Navneet Mishra

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Rizvi college of Engineering, Bandra(W), Mumbai

Education

- St. Xavier's College Autonomous, Mumbai — ***2019 - 2021***
  MSc in Astrophysics — ***CGPA:7.42/10***

- Thakur College of Science and Commerce, Mumbai — ***2015 - 2018***
  BSc in Physics — ***CGPA:6.77/7 (Topper)***

Research Interests

General relativity, Cosmology, Black hole Astrophysics, Gravitational-wave astrophysics

Research Experience

Indian Association for the Cultivation of Science (IASC), Kolkata, India — ***Nov 2020 - Feb 2021***

- Master Project with Dr. Sumanta Chakraborty
  - Explored the basics of the Quasinormal Mode of a Black Hole.

Tata Institute of Fundamental Research (TIFR), Mumbai, India — ***March 2021 - June 2021***

- Master Thesis with Prof. Tejindar Singh
  - Investigated the Quasinormal Mode of a Schwarzschild Black Hole.

Sorbonne University, Observatoire de Paris, France — ***March 2022 - June 2022***

- Research Project (Online) with Shashwat Singh
  - Estimation of parameters of Gravitational Waves (PyCBC).

Centre for Cosmology and Science Popularization (CCSP), Gurugram, India — ***July 2023 - Aug 2023***

- Visiting Research Student with Dr. Sayantan Choudhury
  - Explored the theme "Evading no-go for PBH formation and production of SIGWs using Multiple Sharp Transitions in EFT of single-field inflation."
  - Published a preprint available on **arXiv** :2309.00973v2

Conference and Workshops

Astronomical Society of India (ASI) 2024 — ***Jan-feb 2024***

Presented “Quasinormal Mode of a Schwarzschild Black Hole” (Master’s thesis for the 42nd meeting of the ASI-2024

ICTS - Gravitational-Wave Open Data Workshop — ***2023***

- Introduction to LIGO detectors, Public LIGO/Virgo data, Data quality and GWpy, Introduction to CBC, Searches with PyCBC, Parameter estimation with bilby, CBC Science

IUCAA Refresher Course on Astronomy and Astrophysics — ***2023***

-General Relativity and cosmology, Machine Learning in Astrophysics, Gravitational Waves and LIGO, SMBH, White Dwarfs, GW Detectors, LIGO Instrumentation, GW and Compact Objects, Gravitational Lensing

Research Projects

- Radiative Penrose Process: Study on a charged particle that gains energy in a Kerr black hole's ergosphere, emitting radiation with potential astrophysical implications.
- Massive Highly Rotating Stars using MESA: Investigated stellar dynamics using MESA, studying the behaviour of massive, highly rotating O-type stars.
- Redshift of Quasars by Spectral Fitting: Applied spectral fitting techniques to precisely measure quasar redshift, contributing to our knowledge of distant celestial objects.
- Orbits of Stars in Spherical Mass Distributions with GalPy: Examined stellar orbits in spherical mass distributions using GalPy, providing insights into different gravitational interactions.
- Globular Cluster Characteristics using HR Diagram: Explored globular cluster characteristics through HR Diagram analysis, enhancing our understanding of stellar populations.

Relevant Coursework (LINK)

- General Relativity and Cosmology
- Galaxy: Structure, formation and Dynamics
- Stellar structure and evolution
- Physics of Radiation and Matter
- Astronomy and Astrophysics - An Overview
- Classical mechanics
- Mathematical methods
- Quantum mechanics
- Statistical mechanics
- Electrodynamics

Academic Achievements

- MSc Astrophysics Scholarship Recipient (Rs. 20,000).
- Achieved top 9% rank (Among 15,500 students) in IIT JAM(National Physics Exam).
- Subject Topper in Physics and Mathematics at Thakur College, Mumbai.
- Presented project exhibits for five consecutive years (2013-2018) at the Origin Science Exhibition, Thakur College, Mumbai.
- Presented a poster titled “The EPR Paradox and Bell's Inequality” at the annual PROBE-2020.
- Presented an exhibit at the annual JIGYASA-2019
- Participant in “Summer School in Theoretical Physics” in April 2017.
- Attained top 10% rank in the IAPT(Indian Association of Physics Teachers) Examination - 2017.
- Appointed as the *Youngest Assistant Professor* at St Xavier’s College, Mumbai (2022- 2023).

Teaching Experience

Rizvi College of Engineering

- Visiting Professor **(March 2024)**

St. Xavier’s College, Mumbai

- Assistant Professor **(Nov 2022 - May 2023)** / Visiting Professor **(Nov 2021 - April 2022)**

St. Francis Institute of Technology, Mumbai

- Visiting Professor **(April 2022 - Sept 2022)**

-Conducted theory and practical classes, and designed examination papers.
-Guided and evaluated 20+ Physics projects in St Francis for Prayas 2022 (Science Exhibition). -and 40+ S.Y.BSc Physics projects and assessed 7+ projects at St. Xavier’s.
-Guided T.Y.BSc students for Probe presentation 2022.
-Guided four groups of T.Y.BSc students for BSc Thesis.

Leadership and Initiatives

St. Xavier’s College, Mumbai

- Xavier’s Astronomical Group
  - Established and led impactful stargazing events.
- Curriculum Enhancement
  - Integrated advanced apparatus for celestial observations using the Bresser exos2 telescope, tailored to enhance experiments for Masters in Astrophysics students.
  - Introduced the “Millikan Oil Drop Experiment” to the undergraduate curriculum, enhancing the physics education experience.
- International Academic Mentorship
  - Guided undergraduates into international Master's programs.
  - Provided pivotal recommendation letters for successful admissions.

Miscellaneous activities and certificates

- Data-Driven Astronomy (Coursera: University of Sydney) – 2020
- *Special Theory of Relativity* held by Prof. H. C. Verma and the team from IIT Kanpur 2018-2019
- Theoretical Physics Summer School organized by IAPT – 2017
- Exposure Series in Astrophysics & Cosmology - 2020
- Introduction to Philosophy : Coursera: University of Edinburgh - 2020
- The Science of Well-Being : Coursera: Yale University - 2020

Skills and Miscellaneous

Programming	Python | MATLAB | Wolfram Mathematica
Modules	bilby | gwosc | PyCBC | MESA | Latex | GalPy | EinsteinPy | CLOUDY
Designing	Adobe Photoshop | Canva Design
Other Interests	Flautist | Hindi Poetry Writing | Drawing | Photography | Activism