Section I - General Information

Submitted for Sep 1 2014.

This proposal has been submitted before.

The previous proposal number is P2650.

Proposal Type: Regular
General Category: Pulsars
Observation Category: Galactic
Time Requested this semester: 24
Hours Next Semester: 24
Hours already used for this project: 120
Additional Hours required to complete project: 0
Minimum Useful Time: 1
Expected Data Storage: 100-500 GB

Proposal Title: Long Term Timing of PSR J0348+0432: A Unique and Powerful Laboratory for Extreme Gravity and super-dense matter

ABSTRACT:

We propose to continue long-term timing of the relativistic binary pulsar system J0348+0432, with the goal of improving our precision measurement of the decay of the orbital period from gravitational wave emission. The pulsar has a light WD companion and a mass of 2.01+/-.04 solar masses. According to some theories of gravity, the large difference in the compactness of these objects and the tight 2.46-hr orbit should cause significant emission of dipolar gravitational waves. Our measurement of the orbital decay is, however, in such good agreement with the predictions of general relativity that we now (August 2014) have the most constraining test ever of Scalar-Tensor theories of gravity. Continued Arecibo timing will improve the precision of our orbital decay measurements and yield a more precise mass measurement for this pulsar.

Outreach Abstract:

<table>
<thead>
<tr>
<th>Name</th>
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<th>E-mail</th>
<th>Phone</th>
<th>Student</th>
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This work is not part of a thesis.

Remote Observing Request

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

Section II - Time Request

The following times are in LST.

For these observations night-time is not needed.

<table>
<thead>
<tr>
<th>Begin – End Interval–Interval</th>
<th>Days Needed at This Interval</th>
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<tbody>
<tr>
<td>02:46 – 04:46</td>
<td>12</td>
</tr>
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</table>

Time Constraints (Must Be Justified in the Proposal Text)

Observations should be scheduled every 15 +/- 3 days.

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

Observationbs should be scheduled every 15 +/- 3 days.

### Section III - Instruments Needed

**L-wide**

Atmospheric Observation Instruments:

**Special Equipment or setup:** none

### Section IV - RFI Considerations

**Frequency Ranges Planned**

1130-1730

This proposal requires Iridium RFI protection at 1612 MHz between 10pm and 6am EST.

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**

J0348+0432 Pulsar 03:48:43.6 04:32:11.5 02:51 04:46