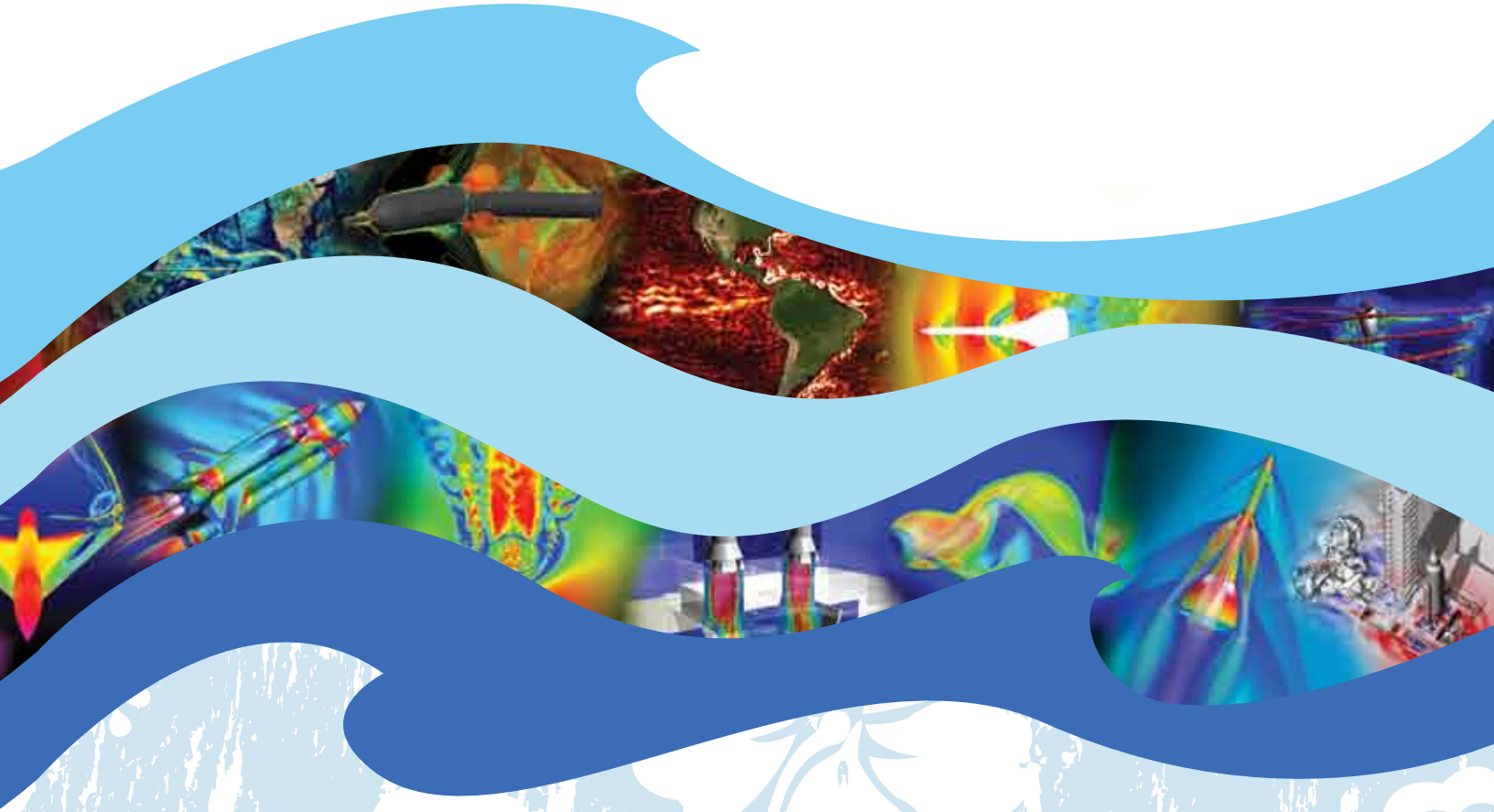
ICCFD7

THE 7TH INTERNATIONAL CONFERENCE ON COMPUTATIONAL FLUID DYNAMICS



JULY 9-13, 2012 • MAUNA LANI BAY HOTEL • KOHALA COAST, HAWAII

Welcome to the beautiful island of Hawaii and the 7th International Conference on Computational Fluid Dynamics (ICCFD7).

As the leading international conference devoted to both basic and applied CFD, this event brings the latest innovations to a large international community. ICCFD was founded in 2000 with the merger of the International Conference on Numerical Methods in Fluid Dynamics (ICNMFD) and the International Symposium on Computational Fluid Dynamics (ISCFD).

This year's conference introduces several new benefits for participants, including longer, more in-depth papers, availability of abstracts and technical papers on the conference website, and the introduction of student best paper awards. In addition, we are honored to have five distinguished invited speakers from the international CFD community. With 208 accepted papers, this is the largest technical program in ICCFD history.

We would like to thank each of you for attending this year's conference and bringing your expertise to our gathering. As CFD experts, you have the vision, the knowledge, and the experience to help pave our way into the future. We encourage you to network with your international colleagues both during and after the technical sessions and at our social events. Please also take time to interact with and encourage the ICCFD7 student members—our future colleagues and leaders.

Our personal respect and thanks to all of you for attending.

CONFERENCE CO-CHAIRS

Dr. Cetin C. Kiris
NASA Ames Research Center

Prof. M. Hafez
University of California, Davis

ICCFD7 Invited Speakers

Each day of the conference, we will feature a distinguished invited speaker in the 8–9 am timeslot.

MONDAY

Prof. Stanley Osher (UCLA)

Stanley Osher received his PhD degree from New York University's Courant Institute of Mathematical Sciences. He is a Professor of Mathematics, Computer Science and Electrical Engineering at UCLA. He is also an Associate Director of the NSF funded Institute for Pure and Applied Mathematics. He is a member of the National Academy of Sciences, the American Academy of Arts and Sciences, and is one of the top 25 most highly cited researchers in both mathematics and computer sciences. He has received numerous academic honors and has co-founded three successful companies, each based largely on his own (joint) research. His current interests mainly involve information science, which includes graphics, image processing, compressed sensing, and machine learning.

He has co-invented and/or co-developed the following widely used algorithms:

- Essentially nonoscillatory (ENO), weighted essentially nonoscillatory (WENO) and other shock capturing schemes for hyperbolic systems of conservation laws and their analogues for Hamilton-Jacobi equations
- The level set method for capturing dynamic surface evolution
- Total variation and other partial differential based methods for image processing
- Bregman iterative methods for L1 and related regularized problems, which arrive in compressive sensing, matrix completion, imaging and elsewhere
- Diffusion generated motion by mean curvature and other threshhold dynamics methods

His website is http://www.math.ucla.edu/~sjo. His recent papers are on the UCLA Math Department CAM website: http://www.math.ucla.edu/applied/cam/index.shtml.

TUESDAY

Prof. Rainald Löhner (GMU)

Rainald Löhner is the head of the CFD center at the department of computational and data sciences of George Mason University in Fairfax, VA, in the outskirts of Washington, D.C. He received his MSc degree in Mechanical Engineering from the Technische Universität at Braunschweig, Germany, as well as a PhD and DSc in Civil Engineering from the University College of Swansea, Wales, where he studied under Profs. Ken Morgan and Olgierd Zienkiewicz. His areas of interest include numerical methods, solvers, grid generation, parallel computing, visualization, pre-processing, fluid-structure interaction as well as shape and process optimization. His codes and methods have been applied in many fields, including aerodynamics of airplanes, cars and trains, hydrodynamics of ships, submarines and UAVs, shock-structure interaction, dispersion analysis in urban areas and haemodynamics of vascular diseases. He is the author of more than 650 articles covering the fields enumerated above, as well as a textbook on applied CFD techniques. His website is http://cds.gmu.edu/node/44

WEDNESDAY

Prof. Kozo Fujii (ISAS/JAXA)

Kozo Fujii is a Professor in the Dept. of Aeronautics and Astronautics at the University of Tokyo, and the Deputy Director General of the Institute of Space and Astronautical Science (ISAS) at the Japan Aerospace Exploration Agency (JAXA). After finishing his PhD in 1980 and spending several years at NASA Ames Research Center and the National Aerospace Laboratory (NAL), he returned to the ISAS in 1988. His current research interests are high-speed aerodynamics, high angle-of-attack aerodynamics, flow control, and the Mars flyer.

Some of his CFD contributions include:

- The first successful vortex breakdown analysis of delta-type wings
- The first successful transonic flow simulations over a transport wing
- The development of algorithms for compressible flow simulations
- The design of the Shinkansen and Maglev trains

He has received many awards such as the Daniel & Florence Guggenheim Award from the International Council of the Aeronautical Sciences in 2004. He has been a fellow of the AIAA since 2004, and a regional editor of the "Notes on Numerical Fluid Mechanics" series and "Computers & Fluids" for many years. He gave a keynote speech at the ASME/JSME/KSME Fluid Engineering Conference and at the 4th Symposium on Hybrid RANS-LES Methods in 2011. His website is: http://flab.eng.isas.jaxa.jp/member/fujii/src/e/fujii2e.html. His work with the ISAS/JAXA High-speed Aerodynamics Laboratory is at: http://flab.eng.isas.jaxa.jp/research/index_eng.html

THURSDAY

Dr. Miguel Visbal (AFRL)

Miguel Visbal is Principal Research Aerospace Engineer and Team Leader of Multidisciplinary Computational Aerodynamics at the Air Vehicles Directorate, Air Force Research Laboratory. He has conducted and led research in the fields of unsteady separation, flow topology, vortex breakdown, flow control, and high-order methods for large-eddy-simulation. Dr. Visbal is an Air Force Research Laboratory Fellow and a recipient of the Air Force Basic Research Award for the development of high-resolution numerical methods for multi-physics simulations. He is the author or co-author of more than 250 technical publications. He is a Fellow of AIAA, an Associate Editor of the AIAA Journal, and has served as member of the Fluid Dynamics and Aero-acoustics Technical Committees. He also serves on the ASME Fluids Engineering Division Honors & Awards and CFD Technical Committees.

