

# 36th Parallel CFD International Conference 2025

24-26 November 2025, Merida, Yucatan, Mexico

## Conference Agenda

### Session Overview

Date: Monday, 24/Nov/2025

8:00am -8:30am	<b>Registration</b> Location: Centro Cultural Universitario	
8:30am -9:00am	<b>Welcome</b> Location: Centro Cultural Universitario	
9:00am -10:00am	<b>Invited Speaker I: Quantum Lattice Boltzmann Methods</b> Location: Centro Cultural Universitario Chair: Juan Carlos Cajas Garcia	
10:00am -10:20am	<b>Coffee Break</b> Location: Centro Cultural Universitario	
10:20am -11:40am	<b>HPC+AI-I: Convergence of Artificial Intelligence and High-Performance Computing for Computational Fluid Dynamics</b> Location: Centro Cultural Universitario  <b>Multi-scale Transformer-based Encoding and Prediction of Turbulent Boundary Layer Flows</b> <u>Rakesh Sarma</u> , Fabian Hübenthal, Fabian Orland, Andreas Lintemann  <b>Evaluating the Computational Performance and Accuracy of a Coupled CFD Solver-ML Workflow</b> <u>Tom Hilgers</u> , Fabian Orland, Fabian Hübenthal, Rakesh Sarma, Andreas Lintemann, Christian Terboven  <b>Estimation of Conformation Stress Fields in Viscoelastic-Fluid Turbulence Using Deep Learning and Hybrid DNS-CNN Simulation</b> Eitetsu Nakashima, Ryo Araki, <u>Takahiro Tsukahara</u>  <b>Algorithms of quasi-linear complexity in vortex particle method for 2D flows simulation and their GPU implementation</b> <u>Evgeniya Ryatina</u> , Ilia Marchevsky, Aleksandra Kolganova	<b>OT-I: Performance Improvements of Parallel Applications</b> Location: Centro Cultural Universitario Chair: Juan Manuel Rivero  <b>ADAPTIVE MESH REFINEMENT FOR THE SPECTRAL-ELEMENT METHOD SIMULATIONS OF TURBULENT FLOWS</b> <u>Samuel Gómez</u> , Jordi Muela, Abel Gargallo-Peiro, Oriol Lehmkühl  <b>MALLEABLE COMPUTATIONAL FLUID DYNAMICS SIMULATIONS</b> <u>Sergio Iserte</u> , <u>Guillaume Houzeaux</u> , Petter Sandas, Antonio Peña, Marta Garcia-Gasulla  <b>Implementation and Evaluation of Thread Overlap Method in a Real CFD Application</b> <u>Takashi Soga</u> , Takanori Uchida, Susumu Date  <b>Flow around a rigid oscillating airfoil undergoing oscillations in pulsating currents</b> <u>Juan Carlos Cajas Garcia</u> , Carlos Rubio Tellez, Ismael Mariño, César Treviño
11:40am -12:00pm	<b>Coffee Break</b> Location: Centro Cultural Universitario	
12:00pm -1:00pm	<b>Atmosphere-I: High Performance Computing and AI for Atmospheric and Oceanic Flows on Exascale Computers</b> Location: Centro Cultural Universitario  <b>INCOMPRESSIBLE FLOW SIMULATIONS WITH ALYA RUNNING FULLY ON GPUs</b> <u>Herbert Owen</u> , Guillaume Houzeaux, Yacine Olds Rouis  <b>Adaptive mesh refinement as a pathway to including realistic radiation models in numerical simulations of the atmosphere</b> <u>Yassine Tissaoui</u> , Samuel Stechmann, Simone Marras, Hang Wang  <b>High resolution simulations of the Earth's atmosphere on GPUs using ClimaAtmos.jl</b> <u>Akshay Sridhar</u>	<b>OT-II: Parallel Solvers</b> Location: Centro Cultural Universitario  <b>A HIGH ORDER IMPLICIT COMPRESSIBLE FLOW SOLVER</b> <u>Guillaume Houzeaux</u> , Manuel Stocchi  <b>GPU-friendly aggressive coarsening for faster AMG Poisson solvers</b> <u>Àdel Alsatti-Baldellou</u> , Artem Mavliutov, Carlo Janna
1:00pm -2:30pm	Lunch	
3:00pm -4:30pm	<b>Social Event: Gran Museo del Mundo Maya</b> Location: Gran Museo del Mundo Maya	

