Md. Aslam Hossain
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CONTACT DETAILS

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LINKS

RESEARCH INTERESTS

- Computational Fluid Dynamics
- Heat and Mass Transfer
- Non-linear Dynamics
- Mathematical Biology
- Numerical Methods for PDE
- AI for Energy & Healthcare
- Thermoacoustic Instability

BIBLIOMETRICS

Google Scholar (Nov., 2026)

88 Citations	**6** h-index
15 Papers	**4** i10-index

ARTICLE HISTORY

- Q1 Journals: 5 articles
- Q2 Journals: 6 articles
- Peer Reviewed: 4 articles
- Submitted: 4 articles
- Under Process: 6 articles

ABOUT ME

A mathematics faculty member and researcher at Pabna University of Science and Technology (PUST), Bangladesh, with specialization in Computational Fluid Dynamics, specifically, heat and mass transfer, magneto-hydrodynamic (MHD) convection, entropy generation, and nanofluid dynamics in complex geometries. Skilled in finite element modeling using COMSOL Multiphysics, with additional experience in incorporating Artificial Intelligence and Machine Learning techniques into computational research frameworks. Have served as principal investigator on multiple nationally funded research projects under the University Grants Commission (UGC) of Bangladesh, demonstrating the capacity to lead and sustain an independent research agenda. Research findings have been published in several peer-reviewed international journals, including Q1 and Q2-indexed publications. Currently seeking a fully funded doctoral research opportunity to further develop research expertise and contribute to the advancement of applied and computational mathematical sciences.

EDUCATION

2016 – 2017 M.S. (Thesis) in Mathematics. GPA: 3.88 / 4.00 (ranked 3rd)

University of Barishal, Barishal-8254, Bangladesh

- **Thesis Title:** Effects of Natural Convection on 2D Incompressible Flow in a Non-inclined and an Inclined Square Cavity of Uniformly and Non-uniformly Heated Walls
- **Key Courses:** Fluid Dynamics, Magneto-hydrodynamics, Advanced Numerical Analysis, Dynamical Systems
- **Award:** Dean's Award 2017, awarded by the faculty in recognition to the excellence result.
- **Fellowship:** NST Fellowship, awarded by the Ministry of Science and Technology, Bangladesh to support thesis work financially.

2012 – 2016 B.S. (Honours) in Mathematics. CGPA: 3.94 / 4.00 (ranked 1st)

University of Barishal, Barishal-8254, Bangladesh

- **Project Title:** A Review of Solution Techniques of Linear Fredholm Integral Equations of Second Kind
- **Key Courses:** Calculus, Basic Statistics & Probability, Linear Algebra, Real & Complex Analysis, Ordinary & Partial Differential Equations, Numerical Analysis, Mechanics, Abstract Algebra, Topology, Tensor Analysis, Mathematical Methods, Functional Analysis, Differential Geometry, Mathematical Modeling in Biology, Hydrodynamics
- **Awards:**

(i) Prime Minister Gold Medal 2018, highest academic honor awarded by the UGC, Bangladesh, and **(ii)** Dean's Award 2016, awarded by the faculty in recognition to the excellence result.

- **Scholarship:** UGC Merit Scholarship 2016, awarded by the Ministry of Education, Bangladesh.

SELECTED JOURNAL PUBLICATIONS

[1] Thermal Performance Enhancement in Wavy Enclosures Using Strategically Positioned Rectangular Blocks under Periodic Heating Conditions for Thermal Management Applications

Md Shohanur Rahman, Marzia Akter Mishu, ***Md. Aslam Hossain****, Md. Azizur Rahman, G.M. Zahidul Islam, Md. Rezvi Hossain, Aftara Mehejabin*

TECHNICAL SKILLS

Simulation & Modeling
- COMSOL Multiphysics
- Mathematica
- Maple

Programming Languages
- Python
- MATLAB

Data & Visualization
- Tecplot
- Origin Lab

RELEVANT TRANSFERABLE SKILLS
- Porous Media Flow Modeling
- Predictive/Reduced-Order Modeling
- Physics Informed Neural Network
- High-Order Numerical Schemes
- Fluid Structure Interaction Modeling
- Open Source CFD/PDE Solver (OpenFOAM, FEniCS)

