

TATA INSTITUTE OF FUNDAMENTAL RESEARCH

## **ICTS Postdoc/Graduate Student Seminar Series**

Title	:	Constraining the fraction of compact dark matter from lensing of gravitational waves
Speaker	:	Apratim Ganguly, International Centre for Theoretical Sciences - TIFR, Bangalore
Date	:	Friday, January 31, 2020
Time	:	11:30 am
Venue	:	Emmy Noether Seminar Room, ICTS Campus, Bangalore
Abstract	:	Massive astrophysical compact halo objects (MACHOs) are viable compact dark matter (DM) candidates, the presence of which in the interstellar medium will lead to lensing of electromagnetic (EM)/gravitational-wave (GW) signals. Various EM lensing searches have constrained the DM density fraction, f_DM, in the form of MACHOs better than f_DM < 10^(-5) in the mass range < 10^(-16) M_sun and > 10^5 M_sun. On the other hand, LIGO-Virgo detectors (10Hz < f < 100Hz) are well suited to probe MACHOs in the mass range 10 – 10^5 M_sun via GW lensing. The lensed lens waveform will have a frequency dependent magnification/demagnification in the wave-optics limit ( $\lambda_(GW) \sim R_(Sch)^{(lens)}$ ), which is true for MACHOs. In this talk, we will discuss how the search of lensing sig- nature in GW events observed by LIGO-Virgo can be used to put bet- ter constraints on f_DM

Note: This will be an ongoing biweekly seminar series (Fridays, 11:30 am) by the ICTS postdocs and graduate students