International Conference on



Latest Advances in Computational and Applied Mathematics-2025

December 8–11, 2025 IISER Thiruvananthapuram

 ${\bf Monday-December~8,~2025}$

Time	LHC 103: Kaumudi	LHC 105: G N Ramachandran	LHC 106: P C Ray	LHC 107: S Ramanujan	
08:30-09:10		$Registration \ ($	(LHC Lounge)		
09:10-09:30	Inauguration				
09:30-10:05	Martin Weiser Adaptive solvers for cardiac electrophysiology simulations				
10:10-10:45	A.K.Pani On Backward Time-Fractional Diffusion Problems: A Unified Approach				
10:50-11:10		Coffee/Tea ($LHC\ Lounge)$		
11:10-12:40					
11:10-11:40	Learning - 1 • Pratik Nayak: Batched GPU solvers for large scale simulations • Sarthak Sharma:	Adaptive FEM - 1 • Kamana Porwal: Adaptive quadratic finite element method for a unilateral contact problem	Methods for Newtonian and Viscoelastic Fluid Models - 1 • Saumya Bajpai: Local		
11:40-12:00	Physics-Informed Deep Learning for Solving Coupled Nonlinear Systems: A PINN-Based Approach for	Tooba M. Shaikh: Adaptive Mixed Finite Element Method for Distributed Optimal Control Problems	Discontinuous Galerkin Method for Kelvin-Voigt Viscoelastic Fluid Flow Model • Debendra Kumar Swain:		
12:00-12:20	Multiphysics Transport • Ashifa Khan: Exponentially fitted mesh spline approach for the numerical study of mathematical	• Quasi-Optimality • Arnab Pal: Convergence and Quasi-Optimality of an AFEM via Inf-Sup Stability for a Dirichlet	Discontinuous Galerkin two-grid method for the transient Boussinesq equations • Antara Wajpe: Fluid Flow		
12:20-12:40	model arising from a model of neuronal variability. Nida Izhar Mallick: A simple and efficient iterative scheme for image restoration	Boundary Control Problem. • Avinash K: On the Convergence of the Modified Scale-3 Haar Wavelet Method for Solving Elliptic PDEs	Analysis In Curved Pipes Using Homotopy Analysis Method • Shishu Pal Singh: Finite Difference Method for Global Stabilization of the Viscous Burgers' Equation with Nonlinear Neumann Boundary Feedback Control		
12:40-13:50		Lunch~(CD)			
13:50-14:25	Olaf Ippisch		, ·,		
	Efficient, Hybrid-Parallel Linear Algebra for Sparse Matrices				
14:30–15:05	Prabhu Ramachandran Adaptive Resolution for SPH with Reproducible Open Source Software				
15:10-15:20		Group Ph	oto (TBA)		
15:20-15:40		Coffee/Tea (LHC Lounge)		
15:40-16:15	Alexander Heinlein Neural Network-Based Models for Physical Systems: Analysis, Domain Decomposition, and Preconditioning				
16:20–18:00	HPC/Scientific Machine Learning - 2	A Posteriori Error Analysis and Adaptive FEM - 2	Recent Advances in Numerical Methods for Newtonian and		
16:20–16:40	• Ziya Uddin: Physics Informed Optimal Homotopy Analysis Method (PI-OHAM): A Hybrid Analytical-Computational Framework for Solving Differential Equations	 Subham Nayak: Adaptive nonconforming FEM for distributed optimal control problems governed by m-harmonic equations Vikas Kumar: H¹-norm error 	Viscoelastic Fluid Models - 2 • Jeremy Rymbai: Nanoparticle aggregation kinematics in hybrid nanofluid over a stretching surface • Hemalatha Veedhuluri: Flow		
16:40-17:00	• Subhashri A R: Global Polynomial Synchronization of Stochastic Reaction Diffusion Neural Networks via Dynamic Hybrid	estimate of a compact ADI finite difference scheme for the 2D multi-term time-fractional convection-diffusion equation	separation-induced stability and bioconvection dynamics in water-based AA7075 nanofluid with gyrotactic microorganisms		
17:00-17:20	Triggered Control with Cyber-Attacks • Vijay Kag: Learning Hidden Physics and System Parameters with	governing groundwater pollution Sahu Nagesh Sumanshankar: Semi-Analytical Solutions of	• Himanshu Upreti: Thermal Analysis of Casson Hybrid Nanofluid Around a Circular Cylinder Using		
