

Mon. Jul 15, 2024

Room A

Plenary Lecture | Plenary lecture

Plenary lecture I

9:15 AM - 10:15 AM Room A

[P1-01] Innovative Simulation for Multiphase Flows and Fluid-structure Interactions

*Takayuki Aoki¹ (1. Tokyo Institute of Technology)

9:15 AM - 10:15 AM

Tue. Jul 16, 2024

Room A

Plenary Lecture | Plenary lecture

Plenary lecture II

9:15 AM - 10:15 AM Room A

[P2-01] High order entropy stable discontinuous Galerkin methods

*Jesse Chan¹ (1. Rice University)

9:15 AM - 10:15 AM

Wed. Jul 17, 2024

Room A

Plenary Lecture | Plenary lecture

Plenary lecture III

9:15 AM - 10:15 AM Room A

[P3-01] A recursive neural-network-based subgrid scale model for large eddy simulation of turbulent flow

*Haecheon Choi¹ (1. Seoul National University)

9:15 AM - 10:15 AM

Thu. Jul 18, 2024

Room A

Plenary Lecture | Plenary lecture

Plenary lecture IV

9:15 AM - 10:15 AM Room A

[P4-01] Reduced order modelling in CFD: state of the art, perspectives and challenges

*Gianluigi Rozza¹ (1. SISSA)

9:15 AM - 10:15 AM

Fri. Jul 19, 2024

Room A

Plenary Lecture | Plenary lecture

Plenary lecture V

9:15 AM - 10:15 AM Room A

[P5-01] Introduction, history, and applications of all speed Riemann flux schemes

*Eiji Shima¹ (1. JAXA)

9:15 AM - 10:15 AM

Mon. Jul 15, 2024

Room A

Oral presentation | Fluid-structure interaction

Fluid-structure interaction-I

10:45 AM - 12:45 PM Room A

[1-A-01] Aerodynamic insights into the three-dimensional clap-and-peel motion

*Farhanuddin Ahmed¹, Nipun Arora¹ (1. Indian Institute of Technology, Jodhpur)

10:45 AM - 11:15 AM

[1-A-02] Effects of airfoil shapes on double transonic dip behaviors in supercritical airfoil flutter

*Eishu Kawashiro¹, Toma Miyake¹, Hiroshi Terashima¹ (1. Hokkaido University)

11:15 AM - 11:45 AM

[1-A-03] Numerical simulation of wave-structure interactions using a ghost-cell immersed boundary method

*D.C. Lo¹, R.S. Shih² (1. National Kaohsiung University of Science and Technology, 2. National Taiwan Ocean University)

11:45 AM - 12:15 PM

[1-A-04] Numerical investigation of correlation between thrust and angle of attack in a cyclorotor system

*Manabu Saito¹, Jun Nagao¹, Ryoichi Kurose¹ (1. Kyoto University)

12:15 PM - 12:45 PM

Room B

Oral presentation | Aero-acoustics

Aero-acoustics-I

10:45 AM - 12:15 PM Room B

[1-B-01] Computational Estimation of the Drag on an Acoustic Liner in Three-Dimensional Turbulent

Flow

*Hideaki Matsuura¹, Daisuke Sasaki¹, Shunji Enomoto², Junichi Oki² (1. Osaka Metropolitan University, 2. Japan Aerospace Exploration Agency)
10:45 AM - 11:15 AM

[1-B-02] Sound Generation and Shock Wave Deformation in Shock Wave - Vortex Ring Interaction
*Swapnil Ashok Ahire¹, Avijit Chatterjee¹ (1. Indian Institute of Technology Bombay)
11:15 AM - 11:45 AM

[1-B-03] Enhanced Simulation Techniques in Predicting X-59 Sonic Boom Loudness Using CFD
*Scott Neuheoff¹, Chase Ashby¹, Jeffrey Housman¹, Jared Duensing¹ (1. NASA Ames Research Center)
11:45 AM - 12:15 PM

Room C

Oral presentation | Reduced order models

Reduced order models-I
10:45 AM - 12:45 PM Room C

[1-C-01] Reduced-order Modeling for Pressure Field via Global Proper Orthogonal Decomposition
*Yuto Nakamura¹, Shintaro Sato¹, Naofumi Ohnishi¹ (1. Tohoku University)
10:45 AM - 11:15 AM

[1-C-02] Large-eddy Simulations and Reduced-Order Modeling for NACA4412 Flow Near The Stall Angle
Yash Bajpai¹, *Rajesh Ranjan¹ (1. Indian Institute of Technology, Kanpur)
11:15 AM - 11:45 AM

[1-C-03] Reduced Order Model-based Uncertainty Analysis for Fluid-Structure Interaction Problems
*Tiantian Xu¹, Jung-Il Choi¹ (1. Yonsei University)
11:45 AM - 12:15 PM

[1-C-04] Analysis of Supersonic Retropropulsion Flow using Modal Decomposition
*Jiaye Qiao¹, Salvador Navarro-Martinez¹ (1. Imperial College London)
12:15 PM - 12:45 PM

Room D

Oral presentation | Multi-phase flow

Multi-phase flow-I

10:45 AM - 12:45 PM Room D

[1-D-01] Is Stokes Number Appropriate for Predicting Multiphase Richtmyer– Meshkov Instability Mixing Zone Width?
*Yingming Si^{1,2}, Baoqing Meng¹, Chun Wang¹, Baolin Tian³ (1. Institute of Mechanics, Chinese Academy of Sciences, 2. University of Chinese Academy of Sciences, 3. Beihang University)
10:45 AM - 11:15 AM

[1-D-02] Numerical simulation of enhanced evaporation by puffing bi-component droplet
*Fumiya Kidena¹, Kenya Kitada¹, Abhishek Lakshman Pillai¹, Ryoichi Kurose¹ (1. Kyoto University)
11:15 AM - 11:45 AM

[1-D-03] Exact interface velocity in immersed boundary method
*Kun Zhou¹ (1. Wuhan University of Science and Technology)
11:45 AM - 12:15 PM

[1-D-04] A Low-dissipation Numerical Method for Capturing Gas-liquid Interfaces in Phase Change Simulation
*Hiro Wakimura¹, Takayuki Aoki¹, Feng Xiao¹ (1. Tokyo Institute of Technology)
12:15 PM - 12:45 PM

Room A

Oral presentation | Fluid-structure interaction

Fluid-structure interaction-II
2:00 PM - 4:00 PM Room A

[2-A-01] Multi-Fidelity Gradient-based Aerostructural Optimization
*Markus Peer Rumpfkeil¹, Phil Beran² (1. University of Dayton, 2. U.S. Air Force Research Laboratory)
2:00 PM - 2:30 PM

[2-A-02] Development of an Elastic-Plastic Eulerian Solver for High-Speed Deformations with the Johnson-Cook Material Model
*Oren Peles¹, Moran Ezra¹, Marcel Martins Alves¹, Yoram Kozak¹, Nitsan Briskin², Avi Uzi², David Touati², Sharon Peles² (1. Tel-Aviv University, 2. Elbit Systems Land)

2:30 PM - 3:00 PM

- [2-A-03] Exploring Static Rotor Approach and Dynamic Rotor Simulation for Magnus Effect VAWT using Direct Forcing Immersed Boundary (DFIB) Method
*Fandi Dwiputra Suprianto¹, Ming-Jyh Chern¹, Chin-Cheng Wang², Desta Goytom Tewolde¹ (1. National Taiwan University of Science and Technology, 2. National Taipei University of Technology)

3:00 PM - 3:30 PM

- [2-A-04] Wall-Modeled Large-Eddy Simulation of Supersonic Parachute Inflation
*Francois Cadieux¹, Michael F Barad¹ (1. NASA Ames Research Center)
- 3:30 PM - 4:00 PM

Room B

Oral presentation | Aero-acoustics

Aero-acoustics-II

2:00 PM - 3:30 PM Room B

- [2-B-01] Turbulent Boundary Layer Noise of Fighter Aircraft Canopy
*Muhammed Alperen Kuş¹, Baha Zafer² (1. Roketsan Inc., 2. Istanbul Technical University)
2:00 PM - 2:30 PM
- [2-B-02] Wall Modelled Large Eddy Simulation for Jet Flap Interaction Aeroacoustics
*Gary Page¹, Hao Xia¹, Andrew Barnes¹, Simran Panesar¹ (1. Loughborough University)
2:30 PM - 3:00 PM
- [2-B-03] Aeroacoustic Study of Morphed Trailing-Edge Airfoils Using Large-Eddy Simulations
Donghun Kang¹, *Seongkyu Lee¹ (1. University of California, Davis)
3:00 PM - 3:30 PM

Room C

Oral presentation | Reduced order models

Reduced order models-II

2:00 PM - 3:30 PM Room C

- [2-C-01] Model Order Reduction by Convex Displacement Interpolation
Simona Cucchiara², *Angelo Iollo¹, Tommaso Taddei¹, Haysam Telib² (1. Université de Bordeaux & Inria ,

2. Optimad Engineering, Torino, Italy)

2:00 PM - 2:30 PM

- [2-C-02] A hybrid-fidelity model for floating wave energy converters
*Michel Bergmann^{1,2}, Beatrice Battisti³ (1. Inria, Memphis team, 200 avenue de la vieille tour, 33450 Talence, France., 2. Institut de Mathématiques de Bordeaux, 351, cours de la libération, 33405 Talence, France, 3. Department of Mechanical and Aerospace Engineering, Politecnico di Torino, Torino, Italy.)

