

# Imaging CO Snowline in Protoplanetary Disks

The condensation fronts, or snow lines, of major volatiles like water and carbon monoxide (CO) in protoplanetary disks play a crucial role in planet formation and composition. Observing CO snow lines directly is challenging due to vertical and radial temperature gradients that keep CO gas in the warm layers above the disk midplane, even beyond the midplane snow line. In this talk, I will present methods for constraining the CO snow line location using multi-transition observations of CO isotopologues and  $\text{N}_2\text{H}^+$ , a molecule that marks regions where CO has frozen out. Using data from the Atacama Large Millimeter/Submillimeter Array (ALMA), I will demonstrate how the vertical thickness of the isothermal layer near the disk midplane influences the CO column density profile, producing a sharp snow line transition. I will also discuss models and simulations for the Next Generation Very Large Array (ngVLA), which will enhance sensitivity and resolution, allowing for the study of CO snow lines across a larger population of disks.

**Monday, November 18th**

2:30 - 3:30 p.m.

725 Commonwealth Ave | Room 502

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