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Evolution and Kinematics of Molecular gas in the Central Molecular Zone of the Galactic Center

Molecular gas in the central 200 parsecs of the Milky Way galaxy exhibits more extreme physical characteristics (e.g., higher density, warmer gas) than gas in the Galactic disk. Recent detailed surveys of this Central Molecular Zone (CMZ) of the galaxy have revealed a large-scale morphology that indicates that molecular clouds are likely to be organized in an orbital structure around the dynamical center, Sgr A*. However, modeling the locations and velocities of molecular clouds in the CMZ is challenging because the velocity structure of the ISM is complex. Spectral line profiles of molecular clouds in the CMZ region frequently show multiple peaked structure, indicating multiple components along the same line-of-sight.

To better connect observations to the proposed orbital models, I have made observations of several regions in the CMZ where the interstellar and kinematic environment is particularly complex. In my talk I will explore feedback effects of a massive stellar cluster on an adjacent molecular cloud. Using VLA observations of the molecular and ionized gas in this region, I will discuss how massive star clusters can drive the complex kinematics in this region. As part of the discussion, I will utilize a variety of interstellar tracers to provide localized consistency checks and additional information for future orbital models.