ICCFD11 Program: Monday, July 11th, 2022

07:30 am – 08:00 am	**Speaker's Briefing**	
08:00 am – 08:15 am	**Opening Remarks by Co-Chairs**	Ali'i Room
08:15 am – 09:15 am	**Invited Lecture**	Ali'i Room

01 | Session

ICCFD11-0101

Risks and Rewards of Multiphase Flow Simulations

Prof. Stéphane Zaleski

Sorbonne Université, Paris, France

02 | Chair: Prahalad Iyer — **Large Eddy Simulation - I** — Lanai Room

09:30 am – 12:00 pm

09:30 am
ICCFD11-0201
Turbulence Development Assessment in a LES Simulation
M. Bove, G. Cazes, M. Draper and M. Mendina
Universidad de la Republica, Uruguay

10:00 am
ICCFD11-0202
Atmospheric Boundary Layer Simulations with a LES Model Nested in a Regional Atmospheric Simulation
M. Bove, A. Vignolo, M. Mendina, G. Usera and G. Cazes
Universidad de la Republica, Uruguay

10:30 am
ICCFD11-2401
Fully-Automated High-Fidelity LES Around High-Lift Aircraft Configuration Near Stall
Hiroyuki Asada and Soshi Kawai
Tohoku University, Japan

11:00 am
ICCFD11-0204
Wall-Modeled LES of Turbulent Flow Over a Two-Dimensional Gaussian Bump
Prahladh S. Iyer and Mujeeb R. Malik
NASA Langley Research Center, USA

11:30 am
ICCFD11-0205
Evaluation of High-Lift Prediction Capability of Wall-modeled LES for a Multielement 30P30N Airfoil
Prahladh S. Iyer, William K. Anderson, Ramampalam, Balakumar, Li Wang, Eric Nielsen and Mujeeb R. Malik
NASA Langley Research Center, USA
Withdrawn

03 | Chair: Eric Ching — **Mesh Motion and Adaptation - I** — Molokai Room

09:30 am – 12:00 pm

09:30 am
ICCFD11-0301
High-order Temporal Approaches for Overset Applications and AMR Grids
Dylan Jude, Jayanarayanan Sitaraman and Andrew Wissink
U.S. Army Combat Capabilities Development Command, USA

10:00 am
ICCFD11-0302
Output-Based Mesh Adaptation for High-Speed Flows
James G. Coder, Benjamin L. S. Couchman, Marshall C. Galbraith, Steven R. Allmaras and Nick Wyman
University of Tennessee, Knoxville, USA

10:30 am
ICCFD11-0303
Flux Reconstruction Solver for Arbitrarily Unstructured Grids with R-refinement
R. Dhib, F. Ben Ameur, R. Vandenhoeck, A. Lani and S. Poedts
University of Leuven, Belgium

11:00 am
ICCFD11-0304
Effect of Anisotropic Mesh Adaptation on Surface Pressure Predictions for Atmospheric Entry Simulations
D. Ekelschot and J.M. Brock
NASA Ames Research Center, USA

11:30 am
ICCFD11-0305
Anisotropic Mesh Modifications for the Moving Discontinuous Galerkin Method with Interface Condition Enforcement for Robust Simulations of High-Speed Viscous Flows
Eric J. Ching, Andrew Kercher and Andrew Corrigan
Naval Research Laboratory, USA

Monday, July 11th, 2022

04 | Chair: David Zingg — Higher Order Methods - I — Maui Room

09:30 pm – 12:00 pm

09:30 am
ICCFD11-0401
Stable and Non-dissipative Kinetic-Energy and Entropy Preserving (KEEP) Schemes for Compressible Flows
Y. Kuya and S. Kawai
Tohoku University, Japan

10:00 am
ICCFD11-0402
Positivity-Preserving Entropy Stable Spectral Collocation Schemes of Arbitrary Order of Accuracy for the 3-D Navier-Stokes Equations
N. K. Yamaleev and J. Upperman
Old Dominion University, USA

10:30 am
ICCFD11-0403
Stable and Conservative High-Order Methods on Triangular Elements Using Tensor-Product Summation-By-Parts Operators
T. Montoya and D. W. Zingg
University of Toronto, Canada

11:00 am
ICCFD11-0404
Obtaining Accurate Functionals from High-Order Generalized Summation-by-Parts Discretizations in Curvilinear Coordinates
D.A. Craig Penner and D.W. Zingg
University of Toronto, Canada

11:30 am
ICCFD11-0405
Assessment of a High-Order Implicit Residual Smoothing Time Scheme for Multiblock Curvilinear Meshes
A. Bienner, X. Gloerfelt and P. Cinnella
Arts et Metiers Tech, France

12:00 pm – 1:15 pm — Hosted Lunch — Hale Piilani Room

05 | Chair: Paola Cinnella — Discrete Galerkin Methods — Lanai Room

01:15 pm - 2:45 pm

01:15 pm
ICCFD11-0501
Large-Scale Investigation of 3D Discontinuous-Galerkin-Hancock Method for Hyperbolic Balance Laws with Stiff Local Sources
W. Kaufmann and J.G. McDonald
University of Ottawa, Canada