UNDERGRADUATE MATH OLYMPIAD (UMO)

Champion
9th National UMO, Regional (Khulna) Round, 2017

2nd Runner-Up
8th National UMO, Final Round, 2016

2nd Runner-Up
8th National UMO, Regional (Khulna) Round, 2016

AFFILIATED SOCIETIES

Bangladesh Mathematical Society (BMS)
Life Member · ID: Aa-1268

Journal of Applied and Computational Mechanics (Shahid Chamran University of Ahvaz), (2026). Impact factor: 3.5. Cite Score: 7.9. Q2 (SCOPUS & ESCI Indexed)

[2] Thermal performance and entropy assessment of a nanofluid-filled wavy cavity utilizing finite-element modeling approach and artificial intelligence
Md. Nur Alam, ***Md. Aslam Hossain*****,* *Shams Forruque Ahmed, Tanmoy Bairagi, Md. Rafiquzzaman Rafi, Mahmmoud M. Syam*
International Journal of Thermofluids (Elsevier), *(2026)* · Cite Score: 11 · Q1 (SCOPUS Indexed)

[3] Optimal Control and Evolutionary Behavior in a Two-Layer Epidemic Model with Travel Restriction and Social Distancing
M.A.H. Sajib, Md. Rajib Arefin, ***Md. Aslam Hossain****, Jun Tanimoto*
Physical Review E (American Physical Society), *(2026).* Vol. 113, 044307 · Impact Factor: 2.4 · Cite Score: 4.1 · Q2 (SCOPUS & SCIE Indexed)

[4] Finite Element Analysis of Natural Convection and Entropy Generation in a T-Shaped Cavity with an Octagonal Block
Sadia Islam, Md. Nur Alam, ***Md. Aslam Hossain****, M.K.A. Mitta, S.F. Ahmed*
Journal of Taibah University for Science (Taylor & Francis), *(2025).* Vol. 19 · Impact Factor: 3.6 · Cite Score: 6.8 · Q2 (SCOPUS & SCIE Indexed)

[5] MHD Mixed Convection and Entropy Generation Inside a Square Wavy Cavity with a Cone Heater
Sadia Islam, Md. Nur Alam, ***Md. Aslam Hossain****, Mst. Kakoly Akter Mita, Shams Forruque Ahmed*
International Communications in Heat and Mass Transfer (Elsevier), *(2025).* 109734 · Impact Factor: 6.2. Cite Score: 8.8 · Q1 (SCOPUS & SCIE Indexed)

[6] Soliton Solutions, Bifurcation, Sensitivity and Chaotic Analysis of the Nonlinear Combined Kairat-II-X Wave Model
Reaz Hossain, Md. Sagib, ***Md. Aslam Hossain****, S.M. Rayhanul Islam*
Physics Letters A (Elsevier), *(2025)*· Impact Factor: 2.7 · Cite Score: 4.2 · Q2 (SCOPUS & SCIE Indexed)

[7] Impacts of Nanoparticle Shape and Periodic Heating on Entropy Generation Inside a Tilted Nanofluid-Filled Rectangular Cavity
Md. Aslam Hossain*, Md. Rafiqul Islam, Md. Nur Alam, Md. Sagib, M.A.H. Sajib, Chinmayee Podder, Bijan Krishna Saha, Md. Jakir Hossen*
International Journal of Thermofluids (Elsevier), *(2025)*· Cite Score: 11 · Q1 (SCOPUS Indexed)

[8] Modelling and Theoretical Overview of Casson Fluid Flow Through a Stretching Sheet with Variable Viscosity and Sinusoidal Boundary Conditions
Rafiqul Islam, ***Aslam Hossain****, Rajib Biswas, Mehedy Hasan, B.M. Jewel Rana, Habibullah Habibullah, Mohammad Afikuzzaman*
International Journal of Ambient Energy (Taylor & Francis), *(2025).* Vol. 46, No. 1, 2539139 · Cite Score: 7.2 · Q2 (SCOPUS Indexed)

