

Technical Page

This proposal has not been submitted before.

Proposal Type: Large
 General Category: Pulsars
 Observation Category: Galactic
 Total Time Requested: 130 Hours
 Minimum Useful Time: 30 minutes

Proposal Title: An Improved Single-Source Detector for the North American Nanohertz Observatory for Gravitational Waves

ABSTRACT:

The North American Nanohertz Observatory for Gravitational Waves (NANOGrav) is a collaboration of scientists and students that uses many radio pulsars as a type of Galactic-scale detector in an effort to be the first to directly detect gravitational waves (GWs). The current NANOGrav observing program is optimized for the detection of a stochastic background of GWs from unresolved sources in the Universe, but not robust for the detection of resolvable, individual GW sources. In this proposal, we request an increased observing cadence for five of the best-timed NANOGrav pulsars in an effort to boost our sensitivity to individual GW sources as shown in recent studies and simulations described in the accompanying text. These measurements will be crucial for understanding largely unconstrained astrophysical processes influencing the population of potential GW sources, such as merging supermassive black-hole binary systems.

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Remote Observing Request

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

Instrument Setup

430 G L-wide S-low

Atmospheric Observation Instruments:

Special Equipment or setup: We will also continue to use the PUPPI data acquisition system currently operating at Arecibo Observatory for high-precision, real-time measurements of TOAs from each pulsar.

RFI Considerations

Frequency Ranges Planned

420-440

1150-1800

1700-2400

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

This proposal requires coordination with GPS L3 at 1381 MHz.