



ICTS Astrophysical Relativity Seminar

Title : Investigating correlations in the parameter estimation of low mass eccentric binaries

Speaker : Eamonn O'Shea (Cornell University, USA)

Date : Wednesday, 16th June 2021

Time : 5:00 pm (IST)

Abstract : The eccentricity of binary black hole mergers is predicted to be a strong indicator of dynamical formation. We investigate the efficacy of the existing quasi-circular parameter estimation pipelines to determine the source parameters of such eccentric systems. We create a set of simulated signals with eccentricity up to 0.3 and find that as the eccentricity increases, the recovered mass parameters are consistent with those of a binary with up to a $\approx 10\%$ higher chirp mass and mass ratio closer to unity. We also parameter estimation on two gravitational wave events, GW151226 and GW170608, to investigate this bias on real data. We find that the correlation between the masses and eccentricity persists in real data, but that there is also a correlation between the measured eccentricity and effective spin. We find that GW151226 could be both eccentric and spinning, and we constrain the eccentricities of GW151226 and GW170608 to be <0.18 and <0.13 respectively.

Venue : Please click on the link to join the seminar

<https://zoom.us/j/94994550938?pwd=Nms3L01nWlg3MDdkMW9BcFB5ajNNZz09>

Meeting ID: 949 9455 0938

Passcode: 529730