Md. Mamun Molla, PhD

Professor and Chairman, Department of Mathematics and Physics
North South University, Dhaka, Bangladesh

Fellow, Bangladesh Academy of Sciences

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Research Profile

Computational fluid dynamics and high-performance computing, with research in GPU-accelerated lattice Boltzmann methods, convective heat transfer, non-Newtonian and multiphase flows, pollutant dispersion, and cardiovascular biofluid mechanics.

Included in the top 2% scientist list (2025 and 2026).

Academic Appointments

Chairman | Department of Mathematics and Physics, North South University | March 2024–present

Professor | Department of Mathematics and Physics, North South University | May 2019–present

Associate Professor | Department of Mathematics and Physics, North South University | February 2016–April 2019

Assistant Professor | Department of Mathematics and Physics, North South University | October 2015–February 2016

Assistant Professor | Department of Electrical and Computer Engineering, North South University | September 2011–October 2015

Postdoctoral Research Associate | Department of Mechanical and Manufacturing Engineering, University of Manitoba, Canada | September 2009–August 2011

Instructor | Mathematics, fluid dynamics and thermodynamics problem-solving classes, University of Glasgow | October 2005–July 2009

Lecturer in Mathematics | Bangladesh University of Engineering and Technology | December 2004–September 2005

Full-time Visiting Lecturer in Mathematics | Bangladesh University of Engineering and Technology | April 2002–November 2004

Education

PhD in Mechanical Engineering | University of Glasgow, 2009. Thesis in computational fluid dynamics.

MPhil in Mathematics | Bangladesh University of Engineering and Technology, 2003. Thesis in computational fluid dynamics. CGPA 3.83/4.00.

MSc in Applied Mathematics | University of Dhaka, 2001. Thesis in computational fluid dynamics. First Class, 2nd position.

BSc (Honours) in Mathematics | University of Dhaka, 1999. First Class, 4th position.

Honours and Awards

NSU Excellent Research Award 2021-2022 (Silver medal in SPES at NSU)

NSU Excellent Research Award 2018-2020 (3rd place in SPES at NSU).

European Union (Marie-Curie) scholarship for attending to the 7th EUROMECH Fluid Mechanics Conference (EFMC7), Manchester University, UK, 14-18 September 2008.

ORS (Overseas Research Scholarship)for the PhD, University of Glasgow, UK, 2005-2008.

Faculty of Engineering Scholarship for the PhD, University of Glasgow, UK, 2005-2008.

A Gold Medal for the best presentation in the 3rd International Conference on Applied Mathematics & Mathematical Physics, Shahjalal University of Science & Technology, Bangladesh, 2005.

National Science and Technology Fellowships, Bangladesh, 2000-2003.

Best award for the reading book competition, World Literature Centre (বিশ্ব সাহিত্য কেন্দ্র), Bangladesh, 1993.

Research Grants as Principal Investigator

Use of GPU Computing in Future Information Technology Education and Scientific Research in Bangladesh", ICT Division, Bangladesh Government, Grant ID: 1280101-1200028431-3631107, Tk-10,00,000.0, 2025-2026

"Lattice Boltzmann Simulation of Energy Storage Systems with Integrated Phase Change Materials Using GPU-Based High-Performance Computing" NSU faculty research grant (CTRG-25-SEPS-13) Tk- 750,000.00(~$6500.0), 2025-2026

"GPU Accelerated Advanced Lattice Boltzmann Simulation of Non-Newtonian Nano Encapsulated Phase-change Materials" Ministry of Science and Technology (MOST) Research Grant (SRG-242294)-Tk-350,000.0 ($3000), 2024-2025

"RANS and Large eddy simulation (LES) of air flow and Polluted Air dispersion in urban areas of Dhaka" NSU faculty research grant (CTRG-24-SEPS-05) Tk- 750,000.00(~$6500.0), 2024-2025.

"Lattice Boltzmann Simulation of Magnetohydrodynamic Convective Flow of Ferrofluids with Temperature-dependent Thermophysical Properties using the GPU Computing" Ministry of Science and Technology (MOST) Research Grant (EAS/SRG-232406)-Tk-450,000.0 ($4500), 2023-2024.

