

Arecibo Observatory
 William E. Gordon Telescope
 Observing Time Request
 COVER SHEET

Section I - General Information

Submitted for Sep 1 2013.

This proposal has not been submitted before.

Proposal Type:	Regular
General Category:	Astronomy
Observation Category:	Extragalactic
Time Requested this semester:	22
Hours Next Semester:	10
Hours already used for this project:	
Additional Hours required to complete project:	
Minimum Useful Time:	3 hours
Expected Data Storage:	less than 100 GB

Proposal Title: The Baryonic Content of Extremely Low Mass Galaxies

ABSTRACT:

We propose continued HI observations of low mass galaxies to better quantify the galaxy mass function. At low masses, the mass function is related to the small-scale matter power spectrum. We focus here on isolated low mass galaxies, which are less affected by environmental processes as compared to similar galaxies in the Local Volume. In 2014A, we observed 61 isolated low mass galaxies with Arecibo with masses between 40-60 km/s, tripling the number of observations in this mass regime. We have determined that even isolated galaxies display significant scatter in their gas mass to stellar mass ratio and the Tully-Fisher relation as compared to more massive galaxies. The proposed observations will better constrain the scatter in the observed scaling relations and allow a more robust estimate of the baryonic and the dynamical masses. We request 32 hours of L-band observing to expand our isolated galaxy sample to lower masses.

Outreach Abstract:

The current accepted cosmological model makes detailed predictions for the relative number of large and small galaxies. The number of small galaxies surrounding the Milky Way is far lower than predicted by this model. However, the Milky Way itself may be responsible for reducing the number of satellites around it. By contrast, we have identified a large sample of isolated small galaxies. Isolated small galaxies are less affected by their surrounding environment and require fewer assumptions when comparing to theoretical models. We will determine the total masses of these isolated small galaxies using neutral hydrogen observations with Arecibo in order to test our current cosmological model.

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This work is part of a PhD 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 required.

Begin – End Interval–Interval	Days Needed at This Interval
7:00 – 18:00	2
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Time Constraints (Must Be Justified in the Proposal Text)

Observing must be at night to avoid standing waves (see proposal). We prefer the targets between 7:00 and 18:00 LST to be scheduled for two consecutive days.

Next Semester Time Request

Begin – End Interval–Interval	Days Needed at This Interval
21:30 – 3:00	1
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Time Constraints (Must Be Justified in the Proposal Text)

Observing must be at night to avoid standing waves (see proposal). The third day with targets between 21:30 and 3:00 LST may be split up into chunks of 3 hours over a flexible range of dates when these targets are up at night.

Section III - Instruments Needed

L-wide

Atmospheric Observation Instruments:

Special Equipment or setup: none

Section IV - RFI Considerations

Frequency Ranges Planned

1425 - 1445

Section V - Observing List

Target List

See proposal for target list.