17:20–17:40	Deep Operator Networks • Muhammad Roshan: A machine learning approach for dynamic prediction of a physiological flow	Counter-Current Imbibition Phenomena Using DTM and RDTM • Rupal Aggarwal: Numerical solution of delay differential equation	 Tapan Kumar Muduli: Lie symmetry analysis of a nonlinear system of partial integro differential 		
17:40-18:00	through an annulus between two peristaltic tubes: Applications in biomedicin • Ratikanta Behera: Neural	using wavelet method • Ravi Shankar Prasad: Numerical study of brain tumor growth in 2D irregular domain with variable-order	equations arising in thermoviscoelasticity • Jyoti Yadav: An Efficient High-Order Scheme for 2D Caputo		
	Network Models for the Dynamic Moore-Penrose Inverse of Tensors	time-fractional derivative	Time-Fractional CDR Equations with Weak Initial Singularity: Analysis and Computation		
19:30	$Dinner\;(VFR)$				

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Time	LHC 103: Kaumudi	LHC 105: G N Ramachandran	LHC 106: P C Ray	LHC 107: S Ramanujan		
08:45-09:00	$Registration \; (LHC \; Lounge)$					
09:00-09:35	Dmitri Kuzmin Convex limiting and entropy fixes for finite element discretizations of nonlinear hyperbolic problems					
09:40-10:15	Praveen Chandrashekar Continuous Galerkin method for compressible flows					
10:20-10:55	Martin Falcke The role of sub-dyadic structure for whole cell behavior – multiscale modelling for cardiology					
11:00-11:20		Coffee/Tea ($(LHC\ Lounge)$			
11:20-12:40	HPC/Scientific Machine Learning - 3	Numerical Methods for Hyperbolic Conservation Laws -	Recent Advances in Numerical Methods for Newtonian and	From Algorithms to Applications: Numerical		
11:20-11:50	• Mayank Kumar Bijay: Neural Networks Predicting Submesoscale Tracer Dispersion	Sanjibanee Sudha: Second order central schemes for 1D systems of	Viscoelastic Fluid Models - 3 • Nishant Ranwan: The finite element analysis of a fluid-structure	Methods for PDEs - 3 • G. Murali Mohan Reddy: Elliptic reconstruction and a		
11:50-12:10	• Anju: Hybrid Physics-Informed Neural Networks with Adaptive Flux Correction for Hyperbolic PDEs • Meenu: Neural Network	nonlocal balance laws. • Subhodip Ghosh: Discontinuous Galerkin methods for Weak and Temple-type Hyperbolic conservation	interaction problem in fixed domains • Bhramarbar Behera: Galerkin Finite Element Analysis Of Singularly Perturbed Integro-Differential	posteriori error estimates for parabolic partial differential equation with small random input data • Vishal Tiwari: A novel numerica		
12:10-12:30	Stabilization of Chaotic Cancer Dynamics Derived from Perturbation-Reduced Models	laws • Balwinder Singh: A compactly supported distribution function based	Convection—Diffusion Problems With Time Delay • Udeshna Bhattacharya:	method for the Cahn-Hilliard equation with degenerate mobility an logarithmic potential		
12:30-12:50	• Atul Kaushik: Neural Network-Based Analysis of MHD Jeffery-Hamel Flow for Couple Stress Fluids in Stretching/Shrinking Channels	contact discontinuity capturing Boltzmann scheme • Samala Rathan: Semi-implicit central scheme for hyperbolic systems of balance laws with relaxed source term	Streaming potential and electro viscous behavior in soft cylindrical nanochannels incorporating slip effects • Rajesh Chary Kandukoori: Magneto-Hydrodynamics Ternary Nanofluids Flow over an Exponentially Stretching Porous Sheet with Variable Properties: Entropy Comparation	• Avijit Sarkar: On Prey-Predator Dynamics With Hunting Cooperatio Among Predators And Allee Effect I Preys		
12:40-14:00	$Generation \ Lunch\ (CDH\ III/VFR)$					
14:00-14:35	Thomas Wick Multigoal-oriented error estimation and adaptivity for coupled problems					
14:40–15:15	Thomas Richter Numerics of fluid-rigid body interactions					
15:20-15:40	$Coffee/Tea \; (LHC \; Lounge)$					
15:40-17:00	From Theory to Computation: FEM and DG Methods for Multiphysics Problems - 1	Numerical Methods for Hyperbolic Conservation Laws -	Recent Developments on Virtual Element Methods - 1 • Sarvesh Kumar: Three and four	Optimal control of PDEs - 1 • Gopikrishnan C: Semi and fully discrete analysis of extended		
