2, 7.7, 8.6, and 11.3 μm is detected at all locations, as well as emission from [Ne II] at 12.8 μm. The spectra are being utilized to investigate the chemistry and evolution of the HII and photodissociation regions in the cloud, and in particular to study the photochemical evolution of macromolecules and carbonaceous grains.

References

Allen, L. E., Hora, J. L., Chavarria, L. A., & Fazio, G. G., 2005, this conference