2:30 PM - 3:00 PM

- [2-C-03] Parametric Reduced Order Model built from RBF-FD meshless simulations of flow and temperature fields in a 3D pipe with wavy surfaces
Fausto Dicech¹, Riccardo Zamolo¹, *Lucia Parussini¹ (1. University of Trieste)
- 3:00 PM - 3:30 PM

Room D

Oral presentation | Multi-phase flow

Multi-phase flow-II

2:00 PM - 4:00 PM Room D

- [2-D-01] A consistent, volume preserving, and adaptive mesh refinement-based framework for modeling phase changing non-isothermal gas-liquid-solid flows
*Amneet Pal Singh Bhalla¹, Ramakrishnan Thirumalaisamy¹ (1. San Diego State University)
2:00 PM - 2:30 PM
- [2-D-02] Application of lattice Boltzmann method to simulate droplet coalescence phenomenon under shear flow
YiYun Wang¹, *YueFang Li¹, ChaoAn Lin¹ (1. Department of Power Mechanical Engineering, National Tsing Hua University, Hsinchu 30013, Taiwan.)
2:30 PM - 3:00 PM
- [2-D-03] Viscous Fingering coupled with Phase Separation
Yuka F. Deki², Chi-Chian Chou³, Ryuta X. Suzuki², Takahiko Ban⁴, Manoranjan Mishra⁵, Yuichiro Nagatsu², *Ching-Yao Chen¹ (1. National Yang Ming Chiao Tung University, 2. Tokyo University of

Agriculture and Technology, 3. Taiwan Space Agency, 4. Osaka University, 5. Indian Institute of Technology Ropar)

3:00 PM - 3:30 PM

[2-D-04] Lagrangian tracking of particle motion around arbitrary moving and deforming objects in conforming body-fitted grids

Francesco Caccia¹, *Alberto Guardone¹ (1.

Politecnico di Milano)

3:30 PM - 4:00 PM

Room A

Oral presentation | Fluid-structure interaction

Fluid-structure interaction-III

4:30 PM - 6:30 PM Room A

[3-A-01] Blast Wave Propagation Through Debris Cloud

*Joseph D Baum¹, Orlando A Soto¹, Michael E Giltrud¹, Fumiya Togashi¹, Rainald Lohner¹ (1. Applied Simulations, Inc)

4:30 PM - 5:00 PM

[3-A-02] The moving rigid-body simulation with immersed boundary method and general pressure equation on multi-GPU cluster

*Jun-Yang Ji¹, Chao-An Lin¹ (1. Department of Power Mechanical Engineering, National Tsing Hua University, Hsinchu 30013, Taiwan)

5:00 PM - 5:30 PM

[3-A-03] Constrained Actuator Line Model with Controls in a Lattice Boltzmann framework for Floating Offshore Wind Turbine Simulations

*Ling Qiu¹, Pei Zhang¹, Sergio Galindo-Torres¹ (1. Key Laboratory of Coastal Environment and Resources of Zhejiang Province, School of Engineering, Westlake University, Hangzhou, China.)

5:30 PM - 6:00 PM

[3-A-04] Data-Driven Fluid-Structure Interaction with Fully-Partitioned Method and Deep Koopman Model

*Yoshiaki Abe¹, Tomoki Yamazaki¹, Freddie D. Witherden², Yu Kawano³ (1. Tohoku University, 2. Texas A&M University, 3. Hiroshima University)

6:00 PM - 6:30 PM

Room B

Oral presentation | Industrial applications

Industrial applications-I

4:30 PM - 6:30 PM Room B

[3-B-01] CFD-Based Heat Transfer and Flow Field

Investigations of a Heat Recovery Steam Generator for Aero Engine Applications

*Mahmoud El-Soueidan¹, Jannik HäBy¹, Marc Schmelcher¹, Alexander Görtz¹ (1. German Aerospace Center (DLR), Cologne, Germany)

4:30 PM - 5:00 PM

[3-B-02] Leveraging Graph Neural Networks for the CFD Simulations of Bioreactors with Variable Geometries

*Umut Kaya^{1,2}, Srikanth Gopireddy², Nora Urbanetz², Ingmar Nopens¹, Jan Verwaeren¹ (1. Ghent University, 2. Daiichi Sankyo Europe GmbH)

5:00 PM - 5:30 PM

[3-B-03] Influence of Vortical Structures on Liquid Metal Breakup in Atomization Process

*Seunghan Lee¹, Jinyul Hwang¹ (1. Pusan National University)

5:30 PM - 6:00 PM

[3-B-04] High-Precision Surrogate Method Based on Fusion Strategy for High-Speed Vehicles Aerodynamic Optimization

*Lulu Jiang¹, Xin Pan¹, Gang Chen¹ (1. Xi'an Jiaotong University)

6:00 PM - 6:30 PM

Room C

Oral presentation | Higher order methods

Higher order methods-I

4:30 PM - 6:30 PM Room C

[3-C-01] Stable and non-dissipative flux reconstruction schemes using Gauss-Legendre points with kinetic energy and entropy preservation (KEEP) property

*Issei Homma¹, Hiroyuki Asada¹, Soshi Kawai¹ (1. Tohoku University)

4:30 PM - 5:00 PM

[3-C-02] Successive correction h-p adaptation for k-exact FV schemes in compressible flow simulations

*Mikail Salihoglu¹, Anca Belme¹, Alexandre Limare²,

Pierre Brenner², David Puech², Grégoire Pont³, Paola Cinnella¹ (1. Sorbonne Université, Institut Jean Le Rond d'Alembert, 2. ArianeGroup, 3. Airbus SAS)
5:00 PM - 5:30 PM

[3-C-03] A consistent viscous discretization approach using Staggered Update Procedure (SUP)
*Shubhashree Subudhi¹, N. Balakrishnan¹ (1. Indian Institute of Science, Bangalore, India)
5:30 PM - 6:00 PM

[3-C-04] High-order Accurate Implicit Scheme Based on Temporal Reconstruction for Solving Compressible Navier-Stokes Equations
*Hanyu Zhou¹, Yu-Xin Ren¹ (1. Tsinghua University)
6:00 PM - 6:30 PM

Room D

Oral presentation | Multi-phase flow

Multi-phase flow-III
4:30 PM - 6:30 PM Room D

[3-D-01] A Smoothed-Terrain-Following Coordinate System for Modeling Gravity-Driven Flows in Depth-Averaged Approach
*Yih-Chin Tai¹, Hock-Kiet Wong¹, Ching-Yuan Ma¹ (1. Dept. Hydraulic and Ocean Engineering, National Cheng Kung University, Tainan, Taiwan)
4:30 PM - 5:00 PM

[3-D-02] A monolithic model of solid-liquid phase change problem
*HUI YAO¹, Mejd Azaiez¹ (1. Bordeaux University, Bordeaux INP, I2M UMR 5295, 33400 Talence, France)
5:00 PM - 5:30 PM

[3-D-03] Numerical study of dense particulate flows using Baer-Nunziato-like models
*Pavel Utkin¹ (1. Harbin Institute of Technology)
5:30 PM - 6:00 PM

[3-D-04] Settling of prolate spheroids in a quiescent fluid at different volume fractions
Xinyu Jiang¹, Chunxiao Xu¹, *Lihao Zhao¹ (1. Department of Engineering Mechanics, Tsinghua University)
6:00 PM - 6:30 PM

