Deba Priyo Guha

Date of birth: | Nationality: Bangladeshi | Gender: Male

(+880) 1820 ****** | debapriyoguha@gmail.com

LinkedIn | GitHub | ResearchGate

Chattogram, Bangladesh

About me:
Aspiring astrophysicist with a strong foundation in machine learning and scientific computing. Experienced in developing physics informed deep learning frameworks for astronomical transient classification and radio galaxy morphology analysis. Selected for Bangladesh National Team for International Olympiad on Astronomy & Astrophysics (2017). Passionate about applying computational methods to unlock the mysteries of the universe.

● RESEARCH INTERESTS

Astrophysics & Cosmology: Astronomical transient detection and classification, radio galaxy morphology, multi wavelength astronomy, time domain astrophysics

Machine Learning for Science: Physics informed deep learning, vision language models for astronomy, interpretable AI for scientific discovery

Methods: Semi supervised learning, transformer architectures, hyperspectral image analysis, multimodal AI systems

● EDUCATION

Feb 2019 – Aug 2024 | Rajshahi, Bangladesh

BACHELOR OF SCIENCE IN ENGINEERING – Rajshahi University of Engineering & Technology (RUET)
Department of Electrical & Computer Engineering (ECE) | ruet.ac.bd

- CGPA: 2.88/4.00
- **Thesis:** "PIE-ADA: Physics Informed Ensemble with Adaptive Data Augmentation for Photometric Transient Classification" | Supervisor: Fariya Tabassum
- **Relevant Coursework:** Neural Networks & Fuzzy Systems, Digital Signal Processing, Pattern Recognition, Data Structures & Algorithms, Probability & Statistics, Electromagnetic Field Theory, Communication Systems

2016 – 2018 | Chattogram, Bangladesh

HIGHER SECONDARY SCHOOL CERTIFICATE (HSC) – Govt. City College Chattogram | gccc.edu.bd

- GPA: 4.83/5.00 | Group: Science

2010 – 2016 | Chattogram, Bangladesh

SECONDARY SCHOOL CERTIFICATE (SSC) – Nasirabad Govt. High School | nghs.tsmts.com

- GPA: 5.00/5.00 | Group: Science

Language Proficiency: IELTS Academic Overall 7.0 (Listening: 8.0, Reading: 7.5, Writing: 6.5, Speaking: 6.0) | Test Date: Sept 2025

● RESEARCH EXPERIENCE

Oct 2025 – Present | Dhaka, Bangladesh

POSTBACCALAUREATE RESEARCH INTERN – Center for Astronomy, Space Science & Astrophysics (CASSA), Independent University, Bangladesh

Supervisor: Dr. Khan Muhammad Bin Asad | cassa.site
- **RGC v2.0 Project:** Developing hierarchical radio AGN classifier for bent morphologies (Wide Angle Tail, Narrow Angle Tail) using 20,000+ LOFAR/LoTSS and VLA/FIRST images
- Implementing semi supervised learning frameworks and spurious source filtering algorithms for radio astronomical surveys

- **Vision LLM for Multi Wavelength Astronomy:** Building multimodal AI system ingesting galaxy images across optical, IR, radio, and X ray bands for automated astrophysical characterization
- Gaining expertise in radio interferometry, large scale astronomical survey processing, and full ML research pipeline

2024 – Present | Rajshahi, Bangladesh
RESEARCH COLLABORATOR – Young Learners' Research Lab, Department of CSE, RUET

Supervisor: Md. Azmain Yakin Srizon (Assistant Professor)
- **LunaXNet Project:** Developing hybrid CNN Transformer framework for lunar mineralogical segmentation from Chandrayaan 1 M3 hyperspectral data (85 spectral bands, 430–3000 nm)
- Implementing Grad CAM based interpretability analysis for olivine, pyroxene, and plagioclase identification on lunar surface

Jan 2024 – Aug 2024 | Rajshahi, Bangladesh
UNDERGRADUATE THESIS RESEARCHER – Department of ECE, RUET

Supervisor: Fariya Tabassum (Assistant Professor & Head, ECE Department)
- Developed **PIE-ADA** (Physics Informed Ensemble with Adaptive Data Augmentation) for photometric transient classification targeting LSST survey
- Implemented astrophysically constrained synthetic data generation: time dilation, interstellar extinction, correlated noise injection
- Extracted 271 multi scale features from PLAsTiCC dataset (7,848 objects, 14 classes: supernovae Ia/II/Ibc, kilonovae, AGN, TDEs)
- Achieved weighted log loss of 0.5759 and 80.38% accuracy, outperforming baselines by 32–48%