FRIDAY

Prof. Spencer Sherwin (Imperial College)

Spencer Sherwin is a Professor of Computational Fluid Mechanics in the Department of Aeronautics at Imperial College London. He received his MSE and PhD degrees from the Department of Mechanical and Aerospace Engineering Department at Princeton University. During his time at Imperial he has maintained a research program into the development and application of the high-order spectral/hp element techniques, with particular application to biomedical flow, separated unsteady aerodynamics, and understanding flow physics through instability analysis. Professor Sherwin leads a successful research group focusing on the development and application of parallel spectral/hp element techniques for solving partial differential equations Spectral/hp Element method research group, Nektar++. His group has applied these techniques using direct numerical simulation and stability analysis to a range of applications including Biomedical Flows and separated Bluff Bodies and Vortex Flows of relevance to offshore engineering and vehicle aerodynamics. He has published over 100 peer-reviewed papers in international journals covering topics from numerical analysis to fundamental fluid-mechanics and biomedical flow modeling, and co-authored a highly cited book on the underlying spectral/hp element methods. Currently he is an associate director in the British Heart Foundation Centre of Excellence at Imperial and EPSRC/EADS funded Laminar Flow Control Centre.

ICCFD7 Schedule Overview

TIME	SUNDAY JULY 8, 2012	MONDAY JULY 9, 2012	TUESDAY JULY 10, 2012	WEDNESDAY JULY 11, 2012	THURSDAY JULY 12, 2012	FRIDAY JULY 13, 2012
07:00 am		Registration (Lanai)	Registration (Lanai)	Registration (Lanai)	Registration (Lanai)	Registration (Lanai)
07:45 am – 08:00 am		Opening Remarks (Ballroom I-III)				
08:00 am – 09:00 am		Invited Lecture Prof. Stanley Osher, UCLA (Ballroom I-III)	Invited Lecture Prof.Rainald Löhner, GMU (Ballroom I-III)	Invited Lecture Kozo Fujii, ISAS/JAXA (Ballroom I-III)	Invited Lecture Miguel Visbal, AFRL (Ballroom I-III)	Invited Lecture Prof.Spenser Sherwin, Imperial College (Ballroom I-III)
09:00 am – 09:30 am		Break	Break	Break	Break	Break
09:30 am – 12:30 am		Technical Sessions (Ballroom I-IV)	Technical Sessions (Ballroom I-IV)	Technical Sessions (Ballroom I-IV)	Technical Sessions (Ballroom I-IV)	Technical Sessions (Ballroom I-IV)
12:30 pm – 02:00 pm		Hosted Lunch (Bay Terrace Restaurant)	Hosted Lunch (Bay Terrace Restaurant)	Hosted Lunch (Bay Terrace Restaurant)	Hosted Lunch (Bay Terrace Restaurant)	
02:00 pm – 05:00 pm		Technical Sessions (Ballroom I-IV)	Technical Sessions (Ballroom I-IV)	Technical Sessions (Ballroom I-IV)	Technical Sessions (Ballroom I-IV)	
02:00 pm – 06:00 pm	Early Registration (Lanai)					
06:00 pm – 09:00 pm		Hosted Reception (Mauna Lani Bay Beach)				
06:30 pm – 09:30 pm					Hosted Luau (Mauna Lani Bay Gardens)	


Luau
Lunch
Meetings
Reception
MAUNA LANI BAY
FUNCTION SPACES,
FLOORPLANS AND SPECS
Kohala
Hamakua
Hilo
Puna
Kau
Honu Lounge
Ballroom I
Ballroom II
Ballroom III
Ballroom IV
Honu Garden
Honu Pond
1. Bay Terrace (Lunch)
2. Canoe House
3. Honu Garden
4. Ocean Grill
5. Hull Sue's
6. Beach Club
7. Golf Clubhouse
8. Mauna Lani Spa & Salon
9. Mauna Lani Fitness Club
10. Camp Mauna Lani
11. Eva Parker Woods Cottage
12. Boathouse
13. Bungalows
14. Villas
15. Milo Tree
16. Meeting Rooms (Ballrooms I-IV)
17. Hale Hoaloha Pavillion
18. Kekaha Lawn
19. Sand Court
20. Mauna Lani Bay Beach (Reception)
21. Mauna Lani Bay Garden (Luau)

ICCFD7 Program: Monday, July 9, 2012

07:45 am – 08:00 am	**Opening Remarks by Co-Chairs**	Ballroom I-III
08:00 am – 09:00 am	**Invited Lecture**	Ballroom I-III

01 | Session

ICCFD7-0101

Sparsity and Computational Fluid Dynamics

Prof. Stanley OSHER

University of California, Los Angeles, USA

10 | Chairs: Nobuyuki SATOFUKA & Aaron KATZ — **Numerical Methods & Algorithms - I** — Ballroom I

09:30 am – 12:30 pm						
	09:30 am **ICCFD7-1001** *Design and Verification Methodology of Boundary Conditions for Finite Volume Schemes* Tong, O., Katz, A., and Sankaran, V. Utah State University, USA	**10:00 am** **ICCFD7-1002** *High-Order CENO Finite-Volume Scheme for Low-Speed Viscous Flows on Three-Dimensional Unstructured Mesh* Charest, M. R. J., Groth, C. P. T., and Gauthier, P. Q. University of Toronto, Canada	**10:30 am** **ICCFD7-1003** *Improved Finite-Volume Method for Radiative Hydrodynamics* Wray, A. NASA Ames Research Center, USA	**11:00 am** **ICCFD7-1004** *Low Dispersion Finite Volume Scheme Based on MDCD Reconstruction* Qiuju, W., Yuxin, R., and Zhensheng, S. Tsinghua University, China	**11:30 am** **ICCFD7-1005** *Development and Analysis of an Improved Finite Volume Method for Polyhedral Meshes* Kang, S., and Hur, N. Sogang University, South Korea	**12:00 pm** **ICCFD7-1006** *A New Quasi-3-D Solver for Meandering Channel Flow by CIP/Multi-Moment Finite Volume Method on a Triangular Mesh* Akoh, R., and Ishikawa, T. Tokyo Institute of Technology, Japan

11 | Chairs: Dochan KWAK & Alexander KUZMIN — **Turbulence Physics** — Ballroom II

09:30 am – 12:30 pm						
	09:30 am **ICCFD7-1101** *Vortical Structures and Turbulent Events in Turbulent Shear Flow* Alfonsi, G., Ciliberti, S. A., Mancini, M., and Primavera, L. Università della Calabria, Italy	**10:00 am** **ICCFD7-1102** *Application of a Lagrangian Particles Method to the Simulation of Passive Scalar Mixing in Isotropic Turbulence* Attili, A., and Bisetti, F. King Abdullah University of Science and Technology, Saudi Arabia	**10:30 am** **ICCFD7-1103** *Characteristics of Linearly-Forced Scalar Mixing in Homogeneous, Isotropic Turbulence* Carroll, P. L., Verma, S., and Blanquart, G. California Institute of Technology, USA	**11:00 am** **ICCFD7-1104** *Turbulence and Waves in Transcritical Shear Flow* Ghannadi, S. K., and Chu, V. H. McGill University, Canada	**11:30 am** **ICCFD7-1105** *Simulation of Decaying Two-Dimensional Turbulence Using Kinetically Reduced Local Navier-Stokes Equations* Hashimoto, T., Tanno, I., Morinishi, K., and Satofuka, N. Kinki University, Japan	**12:00 pm** **ICCFD7-1106** *Stability and Transition in the Near-Field of Pure Planar Plumes* Hattori, T., Armfield, S. W., Kirkpatrick, M. P., and Norris, S. E. The University of Sydney, Australia

Monday, July 9, 2012

12 | Chairs: William CHAN & Andrew WISSINK — Overset Grids & Methods — Ballroom III

09:30 am – 12:30 pm

09:30 am
ICCFD7-1201
Advances in Domain Connectivity for Overset Grids Using the X-Rays Approach
Chan, W. M., Noah, K., and Pandya, S.
NASA Ames Research Center, USA

10:00 am
ICCFD7-1202
Dynamic Overset Grid Computations for CFD Applications on Graphics Processing Units
Chandar, D., Sitaraman, J., and Mavriplis, D.
University of Wyoming, USA

10:30 am
ICCFD7-1203
Some Recent Developments and Applications Related to Overset Mesh Aspects of CFD++
Kachgal, P., Chakravathy, S., and Akdag, V.
Metacomp Technologies, USA