Tue. Jul 16, 2024

Room A

Oral presentation | Fluid-structure interaction

Fluid-structure interaction-IV
10:45 AM - 12:15 PM Room A

[4-A-01] A Front-Tracking Technique for Computing Inflatable Structures in Supersonic Flows with Shocks
Valerio Orlandini¹, Alessia Assonitis¹, *Renato Paciorri¹, Aldo Bonfiglioli² (1. University of Rome La Sapienza - Dept. of Mechanical and Aerospace Engineering, 2. University of Basilicata, School of Engineering)
10:45 AM - 11:15 AM

[4-A-02] Fast and Robust Staggered Approach for Fluid-Structure Interaction Simulation in a Thin Flapping Plate
*Akio Yamano¹, Toshinobu Muramatsu¹, Takashi Iwasa¹ (1. Department of Aerospace Engineering, Graduate School of Engineering, Osaka Metropolitan University)
11:15 AM - 11:45 AM

Room B

Oral presentation | Industrial applications

Industrial applications-II
10:45 AM - 12:45 PM Room B

[4-B-01] Synthesized LES Inlet Conditions with Mapped Wingtip Vortices using VLM Mean Flow Field Data
*Jia Cheng Chan¹, Henrik Hesse¹, Peng Cheng Wang², James Jun Yuan Tan³ (1. University of Glasgow, 2. Singapore Institute of Technology, 3. ST Engineering Aerospace Ltd)
10:45 AM - 11:15 AM

[4-B-02] On the Aerodynamic Instability in a Multistage Axial-centrifugal Combined Compressor
*Cheng Tian¹, Song Fu¹ (1. Tsinghua University)
11:15 AM - 11:45 AM

[4-B-03] Numerical estimation of the leakage source of large floating marine plastic debris washed ashore on the Tsushima coast using the adjoint method
Masazumi Wake¹, *Toru Sato¹ (1. University of Tokyo)
11:45 AM - 12:15 PM

[4-B-04] Numerical Simulation of SLD Icing under Glaze Ice Conditions by Coupling Scheme of Grid- and Particle-Based Method Introducing Purcell Approximation

Masataka Kaneshi¹, *Koji Fukudome², Yuki Abe¹, Makoto Yamamoto¹ (1. Tokyo University of Science, 2. Kanazawa Institute of Technology)
12:15 PM - 12:45 PM

Room C

Oral presentation | Higher order methods

Higher order methods-II

10:45 AM - 12:45 PM Room C

[4-C-01] An unfitted high-order spectral element method for incompressible Navier-Stokes equations with a free surface: The pressure problem

*Jens Visbeck¹, Anders Melander¹, Mario Ricchiuto², Allan Peter Engsig-Karup¹ (1. Department of Applied Mathematics and Computer Science, Technical University of Denmark, Denmark, 2. Team CARDAMOM, INRIA, U. Bordeaux, CNRS, Bordeaux INP, IMB, UMR 5251, France)
10:45 AM - 11:15 AM

[4-C-02] High-order Compact Gas-kinetic Scheme on Structured and Unstructured Meshes for Compressible Flow Simulations

*Fengxiang ZHAO¹, Kun XU^{1,2} (1. Department of Mathematics, The Hong Kong University of Science and Technology, 2. Department of Mechanical and Aerospace Engineering, The Hong Kong University of Science and Technology)
11:15 AM - 11:45 AM

[4-C-03] A Third-Order Hyperbolic Navier-Stokes Solver for Unsteady Simulations on Adaptive Space-Time Tetrahedral Grids

*Hiroaki Nishikawa¹ (1. National Institute of Aerospace)
11:45 AM - 12:15 PM

[4-C-04] Very high-order ENO schemes with multi-resolution

*Hua Shen¹ (1. University of Electronic Science and Technology of China)
12:15 PM - 12:45 PM

Room D

Oral presentation | Multi-phase flow

Multi-phase flow-IV

10:45 AM - 12:45 PM Room D

[4-D-01] Numerical modeling of wave impact on a vertical wall with a deflector

Sergio Croquer Perez¹, *Sébastien Poncet¹, R.W. Jay Lacey¹ (1. Université de Sherbrooke)
10:45 AM - 11:15 AM

[4-D-02] A New Interface tracking method Under Multi-Material ALE Framework: The Intersecting Polygon Tracking Method

*Liqi Liu¹ (1. Institute of Applied Physics and Computational Mathematics)
11:15 AM - 11:45 AM

[4-D-03] VOF Modeling of Droplet Distortion under Supersonic Flow

*Hong Q Yang¹ (1. CFD Research)
11:45 AM - 12:15 PM

[4-D-04] When does a drop stop bouncing on a cold surface?

*Mingguang she Shen¹, Ben Q Li² (1. Yancheng Teachers University, 2. University of Michigan-Dearborn)
12:15 PM - 12:45 PM

Room A

Oral presentation | Numerical methods

Numerical methods-I

2:00 PM - 4:00 PM Room A

[5-A-01] Positivity-preserving algorithm for implicit finite volume methods simulating compressible flows

*Qian Wang¹, Hanyu Zhou² (1. Beijing Computational Science Research Center, 2. Tsinghua University)
2:00 PM - 2:30 PM

[5-A-02] A Fast Coupled Solver for the Steady Navier-Stokes Equations on Rectilinear Grids

*Mark Andrew George¹, Nicholas Williamson¹, Steven Armfield¹ (1. The University of Sydney)
2:30 PM - 3:00 PM

[5-A-03] A node-conservative cell-centered Finite Volume method for solving multidimensional Euler equations over general unstructured

grids

*Pierre-Henri Maire¹, Vincent Delmas^{1,2}, Raphaël Loubère² (1. CEA, 2. Institut de Mathématiques de Bordeaux)

3:00 PM - 3:30 PM

[5-A-04] An Efficient Conservative Primitive Solver for Non-Ideal Fluids in Single- and Multi-Phase Flows

*Giuseppe Sirianni¹, Barbara Re¹, Alberto Guardone¹, Remi Abgrall² (1. Politecnico di Milano, 2. University of Zurich)

3:30 PM - 4:00 PM

Room B

Oral presentation | Industrial applications

Industrial applications-III

2:00 PM - 4:00 PM Room B

[5-B-01] Development of Multiobjective Aerodynamic Three-Dimensional Shape Optimization Method

*Akira Oyama¹, Naruhiko Nimura² (1. Japan Aerospace Exploration Agency, 2. The University of Tokyo)

2:00 PM - 2:30 PM

[5-B-02] Total Uncertainty Quantification of the AIAA UQ Challenge Problem using an Interactive Web Browser Based Tool for Data and Automated Workflow Management

*Earl P Duque¹, Michael D Burklund¹, Dave A Amels¹, Steve M Legensky¹ (1. Intelligent Light)

2:30 PM - 3:00 PM

[5-B-03] Large-Eddy Simulation on Golf-Ball at supercritical Reynolds number and its comparison with Smooth-Sphere

*Shota Nishinakagawa¹, Shushi Nakaoka³, Masahide Onuki², Takahiro Sajima², Makoto Tsubokura⁴ (1. Computational Fluid Dynamics Lab., Graduate School of System Informatics, Kobe University Graduate School., 2. Sumitomo Rubber Industries Ltd., 3. Computational Fluid Dynamics Lab., Computer Science and System Engineering, Kobe University Department., 4. Computational Fluid Dynamics Lab., Kobe University)

3:00 PM - 3:30 PM

[5-B-04] A Hybrid Finite Volume/Element Method for Studying Liquid Argon Time Projection

Chamber Detectors

*Shuang Zhang Tu¹, Chao Jiang¹, Qing Jane Pang¹ (1. Jackson State University)

3:30 PM - 4:00 PM

Room C

Oral presentation | Higher order methods

Higher order methods-III

2:00 PM - 4:00 PM Room C

[5-C-01] A Novel Energy-based Artificial Viscosity for Suppressing Numerical Oscillations in Discontinuous Galerkin and Flux Reconstruction Schemes

*Weicheng Pei¹, Yu-Xin Ren¹ (1. Tsinghua University)

2:00 PM - 2:30 PM

[5-C-02] High-order Space-time Flux Reconstruction Methods for Moving Domain Simulation

*Meilin Yu¹ (1. University of Maryland Baltimore County)

2:30 PM - 3:00 PM

[5-C-03] Robust and Efficient Numerical Schemes for LES of Liquid

Rocket Engine Combustor
*Takanori Haga¹ (1. Japan Aerospace Exploration Agency)

3:00 PM - 3:30 PM

[5-C-04] A robustness-enhanced reconstruction based on discontinuity feedback factor for high-order finite volume scheme

*Hong Zhang¹, Xing Ji¹, Yuan Ding², Kun Xu² (1. School of Aerospace Engineering, Xi'an Jiaotong University, 2. Department of Mathematics, The Hong Kong University of Science and Technology)