01:45 pm
ICCFD11-0502
Deneb: An Open-Source High-Performance Flow Solver Based on DRM-DG Method
Hojun You, Juhyun Kim and Chongam Kim
Seoul National University, S. Korea

06 | Chair: Neal Chaderjian — Rotorcraft CFD — Molokai Room

01:15 pm - 2:45 pm

01:15 pm
ICCFD11-0601
Wake Breakdown in High-Fidelity CFD Simulations of Rotor-in-Hover: New Tools & Insights
Nathan Hariharan, Jennifer N. Abras, and Robert Narducci
Department of Defense (DoD) High Performance Computing Modernization Program, USA

01:45 pm
ICCFD11-0602
Optimization of Non-Conventional Airfoils for Martian Rotorcraft using Direct Numerical Simulations
Lidia Caros, Oliver Buxton and Peter Vincent
Imperial College, UK

02:15 pm
ICCFD11-0603
Quantitative Approach for the Accurate CFD Simulation of Hover in Turbulent Flow
Neal M. Chaderjian
NASA Ames Research Center, USA

Monday, July 11, 2022

07 | Chair: Scott Morton — Multidisciplinary Methods — Maui Room

01:15 pm – 2:45 pm

01:15 pm
ICCFD11-0701
A Multi-Physics Modeling Framework for Plasma Wind Tunnels
A. Munafo, V. Le Maout, S. Kumar, R. Chiodi, F. Panerai, K. Stephani, D. J. Bodony, and M. Panesi
University of Illinois, Urbana-Champaign, USA

01:45 pm
ICCFD11-0702
A Nonlinear Schur Complement Solver for CFD-Based Multidisciplinary Models
Anil Yildirim, Justin S. Gray, and Joaquim R. R. A. Martins
University of Michigan, USA

02:15 pm
ICCFD11-0703
An Infrastructure for Algorithmic Flexibility in Multi-fidelity and Multi-disciplinary CFD Simulations
S. Morton, N. Hariharan, and D. McDaniel
Department of Defense High Performance Computing Modernization Program, USA

08 | Chair: Michel Bergmann — Fluid Structure Interaction & Porosity — Lanai Room

03:00 pm – 04:30 pm

03:00 pm
ICCFD11-0801
Fluid-Structure Interaction with Multi-Body Collision: Application to Collective Fish Swimming in an Impermeable or Porous Enclosure
M. Bergmann
National Institute for Research in Digital Science and Technology (INRIA), France

03:30 pm
ICCFD11-0802
XCOMPUTE: Algorithms and Instruction Sequences for CFD/FEA Multi-Physics
G.J. Orr, R.J. Kwan and M. Doudar
Xplicit Computing Inc, USA

04:00 pm
ICCFD11-0803
Prediction of Permeability for Porous Materials Using a Surrogate Model
Vijay B. Mohan Ramu and Savio J. Poovathingal
University of Kentucky, USA

09 | Chair: Gerrit-Daniel Stitch — Actuator Disk — Molokai Room

03:00 pm – 04:30 pm

03:00 pm
ICCFD11-0901
Propeller Representation in Full- Vehicle CFD: Actuator Disk Versus Body-Force Modeling Approaches
Tianbo Xie and Alejandra Uranga
University of Southern California-Los Angeles, USA

03:30 pm
ICCFD11-0902
Actuator Line Method for Ducted Fan Applications
M-A. Breault and G. Dumas
Laval University, Canada

04:00 pm
ICCFD11-0903
Validation of Actuator Disk, Actuator Line and Sliding Mesh Methods within the LAVA Solver
Gerrit-Daniel Stich, Luis S. Fernandes, Gaetan Kenway, Jeffrey A. Housman and Cetin C. Kiris
NASA Ames Research Center, USA

10 | Chair: H. T. Hyunh — Higher Order Methods - II — Maui Room

03:00 pm – 04:30 pm

03:00 pm
ICCFD11-1001
Output-Based h-p Refinement Strategy with Anisotropic AMR and High-Order CENO Finite-Volume Scheme for Three-Dimensional Inviscid Flows
C. N. Ngigi and C. P. T. Groth
University of Toronto, Canada

03:30 pm
ICCFD11-1002
A High-Order Low-Dissipation Euler–Lagrange Method for Compressible Gas-Particle Flows
Meet Patel and Jesse Capecelatro
University of Michigan, USA

04:00 pm
ICCFD11-1003
Discontinuous Galerkin and Related Methods for ODE
H. T. Huynh
NASA Glenn Research Center, USA

04:30 pm
ICCFD11-3503
Recent Development of Entropy Split Methods for Gas Dynamics and MHD
H.C. Yee, and Björn Sjögreen
NASA Ames Research Center, USA

06:00 pm – 08:00 pm — **Hosted Reception** — Ocean Cottage Lawn

ICCFD11 Program: Tuesday, July 12, 2022

07:30 am – 08:00 am	**Speaker's Briefing**	
08:15 am – 09:15 am	**Invited Lecture**	Ali'i Room

