

Abstract Submitted
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The NANOGrav Pulsar Timing Array Observing Program¹

DAVID NICE, Lafayette College, NANOGrav COLLABORATION — The North American Observatory for Nanohertz Gravitational Waves (NANOGrav) collaboration is fifteen years into a program of long-term, high-precision millisecond pulsar timing. Our goals are to detect and characterize nanohertz gravitational waves (i.e., periods of many years) by measuring their effect on observed pulse arrival times. We presently observe 79 pulsars at least once a month using Arecibo Observatory, the Green Bank Telescope, and the VLA. In addition, daily observations of these pulsars have recently begun with CHIME. We target pulsars with timing precision of $1 \mu\text{s}$ or better, and we achieve precision better than 100 ns in the best cases. Observing a large number of pulsars will allow robust measurement of gravitational waves via correlations in the timing of pairs of pulsars depending on their separation on the sky. We pool data from telescopes worldwide via the International Pulsar Timing Array (IPTA) collaboration, further increasing our sensitivity. We will summarize the observing program and data releases. We will describe new timing wideband techniques that will allow for increased efficiency in gravitational wave searches. We will report on synergistic results from our data set, including new measurements of a massive neutron star.

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