Proposal Identification No.: A Date Received: 2019-Mar-07_12:37:55

Arecibo Observatory

William E. Gordon Telescope

Observing Time Request

COVER SHEET

Section I - General Information

Submitted for Sep 1 2019.

This proposal has not been submitted before.

Proposal Type:	Regular
General Category:	Astronomy
Sub-Category:	Spectroscopy
Observation Category:	Galactic
Time Requested this semester:	15h
Hours Next Semester:	0
Hours already used for this project:	0
Additional Hours required to complete project:	0
Minimum Useful Time:	3
Expected Data Storage:	less than 100 GB

Proposal Title: A Survey for CH Emission in Molecular Outflows towards Extended Green Objects

ABSTRACT:

Outflows and jets are widespread phenomena in astrophysics, which make them an invaluable tool to explore the nature of central engines, from AGNs to protostars. We propose to explore the use of CH as a tracer of shocks and outflows in a sample of 44 high-mass star forming regions with evidence of outflows from 4.5 micron excess in IRAC Spitzer images, i.e., EGO sources. The S-band CH transition is a well known tracer of the interface between molecular and atomic gas in the ISM, and thus, could be a useful probe of the interface between atomic and molecular gas in outflows. In addition, this project will allow us to detect the atomic-molecular transition of the natal clouds where high-mass stars are forming.

Outreach Abstract:

Las estrellas de mayor masa en nuestra Galaxia tienen masas de mas de 8 veces la masa del Sol. Estas estrellas terminan sus vidas en tremendas explosiones de supernova que enriquecen el medio interestelar con elementos pesados como el hierro. Durante la formacion de estas estrellas masivas se generan chorros de gas molecular. En este proyecto, estamos usando el Telescopio de Arecibo para detectar radiacion de una molecula simple (CH) que podria ser generada en flujos moleculares. La deteccion y caracterizacion de esta molecula va a permitir estudios del proceso de formacion de este tipo de estrellas.

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This work is not part of a thesis.

Remote Observing Request

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

Section II - Time Request

The following times are in LST.

For these observations night-time is preferred.

Begin – End Interval–Interval	Days Needed at This Interval
17:30 – 20:30	2
18:00 – 21:00	3
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Time Constraints (Must Be Justified in the Proposal Text)

No strong restrictions, as long as the observations are not scheduled at sunset or sunrise to minimize gain changes. Ideally the first run could be scheduled a few days before the other four runs, to have time to trouble-shoot any unexpected problem.

Section III - Instruments Needed

S-high

Atmospheric Observation Instruments:

Special Equipment or setup: none

Section IV - RFI Considerations

Frequency Ranges Planned

3260 - 3360, specifically:

3263.794 MHz, CH lower satellite line
3335.481 MHz, CH main line
3349.193 MHz CH upper satellite line
3326.98738 MHz H125a

Section V - Observing List

Target List

see science justification