11 | Session — **ICCFD11-1101**

Digital Transformation and Smart Design in Manufacturing Process Realized on the Supercomputer "Fugaku"

Prof. Makoto Tsukobura

Kobe University, Kobe, Japan

12 | Chair: Jeffrey Housman — **Acoustics** — Lanai Room

09:30 am – 12:00 pm

09:30 am
ICCFD11-1201
Ray Tracing Methodology for Jet Noise Prediction
T. Shanbhag, B. Y. Zhou, C. R. S. Ilário and J. J. Alonso
Stanford University, USA

10:00 am
ICCFD11-1202
A Zonal Direct-Hybrid Aeroacoustic Simulation Framework Using a High-Order Discontinuous Galerkin Spectral Element Method
D. Kempf and C.-D. Munz
Universitat Stuttgart, Germany

10:30 am
ICCFD11-1203
Assessment of Wavelet-based Separation Algorithms on Turbulent Boundary Layer Trailing-Edge Noise Prediction
D.H. Kang and S. Lee
University of California, Davis, USA

11:00 am
ICCFD11-1204
Predicting Orion Launch Abort Acoustics
F. Cadieux, M. Barad, J. Jensen, J. Angel and C. Kiris
NASA Ames Research Center, USA

11:30 am
ICCFD11-1205
Algorithmic Improvements to a High-Order Space Marching Method for Sonic Boom Propagation
J. Housman, J. Jensen, G. Kenway and C. Kiris
NASA Ames Research Center, USA

13 | Chair: Michael Olsen — **Mesh Motion and Adaptation - II** — Molokai Room

09:30 am – 12:00 pm

09:30 am
ICCFD11-1301
Developing a Modern CFD Framework with Parallel Algorithms and Mesh Adaption
J. McKee, Y. Mileyko, A. Fisher, and A. Koniges
University of Hawaii, USA

10:00 am
ICCFD11-1302
A Method for Geometry-Sensitive, CFD Solver Independent Mesh Adaptation
N. Wyman, M. Mirsky, P. Galpin and T. Hansen
Cadence CFD, USA

10:30 am
ICCFD11-1303
Parametrically Uniform Mesh Adaption for Unstructured Grids
M. Lawry and M. Opgenorth
Sierra Space, USA

11:00 am
ICCFD11-1304
Automatic Boundary-Layer Adaptation of Structured Grids in VULCAN-CFD
A. Scholten, P. Paredes, F. Li, J. White, R. Baurle and M. Choudhari
NASA Langley Research Center, USA

11:30 am
ICCFD11-1305
Adaptive Mesh Refinement and Turbulence Modeling
Michael E. Olsen
NASA Ames Research Center, USA

Tuesday, July 12, 2022

14 | Chair: Steven Tran — Numerical Methods - I — Maui Room

09:30 am – 12:00 pm

09:30 am
ICCFD11-1401
Conservative Overset for Discontinuous Galerkin Methods
Steven Tran, and Jayanarayanan Sitaraman
U.S. Army Combat Capabilities Development Command, USA

10:00 am
ICCFD11-1402
An Efficient Edge Based Data Structure for a Vertex Based Finite Volume Algorithm on Hybrid Unstructured Meshes
S. Akkurt, and M. Sahin
Istanbul Technical University, Turkey
Withdrawn

10:30 am
ICCFD11-1403
Analysis of Edge-Based Method on Tetrahedra for Diffusion
Boris Diskin, Hiroaki Nishikawa, and Yi Liu
National Institute of Aerospace, USA

11:00 am
ICCFD11-1404
Laminar and Turbulent Behavior Captured by A 3-D Kinetic-Based Discrete Dynamic System
Xiaoyu Zhang, J. M. McDonough, and Huidan Yu
Purdue University, USA

11:30 am
ICCFD11-1405
Numerical Simulations of Laminar Separated Flows Based on Compressible & Incompressible Navier-Stokes Equations for Engineering Education
A. Chuen, and M. Hafez
University of California, Davis, USA
Withdrawn

12:00 pm – 01:15 pm — Hosted Lunch — Hale Piilani Room

15 | Chair: Cetin Kiris — Applied CFD - I — Lanai Room

1:15 pm – 2:45 pm

01:15pm
ICCFD11-1501
Characterising the Standing Wave Airflow Instability in the Print Gap of Inkjet Printers
A. F. V. de A. Adamo, S. G. Mallinson, H. D. McBain, G. D. Horrocks, C. M. de Silva, and T. J. Barber
University of New South Wales, Australia
Withdrawn

01:45 pm
ICCFD11-1502
Development of the PISALE Codebase for Simulating Flow and Transport in Large-scale Coastal Aquifer
Young-Ho Seo, Jonghyun Lee, Alice Koniges, and Aaron Fisher
University of Hawaii, USA

02:15 pm
ICCFD11-1503
Simulation Methodology for Quasi-static Conjugate Heat Transfer Approach of Brake Disc
H.R. Balaji
Wabtec India Industrial Private Limited, India
Withdrawn