11:00 am
ICCFD7-1204
Wall Distance Search Algorithm Using Rasterized Marching Spheres
Roget, B., and Sitaraman, J.
University of Wyoming, USA

11:30 am
ICCFD7-1205
Domain Decomposition vs. Overset Chimera Grid Approaches for Coupling CFD and CAA
Ryan, J., Halpern, L., and Borrel, M.
ONERA, France

12:00 pm
ICCFD7-1206
An Overset Dual-Mesh Solver for Computational Fluid Dynamics
Wissink, A.
U.S. Army Aeroflightdynamics Directorate, USA

13 | Chairs: Christoph BREHM & Janos BENK — Immersed Boundary & Moving Body — Ballroom IV

09:30 am – 12:30 pm

09:30 am
ICCFD7-1301
The Nitsche's Method of the Navier-Stokes Equation for Immersed and Moving Boundaries
Benk, J., Mehl, M., and Ulbrich, M.
Technical University of Munich, Germany

10:00 am
ICCFD7-1302
Local Stability Enhancement of Immersed Boundary/Interface Methods
Brehm, C., and Fasel, H. F.
Science and Technology Corporation, USA

10:30 am
ICCFD7-1303
Arbitrarily Shaped Particles in Shear Flow
de Tullio, M. D., Pascazio, G., and Napolitano, M.
Politecnico di Bari, Italy

11:00 am
ICCFD7-1304
Adaptive Immersed Boundary Method Applied to the Flow of a Rotating Maple Seed
Hylla, E., and Thiele, F.
Berlin Institute of Technology, Germany

11:30 am
ICCFD7-1305
A Discrete-Forcing Immersed Boundary Method for a Thin Flexible Body
Lee, I., and Choi, H.
Seoul National University, South Korea

12:00 pm
ICCFD7-1306
Seamless Immersed Boundary Lattice Boltzmann Method for Incompressible Flow Simulation
Nishida, H., and Meichin, Y.
Kyoto Institute of Technology, Japan

12:30 pm – 02:00 pm — **Hosted Lunch** — Bay Terrace Restaurant

14 | Chairs: Philip ROE & Barry KOREN — Numerical Methods & Algorithms - II — Ballroom I

02:00 pm – 05:00 pm

02:00 pm
ICCFD7-1401
Discretization Methods for Extremely Anisotropic Diffusion
van Es, B., Koren, B., and de Blank, H.
Centrum Wiskunde & Informatica, The Netherlands

02:30 pm
ICCFD7-1402
Assessment and Comparison of Discretization Techniques for Global MHD Modeling of the Solar Wind
Ivan, L., de Sterck, H., Jacobs, C., Keppens, R., and Poedts, S.
University of Waterloo, Canada

03:00 pm
ICCFD7-1403
New Explicit Runge-Kutta Methods for the Incompressible Navier-Stokes Equations
Sanderse, B., and Koren, B.
Centrum Wiskunde & Informatica, The Netherlands

03:30 pm
ICCFD7-1404
Deterministic Solver for Steady State Problems of Gases of Arbitrary Statistics Based on the Semiclassical Boltzmann - BGK Equation
Muljadi, B. P., and Yang, J.-Y.
National Taiwan University, Taiwan

04:00 pm
ICCFD7-1405
A Diffusion Model of the Information Preservation Method
Fei, F., and Fan, J.
Chinese Academy of Sciences, China

04:30 pm
ICCFD7-1406
Spectral Accuracy of Reconstruction on Arbitrary Unstructured Grids
Gerolymos, G. A., and Vallet, I.
Universite´ Pierre et Marie Curie, France

Monday, July 9, 2012

15 | Chairs : Xioalin ZHONG & Alain LERAT — Turbulent Boundary Layer & DNS Applications — Ballroom II

02:00 pm – 05:00 pm

02:00 pm
ICCFD7-1501
DNS of a Spatially Evolving Hypersonic Turbulent Boundary Layer at Mach 8
Liang, X., Li, X., Fu, D., and Ma, Y.
Chinese Academy of Sciences, China

02:30 pm
ICCFD7-1502
Numerical Simulation of Roughness Effect on the Stability of a Hypersonic Boundary Layer
Fong, K. D., Wang, X., and Zhong, X.
University of California, Los Angeles, USA

03:00 pm
ICCFD7-1503
Passive Control of a Hypersonic Non-Equilibrium Boundary Layer using Regular Porous Coating
Wang, X., and Zhong, X.
University of California, Los Angeles, USA

03:30 pm
ICCFD7-1504
Direct Numerical Simulation of Aerosol Growth Processes in a Turbulent Mixing Layer
Zhou, K., Attili, A., and Bisetti, F.
King Abdullah University of Science and Technology, Saudi Arabia

04:00 pm
ICCFD7-1505
Massively Parallel Simulations of Inertial Particles in High-Reynolds-Number Turbulence
Ireland, P. J., and Collins, L. R.
Cornell University, USA

04:30 pm
ICCFD7-1506
A VoF Method for DNS of Droplet-Laden Incompressible Turbulence
Baraldi, A., and Ferrante, A.
University of Washington, Seattle, USA

16 | Chairs: Roger STRAWN & Venkateswaran SANKARAN — Hybrid Methods & Multidisciplinary CFD — Ballroom III

02:00 pm – 05:00 pm

02:00 pm
ICCFD7-1601
Software Design Strategies for Multidisciplinary Computational Fluid Dynamics
Strawn, R. C.
U.S. Army Aeroflightdynamics Directorate, USA

02:30 pm
ICCFD7-1602
A Semi-Unstructured Multi-Block Fourth-Order Energy Stable Weighted Essentially Non-Oscillatory Finite Difference Scheme
Otis, C. C.
University of Pittsburgh, USA

03:00 pm
ICCFD7-1603
Development of an Agglomeration Multigrid Technique in the Hybrid Solver elsA-H
Marmignon, C., Cantaloube, C., Pape, M. C. L., de la Llave Plata, M., Couaillier, V., and Gazaix, M.
ONERA, France

03:30 pm
ICCFD7-1604
Simulating Flow Past a Circular Cylinder Using a Dual-Mesh Hybrid LES/RANS Framework
Xiao, H., and Jenny, P.
Institute of Fluid Dynamics, Switzerland

04:00 pm
ICCFD7-1605
Moment Base Lattice Boltzmann Approach for Multiphysics Flow Problems
Morinishi, K., and Fukui, T.
Kyoto Institute of Technology, Japan

04:30 pm
ICCFD7-1606
Convergence Acceleration of High Order Numerical Simulations using a Hybrid Spectral Difference / Finite Volume Multigrid Method
Allaneau, Y., Li, L. Y., and Jameson, A.
Stanford University, USA

17 | Chairs: Scott IMLAY & Earl DUQUE — Unsteady Flow Applications — Ballroom IV

02:00 pm – 05:00 pm

02:00 pm
ICCFD7-1701
Analysis and Optimization of Guide Vane Jets to Decrease the Unsteady Load on Mixed Flow Hydroturbine Runner Blades
Lewis, B. J., Cimbala, J. M., and Wouden, A. M.
The Pennsylvania State University, USA

02:30 pm
ICCFD7-1702
Interaction of Multiple Flapping Filaments for Cylinder Wake Modification Using the Lattice Boltzmann Method
Revell, A., Favier, J., and Pinelli, A.
The University of Manchester, UK

03:00 pm
ICCFD7-1703
IFDT - Intelligent In-Situ Feature Detection, Extraction, Tracking and Visualization for Turbulent Flow Simulations
Duque, E. P. N., Hiepler, D., and Stone, C. P.
Intelligent Light, USA

03:30 pm
ICCFD7-1704
Generalized Box-Plot for Analysis of Unsteady CFD Solutions
Imlay, S., Rittenberg, D., and Mackey, C.
Tecplot Inc, USA

04:00 pm
ICCFD7-1705
On the Periodic Flow Past a Circular Cylinder
Barbeiro, I. C., Meneghini, J. R., and Aranha, J. A. P.
Escola Politécnica University of São Paulo, Brazil

04:30 pm
ICCFD7-1706
Withdrawn

06:00 pm – 09:00 pm — **Hosted Reception** — Mauna Lani Bay Beach

ICCFD7 Program: Tuesday, July 10, 2012

08:00 am – 09:00 am | **Invited Lecture** | Ballroom I-III

01 | Session

ICCFD7-0102

Scaling the Complete Simulation Pipeline for Complex FSI Problems

Prof. Rainald LÖHNER

George Mason University, USA

18 | Chairs: David ZINGG & Dohyung LEE | **Numerical Methods & Algorithms - III** | Ballroom I

09:30 am – 12:30 pm

09:30 am
ICCFD7-1801
An efficient Newton-Krylov-Schur Parallel Solution Algorithm for the Steady and Unsteady Navier-Stokes Equations
Osusky, M., Boom, P. D., Fernández, D. C. D. R., and Zingg, D. W.
University of Toronto, Canada

10:00 am
ICCFD7-1802
Convergence Error Estimation and Convergence Acceleration in Iteratively Solved Problems
Eyi, S.
Middle East Technical University, Turkey

10:30 am
ICCFD7-1803
A Conservative Linearization Procedure for Simulating Hypersonic Nonequilibrium Flows with Residual Distribution Schemes
Mena, J. G., Lani, A., and Deconinck, H.
von Karman Institute for Fluid Dynamics, Belgium

