Dark Gas in the Interstellar Medium

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Overview

Most of the interstellar material in disk galaxies, including our own, is too warm and tenuous to form new stars. Yet somehow, clouds cold and dense enough to collapse under their own gravity occasionally coalesce. This mysterious process is enabled by the gas changing from predominantly free atoms to molecules that enhance radiative cooling. Molecular association is not directly observable, and the gas itself is often "dark" to standard probes like spectral line emission from neutral atomic hydrogen or carbon monoxide (hydrogen molecules do not radiate when cold, as they are symmetric and lack rotational transitions). But under the right circumstances, this dark gas can be revealed, e.g., as opaque hydrogen emission or absorption, or as infrared continuum radiation from dust grains mixed with hidden molecular hydrogen. We have mapped tracers of such gas over large areas of the Galactic disk at high resolution. We find dark gas clearly revealed in many areas. We present maps of sample features and discuss our ongoing investigation.

References


For more information, see physics.wku.edu/~gibson

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