3:30 PM - 4:00 PM

Room D

Oral presentation | Reacting flow

Reacting flow

2:00 PM - 3:30 PM Room D

[5-D-01] Direct Discontinuous Galerkin Methods for the Reacting, Multi-Species, 3D Compressible Navier-Stokes Equations

*Gianni Absillis¹, Hong Luo¹, Patrick Timothy

Greene², Robert Nourgaliev², Matthew Goodson³
 (1. North Carolina State University, 2. Lawrence
 Livermore National Laboratory, 3. Corvid
 Technologies)
 2:00 PM - 2:30 PM

[5-D-02] Influence of low-temperature chemistry
 modelling on flame characteristics in a ducted
 rocket combustor
 *Niklas Zettervall¹, Christian Ibron¹, Kevin Nordin-
 Bates¹ (1. Swedish Defence Research Agency,
 FOI)
 2:30 PM - 3:00 PM

[5-D-03] A Compressible Flamelet-Based Turbulent
 Combustion Modeling Framework in an All-
 Speed Solver for Rocket Engines
 *Siddharth Thakur¹ (1. University of Florida and
 Streamline Numerics, Inc.)
 3:00 PM - 3:30 PM

Room A

Oral presentation | Numerical methods

Numerical methods-II
 4:30 PM - 6:30 PM Room A

[6-A-01] An asymptotic-preserving
 multidimensionality-aware finite volume
 numerical scheme for Euler equations
 *Alessia Del Grosso¹, Wasilij Barsukow², Raphaël
 Loubère², Pierre-Henri Maire³ (1. Inria Bordeaux, 2.
 Institut de Mathématiques de Bordeaux, 3. CEA
 Cesta)
 4:30 PM - 5:00 PM

[6-A-02] Determining the Significance of
 Nonequilibrium Effects in Materials Using a
 Continuum-Atomistic Framework
 *Tim Linke¹, Dane Sterbentz², Jonathan Belof²,
 Jean-Pierre Delplanque¹ (1. University of
 California, Davis, 2. Lawrence Livermore National
 Laboratory)
 5:00 PM - 5:30 PM

[6-A-03] A generic balanced-force algorithm for
 multiphase flows with moving bodies on
 polyhedral unstructured grids
 *Yichen Huang¹, Bin Xie¹ (1. School of Naval
 Architecture, Ocean and Civil Engineering, Shanghai
 Jiao Tong University)

5:30 PM - 6:00 PM

[6-A-04] Flow Past a Bluff Body: High-fidelity
 Simulation and Intelligent Flow Control
 *Feng Ren¹ (1. Northwestern Polytechnical
 University)
 6:00 PM - 6:30 PM

Room B

Oral presentation | Turbulent flow

Turbulent flow-I
 4:30 PM - 6:30 PM Room B

[6-B-01] *A priori* test of a data-driven SGS model
 considering the multiscale nature of turbulent
 flows
 *Bahrul Jalaali¹, Kie Okabayashi¹ (1. Department of
 Mechanical Engineering, Osaka University)
 4:30 PM - 5:00 PM

[6-B-02] Effects of Crossflow Instability on the
 Development Process of a Turbulent Spot
 *Kosuke Nakagawa¹, Shotaro Okazaki¹, Takahiro
 Ishida², Takahiro Tsukahara¹ (1. Tokyo University
 of Science, 2. Japan Aerospace Exploration Agency)
 5:00 PM - 5:30 PM

[6-B-03] Numerical simulation of turbulent boundary
 layers over an axisymmetric bow with
 turbulent inflow
 *Fei Zhu¹, Jing-Wei Jiang¹, Chun-Xiao Xu¹, Wei-Xi
 Huang¹ (1. Tsinghua University)
 5:30 PM - 6:00 PM

[6-B-04] Parametric Study of Distributed Roughness
 Effects for Transitional Flow
 *Takuto Ogawa¹, Aiko Yakeno¹ (1. Tohoku
 University)
 6:00 PM - 6:30 PM

Room C

Oral presentation | Higher order methods

Higher order methods-IV
 4:30 PM - 6:30 PM Room C

[6-C-01] Online Bayesian Optimization of Polynomial-
 Multigrid Cycles for
 Flux Reconstruction
 *Freddie Witherden¹, Will Trojak², Sambit Mishra¹
 (1. Texas A&M University, 2. IBM Research UK)

4:30 PM - 5:00 PM

- [6-C-02] Analysis of Dispersion and Dissipation Characteristics of Stabilization Methods for Discontinuous Galerkin Schemes
*Geng Liang¹, Hui Xu¹ (1. Shanghai Jiao Tong University)

5:00 PM - 5:30 PM

- [6-C-03] An unstructured high-order compact gas-kinetic scheme in arbitrary Lagrangian-Eulerian formulation
*Yue ZHANG¹, Kun XU¹ (1. Department of Mathematics, Hong Kong University of Science and Technology, Clear Water Bay, Kowloon, Hong Kong)

5:30 PM - 6:00 PM

- [6-C-04] Locally Divergence-Free Oscillation-Eliminating Discontinuous Galerkin Methods for Ideal MHD Equations
*Wei Zeng¹ (1. Beijing Computational Science Research Center)

6:00 PM - 6:30 PM

Room D

Oral presentation | Multi-phase flow

High performance computing-I

4:30 PM - 6:00 PM Room D

- [6-D-01] Xcompact3D Revisited: A Codebase for Heterogeneous Architectures Based on a Distributed-memory Tridiagonal Matrix Algorithm
*Semih Akkurt¹, Sebastien Lemaire², Paul Bartholomew², Stefano Rolfo³, Cedric Flageul⁴, Filippo Spiga⁵, Charles Moulinec³, Sylvain Laizet¹ (1. Imperial College London, 2. EPCC, University of Edinburgh, 3. STFC Daresbury Laboratory, UKRI, 4. Universite de Poitiers, 5. NVIDIA Corporation)
- 4:30 PM - 5:00 PM
- [6-D-02] Ignition Overpressure Analyses of Launch Pads at Different Deflector Angles
Tohid Ghorbani Iriolya¹, *Sinan Eyi¹ (1. Middle East Technical University / Aerospace Engineering Department)
- 5:00 PM - 5:30 PM
- [6-D-03] Task-decomposed Overlapped Pressure Preconditioner for Sustained Strong Scalability on Accelerated Pre-exascale

Systems

- *Niclas Jansson¹, Martin Karp¹, Szilárd Páll¹, Stefano Markidis¹, Philipp Schlatter^{2,1} (1. KTH Royal Institute of Technology, 2. Friedrich-Alexander-Universität (FAU) Erlangen-Nürnberg)

5:30 PM - 6:00 PM

Wed. Jul 17, 2024

Room A

Oral presentation | Numerical methods

Numerical methods-III

10:45 AM - 12:45 PM Room A

- [7-A-01] Kinetic-energy and entropy preserving (KEEP) scheme with logarithmic mean approximations for improved entropy conservation
*Shigetaka Kawai¹, Soshi Kawai¹ (1. Tohoku University)
- 10:45 AM - 11:15 AM
- [7-A-02] Assessment of Immersed Boundary Method Suitable for Kinetic Energy and Entropy Preserving Scheme
*Yutaro Ishida¹, Junya Onishi², ChungGang Li³, Sangwon Kim², Younghwa Cho⁴, Makoto Tsubokura² (1. Numerical Flow Designing CO., LTD., 2. RIKEN-CCS, 3. National Cheng Kung University, 4. Hokkaido University)
- 11:15 AM - 11:45 AM
- [7-A-03] Parallel Multigrid for Reynolds Averaged Navier Stokes on Block Structured Cartesian Grids
*Ankith Anil Das¹, Nicholas Williamson¹, Steven Armfield¹ (1. University of Sydney)
- 11:45 AM - 12:15 PM
- [7-A-04] Numerical Simulation of propeller slip-stream influence on the high lift configuration with Actuator Disk Method
*Longyuan YANG¹, Yunyi SHENG¹, Yong YANG¹ (1. Northwestern Polytechnical University)
- 12:15 PM - 12:45 PM

Room B

Oral presentation | Turbulent flow

Turbulent flow-II

10:45 AM - 12:45 PM Room B

[7-B-01] Ceps-Relambda scaling of inhomogeneous and unsteady turbulence

*Ryo Araki¹, Wouter J. T. Bos², Susumu Goto³ (1. Tokyo University of Science, 2. CNRS, Ecole Centrale de Lyon, 3. Osaka University)

