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

Registration
Location: Centro Cultural Universitario

8:30am - 9:00am

Welcome
Location: Centro Cultural Universitario

9:00am - 10:00am

Invited Speaker I: Quantum Lattice Boltzmann Methods
Location: CCU: Consejo Universitario
Chair: Juan Carlos Cajas Carcia

Quantum Lattice Boltzmann Methods
Matthias Möller

10:00am - 10:20am

Coffee Break
Location: Centro Cultural Universitario

10:20am - 11:40am

HPC+AI-I: Convergence of Artificial Intelligence and High-Performance Computing for Computational Fluid Dynamics
Location: CCU: Consejo Universitario

Multi-scale Transformer-based Encoding and Prediction of Turbulent Boundary Layer Flows
Rakesh Sarma, Fabian Hübenthal, Fabian Orland, Andreas Lintermann

Evaluating the Computational Performance and Accuracy of a Coupled CFD Solver-ML Workflow
Tom Hilgers, Fabian Orland, Fabian Hübenthal, Rakesh Sarma, Andreas Lintermann, Christian Terboven

Estimation of Conformation Stress Fields in Viscoelastic-Fluid Turbulence Using Deep Learning and Hybrid DNS–CNN Simulation
Eitetsu Nakashima, Ryo Araki, Takahiro Tsukahara

Algorithms of quasi-linear complexity in vortex particle method for 2D flows simulation and their GPU implementation
Evgeniya Ryatina, Ilia Marchevsky, Aleksandra Kolganova

OT-I: Performance Improvements of Parallel Applications
Location: CCU: Audiovisual

ADAPTIVE MESH REFINEMENT FOR THE SPECTRAL-ELEMENT METHOD SIMULATIONS OF TURBULENT FLOWS
Samuel Gómez, Jordi Muela, Abel Gargallo-Peiro, Oriol Lehmkuhl

MALLEABLE COMPUTATIONAL FLUID DYNAMICS SIMULATIONS
Sergio Iserte, Guillaume Houzeaux, Petter Sandas, Antonio Peña, Marta Garcia-Gasulla

Implementation and Evaluation of Thread Overlap Method in a Real CFD Application
Takashi Soga, Takanori Uchida, Susumu Date

11:40am - 12:00pm

Coffee Break
Location: Centro Cultural Universitario

12:00pm - 1:00pm

Atmosphere-I: High Performance Computing and AI for Atmospheric and Oceanic Flows on Exascale Computers
Location: CCU: Audiovisual

INCOMPRESSIBLE FLOW SIMULATIONS WITH ALYA RUNNING FULLY ON GPUs
Herbert Owen, Guillaume Houzeaux, Yacine Olds Rouis

Adaptive mesh refinement as a pathway to including realistic radiation models in numerical simulations of the atmosphere
Yassine Tissaoui, Samuel Stechmann, Simone Marras, Hang Wang

High resolution simulations of the Earth's atmosphere on GPUs using ClimaAtmos.jl
Akshay Sridhar

OT-II: Parallel Solvers
Location: CCU: Consejo Universitario

A HIGH ORDER IMPLICIT COMPRESSIBLE FLOW SOLVER
Guillaume Houzeaux, Manuel Stocchi

GPU-friendly aggressive coarsening for faster AMG Poisson solvers
Àdel Alsalti-Baldellou, Artem Mavliutov, Carlo Janna

Flow around a rigid oscillating airfoil undergoing oscillations in pulsating currents
Juan Carlos Cajas Carcia, Carlos Rubio Tellez, Ismael Mariño, César Treviño

1:00pm - 2:30pm

Lunch

3:00pm - 4:30pm

Social Event: Gran Museo del Mundo Maya
Location: Gran Museo del Mundo Maya

Date: Tuesday, 25/Nov/2025

9:00am - 10:00am

Invited Speaker II: Efficient Coupled Multiphysics Simulations Based On Hierarchical Cartesian Meshes
Location: CCU: Consejo Universitario
Chair: Juan Carlos Cajas Carcia

