Ahmed Rakin Kamal

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Personal Information

Date of Birth : 31st January, 1999.
Nationality : Bangladeshi.
Research Interests: Higher Derivative Corrections in String theory, String Cosmology, Swampland Program, Generalised Symmetries, Time Dependent Backgrounds in String theory.
Languages: Bangla (native), English.

Education

2023 - present	PhD in theoretical physics at **Masaryk University** Supervisor : **Linus Wulff**
2021 - 2023	Masters in theoretical physics at **Alma Mater Studiorum - Università di Bologna** Supervisor : **Michele Cicoli**
2020 - 2021	Masters (M2) in mathematical physics at **Universite de Bourgogne-Franche Comte** Supervisor : **Taro Kimura**
2017 - 2019	BSc. in physics at **Brac University** Supervisor : **Mahbub Majumdar**

Research Articles (Published and Pre-Prints)

Aggarwal, Aviral et al. (June 2025). "One loop in $D = 11$ vs $D = 10$: 4-point check". In: arXiv: 2506.16391 [hep-th].

Chakraborty, Dibya et al. (Nov. 2025). "Fibre Inflation Meets Quintessence: Implications of Perturbative Stabilisation". In: arXiv: 2511.19610 [hep-th].

Cicoli, Michele et al. (2025). "Back to the origins of brane–antibrane inflation". In: *Eur. Phys. J. C* 85.3, p. 315. DOI: 10.1140/epjc/s10052-025-13982-9. arXiv: 2410.00097 [hep-th].

Hai, Mishaal et al. (June 2025). "Perturbative Kähler Moduli Inflation". In: arXiv: 2506.08083 [hep-th].

Hsia, Steven Weilong et al. (2025). "No manifest T duality at order α'3". In: *Phys. Rev. D* 111.6, p. L061904. DOI: 10.1103/PhysRevD.111.L061904. arXiv: 2411.15302 [hep-th].

Kamal, Ahmed Rakin and Ratul Mahanta (Dec. 2025). "Time-dependent flux backgrounds in type IIB supergravity". In: arXiv: 2512.19793 [hep-th].

Ongoing Projects

Time Dependent Flux Backgrounds in String Theory

With Dr. Ratul Mahanta (University of Science and Technology of China (USTC)), we have constructed explicit time dependent backgrounds in type IIB supergravity with all fluxes which is to appear in arxiv soon. We are now planning to develop on this further by extending it to constructing warped time dependent backgrounds and also study their cosmological implications.

String Universality and the Swampland

With Dr. Markus Dierigl (CERN), I am looking into string universality in 8D supergravity.

Higher-Form Symmetries and Axion Physics

With few collaborators from Bangladesh, we are looking into higher form symmetries in higher dimensional theories and studying how strong CP problem can be solved using interplay between Kaluza-Klein reduction and higher form symmetries.

Work Experience

Lecturer, Brac University Jan 2020 - 2026

I have served as a lecturer at BRAC University in Bangladesh where I taught courses on elementary calculus and introductory physics designed for engineering majors. Besides, I have also designed online courses during COVID and helped introduce an online platform similar to edX for Brac University. I also supervised many physics undergraduate students from Brac University in the last two years.

Research Intern, Institute of Mathematics at Dijon 2020

I served as a research intern under Prof. Taro Kimura where I studied JT gravity and matrix models.

Research Visits

April-May 2024	Research Visit at **University of Bologna** I visited University of Bologna and Collaborated with Prof. Michele Cicoli's group.
October-November 2025	Research Visit at **CERN** I did a research visit to Prof. Irene Valenzuela at CERN.
April-May 2026	Research Visit at **KU Leuven** I got a grant to visit Prof. Thomas Van Riet's group at KU Leuven.

