

ICTS Astrophysical Relativity Seminar

- Title** : Measuring the distribution of binary black hole spins
- Speaker** : Javier Roulet (UC SB, Santa Barbara)
- Date** : Wednesday, 10th August, 2022
- Time** : 11:30 am (IST)
- Abstract** : With over a hundred detections to date, the discoveries of compact binary mergers by gravitational wave observatories LIGO and Virgo have allowed us to start characterizing the astrophysical population of binary black holes. This task requires measuring the fifteen parameters (masses, spins, location, orientation, etc...) that characterize each merger event. However, these high dimensional distributions are challenging to describe due to the presence of nonlinear correlations and multiple modes. In this seminar I will describe a series of coordinate changes that, by identifying parameter combinations that control specific observable signatures in the data, remove these degeneracies and multimodality, making parameter estimation amenable. Among the new coordinates is a spin azimuth that can be measured surprisingly well in several cases, hinting that some black hole spins are misaligned with the orbit. This is very interesting because the degree of spin-orbit alignment is a robust discriminator between isolated and dynamical formation channels, which predict spins preferentially aligned with the orbit or randomly oriented, respectively. At the same time, I will show that the observed proportion of events with spins aligned versus anti-aligned with the orbit disfavors the hypothesis that the spin distribution is isotropic.

Venue : **Hybrid Mode**

Offline: Madhava Lecture Hall

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

<https://icts-res-in.zoom.us/j/83556423192?pwd=ODVOSIBxZk1YQW9zQUVvR29LWVRTUT09>

Meeting ID: 835 5642 3192

Passcode: 101122