

AKSHITA MITTAL

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Gran Sasso Science Institute, L'Aquila, Italy
Graduate Student

PHD THESIS

Stellar Oscillations as Probes of Neutron Star Interiors

Nov 2025 – Present

PI: Prof. Andrea Maselli — Collaborators: Prof. Kostas Kokkotas, Prof. Leonardo Gualtieri

- I study stellar oscillations in neutron star interiors, developing perturbative frameworks to model hot, rapidly rotating post-merger remnants in full general relativity. My work includes improving semi-analytical methods with viscosity and finite-temperature effects, and investigating the gravitational-wave emission and detectability of post-merger oscillation modes with next-generation detectors such as the Einstein Telescope.

EDUCATION

PhD in Astroparticle Physics | Gran Sasso Science Institute, L'Aquila

Nov 2024 – Present

- Second-year student in the Astroparticle Physics graduate program at GSSI
- Relevant coursework: Gravitation and Cosmology-Theory — Gravitation and Cosmology-Experiments — Physics of Neutron Stars — Astrophysics of Neutron Stars — Statistical Methods in Astroparticle Physics — Compact Objects Formation and Evolution — Feedback Control and Deep Loop Shaping — Multi-Messenger Transients

BS-MS in Physics with Minor in Data Science | IISER Thiruvananthapuram

July 2024

- Masters Thesis: *Impact of parameter mismodeling on gravitational-wave searches*
- Data Science Minor Thesis: *Exploring the Scope of Multiband Detection with Next-Generation Gravitational Wave Detectors*

Higher Secondary | West Point School, Kotkapura, Punjab

2018

- Percentage: 93.2

WORKSHOPS, CONFERENCES AND SUMMER SCHOOLS

From Deep Space to Deep Earth: The Experimental Network in Sardinia

Oct 2025

- Attended workshop on geophysical characterization and environmental noise studies for the Einstein Telescope and other next-generation gravitational-wave experiments

Nuclear Physics of Multi-Messenger Mergers Summer School

June 2025

- Participated in summer school on multi-messenger neutron star mergers, including training in gravitational-wave data analysis, Bayesian inference, and PyCBC parameter estimation

AWARDS, HONORS, AND FELLOWSHIPS

- **Hall of Fame, Science and Technology Council, IISER Thiruvananthapuram** (2024) — For contributions to sci-comm initiatives
- **oSTEM Graduate Application Aid Program** (2023) — Financial support for graduate school application fees for gender and sexuality minorities in STEM
- **DAAD WISE Fellowship**, Deutscher Akademischer Austauschdienst (2022)
- **International Astronomy and Astrophysics Competition (IAAC)** (2020) — Gold Honor
- **SIMIODE Challenge Using Differential Equations Modeling (SCUDEM)** (2020) — Meritorious Award
- **Researchathon**, National Institute of Technology Surat (2020) — Gold medal in national-level physics research competition

SCIENCE COMMUNICATION AND OUTREACH

Graduate Outreach

- **Astrobites** | *Writer, Editor* Jan 2026 – Present
Contributing writer for Astrobites, a graduate student-run astrophysics research digest affiliated with the American Astronomical Society.
Published articles: [[My Astrobites](#)]
- **R4GE: Researchers for Gender Equity** | *Member* Oct 2025 – Present
Initiative promoting gender equity and inclusivity in the GSSI academic community

Undergraduate Outreach

- **Inventa Magazine** | *Managing Editor* 2021–22
- **Ether** | *Editor, Designer* 2020–22
- **Exhibit A** | *Founding Member, Editor, Designer* 2019–22
- **Club of Mathematics, IISER Thiruvananthapuram** | *Coordinator* 2019–20

EARLY RESEARCH EXPERIENCE

- Institute for Gravitation and the Cosmos, Penn State University** **2024**
Remote Research Project, PI: Prof. Bangalore Sathyaprakash
• Studied misinterpretation of gravitational wave events with quasispherical waveforms (manuscript in preparation)
- Graduate School of Science, Kyoto University** **2023**
Machine Learning Project, PI: Prof. Takahiro Tanaka *Kyoto, Japan*
• Explored CNN-based excess-power methods for all-sky searches of continuous gravitational waves for DECIGO
- Max Planck Institute for Gravitational Physics** **2022**
Internship, PI: Dr. Frank Ohme *Hannover, Germany*
• Investigated effects of binary parameters on inspiral SNR and modified dispersion relations using PyCBC
- Inter-University Centre for Astronomy and Astrophysics** **2021**
Internship, PI: Prof. Sanjit Mitra *Pune, India*
• Performed injection studies and parameter estimation for binary mergers using Bilby
- Thapar Institute of Engineering and Technology** **2020**
Internship, PI: Dr. Mamta Gulati *Patiala, India*
• Introductory research training in astronomy and astrophysics through guided reading and presentations

TEACHING EXPERIENCE

- PHY312: Classical Mechanics** | *Teaching Assistant, IISER Thiruvananthapuram* **2023**

OTHER WORK EXPERIENCE

- Dreamscape Media** | *Social Media Strategist* **2021-2022**
• Collaborated on advertising and social media management

SKILLS AND MISCELLANEOUS

- Programming** Python | Fortran | MATLAB | Wolfram Mathematica
- Markup** Latex | HTML | CSS
- Designing** Adobe InDesign | Adobe Illustrator | Adobe Spark