Tirna Deb, PhD

📞 +1 (978)942-1419 — ✉ tirnadeb.astro@gmail.com — in linkedin.com/in/tirna-deb-ph-d �
https://github.com/drtirnadeb/

Education

PhD in Astrophysics, University of Groningen, The Netherlands	Sep 2017- Mar 2022
Bachelor & Master of Science in Physics, Presidency University, Kolkata, India	July 2011-July 2016

Awards & Honors

- Awarded the prestigious Rubicon Fellowship ($164k) by the Dutch Research Council and the South African Radio Astronomy Observatory Postdoctoral Fellowship ($150k) respectively (2022-25).
- Received INSPIRE Scholarship, recognizing top 1% students in India; fully funded Bachelors & Masters in Physics (2011–16).
- Ranked 11th out of 750,000 students in state high school final examination (2011).

Professional Experience

Harvard University, United States of America, *Rubicon Fellow* — Nov 2023 – Present
- Led telescope proposals globally, securing 200+ hours of data ($\sim$$15M) for large-scale analysis & ML applications.
- Applied ML algorithms for galaxy morphology classification, enhancing automation and efficiency.
- Built data-driven models for pattern recognition in multi-TB datasets using Python, clustering, and feature engineering.
- Led a 20+ member global research team, managing data-driven projects with 10+ papers in progress.

University of Western Cape, South Africa, *Postdoctoral Fellow* — Apr 2022 – Oct 2023
- Processed 30+ TB of data using Python, applying data cleaning, transformation, and anomaly detection techniques.
- Built automated pipelines for data reduction and signal extraction, boosting efficiency by 40% & accelerating discoveries.
- Designed 50+ 2D/3D VR visualizations for high-dimensional data analysis, shaping multibillion-dollar survey strategies.

University of Groningen, the Netherlands, *Graduate Researcher* — Sep 2017 – Mar 2022
- Processed 15+ TB of multi-source data using HPC and batch processing to uncover hidden patterns in noisy datasets.
- Designed a dynamical model for anomaly detection, leading to one of the first neutral gas detections in jellyfish galaxies.
- Developed an algorithm for faint signal detection in 3D data, boosting rates by 200% and demonstrating one of the first results from state-of-the-art telescope MeerKAT.

Inter University Center for Astronomy & Astrophysics, India, *Research Assistant* — Jan 2016 – Jun 2017
- Analyzed 100+ astronomical images & developed models to study galaxies using numerical & analytical methods.

Technical Skills

- **Mathematics & Statistics**: Bayesian analysis, regression models, PCA, uncertainty estimation, hypothesis testing, linear algebra, optimization, time series analysis.
- **Data Science & Programming**: Python (Pandas, NumPy, Scikit-Learn), SQL, GitHub, MS Excel, data visualization (Matplotlib, Seaborn), exploratory data analysis (EDA), machine learning (supervised and unsupervised).
- **MIT Applied Data Science Program (2024)**: 12 week AI, python and ML-focused program with real-world applications.

Data Science Side Projects

Boston House Pricing (linear regression, feature engineering), Used Car Price Prediction (regression, tree-based models), FoodHub Analysis (EDA, data visualization); **Project Repository:** GitHub

Publications & Presentations

Published 15 peer-reviewed papers (7 as first author) in top-tier astronomy journals and delivered 35+ talks, including 10 invited presentations at leading conferences around the world. See full list on Google Scholar.

Communication Skills and Additional Information

- **Teaching & Mentorship:** Mentored students and lectured courses at Harvard, supervised master's theses in South Africa, taught undergraduate astronomy in Groningen, and tutored high school students in Math and Physics in India.
- **Communication & Leadership:** Organized events and workshops (GOPHER) and led cultural initiatives (GISA) in the Netherlands, including website design and performances.
- **Hobbies & Interests:** Fine arts, Indian classical music, Creative writing, Video editing, Board games, and, Traveling.