10:45 AM - 11:15 AM

[7-B-02] Machine Learning Categorization of a Large CFD Data Set of Airfoil Leading-Edge Defects

*Andre F. P. Ribeiro¹, Alexander Meyer Forsting² (1. Delft University of Technology, 2. Technical University of Denmark)

11:15 AM - 11:45 AM

[7-B-03] Turbulence Model Uncertainty Estimation via Monte

Carlo Perturbation of the Reynolds Stress Tensor

*Giulio Gori¹ (1. Department of Aerospace Science and Technology, Politecnico di Milano)

11:45 AM - 12:15 PM

[7-B-04] Comparison of ILES and RANS Computation of Subsonic Base Flow over Axisymmetric Body

*Jaehyoung Park¹, Donguk Kim¹, Seungsoo Lee¹, Jin Seok Park¹ (1. Department of Aerospace Engineering, Inha University)

12:15 PM - 12:45 PM

Room C

Oral presentation | Mesh generation/adaptation

Mesh generation/adaptation-I

10:45 AM - 12:15 PM Room C

[7-C-01] Error Estimation for Adaptive Mesh Refinement in Droplet Simulations

*Darsh Nathawani¹, Matthew Knepley¹ (1. University at Buffalo)

10:45 AM - 11:15 AM

[7-C-02] Anisotropically Adapted Quad-dominant Meshes for High-order Discontinuous Galerkin Methods

*Dipendrasingh Kain¹, Gowri Venugopal¹, Aravind Balan¹, Ajay Rangarajan², Georg May³ (1. Indian Institute of Science (IISc), 2. RWTH Aachen University, 3. Von Karman Institute for Fluid Dynamics)

11:15 AM - 11:45 AM

[7-C-03] Application of High-order Discontinuous

Galerkin

Methods for Aerodynamic Shape Optimization with

Adaptive Meshing

*Kush Pandya¹, Aravind Balan¹, Georg May² (1.

Indian Institute of Science, 2. Von Karman Institute for Fluid Dynamics)

11:45 AM - 12:15 PM

Room D

Oral presentation | Multi-phase flow

High performance computing-II

10:45 AM - 12:15 PM Room D

[7-D-01] A Wall-Distance Method for Turbulence Modeling

*Xinyu Zhang¹, Boris Diskin², Aaron Walden², Eric J. Nielsen² (1. Analytical Mechanics Associates, 2. NASA Langley Research Center)

10:45 AM - 11:15 AM

[7-D-02] 10 Years of AIAA Hover Prediction Workshops:

State-of-the-Art and Future Plans

*Nathan Hariharan¹ (1. HPCMP CREATE)

11:15 AM - 11:45 AM

[7-D-03] Evaluate Computational Efficiency of Adaptive Particle Neural Particle Method (NPM-A) for Modeling Fluid Flow Problems

Pei-Hsin Pai¹, *Heng-Chuan Kan², Yih-Chin Tai¹ (1. Department of Hydraulic and Ocean Engineering, National Cheng Kung University, 2. National Center for High-performance Computing, National Applied Research Laboratories>)

11:45 AM - 12:15 PM

Room A

Oral presentation | Numerical methods

Numerical methods-IV

2:00 PM - 4:00 PM Room A

[8-A-01] Numerical investigation of the Block Spectral Stresses (BSS) method for turbulence modeling and shock-capturing

*Matteo Ruggeri¹, Victor C. B. Sousa¹, Carlo Scalo¹ (1. Purdue University)

2:00 PM - 2:30 PM

[8-A-02] Application of Hybrid MUSCL-THINC Approach to Magnetohydrodynamic Simulations for Sharply Capturing Discontinuities

*Tomohiro Mamashita¹, Gaku Fukushima¹, Keiichi Kitamura¹ (1. Yokohama National University)

2:30 PM - 3:00 PM

[8-A-03] On the Convolutional Immersed Boundary Method for Suppression of Spurious Force Oscillations

*Pao-Hsiung Chiu¹ (1. IHPC, Agency for Science, Technology and Research, Singapore)

3:00 PM - 3:30 PM

[8-A-04] A Third-order Weighted Compact Least-Squares Scheme for Hyperbolic Conservation Laws on Non-Uniform Grids

*Luxin Li¹, Jianhua Pan¹ (1. Ningbo University)

3:30 PM - 4:00 PM

Room B

Oral presentation | Turbulence simulation (DNS,LES,RANS)

Turbulence simulation(DNS,LES,RANS)-I

2:00 PM - 4:00 PM Room B

[8-B-01] Scale-Adaptive Airflow Simulations in a Complete Human Airways up to Transitional Bronchioles

*Quoc Hung Nguyen¹, Chin-Long Lin², Sanghun Choi¹ (1. Kyungpook National University, 2. The

University of Iowa)

2:00 PM - 2:30 PM

[8-B-02] Large Eddy Simulation in the Indoor Vertical Farming modelling

*Ali Ashnani¹, Alpo Laitinen², Ville Vuorinen³, Ossi Kaario⁴ (1. Aalto University, Department of Mechanical Engineering, 2. Aalto University,

Department of Mechanical Engineering, 3. Aalto University, Department of Mechanical Engineering, 4. Aalto University, Department of Mechanical Engineering)

2:30 PM - 3:00 PM

[8-B-03] Roughness induced instability and subcritical bypass transition in the high-speed leading-edge boundary layer

*Youcheng Xi¹, Song Fu¹ (1. Tsinghua University)

3:00 PM - 3:30 PM

[8-B-04] Validating Quadratic Constitutive Relation

using Flow Database at High Reynolds Numbers

*Yoshiharu Tamaki¹, Soshi Kawai², Taro Imamura¹ (1. The University of Tokyo, 2. Tohoku University)

3:30 PM - 4:00 PM

Room C

Oral presentation | Mesh generation/adaptation

Mesh generation/adaptation-II

2:00 PM - 3:30 PM Room C

[8-C-01] Towards Robust Time-Accurate

Anisotropically Adaptive Hybridized Discontinuous Galerkin Method

*Tomáš Levý¹, Georg May² (1. University of West Bohemia, 2. von Karman Institute for Fluid Dynamics)

2:00 PM - 2:30 PM

[8-C-02] Space- Time Computational Analysis of Car and Tire Aerodynamics with T-Splines Discretization

*Zhaojing Xu¹, Raiki Kobayashi¹, Takashi Kuraishi^{1,2}, Kenji Takizawa¹, Tayfun E. Tezduyar^{1,2} (1. Waseda University, 2. Rice University)

2:30 PM - 3:00 PM

[8-C-03] Near-body Mesh Adaption for Transitional Flows using OVERFLOW

*Balaji Shankar Venkatachari¹, Joseph M Derlaga², Michael V Donello², Meelan M Choudhari² (1. Analytical Mechanics Associates, Inc., 2. NASA Langley Research Center)

3:00 PM - 3:30 PM

Room D

Oral presentation | Incompressible/compressible/hypersonic flow

Incompressible/compressible/hypersonic flow-I

2:00 PM - 4:00 PM Room D

[8-D-01] Analysis of Laser-Supported Detonation Wave Expanding to the Outside of a Laser Beam

*Yuma Itakura¹, Kyohei Kato¹, Kimiya Komurasaki¹, Hokuto Sekine¹, Hiroyuki Koizumi¹ (1. The University of Tokyo)

2:00 PM - 2:30 PM

[8-D-02] Evaluation of Active Drag in Freestyle

Swimming

using the Immersed Boundary Surface Method

*Alexander Haskins¹, Alex Lennon¹, Adrian Murphy¹,
Dominic Chandar¹ (1. Queen's University Belfast)

2:30 PM - 3:00 PM

[8-D-03] Simulation of High Altitude Rarefied

Hypersonic Flow with Large Species Density
Variation Based on DSMC Method

*Takato Morimoto¹, Virgile Charton^{1,2}, Eiichiro
Yamaoka¹, Kiyoshi Kinefuchi¹ (1. Department of
Aerospace Engineering, Nagoya University, 2. Japan
Society for the Promotion of Science International
Research Fellow)

3:00 PM - 3:30 PM

[8-D-04] Characteristics of optimal disturbances for
hypersonic flows over blunt wedges

*Yifeng Chen¹, peixu Guo¹, jiaao hao¹, chihyung
wen¹ (1. The Hong Kong Polytechnic University)

3:30 PM - 4:00 PM

Room A

Oral presentation | Numerical methods

Numerical methods-V

4:30 PM - 6:30 PM Room A

[9-A-01] A Mass-Conservative Immersed Boundary
Method for Compressible Flows

Kasturirangan Madabushi¹, *Santanu Ghosh¹ (1.
Indian Institute of Technology Madras)

