

ICTS Ph.D. Thesis Defence

- Title** : Testing general relativity using observations of gravitational waves from the inspiral, merger and ringdown of binary black holes
- Speaker** : Abhirup Ghosh, ICTS-TIFR, Bangalore
- Thesis Advisor** : Parameswaran Ajith
- Date** : Friday, January 25, 2019
- Time** : 2:30 PM
- Venue** : Emmy Noether Seminar Room, ICTS Campus, Bangalore
- Abstract** : The observation of gravitational waves (GWs) from eleven compact binary coalescences over the first two observing runs of the advanced LIGO-Virgo detectors, have firmly opened the field of GW astronomy. These observations, for the first time, have also allowed us to test Einstein's theory of general relativity (GR) in the strong-field dynamical regimes of gravity. The inspiral-merger-ringdown (IMR) consistency test, proposed in this thesis, was among the first strong-field tests of GR performed on an actual GW observation. It helped establish the consistency of the first LIGO event, as well as subsequent detections, with binary black hole (BBH) systems described in GR. In this talk we will discuss:
1. inferring properties of BBH systems from observations of GWs using a Bayesian formalism
 2. using that information to test GR within the framework of the IMR consistency test.
- We will present latest results of the test from LIGO-Virgo observations, as well as prospects with future GW detectors.