MOHD UMER DAR

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Education

MSc Physics. **University of Kashmir**
Oct 2021– Feb 2024

Experience

Research intern(remote) (Gravitational wave astronomy). **KITP, University of California Santa Barbara**
June 2024– November 2025

- I have been working with BHPTNRSurrogate model (based on point particle black hole perturbation theory).

  I have been particularly comparing BHPTNRSur1dqe4 and post-Newtonian (PN) approximation at 2.5 PN, 3.5 PN , 4PN and 4.5 PN orders.
- I compared the waveforms generated using BHPTNRSurrogate (for different modes 22,33,44,21,32,43,23,etc.) with different PN orders(2PN, 2.5PN, 3PN , 3.5PN, 4PN and 4.5PN) for different mass ratios ($q = 2.5$ to $q = 100$).
- I calculated norm error 4.5PN vs BHPT for mass ratios $q = 2.5$ to $q = 100$.
- I did the flux comparison of 4.5 and BHPT for different modes and different mass ratios.
- I did the flux comparison of different PN orders and BHPTSurrogate for different modes and different mass ratios .

- **BHPT vs Universal model comparison**:
- I obtained the waveform for large mass ratios from ppbhpt and universal and did the comparison which came out to be outstanding for large mass ratios.
- I obtained the universal phase for both bhpt and universal model.
- I obtained the universal amplitude for both bhpt and universal models.

Internship **IISc, Bangalore**
(March -April 2024)

- Path integrals in Quantum Field Theory.

MSc Thesis **University of Kashmir**

- Phase Transitions using AdS/CFT correspondence.

Skills

- Python
- LaTeX