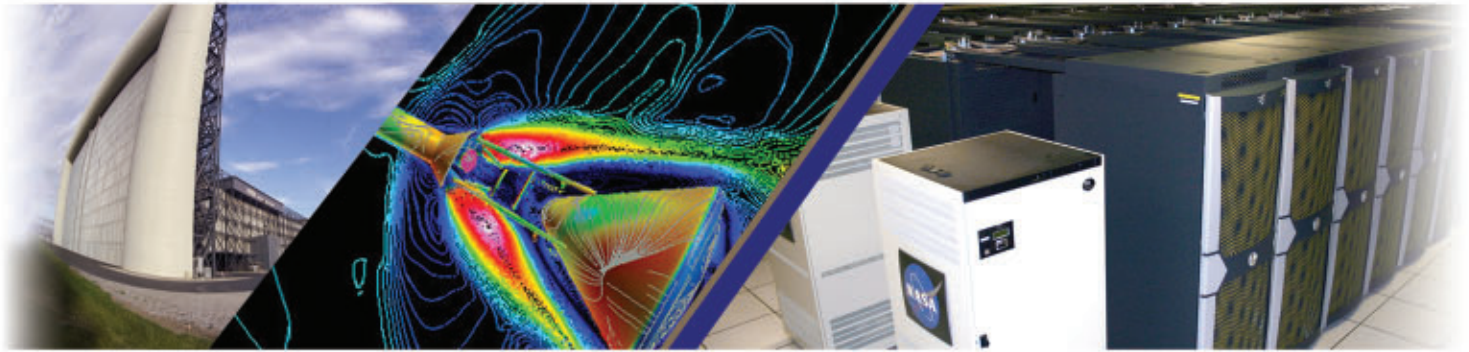




21st International Conference on Parallel Computational Fluid Dynamics



Parallel CFD 2009

21st International Conference on
Parallel Computational Fluid Dynamics

May 18–22, 2009, Moffett Field, California, USA



Monday, May 18, 2009

Tutorial: Hybrid OpenMP/MPI Programming and Other Models for Multi-Core Architectures

Gabriele Jost¹, Alice Koniges², Gerhard Wellein³, Georg Hager^{3}, Rolf Rabenseifner^{4*}*

¹Texas Advanced Computing Center, The University of Texas at Austin

²Lawrence Berkeley National Laboratory

³Erlangen Regional Computing Center, University of Erlangen-Nuremberg, Germany

⁴High Performance Computing Center Stuttgart

** author only—not speaking*

Location: EAGLE ROOM

1:00pm–
5:00pm

4:00pm–
7:00pm

**Registration
Location: LOBBY**



Tuesday, May 19, 2009

8:30am–
9:00am

Opening Remarks
Location: EAGLE ROOM

9:00am–
9:45am

Keynote Presentation
Horst Simon, Lawrence Berkeley National Laboratory
Future Directions in High Performance Computing (HPC) 2009–2018
Location: EAGLE ROOM

