HYBRID MODE

International SPARC Workshop on
Computational and AI-Driven Multi-Physics Simulation in Porous Media
(CAIMS-Poro-2025)
16-20 June, 2025

Organized by: Department of Applied Mathematics, Defence Institute of Advanced Technology(DIAT)
Deemed to be University(DU), Girinagar, Pune – 411025. ● www.diat.ac.in
Funded by Department of Defence R & D, Ministry of Defence, Government of India.

About SPARC

The Scheme for Promotion of Academic and Research Collaboration (SPARC) initiative, launched by MHRD (Ministry of Human Resource Development(now Ministry of Education) Government of India is designed to enhance the research ecosystem of Indian higher educational institutions. It enables academic and research collaborations with top universities from 28 selected countries, focusing on solving problems of national and global significance. SPARC empowers Indian institutions to lead cutting-edge, translatable research and drive global academic collaboration. SPARC supports a range of impactful activities, including:

- Visits and long-term stays of leading international faculty in Indian institutions for research and teaching
- International research exposure for Indian students through visits to premier global laboratories
- Joint development of advanced courses, products, world-class research publications including books / monographs, patents, MoUs and technologies
- Strengthening bilateral partnerships via Indo-X Workshops and collaborative research projects
- High-profile international conferences / workshops to showcase outcomes, promote dissemination, and boost global visibility.

About DIAT-DU

The Defence Institute of Advanced Technology (DIAT) is a Deemed-to-be University(DU) funded by the Department of Defence R& D, dedicated to advancing education and research in defence technologies to serve national interests. It primarily caters to officers from the Tri-Servises(Army, Navy, Air Force), DRDO, CWPRS, public sector undertakings such as Bharat Forge, BDL, BHEL / BEL, HAL and Ordnance Factories(ODFs) etc.. Additionally, a select number of GATE/ CSIR-NET/ SET /JAM / DST-INSPIRE, WISE qualified students are admitted to its programs. Guided by the principles of "Excellence in Teaching" and "Research with Relevance to Defence," DIAT offers a focused academic environment with 12-M.Tech programmes, 8-M.Sc. programmes, over 20-specialized short-term courses (ranging from 2 to 9 months), and various customized training programs. It ranked 5th in Academic and Research Excellence and 20th overall in Outlook-The Indian Centre for Academic Rankings & Excellence(ICARE's) rankings of government engineering colleges in 2022 and secured 63rd position in the Engineering category of the NIRF 2024 rankings also accredited by NBA. Notably, DIAT exclusively offers postgraduate and doctoral degree programmes only.

About Department

The Department of Applied Mathematics offers M.Tech in Modelling & Simulation, Data Science, M. Sc. in Data Science and PhD Programmes. These multidisciplinary programs attract students from diverse academic backgrounds. The objective is to equip students with a deep understanding of applied mathematics, statistics, computer programming, and real-world problem-solving. Emphasis is placed on data collection, preprocessing, model building, simulation techniques, and analytical tools to address challenges in engineering and scientific applications. Faculty research spans a broad spectrum of areas, including numerical solutions of PDEs- Finite Element(FE), Finite Difference(FD), AL/ ML methods, fictitious domain and domain decomposition techniques, theoretical computational fluid dynamics, heat and mass transfer, biomechanics, optimization, AI/ML for Defence Applications, fuzzy logic, cryptography, Genetic Algorithm, Parallel Computing, digital image and signal processing, responsible AI, Computer Vision, Statistical Analysis, Data Analytics, Medical Imaging, Computational Instrumentation, computer-aided diagnostics for medical ultrasound imaging systems, autonomous navigation in rural/ agriculture scenarios, Prognostics and Health Management, ballistics among others.

About Workshop

This CAIMS-Poro-2025 workshop is supported by the SPARC research grant (Ministry of Education, Govt. India) for an international collaborative research project sanctioned to the organisers.

The main aim of the CAIMS-Poro-2025 to foster collaboration among researchers from academia and industry, bringing together expertise in applied mathematics, computational modelling, machine learning, and scientific computing.

The workshop includes invited talks, technical sessions, and hands-on training to equip participants with practical tools and insights. We invite applied mathematicians and multidisciplinary researchers from academia and industry with expertise in modelling and numerical methods to discuss the latest developments in transport phenomena and coupled problems in porous media.

Modelling of flow and transport in porous media is rapidly evolving field and is an essential component of many scientific and engineering applications, with increased interest in recent years. However, accurate mathematical and numerical simulation of flow and transport remains a challenging topic from many aspects of physical modelling, numerical analysis and scientific computation. As modern-day scientific research increasingly relies on complex simulations and massive datasets, challenges such as data reproducibility, model accuracy, and efficient computation are more relevant than ever.

The workshop will highlight novel algorithms, innovative frameworks, and real-world applications in various domains such as engineering, sustainability, and artificial intelligence. Topics include (but are not limited to:)

Workshop Focus:
- Latest in numerical simulation, solver design, and AI-driven modelling.
- Numerical methods for computational fluid dynamics (CFD) and continuum mechanics as a basis for simulations.
- Integration of physics-based and data-driven approaches.
- Hands-on sessions using MATLAB & Python.
- Bridging theory, computation, and real-world applications.