15:40-16:00	• Konduri Aditya: Scalable asynchrony-tolerant numerical fluxes for DG solvers	• Aekta Aggarwal: Nonlocal Conservation Laws, Modelling Traffic Flow and Crowd Dynamics	fields mixed formulations for poroelasticity • Ankit Kumar: Convergence	Fisher-Kolmogorov equation with nonstandard FEMs for space discretization		
16:00-16:20	• Surabhi Rathore: Stabilised Galerkin-FE Approximations with POD-ROM for Real-Time Cardiovascular Flow Simulation	 Rahul Barthwal: On a Generalized Riemann problem solver for a rich hyperbolic system Sujoy Basak: Bound preserving 	analysis of the mixed virtual element methods for the Sobolev equation with convection • Nitesh Verma: A Virtual Element	 Himani Roul: Analysis of Sparse Control in Heart Tissue Dynamics Using Gradient-Driven Functionals Ankur Upadhyay: Non-smooth 		
16:20–16:40	• Kedar Wagh: A kinetic energy preserving discontinuous Galerkin scheme based on discrete kinetic	Lax-Wendroff flux reconstruction method for special relativistic hydrodynamics	Method for the Biot-Brinkman Equations Using Nitsche's Technique • Aswini.N.K: DGVEM for	Time-Space Control-Constrained Optimal Control Problem in a Cardiac Electrophysiology Model Maria Robert: A Lagrange		
	model • Gautam Singh: Direct	• Sudipta Sahu: IMEX second order central scheme for discrete	Parabolic Problems	multiplier approach to optimal contr of the monodomain model		
16:40-17:00	Discontinuous Galerkin Method for Singularly Perturbed Problems	velocity kinetic models		of the monodomain model		

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09:00-09:35	Hartwig Anzt Mixed Feeling about Mixed Precision: Can we adapt Numerical Algorithms to AI Hardware?					
09:40-10:15	G D V Gowda A convergent MUSCL-Hancock Scheme for Non-Local Conservation Laws					
10:20-10:55	Joscha Gedicke P ₁ and SIP Discretizations for					
11:00-11:20			Coffee/Tea (LHC Lounge)			
11:20-12:40	HPC/Scientific Machine Learning - 4	From Theory to Computation: FEM and	Recent Developments on Virtual Element Methods	Optimal control of PDEs - 2	From Algorithms to Applications: Numerical	
11:20-11:40	• Mohd Vaseem: Wavelet-Based Pinn For Micropolar Mepcm Flow Over Paraboloidal Surface	DG Methods for Multiphysics Problems - 2 • Aniruddha Seal: C0	- 2 • Ankur: A Virtual Element Framework for Modified Pois- son−Nernst−Planck−Navier−Stok	• Pratibha Shakya: Finite Element Method For Parabolic Optimal Control Problem With A Bilinear	Methods for PDEs - 4 • Richa Singh: Fast Higher Order Approximations For A Nonlinear Time-Fractional	
11:40–12:00	• Jain M Francis: Capturing Shocks In Weakly Hyperbolic Systems Using	Interior Penalty Method For Time-Fractional Cahn-Hilliard Equation • Manika Bag:	of Room-Temperature Ionic Liquids • Priyal Garg: A Meshless	State Equation • Soundarya G: Uncertainty-Aware Modeling	Biharmonic Equation With Initial Singularity • Mohammad Saif: A	
12:00-12:20	Physics-Informed Neural Network Framework • Geetanjli: Computation Of Waveguide Eigenmodes By Physics-Informed Neural	Well-Posedness Of Three-Dimensional Damped Cahn-Hilliard-Navier-Stokes Equations • Suraj Kumar: A	Hybrid Approach To The Navier-Stokes Equations • Ambit Kumar Pany: Second order backward difference scheme combined	And Optimal Control Of Ransomware Propagation • Hemaleka A: Optimal Control Analysis Of A Fractional-Order Tuberculosis	Fixed-Point Iterative Method for Solving Fractional Order Boundary Value Problems • Sumit Kumar: Investigating Secondary And	
