

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

TEST SCORES

TOEFL- 113/120

- Reading- 26/30
- Listening- 29/30
- Speaking- 30/30
- Writing- 28/30

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**).

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