16 | Chair: James Coder — Shock Capturing — Molokai Room

1:15 pm – 2:45 pm

01:15 pm
ICCFD11-1601
Comparative Assessment of Accuracy of Shock-Capturing Schemes in Terms of Local-Truncation-Error
Yoonpyo Hong, Soo Hyung Park, and Kwanjung Yee
Seoul National University, South Korea

01:45 pm
ICCFD11-1602
A Shock Capturing Sub-Filter Scale Legendre Spectral Viscosity (LSV) Closure Applied to High-Order Flux Reconstruction Schemes
V. C. B. Sousa, and C. Scalo
Purdue University, USA

02:15 pm
ICCFD11-1603
Robust, Compact Shock Capturing for High-Order Navier-Stokes Simulations
J. G. Coder, M. R. Holst, and R. G. Glasby
University of Tennessee – Knoxville, USA
Withdrawn

Tuesday, July 12, 2022

17 | Chair: Francois Cadieux — Numerical Methods - II — Maui Room

1:15 pm – 2:45 pm

01:15 pm
ICCFD11-1701
Progress in the Usage of Inexact Linearizations in Piggy-Back Iterations for Adjoint Computation
E. Padway
National Institute of Aerospace, USA

01:45 pm
ICCFD11-1702
Improving the Performance of a Compressible RANS Solver for Low and High Mach Number Flows
Sabet Seraj, Anil Yildirim, Joshua L. Anibal, Joaquim R. and R. A. Martins
University of Michigan, USA

02:15 pm
ICCFD11-1703
Level-Set Immersed Boundary Technique for Turbulent Flow Simulations
R. Boukharfane, S. Benjelloun, and M. Parsani
Mohammedia Polytechnic University, Morocco
Withdrawn

18 | Chairs: Shishir Pandya & Christoph Brehm — Special Session — Ali'i Room

03:00 pm – 04:30 pm

3:00 pm
Memorial Lecture for Dr. Joseph S. Shang
D. Gaitonde
The Ohio State University, USA

03:30 pm
ICCFD11-1802
Progress Toward Realizing the CFD Vision 2030
John R. Chawner
Cadence CFD, USA

4:00 pm – 5:00 pm
Panel Discussion
From Joe Shang to Vision 2030: Future of CFD

ICCFD11 Program: Wednesday, July 13, 2022

07:30 am – 08:00 am — **Speaker's Briefing**

08:15 am – 09:15 am — **Invited Lecture** — Ali'i Room

19 | Session — ICCFD11-1901

Computational Experiments in Turbulent Flows: From Numerics to Improved Modeling

Prof. Sanjiva K. Lele
Stanford University

20 | Chair: Claudia Parisuana — **Applied CFD - II** — Lanai Room

09:30 am – 12:00 pm

09:30 am
ICCFD11-2001
A Time-accurate, Fast-running CFD Method for the Prediction of A Full Aircraft Flutter Boundary
H. Q. Yang, and Ben Armstrong
CFD Research Corporation, USA

10:00 am
ICCFD11-2002
UAV Icing: Challenges for Computational Fluid Dynamic (CFD) Tools
R. Hann
Norwegian University of Science and Technology, Norway

10:30 am
ICCFD11-2003
CFD Modeling of Droplets Heated by an X-ray Free Electron Laser
D. Eder, C. Parisuana, M. Gauthier, C. Schoenwaelder, and S. Glenzer
University of Hawaii, USA

11:00 am
ICCFD11-2004
Numerical Investigation of a Bio-Inspired Airfoil with Air-Permeable Holes
E. Tangermann, G. Ercolani, and M. Klein
Universität der Bundeswehr München, Germany

11:30 am
ICCFD11-2005
Influence of Canard on the Longitudinal and Lateral-Directional characteristics of a Delta configuration at Low Speeds
Pathanjali R J, Praveen Kumar B, Muralidhar M, and Subhendu Saha
Aeronautical Development Agency, India

21 | Chair: Rebecca Barney — **Multiphase Flows - I** — Molokai Room

09:30 am – 12:00 pm

09:30 am
ICCFD11-2101
Pseudo-Boiling of Supercritical Water
R. Barney, R. McCallen, and J.P. Delplanque
Lawrence Livermore National Laboratory, USA

10:00 am
ICCFD11-2102
All-speed Multi-phase Computational Framework for Simulating the Entire Process of Underwater Explosions: Shocks, Cavitations, and Bubble Pulsations
Kyungjun Choi, and Chongam Kim
Seoul National University, South Korea

10:30 am
ICCFD11-2103
Simulation of Cloud Cavitating Flow in a Venturi Using RANS and DES in OpenFOAM
Dhruv Apte, Xingming Ge, and Olivier Coutier-Delgosha
VA Tech., USA
Withdrawn

11:00 am
ICCFD11-2104
Moment Closure Description of Polydisperse, Polykinetic and Evaporating Liquid Sprays
T. F. Leung, and C. P. T. Groth
University of Toronto, Canada