"Macro and Mesoscopic Simulation of Convective Flows of Two-phase Mixture Nanofluids with Sensitivity Analysis by Response Surface Methodology" NSU faculty research grant (CTRG-23-SEPS-11) Tk-500,000.00(~$5000.0), 2023-2024.

"GPU Optimized Lattice Boltzmann Simulation of Convective Heat Transfer and Entropy Production" Ministry of Science and Technology (MOST) Research Grant (EAS/SRG-222427)-Tk-600,000.0 ($6000), 2022-2023.

"Numerical Simulation of Magnetohydrodynamic Convective Heat Transfer of Nano and Ferro Fluids in Model Heat Exchangers" NSU faculty research grant (CTRG-22-SEPS-09) Tk- 500,000.00(~$5000.0), 2022-2023.

Ministry of Science and Technology (MOST) Research Grant (EAS-474)-Tk-350,000.0 ($4000), 2021-2022.

"Entropy Generation and Convective Heat Transfer Simulation of Nanofluids with Variable Thermophysical Properties" NSU faculty research grant (CTRG-21-SEPS-12)Tk- 500,000.00(~$6000.0), 2021-2022.

"Lattice Boltzmann Simulation of Convective Heat Transfer of Hybrid Nanofluids using GPU Computing" Ministry of Science and Technology (MOST) Research Grant (EAS-441)-Tk-400,000.0 ($5000), 2020-2021.

"Three-Dimensional Simulation of Convective Heat and Mass Transfer with Entropy Generation of Non-Newtonian Fluids using High-Performance Parallel Computing via Cluster CPU and GPU" NSU faculty research grant (CTRG-20-SEPS-15)Tk- 500,000.00(~$6000.0), 2020-2021.

"Simulation of Pollutant Dispersion in Urban Areas with Three-Dimensional Building Arrays in the City of Dhaka" Higher Education Research Grant (MS20191054)-Tk1200000.0 (~$14000.0), 2020-2022 (BANBEIS, Ministry of Education, Bangladesh)

"Numerical Simulation of Turbulent Air Flow and Pollutant Dispersion in Urban Areas of Dhaka City using High Performance Parallel Computing" NSU faculty research grant (CTRG19/SEPS/09)Tk- 490,000.00(~$6000.0), 2019-2020.

"Transition to Turbulent Non-Newtonian Fluid Flow Simulation using High-Performance Parallel Computing via GPU and Cluster CPU"NSU faculty research grant (No. NSU-RP-18-067) Tk- 400,000.00(~$5000.0), 2018-2019.

NSU faculty research grant Tk- 295,000.00, 2016-2017.

NVIDIA Tesla k40 GPU card grant from NVIDIA Corporation, USA, 2016 ($5000)

NSU research grant Tk- 75,000.00, 2013-2014.

NSU research grant Tk- 300,000.00, 2012-2013.

Research Training and Thesis Topics

Postdoctoral project (2009-2011): Computational biofluids, DNS of turbulent wall-bounded flows

PhD Thesis (2009): "LES of transition-to-turbulent pulsatile flow in the models of arterial stenosis and aneurysm",

MPhil Thesis (2003): "Natural convection flow with temperature dependent viscosity and thermal conductivity along a vertical wavy surface and a horizontal circular cylinder".

MSc Thesis (2001): "Natural convection flow along a vertical wavy surface with uniform surface temperature and heat flux in presence of heat generation/absorption".

Research Supervision

Postdoctoral Supervision

Successfully supervised a UGC Postdoctoral Fellow Dr. Sharaban Thohura, Professor, Department of Mathematics, Jagannath University (2024-2025).

