

Technical Page

Proposal Type: Large
 General Category: Pulsars
 Observation Category: Extragalactic
 Total Time Requested: 1323 Hours
 Minimum Useful Time: 4

Proposal Title: The North American Nanohertz Observatory for Gravitational Waves

ABSTRACT:

Direct detection of gravitational waves (GW) is a major goal in experimental physics and will open an entirely new astronomical spectrum. Precision pulsar timing stands an excellent chance of being the first method to accomplish this feat. Combining data from many objects into a Pulsar Timing Array (PTA) makes GW detection possible. Long timing baselines (5–10 years) dramatically improve GW sensitivity. Increasing the number of pulsars in the array also improves sensitivity, and the past several years have seen a unexpected number of new millisecond pulsars discovered. New instrumentation for pulsar timing now provides an order of magnitude more bandwidth than previous instruments. In this large proposal, we request time to continue and expand our ongoing PTA project over the next three years, taking advantage of all these improvements. These results will provide the best GW sensitivity yet achieved, and the results will significantly constrain the astrophysics of GW sources.

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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 327

Atmospheric Observation Instruments:

Special Equipment or setup: ASP, PUPPI, and WAPP pulsar backends. ASP is the primary instrument for year 1. After that time, PUPPI will be the primary instrument. See text for details.

RFI Considerations

Frequency Ranges Planned

310-350

420-440

1100-1800

1800-2400

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

This proposal requires coordination with GPS L3 at 1381 MHz.