



## ICTS Ph.D Thesis Defense Seminar

**Title** : Exploring gravity, astrophysics, and cosmology with gravitational waves

**Speaker** : Aditya Vijaykumar (ICTS -TIFR, Bengaluru)

**Date** : Friday, 9<sup>th</sup> February 2024

**Time** : 3:30 PM (IST)

**Abstract** : Gravitational-wave (GW) astronomy has opened a whole new window of looking at the Universe, and has revolutionized our understanding of compact binary sources that these waves arise from. In this seminar, I shall explore a few possibilities of probing gravity, cosmology, and astrophysics using observations of GWs from current and future detectors. This will include 1) developing a method to place constraints on the time variation of the gravitational constant  $G$  using the detected LIGO-Virgo binary neutron star (BNS) mergers, 2) asking whether a BNS merger near a supermassive black hole (SMBH) could enable a detection of the elusive post-merger signal, 3) investigating how well we can measure the imprint of centre-of-mass acceleration on a GW signal, and 4) develop a method to measure the large-scale two-point correlation function using GW observations in proposed next-generation detectors, accounting for localization uncertainties and realistic merger rates.

**Venue** : Feynman Lecture Hall & Online

Zoom link: <https://icts-res-in.zoom.us/j/91370107548?pwd=R2JxenNjNjJleW9DS1kzbWhFOUxRZz09>

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