Thesis Supervision

Merzia Akter, Higher Order Lattice Boltzmann simulation of nan-encapsulated phase change material suspended in chamber with multiples heaters (MSc thesis is ongoing)

Rahikim Tanzim, Large-eddy simulation of turbulent air flow and pollutant dispersion in Dhaka city (MSc thesis is ongoing)

Rabiul Islam, Computational Fluid Dynamics simulation of Boil-Off Gas (BOG) and Thermal Convection in LNG tank (MSc thesis is ongoing)

Sajid Dewan, Bio-inspired proton exchange-membrane fuel cell (PEMFC) simulation for the improved current density (MSc thesis is ongoing)

Md. Mahadul Islam, Numerical Investigation of MHD Double-Diffusive Natural Convection of NEPCM within an Enclosure Containing Annular Cylinders (MSc thesis completed on 30 June 2026)

Mejbah Ullah Chowdhury, CFD and Machine Learning-Based Analysis of Natural Convection in Non-Newtonian NEPCM Suspensions within Complex Enclosures (MSc thesis completed on 30 June 2026)

Malati Mazumder: Conduction-Convection Interaction of MHD Water-Cu Nanofluid Flow along a Vertical Surface using the Finite Difference Method, PhD thesis (on going from 2022-2026) (Co-supervisor, Department of Mathematics, Jahangirnagar University)

Noor-e-Alam Siddiki: Investigation of Heat Transfer and Flow Dynamics of Non-Newtonian Nanofluids in Closed Domains for Various Convection Modes, (PhD thesis completed) (2026) (Co-supervisor, Department of Mathematics, Jahangirnagar University)

Eabad Ali: Turbulent flow and dispersion simulation in a canyon street using RANS, (PhD thesis completed) (2023) (Co-supervisor, Department of Mathematics Dhaka University of Engineering and Technology)

Turbulent indoor air flow simulation using large-eddy-simulation in lattice Boltzmann method using GPU computing, MSc thesis (2018)

Natural convention flow of nanofluid along a vertical complex wavy surface with uniform heat flux, MPhil thesis (2017)) (Joint program with the Bangladesh University of Engineering and Technology)

Lattice Boltzmann Simulation of Airflow and Heat Transfer in a General Ward of Hospital, BSc thesis (2016)

Numerical simulation of non-Newtonian blood flow through a model arterial aneurysm with moving wall, BSc thesis (2015)

Finite volume simulation of nanofluid in a wavy channel, MSc thesis (2014)

Buoyancy Driven Natural Convection Flow in an Enclosure with Two Discrete Heating from Below, BSc thesis (2014)

Biomegnatic fluid flow in a model arterial aneurysm using finite volume method, BSc thesis (2013)

Numerical simulation of blood flow through a model arterial stenosis with complaint wall, BSc thesis (2012)

Academic Leadership and Professional Service

Research Coordinator | School of Engineering and Physical Sciences, North South University | 2019–2024

Convocation Marshal for the 26th convocation of NSU which was held on 7 January 2025

Convocation Marshal for the 25th convocation of NSU which was held on 7 December 2025

Professional Memberships

Fellow, Bangladesh Academy of Science (BAS)

Life member of the Bangladesh Mathematical Society (Member No: 749).

Founding member of the Bangladesh Society for Mathematical Biology (BSMB)

Journal Peer Review

Journals reviewed include the following.

Physics of Fluids • International Journal of Heat and Fluid Flow • Applied Mathematics and Computation

Applied Mathematical Modeling • ASME Journal of Heat Transfer • ASME Journal of Fluid Engineering

Non-linear Analysis: Modeling and Control • International Journal of Numerical Heat Transfer • International Journal of Thermal Science

International Journal of Energy and Technology • Chemical Engineering Communication • Engineering Application of Computational Fluid Dynamics

Progress in Computational Fluid Dynamics: An International Journal • Mecanica • Journal of Thermophysics and Heat Transfer

Central European Journal of Physics • Heat and Mass Transfer • Nonlinear Engineering – Modeling and Application

International Journal of Computer Mathematics • Int. Journal of Heat and Mass Transfer • Int. Journal of Non-Newtonian Fluid Mechanics

Computing and Numerical Methods

GPU programming with CUDA C/C++ and OpenACC. Parallel computing with MPI and OpenMP. Linux, OpenFOAM, C, C++, Fortran, MATLAB, Mathematica and Tecplot.