9:45am–
10:15am

Coffee Break
Location: LOBBY

	Session 1A: CFD Applications for NASA's Space Exploration Mission <i>Session Chair: Dochan Kwak, NASA Ames Research Center</i> Location: EAGLE ROOM	Session 1B: Unstructured/Overset Grid Methods <i>Session Chair: David Keyes, Columbia University</i> Location: WORLD ROOM	Session 1C: Turbulence <i>Session Chair: Terry Holst, NASA Ames Research Center</i> Location: SPACE STATION ROOM
10:15am– 10:45am	CFD—Mature Technology for Space Exploration Mission Support? <i>Rupak Biswas¹, Dochan Kwak¹, Eugene Tu¹</i> ¹ NASA Ames Research Center	An Overset Unstructured Grid Method for Parallel Solvers <i>Hasan Akay¹, Resat Payli¹, Jingxin Liu¹, Akin Ecer¹</i> ¹ Indiana University-Purdue University Indianapolis	Three-Dimensional Parallel Adaptive Mesh Refinement Simulations of Shock-Driven Turbulent Mixing in Plane and Converging Geometries <i>Manuel Lombardini¹, Ralf Deiterding²</i> ¹ California Institute of Technology ² Oak Ridge National Laboratory
10:45am– 11:15am	NASA's Space Operations Mission Directorate Parallel Computing Applications <i>Reynaldo Gomez¹</i> ¹ NASA Johnson Space Center	Parallel Performance of ADPDIS3D – A High Order Multiblock Overlapping Grid Solver for Hypersonic Turbulence <i>Bjorn Sjogreen¹, Helen Yee², M. Jahed Djomehr², Art Lazanoff², William Henshaw¹</i> ¹ Lawrence Livermore National Laboratory ² NASA Ames Research Center	Large Scale Simulation of Turbulence Using a Hybrid Spectral/Finite Difference Solver <i>Julien Bodart¹, Laurent Joly¹, Jean-Bernard Cazalbou¹</i> ¹ Université de Toulouse
11:15am– 11:45am	High Performance Computing Applications for Development of the Orion Aerospace Flight Databases <i>Joseph Olejniczak¹</i> ¹ NASA Ames Research Center	Efficiency Enhancement of an Unstructured CFD-Code on Distributed Computing Systems <i>Thomas Alrutz¹, Christian Simmendinger¹, Thomas Gerhold²</i> ¹ T-Systems Solution for Research GmbH ² DLR, Institute of Aerodynamics and Flow Technology	Turbulent Flow Around a Wall-mounted Cube: Direct Numerical Simulation and Regularization Modeling <i>F. Xavier Trias^{1,2}, Andrey Gorobets¹, Roel Verstappen², Manel Soria¹, Assensi Oliva Llana¹</i> ¹ Technical University of Catalonia ² University of Groningen
11:45am– 12:15pm	Time-Accurate Computational Analysis of the Flame Trench Applications <i>Cetin Kiris¹, Jeffrey Housman², Daniel Schauerhammer², Marshall Gusman², William Chan¹, Dochan Kwak¹</i> ¹ NASA Ames Research Center ² ELORET Corp.	Parallel Poisson Solver for Revolved Unstructured Grids; DNS of the Flow Around a Sphere at Re = 3700 <i>Ricard Borrell Pol¹, Oriol Lehmkuhl Barba^{2,1}, Ivette Rodriguez Pérez¹, Carles David Pérez Segarra¹, Assensi Oliva Llana¹</i> ¹ Technical University of Catalonia ² TERMO FLUIDS S.L.	Parallel Simulation of Turbulent Flow Inside an Aspiration Chamber Using Fluent Software <i>Violetta Zoria¹, Joshua Strodbeck¹, James McDonough¹, Konstantin Logachev²</i> ¹ University of Kentucky ² Shukhov Belgorod State Technological University

