

AKSHITA MITTAL

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Indian Institute of Science Education and Research, Thiruvananthapuram
Fourth Year BS-MS Student

RESEARCH INTERESTS

Gravitational-wave astrophysics, computational astrophysics, Bayesian statistics, machine learning, general relativity, cosmology, particle physics

RESEARCH EXPERIENCE

Minor Project

Jan 2023 – Present

IISER Thiruvananthapuram X IUCAA

India

- With Dr Apratim Ganguly and Kanchan Soni, IUCAA and Dr Shabnam Iyyani, IISER Thiruvananthapuram
- Predictive GW analysis to explore underlying population distribution of compact binary parameters in deci-hertz band

Remote Internship

July 2022 – Sept 2022

Max Planck Institute for Gravitational Physics - Hannover

Saxony, Germany

- With Prof. Frank Ohme and Dr Krishnendu Nair, Max Planck Institute for Gravitational Physics, Hannover
- Tests of general relativity using gravitational-wave observations from binary mergers
- Analysis of effect of mass and distance on SNR of inspiralling binaries and on the mass of the graviton

Remote Internship

Apr 2021 – June 2021

Inter-University Centre for Astronomy and Astrophysics - Pune

Maharashtra, India

- With Prof. Sanjit Mitra and Kanchan Soni, Inter-University Centre for Astronomy and Astrophysics, Pune
- Literature survey for the use of GW higher-order modes in post-merger data analysis

Remote Internship

July 2020 – Sept 2020

Thapar Institute of Engineering and Technology - Patiala

Punjab, India

- With Dr Mamta Gulati, School of Mathematics, Thapar Institute of Engineering and Technology, Patiala
- In-depth study of *Fundamental Astronomy* by Hannu Karttunen and *Astrophysics for Physicists* by Arnab Rai Choudhari

EDUCATION

IISER Thiruvananthapuram, Kerala | Integrated MS

2019 – Present

- CGPA: 8.48

West Point School, Kotkapura, Punjab | Higher Secondary (Grade 12)

2018

- Percentage: 93.2
- Subjects: Physics, Chemistry, Mathematics

Dasmesh Public School, Kotkapura, Punjab | Secondary (Grade 10)

2016

- GPA: 10

ACHIEVEMENTS

- Awarded the **DAAD WISE** fellowship for the year 2022
- Gold Honor in the **International Astronomy and Astrophysics Competition 2020** (IAAC 2020)
- Winner of national-level physics research competition **Researchathon 2020** organised by the National Institute of Technology, Surat, India

PROJECTS AND WORKSHOPS

A Star is [Un]Born: Understanding Stellar Collapse

- Semester project for course on general relativity and cosmology
- With Dr Sreedhar B Dutta, School of Physics, IISER Thiruvananthapuram
- Review of metrics and Tolmann-Oppenheimer-Volkoff (TOV) equations of different stellar bodies

LIGO Interferometer Noise

- Paper presentation seminar organised by the Society of Materials and Mechanical Engineers, IIT Ropar
- With Dr Joy Mitra, School of Physics, IISER Thiruvananthapuram
- Reduction of thermal noise in LIGO interferometers by change in mirror coatings

SCUDEM 2020

- With Dr Zehor Belkhatir, University of Leicester, England
- Modelling of decay of oil agglomerates from the Deepwater Horizon Accident using differential equations

LISC Continuous Gravitational Waves Workshop

- Organised by ICTS in collaboration with LIGO India
- CGW data analysis basics: matched filtering, F-statistic, parameter space metric
- PyFstat to analyse CGW data

LIGO Gravitational Waves Science Communication Workshop

- Organised by IUCAA and IISER Pune in collaboration with LIGO India
- Interactive sessions and assignments on effective science communication within and without academia

WORK AND VOLUNTEER EXPERIENCE

Research Matters | *Writer* | 2021-Present

- Science communication platform by Gubbi Labs
- Reviews of scientific articles on physics, climate change and government policy

Gandhi Fellowship | *Social Media Strategist* | 2021-Present

- Piramal School of Leadership's non-government organisation
- Core member of Dreamscape Media's social media management team

Inventa Magazine | *Managing Editor* | 2021-22

- Annual inter-IISER magazine in collaboration with CEBS, NISER and IISc
- Member of the Operational Committee of the platform from 2021-22

COMPUTER SKILLS

Programming

Python | R | MATLAB | Wolfram Mathematica

Packages

bilby_pipe | gwosc | PyCBC | lalsuite

OTHER INTERESTS

Environmental and political activism | Hindustani music | Quizzing | Feminist and anti-caste literature

REFERENCES

1. Dr Frank Ohme

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Binary Merger Observations and
Numerical Relativity,
Hannover, Germany
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2. Prof. Sanjit Mitra

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