Date: Tuesday, 25/Nov/2025

9:00am - 10:00am	<p><b>Invited Speaker II: Efficient Coupled Multiphysics Simulations Based On Hierarchical Cartesian Meshes</b> Location: Centro Cultural Universitario Chair: Juan Carlos Cajas Carcia</p> <p><b>9:00am - 10:00am</b> <b>Efficient Coupled Multiphysics Simulations based on Hierarchical Cartesian Meshes</b> <b>Matthias Meinke, Ansgar Niemöller, Tim Wegmann, Thede Kiwitt, Dominik Krug</b></p>	
10:00am - 10:20am	<p><b>Coffee Break</b> Location: Centro Cultural Universitario</p>	
10:20am - 11:40am	<p><b>Atmosphere-II: High Performance Computing and AI for Atmospheric and Oceanic Flows on Exascale Computers</b> Location: Centro Cultural Universitario</p> <p><b>JEXPRESSO V0.1: A JULIA-LANGUAGE, USER-FRIENDLY, MULTI-PHYSICS PARALLEL SOLVER FOR THE SOLUTION OF CONSERVATIONS LAWS ON CPUs AND GPUs</b> <b>Simone Marras, Yassine Tissaoui, Hang Wang, Sam Stechmann</b></p> <p><b>Large Eddy Simulation of Offshore Wind Farms using the open source code SOD2D</b> <b>Matias Avila Salinas, Herbert Owen, Oriol Lehmkuhl, Roberto Aurelio Chavez-Arroyo</b></p> <p><b>Computational study of convection-driven flows in sea breeze circulation over the Yucatán peninsula</b> <b>Erick Salcedo, Juan Carlos Cajas, César Treviño, Ismael Mariño-Tapia, Lorenzo Alberto Martínez-Suástegui</b></p>	<p><b>OT-III: Large Scale and Industrial Applications</b> Location: Centro Cultural Universitario</p> <p><b>Hippo: a multiphysics tool for nuclear fusion applications based on OpenFOAM and MOOSE</b> <b>Matthew Falcone, Harry Saunders, Kingsley Collie, Kyle Damm, Seimon Powell, Aleksander Dubas, Andrew Davis</b></p> <p><b>HIGH-FIDELITY PARTICLE-IN-CELL SIMULATIONS FOR THE SPACE CHARGE COMPENSATION OF HYDROGEN ION SOURCES</b> <b>David Emerson, Benzi John, Kiran Jonathan, Olli Tarvainen, Erin Flannigan, Daniel Faircloth</b></p> <p><b>3-D SIMULATION OF IGNITION IN THE HEAD VORTEX OF A REACTIVE STARTING HOT JET INTO A CH4-H2/AIR MIXTURE</b> <b>Shahrzad Ghadiri, M. Razi Nalim</b></p>
11:40am - 12:10pm	<p><b>Coffee Break</b> Location: Centro Cultural Universitario</p>	
12:10pm - 1:30pm	<p><b>Biomedicine: HPC Modelling of Physiological Flows: Multi-Scale and Multi-Physics Simulations in Biomedicine</b> Location: Centro Cultural Universitario</p> <p><b>Direct Numerical Simulations of rigid lung models</b> <b>Marco Atzori, Emanuele Gallorini, Ciro Cottini, Andrea Benassi, Maurizio Quadrio</b></p> <p><b>Digital Twin Models of the Human Respiratory System: A Multi-Scale Focus on the Lower Airways</b> <b>Digital Twin Models of the Human Respiratory System: A Multi-Scale Focus on the Lower Airways</b> <b>hadrien calmet, Alice Novell Mazzara, Carlos Arnedo, Guillaume Houzeaux, Beatriz Eguzkitza</b></p> <p><b>Blood flow simulation in a model of arterial stenosis with HPC resources</b> <b>David Hernández Obin</b></p>	<p><b>OT-IV: GPU-Accelerated Simulations-I</b> Location: Centro Cultural Universitario</p> <p><b>A GPU-Accelerated Spectral Element Solver for High-Performance Moving-Mesh Simulations</b> <b>José María Cela París, Abel Gargallo-Peiro, Oriol Lehmkuhl</b></p> <p><b>Energy Profiling on MareNostrum 5 for Large-scale Shock Simulations with a Hybrid Riemann–Entropy Solver</b> <b>Kseniya Ivanova, Jordi Muela, Oriol Lehmkuhl</b></p> <p><b>On the application of an effective LBM implementation on GPU architecture for real-time simulations</b> <b>Erwan ZAMORA MEDINA, Nicolas ALFEREZ, Simon MARIE</b></p> <p><b>An effective comparison of CUDA .vs. OpenACC implementation of a Lattice Boltzmann kernel on multi-GPU for large scale simulations – PARCFD2025</b> <b>Noureddine TAIBI, Erwan ZAMORA MEDINA, Carlos JUNQUEIRA-JUNIOR, Simon MARIE</b></p>
1:30pm - 3:00pm	<p>Lunch</p>	
3:00pm - 3:30pm	<p><b>Keynote: The Evolution of Environmental Modeling in the Era of High-Performance Computing</b> Location: Centro Cultural Universitario Chair: Juan Carlos Cajas Carcia</p>	
3:30pm - 3:40pm	<p><b>Short Break</b> Location: Centro Cultural Universitario</p>	
3:40pm - 5:00pm	<p><b>HPC+AI-II: Convergence of Artificial Intelligence and High-Performance Computing for Computational Fluid Dynamics</b> Location: Centro Cultural Universitario</p> <p><b>Drag-based route planning for urban aerial vehicles</b> <b>Hojin Lee, Rishabh Puri, Rakesh Sarma, Andreas Lintermann, Sangseung Lee, Mario Rüttgers</b></p> <p><b>When AI Meets Engineering Design: Constraining Its Creativity for Smarter Vehicle Aerodynamics Design</b> <b>Makoto Tsubokura, Takaji Nakashima, Keigo Shimizu, Moshun Ikeda, Bisser Raytchev</b></p> <p><b>TURBULENCE CONTROL VIA MODULAR MULTI-AGENT REINFORCEMENT LEARNING</b> <b>Pol Suárez, Yuning Wang, Ricardo Vinuesa</b></p> <p><b>Neural Network for Subgrid Turbulence Modeling on LES Simulations</b> <b>Eduardo Vital Brasil Lorenzo Fernandez, Jean-Marc Gratien, Yassine Ayoun, Thibault Faney, Julien Bohbot</b></p>	
7:00pm - 10:00pm	<p><b>Conference Dinner</b> Location: Museo de la Gastronomía Yucateca</p>	

