

Abstract Submitted  
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**Searching for GW signals from eccentric supermassive black-hole binaries with pulsar-timing arrays** STEPHEN TAYLOR, JPL/Caltech, JONATHAN GAIR, Institute of Astronomy, University of Cambridge, ELIU HUERTA, SEAN MCWILLIAMS, West Virginia University — The mergers of massive galaxies leads to the formation of supermassive black-hole binaries in the common merger remnants. Various mechanisms have been proposed to harden these binaries into the adiabatic GW inspiral regime, from interactions with circumbinary disks to stellar scattering. It may be the case that these mechanisms leave the binary with a residual eccentricity, such that the deviation to the time-of-arrival of pulsar signals induced by the emitted GW passing between the Earth and a pulsar will contain a signature of this eccentricity. Current pulsar-timing search pipelines only probe circular binary systems, but much effort is now being devoted to considering the influence of the binary environment on GW signals. We will detail our efforts in constructing a generalised GW search pipeline to constrain the eccentricity of single systems with arrays of precisely-timed pulsars, which may shed light on the influence of various supermassive black-hole binary hardening mechanisms and illuminate the importance of environmental couplings.

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