11:00 am
ICCFD7-1804
Numerical Dissipation and Wrong Propagation Speed of Discontinuities for Stiff Source Terms
Yee, H. C., Kotov, D. V., and Sjögreen, B.
NASA Ames Research Center, USA

11:30 am
ICCFD7-1805
An Implicit Algorithm for High-Order Discontinuous Galerkin Methods Based on Newton/Gauss-Seidel Iterations
Wei, L., Laiping, Z., Xin, H., and Lixin, H.
State Key Laboratory of Aerodynamics, China

12:00 pm
ICCFD7-1806
Study on the Computational Efficiency of Three Dimensional Euler Equations by Multi-Resolution Analysis
Park, K., Kang, H., Lee, D., Lee, D., and Kwak, D.
Seoul National University, South Korea

19 | Chairs: Steven ALLMARAS & Eli TURKEL | **Turbulence Modeling** | Ballroom II

09:30 am – 12:30 pm

09:30 am
ICCFD7-1901
Use of Evolutionary Computation in the Analysis and Optimisation of Turbulence Models
Fabritius, B., and Tabor, G.
University of Exeter, UK

10:00 am
ICCFD7-1902
Modifications and Clarifications for the Implementation of the Spalart-Allmaras Turbulence Model
Allmaras, S. R. , Johnson, F. T., and Spalart, P. R.
AeroDynamics Solutions, Inc., USA

10:30 am
ICCFD7-1903
Improvement of Two-Equation Turbulence Model with Anisotropic Eddy-Viscosity for Hybrid Rocket Research
Mikiro, M., and Shimada, T.
University of Tokyo & JAXA, Japan

11:00 am
ICCFD7-1904
Fast Iterative Methods for Navier-Stokes Equations with a SST Turbulence Model and Dual Time Steps
Turkel, E., Peles, O., and Yaniv, S.
Tel Aviv University, Israel

11:30 am
ICCFD7-1905
Wavelet Decomposition of Turbulent Velocity and its Application to Subgrid Scale Modeling
Denev, J. A., Falconi, C. J., and Bockhorn, H.
Karluhe Institute of Technology, Germany

12:00 pm
ICCFD7-1906
Detached-Eddy Simulation Based on the v2-f Model
Jee, S., and Shariff, K.
NASA Ames Research Center, USA

Tuesday, July 10, 2012

20 | Chairs: Susan CLIFF & Alaa ELMILIGUI — Design Optimization - I — Ballroom III

09:30 am – 12:30 pm

09:30 am
ICCFD7-2001
Parametric Deformation of Discrete Geometry for Aerodynamic Shape Design
Anderson, G. R., Aftosmis, M. J., and Nemec, M.
Stanford University & NASA Ames Research Center, USA

10:00 am
ICCFD7-2002
Parameter Classification using Adjoint Derived Sensitivities for Aerodynamic Shape Optimization for Transonic Aircraft
Wu, W., Fan, Z., Chen, D., Qin, N., Ma, X., and Tang, X.
State Key Laboratory of Aerodynamics, China

10:30 am
ICCFD7-2003
Inverse and Variational Methods for Waverider Geometry Generation and Optimization
Morgan, M., and Khaikine, V.
Hampton University, USA

11:00 am
ICCFD7-2004
Numerical Predictions of Sonic Boom Signatures for Straight Line Segmented Leading Edge Model
Elmiligui, A., Wilcox, F., Cliff, S., and Thomas, S.
NASA Langley Research Center, USA

11:30 am
ICCFD7-2005
Conceptual Design of Low Sonic Boom Aircraft Using Adjoint-Based CFD
Wintzer, M., and Kroo, I.
Stanford University, USA

12:00 pm
ICCFD7-2006
Design of Rail Instrumentation for Wind Tunnel Sonic Boom Measurements and Computational-Experimental Comparisons
Cliff, S., Elmiligui, A., Aftosmis, M., Thomas, S., Morgenstern, J., and Durston, D.
NASA Ames Research Center, USA

21 | Chairs: Michael BARAD & Alain BERLEMONT — Immersed Boundary & Multi-Phase & Level-Set — Ballroom IV

09:30 am – 12:30 pm

09:30 am
ICCFD7-2101
Applications of Immersed Boundary Method and Conservative Phase Field Method for Solving the Incompressible Two-phase Flows
Chiu, P.-H., Lin, Y.-T., Chang, C.-J., and Chan, Y.-K.
Institute of Nuclear Energy Research, Taiwan

10:00 am
ICCFD7-2102
Accurate Sharp Interface Scheme for Multimaterials
Gorsse, Y., Iollo, A., Milcent, T., and Telib, H.
Université de Bordeaux, France

10:30 am
ICCFD7-2103
Boundary in Cell (BIC) Method for Gas-Solid Dynamics Simulations
Menshov, I.
Russian Academy of Sciences, Russia

11:00 am
ICCFD7-2104
Recent Progress on the LS-STAG Immersed Boundary Method for the Computation of Viscoelastic and non-Newtonian Flows
Botella, O., and Cheny, Y.
Nancy-Université, France

11:30 am
ICCFD7-2105
Simulation of Liquid/Gas Interface Break-up with a Coupled Level Set/VOF/Ghost Fluid Method
Berlemont, A., Bouali, Z., Cousin, J., Desjonquères, P., Doring, M., Ménard, T., and Noël, E.
CORIA, France

12:00 pm
ICCFD7-2106
A Level Set Based Method to Simulate Contact Line Motion and Dynamic Contact Angles for Multiphase Flow
Rocca, G. D., and Blanquart, G.
California Institute of Technology, CA.

12:30 pm – 02:00 pm — **Hosted Lunch** — Bay Terrace Restaurant

22 | Chairs: Antony JAMESON & Meng-Sing LIOU — Numerical Methods & Algorithms - IV — Ballroom I

02:00 pm – 05:00 pm

02:00 pm
ICCFD7-2201
LES Modeling with High-order Flux Reconstruction and Spectral Difference Schemes
Lodato, G., and Jameson, A.
Stanford University, USA

02:30 pm
ICCFD7-2202
Improved Flux Formulations for Unsteady Low Mach Number Flows
Hosangadi, A., Sachdev, J., and Sankaran, V.
CRAFT Tech, USA

03:00 pm
ICCFD7-2203
Unresolved Problems by Shock Capturing
Liou, M.-S.
NASA Glenn Research Center, USA

03:30 pm
ICCFD7-2204
Dissipation of Upwind Schemes at High Wave Numbers
Hannemann, V., Siegmund, A., Oßwald, K., Birken, P., Weinman, K., and Meister, A.
DLR, Germany

04:00 pm
ICCFD7-2205
Flux Functions for Reducing Numerical Shockwave Anomalies
Zaide, D. W., and Roe, P. L.
University of Michigan, USA

04:30 pm
ICCFD7-2206
Effects of Numerical Diffusion and Mass Conservation Errors on Turbulent Transport of High Schmidt Number Scalars
Verma, S., and Blanquart, G.
California Institute of Technology, USA

Tuesday, July 10, 2012

23 | Chairs: Kozo FUJII & Daniel LIVESCU — Direct Numerical Simulation Studies — Ballroom II

02:00 pm – 05:00 pm

02:00 pm
ICCFD7-2301
DNS Study on Turbulence Generation and Sustenance in Late Boundary Layer Transition
Liu, C., Lu, P., Thapa, M., and Yan, Y.
University of Texas at Arlington, USA

02:30 pm
ICCFD7-2302
Direct Numerical Simulation of Particle Dispersion in a Spatially Developing Turbulent Boundary Layer
Dodd, M. S., Webster, K., and Ferrante, A.
University of Washington, USA

03:00 pm
ICCFD7-2303
Pressure Statistics from Direct Simulation of Turbulent Boundary Layer
Gungor, A. G., Sillero, J. A., and Jiménez, J.
Universidad Politecnica de Madrid, Spain

03:30 pm
ICCFD7-2304
Direct Numerical Simulations of Rayleigh-Taylor Instability with Gravity Reversal
Livescu, D., and Wei, T.
Los Alamos National Laboratory, USA.

