

## Technical Page

This proposal has not been submitted before.

Proposal Type: Regular  
 General Category: Astronomy  
 Observation Category: Galactic  
 Total Time Requested: 62 h Hours  
 Minimum Useful Time: 2 h

**Proposal Title:** Probing Dark Gas and Cloud Chemical Evolution toward Transition Clouds

*ABSTRACT:*

Results from dust observations of Planck all-sky mission and gamma-ray observations of Energetic Gamma Ray Experiment Telescope (EGRET) have revealed the existence of "CO dark molecular gas" (DMG) - molecular gas without CO emission. CH is a precursor species leading to CO formation. CH column density is predicted to vary linearly as molecular hydrogen (H<sub>2</sub>) column density. We propose CH emission/absorption toward 21 Millennium sources to derive CH physical properties including excitation temperature and column density. Then we propose to observe 9 DMG clouds, selected from our combined analysis of GOTC+ C+ emission and HI self-absorption, to derive CH abundances in DMG clouds with different physical environments. The knowledge we gain from this program could potentially help reveal CH physical properties and establish CH along with ionized carbon as tracers of DMG in diffuse molecular cloud.

| Name        | Institution  | E-mail            | Phone                | Student |
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### Remote Observing Request

- Observer will travel to AO
- Remote Observing
- In Absentia (instructions to operator)

### Instrument Setup

S-high

**Atmospheric Observation Instruments:**

**Special Equipment or setup:** none

**RFI Considerations**

**Frequency Ranges Planned**

3325-3355