Development Works

ICTP Physics Without Frontiers Bangladesh	In collaboration with Prof. Nabil Iqbal (Durham University) and ICTP, I co-founded Physics Without Frontiers Bangladesh in 2024. Since its inception, we have organized three courses: two on Quantum Field Theory (QFT) in 2024 and 2025, and one on General Relativity (GR) in 2025. Each course enrolled approximately 150 students, significantly contributing to the growth of the physics community in Bangladesh. I also delivered a series of four lectures on the Standard Model as part of one of the QFT courses. Additionally, we established an internship and mentorship program designed to introduce undergraduate and master's students to advanced research topics in theoretical physics.
Organisation of Seminars and Workshops	I have also organized several offline seminars and workshops in Bangladesh. Among the most notable was the Jamal Nazrul Islam Memorial Winter School, for which we secured approximately 20,000 Euros in funding and successfully hosted an on-site school in Dhaka, Bangladesh. The event featured lectures by distinguished theoretical physicists, including Prof. Ashoke Sen, Prof. Michele Cicoli, and Prof. Suvrat Raju.

Conferences

2025 KMPB School 2025: D-branes in Physics and Mathematics (KMPB25).
2025 Integrability, Dualities and Deformations **Poster Presented**.
2024 Accelerated expansion, dS, and Strings: From the Swampland to the Landscape, Madrid .
2024 String Phenomenology 2024, Padova **Poster Presented**.
2024 ESI Landscape vs Swampland, Vienna
2024 ICTP String Math 2024 , Trieste **Poster Presented**
2023 Deconstructing The String Landscape (a.k.a Landscapia) 2023, Paris.
2023 ICTP Summer School on Superstrings and related topics 2023, Trieste.
2022 ICTP Summer School on Superstrings and related topics 2022, Trieste.
2021 17th Modave Summer School in Mathematical Physics 2021, Brussels.

Teaching Experience

2025 Gave lectures on Standard Model at ICTP PWF School on QFT and Standard Model
2020-2023 Taught courses on Calculus, Electricity and Magnetism, Linear Algebra, Complex Analysis at Brac University.

Software Skills

Skills : Affluent in Mathematica and Latex.

Student Supervised

2024: Shavin Shayok Dipro (Brac University) *A Toy-Model Resolving the Black Hole Information Paradox*.
2024: Saif Ar Rasul and Sitima Moeen (Brac University) Axion Monodromy Inflation and the late universe
2025-2026 Falguni Biswas (University of Dhaka) and Yeshan Juberi (Brac University)
Higher Form Symmetries and Axion Physics.
2025-2026 Kazi Fahim Reza Arko and Fahim Hoque (Brac University)
Time Dependent Backgrounds in String Theory.

Undergraduate and Masters Works

2023 Master thesis at the University of Bologna Perturbative Moduli Stabilization And String Inflation
Supervisor: Professor Michele Cicoli.
2021 Master thesis at the University of Burgundy Advances in 2 dimensional quantum gravity
Supervisor: Dr. Taro Kimura.
2019 Undergraduate thesis at Brac University Non-Local Gravitational Interactions and the Black hole Information Paradox .
Supervisor: Dr. Mahbub Alam Majumdar.
2019 Gave a talk during my undergraduate studies on Black hole Information Paradox and Correlations between Hawking Radiation.
2023 Gave a presentation on RNS formalism and RG Induced Moduli Stabilization and wrote an article, for a course, on Brane-antibrane inflation

Awards and Achievement

Undergraduate Deans list in 6 out of 9 Semesters .
Undergraduate Vice Chancellors Certificate (47th Batch of the Residential Semester (RS)).
Graduate Stood first in the merit scholarship for international students at Alma Mater Studiorum - Università di Bologna.
Graduate Got the merit scholarship for the best international students at Université de Bourgogne reserved for masters students enrolled in the program MATH4PHYS.
Graduate CALIGOLA grant to visit CERN.
Graduate Erasmus grant to visit KU Leuven.

References

Prof. Jörgen Linus Wulff — Associate Professor, Department of Theoretical Physics and Astrophysics, Masaryk University. Email: wulff@mail.muni.cz.
Prof. Michele Cicoli — Professor, Department of Physics and Astronomy, Alma Mater Studiorum - Università di Bologna. Email: michele.cicoli@unibo.it.
Prof. Fernando Quevedo — Professor, New York University Abu Dhabi and University of Cambridge. Email: fq2054@nyu.edu.
Prof. Nabil Iqbal — Professor, Department of Mathematical Sciences, Durham University. Email: nabil.iqbal@durham.ac.uk.
Prof. Mahbub Alam Majumdar — Professor and Dean, School of Data and Sciences. Email: majumdar@bracu.ac.bd.