04:00 pm
ICCFD7-2305
A High-Order Shock-Fitting Non-Equilibrium Flow Solver for DNS of Strong Shock and Turbulence Interactions
Wang, X., and Zhong, X.
University of California, Los Angeles, USA

04:30 pm
ICCFD7-2306
Computational Investigation of Supersonic Boundary Layer Transition over Canonical Fuselage Nose Configurations
Choudhari, M., Tokugawa, N., Li, F., Chang, C.-L., White, J. A., Ishikawa, H., Ueda, Y., Atobe, T., and Fujii, K.
NASA Langley Research Center, USA & JAXA, Japan

24 | Chairs: Markus RUMPFKEIL & K. SRINIVAS — Design Optimization - II — Ballroom III

02:00 pm – 05:00 pm

02:00 pm
ICCFD7-2401
EGO Method for Diffusing S-duct Shape Design
Bae, H. G., Park, S. H., and Kwon, J. H.
Korea Advanced Institute of Science and Technology, South Korea

02:30 pm
ICCFD7-2402
GA Optimization Design of Multi-Element Airfoil
Chen, H., Zhang, Y., Zhang, W., Fu, S., Chen, Y., Li, Y., and Zhou, T.
Tsinghua University, China

03:00 pm
ICCFD7-2403
Adjoint-based Optimization of the Flapping Wing Performance
Jones, M., and Yamaleev, N.
North Carolina A&T State University, USA

03:30 pm
ICCFD7-2404
Shock-Free Aerofoil/Wing Design Optimisation via Morphing Technique: Leading and Trailing Edge Deformation
Lee, D. S., Srinivas, K., Periaux, J., and Oñate, E.
CIMNE, Spain & University of Sydney, Australia

04:00 pm
ICCFD7-2405
A RANS-Based Optimal Design of Bleed System for Supersonic Inlets
Liou, M.-F., and Gea, L.-M.
NASA Glenn Research Center, USA

04:30 pm
ICCFD7-2406
Optimization Under Uncertainty Using Derivatives and Kriging Surrogate Models
Rumpfkeil, M. P.
University of Dayton, USA

25 | Chairs: Clinton GROTH & Marco CEZE — Adjoint Methods & Mesh Adaptation — Ballroom IV

02:00 pm – 05:00 pm

02:00 pm
ICCFD7-2501
Automatic hp-Adaptation Using Continuous Adjoint and a Discontinuity Sensor
Li, L. Y., and Jameson, A.
Stanford University, USA

02:30 pm
ICCFD7-2502
Discrete Adjoint Error Estimation and Adaptive Refinement in Unsteady Flow Problems
Flynt, B. T., and Mavriplis, D. J.
University of Wyoming, USA

03:00 pm
ICCFD7-2503
Efficiently Modeling Viscous Flow Effects by Means of Regularization Turbulence Modeling and Local Grid Refinement
van der Heideny, H. J. L., van der Plasy, P., Veldmany, A. E. P., Luppesy, R., and Verstappen, R. W. C. P.
University of Groningen, The Netherlands

03:30 pm
ICCFD7-2504
Block-Based Adaptive Mesh Refinement Finite-Volume Scheme for Hybrid Multi-Block Meshes
Zheng, J. Z. X., and Groth, C. P. T.
University of Toronto, Canada

04:00 pm
ICCFD7-2505
Numerical Simulation of Transient Flow in a Hypersonic Wind Tunnel
Bensassi, K., Lani, A., Deconinck, H., and Rambaud, P.
von Kármán Institute for Fluid Dynamics, Belgium

04:30 pm
ICCFD7-2506
Withdrawn

ICCFD7 Program: Wednesday, July 11, 2012

08:00 am – 09:00 am | **Invited Lecture** | Ballroom I-III

01 | Session

ICCFD7-0103

Three Key Components of Today's CFD for Aerodynamic Design Innovation - LES, Spectral-like Schemes and Data Mining Techniques

Prof. Kozo FUJII

Japan Aerospace Exploration Agency, Japan

26 | Chairs: Stanley OSHER & M. HAFEZ | **Numerical Methods & Algorithms - V** | Ballroom I

09:30 am – 12:30 pm

09:30 am
ICCFD7-2601
Numerical Simulation of Incompressible Flow using a Velocity-Pressure-Vorticity Formulation
Chacón, B, and Hafez, M. M.
University of California, Davis, USA

10:00 am
ICCFD7-2602
Variational Multiscale Simulation of Flow along a Circular Cylinder with Exact Geometry
Ahn, H. T., Motlagh, Y. G., and Hughes T.
University of Ulsan, South Korea

10:30 am
ICCFD7-2603
Efficient Implementation of the CPR Formulation for the Navier-Stokes Equations on GPUs
Hoffmann, M., Munz, C.-D., and Wang, Z. J.
Universität Stuttgart, Germany

11:00 am
ICCFD7-2604
A Simple Two-step Riemann Solver That Separates Acoustic Waves from Contact and Shear Waves
Sun, M.
Tohoku University, Japan

11:30 am
ICCFD7-2605
Discontinuous Numerical Perturbation Reconstructing Algorithm for Convective-Diffusion Equation
Gao, Z., and Shen, Y.
Chinese Academy of Sciences, China

12:00 pm
ICCFD7-2606
Robust Performance Assessment for an Oscillating Airfoil Using a Time-Spectral-Method and Uncertainty Propagation
Congedo, P.M., Corre, C., and Abgrall, R.
INRIA, France

27 | Chairs: Fernando GRINSTEIN & Ashvin HOSANGADI | **Large Eddy Simulation & Detached Eddy Simulation** | Ballroom II

09:30 am – 12:30 pm

09:30 am
ICCFD7-2701
Delayed-Detached Eddy Simulation for Optical Path Control on Backward Step Flow
Lee, C. Y., Park, S. H., Cho, S., and Lee, I.
Konkuk University, South Korea

10:00 am
ICCFD7-2702
Implicit Large-Eddy Simulation of Isotropic Turbulent Mixing
Grinstein, F. F., Wachtor, A. J., and DeVore, C. R.
Los Alamos National Laboratory, USA

10:30 am
ICCFD7-2703
LES Study on Vortex Ring-Shock Interaction Behind MVG
Yan, Y., Wang, X., and Liu, C.
University of Texas at Arlington, USA

11:00 am
ICCFD7-2704
Towards Petascale LES of Reacting Flow
Yilmaz, S. L., Pisciuneri, P. H., and Givi, P.
University of Pittsburgh, USA

11:30 am
ICCFD7-2705
Adaptation-Based Detached Eddy Simulation of Air Flow Through a Short Inlet Duct with/without Coanda Injection
Chen, Y., Sahni, O., Jansen, K. E., and Amitay, M.
Rensselaer Polytechnic Institute, USA

12:00 pm
ICCFD7-2706
Evaluation of Numerical Dissipation Sensitivity of IDDES
Liu, J., Xiao, J., and Fu, S.
Tsinghua University, China

Wednesday, July 11, 2012

28 | Chairs: Remi ABGRALL & Taku NONAMURA — **High-Order Methods - I** — Ballroom III

09:30 am – 12:30 pm

09:30 am
ICCFD7-2801
Symmetric-Conservative Metric Evaluations for Higher-Order Finite Difference Scheme with the GCL Identities on Three-Dimensional Moving and Deforming Mesh
Abe, Y., Iizuka, N., Nonomura, T., and Fujii, K.
University of Tokyo, Japan

10:00 am
ICCFD7-2802
High Order Residual Distribution Scheme for the RANS Equations
Abgrall, R., de Santis, D., and Ricchiuto, M.
INRIA, France

10:30 am
ICCFD7-2803
High-Order Compact-Stencil Summation-By-Parts Operators for the Second Derivative with Variable Coefficients
Fernández, D. C. D. R., and Zingg, D. W.
University of Toronto, Canada

11:00 am
ICCFD7-2804
Analysis of High-Order Residual-Based Dissipation for Unsteady Compressible Flows
Grimich, K., Cinnella, P., and Lerat, A.
Arts et Métiers-ParisTech, France

11:30 am
ICCFD7-2805
On the High-Order Multi-dimensional Gas-Kinetic Scheme
Li, Q., and Fu, S.
Tsinghua University, China

12:00 pm
ICCFD7-2806
Optimized Sixth Order Monotonicity-Preserving Scheme
Li, X., Leng, Y., and He, Z.
Institute of Mechanics, CAS, China

29 | Chairs: Robert KUNZ & Jeffrey HOUSMAN — **Multi-Phase Flows & Porous Media** — Ballroom IV

09:30 am – 12:30 pm

09:30 am
ICCFD7-2901
Simulation of Liquid Jet Breakup Process by Three-Dimensional Incompressible SPH Method
Takashima, T., Ito, T., Shigeta, M., Izawa, S., and Fukunishi, Y.
Tohoku University, Japan

10:00 am
ICCFD7-2902
Direct Numerical Simulation of Compressible Multi-Phase Flow with a Pressure-Based Method
Boger, M., Jaegle, F., Fechter, S., Weigand, B., and Munz, C.-D.
University of Stuttgart, Germany

10:30 am
ICCFD7-2903
CFD Analysis of Two-Phase Flow with a Prediction of Torque Demand of a Bi-Lobe Rotor of a Mixing Chamber
Chetan, C. J., Rajan, N. K. S., Kulkarni, P. S., and Padmanabhan, B.
Indian Institute of Science, India

11:00 am
ICCFD7-2904
Integrated Adaptive Numerical Method for Transient Two-Phase Flow in Heterogeneous Porous Media
Chueh, C. C., Bangerth, W., and Djilali, N.
University of Victoria, Canada

11:30 am
ICCFD7-2905
HPC Fluid Flow Simulations in Porous Media Geometries
Lieb, M., Mehl, M., and Neckel, T.
Technische Universität Munchen, Germany

12:00 pm
ICCFD7-2906
A Discontinuous Galerkin Based Multiscale Method for Compressible Multi-Phase Flow
Jaegle, F., Fechter, S., Boger, M., Zeiler. C., and Munz, C.-D.
University of Stuttgart, Germany

12:30 pm – 02:00 pm — **Hosted Lunch** — Bay Terrace Restaurant

30 | Chairs: Jean-Jaques CHATTOT & Prakash KULKARNI — **Aerothermodynamics, Reacting Flows & Heat Transfer - I** — Ballroom I

02:00 pm – 05:00 pm

02:00 pm
ICCFD7-3001
A Hydrothermal Convective Flow at Extremely High Temperature
Komurasaki, S.
Nihon University, Japan

