

Mubtasim Fuad

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Research Interests

- **Primary areas:** High Energy Physics - Theory (hep-th), General Relativity & Cosmology (gr-qc)
- **Current topics:** G_2 -holonomy manifolds & M-theory; rational conformal field theories & categorical structures; weak gravitational & Doppler lensing
- **Secondary topics exploring:** Physics-informed neural networks (PINNs) for field theories & strings

Education

- **University of Dhaka** Dhaka
Master of Science - Theoretical Physics 2023 - 2024
Thesis: In Search of Local Descriptions of M-Theory on G_2 -Holonomy Manifolds
Supervisor: [Dr. Tibra Ali](#)
- **Jahangirnagar University** Dhaka
Bachelor of Science (Honors) - Physics 2017 - 2022

Publications

- **M. Fuad**, S. A. Ema, and M. R. Hossen. “Impact of Screening on Weak Gravitational Lensing Observables in Relativistic N -body Simulations.” *Scientific Reports*, under revision (submitted 26 February 2026)
- **M. Fuad**, S. A. Ema, and M. R. Hossen. “Tracing Cosmological Signature with Doppler Lensing: Insights from Cosmological Simulations.” *Physics Letters B* **850**, 140197 (2026). DOI: [10.1016/j.physletb.2026.140197](https://doi.org/10.1016/j.physletb.2026.140197)

Conference Contributions

- “Analyzing Relativistic N -body Simulations for Precision Lensing Cosmology.” *International Conference on Physics (ICP) 2026*, DU, Dhaka, Bangladesh, 11 April 2026. (Talk)
- “Relativistic N -body Approaches for Precision Cosmology with Doppler and Weak Gravitational Lensing.” *International Conference on Advances in Physics (ICAP) 2025*, SUST, Sylhet, Bangladesh, 18 December 2025. (Talk)

Experience

- **Research Assistant**
Astrophysics & Cosmology Research Group, Dept. of Physics, JU Jan 2024 - Present
 - Conduct research stemming from the [UGC-funded](#) project “Measurement of Gravitational Lensing Signals in the Framework of General Theory of Relativity: A Step Towards Precision Cosmology” under [Dr. Md. Rasel Hossen](#)
 - Apply PINNs to research methodology in astrophysical plasma systems
 - Mentor new members of the research group with their respective projects and theses

- **Summer Intern**

ICTP Physics Without Frontiers

Jul 2025 - Aug 2025

- Studied the classification of rational conformal field theories using number-theoretic and categorical methods under [Dr. Arpit Das](#)

- **Co-Editor**

Biggan Blog (STEM Blog)

Mar 2021 - Present

- Reviewed and edited physics & math articles for scientific accuracy and clarity
- Edited and illustrated a commemorative ebook of 50 curated articles (500+ pages) marking 12 years of the blog in 2021

Content Writer

2016 - 2021

- Authored semi-technical and popular science articles on physics & math in Bengali for public outreach

- **Tutor & Mentor**

2017 - Present

- Mentor undergraduate and master's students on their theses and research projects
- Guide undergraduate students for international competitions including 'The University Physics Competition'

Skills

- **Technical Skills:**

- **Computational Tools:** Python, Mathematica, C, C++, HPC with BdRen Linux server
- **Documentation Tools:** L^AT_EX, Office suite, Git

- **Language Proficiency:** English (IELTS Academic 7.0, no band below 6.5), Bengali (native)

Selected Schools, Courses & Workshops

- **Pre-Strings School 2026**

Shanghai Institute for Mathematics and Interdisciplinary Sciences

Jun 27 - Jul 4, 2026

- **II São Paulo School on Gravitational Physics**

ICTP PWF

Jul 14 - 18, 2025

- **PWF Bangladesh: Jamal Nazrul Islam Memorial Winter School in Mathematical and Theoretical Physics**

ICTP PWF

Jan 29 - Feb 2, 2025

- **Effective Field Theories and Beyond**

Mainz Institute for Theoretical Physics, Johannes Gutenberg University

Dec 3 - 5, 2024

- **Advanced Lectures on Theoretical Physics: Introduction to the Swampland**

ICTP PWF Physics Latam

Nov 25 - Dec 2, 2024

- **Mini-course on Beautiful Papers**

Perimeter Institute for Theoretical Physics (Dr. Pedro Vieira)

Oct 7, 2024 - Jan 31, 2025

- **PWF Bangladesh: School on Quantum Field Theory**

ICTP PWF

Aug 25 - Oct 1, 2024

- **Advanced Lectures on Theoretical Physics: Cohomology in Algebraic Geometry**

ICTP PWF Physics Latam

Jul 15 - Aug 1, 2024

- **Advanced Lectures on Theoretical Physics: Algebraic Topology in Physics**

ICTP PWF Physics Latam

May 29 - Jun 7, 2024

- **Qi 101 - Quantum Mechanics for Quantum Information**
Tensor (Dr. Tibra Ali) *Oct 2022 - Sep 2023*
- **2nd Tensor-Perimeter Scholars International Winter School in Theoretical Physics**
Tensor & Perimeter Institute *Jan 9 - 20, 2023*
- **Summer School on Cosmology 2022**
International Centre for Theoretical Physics *Jul 4 - 15, 2022*

Awards & Competitions

- **Undergraduate Education Scholarship with Tuition Waiver** *2017-2022*
Jahangirnagar University
Obtained annually based on undergraduate performance
- **Silver Medal Winner** *2019 & 2021*
The University Physics Competition
Ranked Silver Medal Winner in two editions, as Team no. 151 (Problem A, 2019) and Team no. 232 (Problem B, 2021)
- **Prize Winner** *2018*
Bangladesh Mathematical Society
Received a prize in the 10th Undergraduate Mathematical Olympiad (Dhaka North Region) and subsequently participated in the 'National Round'
- **Prize Winner** *2012 & 2016*
Bangladesh Mathematical Olympiad Committee (BdMOC)
Received a prize in the Regional Round and participated in the National Round of the Bangladesh Mathematical Olympiad in the Junior (2012) and Higher Secondary (2016) categories, respectively