Proposal Identification No.: R2081  
Date Received: 2005-Feb-01 19:48:10

Technical Page

Proposal Type: Regular  
General Category: Planetary Radar  
Observation Category: Solar System  
Total Time Requested: 11 Hours

**Proposal Title:** Dynamical and Physical Characterization of Sun-Earth Horseshoe Orbit Asteroid 54509 (2000 PH5)

**ABSTRACT:**

We request 11 hours of Arecibo Planetary Radar time to study asteroid 54509 (2000 PH5), the only object on a Sun-Earth horseshoe orbit suitable for detailed physical characterization using radar. These observations of the oddly-shaped 120 to 180-m diameter object will build upon those made in July 2001 using the Goldstone radar and July 2004 using the Arecibo radar. The target will be at a different aspect angle in July 2005 than it was in July 2004 meaning bandwidth measurements will further constrain the location of the target’s spin pole. Having an accurate spin vector orientation will aid in the modeling of 2000 PH5’s shape and examining 2000 PH5’s Yarkovsky evolution. Precise ranging measurements will be used to measure the Yarkovsky drift of 2000 PH5’s orbit and provide constraints on its mass and thermal properties.

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<tr>
<th>Name</th>
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**Service Observing Request**  
**Remote Observing Request**

- X None
-   All of the observing run.
-   Part of the observing run.
-   Queue Observing

- X No
-   Maybe
-   Yes

**Instrument Setup**

- S-Band radar
- S-band receiver

**Atmospheric Observation Instruments:**

**Special Equipment or setup:** none

**RFI Considerations**
Frequency Ranges Planned