02:30 pm
ICCFD7-3002
An Efficient Monte-Carlo Radiative Transport Algorithm for Aerothermodynamic Simulations
Sanna, A., Lani, A., Palomba, C., and Deconinck, H.
Von Karman Institute for Fluid Dynamics, Belgium

03:00 pm
ICCFD7-3003
Robust and Accurate Computation of Multifluid Non-Reacting and Reacting Flows Using Discrete Equations Method, Anti-Diffusive Discretization and Upwind Controlled-Downwind Splitting
Tang, K., Beccantini, A., and Corre, C.
CEA Saclay, France

03:30 pm
ICCFD7-3004
Investigation of Irreversibility in Data Centre Environment
Fakhim, B., Srinarayana, N., Behnia, M., and Armfield, S. W.
The University of Sydney, Australia

04:00 pm
ICCFD7-3005
Effect of Inlet Jet Injection Angle on a Calandria Based Reactor – An Investigation with Numerical Analysis of Heat & Mass Transfer for an Optimum Reactor Design
Rajan, N. K. S., Kulkarni, P. S., and Reddy, M. V. R.
Indian Institute of Science, India

04:30 pm
ICCFD7-3006
CFD Simulation of Subcooled Boiling Flow in Nuclear Fuel Bundle
In, W. K., Shin, C. H., and Lee, C. Y.
Korea Atomic Energy Research Institute, South Korea

Wednesday, July 11, 2012

31 | Chairs: David SCHUSTER & Eiji SHIMA — Aeroelastic Predictions, Aeroacoustics, & Jets — Ballroom II

02:00 pm – 05:00 pm

02:00 pm
ICCFD7-3101
A Summary of Data and Findings from the First Aeroelastic Prediction Workshop
Schuster, D. M.
NASA Langley Research Center, USA

02:30 pm
ICCFD7-3102
Towards Hybrid Grid CFD Simulations of the Launch Environment
Moini-Yekta, S., Barad, M., Sozer, E., Housman, J., Brehm, C., and Kiris, C.
NASA Ames Research Center, USA

03:00 pm
ICCFD7-3103
Impact of Spatial and Temporal Resolution on the Aeroacoustic Wave from a Two-dimensional Impinging Jet
Nonomura, T., Tsutsumi, S., Takaki, R., Shima, E., and Fujii, K.
Japan Aerospace Exploration Agency, Japan

03:30 pm
ICCFD7-3104
Analysis of Acoustic Wave from Supersonic Jets Impinging to an Inclined Flat Plate
Tsutsumi, S., Nonomura,T., Fujii, K., Nakanishi, Y., Okamoto, K., and Teramoto S.
Japan Aerospace Exploration Agency, Japan

04:00 pm
ICCFD7-3105
Progress and Challenges in Liquid Rocket Combustion Stability Modeling
Sankaran, V., Talley, D. and Harvazinski, M.
US Air Force, USA

04:30 pm
ICCFD7-3106
New Approaches for Efficient Computation of Low Mach Number Unsteady Flows with Sound Propagation
Shima, E.
Japan Aerospace Exploration Agency, Japan

32 | Chairs: Spencer SHERWIN & Robert NOURGALIEV — Biological Flows — Ballroom III

02:00 pm – 05:00 pm

02:00 pm
ICCFD7-3201
Numerical Modeling of Flow in Lower Urinary Tract Using High-Resolution Methods
Brandner, M., Egermaier, J., and Kopincová, H.
The University of West Bohemia, Czech Republic

02:30 pm
ICCFD7-3202
Multi-scale Multi-physics Modeling of Cerebral Blood Flow and Embolus Transport
Bui, A., Nourgaliev, R., and Dinh, T. N.
Idaho National Laboratory, USA

03:00 pm
ICCFD7-3203
Numerical Study of the Thunniform Mode of Fish Swimming with Different Caudal Fin Shapes
Laiping, Z., Xinghua, C., and Xin, H.
State Key Laboratory of Aerodynamics, China

03:30 pm
ICCFD7-3204
Numerical Simulation of Blood Flow through a Patient Specific Stented Cerebral Aneurysm Using an Immersed Boundary Approach
Mendina, M., and Usera, G.
Universidad de la República, Uruguay

04:00 pm
ICCFD7-3205
A Two-Dimensional Model of Blood Plasma Flow with Oxygen Transport and Blood Cell Membrane Deformation
Tekleab, Y., and Harris, W.
Massachusetts Institute of Technology, USA

04:30 pm
ICCFD7-3206
Withdrawn

33 | Chairs: Pavel BURDA & David YOUNG — Free-Surface Flows & Analytical Methods — Ballroom IV

02:00 pm – 05:00 pm

02:00 pm
ICCFD7-3301
Rivulet Evolution in Gravity-Driven Thin-Film Flows
Slade, D., Veremieiev, S., Lee, Y. C., and Gaskell, P. H.
University of Leeds, UK

02:30 pm
ICCFD7-3302
Viscoplastic Free-Surface Flows: The Herschel-Bulkley Case
Vigneaux, P.
Ecole Normale Supérieure de Lyon, France

03:00 pm
ICCFD7-3303
Manning Friction in Steep Open-Channel Flow
Wang, T., and Chu, V. H.
McGill University, Canada.

03:30 pm
ICCFD7-3304
Three-Dimensional Thin-Film Flow Over Topography: Full Navier-Stokes Solutions
Veremieiev, S., Thompson, H. M., and Gaskell, P. H.
University of Leeds, UK

04:00 pm
ICCFD7-3305
Analytical Solution of Stokes Flow Near Corners and Applications to Solving Navier-Stokes Equations with High Precision
Burda, P., Novotný, J., and Šístek, J.
Czech Technical University, Czech Republic

04:30 pm
ICCFD7-3306
Use of Integral Boundary Layer Methods for Separated Flow and Thoughts on Fidelity in CFD
Young, D. P.
The Boeing Company, USA

ICCFD7 Program: Thursday, July 12, 2012

08:00 am – 09:00 am | **Invited Lecture** | Ballroom I-III

01 | Session

ICCFD7-0104

Recent Applications of a High-Fidelity Computational Approach to the Prediction and Control of Complex Unsteady Flows

Dr. Miguel VISBAL

Air Force Research Laboratory, USA

34 | Chairs: Vadim SMELYYANSKIY & Emre SOZER | **Aerothermodynamics, Reacting Flows & Heat Transfer - II** | Ballroom I

09:30 am – 12:30 pm

09:30 am
ICCFD7-3401
Numerical Studies on the Influence of Periodical Flow Forcing on the Mixing Quality and Flow Structure of a Swirl Burner
Schrödinger, C., Moeck, J. P., Paschereit, C. O., and Oevermann, M.
Institut für Strömungsmechanik und Technische Akustik, Germany

10:00 am
ICCFD7-3402
Numerical Simulation of the Carbon Combustion Synthesis of Oxides Particles
Markov, A., Filimonov, I., and Martirosyan, K.
Russian Academy of Sciences, Russia

10:30 am
ICCFD7-3403
Ultra-Wet Operation of a Hydrogen Fueled GT Combustor: Large Eddy Simulation Employing Detailed Chemistry
Krüger, O., Duwig, C., Terhaar, S., and Paschereit, C. O.
Technische Universität Berlin, Germany

11:00 am
ICCFD7-3404
A Numerical Study of Chaotic Dynamics in Thermal Ignition and Reactive Swirling Flow
Tavernetti, W. E., and Hafez, M. M.
University of California, Davis, USA

11:30 am
ICCFD7-3405
Effects of P-1 Radiation Model on Heat Fluxes to Rocket Base Surface
Lee, J. W., Kim, J. G., and Kim, K. H.
Seoul National University, South Korea

12:00 pm
ICCFD7-3406
Overheating Anomalies during Flight Test due to the Base Bleeding
Luchinsky, D., Hafiychuck, H., Osipov, V., Ponizhovskaya, E., Smelyanskiy, V., Dagostino, M., Canabal, F., and Mobley, B. L.
NASA Ames Research Center, USA

35 | Chairs: Neal CHADERJIAN & Jaw-Yen YANG | **Wind Turbines & Rotorcraft Aerodynamics** | Ballroom II

09:30 am – 12:30 pm

09:30 am
ICCFD7-3501
Unsteady Hybrid Navier-Stokes/Vortex Model Applied to Wind Turbine Aerodynamics under Yaw Conditions
Suzuki, K., and Chattot, J. J.
University of California, Davis, USA

10:00 am
ICCFD7-3502
Aerodynamic Analysis of Wind Turbines Rotors with High Lift Airfoils by Using Pre-Conditioned WENO Scheme
Huang, J. C., Lin, H., and Yang, J. Y.
National Taiwan Ocean University, Taiwan

10:30 am
ICCFD7-3503
Numerical Simulation of Horizontal-Axis Wind Turbine (HAWT)
Bergmann, M., and Iollo, A.
INRIA, France

11:00 am
ICCFD7-3504
Effect of Inflow Conditions for Turbulence Models for Hovering Tilt-Rotor Flows
Kaul, U. K.
NASA Ames Research Center, USA

11:30 am
ICCFD7-3505
Development of a Coupled CFD-VPM Method
Anbarci, K., and Aslan, A. R.
Istanbul Technical University, Turkey