12:15pm–
1:30pm

Lunch
Location: LOBBY

**Tuesday, May 19, 2009****Invited Presentation***Wagdi Habashi, McGill University***A Frontier of Parallel CFD: Real-time in-flight Icing Simulation Over Complete Aircraft****Location: EAGLE ROOM**1:30pm–
2:15pm**Session 2A: Parallel CFD in Ship Aero and Hydrodynamics***Session Chair: Shahrouz Aliabadi,
Jackson State University***Room: EAGLE****Session 2B: Mechanical/Aerospace Engineering Applications I***Session Chair: Ramesh Agarwal, Washington
University in St. Louis***Location: WORLD ROOM****Session 2C: Parallel Algorithms/Solvers I***Session Chair: Sergey Peigin, Israel
Aerospace Industries***Location: SPACE STATION ROOM****Parallel Hybrid Finite Element/Volume Methods for Ship Hydrodynamics***Shahrouz Aliabadi¹, Tian Wan¹, Christopher Bigler²**¹Jackson State University, Northrop Grumman
Center for High Performance Computing
²University of Michigan*2:15pm–
2:45pm**Optimization of Synthetic Jet Parameters over an Elliptical Profile Using Response Surface Methodology***Engin Erler¹, Ismail Tuncer¹, Myhngoh Sohn²**¹Middle East Technical University
²Korea Air Force Academy***Understanding the Performance of Hybrid MPI/OpenMP Programming Model for Implicit CFD Codes***Dinesh Kaushik¹, Satish Balay¹, David Keyes²,
Barry Smith¹**¹Argonne National Laboratory
²Columbia University***On the Parallelization of Particle Finite Element Method***Pooyan Dadvand¹, Riccardo Rossi¹,
Eugenio Oñate¹**¹International Center for Numerical Methods in
Engineering*2:45pm–
3:15pm**Parallel Computations on Three Dimensional Aero-Acoustic Field Past a Circular Cylinder***Tae soo Kim¹, Jae soo Kim¹, Pa ul Mun¹**¹Chosun University***Enabling Temporal Blocking for a Lattice Boltzmann Flow Solver through Multicore-Aware Wavefront Parallelization***Johannes Habich¹, Thomas Zeiser¹, Georg
Hager¹, Gerhard Wellein¹**¹Erlangen Regional Computing Center***Large Scale Parallel Computing and Scalability Study for Surface Combatant Static Maneuver and Straight Ahead Conditions Using CFDShip-Iowa***Frederick Stern¹, Shanti Bhushan¹, Pablo
Carrica¹, Jianming Yang¹**¹University of Iowa*3:15pm–
3:45pm**Aerodynamic Database Generation Using Surrogate Model-Based Adaptive Sampling and Automated Mesh Refinement***Andrea Nelson¹, Matthew McMullen¹**¹ELORET Corp.***On a Parallel Implementation of the BDDC Method and its Application to the Stokes Problem***Jakub Šítek^{1,3}, Pavel Burda², Alexander
Damašek¹, Jan Mandel³, Jaroslav Novotný^{1,2},
Bedřich Sousedík^{1,3}**¹Academy of Sciences of the Czech Republic
²Czech Technical University in Prague
³University of Colorado Denver***Soroban-Grid CIP Method for Ocean Research and Ship Design - High Performance Computing with Earth Simulator***Takashi Yabe¹, Youichi Ogata², Takeshi
Sugimura³, Kenji Takizawa⁴, Keiko Takahashi³**¹Tokyo Institute of Technology**²Hiroshima University**³Japan Agency for Marine-Earth Science and
Technology**⁴Rice University*3:45pm–
4:15pm**Parallel Time-Accurate Computations of Dynamic Derivatives***Jubaraj Sahu¹**¹U.S. Army Research Laboratory***Parallel Implementation of the Adaptive Aitken-Schwarz Method for Non-Separable Operator***Thomas Dufaud¹, Damien Tromeur-Dervout¹**¹Université de Lyon*4:15pm–
4:45pm**Coffee Break
Location: LOBBY****Panel: PetaFLOPS and Beyond***Moderator: Ron Bailey, NASA Ames Research Center***Panelists:**

- Michael Aftosmis, NASA Ames Research Center
- David Emerson, Daresbury Laboratory
- John Grosh, Lawrence Livermore National Laboratory
- John Shalf, Lawrence Berkeley National Laboratory
- Suga A. Sugavanam, IBM Systems & Technology Group

4:45pm–
6:00pm**Poster Reception
Location: LOBBY***12 posters to be presented*6:00pm–
8:00pm



Wednesday, May 20, 2009

8:45am–
9:00am

Announcements
Location: EAGLE ROOM

9:00am–
9:45am

Invited Presentation
Thomas Sterling, Louisiana State University
Enabling Exascale through the ParalleX Paradigm
Location: EAGLE ROOM

