

# Gravitational waves from supermassive black holes at pulsar timing arrays

Inspiralling SMBH binaries constitute a natural explanation of the gravitational wave (GW) background discovered in pulsar timing array (PTA) data. In this talk, I will present a fast semianalytical computation of the expected GW background from SMBH binaries and discuss the SMBH fit to the PTA data that shows evidence of environmental effects or binary eccentricities. I will identify signatures that can be used to distinguish between these effects and to confirm whether the signal comes from SMBH binaries, and show how the PTA GW observations can be linked to the JWST observations of dual AGNs and little red dots. Finally, I will discuss potential ways to test dark matter properties through SMBH observations.

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