



ICTS

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TATA INSTITUTE OF FUNDAMENTAL RESEARCH

## **ICTS Thesis Defense Seminar**

- Title** : Prospects of Observing Gravitational Lensing of Continuous Gravitational Waves
- Speaker** : Aditya Kumar Sharma (ICTS-TIFR, Bengaluru)
- Date** : Tuesday, 15 July 2025
- Time** : 3:00 PM (IST)
- Abstract** : Rapidly spinning, non-axisymmetric neutron stars emit long-lived, nearly monochromatic gravitational waves (GWs). Some of these sources of continuous GWs (CWs) may lie favourably aligned behind the Galactic Supermassive Black Hole, Sgr A\*, resulting in gravitational lensing of their emitted signals. In this talk, we assess the detectability of such gravitationally lensed CWs with the upcoming third generation detector network, consisting of the Einstein Telescope and two Cosmic Explorers. These detections can serve as novel probes of the Galactic Center's properties, including independent measurement of the mass of Sgr A\*. We demonstrate how future observations of such lensed CWs can be used to infer the mass of Sgr A\*, and estimate the precision of this measurement. In favourable scenarios, we find that this method can be at par with the current electromagnetic observation measurements.
- Venue** : Online
- Zoom link: <https://icts-res-in.zoom.us/j/97617652280?pwd=BDP14GnyLZpMCUa63j7ArWyTHjEvXm.1>
- Meeting ID: 976 1765 2280
- Passcode: 151516