11:30 am
ICCFD11-2105
A Polydisperse Gaussian-Moment Method for Extended Statistical Modelling of Multiphase Flows
M. Marchildon, B. Allard, L. Ivan, and J.G. McDonald
University of Ottawa, Canada

22 | Chair: Thomas Schwartzentruber — **Hypersonics - I** — Maui Room

09:30 am – 12:00 pm

09:30 am
ICCFD11-2201
Verification of Nonequilibrium Thermochemistry Models for Hypersonic CFD by First-Principles Simulation
E. Torres, T. Gross, E. Geistfeld, and T.E. Schwartzentruber
University of Minnesota, USA

10:00 am
ICCFD11-2202
Arbitrary Lagrangian Eulerian Simulations of High Speed Particle Impacts Encountered During Hypersonic Flight
Peter Yip, Erik Torres, Ioannis Nompelis, and Thomas E. Schwartzentruber
University of Minnesota, USA

10:30 am
ICCFD11-2203
Effect of Atmospheric Particulates on Hypersonic Boundary Layer Transition
J. B. Habeck, [illegible] Melander, and G. V. Candler
U. of Minnesota, USA
Withdrawn

11:00 am
ICCFD11-2204
Property-Preserving Limiters for Discontinuous Galerkin Discretizations of Hyperbolic Problems
D. Kuzmin
Technical University Dortmund, Germany

Wednesday, July 13, 2022

12:00 pm – 01:15 pm	**Hosted Lunch**	Hale Piilani Room

23 | Chair: Christoph Brehm — Cartesian Grid Methods — Lanai Room

01:15 Pm – 02:45 pm

01:15 pm
ICCFD11-2301
High-Order Cut-Cell Methods for High-Fidelity Flow Simulations
P. T. Brady and D. Livescu
Los Alamos National Laboratory, USA

01:45 pm
ICCFD11-2302
Comparison of LBM-RANS and LBM-VLES for 3D Taylor-Green Vortex Problems
A. Jammalamadaka, Y. Li, R. Zhang, and H. Chen
Dassault Space Systems, USA

24 | Chair: TBD — High-Lift Systems CFD — Molokai Room

01:15 Pm – 02:45 pm

01:15 pm
ICCFD11-2401
Fully-Automated High-Fidelity LES Around High-Lift Aircraft Configuration Near Stall
Hiroyuki Asada and Soshi Kawai
Tohoku University, Japan
Moved to Session 2, Monday, July 11 at 10:30 am

01:45 pm
ICCFD11-2402
RANS Computations of 3D Flows Past JAXA and NASA CRM High Lift Models using Various Turbulence Models
R. K. Agarwal and K. Hendrickson
U. of Washington, USA
Withdrawn

02:15 pm
ICCFD11-2403
Hybrid RANS-LES Simulations of the NASA High-Lift Common Research Model
N. Ashton, P. Batten, and V. Skaperdas
Amazon Web Services, UK
Withdrawn

25 | Chair: Shishir Pandya — Multi-material Flows — Maui Room

01:15 Pm – 02:45 pm

01:15 PM
ICCFD11-2501
Discontinuous Galerkin Methods for Multi-Material Shock Hydrodynamics
A. Pandare, W. Li, J. Waltz, H. Luo, and J. Bakosi
Los Alamos National Laboratory, USA

01:45 PM
ICCFD11-2502
A Moving Discontinuous Galerkin Finite Element Method with Interface Condition Enforcement for Compressible Multi-material Flows
H. Luo, G. Absillis and R. Nourgaliv
North Carolina State University, USA

Wednesday, July 13, 2022

26 | Chair: Savio Poovathingal — Ablation — Lanai Room

03:00 pm – 4:30 pm

03:00 pm
ICCFD11-2601
Effects of Thermochemical Non-Equilibrium in the Boundary Layer of an Ablative Thermal Protection System: A State-to-State Approach
F. Bonelli, D. Ninni, L. D. Pietanza, G. Colonna, B. Helber,T. E. Magin, and G. Pascazio
Politecnico di Bari, Italy

03:30 pm
ICCFD11-2602
Study of Graphite Ablation at Arc-Jet Conditions Using Finite-Rate and Equilibrium Chemistry Models
Aleksander L. Zibitsker, Joel A. McQuaid, Christoph Brehm, and Alexandre Martin
University of Kentucky, USA

04:00 pm
ICCFD11-2603
Hinge Method for CFD and Fluid- Ablation Interaction Modeling
R. Fu and A. Martin
University of Kentucky, USA
Withdrawn

27 | Chair: Pedro Paredes — Transition Modeling — Molokai Room

03:00 pm – 4:30 pm

03:00 pm
ICCFD11-2701
Receptivity of the BoLT-2 Boundary Layer to Freestream Disturbances
Zachary M. Johnston, Luke J. Melander, and Graham V. Candler
University of Minnesota, USA

03:30 pm
ICCFD11-2702
The Harmonic Linearized Navier-Stokes Equations for Transition Prediction in Three-Dimensional Flows
P. Paredes, M. Choudhari, M. Carpenter, and F. Li
NASA Langley Research Center, USA

