



Arpit Mann

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M.Sc.

Astronomy

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EDUCATION

Degree/Certificate	Institute/Board	CGPA/Percentage	Year
M.Sc. Astronomy	Indian Institute of Technology Indore	Ongoing	2026-Present
B.Sc. Physics (Hons)	Shivaji College, University of Delhi	First Division	2022-2025
Senior Secondary	CBSE Board	90.0%	2022
Secondary	CBSE Board	94.2%	2020

EXPERIENCE

- Starscapes Experience - Intern** 2024
Product Development and Outreach Gurgaon
 - Assisted in astrophysical data analysis and visualization using Python and MATLAB
 - Collaborated on developing astronomy outreach material for diverse audiences
- National Physical Laboratory (NPL) - Trainee** Jan. 2025
Optical Radiation Metrology Training Programme New Delhi
 - Completed a training programme on optical radiation metrology at CSIR-NPL
 - Gained hands-on experience in instrumentation and experimental data collection
- Nehru Planetarium - Participant** 2024
Astronomy Bootcamp New Delhi
 - Attended workshops on cosmology, astrophysics, and general relativity
 - Developed Python-based simulations for astronomical data interpretation

PROJECTS

- Storm-Time Equatorial Electrojet (EEJ) Prediction** ONGOING
Independent Research Project Dashboard
 - Built an XGBoost baseline and an LSTM model with intensity-weighted MSE loss to predict storm-time EEJ over the Indian sector from NASA OMNI solar wind data
 - Achieved ~32% MAE improvement on intense storms; documented a domain-shift failure on the SC25 extreme event (May 2024, SYM-H -518 nT)
 - Deployed the full pipeline as a FastAPI REST service with a web dashboard
- Onset Leakage in ML Stellar Flare Forecasting** ONGOING
Sole-author manuscript, RAS Techniques and Instruments (Under Major Revision) Code & Data
 - Introduced a model-agnostic guard-gap cross-validation test that measures how much of a flare-forecasting classifier's score comes from reading the flare onset inside the input window rather than predicting it
 - Applied it to an LSTM forecaster on 80 M dwarfs (TESS 20-s cadence, leave-one-star-out): a 10-min guard cut the robust mean ROC-AUC from 0.997 to 0.870 against a within-star permutation floor of 0.492 ± 0.026 , showing that the final ten minutes carry about a quarter of the above-chance signal
 - Showed the un-guarded task is near-trivial — a logistic regression on 16 summary statistics with no temporal modelling reaches ROC-AUC 0.998, matching the LSTM — evidence that the benchmark was measuring onset detection, not forecasting
- Exoplanetary Environment Simulation** Oct. 2023
NASA International Space Apps Challenge, Team Leader
 - Led a team of four to design and simulate 3D exoplanetary environments using NASA's open data
 - Modeled conditions for potential extraterrestrial habitability using physics-based algorithms
- Light-to-Mars Model** 2024
Educational Outreach Project
 - Developed an Arduino-based interactive model using LEDs to visualize the speed of light and interplanetary distances
 - Designed to simplify complex astrophysical concepts for students

TECHNICAL SKILLS

- **Programming:** Python, C++, JavaScript, MATLAB, MySQL
- **Data & ML:** Data Analysis, XGBoost, LSTM
- **Web & Deployment:** HTML, CSS, FastAPI, Cloudflare Pages, GitHub
- **Tools & Systems:** L^AT_EX, Linux (Ubuntu), Nextcloud, Tailscale, Cloudflare Tunnels
- **Languages:** English (Fluent), Hindi (Fluent), German (Basic)

CERTIFICATIONS

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| • World Space Week 2025 Participation , Propagation Institute for Advanced Studies | <i>Oct. 2025</i> |
| • Arduino Training (Score: 90%) , Spoken Tutorial Project, IIT Bombay | <i>Feb. 2025</i> |
| • Optical Radiation Metrology Training Programme , CSIR-National Physical Laboratory, New Delhi | <i>Jan. 2025</i> |
| • Astronomy: Exploring Time and Space , Coursera, University of Arizona | <i>Jun. 2024</i> |
| • IAAC 2023, Qualified for Pre-final Round , International Astronomy and Astrophysics Competition | <i>May 2023</i> |

KEY COURSES TAKEN

- **M.Sc. Physics:** Classical Mechanics, Classical Electrodynamics, Quantum Mechanics and Spectroscopy
- **M.Sc. Astrophysics & Computation:** Astrophysical Fluids and Plasma, Numerical Techniques for Astronomy
- **B.Sc. Physics:** Mechanics, Waves and Oscillations, Electricity and Magnetism, Thermal Physics, Light and Matter, Modern Physics, Solid State Physics, Electromagnetic Theory, Quantum Mechanics I, Statistical Mechanics, Atomic, Molecular and Nuclear Physics, Research Methodology
- **Mathematics & Statistics:** Mathematical Physics I–III, Abstract Algebra, Numerical Methods, Statistical Analysis in Physics
- **Electronics:** Electrical Circuit Analysis, Analog Electronics, Digital Electronics, Communication Systems
- **Computer Science:** Programming with Python, Data Analysis and Visualization using Python, Database Management Systems, Introduction to Web Programming

ACHIEVEMENTS

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| • All India Rank 465 , IIT JAM 2026, Astronomy admission to IIT Indore | <i>2026</i> |
| • District Topper , Vidyarthi Vigyan Manthan (VVM) 2018-19, National Level | <i>2018-2019</i> |