

NEHA SHARMA

+91 89295 43505 ◊ neha.sharma@icts.res.in

EDUCATION

International Centre for Theoretical Sciences (ICTS)

August 2022 - Present

Integrated-Ph.D. in Physics

PI : Parameswaran Ajith

Miranda House–Delhi University

2018-2021

B.Sc. in Physics (CGPA : 9.4/10.0)

RESEARCH EXPERIENCE

Graduate Researcher, ICTS

August 2022 - Present

PI : Parameswaran Ajith, ICTS

- Investigating the first order phase transition occurring in the core of neutron stars, which releases immense amount of energy and a fraction of which excites quasi-normal modes and emit gravitational waves.
- Aim is to constraint the fraction of energy available for Gravitational waves using GW and EM observations.

Graduate Researcher, ICTS

August 2022 - Present

PI : Prayush Kumar, ICTS

- Developing a formalism for fast likelihood evaluation in time domain, building on the principles of relative binning previously implemented in frequency domain. The time domain relative binning method achieves substantial speedup in likelihood evaluation, particularly for longer gravitational waves.

Graduate Researcher, ICTS

August 2022 - Present

PI : Parameswaran Ajith, ICTS

- Determined the lensing fraction of strongly lensed gravitational waves using Lunar Gravitational-Wave Antenna (LGWA).

Summer Research Fellow, Miranda House, Delhi University

June - August 2021

PI : Divakar Pathak, Miranda House

- Investigated the properties of Charmonium ($c\bar{c}$) and bottomonium ($b\bar{b}$) states and regenerated their mass spectra for various potential models such as Cornell, MZ, Richardson and Quigg Rosner potential model.

Summer Research Fellow, Miranda House, Delhi University

June - August 2020

PI : Divakar Pathak, Miranda House

- Studied basic tools and methods used in vector analysis, classical dynamics and its applications in atmospheric physics.

TEACHING EXPERIENCE

Gravitational Wave Open Data Workshop 2025, ICTS ☞

May 12, 2025 - May 14, 2025

Speaker & Tutor

- Delivered a lecture on Bayesian parameter estimation techniques used in gravitational wave astronomy. This lecture focused on compact binary coalescence systems, fundamentals of Bayes' theorem and various sampling methods. ☞

- Guided students in performing Bayesian parameter estimation of real and simulated gravitational-wave signals using Bilby.

Summer School on Gravitational-Wave Astronomy, ICTS

July 1, 2024 - July 12, 2024

Tutor

- Conducted a week-long interactive session during summer school on Gravitational wave astronomy at ICTS, focused on the discussion of various numerical techniques used in the searches of Continuous gravitational waves.

CONFERENCE PRESENTATIONS

ICTS In-House 2025

April 19-22, 2025

- **Title** : Fast parameter estimation in time domain using Relative Binning (*oral talk*)

33rd Indian Association for General Relativity and Gravitation (IAGRG) Conference, BITS Pilani

January 02-04, 2025

- **Title** : Fast likelihood evaluation using relative binning in time domain (*oral talk*)

ICTS In-House 2024

March 28, April 1-2, 2024

- **Title** : Prospects of detection of strongly lensed gravitational waves using LGWA(*poster*)

International Conference on Gravitation and Cosmology, IIT Guwahati

December 06-09, 2023

- **Title** : Prospects of detection of strongly lensed gravitational waves using LGWA (*poster*)

DATA ANALYTICS SKILLS

Programming Languages

Python, C++ (Basic)

Software & Tools

LaTeX, Mathematica, HTML

ACHIEVEMENTS

All India Rank-99 in the Joint Entrance Screening Test (JEST)	2022
Bronze Medal in University Physics Competition	2020
First Position in Inter-College Poster Presentation on “Cell Phone Operated Land Rover”	2020

PUBLIC OUTREACH

Telescope session, ICTS outreach activities

January 27, February 21 - 2025

- Conducted multiple Telescope sessions along with 3 other group members, as part of ICTS outreach program for general public and school students, aimed at observing and discussing various planets.

REFERENCES

Parameswaran Ajith

Faculty at ICTS

Area of Research : Gravitational-Wave Physics and Astrophysics

+91 80 4653 6210

ajith@icts.res.in

Prayush Kumar

Faculty at ICTS

Area of Research : Numerical and Observational General Relativity

+91 80 4653 6390

prayush@icts.res.in