4:30 PM - 5:00 PM

[9-A-02] Obtaining converged flow solutions using
quantum annealing algorithm

*Yuichi Kuya¹, Asaga Takahito¹ (1. Tohoku
University)

5:00 PM - 5:30 PM

[9-A-03] Implementation and Analysis of a KEEP
Scheme for Numerical Simulations of the
Navier-Stokes Equations

Andrew Heletkanycz¹, *James George Coder¹ (1.
The Pennsylvania State University)

5:30 PM - 6:00 PM

[9-A-04] A novel pressure-based solver for subsonic
compressible flows

*Jerome Jansen¹, Stephane Glockner¹, Arnaud
Erriguible¹ (1. Institut de mécanique et d'ingénierie
de Bordeaux)

6:00 PM - 6:30 PM

Room B

Oral presentation | Turbulence simulation (DNS,LES,RANS)

Turbulence simulation(DNS,LES,RANS)-II

4:30 PM - 6:30 PM Room B

[9-B-01] Wall-Modelled Large-Eddy Simulation of the
Aerospatiale A-airfoil at Near Stall Conditions

*Timofey Mukha¹, Matteo Parsani¹ (1. King
Abdullah University of Science and Technology)

4:30 PM - 5:00 PM

[9-B-02] Implicit U-Net Enhanced Fourier Neural
Operator for Long-Term

Dynamics Prediction in Turbulence

*Zhijie Li^{1,2}, Wenhui Peng^{1,2}, Zelong Yuan^{1,2},
Jianchun Wang^{1,2} (1. Department of Mechanics and
Aerospace Engineering, Southern University of
Science and Technology, 2. Guangdong-Hong Kong-
Macao Joint Laboratory for Data-Driven Fluid
Mechanics and Engineering Applications, Southern
University of Science and Technology)

5:00 PM - 5:30 PM

[9-B-03] Robust Data-driven RANS Turbulence Modeling
Using Conditioned Field Inversion and Symbolic
Regression

*Chenyu Wu¹, Yufei Zhang¹ (1. School of Aerospace
Engineering, Tsinghua University, China)

5:30 PM - 6:00 PM

[9-B-04] High-Fidelity Simulations of Active Flow
Control Over An Airfoil With Deep
Reinforcement Learning

*Kevin Tan¹, Kengo Asada¹, Tomoaki Tatsukawa¹,
Kozo Fujii¹ (1. Department of Information and
Computer Technology, Tokyo University of
Science)

6:00 PM - 6:30 PM

Room C

Oral presentation | Data science and AI

Data science and AI-I

4:30 PM - 6:30 PM Room C

[9-C-01] Application of Variational Data Assimilation
to High-Speed Outflow Boundary-Value
Problems of the Ideal Magnetohydrodynamics

Equations

*Jose Henrique Arnal¹, Clinton P. T. Groth¹ (1. University of Toronto Institute for Aerospace Studies)

4:30 PM - 5:00 PM

[9-C-02] Fast and Efficient hp-Variational PINNs framework for solving the Incompressible Navier-Stokes equations

*Thivin Anandh¹, Divij Ghose¹, Sashikumar Ganesan¹ (1. Indian Institute of Science, India)

5:00 PM - 5:30 PM

[9-C-03] Field Inversion and Symbolic Regression Augmented Spalart-Allmaras Model for Airfoil

*Zizhou He¹, Yufei Zhang¹ (1. School of Aerospace Engineering, Tsinghua University)

5:30 PM - 6:00 PM

[9-C-04] Weight-Sharing Mode Decomposition Model Based on CNN for Unsteady Flows

*Yosuke Shimoda¹, Naoya Fukushima¹ (1. Tokai University)

6:00 PM - 6:30 PM

Room D

Oral presentation | Incompressible/compressible/hypersonic flow

Incompressible/compressible/hypersonic flow-II
4:30 PM - 6:30 PM Room D

[9-D-01] Characteristics of Mixing and Available Potential Energy Density of Cylindrical Gravity Currents

*Wai Kit Lam¹, Yicheng Cao¹, Leon Chan¹, Duncan Sutherland², Richard Manasseh³, Khalid Moinuddin⁴, Andrew Ooi¹ (1. University of Melbourne, 2. University of New South Wales, 3. Swinburne University of Technology, 4. Victoria University)

4:30 PM - 5:00 PM

[9-D-02] Solving High Reynolds Number Flows on Cartesian Cut-cell Meshes using a Jacobian-Free Newton-Krylov Method

*Alexander O. Kleb¹, Krzysztof J. Fidkowski¹, Joaquim R. R. A. Martins¹ (1. University of Michigan)

5:00 PM - 5:30 PM

[9-D-03] Analysis of Base Jet Effect on Unsteady Characteristics of Base Flow for Supersonic Vehicle

*Yuyan Tian¹, Zhenxun Gao¹ (1. Beihang University)

5:30 PM - 6:00 PM

[9-D-04] Influence of Ablation on Laminar-Turbulent Transition over Compression Ramp at Mach 8

*Ata Onur Baskaya¹, Stefan Hicke¹ (1. Faculty of Aerospace Engineering, Delft University of Technology, Delft, The Netherlands)

6:00 PM - 6:30 PM

Thu. Jul 18, 2024

Room A

Oral presentation | Numerical methods

Numerical methods-VI

10:45 AM - 12:45 PM Room A

[10-A-01] Shock Capturing via Limiting for Discontinuous Galerkin and Flux Reconstruction Methods

*H.T. Huynh¹ (1. NASA Glenn Research Center)

10:45 AM - 11:15 AM

[10-A-02] Simulating Conjugate Heat Transfer Phenomena with Significant Heat Transfer Using the Immersed Boundary Method on a Massively Parallelized System

*ChungGang Li¹, Chien-Chou Tseng¹ (1. Department of Mechanical Engineering, National Cheng Kung University)

11:15 AM - 11:45 AM

[10-A-03] A new subgrid-scale model for large eddy simulations of incompressible turbulent flows within the lattice Boltzmann framework

*Heng Zhang¹, Haibao Hu (1. NorthWestern Polytechnical University)

11:45 AM - 12:15 PM

[10-A-04] Implicit Preconditioning for Explicit Multigrid Solvers on Cut-Cell Cartesian Meshes

*Jonathan Chiew¹, Michael Aftosmis¹ (1. NASA Ames Research Center)

12:15 PM - 12:45 PM

Room B

Oral presentation | Turbulence simulation (DNS,LES,RANS)

Turbulence simulation(DNS,LES,RANS)-III

10:45 AM - 12:45 PM Room B

- [10-B-01] Evaluation and improvement of turbulence model in supersonic rough-wall turbulent boundary layers
*Yuhan Wang¹, Zhenxun Gao¹ (1. Beihang university)
10:45 AM - 11:15 AM
- [10-B-02] Mode Analysis Using DNS Data of Oscillating Grid Turbulence Subjected to System Rotation
*Ryuga Sumi¹, Toru Yamada¹, Yohei Morinishi¹ (1. Nagoya Institute of Technology)
11:15 AM - 11:45 AM
- [10-B-03] Comparison of wall-modeled and wall-resolved large eddy simulation of the high-lift Common Research Model
*Zhi Jian Wang¹, Avery Hantla¹ (1. University of Kansas)
11:45 AM - 12:15 PM
- [10-B-04] Numerical Simulation of Base Jet in Supersonic Flow with Gas-Kinetic Method
*Tao Liu¹, Qibing Li¹, Jianhui Wu², Yue Zhao² (1. Department of Engineering Mechanics, Tsinghua University, 2. China Academy of Launch Vehicle Technology)
12:15 PM - 12:45 PM

Room C

Oral presentation | Data science and AI

Data science and AI-II
10:45 AM - 12:45 PM Room C

- [10-C-01] Data-driven optimal control of self-propelled undulatory swimmers
*Karl Maroun¹, Michel Bergmann², Philippe Traoré¹ (1. Université de Poitiers, 2. INRIA Bordeaux Sud-Ouest)
10:45 AM - 11:15 AM
- [10-C-02] Application of Graph Neural Networks to Accelerate Airflow and Pressure Prediction on 1D Human Airways
*Tam Minh Tran¹, Hung Quoc Nguyen¹, Phong C. H. Nguyen², Stephen S. Baek², Ching-Long Lin³, Sanghun Choi¹ (1. Kyungpook National University, Daegu, South Korea, 2. The University of Virginia,

