

Abstract Submitted
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The First 10 Years Of PTA Nanohertz Gravitational-Wave Astronomy¹ STEPHEN TAYLOR, Vanderbilt University, JOSEPH SIMON, NASA Jet Propulsion Laboratory / Caltech, NIHAN POL, West Virginia University, NANOGrav PFC COLLABORATION — Pulsar-timing Arrays (PTAs) such as NANOGrav (the North American Nanohertz Observatory for Gravitational waves) are expected to make a detection of the nanohertz stochastic gravitational-wave background (GWB) from a population of supermassive black-hole binaries (SMBHBS) within the next 3 - 7 years. This detection relies on the long-timescale monitoring of many millisecond pulsars to register the distinctive quadrupolar Hellings Downs spatial correlation signature. Given these estimates of the timeline to detection, the next step is to understand the scientific milestones that we will pass along the way to detection and beyond. We ask how long it will be until we can constrain features in the GWB strain spectrum. We forecast PTAs several decades beyond the present under different observing strategies, and investigate how well we can infer the shape and properties of the GWB spectrum, linking these properties to the astrophysics of the source population.

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