Parth Nanda

Email: parth.nanda@xaviers.edu.in
LinkedIn: parth-nanda-27nov2005
GitHub: ParthNanda27
Webpage: www.parthnanda.com
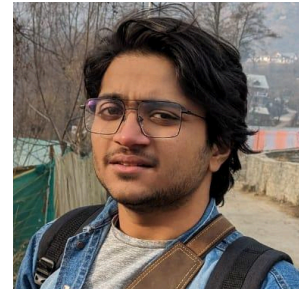
Undergraduate Physics major at St. Xavier's College with a strong focus on Astrophysics and applied research. Experienced through internships at SAC-ISRO and in Space Technology and Aeronautical Rocketry, working with satellite data analysis, remote sensing, propulsion systems, and orbital mechanics. Contributed to interdisciplinary projects at Wilson College, strengthening teamwork, leadership, and analytical abilities. Proactive, detail-driven, and adaptable, with a consistent drive for innovation and learning. Outside academics, engaged in amateur photography, especially landscapes and astrophotography.

Education

B.Sc. Physics (2023-2026); St. Xavier's College (Empowered Autonomous), Mumbai.
Higher Secondary Education (PCM); Lakshya Institute; Mumbai.
Primary and Secondary Education; Fatima High School; Mumbai.

Experiences

- Editor; Physics Department Magazine, St. Xavier's College, Mumbai
  Dec 2024 – Aug 2025
  Curated and edited content for the department magazine, working with students and faculty to highlight research and key discussions. Managed the editorial workflow from planning to publication, promoting clear and accessible science communication.

- Research Intern; ANSD, Space Applications Centre (ISRO)
  Apr 2025 – Jun 2025
  Developed an LSTM-based model to predict ionospheric Total Electron Content (TEC) using dual-frequency GNSS data. Integrated real-time solar observations from Aditya-L1 to improve responsiveness to space-weather events such as flares and CMEs. Focused on modelling ionospheric delays and enhancing forecast reliability for satellite communication and navigation systems.

- Non-Profit Mentorship; Don Bosco Oratory, Mumbai
  July 2023 - Mar 2024
  Non-Profit Mentorship Supported underserved communities through teaching, workshops, and engagement activities, enhancing communication, leadership, and project management skills.

- Internship; Space Technology & Aeronautical Rocketry, Surat
  Oct 2023 - Dec 2023
  Gained experience in astrodynamics, aerodynamics, and rocket engineering. Worked on deriving orbital parameters, designing and simulating optimal orbits, and performing Delta-V budgeting for space missions. Contributed to the design, analysis, and optimization of rocket systems.

Projects

- **TEC Prediction with GNSS–Aditya-L1 & LSTM; Space Applications Centre (ISRO)**
  Developed an LSTM-based TEC forecasting model using GNSS VTEC and Aditya-L1 solar data. Processed STEC→VTEC, applied filtering and feature engineering, and achieved low-error next-step predictions. Built the full workflow in Python.
- **Extended Kalman Filter for GPS Positioning; Space Applications Centre (ISRO)**
  Developed an EKF framework for stationary, low-dynamic, and high-dynamic GPS navigation, including state/measurement modelling, clock-error handling, noise covariances, and Newton/Gauss-Newton initialization.
- **Rocket Physics, Propulsion & GMAT Orbital Simulations; STAR**
  Worked with propulsion relations (Isp, Δv), ascent dynamics, mass–staging analysis, and orbital calculations. Performed GMAT simulations for circular and transfer orbits and completed supporting technical exercises.
- **Study of the Doppler Effect; St. Xavier's College**
  Simulated Doppler shifts using a rotating sound source and compared measured frequencies with theoretical predictions, achieving <1% error. Presented the project's methods and findings.
- **Quantum Wavefunction Tunneling & Trapping; St. Xavier's College**
  Simulated Gaussian wave packets in a 1D finite well with Crank–Nicolson TDSE, showing tunneling, reflection, and partial trapping. Evaluated bound-state occupations and energy levels via eigenstate projections.

- **Mechanical Equivalent of Heat (J) Using Thermocouple-Arduino; St. Xavier's College**
  Built an Arduino–thermocouple setup to measure temperature rise during electrical heating and compute $J=E/Q$. Included signal conditioning, calibration, and full data-analysis workflow.
- **Analysis of Resonance in a Series LCR Circuit; St. Xavier's College**
  Measured current across varying AC frequencies to locate the resonance peak and validate impedance minimization, confirming theoretical LCR behavior through experimental plots.

Skills

Data Analysis; Machine Learning; Navigation; Orbital Mechanics; Python Programming; Scientific Communication; Research Methodology; Embedded Systems

Certifications

Research Internship; Space Applications Centre-ISRO; April 2025 - June 2025.
Astronomy Course; Wilson College Mumbai; July 2023 - July 2024.
Physics Model Exhibition (Jigyasa); St. Xavier's College Mumbai; Sept 2024, Aug 2025.
PROBE Poster Exhibition; St. Xavier's College Mumbai; Jan 2025.