Recent Advances in Our Understanding of the Molecular Complexity in Astronomical Environments.

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Over the past several years, observations of a variety of astronomical environments has led to the detection and characterization of new molecular species as well as to a better understanding of the physical and chemical conditions of these regions. Molecular material is now found in a host of Galactic and extragalactic environments and has been used as tracers of a variety of conditions including but certainly not limited to, PDRs, XDRs, shocks, diffuse gas, dense gas, HMCs and UC HII regions. In the era of large single dish telescopes and broadband interferometric arrays, we are truly getting a chemical picture of the universe. This presentation will look at the recent advances our team has made in the detection of new astronomical molecules and how these new detections are driving better and more complex theories of large molecule formation in astronomical environments. Included in this presentation will be the first astronomical observation of a chiral molecule detected towards the high mass star forming region SgrB2N [1]. Figure 1 shows the detection of propylene oxide (CH3CHCH2O) (reproduced from [1])

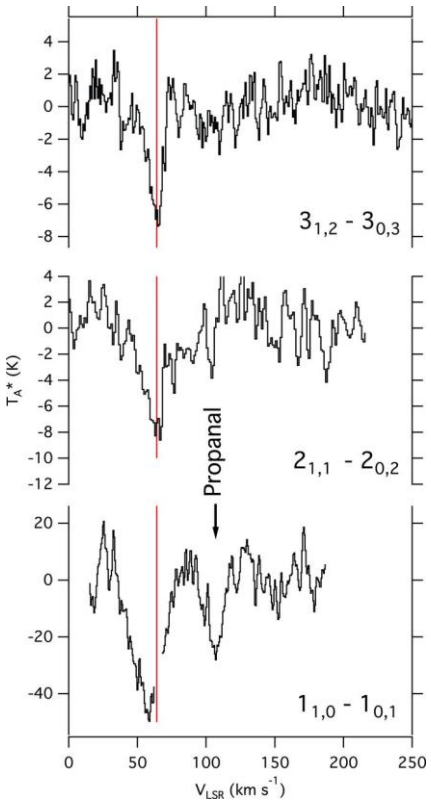

Figure. 1: Observations of the 1(1,0) – 1(0,1) (Parkes), 2(1,1) – 2(0,2) (GBT), and 3(1,2) – 3(0,3) (GBT) transitions of propylene oxide, in absorption, toward the Galactic center.

References

[1] McGuire et al. 2016, Science, 352, 6292, 1449