CUDA C/C++ code of Lattice Boltzmann method for GPU computing

High performance computing, parallel programming (using MPI and OpenMP) in DNS, LES, hybrid RANS/LES techniques

OpenMP code of Direct Numerical Simulation (DNS) and Large Eddy Simulation (LES) techniques based on the Cartesian curvilinear coordinates for incompressible fluid flow and thermal flow.

3D grid generation code using transfinite interpolation.

Single-Relaxation and Multiple-Relaxation-time based Lattice Boltzmann methods (LBM).

Explicit and implicit finite difference and volume method for the Navier-Stokes equation using velocity-pressure correction technique with different solvers.

Upwind explicit finite difference method for the Navier-Stokes equation in the velocity-vorticity formulation.

Alternating Direction Implicit (ADI) finite difference method together with Successive over relaxation (SOR) scheme for the Navier-Stokes equation.

Explicit method for Darcy's law for porous media coupled with the energy equations.

Implicit finite difference method together with Keller box scheme (Cebeci and Bradshaw, Springer 1984) for the boundary layer equations.

Marching order implicit finite difference method together with double sweep technique for the parabolic boundary value problem.

Nachtsheim-Swigert iteration technique together with 6th order Runge-Kutta method (Nachtsheim and Swigert, NASA TN- D30041965).

Local non-similarity method for the boundary layer equations.

Invited Talks Conferences and Workshops

Keynote Speaker, "Simulation Through High-Performance Parallel Computing: Applications in Computational Fluid Dynamics" Seminar on "Simulation For Everything: The Future of Digital Innovation", 12 June 2026, North South University. Bangladesh Society for Modeling and Simulation.

Invited Speaker, “Mesoscopic Simulation of non-Newtonian experimental data based copper-alumina-ethylene glycol hybrid nanofluid with a central radiator by machine learning validations of D3Q27 MRT-LBM” International Conference on Physics (ICP-2024), 09-11 May 2024, Bangladesh Atomic Energy Commission, Bangladesh

Plenary speaker for math’s, “Science Olympiad 2024” Organized by the Bangladesh Academy of Science (BAS), 9 March 2024.

Invited Speaker, “Large-Eddy Simulation of Turbulent Air Flow and Pollutant Dispersion in a Model Street Canyon and Urban Area” ADVNCED MATHEMATICAL MODELING: APPLICATION TO BIOMEDICAL ENGINEERING, 13 December 2023, Jashore University of Science and Technology, Jashore Bangladesh

Invited Speaker, “Large-Eddy Simulation of Air Flow and Pollution Dispersion from a Ground-level Point-source in a Model Urban Area” 1st National Conference on Advances in Science and Technology (NCAST), 7 - 8 December, 2023, BUET, Dhaka-1000, Bangladesh

Invited Speaker, “Computational Fluid Dynamics By High-Performnace Parallel Computing” “Department of Mathematics, Jashore University of Science and Technology, Jashore, 26 August 2023

Invited Speaker, “Research Collaboration between NSU and Nippon-Koei Japan” “Nippon-Koei Japan RND center, Tokyo & Sucuba, Japan 08 May 2023.

Keynote Speaker “Improved Lattice Boltzmann Simulation of Newtonian and non-Newtonian Fluid flows and Convective Heat Transfer using the GPU Computing” A F Mujibur Rahman-Bangladesh Mathematical Society National Mathematics Conference 2022, Jahangirnagar University, January 13-14, 2023

Session Chair “5th Young Scientist Congress”, Bangladesh Academy of Science (BAS), 25-27 November, 2022

Invited Speaker “cascaded Lattice Boltzmann Simulation of Convective Heat Transfer and Entropy Production using the GPU Computing”, 1st International Conference on Frontier in Sciences (ICFC-2022), 11-12 November 2022, Bangladesh University of Engineering and Technology (BUET), Dhaka-1000, Bangladesh.