[9] Thermal Performance Enhancement in a Hexagonal Cavity Filled with Hybrid Nanofluid and a Steering-Shaped Insertion
Bijan Krishna Saha, Goutam Barai, Nithan Majumdar, ***Md. Aslam Hossain****, Goutam Saha, Suvash C. Saha*
Frontiers in Energy Research (Frontiers Media SA), *(2025).* Vol. 13: 1602241 · Impact Factor: 2.4 · Cite Score: 6.3 · Q2 (SCOPUS & SCIE Indexed)

[10] Enhanced Thermal Efficiency on Mixed Convection Flow of TiO_2-Water Nanofluid Inside a Double Lid-Driven Zigzag Cavity with and without Heated Obstacles Insertion
Md. Aslam Hossain*, M.A.H. Sajib, Md. Sagib, Md. Rafiqul Islam, Goutam Barai, Chinmayee Podder, Bijan Krishna Saha*
International Journal of Thermofluids (Elsevier), *(2025)* · Cite Score: 11 · Q1 (SCOPUS Indexed)

[11] On Traveling Wave Solutions with Stability and Phase Plane Analysis for the Modified Benjamin-Bona-Mahony Equation
Md. Sagib, ***Md. Aslam Hossain****, Bijan Krishna Saha, Kamruzzaman Khan*
PLOS ONE (Public Library of Science), *(2024).* Vol. 19(7) · Impact Factor: 2.9 · Q1 (SCOPUS & SCIE Indexed)

SUBMITTED MANUSCRIPTS

[1] AI-assisted CFD framework and thermal management of magnetically controlled nanofluid systems with irreversibility analysis using multiple nanoparticles and base fluids in bio-inspired heart-shaped cavity

***Md. Aslam Hossain**, Muhammad Ziaul Haque, Sadia Islam, Md. Sagib, G.M. Zahidul Islam, Chinmayee Podder*, Bijan Krishna Saha**

[2] Entropy generation optimization and heatline visualization for enhanced MHD mixed convection inside a Cu-Ethylene glycol nanofluid filled truncated prismatic cone with a heated rotating cylinder

*Sadia Islam, Muhammad Ziaul Haque, **Md. Aslam Hossain***, Md. Nur Alam*

[3] Magnetic Control of Natural Convection and Thermodynamic Irreversibility in a Heart-Shaped Enclosure: Heatline Insights into TiO_2-Ethylene Glycol Nanofluid Transport

***Md. Aslam Hossain*,** Md. Nur Alam, Sabbir Iftekhar Sakib, Md. Jahangir Alam, Sadia Islam, Muhammad Ziaul Haque, Prioyjit Das, Israt Jahan Shifa , Shams Forruque Ahme**

[4] Numerical Analysis for the Impacts of an Embedded Circular Heat Source on Entropy Generation Inside a Rectangular Cavity

*Rukaya Parven, Sadia Islam, Ashikur Rahman, **Md. Aslam Hossain***, Md. Nur Alam*

RESEARCH GRANTS AWARDED

1. Fiscal Year: 2025–2026 (Completed)

Optimization of MHD Mixed Convection Heat Transfer with Entropy Generation and Heatline Visualization Inside a Nanofluid-Filled Novel Double Lid-Driven Heart-Shaped Cavity with Ring-Shaped Heat Source Using FEM along with AI Prediction

Funded by University Grants Commission (UGC) of Bangladesh through PUST.
Project Value: BDT 4, 50,000 (approx. $3639). Position in the project: Principal Investigator

2. Fiscal Year: 2024–2025 (Completed)

Finite Element Analysis of Entropy Generation Due to Mixed Convective Flow of Aluminium Oxide-Water Nanofluid Inside a Vented Cavity

Funded by University Grants Commission (UGC) of Bangladesh through PUST.
Project Value: BDT 1, 90,000 (approx. $1536). Position in the project: Principal Investigator