Key Topics:
- CFD, FEM, FDM, FVM, BEM & mesh-free methods
- ML/DL for predictive modelling & data assimilation
- Fractional PDEs for complex diffusion processes
- Physics-informed machine learning & hybrid frameworks
- Blending physics-based and data-driven models to fluid flow porous media problems.

Targeted Audience

Participation in this workshop is open to all Faculty, Ph.D., UG / PG, Post-doctoral, students, Industry and R&D organisations.

Deadline of Registration

- Deadline for Registration: 04-06-2025
- Confirmation of Registration:06-06-2025

Contact Details

- Chairman:+917798066628(M), 02024604473(O)
- Coordinator:+917696615848(M),02024604588(O)
- E-mail: appmatdiat@gmail.com
- Dept.Ph.No:02024604472(O), 02024389411(F),

Resource Persons

- Prof. B. V. Rathish Kumar, I.I.T. Kanpur, India
- Prof. Kambiz Vafai, Univ. of California, Riverside, USA.
- Prof. Peeyush Chandra, Retd., I.I.T. Kanpur, India.
- Prof. Khalil M. Khanafer, Univ. of Michigan-Flint, USA.
- Prof. S. Sundar, Director, N.I.T. Mizoram.
- Prof. G. P. Raja Sekhar, V.Chancellor-A.U., Vizag., India.
- Prof. P.V.S.N. Murthy, I.I.T. Kharagpur, India.
- Prof. Y.V.S.S. Sanyasiraju, I.I.T. Madras, India.
- Prof. Paola Cinneella, Sorbonne University, Paris, France.
- Prof. Harbir Antil, George Mason University, U.S.A.
- Prof. Satyajit Roy, I.I.T. Madras, India.
- Prof. T.V.S. Sekhar, I.I.T. Bhubaneswar, India.
- Dr. Tanujit Chakraborty, Sorbonne University AbuDhabi.
- Prof. Habil Kai Diethelm, THWS, Germany.
- Prof. Manoranjan Mishra, I.I.T. Ropar, India.
- Prof. Nagaiah Chamakuri, I.I.S.E.R., Trivandrum, India.
- Prof. S. Gopalakrishnan, I.I.T. Bombay, India.
- Prof. Roger G. Ghanem, USC Viterbi, U.S.A.
- Prof. M. A. Sheremet, Tomsk State University, Russia.
- Dr. Dond Asha Kisan, I.I.S.E.R., Trivandrum, India.
- Dr. Pratibhamoy Das, I.I.T. Patna, India.
- Dr. Ajay Mishra, D.I.A.T., Pune, India.
- Prof. S.V.S.S.N.V.G. K. Murthy, D.I.A.T., Pune, India.

Organizing Committee

Chief Patron: Dr. Samir V. Kamat
Secretary, Dept. of Defence R&D, Chairman-DRDO and Governing Council, DIAT(DU).

Patron: Dr. B. H. V. S. N. Murthy
Vice Chancellor, DIAT.

Organisers:
- Prof. S. V. S. S. N. V. G. Krishna Murthy
  Defence Institute of Advanced Technology, India.
- Prof. B. V. Rathish Kumar
  Indian Institute of Technology Kanpur, India.
- Prof. Kambiz Vafai
  University of California, Riverside, USA.
- Prof. Khalil M.Khanafer
  University of Michigan-Flint, USA.

Local Organising Committee - Dept. of Appl. Maths.
- Dr. S.V.S.S.N.V.G. Krishna Murthy, DIAT - Chairman - Local Institute(DIAT) Coordinator, SPARC.
- Dr. Odelu Ojjela, DIAT - Co-Chairman
- Dr. Yogeshwar Singh Dadwhal, DIAT - Coordinator
- Dr. D. Srikanth, DIAT.
- Dr. Debasish Pradhan, DIAT.
- Dr. Bharath Ramkrishna, DIAT.
- Dr. Sushma Kumari, DIAT.

Registration Process & Fee Details

Non-Refundable Registration Fee (Including GST):
- Students(UG/PG): Rs.1000/-
- Students(PhD/Postdoc): Rs.1500/-
- Academia-Faculty: Rs.2000/-
- Industry,R&D:DRDO/PSU/Services:Rs.2500/-
- DIAT-Students(PG/PhD/Postdoc): Rs.250/-

Registration Process

Participants can apply through the Google Form link or QR code provided below after completing the registration fee payment.

Registration Link

CLICK HERE

SCAN ME

Bank Account Details:
- Acc Name:DIAT (DEEMED UNIVERSITY) IMPREST
- Bank : State Bank of India
- A/c Number : 30166494269
- Type of Account : Current
- Branch : IAT Girinagar
- IFSC Code : SBIN0002155,
- MICR : 411002021
- SWIFT Code: SBININBB218

QR CODE For Payment

Important Information

- Hostel accommodation and food will be arranged for participants in the institute hostels on a direct payment basis or through coupons, upon prior request.
- Please note that accommodation will be provided on a first-come, first-served basis due to limited availability.
- No TA/DA will be provided to the participants.