Title: AI-Driven Modelling, Computational Fluid Dynamics and Multiphysics Applications in Aerospace and Thermal Engineering



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Proposal

1. BACKGROUND AND RATIONALE

The International Conference on AI and ML Methods in Advanced Computing (AIMLAC-2027) aims to bring together leading researchers, academicians, scientists, and industry professionals to exchange innovative ideas and recent advancements in artificial intelligence, machine learning, numerical modelling, and advanced computing. As an extension of the conference's scientific objectives, we propose a Special Issue. This Special Issue will provide an international platform for publishing high-quality, original research contributions integrating AI-driven computational methodologies with physics-based modelling to address complex challenges in aerospace, fluid dynamics, thermal sciences, and Multiphysics engineering.

2. AIM AND SCOPE

The proposed Special Issue aims to highlight recent advances in AI-assisted numerical simulations, computational fluid dynamics (CFD), heat transfer, turbulence modelling, and coupled multiphysics systems. Particular emphasis will be placed on physics-informed neural networks (PINNs), machine learning-enhanced CFD, deep learning, reduced-order modelling, digital twins, and high-performance scientific computing related to **Thermal and Fluid Systems in Aerospace**.

The Special Issue seeks to bridge traditional computational approaches and emerging intelligent modelling techniques, promoting computational efficiency, predictive accuracy, physical interpretability, and sustainable engineering innovations.

3. MAJOR TOPICS OF INTEREST

The Special Issue will welcome original research and review articles covering, but not limited to:

- AI and machine learning applications in computational fluid dynamics.
- Physics-informed neural networks and hybrid AI–CFD frameworks.
- Aerospace aerodynamics, propulsion, compressible and hypersonic flows.
- Turbulence modelling, flow control, and data-driven flow prediction.
- Heat and mass transfer, thermal management, and energy systems.
- Multiphysics and multiscale modelling, fluid–structure interaction, and conjugate heat transfer.
- AI-driven combustion modelling and advanced thermal-fluid systems.
- High-performance computing and intelligent numerical algorithms.
- Sustainable aerospace technologies and advanced engineering applications.

4. MANUSCRIPT SELECTION AND PEER-REVIEW PROCESS

The Special Issue will invite substantially extended versions of selected high-quality papers presented at AIMLAC-2027, together with relevant original contributions from the broader international research community, subject to the journal's policies.

All submissions will undergo the journal's standard independent peer-review process. Extended conference papers must demonstrate significant additional scientific contributions, originality, and methodological advancements beyond their conference versions. Manuscripts will be evaluated based on scientific novelty, computational accuracy, validation, reproducibility, and relevance to the Special Issue.

5. EXPECTED OUTCOMES AND SIGNIFICANCE

The proposed Special Issue is expected to advance interdisciplinary research at the intersection of artificial intelligence, computational mathematics, aerospace engineering, and thermal sciences. It will facilitate the dissemination of innovative AI-integrated simulation methodologies, promote international research collaborations, and contribute to the development of efficient, reliable, and sustainable engineering technologies.

By bringing together selected research outcomes from AIMLAC-2027 and complementary international contributions, the Special Issue will provide a valuable scholarly resource for researchers, engineers, and practitioners working on next-generation intelligent computational engineering systems.

Tentative schedule

Milestone	**Proposed Date**
Call for Papers (CFP) Published Online	February 20, 2027
Expected First Submission	March 15, 2027
Full Manuscript Submission Deadline	June 30, 2027
First-Round Review Decisions Completed	August 31, 2027
Revised Submissions Deadline	October 15, 2027
Final Decisions & Notifications Completed	November 30, 2027
Final Manuscripts to Publisher/Online Release	January 2028

SOURCE

Selected and Extended Research Papers from the International Conference on AI and ML Methods in Advanced Computing (AIMLAC-2027), 11–13 February 2027 Motilal Nehru National Institute of Technology Allahabad (MNNIT Allahabad), Prayagraj, India. **Conference Website: https://mnnit.ac.in/aimlac/**

PROFILE

Prof. Rama S.R. Gorla is presently working as Professor of Aerospace Engineering, Department of Aeronautics and Astronautics (ENY), Air Force Institute of Technology (AFIT). Prior to this, he was worked as Fenn Distinguished Research Professor in the Department of Mechanical Engineering at Cleveland State University. He received the Ph.D. degree in Mechanical Engineering from the University of Toledo in 1972. His primary research areas are combustion, heat transfer and fluid dynamics. He was involved in the testing and development of a three-dimensional Navier Stokes Computational Code for Wright Patterson Air Force Base. He worked as a turbomachinery design engineer at Teledyne Continental Motors Turbine Engines (TCM-TE) in Toledo, Ohio and as a design engineer of the aerothermodynamics of rotating machinery at Chrysler Corporation in Highland Park, Michigan. He completed a research program funded by NASA Lewis Research Center in Turbine Heat Transfer. Dr. Gorla has published over 550 technical papers in refereed journals and contributed several book chapters in Encyclopedia of Fluid Mechanics. NASA, AFOSR and local industry have sponsored his research. He co-authored text books on Advanced Differential Equations published by Studera Press in 2016 and Turbomachinery published by Marcel & Dekker Company in 2003. He is the recipient of two Distinguished Faculty awards from Cleveland State University, the first for research in 1999 and the second for teaching in 2004. He was given the Teaching Excellence Award from the Northeast Ohio Council on Higher Education in 2004. He received the Distinguished Technical Educator Award from the Cleveland Technical Societies Council in May 2006. He serves on the editorial board of several journals.

Prof. P.V.S.N. Murthy is a faculty member in the Department of Mathematics at the Indian Institute of Technology Kharagpur, India. His research focuses on fluid mechanics, convection in porous media, biofluid dynamics, and solute transport in microvessels. His contributions include mathematical modelling of non-Newtonian and pulsatile flows, Taylor dispersion, nanoparticle transport, and coupled transport phenomena in biomedical systems. His research also encompasses computational investigations of magnetic nanoparticle-mediated hyperthermia and related cancer therapy applications. His expertise in mathematical modelling and fluid transport provides a strong foundation for interdisciplinary research at the interface of applied mathematics, numerical computation, and scientific modelling.

Research Interests: Convection in porous media, biofluid mechanics, solute dispersion in microvessels, non-Newtonian fluid mechanics, computational fluid dynamics, mathematical modelling of biomedical transport phenomena, and numerical simulation of nanoparticle-mediated hyperthermia.

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Dr. B. Vasu is an Associate Professor in the Department of Mathematics at Motilal Nehru National Institute of Technology Allahabad, India and serves as Convener/Organizing Secretary of **AIMLAC-2027**. His research focuses on Computational Fluid Dynamics, Numerical Analysis, Computational Hemodynamics, Modelling and Simulation of Nanodrug Delivery, Artificial Intelligence (AI) and Machine Learning (ML), Magnetohydrodynamics. He has authored numerous research papers in reputed indexed international journals and several books and book chapters. Dr. Vasu has also supervised several research scholars and contributed to national/international conferences. He is actively working in various research collaborations in India and abroad. He has been awarded UGC Research Award and Early Career Research Award by SERB, Government of India. His scholarly work also includes research on AI and machine learning in multiscale nanomedicine modeling, reflecting the interdisciplinary connection between computational mathematics and emerging computational methods.

Research Interests: Computational fluid dynamics, numerical analysis, computational hemodynamics, finite element methods, nanofluid flow and heat transfer, mathematical modeling, and AI/ML-assisted computational methods.

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Google Scholar: https://scholar.google.com/citations?user=WgT7TsQAAAAJ&hl=en