12:00 pm
ICCFD7-3506
Advances in Rotor Performance and Turbulent Wake Simulation using DES and Adaptive Mesh Refinement
Chaderjian, N. M.
NASA Ames Research Center, USA

Thursday, July 12, 2012

36 | Chairs: Miguel VISBAL & Z. J. WANG — High-Order Methods - II — Ballroom III

09:30 am – 12:30 pm

09:30 am
ICCFD7-3601
Very-High-Order Conservative Discretization of Diffusive Terms with Variable Viscosity
Gerolymos, G. A., and Vallet, I.
Universite´ Pierre et Marie Curie, France

10:00 am
ICCFD7-3602
High Order SFV Method for the Numerical Simulation of Gas Flows with Uncertainties
Tokareva, S., Mishra, S., and Schwab, C.
ETH Zurich, Switzerland

10:30 am
ICCFD7-3603
Numerical Simulation with High-Order Scheme for Delta Wing Vortex Breakdown
Wang, G.
China Aerodynamics Research and Development Center, China

11:00 am
ICCFD7-3604
DNS and ILES of Transitional Flows around a SD7003 using a High-Order Discontinuous Galerkin Method
de Wiart, C. C., and Hillewaert, K.
Cenaero, Belgium

11:30 am
ICCFD7-3605
High-Order Central ENO Finite-Volume Scheme for MHD on Three-Dimensional Cubed-Sphere Grids
Ivan, L., Susanto, A., Groth, C. P. T., and Sterck, H. D.
University of Waterloo, Canada

12:00 pm
ICCFD7-3606
High-Order Residual-Based Scheme on Unstructured Grids
Du, X., and Corre, C.
Commercial Aircraft Corporation of China, China

37 | Chairs: Charles-Henri BRUNEAU & Michel BORREL — Multi-Phase Flows, Jets & Cavitation — Ballroom IV

09:30 am – 12:30 pm

09:30 am
ICCFD7-3701
Efficient Algorithm for Viscous Two-Phase Flows with Real Gas Effects
Abgrall, R., Rodio, M. G., and Congedo, P. M.
INRIA, France

10:00 am
ICCFD7-3702
Comparative Study of AUSM-Family Schemes in Compressible Multi-Phase Flow Simulations
Kitamura, K., and Liou, M.-S.
JAXA, Japan & NASA Glenn Research Center, USA

10:30 am
ICCFD7-3703
Numerical Simulations of Two-Dimensional Turbulent Thermal Convection on the Surface of a Soap Bubble
Bruneau, C.-H., Fischer, P., and Xiong, Y.-L.
University of Bordeaux, France

11:00 am
ICCFD7-3704
A Weighted Essentially Non-Oscillatory Implementation of a Reynolds-Averaged Navier–Stokes Model for Richtmyer–Meshkov Instability-Induced Mixing
Moran-Lopez, J. T., Holloway, J. P., and Schilling, O.
University of Michigan, USA

11:30 am
ICCFD7-3705
Dynamic Model of Vortex Cavitation based on Axisymmetric Navier-Stokes Equation
Ito, K., Ezure, T., Ohno, S., and Kamide, H.
Japan Atomic Energy Agency, Japan

12:00 pm
ICCFD7-3706
SPH Simulation of Gas Arc Welding Process
Ito, M., Izawa, S., Fukunishi, Y., and Shigeta, M.
Tohoku University, Japan

12:30 pm – 02:00 pm — Hosted Lunch — Bay Terrace Restaurant

38 | Chairs: Krzysztof FIDOWSKI & Xiaowen WANG — Adaptive Methods — Ballroom I

02:00 pm – 05:00 pm

02:00 pm
ICCFD7-3801
Simulations of Compressible Rayleigh-Taylor Instability Using the Adaptive Wavelet Collocation Method
Reckinger, S. J., Livescu, D., and Vasilyev, O. V.
University of Colorado at Boulder, USA

02:30 pm
ICCFD7-3802
Parallel Output-Adaptive Solution Strategies for Unsteady Aerodynamics on Deformable Domains
Kast, M., Ceze, M., and Fidkowski, K.
University of Michigan, USA

03:00 pm
ICCFD7-3803
A Conservation Adaptive Scheme for the Two-Dimensional Airfoil-Vortex Interaction Problem
Guardone, A., Isola, D., and Quaranta, G.
Politecnico di Milano, Italy

03:30 pm
ICCFD7-3804
Dynamic Mesh Deformation for the Preconditioned Implicit Adaptive Non-Linear Frequency Domain Method (Adaptive NLFD)
Mosahebi, A., and Nadarajah, S.
McGill University, Canada

04:00 - 05:00 pm
Panel Discussions
in Ballroom II

Thursday, July 12, 2012

39 | Chairs: Rustem ASLAN & Seiji TSUTSUNAMI — Flow Control & Drag Reduction — Ballroom II

02:00 – 05:00 pm

02:00 pm
ICCFD7-3901
Study on Drag Reduction of a Ship Due to a Drainage Slit
Aiming, L., Jiamei, W., and Wei, W.
Wuhan University of Technology, China

02:30 pm
ICCFD7-3902
Numerical Simulation of the Vortex Dynamics and of the Flow Control Around a Simplified Ground Vehicle
Bruneau, C.-H., Creusé, E., Gilliéron, P., and Mortazavi, I.
University of Bordeaux, France

03:00 pm
ICCFD7-3903
Reduced Order Model for Flow Control on a Bluff Body
Gilka, G., and Thiele, F.
Technical University Berlin, Germany

03:30 pm
ICCFD7-3904
LES and PANS of Passive and Active Control of Flows Around Generic Vehicle Bodies
Krajnovic, S.
Chalmers University of Technology, Sweden

04:00 - 05:00 pm
Panel Discussions
in Ballroom II

40 | Chairs: Rainald LÖHNER & Dmitry LUCHINSKY — Detonation & Explosion — Ballroom III

02:00 pm – 05:00 pm

02:00 pm
ICCFD7-4001
Detonation in Rotating and Deformating Chambers
Levin, V. A., Manuylovich, I. S., and Markov, V. V.
Institute of Mechanics of the MSU, Russia

02:30 pm
ICCFD7-4002
Numerical Study on Three-Dimensional Rotating Detonation Wave in Cylinder Tube
Xin-Meng, T., Ye-Tao, S., and Jian-Ping, W.
Peking University, China

03:00 pm
ICCFD7-4003
Numerical Simulation of TNT-Al Explosives in Explosion Chamber
Togashi, F., Baum, J. D., and Löhner, R.
SAIC, USA

03:30 pm
ICCFD7-4004
Three-Dimensional Phenomenon of Continuously Rotating Detonation Engines
Zhou, R., Wang, J., and Wu, D.
Beijing University of Aeronautics and Astronautics, China

04:00 - 05:00 pm
Panel Discussions
in Ballroom II

41 | Chairs: Haecheon CHOI & Marcello NAPOLITANO — Flapping/Pitching Wing Aerodynamics — Ballroom IV

02:00 pm – 05:00 pm

02:00 pm
ICCFD7-4101
High-Fidelity Constrained Optimization of a Pitching and Plunging Airfoil
Culbreth, M., Allaneau, Y., and Jameson, A.
Stanford University, USA

02:30 pm
ICCFD7-4102
Three-dimensional Flows around a Flapping Wing in Ground Effect
Kweon, J., and Choi, H.
Seoul National University, South Korea

03:00 pm
ICCFD7-4103
Large-Eddy Simulation of Unsteady Separation Over a Pitching Airfoil at High-Reynolds Number
You, D., and Bromby, W.
Carnegie Mellon University, USA

03:30 pm
ICCFD7-4104
High-Fidelity Flapping-Wing Aerodynamics Simulations with a Dynamic Unstructured Grid Based Spectral Difference Method
Yu, M., Wang, Z. J., and Hu, H.
Iowa State University, USA

04:00 - 05:00 pm
Panel Discussions
in Ballroom II

06:30 pm – 09:30 pm — **Hosted Luau** — Mauna Lani Bay Gardens

ICCFD7 Program: Friday, July 13, 2012

08:00 am – 09:00 am | **Invited Lecture** | Ballroom I-III

01 | Session

ICCFD7-0105

From h to p Efficiently: What Stops High-Order Codes Running Efficiently at Low-Order and Vice Versa

Prof. Spencer SHERWIN

Imperial College, UK

42 | Chairs: Nicholas BURGESS & Chongam KIM | **Discontinuous Galerkin Methods** | Ballroom I

09:30 am – 12:30 pm	09:30 am	10:00 am	10:30 am	11:00 am	11:30 am	12:00 pm
	ICCFD7-4201 *A Runge Kutta Discontinuous Galerkin Approach to Solve Reactive Flows on Structured and Unstructured Grids: The Parabolic and Source Operators* Ryan, J., Billet, G., and Borrel, M. ONERA, France	**ICCFD7-4202** *High-Order Discontinuous Galerkin Methods for Turbulent High-Lift Flows* Burgess, N. K., and Mavriplis, D. J. Science and Technology Corporation, USA	**ICCFD7-4203** *A Hermit WENO Reconstruction-Based Discontinuous Galerkin Method for Compressible Flows on Tetrahedral Grids* Luo, H., and Li, S. North Carolina State University, USA	**ICCFD7-4204** *Multi-Dimensional Limiting Strategy for Arbitrary Higher-Order Discontinuous Galerkin Methods in Inviscid and Viscous Flows* Park, J. S., and Kim, C. Seoul National University, South Korea	**ICCFD7-4205** *An Implicit Reconstructed Discontinuous Galerkin Method on Tetrahedron Grids* Xia, Y., and Nourgaliev, R. North Carolina State University, USA	**ICCFD7-4206** *The Multi-Dimensional Limiters for Discontinuous Galerkin Methods on Unstructured Grids* Li, W., and Ren, Y.-X. Tsinghua University, China

