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TATA INSTITUTE OF FUNDAMENTAL RESEARCH

ICTS Astrophysics & Relativity Seminar (HYBRID)

Title : New black hole mergers from a search pipeline for gravitational waves with higher-order harmonics

Speaker : Digvijay Wadekar (Institute for Advanced Study, USA)

Date : Thursday, 24th August, 2023

Time : 11:00 AM (IST)

Abstract : Nearly all of the previous GW searches include waveforms with only the quadrupole mode (l,m)=(2,2), i.e., omitting higher-order modes such as (l,m)=(3,3),(4,4). We will show that a combination of post-Newtonian formulae and machine learning tools can be used to efficiently introduce higher-mode templates into a quadrupole-only search pipeline. This increases the sensitivity of the search to binary black holes (BBH) in the high mass regime and asymmetric mass-ratio systems. We also develop tools to downweight short-duration glitches in the IAS pipeline and further improve the search sensitivity to high-mass BBHs. Finally, we will discuss the detection of new BBH mergers in the LIGO-VIRGO O3 data with our improved search pipeline.

Venue : **Offline:** Madhava Lecture Hall (ICTS)

Online: Please click the below link to join the seminar

https://icts-res-in.zoom.us/j/88140692588?pwd=eUwrWGpyMWdyY3k2QkpaVUxnbjc5dz09

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