Section I - General Information

Submitted for Sep 1 2013.

This proposal has been submitted before.

The previous proposal number is A2757.

Proposal Type: Commensal
General Category: Astronomy
Sub-Category: Spectroscopy
Observation Category: Galactic
Time Requested this semester: 0 (commensal observing only)
Hours Next Semester: 0 (commensal observing only)
Hours already used for this project: 1030
Additional Hours required to complete project: 650
Minimum Useful Time: 1h
Expected Data Storage: less than 100 GB

Proposal Title: SIGGMA: Survey of Ionized Gas in the Galaxy, Made with Arecibo

ABSTRACT:

A key aim of the GALFA consortium is to provide legacy data sets that are more extensive than those achievable by a small group of investigators, and that are rich enough to provide a wide range of science well beyond that envisioned by the proposers. We propose to create the most extensive radio recombination line (RRL) survey ever made. Our Survey of Ionized Gas in the Galaxy, Made with Arecibo (SIGGMA) will fully sample the entire Galactic plane observable from Arecibo Observatory in the set of RRLs that fall in the bandpass of the ALFA receiver. RRLS provide a wide range of critical information on the physical state of ionized interstellar gas that is generally not obtainable through other observational means. We will use these data to identify new HII regions, compute HII region electron temperatures, investigate photodissociation region physics with carbon RRLs, and investigate the origin of the warm ionized medium.

Outreach Abstract:

When gases get really hot they can turn into a plasma, which has different properties from normal gases. Our survey with the Arecibo telescope will directly trace this plasma in the Milky Way, providing insight into the origins and the physics of this state of matter in our Galaxy. More detailed information is available on the SIGGMA website, at http://www.naic.edu/~siggma.

<table>
<thead>
<tr>
<th>Name</th>
<th>Institution</th>
<th>E-mail</th>
<th>Phone</th>
<th>Student</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loren D Anderson</td>
<td>West Virginia Univer-</td>
<td><a href="mailto:loren.anderson@mail.wvu.edu">loren.anderson@mail.wvu.edu</a></td>
<td>304-293-4884</td>
<td>no</td>
</tr>
<tr>
<td>Robert F Minchin</td>
<td>Arecibo Observatory</td>
<td><a href="mailto:rminchin@naic.edu">rminchin@naic.edu</a></td>
<td>787-878-2612 x283</td>
<td>no</td>
</tr>
</tbody>
</table>
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.

<table>
<thead>
<tr>
<th>Begin – End</th>
<th>Days Needed at This Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>–</td>
<td>–</td>
</tr>
</tbody>
</table>

Time Constraints (Must Be Justified in the Proposal Text)

Observation in the inner Galaxy are commensal with PALFA and are detailed in their request; we note that SIGGMA can only use night time observations. Observation in the outer Galaxy are commensal with ALFAZOA and are detailed in their request.

Next Semester Time Request
**Time Constraints (Must Be Justified in the Proposal Text)**

Observation in the inner Galaxy are commensal with PALFA and are detailed in their request; we note that SIGGMA can only use night time observations. Observation in the outer Galaxy are commensal with ALFAZOA and are detailed in their request.

**Section III - Instruments Needed**

**ALFA**

Atmospheric Observation Instruments:

**Special Equipment or setup:** none

**Section IV - RFI Considerations**

**Frequency Ranges Planned**

1225 - 1525

This proposal requires coordination with Punta Salinas radar within the band 1222-1381 MHz.

This proposal requires coordination with GPS L3 at 1381 MHz.

**Section V - Observing List**

**Target List**

Outer Galaxy: 175 < l < 207, -2 < b < 1 (commensal with ALFAZOA)

Inner Galaxy: 30 < l < 75, -2 < b < 2 (commensal with PALFA)