43 | Chairs: Shishir PANDYA & James KLESS | **Fixed Wing Aerodynamics** | Ballroom II

09:30 am – 12:30 pm	09:30 am	10:00 am	10:30 am	11:00 am	11:30 am	12:00 pm
	ICCFD7-4301 *Airfoils Admitting Anomalous Behavior of Lift Coefficient in Descending Transonic Flight* Kuzmin, A., and Ryabinin, A. St. Petersburg State University, Russia	**ICCFD7-4302** *Characterization and Design of Tubercle Leading-Edge Wings* Lohry, M. W., Clifton, D., and Martinelli, L. Princeton University, USA	**ICCFD7-4303** *Numerical Study of the Aerodynamic Characteristics of A Winged Slender Body Dynamically Entering High Angles of Attack* Xie, Y. F., Yuan, X. X., Deng, X. B., and Chen, Q. China Aerodynamics Research and Development Center, China	**ICCFD7-4304** *External Aerodynamics Simulations on the D8 "Double-Bubble" Aircraft Design* Pandya, S. A. NASA Ames Research Center, USA	**ICCFD7-4305** *Numerical Simulations on the 76/40° Double Delta Wing Using RANS/LES Hybrid Method* Sun, D., Li, Q., and Zhang, H. Beijing University of Aeronautics and Astronautics, China	**ICCFD7-4306** *An Inviscid Analysis of Extended Formation Flight* Kless, J. E., and Aftosmis, M. J. Science and Technology Corporation, USA

Friday, July 13, 2012

44 | Chairs: Steven ARMFIELD & Hyung-Teak AHN — Boundary Layer Stability & Transition — Ballroom III

09:30 am – 12:30 pm

09:30 am
ICCFD7-4401
Numerical Analysis of Stabilizing Effect of Longitudinal Wall-Oscillation for Two Dimensional Channel Flow
Atobe, T.
Japan Aerospace Exploration Agency, Japan

10:00 am
ICCFD7-4402
Transition in Conjugate Natural Convection Boundary Layer Flow
Armfield, S. W., Williamson, N., and Kirkpatrick, M. P.
The University of Sydney, Australia

10:30 am
ICCFD7-4403
Numerical Study on Leading Edge Receptivity of the Flat Plate Boundary Layer to Vortical Disturbance
Nishio, Y., Shigeta, M., Izawa, S., and Fukunishi, Y.
Tohoku University, Japan

11:00 am
ICCFD7-4404
Calibration and Application of γ-ReΘ Transition Model
Yuntao, W.
China Aerodynamics Research and Development Center, China

11:30 am
ICCFD7-4405
Turbulent Thermal Boundary Layers Simulations in Rough Walls via DNS
Chen, Y., Araya, G., and Castillo, L.
Rensselaer Polytechnic Institute, USA

12:00 pm
ICCFD7-4406
Numerical Study of Instability and Laminar-Turbulent Transition of High-Speed Boundary Layers Using Navier-Stokes Equations and eN-Method
Soudakov, V. G., Egorov, I. V., and Fedorov, A. V.
Central Aerohydrodynamic Institute, Russia

45 | Chairs: Shigeru OBAYASHI & Pavel MOSES — Multi-Physics & Multi-Disciplinary Applications — Ballroom IV

09:30 am – 12:30 pm

09:30 am
ICCFD7-4501
Heat and Fluid Flow Past Non-Spherical Particles at Different Angles of Attack
Richter, A., and Nikrityuk, P. A.
Technische Universität Bergakademie Freiberg, Germany

10:00 am
ICCFD7-4502
Monolithic Solver in ALE Framework for Interaction of Incompressible Fluid and Elastic Structure
Moses, P.
Czech Technical University in Prague, Czech Republic

10:30 am
ICCFD7-4503
CFD Simulations of the Wind Environment at Shonai Airport Integrated with Weather Prediction Data
Shimoyama, K., Nakanomyo, H., and Obayashi, S.
Tohoku University, Japan

11:00 am
ICCFD7-4504
Development and Application of Multidisciplinary Coupled Computational Techniques for Projectile Aerodynamics
Sahu, J., Costello, M., and Montalvo, C.
U.S. Army Research Laboratory, USA

11:30 am
ICCFD7-4505
Numerical Study of Gas-Jet Wiping Process for Hot-Dip Galvanizing of Steel Strips
Myrillas. K., Rambaud, P., and Buchlin, J.-M.
von Karman Institute for Fluid Dynamics, Belgium

12:00 pm
ICCFD7-4506
Withdrawn

Notes

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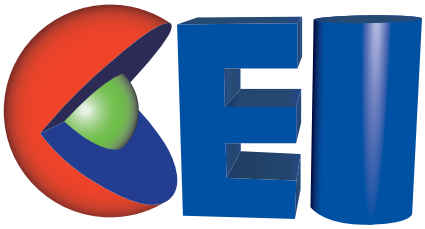

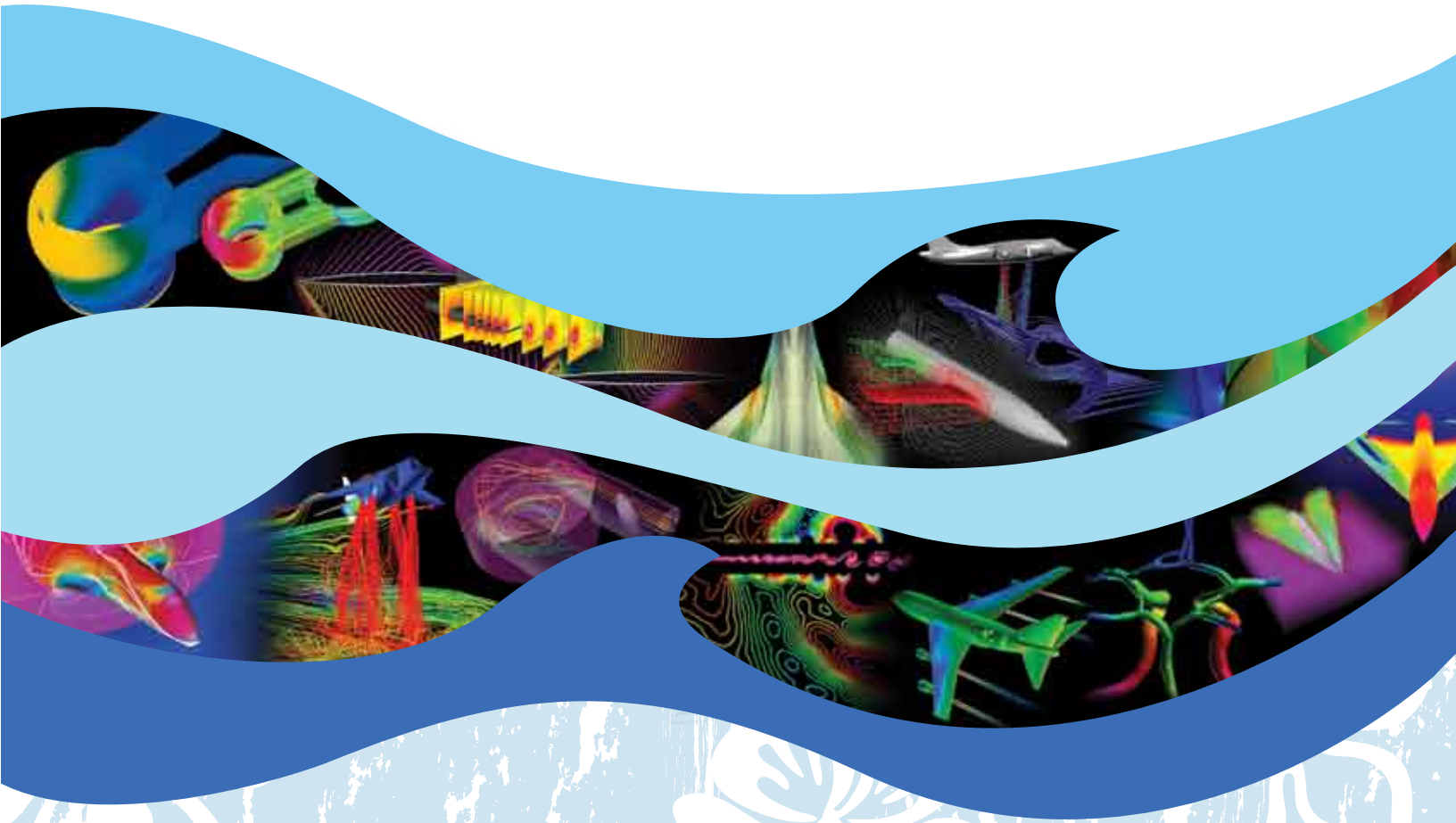

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