12:20-12:40	Networks • Mahipal Jetta: On A Fractional Telegraph-Diffusion Model For Image Denoising	Dimensional-Splitting Non-Symmetric Interior Penalty Galerkin Method For 2D Singularly Perturbed Degenerate Parabolic Problems • Aditi Tomar: IMEX-Alikhanov-FEM for time-fractional PDEs/PIDEs	with FEM for a 2D Sobolev equation with Burgers' type non-linearity • Shantanu: Time-Fractional Smoluchowski Coagulation Equation: Analytical Study	Model With Age-Structured Population Bhargav Kumar K: Optimal Control Of Renewal Equation With Generic Cost Functional	Tertiary Vortex Phenomena in Flow Past a Circular Cylinder using Explicit RK-Type HOC Methods • Himanshu Kumar Dwivedi: A Novel Fast Second Order Approach with High-Order Compact Difference Scheme and its Analysis for the Tempered	
			/ CD /		Fractional Burgers Equation	
12:40-14:00	Lunch (CDH III/VFR) Gernot Plank Computational Models of Cardiac Function - Closing the Gaps between Virtual and Physical Reality Discription of the Computation of Cardiac Function - Closing the Gaps between Virtual and Physical Reality					
14:40–15:15	Computational Models of Cardio	ac Function - Closing the Gaps be	tween Virtual and Physical Reality	y		
	Computational Models of Cardia Phani Motamarri		tween Virtual and Physical Reality	<u> </u>	he exascale era	
14:40–15:15	Computational Models of Cardia Phani Motamarri	tolerant to approximate matrix-v		antum modelling of materials in t	he exascale era	
14:00–14:35 14:40–15:15 15:20–16:20 16:20–16:55	Computational Models of Cardia Phani Motamarri	\cdot tolerant to approximate matrix-v $Post$	ector products: Applications to qua	antum modelling of materials in t	he exascale era	
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14:40–15:15 15:20–16:20 16:20–16:55 17:00–18:40	Phani Motamarri A subspace iteration eigensolver Moritz Hauck Iterative solution of Timoshenke HPC/Scientific Machine Learning - 5 • Raghvendra Pratap Singh: Boundary Layer Physics-Informed Neural Networks For A Class Of Singularly Perturbed Fredholm Integro-Differential Equations	Post Post beam network models Numerical Methods for Hyperbolic Conservation Laws - 3 Rakesh Kumar: Higher Order Accurate Numerical Schemes For Hyperbolic Conservation Laws	Numerical Frontiers in Fluid Dynamics and Flow Simulation - 1 Rakib Mondal: Existence And Uniqueness Of C ¹ Solution to the BVP for Blood Flow Model with Body Forces	Recent Advances in PDEs, Modelling, and Applied Analysis - 1 Nitin Kumar: Bifurcation Curve Detection With Deflation For Multi-Parametric PDEs	Online Sessions • Monika Rani: A Robust Deep Learning Framework Using ANN and PINN for Solving a class of Singularly Perturbed Fredholm Integro-Differential Equation • Arijit Pal: A Posteriori	
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08:30-09:00	$Registration \; (LHC \; Lounge)$				
09:00-09:35	Sandra May The DoD Stabilization to solve the small cell problem				
09:40-10:15	Thirupathi Gudi C0-IP methods for optimal control problems governed by the PDEs in nondivergence form: Formulations and Approximations.				
10:20-10:40		Coffee/Tea (.	$LHC\ Lounge)$		
10:40-12:40	Numerical Frontiers in Fluid Dynamics and Flow Simulation - 2	Recent Advances in Numerical Methods for Newtonian and Viscoelastic Fluid Models - 4	From Theory to Computation: FEM and DG Methods for Multiphysics Problems - 3	Recent Advances in PDEs, Modelling, and Applied Analysis - 2	
10:40-11:00	• Dipti Ranjan Parida: Novel Mathematical Models Capture Energy Transfer Patterns In Wave	• Ruthra J S: Buoyancy Driven Convection In A Partially Open C-Shaped Enclosure Filled With A	• Rishi Das: Darcy-Forchheimer Equations: Robust Stability And Preconditioning	Panchal Vijaykumar Amrutlal: Bi-Objective Optimization In Non-Markovian Finite-Capacity	
11:00-11:20	Turbulence • Devika Jayan: Effect Of Temperature Modulation On Salt-Finger Convection In Micropolar Liquids	Nanofluid Om Prakash Meena: Magnetic And Joule Heating Effects On Mixed Convection Flow Across A Vertical Cone	 Kanchan Dwivedi: Large Time Asymptotics For The Viscous Burgers Equation Under Impulsive Forcing Nikhil Kodali: Residual-Based Chebyshev Filtered Subspace Iteration 	Retrial Queue Models With N-Policy • Utsavkumar Dhansukhbhai Patel: Review On Mathematical Model For Permeable Reactive Barrier To Contain Volatile Organic	