Charlottesville, USA, 3. The University of Iowa, Iowa City, USA)

11:15 AM - 11:45 AM

- [10-C-03] *Improving RANS turbulence models using random forests and neural networks*
*Pedro Stefanin Volpiani¹ (1. ONERA)
11:45 AM - 12:15 PM
- [10-C-04] Coupling Machine Learning local predictions with a Computational Fluid Dynamics solver to accelerate transient buoyant plume simulations
*Clément Caron^{1,2}, Philippe Lauret¹, Alain Bastide¹ (1. University of Reunion, 2. INTEGRALE Ingénierie)
12:15 PM - 12:45 PM

Room D

Oral presentation | Incompressible/compressible/hypersonic flow

Incompressible/compressible/hypersonic flow-III
10:45 AM - 12:45 PM Room D

- [10-D-01] A Space-Marching Immersed-Boundary Method for Near-Field Sonic Boom Simulation
*Rei Yamashita¹ (1. The University of Tokyo)
10:45 AM - 11:15 AM
- [10-D-02] Simulation-Based Blood Flow Analysis using a Machine-Learning Vascular Model .
*Kyung Eun Lee¹, Seong Hoon Jeong¹, Labin Kim¹ (1. Department of Mechanical Engineering, Inha University)
11:15 AM - 11:45 AM
- [10-D-03] Numerical Simulation of Flying Car with Fluid-Body Interaction using Hierarchical Cartesian Mesh
*Ayato Takii¹, Rahul Bale¹, Chung-Gang Li², Masashi Yamakawa³, Makoto Tsubokura¹ (1. RIKEN Center for Computational Science, 2. National Cheng Kung University, 3. Kyoto Institute of Technology)
11:45 AM - 12:15 PM
- [10-D-04] Effect of Chemical Reaction on the Flight Stability of the Hypersonic Vehicle at High Altitude
*Kyeol Yune¹, Seungjoon Chang¹, Seil Seo¹, Chongam Kim¹ (1. Seoul National University)
12:15 PM - 12:45 PM

Room A

Oral presentation | Numerical methods

Numerical methods-VII

2:00 PM - 4:00 PM Room A

- [11-A-01] A small cell correction technique for multilevel Cartesian mesh methods
*Matthias Meinke¹, Tim Wegmann¹, Wolfgang Schröder¹ (1. Institute of Aerodynamics, RWTH Aachen University)
2:00 PM - 2:30 PM
- [11-A-02] An immersed boundary wall-modeled large-eddy simulation approach for low and high-speed flows
*Christoph Brehm¹, Johan Larsson¹, William van Noordt² (1. University of Maryland, 2. University of Oxford)
2:30 PM - 3:00 PM
- [11-A-03] Direct Poisson Solver Combining Domain Decomposition and Influence Matrix Methods and its application to DNS of Oscillating Grid Turbulence
*Toru Yamada¹, Yuki Ohno¹, Yohei Morinishi¹ (1. Nagoya Institute of Technology)
3:00 PM - 3:30 PM
- [11-A-04] Exploring Interface Conservation in Computational Fluid Dynamics
*Hong Luo¹, Gianni Absillis¹, Xiaodong Liu¹ (1. North Carolina State University)
3:30 PM - 4:00 PM

Room B

Oral presentation | Turbulence simulation (DNS,LES,RANS)

Turbulence simulation(DNS,LES,RANS)-IV

2:00 PM - 4:00 PM Room B

- [11-B-01] DNS of hypersonic shockwave/turbulent boundary layer interactions: Wall temperature effects
*Xinliang Li¹, Ji Zhang¹ (1. LHD, Institute of Mechanics, Chinese Academy of Sciences)
2:00 PM - 2:30 PM
- [11-B-02] Hybrid RANS-LES Method for Simulating HVAB Rotor in Hover and Descent Flight
*Chunhua Sheng¹, Qiuying Zhao¹ (1. The

University of Toledo, Ohio, USA)

2:30 PM - 3:00 PM

- [11-B-03] Computational Modelling of Heat Convection using High Prandtl Number Fluids
*Haotian He¹, Ningshu Li¹, Hector Iacovides¹, Timothy J Craft¹ (1. Thermo-Fluids Group, Faculty of Science and Engineering, The University of Manchester, Manchester, UK)
3:00 PM - 3:30 PM
- [11-B-04] Investigation of Stable and Conservative, Tunable Filters for High-Resolution Turbulent Flow Simulations
*James Coder¹ (1. Penn State University)
3:30 PM - 4:00 PM

Room C

Oral presentation | Data science and AI

Data science and AI-III

2:00 PM - 4:00 PM Room C

- [11-C-01] Representation of Small-Scale Spatiotemporal Nonlinear Dynamics by Low-dimensional Manifold
*Pengyu Lai¹, Jing Wang¹, Rui Wang¹, Dewu Yang¹, Hui Xu¹ (1. Shanghai Jiao Tong University)
2:00 PM - 2:30 PM
- [11-C-02] Data-driven thermal control of secondary flow in a marginally turbulent square-duct flow and relevance to the invariant solutions
*Atsushi Sekimoto¹, Takashi Mitani¹ (1. Okayama University)
2:30 PM - 3:00 PM
- [11-C-03] Resolving weak ow interaction on an array of cylinders with PINN
*Adhika Satyadharma¹, Ming-Jyh Chern¹, Heng-Chuan Kan², Wen-Yao Chiang¹ (1. National Taiwan University of Science and Technology, 2. National Center for High-performance Computing, National Applied Research Laboratories)
3:00 PM - 3:30 PM
- [11-C-04] PDE-free Models for Transitional Flows: a Universal Substituted Machine Learning Framework
*Lei Wu¹, Zuoli Xiao^{1,2} (1. State Key Laboratory for Turbulence and Complex Systems, College of

Engineering, Peking University, Beijing, China, 2.
Department of Mechanics and Engineering Science,
College of Engineering, Peking University, Beijing,
China)
3:30 PM - 4:00 PM

Room D

Oral presentation | Incompressible/compressible/hypersonic flow

Incompressible/compressible/hypersonic flow-IV
2:00 PM - 4:00 PM Room D

- [11-D-01] Simulations of an Unsteady Three-dimensional Hypersonic Double-cone Flow at Mach 10.4
*Cheng Li¹, Jiaao Hao¹ (1. Department of Aeronautical and Aviation Engineering, The Hong Kong Polytechnic University, Kowloon, Hong Kong)
2:00 PM - 2:30 PM
- [11-D-02] Novel implicit finite volume frameworks for hypersonic steady flow problems.
*Benoît Cossart^{1,2}, Raphaël Loubère², Jean-Philippe Braeunig¹ (1. CEA-CESTA, 2. Université de Bordeaux)
2:30 PM - 3:00 PM
- [11-D-03] Active control by synthetic jets on a high lift wing section for STOL applications
Amsha S¹, *Shubhashree S¹, Balakrishnan N¹, Ramesh O N¹ (1. Indian Institute of Science)
3:00 PM - 3:30 PM
- [11-D-04] Assessment of a Consistent Multi-temperature Kinetic Model for Hypersonic Neutral Air Flows using a High-order-accurate Finite Volume Solver
*Giuseppe Pascazio¹, Davide Ninni¹, Antonio Narracci^{1,3}, Gianpiero Colonna², Francesco Bonelli¹ (1. Politecnico di Bari, 2. Istituto per la Scienza e Tecnologia dei Plasmi, 3. Università del Salento)
3:30 PM - 4:00 PM

Fri. Jul 19, 2024

Room A

Oral presentation | Numerical methods

Numerical methods-VIII
10:45 AM - 12:45 PM Room A

- [13-A-01] Importance of considering repeated use of a combination of explicit filters
*Yuki Wakamatsu¹ (1. Japan Coast Guard Academy)
10:45 AM - 11:15 AM
- [13-A-02] A hybrid nodal solver with rotation property for the cell-centered Lagrangian scheme
*Chunyuan Xu¹, Zhijun Shen¹, Qinghong Zeng¹ (1. Institute of Applied Physics and Computational Mathematics)
11:15 AM - 11:45 AM
- [13-A-03] A positivity-preserving high-order compact finite volume method for transport eikonal equation
*Qianmin Huang^{1,2} (1. CAEP Software Center for High Performance Numerical Simulation, Beijing 100088, China, 2. Institute of Applied Physics and Computational Mathematics, Beijing 100088, China)
11:45 AM - 12:15 PM
- [13-A-04] A scale-invariant third-order WENO scheme with optimal accuracy
*Peng Jin^{1,2}, Ahmed Al-Rikabi³, Xi Deng^{4,5} (1. CAEP Software Center for High Performance Numerical Simulation, Beijing, 2. Institute of Applied Physics and Computational Mathematics, Beijing, 3. School of Engineering and Material Science, Queen Mary University of London, United Kingdom, 4. Department of Aeronautics, Imperial College London, United Kingdom, 5. Department of Engineering, University of Cambridge, United Kingdom)
12:15 PM - 12:45 PM

