

## **ICTS Seminar**

- Title : The Rate of Compact Binary Mergers Inferred from LIGO-Virgo's First and Second Observing Runs
- Speaker : Shashvath Kapadia, University of Wisconsin Milwaukee, USA
- Date : Tuesday, January 1, 2019
- Time : 11:00 AM
- Venue : Emmy Noether Seminar Room, ICTS Campus, Bangalore
- Abstract : Estimating the rates of compact binary mergers from gravitationalwave (GW) data produced by the LIGO-Virgo network of ground based detectors is an important science target of the LIGO-Virgo collaboration (LVC), given that such rates could help inform the construction of models of stellar mass binaries. In this talk, we describe the Poisson-statistics-based formalism used to compute these rates. From data acquired during the first and second observing runs (O1 and O2) and analyzed by the GstLAL pipeline, we estimate posterior probability distributions on the astrophysical rates of mergers for three distinct classes of compact binaries, as well as assign source-specific probabilities of astrophysical origin to candidate events. We find the rate of binary black hole mergers and binary neutron star mergers, at 90% confidence, to be 9–100/Gpc^3/yr and 97–3140/Gpc^3/yr, respectively, and a 90% upper limit on the rate of neutron star black hole mergers to be 610/Gpc^3/yr.