**Date: Wednesday, 26/Nov/2025**

9:00am - 10:00am	<b>Invited Speaker III: High Performance Computing at UNAM: New Paradigm</b> Location: <a href="#">Centro Cultural Universitario</a> Chair: Juan Carlos Cajas Carcia
10:00am - 10:20am	<b>Coffee Break</b> Location: <a href="#">Centro Cultural Universitario</a>
10:20am - 11:40am	<b>HPC+AI-III: Convergence of Artificial Intelligence and High-Performance Computing for Computational Fluid Dynamics</b> Location: <a href="#">Centro Cultural Universitario</a>  <b>Airfoil Shape Optimization using Bayesian Methods</b> <u>Vaishali Ravishankar, Fabian Hübenthal, Soji Mathew Jacob, Arno Feiden</u>  <b>Airfoil Shape Optimization via Deep Reinforcement Learning with Multi-Fidelity CFD Solvers</b> <u>BEDRI YAGIZ, Oriol Lehmkuhl</u>  <b>DEVELOPMENT OF A GANs-BASED WALL MODEL FOR LARGE EDDY SIMULATION USING LOCAL FLOW INFORMATION</b> <u>Takumi Endo, Ming Liu, Chisachi Kato, Yosuke Hasegawa</u>  <b>Parallel Training and Performance Evaluation of PI-DeepONet: Generalization to Inflow Boundary Conditions in 2D Channel Flow</b> <u>Junya Onishi, Makoto Tsubokura</u>
11:40am - 12:10pm	<b>OT-V: GPU-Accelerated Simulations-II</b> Location: <a href="#">Centro Cultural Universitario</a>  <b>An Immersed Boundary Method with Volume Fraction-Based Forcing for High-Speed Flows</b> <u>Punit Pandey, Bhavya Jain, Ankit Bansal, Krishna Mohan Singh, Yannick Hoarau</u>  <b>DESIGN OF A PASSIVE AIR CONDITIONING SYSTEM BY MEANS OF BIDIMENSIONAL AND TRANSITORY NUMERICAL SIMULATIONS BASED ON CONTROL VOLUME SCHEMES</b> <u>Juan Manuel Rivero, César Treviño</u>  <b>Numerical simulations of thermal fluid flow through GPU enabled legacy code</b> <u>Karla Figueroa, Juan Carlos Cajas Carcia</u>  <b>Porting OpenFOAM on GPU via modern C++</b> <u>Mayank Kumar, Jony Castagna, Mattijs Janssens, Yiyun Tan, Wendi Liu, Gavin Tabor</u>
11:40am - 12:10pm	<b>Closing Ceremony</b> Location: <a href="#">Centro Cultural Universitario</a>