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Probing The Nanohertz Gravitational-wave Landscape With Pulsar Timing Arrays: A Status Report

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Decade-length observation campaigns of millisecond pulsars offer the potential to probe the nanohertz band of gravitational-waves, where the dominant sources are supermassive black-hole binaries formed during massive galaxy mergers. With three major collaborations timing tens of these pulsars over many years, and on the verge of forging a combined dataset, I will review the most recent advances in the pulsar-timing search for gravitational-waves. Stringent constraints have allowed us to comment on the merger-rate of massive galaxies, and the mechanisms by which the final-parsec problem of massive black-hole binary evolution is mitigated. Detection is expected within 5-10 years, which will prove that the final-parsec problem is overcome for the most massive black-hole binaries, and will subsequently allow us to study the dynamical environments of these systems.

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