04:00 pm
ICCFD11-2703
Dynamic QSV-LES of Hypersonic Boundary Layer Transition Delay via Porous Walls Over a Blunt Cone
V. C. B. Sousa, V. Wartemann, A. Wagner, and C. Scalo
Purdue University, USA

28 | Chair: Antonino Ferrante — Direct Navier-Stokes — Maui Room

03:00 pm – 4:30 pm

03:00 pm
ICCFD11-2801
Direct Numerical Simulation of a Turbulent Boundary Layer Separating Over a Curved Wall Using FastRK3
A. B. Aithal and A. Ferrante
University of Washington, USA
Moved to Session 31, Thursday, July 14, 11:00 am

03:30 pm
ICCFD11-2802
Direct Numerical Simulation Of Boundary Layer Transition At Mach 6 Over An Ablative Surface Approaching A 53-Degree Compression Ramp
B. Vollmer, and D. J. Bodony
University of Illinois, Urbana-Champaign, USA
Withdrawn

04:00 pm
ICCFD11-2803
Direct Numerical Simulation of differentially heated cavity at low Prandtl numbers
J. Oder, M. Alsiyabi, L. Koloszar, W. Munters, and D. Laboureur
von Karmen Institute, Belgium
Withdrawn

ICCFD11 Program: Thursday, July 14, 2022

07:30 am – 08:00 am — **Speaker's Briefing**

08:15 am – 09:15 am — **Invited Lecture** — Ali'i Room

29 | Session

ICCFD11-2901

Recent Advances and Future Prospects for Hypersonic CFD

Prof. Graham Candler

University of Minnesota

30 | Chair: Jubaraj Sahu — **Numerical Methods - III** — Lanai Room

09:30 am – 12:00 pm

09:30 am
ICCFD11-3001
An Adaptive Space-Time Hyperbolic Navier-Stokes Solver for Two-Dimensional Unsteady Viscous Flows
E. Padway and H. Nishikawa
National Institute of Aerospace, USA

10:00 am
ICCFD11-3002
Time-Accurate Solution of Unsteady Flows in an Implicit Solver Using Block LUSG Method
M. R. Nived, Sa[illegible]aketha
Chandra A[illegible]uri, and Vinayak Eswaran
Indian Institute of Technology Hyderabad, India
Withdrawn

10:30 am
ICCFD11-3003
Bound-Preserving and Entropy-Stable Algebraic Flux Correction Schemes for the Shallow Water Equations with Topography
H. Hajduk and D. Kuzmin
Technical University Dortmund, Germany

11:00 am
ICCFD11-3004
Advanced CFD-Based Coupled Computational Approach for Prediction of Complex Flight Behaviors
Jubaraj Sahu, Bradley Burchett, and Benjamin Gruenwald
Oak Ridge Associated Universities, USA

11:30 am
ICCFD11-3005
Development of Three-Dimensional Ray Tracing Solver for Communication Blackout in Atmospheric Entries
Vincent F. Giangaspero, V. Sharma, S. Poedts, and A.Lani
von Karmen Institute, Belgium

31 | Chair: Aditya Ghate — **Turbulent Flows** — Molokai Room

09:30 am – 12:00 pm

09:30 am
ICCFD11-3101
Dynamic Scale-Resolving Paradigm for Coarse Grained Simulations of Turbulent Mixing
Fernando F. Grinstein
Los Alamos National Laboratory, USA

10:00 am
ICCFD11-3102
Direct Numerical Simulation of Turbulent Flow Using Hyperbolic Moment Methods
L. Ivan and W. Kaufmann
Canadian Nuclear Laboratories, Canada

10:30 am
ICCFD11-3103
Coarse Grained Simulation and Dynamic Bridging for Turbulent Mixing Predictions
John William Poduska, Sr.
Massachusetts Institute of Technology, USA

11:00 am
ICCFD11-2801
Direct Numerical Simulation of a Turbulent Boundary Layer Separating Over a Curved Wall Using FastRK3
A. B. Aithal and A. Ferrante
University of Washington, USA

11:30 am
ICCFD11-3105
Flow Field Reconstruction for Inhomogeneous Turbulence Using Data and Physics Driven Models
Aditya S. Ghate, and Sanjiva K. Lele
Stanford University, USA

32 | Chair: Chun Tang — **Hypersonics - II** — Maui Room

09:30 am – 12:00 pm

09:30 am
ICCFD11-3201
Comparison and Uncertainty Assessment of CFD Codes for Hypersonic Flow Modeling
C. N. Onyeador, C. J. Waligura, L. Lopez, D. Hoskins, K. M. Sabo, and W. L. Harris
Massachusetts Institute of Technology, USA

10:00 am
ICCFD11-3202
Blowing Effects on the Material Response of an Orthotropic Charring Ablator
L.P. Askins and A. Martin
University of Kentucky, USA

10:30 am
ICCFD11-3203
Characterization and Modeling of Spallation in Thermal Protection Systems
K. Price, S. Bailey, and A. Martin
University of Kentucky, USA

