

## Technical Page

This proposal has not been submitted before.

Proposal Type: Director Discretionary Time  
 General Category: Pulsars  
 Observation Category:  
 Total Time Requested: 7.5 Hours  
 Minimum Useful Time:

**Proposal Title:** A Radio Pulsar with a Two-Minute Orbiting Companion??

*ABSTRACT:*

Pulsar B1859+07 has long been known to show ‘swooshes’ – that is, strange changes in its emission where the longitude of emission moves forward over a few pulses, stays there for 10-20 pulses and then returns to its original longitude. We have now shown that these changes exhibit a rough periodicity of about 150 rotation periods or some 100 seconds. We explore the shocking possibility that the ‘swooshes’ are produced by an orbiting companion – perhaps a white-dwarf core – orbiting a pulsar every several minutes. Moreover, a tidal theory to explain these effects is being developed in collaboration with a Chinese theory group. The ‘swooshes’ show secular changes, so we need to follow up with new observations. Please see the attached paper. We request time for one additional rise-to-set observation of B1859+07 as well as other time to finish up a nearly completed large project for publication.

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### Remote Observing Request

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

### Instrument Setup

L-wide 327

### Atmospheric Observation Instruments:

**Special Equipment or setup:** none

## **RFI Considerations**

### **Frequency Ranges Planned**

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.