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Searching for New Physics with NANOGrav

Friday 30 June 2023 10:00 (30 minutes)

Pulsar timing array experiments aim to detect nHz-frequency gravitational waves using high-precision timing of millisecond pulsars. Of particular interest is a stochastic gravitational wave background (SGWB), which is expected to arise predominantly from a population of inspiraling supermassive black hole binaries, but there may also be contributions from exotic cosmological sources, such as inflation, first-order phase transitions, and topological defects. On behalf of the North American Nanohertz Observatory for Gravitational Waves (NANOGrav) collaboration, I will present the search for a SGWB using the latest NANOGrav data and show the results of our analyses for various early universe physics scenarios. I will also discuss searches for signatures of dark matter models that impart deterministic signals in the timing data.

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