11:00 am
ICCFD11-3204
A High-Order Scheme for the Numerical Simulation of High-Enthalpy Hypersonic Flows
D. Passiatore, L. Sciacovelli, P. Cinnella, and G. Pascazio
Politecnico di Bari, Italy

11:30 am
ICCFD11-3205
Rapid Hypersonic Simulations Using US3D and Pointwise
C. Tang
NASA Ames Research Center, USA

Thursday, July 14, 2022

12:00 pm – 01:15 pm	**Hosted Lunch**	Hale Piilani Room

33 | Chair: Derek Dalle — Uncertainty Quantification — Lanai Room

01:15 Pm – 02:45 pm

01:15 pm
ICCFD11-3301
Physics-Based Regression vs. CFD for Hagen-Poiseuille and Womersley Flows and Uncertainty Quantification
Huiru Li, Md Mahfuzul Islam, Huidan Yu and Xiaoping Du
Indiana University–Purdue University Indianapolis, USA

01:45 pm
ICCFD11-3302
Uncertainty Quantification of Geometric Uncertainties in Aerodynamic Systems through an Adjoint Approach
K. D. Kantarakias and G. Papadakis
Imperial College, UK
Withdrawn

02:15 pm
ICCFD11-3303
Distribution of SLS Integrated Load Uncertainty to Surface Pressures and Sectional Loads
Derek J. Dalle, Stuart E. Rogers, Aaron C. Burkhead and Jamie G. Meeroff
NASA Ames Research Center, USA

34 | Chair: Luis Fernandez — Wind Turbine — Molokai Room

01:15 Pm – 02:45 pm

01:15 pm
ICCFD11-3401
Deep Learning for Wake Modeling of Wind Turbines
Suraj Pawar, Ashesh Sharma, Ganesh Vijayakumar, Christopher J. Bay, and Shashank Yellapantula
Oklahoma State University, USA

01:45 pm
ICCFD11-3402
Analysis on the Flow Over a Vertical-Axis Wind Turbine with Varying Tip-Speed Ratio and Solidity
Sangwoo Ahnn and Haecheon Choi
Seoul National University, South Korea

02:15 pm
ICCFD11-3403
An Open-Source Incompressible-Flow Hybrid-Solver Framework for Massively Parallel Blade-Resolved Wind Farm Simulations Under Atmospheric Inflow
Ashesh Sharma, Michael J Brazell, Ganesh Vijayakumar, Shreyas Ananthan, Lawrence Cheung, Marc Henry de Frahan, Paul Mullowney, Jon Rood, Philip Sakievich and Michael A. Sprague
National Renewable Energy Laboratory, USA

35 | Chair: Leonardo Machado — Magneto-Hydro, and Solar Dynamics — Maui Room

01:15 Pm – 02:45 pm

01:15 pm
ICCFD11-3501
Discrete Exterior Calculus for the Simulation of Forced 2D Turbulent Flows on a Sphere
R. Ayoub, P. Jagad, R. Samtaney, J. Philidet, and L. Gizon
King Abdullah University of Science and Technology, Saudi Arabia

01:45 pm
ICCFD11-3502
A Monolithic Face-Based Discretization of the Incompressible Magnetohydrodynamics Equations
K. Ata, and M. Sahin
Istanbul Technical University, Turkey
Withdrawn

02:15 pm
ICCFD11-3503
Recent Development of Entropy Split Methods for Gas Dynamics and MHD
H.C. Yee, and Björn Sjögreen
NASA Ames Research Center, USA
Moved to Session 10, Monday, July 11 at 04:30 pm

Thursday, July 14, 2022

36 | Chair: Steve Legensky — Bio-Medical CFD — Lanai Room

03:00 pm – 04:30 pm

03:00 pm
ICCFD11-3601
A Numerical Simulation on Hemolysis based on Power-Law Models in the FDA Benchmark Blood Pump
Withdrawn
J. Choi and Hyundur Sogang
Sogang University, South Korea

03:30 pm
ICCFD11-3602
Estimation of the Risk of Airborne Transmission in an Elementary School Classroom through Large Eddy Simulation
A. Vignolo, M. Draper, and G. Usera
Universidad de la Republica, Uruguay

04:00 pm
ICCFD11-3603
Industrial and Biomedical CFD Workflows Enhanced via Coprocessing for Knowledge Capture and Computational Steering
Steve M. Legensky, Earl P.N. Duque, Dave A. Amels, Brad Whitlock, Marcus Meyer, Axel Gerstenberger, and Paolo Adami
Intelligent Light, USA

37 | Chair: Timothy Chau — Unsteady CFD – I — Molokai Room

03:00 pm – 4:30 pm

03:00 pm
ICCFD11-3701
Analysis of a Flapping Blade in Two-Phase Flow
A. Viljoen, W. H. Ho and D. J. Chandar
University of the Witwatersrand, Johannesburg, South Africa