Efficient Coupled Multiphysics Simulations based on Hierarchical Cartesian Meshes
Matthias Meinke, Ansgar Niemöller, Tim Wegmann, Thede Kiwitt, Dominik Krug

10:00am - 10:20am

Coffee Break
Location: Centro Cultural Universitario

10:20am - 11:40am

Atmosphere-II: High Performance Computing and AI for Atmospheric and Oceanic Flows on Exascale Computers
Location: CCU: Audiovisual

JEXPRESSO V0.1: A JULIA-LANGUAGE, USER-FRIENDLY, MULTI-PHYSICS PARALLEL SOLVER FOR THE SOLUTION OF CONSERVATIONS LAWS ON CPUs AND GPUs
Simone Marras, Yassine Tissaoui, Hang Wang, Sam Stechmann

Large Eddy Simulation of Offshore Wind Farms using the open source code SOD2D
Matias Avila Salinas, Herbert Owen, Oriol Lehmkuhl, Roberto Aurelio Chavez-Arroyo

Computational study of convection-driven flows in sea breeze circulation over the Yucatán peninsula
Erick Salcedo, Juan Carlos Cajas, César Treviño, Ismael Mariño-Tapia, Lorenzo Alberto Martínez-Suástegui

OT-III: Large Scale and Industrial Applications
Location: CCU: Consejo Universitario

Hippo: a multiphysics tool for nuclear fusion applications based on OpenFOAM and MOOSE
Matthew Falcone, Harry Saunders, Kingsley Collie, Kyle Damm, Seimon Powell, Aleksander Dubas, Andrew Davis

HIGH-FIDELITY PARTICLE-IN-CELL SIMULATIONS FOR THE SPACE CHARGE COMPENSATION OF HYDROGEN ION SOURCES
David Emerson, Benzi John, Kiran Jonathan, Olli Tarvainen, Erin Flannigan, Daniel Faircloth

3-D SIMULATION OF IGNITION IN THE HEAD VORTEX OF A REACTIVE STARTING HOT JET INTO A CH4–H2/AIR MIXTURE
Shahrzad Ghadiri, M. Razi Nalim

11:40am - 12:10pm

Coffee Break
Location: Centro Cultural Universitario

12:10pm - 1:30pm

Biomedicine: HPC Modelling of Physiological Flows: Multi-Scale and Multi-Physics Simulations in Biomedicine
Location: CCU: Audiovisual

Direct Numerical Simulations of rigid lung models
Marco Atzori, Emanuele Gallorini, Ciro Cottini, Andrea Benassi, Maurizio Quadrio

Digital Twin Models of the Human Respiratory System: A Multi-Scale Focus on the Lower AirwaysDigital Twin Models of the Human Respiratory System: A Multi-Scale Focus on the Lower Airways
hadrien calmet, Alice Novell Mazzara, Carlos Arnedo, Guillaume Houzeaux, Beatriz Eguzkitza

Blood flow simulation in a model of arterial stenosis with HPC resources
David Hernández Obín

OT-IV: GPU-Accelerated Simulations-I
Location: CCU: Consejo Universitario

A GPU-Accelerated Spectral Element Solver for High-Performance Moving-Mesh Simulations
José María Cela París, Abel Gargallo-Peiro, Oriol Lehmkuhl

Energy Profiling on MareNostrum 5 for Large-scale Shock Simulations with a Hybrid Riemann–Entropy Solver
Kseniya Ivanova, Jordi Muela, Oriol Lehmkuhl

On the application of an effective LBM implementation on GPU architecture for real-time simulations
Erwan ZAMORA MEDINA, Nicolas ALFEREZ, Simon MARIE

An effective comparison of CUDA .vs. OpenACC implementation of a Lattice Boltzmann kernel on multi-GPU for large scale simulations – PARCFD2025
Noureddine TAIBI, Erwan ZAMORA MEDINA, Carlos JUNQUEIRA-JUNIOR, Simon MARIE