Invited Speaker “Improved Lattice Boltzmann Simulation of Convective Heat Transfer and Entropy Production using the GPU Computing”, 1st International Conference of Physical Sciences 2022 (ICPS-2022), 21-23 October, 2022 at Shahjalal University of Science and Technology (SUST), Sylhet, Bangladesh..

Invited Speaker “Introduction to High-Performance Parallel Computing: Applications in Computational Fluid Dynamics”, A day Long Seminar “Mathematics for a Better Life” , 24 July 2022, Department of Mathematics, Jahangirnagar University.

Invited Speaker “Computational Fluid Dynamics with Different Applications”, A day Long Seminar in, 28 June 2022, Cumilla University Cumilla, Bangladesh.

Invited Speaker “Simulation of Air Flow and Pollutant Dispersion in a Model Street Canyon Intersection of a City”, 22nd International Mathematics Conference, 10-11 December 2021, Dhaka, Bangladesh.

Invited Speaker “Discussion on High-Performance Parallel Computing Using Cluster CPU and GPU”, Seminar on Modeling and Simulation, Dept. of Applied Mathematics, University of Dhaka, 26 September 2018, Dhaka, Bangladesh.

Invited Speaker “Multiple-relaxatiom-time Lattice Boltzmann Simulation of Non-Newtonian Fluids using GPU Computing”, Bangladesh Academy of Science (BAS) 3rd Young Scientist Congress on 14-15 September 2018, Dhaka, Bangladesh.

Invited Speaker “High-Performance Scientific Simulation by Using Graphics Card: GPU Computation”, International Conference on Nanotechnology and Condensed Matter Physics (ICNCMP 2018) on 11-12 January 2018, Dhaka, Bangladesh.

Speaker “Lattice Boltzmann Simulation of Airflow and Passive Scalar in different Model Geometry using GPU Computing”, Seminar on NSU “Faculty Research Grant 2016-2017”on 17 September 2018, Dhaka Dhaka, Bangladesh.

Presented a talk in biweekly seminar on “ Application of Computational Fluid Dynamics in Real Life Problem” 2016, Dept. of Mathematics & Physics, North South University, Dhaka Dhaka, Bangladesh.

Invited speaker “ Recent Developments of the Computational Fluid Dynamics in Bangladesh” one day seminar on Recent developments of the Applied Mathematics Research in Bangladesh, 25 April 2014, Dhaka University of Engineering &Technology (DUET), Dhaka, Bangladesh.

Presented a paper entitle, “Natural convection flow in a rectangular enclosure with two discrete heating from bellow” 5th BSME Conference, December 21-23, 2012, IUT, Gazipur, Bangladesh.

Presented a paper entitle, “Large eddy simulation of pulsatile flow in a constricted pipe” 19th Bangladesh Mathematics Conference, December 18-21, 2011, IUT, Gazipur, Bangladesh.

Attended on a workshop “ High Performance Computing” July12-15, 2010, University of Manitoba, Canada

Presented a paper entitled, “Large eddy simulation of physiological Pulsatile flow based on dynamic nonlinear subgrid scale stress model”, ASME 2011 9th International Confernce on Nanochanel, Microchannels and Minichannels-ICNMM2011, June 19-22, 2011, Edmonton, Canada.

Presented a paper entitled, “LES of Physiological Pulsatile flow in a model stenosis”, 7th EUROMECH Fluid Mechanics Conference, University of Manchester, UK, 14-18 September 2008

Presented a paper entitled, “Physiological flow in a model of arterial stenosis”, 16th Congress European Society of Biomechanics, Lucerne, Switzerland, 6-9 July 2008.

Presented a paper entitled, “Large Eddy Simulation for the pulsatile flow in a model arterial stenosis”, Faculty of Engineering Postgraduate Conference, University of Glasgow, UK, 30 April-01 May 2007.

Presented a poster entitled, “Transitional blood flows modeling in an arterial stenosis using Large Eddy Simulation” British Applied Mathematics Colloquium (BAMC), Keele University, UK, 24-27 April 2006.

Presented a paper entitled, “Pulsatile flow in a model arterial stenosis using Large Eddy Simulation” Colloquium of the Department of Mechanical Engineering, University of Glasgow, UK, June 2006.

