Estuti Shukla

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EDUCATION

IISER KOLKATA
2016-2021 | Kolkata, India
BS-MS Dual Degree
Indian Institute of Science Education and Research
Masters in Physics
Cum. GPA: 8.74 / 10.0
Major GPA: 9.03 / 10.0

SARDAR PATEL VIDYALAYA
Grad. May 2016 | Delhi, India
Senior Secondary Examination
XIITH (CBSE)
Percentage- 95 %

RESEARCH INTERESTS

General Relativity,
Gravitational Physics,
Numerical Relativity, Cosmology

SKILLS

PROGRAMMING
Advanced
• Python
• LaTeX • C/C++
Intermediate
• Mathematica • R • MATLAB
Familiar:
• HTML

OPERATING SYSTEMS
•GNU/Linux • Windows

OTHERS
• Git/GitHub• GNUplot • Origin

COURSEWORK

Advanced Statistical Mechanics,
Research Methodology,
High Energy Physics,
General Relativity,
Condensed Matter Physics,
Quantum Field Theory,
Non-linear Dynamics,
Electrodynamics,Optics
Thermodynamics,
Classical Mechanics,
Astrophysics,
Computational Physics,
Data Structures & Algorithms,
Space Astronomy, Linear Algebra

WORK EXPERIENCE

ICTS-TIFR BANGALORE | Visiting Student Researcher
September 2021 - Present | Prof. Prayush Kumar | Bangalore
- Project Description- Studying the properties of dynamical horizons using numerical relativity (SpEC code).

IIT MADRAS | Research Intern
June 2021 - Present | Prof. Chandra Kant Mishra | Remote
- Project Description- SNR analysis of IMRIs for the proposed space-based detector DECIGO.

IISER KOLKATA | Master's Thesis
July 2020 - July 2021 | Prof. Rajesh Kumble Nayak | Kolkata, India
- Thesis Title- Static Stars in Cosmological Backgrounds
- Project Description- Studying model of stars in Einstein and de Sitter universe using TOV equations modified as per the background universe. We are studying various mass-radius relationships and searching for the possibility of black hole mimickers. This work is being written into a publication.

JOHNS HOPKINS | Research Intern
Oct 2020 - Present | Prof. Emanuele Berti | Remote
- Project Description- Studied non-linearities associated with merger-ring down phase of binary black holes. This work is being written into a publication.

UMASS DARTMOUTH | Summer Research Intern
Jun 2020 - Sep 2020 | Prof. Gaurav Khanna and Prof. Scott Field | Remote
- Project Description- I added functionalities such as remnant Bondi mass and kick velocity to the EMRI surrogate model developed by the gravity group at UMassD. I was added as a contributor to the open-source model.

IISER KOLKATA | Independent Study
July 2020 - Dec 2020 | Prof. Dibyendu Nandi | Kolkata, India
- Study Description- Studied the fundamentals of magneto-hydrodynamics, fluids and plasma.

IUCAA PUNE | Workshop and Hackathon
Dec 2019 - March 2020 | LIGO India | Pune, India
- Workshop and Hackathon Description- My two-member team won the FINESSE (Frequency domain INterfErometer Simulation SoftwarE) hackathon conducted by LIGO India and University of Glasgow. After being selected for a three months mentorship workshop for designing gravitational wave detectors using the FINESSE software, we competed to improvise a design of the interferometer.

IISER MOHALI | Summer Research Intern
May 2019 – July 2019 | Prof. Jasjeet Singh Bagla | Mohali, India
- Project Description- Learnt ray tracing method to simulate "image" of black hole and null geodesics in Schwarzschild metric.

IIT INDORE | Summer Research Intern
May 2018 – July 2018 | Dr. Bhargav Vaidya | Indore, India
- Project Description- Studied shock waves in MHD framework. Learnt about Rankine Hugoniot conditions and simulated shock waves in python.

LANGUAGES

English, Hindi

OTHER INTERESTS

Long distance running,
Playing Ukulele,
Trekking,
Public speaking,
Playing badminton,
Theater

TEACHING EXPERIENCE

IISER KOLKATA | Teaching Assistant

Jan 2021 - May 2021 | General Theory of Relativity & Cosmology | Kolkata

- Teaching assistant for PH4205 General Relativity course under the guidance of Prof. Rajesh Nayak.

IISER KOLKATA | Teaching Assistant

July 2020 - Dec 2020 | Intermediate Quantum Mechanics | Kolkata

- Teaching assistant for PH3102 Quantum Mechanics course under the guidance of Prof. Soumitro Banerjee.

PUBLICATIONS

[1] E. Shukla, V. Baibhav, E. Berti, V. Cardoso, U. Sperhake, K. Wong, T. Helfer, et al. The unreasonable power of black hole perturbation theory (**in preparation**).

[2] E. Shukla and R. K. Nayak. Static stars in cosmological backgrounds (**in preparation**).

TALKS/PRESENTATION

3rd Sep'20	Talk on computing remnant mass of binary black hole mergers using EMRI surrogate model at UMass Dartmouth's physics colloquium series.
11th Mar'20	Group presentation on probing neutron stars merger with LIGO interferometer for FINESSE Hackthon at IUCAA Pune.

SEMINARS/WORKSHOPS/CONFERENCES

July'21	ICTS Summer School on Gravitational- Wave Astronomy, ICTS-TIFR Bangalore (Virtual)
Sep-Dec'20	Semester Program on Advances in Computational Relativity by ICERM, Brown University (Virtual)
Sep'20	Vienna Summer School on Gravitational Quantum Physics by University of Vienna(Virtual)
Aug'20	North American Einstein Toolkit Workshop by LSU (Virtual)
May'20	BHP Toolkit Spring Workshop 2020 (Virtual)
May'20	Gravitational Wave Summer School on Numerical Relativity by ICTS-TIFR Bangalore (Virtual)
Nov'19	Data Science in Astrophysics GW research at IIIT Allahabad
Oct'19	Bootcamp by NVIDIA on High-performance computing at IISERK
Nov'16	National Science (Vijyoshi) Camp by DST, Gov. of India at IISERK

AWARDS AND RECOGNITION

2021	One out of 7 people selected for the prestigious LTVSP program (ICTS)
2020	Won FINESSE Hackathon and was supposed to be hosted as an intern in a GW institution in Europe (cancelled due to pandemic)
2016	DST Inspire Scholarship by Govt. of India
2016	Top 1 % in CBSE Board Class XIIth Examination in India

EXTRA CURRICULAR

2020-21	Established IKQRAAR, the official LGBTQ+ support platform at IISERK
2019-20	Founder and Secretary of Trekking and Adventure Club, IISERK
2019-20	Founding Member and Coordinator of Student Alumni Cell, IISERK
2018-19	Secretary of Aarshi, Dramatics Club, IISERK
Dec'18	Event Organiser at 1st Inter-IISER Cultural Meet (IICM)'18
2017-18	Sponsorship Head, Core Committee, Inquivesta, college fest of IISERK