ICTS | INTERNATIONAL CENTRE for THEORETICAL SCIENCES

TATA INSTITUTE OF FUNDAMENTAL RESEARCH

ICTS Astrophysics and Relativity Seminar

Title : Statistical and Collaborative Challenges in Multi-Messenger Astrophysics

Speaker : Galin Jones (University of Minnesota)

Date : Thursday, 22nd December, 2022

Time : 03:00 PM

Abstract : Multi-Messenger Astrophysics employs multiple messengers to study astrophysical and cosmological events and processes: light, gravitational waves, neutrino particles, cosmic rays, and gamma rays. The field is experiencing a substantial increase in data with more to come driven by new telescopes, gravitational-wave detectors, neutrino detectors, and gamma-ray detectors. This is prompting development of novel tools for data processing and analysis, including tools for machine learning and Bayesian statistical methods, among others.

The University of Minnesota is developing a novel interdisciplinary approach to addressing these challenges through teams of faculty and students from Statistics, Computer Science, Electrical Engineering, and Physics & Astronomy. I will consider some of the successes and challenges in taking such an approach, but the focus will be on statistical challenges and potential solutions. This will be illustrated with case studies on research projects involving (i) constraining the neutron star equation of state based on binary neutron star post-merger gravitational wave signals, (ii) a study of supernova siblings and the properties of the host galaxies, (iii) using observed kilonova candidates to inform ejecta quantities, and (iv) cross-correlation between stochastic gravitational wave backgrounds and the cosmic microwave background.

Venue : **Hybrid Mode**

Offline: Emmy Noether Seminar Room

Online: Please click on the below link to join the meeting

https://icts-res-in.zoom.us/j/87588442039?pwd=ZFAwYlJWTnN2SjVhM0RpN296b1J1QT09

Meeting ID: 875 8844 2039
Passcode: 223322