Presented a paper entitled “Natural convection flow over a vertical permeable cone with uniform heat flux in presence of temperature dependent viscosity” 3rd International Conference on Applied Mathematics & Mathematical Physics, Shahjalal University of Science & Technology, Bangladesh, January 06-09, 2005.

Presented a paper entitled “Natural convection flow from an isothermal horizontal circular cylinder with temperature dependent viscosity”, 14th Mathematics Conference, University of Dhaka, Bangladesh, December 27-29, 2003.

Presented a paper entitled “Natural convection flow along a vertical wavy surface with uniform surface temperature in presence of heat generation/absorption”, 2nd International Conference on Applied Mathematics & Mathematical Physics, Shahjalal University of Science & Technology, Bangladesh, September 11-15, 2000.

Presented a paper entitled “Natural convection flow along a vertical wavy surface with temperature dependent viscosity and thermal conductivity”, 2nd BSME-ASME International Conference on Thermal Engineering, Bangladesh University of Engineering &Technology, Bangladesh.

Workshop on the “Perturbation Theory” November 1999, University of Dhaka, Bangladesh.

12th Bangladesh Mathematics Conference, University of Chittagong, Bangladesh, November 17-19, 1999.

Publications

Publication details and journal metrics are reproduced from the source CV. SJR denotes SCImago Journal Rank and IF denotes impact factor.

Journal Articles and Other Publications

2026

Fiayaz, M.M. Molla Coupled Magneto-Radiative Heat Transfer in Cu–Graphite/n-Decane Hybrid Nanofluid: Finite Element Simulation and Hybrid AI Surrogate Modeling of Mixed Convection in a Multi-Cylinder Octagonal Cavity, Next chemical Engineering

S. Hansda, M.M. Molla, Heat transfer enhancement in baffled cavities with and without nanofluids: current trends, emerging nanofluids, and future research directions, Thermochemical Acta, Elsevier (SCOPUS), (IF=3.6) (SRJ:Q2).

Z. Ahsan, R. Tanzim, M.M. Molla, Mixed convection of a non-Newtonian power-law fluid in an anti-parallel lid-driven square cavity with differentially heated lids, Applications in Engineering Science, Elsevier (SCOPUS), (IF=3.5) (SRJ:Q2).

A. T. Meem, M. Z. Hossain, Hasina Akter, M. M. Molla, M. N. Akhter, Effects of Exothermic Chemical Reaction on Double Diffusive Convective Heat and Mass Transfer of Power-law fluids in an irregular enclosure with an internal circular Cylinder, Chemical Engineering Journal Advances, (Accepted) (Elsevier) (SCOPUS) (IF:6.9) (SRJ:Q1).

M. M. Molla, A Novel Two-Dimensional D2Q9 Cumulant-Based Lattice Boltzmann Method: Simulation and Validation Across Multiple Flow Phenomena, Communications in Nonlinear Science and Numerical Simulation 152 (2026) 109327 , (Elsevier) (SCOPUS) (IF:3.8) (SRJ:Q1). https://doi.org/10.1016/j.cnsns.2025.109327

S. Souai, S. Garrouri, S. Trabelsi, M. M. Molla, E Sediki: Thermo-hydrodynamic performance of a porous multi-slot air jet impingement heat exchanger with heated baffles, Applied Thermal Engineering 306 (2026) 133091, (Elsevier) (Scopus). (SJR:Q1) (IF:7.5).https://doi.org/10.1016/j.applthermaleng.2026.133091

M. S. Rana, M. Z. Hossain, M. M. Molla, S. Hansda, S Souai: Conjugate Magnetohydrodynamic Mixed Convection of Hybrid Ferrofluid in a Dilated Cavity with Heated Counter-Rotating Solid Cylinders, Physica Scripta 2026 101 335205, (IOP), (IF:2.6) (SRJ:Q2). https://doi.org/10.1088/1402-4896/ae980d

