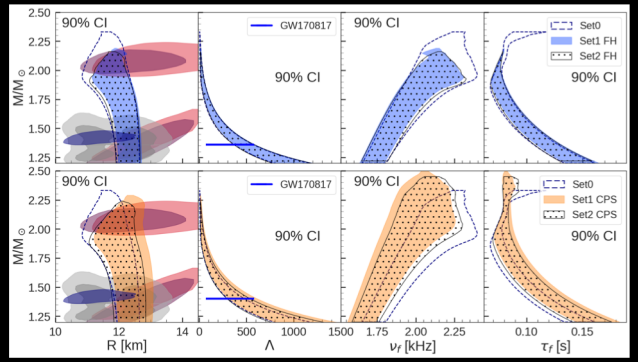
Neutron Stars and Gravitational Waves



Neutron stars(NS) are born in the aftermath of the supernova collapse of massive stars. They are natural laboratories for cold and dense matter with densities a few times that of ordinary nuclear matter. The study of this super-dense matter connects Einstein's General Relativity to Nuclear Physics. Our group attempts to formulate theories to explain the recent astrophysical observations of LIGO, VIRGO, NICER, GW170817 to mention a few.

Here are some of the key research areas to understand the interior of compact stars:

- Equation of State (EoS) with strange components like Hyperons, antikaons, quark, dark matter
- Constraints on Neutron Star EoS using Nuclear Physics and Astrophysical Data
- Quasinormal Modes
- Gravitational Wave Emission (GW) from Binary NS Merger
- Constraining Modified Theories of Gravity

We are also part of the Indian Pulsar Timing Array (InPTA) collaboration, which aims to detect nanoHertz gravitational wave emission using uGMRT near Pune.

Faculty:
Prof. Sarmistha Banik
Dr Swastik Bhattacharya

Adjunct assistant professor:
Dr Sakshi Gautam
(on leave from Panjab University)

PhD students:
Debanjan Guha Roy
Anagh Venneti
Aprajita Shrivastava
Payaswinee Dhoke (Arvikar)

*Active members of InPTA Indian Pulsar Timing Array

Former Group Members:

PhD students:
Dr Smruti Smita Lenka
Dr Krishna Prakash Nunna
Dr Nobleson K*

Post Docs:
Dr Neelam Dhanda Batra*
Dr Somnath Mukhopadhyay
Dr Tuhin Malik