9:45am–
10:15am

Coffee Break
Location: LOBBY

	Session 3A: CFD on the World's Four Fastest Supercomputers <i>Session Chair: Ron Bailey, NASA Ames Research Center</i> Location: EAGLE ROOM	Session 3B: Acoustics and Combustion <i>Session Chair: James McDonough, University of Kentucky</i> Location: WORLD ROOM	Session 3C: Parallel Algorithms/Solvers II <i>Session Chair: Gerhard Wellein, Erlangen Regional Computing Center</i> Location: SPACE STATION ROOM
10:15am– 10:45am	Adapting the CFDNS Compressible Navier-Stokes Solver to the Roadrunner Hybrid Supercomputer <i>Jamaludin Mohd-Yusof¹, Daniel Livescu¹, Timothy Kelly¹</i> ¹ Los Alamos National Laboratory	Computational Aeroacoustics of a Supersonic Jet Impinging on an Inclined Flat Plate Using High Speed Parallel Computers <i>Taku Nonomura¹, Yoshinori Goto¹, Kozo Fujii²</i> ¹ University of Tokyo ² Japan Aerospace Exploration Agency	Parallel Performance of the Deflated Conjugate Gradient <i>Romain Aubry¹, Guillaume Houzeaux¹, Mariano Vázquez¹</i> ¹ Barcelona Supercomputing Center
10:45am– 11:15am	Large Eddy Simulation of Turbulence-Chemistry Interactions in Reacting Flows: Experiences on the ORNL NCCS Cray-XT Platforms (Jaguar) <i>Joseph Oefelein¹, Ramanan Sankaran²</i> ¹ Sandia National Laboratories ² Oak Ridge National Laboratory	Parallel Simulations of Acoustic Wave Propagation in a 3-D Spherical Model of the Sun <i>Thomas Hartlep¹, Nagi N. Mansour², Junwei Zhao¹, Alexander G. Kosovichev¹</i> ¹ Stanford University ² NASA Ames Research Center	A Parallel Free Surface Lattice Boltzmann Method for Large-Scale Applications <i>Stefan Donath¹, Christian Feichtinger¹, Thomas Pohl¹, Jan Göetz¹, Ulrich Rüede¹</i> ¹ University of Erlangen
11:15am– 11:45am	Large Scale Aerodynamic Calculation on Pleiades <i>Thomas Pulliam¹, Dennis Jespersen¹</i> ¹ NASA Ames Research Center	Parallel Adaptive Simulation of Weak and Strong Transverse-Wave Structures in H2-O2-Ar Detonations <i>Ralf Deiterding¹</i> ¹ Oak Ridge National Laboratory	Integrated Hurricane and Overland Flow Modeling in Parallel Platform <i>Muhammad Akbar¹, Shahrouz Aliabadi¹</i> ¹ Jackson State University
11:45am– 12:15pm	On the Performance of the Miranda CFD Code on Multicore Architectures <i>Martin Schulz¹, Andrew Cook¹, William Cabot¹, Bronis de Supinski¹, William Krauss¹</i> ¹ Lawrence Livermore National Laboratory	A Study on Combustion Flow Dynamics by High-Fidelity Numerical Simulation <i>Junji Shinjo¹, Shingo Matsuyama¹, Yasuhiro Mizobuchi¹, Naoyuki Fujita¹, Ryoji Takaki¹, Yuichi Matsuo¹</i> ¹ Japan Aerospace Exploration Agency	A Framework for Parallel Flow Computation with Multi-Box Layout <i>Kenji Ono¹, Takashi Michikawa², Tsuyoshi Tamaki³, Osamu Hiramoto⁴</i> ¹ Hokkaido University ² University of Tokyo ³ Fujitsu Nagano Systems Engineering ⁴ HIR

12:15pm–
6:00pm

Half-Day Excursion
Location: CLOS LACHANCE WINERY



Thursday, May 21, 2009

8:45am–
9:00am

Announcements
Location: EAGLE ROOM

9:00am–
9:45am

Invited Presentation
Dimitris Drikakis, Cranfield University
High-fidelity CFD Simulations of Shock Physics, Instabilities, Transition and Turbulence Using High-order Methods and Parallel Computing
Location: EAGLE ROOM

