

Atal Bihari Vajpayee Indian Institute of Information Technology and Management Gwalior

A five days Workshop on:
Physics-Driven Machine Learning for Fluid Dynamics with Special
Reference to Weather Prediction (PDMF-WP 2025)

During: **02-06 May, 2025 (Hybrid mode).**



Organised by:
Department of Engineering Sciences
ABV-IITM Gwalior

Patron:
Prof. S.N. Singh
Director, ABV-IITM Gwalior

Chairperson
Prof. Joydip Dhar
Professor, Department of Engineering Sciences

Conveners/Coordinators
Dr. Prabir Barman & Dr. Kapil Kant
Assistant Professor, Department of Engineering Sciences

Prof. Anurag Srivastava, Prof. Pankaj Srivastava, Dr. Ajay Kumar, Dr. Anuraj Singh, Dr. Jeevaraj S, Dr. Pragya Shukla, Dr. Purnedu Mishra, Dr. Anuwedita Singh

Sponsored by:

अनुसंधान नेशनल रिसर्च फाउंडेशन
Anusandhan National Research Foundation

About the Workshop: This workshop explores the integration of Artificial Intelligence (AI) with Computational Fluid Dynamics (CFD), with a special focus on Physics-Informed Neural Networks (PINNs) for weather prediction. It aims to provide a comprehensive understanding of how AI-driven models enhance numerical simulations, atmospheric modeling, and predictive accuracy in meteorology. Participants will gain hands-on experience with cutting-edge AI techniques applied to CFD and weather forecasting.

Key Highlights

- **Introduction to AI-driven CFD** and its role in weather prediction.
- **Deep dive into Physics-Informed Neural Networks (PINNs)** for CFD applications.
- **Case studies and real-world applications** in climate and atmospheric sciences.
- **Hands-on coding sessions** to implement AI models in CFD simulations.
- **Expert-led discussions** on the future of AI in weather forecasting.

Topics Covered

- **Fundamentals of CFD and Weather Prediction Models.**
- **AI-enhanced Numerical Methods** in fluid dynamics.
- **PINNs and their Applications** in meteorology.
- **Data-driven Weather Forecasting** using deep learning.
- **Computational Tools and Software** for AI-driven CFD.
- **Challenges and Future Trends** in AI-based weather prediction.

About the Department:

The Department of Engineering Sciences at ABV-IIITM Gwalior is a multidisciplinary department focused on both fundamental and applied research in various engineering domains. It offers courses and research opportunities in Mathematics and Physics and provides academic programs at multiple levels, including B.Tech., M.S., and Ph.D. With a dedicated faculty engaged in cutting-edge research, the department actively contributes to advancements in emerging fields such as artificial intelligence in engineering, numerical simulations, and interdisciplinary problem-solving.

About the Institute:

Atal Bihari Vajpayee Indian Institute of Information Technology and Management (ABV-IIITM) Gwalior is a premier institute in India specializing in information technology and management education. Established in 1997, it holds the status of an Institute of National Importance. The institute offers undergraduate, postgraduate, and doctoral programs in IT, management, and applied sciences. ABV-IIITM is known for its strong research focus, particularly in areas like artificial intelligence, cybersecurity, and computational sciences. With a state-of-the-art campus, the institute fosters innovation, entrepreneurship, and interdisciplinary learning, contributing significantly to India's technological and managerial advancements.

Advisory Committee/Resource Persons

Prof. B. V. Rathish Kumar, Professor, IIT Kanpur
Prof. SHALABH, Professor, IIT Kanpur
Dr. T N Rao, Scientist, NARL-ISRO
Prof. Adway Mitra, Professor, IIT Kharagpur
Dr. Bipin Kumar, Scientist, IITM Pune
Prof. P. V. S. N. Murthy, Professor, IIT Kharagpur
Dr. K. Kishore Kumar, Scientist, VSSC-ISRO
Prof. V. Sree Hari Rao, Professor, FSRTI Hyderabad
Prof. P. S. Rao, Associate Professor, IIT(ISM) Dhanbad
Prof. Gnaneshwar Nelakanti, Professor, IIT Kharagpur
Prof. Prawal Sinha, Professor (Retired), IIT Kanpur
Prof. Jitendra Kumar, Assistant Professor, MANIT Bhopal
Dr. Nanda Poddar, Post Doctoral Researcher, University of Galway
Pinaki Ranjan Sarkar, Scientist, SHAR-ISRO

Who can participate:

The workshop is open to UG/PG students, Research Scholars, Postdocs, faculty members from Institutes, Universities, Colleges, Startups, Entrepreneurs, Professional, and Industry personnel working in the concerned/allied disciplines.

Registration fees:

Offline Participants (Hostel accommodation included*):

UG/PG Student: 1500.00 + 18% GST.

Research Scholar/Postdoc/Faculty: 2500.00 + 18% GST.

Industry/R&D: 3500.00 + 18% GST.

All Online Participants: 1000.00 + 18% GST

* Payment basis *Guest house accommodation* is subjected to the availability.

Account details for fees payment:

Account Name: ABV-IIITM FDP ACCOUNT

Address: Bank of India, IIITM Campus, Gwalior

Account No.: 945210110009380

IFSC: BKID0009462, MICR: 474013010

Link for registration



Please upload **payment receipt** and a **valid ID card** (issues by Govt. or Institution) during registration.

Have any queries?

Contact us:

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