11:20-11:40	 Sukdeb Manna: A Mathematical Approach To Precision Therapeutics For Cholesterol Regulation Sukhendu Das Adhikary: 	• Angel Priya E: MHD Darcy-Forchheimer Flow with Chemical Reaction along a Stretching Sheet.	For Sparse Hermitian Eigenvalue Problems Tolerant To Inexact Matrix-Vector Products Gopika P B: Novel Bidomain	Compound Remediation. • Monalisa Anand: Influence of Incubation Delays on Covid-19 Transmission in Diabetic and	
11:40-12:00	Turbulence Of Thermoacoustic Internal Gravity Waves In The Lower Atmosphere Through Pde Modelling And Simulation.	• Sheetal: Direct Numerical Simulation Of Plane Poiseuille Flow Of A Viscoplastic Fluid In A Channel With Hydrophobic Wavy Walls	Partitioned Strategies For The Simulation Of Ventricular Fibrillation Dynamics • Anoja Vijay: Finite Element	Non-Diabetic Populations • Rakesh Kumar Meena: Metaheuristic Optimization And Fuzzy Modelling For M/G/1	
12:00-12:20	• Manisha Jangir: Magneto-Convection In Anisotropic Non-Darcy Porous Media With Non-Uniform Boundary Heating And Internal Heat Generation	• Subrahamanyam Upadhyay: Wavelet Collocation Method Applied To Study Bioheat Transfer In Skin Tissue	Method For Two-Phase Flow Using Volume Of Fluid Method With Stabilization Techniques Gourab Panigrahi: Matrix-Free Algorithms For Fast Electronic	Fault-Tolerant Machining System With Vacation • Buddhadev Pal: Almost Ricci-Bourguignon Soliton On Warped Product Space	
12:20-12:40	• Akhilesh Yadav: Almost Ricci Solitons On Weakly Ricci Symmetric Perfect Fluid Spacetime.		Architecture Calculations On Distributed Architectures Using Finite-Element Discretization	• Anupam Priyadarshi: From Stability to Chaos: Fractional-Order Modeling of Intra-Guild Predation with Long-Term Ecological Memory	
12:40-13:50		Lunch (CD.	H III/VFR)		
13:50-14:50	Numerical Frontiers in Fluid Dynamics and Flow Simulation - 3	A Posteriori Error Analysis and Adaptive FEM - 3 • Evana Islam Sarkar: Finite	Recent Advances in PDEs, Modelling, and Applied Analysis - 3	Recent Advances in PDEs, Modelling, and Applied Analysis - 4	
13:50-14:10	• Pratham Singh: Coherent Structure Dynamics Of Heat Transfer In Wakes Of An Inclined Elliptical Cylinder: A Novel Lagrangian	Element Analysis Of The 3-D Mhd System With P-Laplacian Priyanka: Error Analysis Of A Fast ADI Compact Finite Difference	• V Umapathi: Existence And Stability Results For Impulsive Fractional Integrodifferential Equations Involving The Hadamard	Aditya Bhattacharya: Determining Effectiveness Of Treatment Measures In Controlling Dengue Outbreaks Using Optimal	
14:10-14:30	Framework • Prashant Kumar Vishwakarma: A Bi-Slope Linear Distribution Function-Based Boltzmann Scheme	Method For Two-Dimensional Semi-Linear Time-Fractional Problem With Weak Initial Singularity	Derivative In Sobolev Spaces • Kanailal Mahato: Composition Of Pseudo-Differential Operators Via Coupled Fractional Fourier	Control • Pardeep Kumar: Chaos-Control Of Nanoparticles Transport In Tumors	
14:30–14:50	For Fluid Flows • Aiswarya R Iyer: Asymptotic Dispersion Behaviour Of Contaminants In Heterogeneous Groundwater Systems Under Directional Inlet Regime	• Nitin: A high order numerical method for solving parabolic degenerate convection-diffusion singularly perturbed problem on the Bakhvalov-type meshes	Transform • Jyotiranjan Nayak: A Comparative Analysis Of Quadrilateral And Triangular Finite Elements In SIMP-Based Topology Optimization.	• Sameer Nitin Khandagale: A High-Order Numerical Scheme Based On L2-1∑-ADI Difference Method Or Nonuniform Meshes For A 2D Variable Coefficients Time Fractional Reaction-Diffusion Equation	
14:50–15:25	Christian Engwer Efficient simulation and discretization	methods for brain source analysis			
15:30-16:05	Volker John Some experiences in using ML techniques for the numerical solution of PDEs				
16:10-16:20	Closing Remarks				
16:20		High Tea (L	HC Lounge)		