● PUBLICATIONS & MANUSCRIPTS

In Preparation (First Author):
- **D. P. Guha**, F. Akter, F. Tabassum, "PIE-ADA: Physics Informed Ensemble with Adaptive Data Augmentation for Photometric Transient Classification," Target: *Monthly Notices of the Royal Astronomical Society*
- **D. P. Guha**, M. A. Y. Srizon, et al., "LunaXNet: Pre Post AI Framework for Mineralogical Segmentation from Lunar Hyperspectral Data," Target: *IEEE Trans. Geoscience & Remote Sensing*

In Preparation (Co Author):
- M. S. H. Shahal, A. Khan, **D. P. Guha**, K. M. B. Asad, et al., "RGC v2.0: Hierarchical Multi Class Classification of Radio AGN Morphologies," Target: *Astronomy & Astrophysics*
- M. S. Hossain, et al., **D. P. Guha**, K. M. B. Asad, et al., "Vision Language Models for Multi Wavelength Galaxy Characterization," Target: *The Astrophysical Journal Supplement Series*

● HONORS & AWARDS

International Astronomy & Physics Achievements
- **2017: Bangladesh National Team Selection** – 11th International Olympiad on Astronomy & Astrophysics (IOAA), Phuket, Thailand | Selected as 1 of 5 national representatives
- **2023: Silver Medal** – University Physics Competition (International) | 48 hour advanced theoretical physics problem
- **2022: Accomplished Winner** – University Physics Competition (International)
- **2020: Silver Medal** – University Physics Competition (International)
- **2021: Bronze Honor** – International Astronomy & Astrophysics Competition (IAAC)
- **2021: Bronze Honor** – International Youth Math Challenge (IYMC)
- **2020: Silver Honor** – International Youth Math Challenge (IYMC)

National Olympiad Achievements
- **2017: National Winner** – 12th Bangladesh Astro Olympiad | Selected for Bangladesh Team
- **2018: Regional Champion** – 8th Bangladesh Physics Olympiad | Honorable Mention at National Round
- **2023: Mathematics Winner** – National STEAM Olympiad, Bangladesh
- **2021: Honorable Mention** – ICPC Asia Dhaka Regional Preliminary

Other Recognition
- **2020: Role Model Award** – US Embassy Student Leadership Development Workshop, Dhaka
- **2016: Outstanding Performance Award** – SSC Examination (GPA 5.00/5.00), Cambrian Education Group

● TECHNICAL SKILLS

Programming: Python (TensorFlow, PyTorch, Keras, Scikit learn) | C/C++ | MATLAB | SQL | Bash
Machine Learning: CNNs, Transformers (ViT, BERT), GANs/VAEs, Semi supervised learning, Vision language models (CLIP, BLIP)
Astronomy Tools: Astropy, FITS handling, DS9, TOPCAT, Radio imaging (LOFAR/VLA), Multi wavelength cross matching
Computing: Git/GitHub, Linux/Unix, HPC (SLURM), Jupyter, Google Colab, LaTeX

● PROFESSIONAL TRAINING

May 2025
CASSA WORKSHOP: UNCLOUDING THOUSAND EYES OF ARRAY RADIO TELESCOPE

Radio interferometry fundamentals, LOFAR data processing pipelines, primary beam modeling with Python, HPC server usage

● LEADERSHIP & OUTREACH

June 2022 – May 2023
PRESIDENT – Astronomy & Science Society of RUET (ASSR)

○ Led 50+ member organization; organized AURORA 2023 national science festival (500+ participants)
○ Conducted telescope observation sessions, astronomy seminars, and STEM outreach programs
○ Served as olympiad problem setter and judge for science competitions

2019 – Present
ACADEMIC TEAM MEMBER – Bangladesh Mathematical/Physics/Astronomy Olympiads

○ Question creation and evaluation for BdMO, BdPhO, BDOAA (regional/national rounds)
○ Mentored students in olympiad training camps

Dec 2018 – Present
FOUNDER & LEAD INSTRUCTOR – STEM by Priyojeet

○ Private tutoring in physics, mathematics, programming for 18+ students
○ Students achieved admissions to BUET, medical colleges, and top universities

● EXTRACURRICULAR ACTIVITIES

○ **Competitive Archer:** Active member, CTG Archery Club | 5th Position, 2nd Chittagong Open Archery Championship (2025)
○ **Competitive Programming:** 160+ problems solved on LeetCode, Codeforces, CodeChef, AtCoder

● REFERENCES

Khan Muhammad Bin Asad, PhD
Assistant Professor & Director
CASSA, IUB, Bangladesh
kasad@iub.edu.bd
(+880) 1320 767186

Md. Azmain Yakin Srizon
Assistant Professor
Department of CSE, RUET
azmainsrizon@cse.ruet.ac.bd
(+880) 1790 187189

Fariya Tabassum
Assistant Professor & Former Head
Department of ECE, RUET
fariya@ece.ruet.ac.bd
(+880) 1303 086970

Last Updated: December 2025