

Technical Page

Proposal Type: Urgent
 General Category: Pulsars
 Observation Category: Galactic
 Total Time Requested: 24 Hours
 Minimum Useful Time: 20 minutes

Proposal Title: Timing PSR J0348+0432: A fantastic, new gravitational laboratory

ABSTRACT:

We have discovered a new binary pulsar, PSR J0348+0432, that promises to yield spectacular results for studies of gravity and the behavior of super-dense matter. It could be, by far, the most massive neutron star known; optical data provide an amazing - although preliminary - estimate of 2.4 solar masses; this would have fundamental implications for our understanding of neutron stars. Furthermore, it will also provide the most restrictive limits ever on alternative theories of gravity - its orbital period is 2.4 hours, so we will be able to detect the orbital decay within a couple of years or so if we time the pulsar with Arecibo. We are planning to submit a regular proposal for timing this object during the June 1 deadline. However, the measurement of the orbital decay increases very fast with time, so starting the timing now will allow us to find the best receiver to time this pulsar and greatly anticipate the date of detection of the orbital decay. Apart from providing a precise test of general relativity, the orbital decay in this system will independently confirm the high mass now being estimated from the optical data.

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Remote Observing Request

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

Instrument Setup

L-wide S-low

Atmospheric Observation Instruments:

Special Equipment or setup: none

RFI Considerations

Frequency Ranges Planned

1120-1660

1950-2350

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.