03:30 pm
ICCFD11-3702
Vortex Structure Analysis Method for Separated Shear Flow
Takuto Ogawa, Tomoaki Tatsukawa and Fujii Kozo
Tokyo University of Science, Japan

04:00 pm
ICCFD11-3703
Flow Characteristics of the Wandering Blade Tip Vortex
Young-Jin Yoon and Haecheon Choi
Seoul National University, South Korea

38 | Chair: Nathan Hariharan — Artificial Intelligence — Maui Room

03:00 pm – 4:30 pm

03:00 pm
ICCFD11-3801
Obstacle Location and Identification using Time Reversal and Deep Learning
Adar Kahana, Oded Ovadia, Eli Turkel and Dan Givoli
Tel-Aviv University, Israel

03:30 pm
ICCFD11-3802
Machine Learning-Based Physics Inference from High-Fidelity Solutions: Vortical Features & Flow Separation
Nathan Hariharan and Jennifer N. Abras
Department of Defense High Performance Computing Modernization Program, USA

04:00 pm
ICCFD11-3803
GPU-Based HPC and AI Developments for CFD
Steve Oberlin, J. Luitjens and O. Hennigh
Nvidia Corporation, USA

04:30 pm
ICCFD11-4202
A Large Time Step Numerical Method for the Euler Equations using Deep Learning
Oded Ovadia, Adar Kahana, and Eli Turkel
Tel-Aviv University, Israel

05:30 pm – 09:00 pm — **Hosted Luau** — Meet at the Ali'i Room

ICCFD11 Program: Friday, July 15, 2022

07:30 am – 08:00 am — **Speaker's Briefing**

08:15 am – 09:15 am — **Invited Lecture** — Ali'i Room

39 | Session — ICCFD11-3901

Nonlinear Stability, Algorithm Optimization, and Monolithic Methods

Prof. David Zingg

University of Toronto

40 | Chair: Bruce Crawford — **Reacting Flows** — Lanai Room

09:30 am – 12:00 pm

09:30 am
ICCFD11-4001
Multi-Resolution Analysis of Partially-Stirred Reactor Models for Subgrid Turbulence / Chemistry Interactions
J. Edwards, C. Rajath and A. Navratil
North Carolina State University, USA

10:00 am
ICCFD11-4002
Numerical Simulation of Underwater Explosions Using Unstructured Grids
Lingquan Li, Rainald Löhner and Facundo Nicolas Airaudo
George Mason University, USA

10:30 am
ICCFD11-4003
Controlling Spatio-Temporal Evolution of Square and Rectangular Flames via Inlet Conditions
J. Stempka, and A. Tyliszczak
Czestochowa University of Technology, Poland

11:00 am
ICCFD11-4004
Validation of the New Modeling Capabilities of the Ansys Fluent CFD High-Speed Solver for the Simulation of Supersonic Combustion in SCRAMjets and Rotating Detonation Engines
Bruce Crawford, Ishan Verma, Stefano Orsino, Jean-Sebastien Cagnone, and Shaoping Li
Ansys, USA

41 | Chair: Alexander Zibitsker — **Multiphase - II** — Molokai Room

09:30 am – 12:00 pm

09:30 am
ICCFD11-4101
Multidimensional Aware Riemann Solver for the Eulerian Droplet Equation System
H. Beaugendre, T. Vigier and F. Morency
National Institute for Research in Digital Science and Technology (INRIA), France

10:00 am
ICCFD11-4102
Direct Numerical Simulation of Droplet Laden Homogeneous Shear Turbulence: Numerical Method and Flow Physics
P. Trefftz-Posada and A. Ferrante
University of Washington, USA

10:30 am
ICCFD11-4103
Simulating Paraffin Wax Droplets Using Mixed Finite Element Method
Darsh K. Nathawani and Matthew G. Knepley
The State University of New York, Buffalo, USA

11:00 am
ICCFD11-4104
Numerical Study of Particle-Particle Interactions in a High Density Supersonic Flow
Raghava S. Gudavuluri, Kaveh A. Tagavi and Alexandre Martin
U. of Kentucky, USA
Withdrawn

42 | Chair: Cory Stack — **Unsteady CFD - II** — Maui Room

09:30 am – 12:00 pm

09:30 am
ICCFD11-4201
On the Simulation of Statistically Unsteady Flows with the RANS Equations
L. Eca, M. Kerkvliet and S. L. Toxopeus
Instituto Superior Tecnico, Portugal

10:00 am
ICCFD11-4202
A Large Time Step Numerical Method for the Euler Equations using Deep Learning
Oded Ovadia, Adar Kahana, and Eli Turkel
Tel-Aviv University, Israel
Moved to Session 38, Thursday, July 14 at 04:30 pm

10:30 am
ICCFD11-4203
Flow Characteristics of the Wandering Blade Tip Vortex
Young-Jin Yoon and Haecheon Choi
Seoul National University, South Korea

11:00 am
ICCFD11-4204
Influence of Blunt-Body Base Protuberances on Near-Wake Unsteadiness
C. Stack, L. Dechant, B. Robbins, Y. Zhang and K. Casper
Sandia National Laboratories, USA