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Probing the Universe using Pulsar Timing Arrays

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Millisecond pulsars are extremely stable in their rotation. This stability provides very precise astrophysical timing measurements in the Galaxy. The Pulsar Timing Array (PTA) collaborations use this property to search for Gravitational Waves (GW). Last year, they reported evidence for the presence of a GW signal in their dataset. The main candidate for such a signal is a population of Super Massive Black Hole Binaries (SMBHB). The sum of their individual GW emissions would produce a stochastic Gravitational Wave Background (GWB) that could explain what is observed in the real data. This presentation will give a basic understanding of how PTAs work. Then, we will discuss the latest results that were obtained by the international collaborations and explore alternative explanations to the signal that is currently observed.

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