1:30pm - 3:00pm

Lunch

3:00pm - 3:30pm

Keynote: The Evolution of Environmental Modeling in the Era of High-Performance Computing
Location: CCU: Consejo Universitario
Chair: Juan Carlos Cajas Carcia

The Evolution of Environmental Modeling in the Era of High-Performance Computing
Simone Marras

3:30pm - 3:40pm

Short Break
Location: Centro Cultural Universitario

3:40pm - 5:00pm

HPC+AI-II: Convergence of Artificial Intelligence and High-Performance Computing for Computational Fluid Dynamics
Location: CCU: Consejo Universitario

Drag-based route planning for urban aerial vehicles
Hojin Lee, Rishabh Puri, Rakesh Sarma, Andreas Lintermann, Sangseung Lee, Mario Rüttgers

When AI Meets Engineering Design: Constraining Its Creativity for Smarter Vehicle Aerodynamics Design
Makoto Tsubokura, Takuji Nakashima, Keigo Shimizu, Moshun Ikeda, Bisser Raytchev

TURBULENCE CONTROL VIA MODULAR MULTI-AGENT REINFORCEMENT LEARNING
Pol Suárez, Yuning Wang, Ricardo Vinuesa

Neural Network for Subgrid Turbulence Modeling on LES Simulations
Eduardo Vital Brasil Lorenzo Fernandez, Jean-Marc Gratien, Yassine Ayoun, Thibault Faney, Julien Bohbot

7:00pm - 10:00pm

Conference Dinner
Location: Museo de la Gastronomía Yucateca

Date: Wednesday, 26/Nov/2025

9:00am - 10:00am

Invited Speaker III: High Performance Computing at UNAM: New Paradigm
Location: CCU: Consejo Universitario
Chair: **Juan Carlos Cajas Carcia**

High Performance Computing at UNAM: New Paradigm
Héctor Benítez Pérez

10:00am - 10:20am

Coffee Break
Location: Centro Cultural Universitario

10:20am - 11:40am

HPC+AI-III: Convergence of Artificial Intelligence and High-Performance Computing for Computational Fluid Dynamics
Location: CCU: Consejo Universitario

Airfoil Shape Optimization using Bayesian Methods
Vaishali Ravishankar, Fabian Hübenthal, Soji Mathew Jacob, Arno Feiden

Airfoil Shape Optimization via Deep Reinforcement Learning with Multi-Fidelity CFD Solvers
BEDRI YAGIZ, Oriol Lehmkuhl

DEVELOPMENT OF A GANs-BASED WALL MODEL FOR LARGE EDDY SIMULATION USING LOCAL FLOW INFORMATION
Takumi Endo, Ming Liu, Chisachi Kato, Yosuke Hasegawa

Parallel Training and Performance Evaluation of PI-DeepONet: Generalization to Inflow Boundary Conditions in 2D Channel Flow
Junya Onishi, Makoto Tsubokura

OT-V: GPU-Accelerated Simulations-II
Location: CCU: Audiovisual

An Immersed Boundary Method with Volume Fraction-Based Forcing for High-Speed Flows
Punit Pandey, Bhavya Jain, Ankit Bansal, Krishna Mohan Singh, Yannick Hoarau

DESIGN OF A PASSIVE AIR CONDITIONING SYSTEM BY MEANS OF BIDIMENSIONAL AND TRANSITORY NUMERICAL SIMULATIONS BASED ON CONTROL VOLUME SCHEMES
Juan Manuel Rivero, César Treviño

Numerical simulations of thermal fluid flow through GPU enabled legacy code
Karla Figueroa, Juan Carlos Cajas Carcia

Porting OpenFOAM on GPU via modern C++
Mayank Kumar, Jony Castagna, Mattijs Janssens, Yiyun Tan, Wendi Liu, Gavin Tabor

11:40am - 12:10pm

Closing Ceremony
Location: Centro Cultural Universitario