M. M. Molla, M. M. Islam, M. Jannat, I. Jahan, K. Suchana, I. J. Supti, A. Hossain, S. Hansda, M. F. Hasan, A Comprehensive Systematic Review of Numerical Studies on Flow and Heat Transfer of Shear-Rate-Dependent Non-Newtonian Fluids, Int. Communications Heat Mass Transfer 172 (2026) 110157 , (Elsevier) (SCOPUS) (IF:6.2) (SRJ:Q1). https://doi.org/10.1016/j.icheatmasstransfer.2026.111387

R. Sultana, M. A. Hossain, S. Islam, B. Neogi, M. M. Molla, M. M. Rahman, Sensitivity of Double-Diffusive Mixed Convection in an Enclosure With a Zigzag Bottom Wall and a Torsionally Oscillating Lid Using Hybrid Nanofluid, Engineering Reports, 2026; 8:e70885 (weily) https://doi.org/10.1002/eng2.70885 (Scopus). (SJR:Q2) (IF:2).

M. Z Mahmud, M. M. Molla, M. F..Hasan, M.N. Akhter. Hassan: Symmetry Patterns and Machine Learning Prediction of Urban Pollutant Dispersion, Symmetry, 2026, 18(8), 1392 MDPI (Scopus). (SJR:Q2) (IF:2.2). https://doi.org/10.3390/sym18081392

M. Mazumder, M. U. Ahmmed, M. M. Molla, M. F..Hasan, S. Hassan: Thermal transport analysis of water and MWCNT-Fe3O4 hybrid nanofluids along a vertical surface with radiation effects, Applied Mechanics (MDPI) (Scopus). (SJR:Q2) (IF:1.5). https://doi.org/10.3390/applmech7020033

Z. Akter; D. Dipu; P. Nag, M. M. Molla; G. Saha :Thermo-Hydraulic Optimization of Hybrid Nanocoolant Flow in Ribbed Microchannels Using CFD-Enhanced Machine Learning with Explainable Analysis, Case Studies in Thermal Engineering (Elsevier) (Scopus). (SJR:Q1) (IF:6.6). https://doi.org/10.1016/j.csite.2026.107968

S. Hansda, S. Soren, U. Khan, A. Ishak, A. K. Hussein, M. M. Molla: Second-law analysis of double diffusive convection of Casson ternary nanofluid in a porous enclosure with a T-shaped baffle, CMES-Computer Modeling in Engineering & Sciences, 2026

(Tech Science) (Scopus). (SJR:Q2) (IF=2.5) https://doi.org/10.32604/cmes.2026.079635

M. M. Islam, M. M. Molla, P. Nag, M. M. Alam, S. Souai: Natural Convection of MHD Double Diffusive Nano-Encapsulated Phase Change Material (NEPCM) in the Annulus between Concentric Horizontal Circular and Square Cylinders, International Journal of Energy Research 2026; 2026:9231171 (Wiley & Sons) (Scopus). (SJR:Q1) (IF=4.2) https://doi.org/10.1155/er/9231171

S. Hansda, S. Soren, A. K. Hussein, A. Chattopadhyay, M. M. Molla, Z. T. Al-Sharify, M. S. Alhassan, M. B. B. Hamida, B. Souayeh: Natural convection in U-shaped cavities with nanofluids: A comprehensive review of heat transfer mechanisms and applications, Int. Communications Heat Mass Transfer 172 (2026) 110157 , (Elsevier) (SCOPUS) (IF:6.2) (SRJ:Q1). https://doi.org/10.1016/j.icheatmasstransfer.2025.110157

D. Das, Z. Akter, P.Nag, M. M. Molla, G. Saha: Thermal performance of an experimentally observed shear-thinning MWCNT-Fe3O4-EG hybrid nanofluid under coupled shear and buoyancy effects: A CFD-machine learning study, Results in Engineering, 29 (2026) 109159 , (Elsevier) (SCOPUS) (IF:9.4) (SRJ:Q1). https://doi.org/10.1016/j.rineng.2026.109159

S. Hansda, S. Soren, U. Khan, D. Majhi, M. M. Molla, A. K. Hussein, Magnetohydrodynamic thermosolutal convection of a radiative ternary hybrid nanofluid in a wavy porous cavity under half-sinusoidal boundary conditions, Open Mathematics (accepted on 24 August 2026), Walter de Gruyter GmbH (Scopus), Germany. (IF=0.9) (SRJ:Q3).

