Technical Page

Proposal Type:	Regular
General Category:	Pulsars
Observation Category:	Galactic
Total Time Requested:	33 Hours
Minimum Useful Time:	1.00 hr

Proposal Title: Refined Relativistic Orbital Elements and Mass Measurements for Two Neutron Stars

ABSTRACT:

Arecibo observations of the pulsar–white-dwarf binaries J0621+1002 and J0751+1807 have yielded measured relativistic precession (J0621+1002), orbital decay due to gravitational radiation emission (J0751+1807), and Shapiro delay (J0751+1807). Relativistic and Keplerian orbital elements constrain these neutron stars to have masses 1.53+0.10-0.20 and 1.26+-0.014 solar masses, respectively (68 percent confidence). These mass measurements are among the very few constraints available on the equation of state of nuclear matter at high densities, and it is crucial that the uncertainties in the measurements be reduced. It has been several years since either of these pulsars has been observed at Arecibo. In this program, we will observe a full orbit of each pulsar in order to increase the precision of the relativistic orbital elements and to refine the derived mass values.

Name	Institution	E-mail	Phone	Student
David J Nice	Lafayette College	niced@lafayette.edu	610-330-5204	no

Remote Observing Request

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

Instrument Setup

430 G L-wide

Atmospheric Observation Instruments:

Special Equipment or setup: none

RFI Considerations

Frequency Ranges Planned

420-440 MHz
1120-1700 MHz

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

This proposal requires coordination with GPS L3 at 1381 MHz.