Room B

Oral presentation | Turbulence simulation (DNS,LES,RANS)

Turbulence simulation(DNS,LES,RANS)-V
10:45 AM - 12:45 PM Room B

- [13-B-01] Computational Modelling of Heat Convection using Liquid Metals
*Ningshu Li^{1,2,3,4}, Haotian He^{1,2,3,4}, Hector Iacovides^{1,2,3,4}, Timothy Craft^{1,2,3,4} (1. Thermo-Fluids Group, 2. Faculty of Science and Engineering, 3. Department of Mechanical, Aerospace and Civil Engineering, 4. The University

of Manchester)

10:45 AM - 11:15 AM

- [13-B-02] High-Fidelity Aerodynamic Shape Optimization of a Cruise-Slotted Transonic Truss-Braced Wing Single-Aisle Aircraft
*Timothy Chau¹, Jared C Duensing¹ (1. NASA Ames Research Center)
11:15 AM - 11:45 AM
- [13-B-03] Grey area mitigation in Equivalent-DES using commutation error estimators
*Christophe Friess¹, Antoine Monot², Jeroen Wackers² (1. Aix-Marseille Université, CNRS, Centrale Marseille M2P2 UMR 7340, 2. LHEEA Lab, Ecole Centrale de Nantes, CNRS UMR 6598)
11:45 AM - 12:15 PM
- [13-B-04] Empirical Two-Layer Model for Predicting Near-Wall Diffusive Flux at High Schmidt or Prandtl Numbers
*Kin Wing Wong¹, Ignas Mickus¹, Dmitry Grishchenko¹, Pavel Kudinov¹ (1. Division of Nuclear Science and Engineering, KTH Royal Institute of Technology, 11428 Stockholm, Sweden)
12:15 PM - 12:45 PM

Room C

Oral presentation | Data science and AI

Data science and AI-IV

10:45 AM - 12:45 PM Room C

- [13-C-01] Flow Prediction and Shape Optimization of Aerodynamic Bodies Using Physics-Informed Machine Learning
Prashant Kumar¹, *Rajesh Ranjan¹ (1. Indian Institute of Technology, Kanpur)
10:45 AM - 11:15 AM
- [13-C-02] Turbulence Modeling with Field Inversion for a Slender Body at a Non-Zero Angle of Attack
*Yeji Yun¹, Seoyeon Heo¹, Junho Eom¹, Solkeun Jee¹ (1. Gwangju Institute of Science and Technology)
11:15 AM - 11:45 AM
- [13-C-03] A structure-preserving reconstruction scheme for compressible single- and multi-phase flows based on artificial neural

networks

*Minsheng Huang¹, Lidong Cheng^{1,2}, Wenjun Ying^{1,3}

(1. Shanghai Jiao Tong University, 2. Sichuan Research Institute, Shanghai Jiao Tong University, 3. School of Mathematical Sciences, MOE-LSC and Institute of Natural Sciences, Shanghai Jiao Tong University)

11:45 AM - 12:15 PM

- [13-C-04] Out-of-distribution prediction in RANS turbulence modelling
*Richard Dwight¹ (1. TU Delft)
12:15 PM - 12:45 PM

Room D

Oral presentation | Incompressible/compressible/hypersonic flow

Incompressible/compressible/hypersonic flow-V

10:45 AM - 12:45 PM Room D

- [13-D-01] Shock-fitting and shock-capturing simulations of transonic flows in a channel with a half lenticular profile
*Aldo Bonfiglioli¹, Renato Paciorri², Alessia Assonitis² (1. Università degli studi della Basilicata, 2. Università di Roma La Sapienza)
10:45 AM - 11:15 AM
- [13-D-02] Numerical Investigation of Disturbance Growth on a Blunt Body in High Enthalpy Hypersonic Flow
*Shuto Yatsuyanagi¹, Hideyuki Tanno¹ (1. JAXA)
11:15 AM - 11:45 AM
- [13-D-03] Determining the spatial resolution in direct numerical simulations of compressible turbulence by using Burgers equation
Chensheng Luo¹, *Le Fang¹, Jiaying Hong¹ (1. Beihang University)
11:45 AM - 12:15 PM
- [13-D-04] Exploration of the Influence of Various Backpressure Mechanisms to Inlet Unstart
Jonathan Sosa¹, *Cal Rising¹ (1. U.S. Naval Research Laboratory)
12:15 PM - 12:45 PM

Thu. Jul 18, 2024

Room P

Poster presentation | Poster session

Poster Session

4:30 PM - 6:30 PM Room P

- [PO-01] Wall-Modeled Large Eddy Simulation on Heat Transfer in a Nasal Cavity to 14-Generation Respiratory Tract
*Xinlei Huang¹, Huining Cui¹ (1. University of Technology Sydney)
4:30 PM - 6:30 PM
- [PO-02] Physics-informed neural networks for fluid-induced excitation
*jeongsu lee¹ (1. Gachon University)
4:30 PM - 6:30 PM
- [PO-03] Structure and dynamics of amphiphilic patchy cubes in slit-like confinement
*Takahiro Ikeda¹, Yusei Kobayashi¹, Masashi Yamakawa¹ (1. Kyoto Institute of Technology)
4:30 PM - 6:30 PM
- [PO-04] Air- water transport processes of heat and momentum during wind- wave dynamical interactions
*Jinlong Zhang¹, Yuhong Dong¹, Lian Shen² (1. Shanghai University, 2. University of Minnesota)
4:30 PM - 6:30 PM
- [PO-05] Deep-learning-based reduced-order modeling to assess urban wind environment
Mingyu Yang¹, *Jungwoo Kim¹, Jung-II Choi¹ (1. Yonsei University)
4:30 PM - 6:30 PM
- [PO-06] Numerical Analysis of the Use of Plasma Actuators to Control Pitching and Heaving Motion of an Airfoil
Dereje Arijamo Dolla¹, Yue-Cheng Chung¹, You-Chen Wang¹, *Chin-Cheng Wang¹ (1. National Taipei University of Technology)
4:30 PM - 6:30 PM
- [PO-07] Fast Prediction of Indoor Heat Transfer Based on Convolutional Autoencoder with ResNet
*Shaofan Wang¹, Philipp Geyer¹ (1. Leibniz Universität Hannover)
4:30 PM - 6:30 PM
- [PO-08] Numerical Analysis of Steady Flows in a porous and permeable scaffold.
*LABIN KIM¹, SEONG HOON JEONG¹, KYUNG EUN LEE¹ (1. Department of Mechanical Engineering, Inha University)
4:30 PM - 6:30 PM
- [PO-09] Detection of Bubble Size and Location using

Ultrasound Simulation with Machine Learning
*Zi Wang¹, Shu Takagi¹, Yoshiki Watanabe¹ (1. The University of Tokyo)

4:30 PM - 6:30 PM

- [PO-10] Comparison of the high-order Runge-Kutta discontinuous Galerkin method and gas-kinetic scheme for inviscid compressible flow simulations
*Yixiao Wang¹, Xing Ji¹, Gang Chen¹ (1. Xi'an Jiaotong University)
4:30 PM - 6:30 PM
- [PO-11] Numerical Simulation of Gas-Liquid Two-Phase Flow with Phase Change for Engineering Applications
*Katsuki Hirai¹, Yuki Kawamoto¹, Shotaro Nara¹, Shun Takahashi², Akiko Kawachi¹, Shun Okazaki², Hideyuki Fuke² (1. Tokai University, 2. Japan Aerospace Exploration Agency)
4:30 PM - 6:30 PM
- [PO-12] Fluid-Structure Interaction and Dynamic Mode Decomposition Analysis of a Nonslender Cropped Delta Wing in Transonic Regime
*Sheila Chica Francisco Langa¹, Yusuke Takahashi¹ (1. Hokkaido University)
4:30 PM - 6:30 PM

Mon. Jul 15, 2024

Room A

Other | Other

Opening remarks

9:00 AM - 9:15 AM Room A

Fri. Jul 19, 2024

Room A

Other | Other

Closing remarks

12:45 PM - 1:00 PM Room A