2025

M. M. Molla, I. Jahan, M. F. Hasan: Central moments-based lattice Boltzmann simulation of Bingham nano-encapsulated phase change materials for prototyping energy storage with three horizontal heated plates, Journal of Energy Storage, 139 (2025) 118792 (Elsevier) (IF:10.7) (SRJ:Q1) (SCOPUS). https://doi.org/10.1016/j.est.2025.118792

M. M. Molla, K Suchana, A. Rahman, S. Siddiqa: Simulation of Herschel-Bulkley Fluid Dispersed with Nano-Encapsulated Phase Change Materials for prototyping energy storage with three vertical heated plates using Cascaded Lattice Boltzmann Method, Arabian Journal for Science and Engineering, 2025 (Springer) (SCOPUS) (IF:2.9) (SRJ:Q1). https://doi.org/10.1007/s13369-025-10719-4

I. J. Supti, M.Z Hossain, M. M. Molla: Magnetohydrodynamic double diffusive mixed convection of power-law non-Newtonian hybrid nanofluid in rotating eccentric annuli with different positions of inner cylinder, South African Journal of Chemical Engineering (Elsevier) (SCOPUS) (IF:5.5) (SRJ:Q1). https://doi.org/10.1016/j.sajce.2025.09.011

A. T. Meem, M. Z. Hossain, Hasina Akter, M. M. Molla: Data-Driven Insights of Flow Over Heated Elliptic Cylinders: Machine Learning and CFD Perspectives on Non-Newtonian Forced Convection, Case Studies in Thermal Engineering 74 (2025) 106753 (Elsevier) (Scopus). (SJR:Q1) (IF:6.6). https://doi.org/10.1016/j.csite.2025.106753

S Souai, M. M Islam, S. Hansda, S. Trabelsia, S. Garrouria, M. M. Molla, E. Sedikia: Numerical assessment of magnetohydrodynamic double-diffusive mixed convection of hybrid nanofluid in a porous n-shaped enclosure, European Journal of Mechanics / B Fluids 114 (2025) 204337 (Elsevier) (Scopus). (SJR:Q2) (IF:2.5). https://doi.org/10.1016/j.euromechflu.2025.204337

M. M. Molla: Development and Numerical Validations of a Two-Dimensional Cumulant-Driven Thermal Lattice Boltzmann Method, Results in Engineering 27 (2025) (Elsevier) (SCOPUS). (IF:7.9) (SJR:Q1) https://doi.org/10.1016/j.rineng.2025.106225

S. Thohura, M. M. Molla; Thermophoresis Effects on Double-Diffusive Convection and Entropy in a Wavy Enclosure with NEPCM, Case Studies in Thermal Engineering 73 (2025) 106532 (Elsevier) (SCOPUS). (IF:6.6) (SJR:Q1) https://doi.org/10.1016/j.csite.2025.106532

Z. Akter, P. Nag, H. Akter, M. M. Molla, G. Saha: Assessing thermal and hydrodynamic performance of non-Newtonian nano-coolant flow through a porous backward-facing step channel with non-Darcian effects, Results in Engineering 27(2025) 106027 (Elsevier) (SCOPUS). (IF:9.4) (SJR:Q1) https://doi.org/10.1016/j.rineng.2025.106027

M. M. U Chowdhury; M. M. Molla, J. I Ahad, P. Nag, A. Rahman; CFD and Machine Learning-Based Predictive Modeling of Natural Convection in Non-Newtonian Nano-Encapsulated Phase Change Material within an Enclosure with a Corrugated Heated Cylinder, Applied Thermal Engineering (2025) (Elsevier) (Scopus). (SJR:Q1) (IF:7.5). https://doi.org/10.1016/j.applthermaleng.2025.127240

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