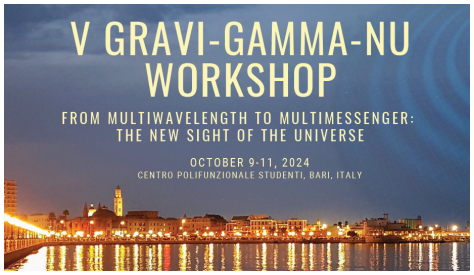

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Search for gravitational waves from individual supermassive black hole binaries in MeerTime data

Wednesday, 9 October 2024 15:30 (15 minutes)

Although the recent evidence presented by Pulsar Timing Arrays (PTAs) is that for a stochastic Gravitational Wave Background (GWB), which was most likely produced by the superimposition of several GW signals, simulations of the merger history of supermassive black hole binaries (SMBHBs) suggest a narrow possibility of the detection of some of the most massive or fortunately located individual Continuous Gravitational Wave (CGW) sources in the highest precision PTA datasets that are currently being generated. The detection of CGW sources in the nHz regime would confirm the existence of sub-parsec SMBHBs, can probe their dynamics and evolution history, as well as provide several tests of fundamental physics.

In this talk, I will present the results of a search for CGWs in the first 4.5 years of data from the MeerTime Pulsar Timing Array (MPTA), which consists of ultra-precise Time Of Arrivals (TOAs) from 88 Millisecond Pulsars (MSPs). In particular, I focus on searching for CGWs from known sources, building a catalog with the best sources from the literature to initiate a targeted search. MeerTime is a large survey project of MeerKAT, one of the most sensitive radio telescopes and a precursor to the Square Kilometer Array (SKA) in South Africa.

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