



Rohit Kumar Parbat

BTech in Engineering Physics

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PROFILE

- Passionate about exploring the universe through physics and computational methods, I specialize in astronomy, astrophysics, and data-driven research. Skilled in scientific analysis and machine learning, I aim to contribute innovative insights into fundamental physical phenomena.

EDUCATION

- **National Institute of Technology, Calicut** 2021 – 2025
Bachelor of Technology in Engineering Physics Calicut, India
CGPA: 8.4 / 10

PROJECTS & CONTRIBUTIONS

- **Supernova Cosmology: Analysis of Supernova Ia Spectrum** May 2024 - July 2024
Summer Research Internship, IAS SRFP 2024
Indian Institute of Technology, Dharwad
Guide: Dr. D Narasimha
 - Conducted an extensive literature survey on Type Ia supernovae to understand spectral features, light curve properties, and cosmological applications
 - Performed spectral analysis of supernova Ia from cFA Supernova Data Archive to find key absorption lines, and measure doppler velocity, FWHM, psuedo-equivalent width
 - Examined the light curve of around 150 supernova Ia in various photometric bands to find the peak brightness
- **Solar Terrestrial Relations** August 2024 - Dec 2025
Undergraduate Researcher
Solar Astrophysics Lab, NIT Calicut
Guide: Dr Ram Ajor Maurya
 - Analyzed long-term variations and periodicity in solar and geomagnetic indices (SN, F10.7, Kp, Ap) from 1932–2024 using Fourier Transform, Wavelet Analysis, and correlation techniques
 - Developed predictive models for Solar Cycle 25 sunspot numbers using statistical forecasting model like SARIMA and Long Short-Term Memory (LSTM) model, and compare them on different matrices
 - Fitted skewed Gaussian models to sunspot data to extract cycle parameters, and established statistical relationships between skewness, kurtosis, and solar cycle parity via regression analysis
 - Present this research work during in house symposium-Confluentia 2025 as poster, organized by Department of Physics, NIT Calicut

TECHNICAL SKILLS

- **Programming and Scripting Languages**
Python, C, LaTeX
- **Tools and Libraries**
Microsoft Office Suite, NumPy, Pandas, Matplotlib, Scikit-learn, Adobe Creative Cloud

- **Operating Systems**
Windows, Ubuntu

ACHIEVEMENTS / AWARDS

- **Indian Academy of Science Fellowship, 2024**
Selected for the prestigious Indian Academy of Sciences Summer Research Fellowship Programme, 2024. Worked under the supervision of Dr D Narasimha at Indian Institute of Technology, Dharwad.
- **IIT JAM (Physics), 2026**
Secured All India Rank (AIR) 25 in a national-level examination for admission to postgraduate science programs in India.
- **GATE (Physics), 2026**
Secured All India Rank (AIR) 604 in a national-level examination for postgraduate admissions and research opportunities in India.

WORKSHOPS AND CONFERENCES

- **Astronomy and Astrophysics for Amateur Astronomers**
Organized by NIT Calicut May 2023
- **AstroSat and XPosat Data Analysis Workshop**
Organized by IUCCA, Pune and Providence Women's College, Kozhikode June 2025
- **National Level School on Analysis and Statistical Modelling of Space Science Data**
Organised By Manipal Centre for Natural Sciences (MCNS) July 2025

RESEARCH / PUBLICATIONS

- **Nonlinear Correlations and Multi-Scale Periodic Behaviors in Solar-Driven Magnetospheric Variability**, presented at *ReCON III Conference*, NIT Calicut (Aug 2025). Under conference proceedings.

CERTIFICATIONS

- **Data Science in Astronomy**
Spartificial July 2023 - November 2023
- **100 Days Python Bootcamp**
Udemy January 2022

RELEVANT COURSES

- **Physics:** Classical Mechanics, Quantum Mechanics, Electromagnetism, Statistical Physics, Thermodynamics, Optics, Optical Engineering, Atomic and Molecular Physics, Condensed Matter Physics, Laser Physics, Nuclear and Particle Physics, Nuclear Engineering, Astronomy and Astrophysics, General Theory of Relativity
- **Mathematics:** Multivariable Calculus, Linear Algebra, Differential Equations, Complex Analysis, Probability Theory
- **Electrical and Electronics:** Analog Electronics, Digital Electronics, Semiconductor Device Modelling
- **Programming:** C, Python, Computational Physics, Modelling and Simulation Using Python

EXTRACURRICULAR ACTIVITIES

- **Poster Design (Remote Work)**, ScienceOverse Ahmedabad April 2022 - December 2022
- **Design Team**, Bhauthiki (Physics Association, NIT Calicut) August 2022 - May 2025
- **Citizen Scientist**
All India Asteroid Search Campaign 2024 August 2024
- **Physics Tutor**, Student Guidance Cell July 2023 - April 2025