3. Fiscal Year: 2023–2024 (Completed)

Entropy Generation During Natural Convective Flow of Titanium Oxide-Water Nanofluid Inside an Inclined Rectangular Cavity: Non-Uniform Heating Case

Funded by University Grants Commission (UGC) of Bangladesh through PUST.
Project Value: BDT 2, 00,000 (approx. $1617). Position in the project: Principal Investigator

PROFESSIONAL & ACADEMIC EXPERIENCES

Pabna University of Science and Technology (PUST), Pabna, Bangladesh

Oct 17, 2025 – Present	Assistant Professor in Mathematics
Oct 17, 2022 – Oct 16, 2025	Lecturer in Mathematics

Conducted Courses: Fluid Dynamics, Geophysical Fluid Dynamics, Hydrodynamics, Mechanics, Complex Analysis, Geometry of Two Dimensions, Linear Algebra, Discrete Mathematics & Graph Theory, Differential Geometry, Ring Theory, Number Theory, Fundamentals of Mathematics.

ADMINISTRATIVE EXPERIENCES

Oct 10, 2024 – Present **Assistant Director**.

Office of the Student Advisor, PUST, Pabna, Bangladesh

SUPERVISION

Postgraduate (M.Sc.) Supervision

[1] **Nawshin Afroz Sima** (ID: 190320, Session: 2022–23); **Title:** AI-Assisted CFD Modeling, Thermal Performance Evaluation, and Entropy Generation Optimization of Steady and Unsteady MHD Hybrid Nanofluid Flow in a Vented Trapezoidal Cavity with a Heated Fin and Dual Cylindrical Obstacles under Diverse Flow and Thermal Boundary Conditions for Advanced Thermal Engineering Applications. (Ongoing, Supervisor)

[2] **Sadia Islam** (ID: 180325, Session: 2021–22); **Title:** Finite-Element Analysis of Entropy Generation and Heat Transfer in Complex Cavities with Internal Obstacles under Natural and MHD Mixed Convection. (Completed, Co-Supervisor)

Undergraduate (B.Sc.) Supervision:

Supervised 15 B.Sc. (Hons.) projects- 12 on heat transfer analysis, and 3 on AI applications in healthcare, agriculture, and banking. Currently supervising 4 additional B.Sc. (Hons.) projects on AI for healthcare.

VOLUNTARY ACTIVITIES

EFAST 2026 - International Conference on Emerging Frontiers in Advanced Sciences and Technologies 2026

Jointly organized by PUST & Centre of Excellence for Advance Computing, UniMAP, Malaysia on the date of 27–28 June 2026

- Member, Transportation and Accommodation Committee
- Member, Venue Management Committee
- Secretary, Volunteer Management Committee

PROFESSIONAL TRAINING

- **Training Name:** Professional Development Training for University Faculty
- **Offering Institute:** University Teachers' Training Academy (UTTA), Bangladesh
- **Supervision:** University Grants Commission (UGC), Bangladesh (HEAT Project)
- **Organization:** Bangladesh Open University (BOU), Gazipur, Bangladesh
- **Duration:** Oct 12, 2025 – Feb 5, 2026 · **Trainee ID**: UHFT-250032
- **Areas:** Higher education pedagogy, research integrity, institutional governance, and quality assurance.

LANGUAGE PROFICIENCY

- **English:** Have a good command of speaking, listening, reading & writing. English was the medium of instruction (MOI) throughout the B.S. & M.S. program.
- **Bengali:** Native Language.

ATTENDED CONFERENCES, WORKSHOP AND WEBINAR

- International Conference on Emerging Frontiers in Advanced Sciences and Technologies 2026 (EFAST 2026), PUST, Bangladesh, 27–28 June 2026.
- 20th International Mathematics Conference 2017, Dept. of Mathematics, University of Dhaka, 08–10 December 2017.
- Webinar on "Mathematics and its Applications", Dept. of Mathematics, CUET in collaboration with Bangladesh Mathematical Society, 3 October 2020.

REFERENCES

Dr. Md. Fazlul Hoque
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