9:45am–
10:15am

Coffee Break
Location: LOBBY

Session 4A: Parallel CFD: Performance and Scaling Tools <i>Session Chair: Bharat Soni, University of Alabama at Birmingham</i> Location: EAGLE ROOM	Session 4B: Mechanical/Aerospace Engineering Applications II <i>Session Chair: Ismail Tuncer, Middle East Technical University</i> Location: WORLD ROOM	Session 4C: Design Optimization <i>Session Chair: Charles Nietubicz, Army Research Center</i> Location: SPACE STATION ROOM
<p>10:15am– 10:45am</p> <p>Performance Engineering: Tools and Techniques for Getting the Most out of your Application <i>David Cronk¹</i> ¹The University of Tennessee</p>	<p>10:15am– 10:45am</p> <p>Exploring Discretization Error in Simulation-Based Aerodynamic Databases <i>Michael Aftosmis¹, Marian Nemec²</i> ¹NASA Ames Research Center ²ELORET Corp.</p>	<p>10:15am– 10:45am</p> <p>Parallel Performance of CFD Applications and the Ubiquitous Need for HPC with High Fidelity, Multidisciplinary Analysis and Optimization (MDO) <i>Mark Kremenetsky¹, Srinivas Kodiyalam¹</i> ¹Silicon Graphics Inc.</p>
<p>10:45am– 11:15am</p> <p>Multi-Language Instrumentation of CFD Applications Using TAU <i>Sameer Shende¹, Allen D. Malony¹, Alan Morris¹</i> ¹ParaTools, Inc.</p>	<p>10:45am– 11:15am</p> <p>A Hybrid CPU/GPU Parallel Algorithm for Coupled Eulerian and Vortex Particle Methods <i>Christopher Stone¹, Earl Duque¹, Christopher Hennes²</i> ¹Intelligent Light ²Vortex Consulting</p>	<p>10:45am– 11:15am</p> <p>Efficient Parallel Algorithm for Aerodynamic Design of Wing-Body-Junction Driven by Accurate Navier-Stokes Computations <i>Sergey Peigin¹, Boris Epstein²</i> ¹Israel Aerospace Industries ²The Academic College of Tel-Aviv-Yaffo</p>
<p>11:15am– 11:45am</p> <p>Parallel Performance Evaluation of Helios <i>Andrew Wissink¹, Sameer Shende²</i> ¹Scaled Numerical Physics LLC ²ParaTools, Inc.</p>	<p>11:15am– 11:45am</p> <p>Numerical Drag Reduction Studies of Generic Truck Models Using Active Flow Control <i>Ramesh Agarwal¹, Miles Bellman¹, Jonathan Naber¹</i> ¹Washington University in St. Louis</p>	<p>11:15am– 11:45am</p> <p>Adjoint-Based Adaptive Meshing and Shape Optimization in a Parallel Setting <i>Marshall Gusman¹, Jeff Housman¹, Cetin Kiris²</i> ¹U.C. Davis & ELORET Corp. ²NASA Ames Research Center</p>
<p>11:45am– 12:15pm</p> <p>Analyzing the Performance of Scientific Applications with Open SpeedShop <i>Martin Schulz¹, Jim Galarowicz², Don Maghrak², William Hachfeld², David Montoya³, Scott Cranford⁴</i> ¹Lawrence Livermore National Laboratory ²Krell Institute ³Los Alamos National Laboratory ⁴Sandia National Laboratories</p>	<p>11:45am– 12:15pm</p> <p>Flow Modeling of Projectile Using Overset Flow Solver <i>Erdal Yilmaz¹, Shahrouz Aliabadi¹</i> ¹Jackson State University</p>	<p>11:45am– 12:15pm</p> <p>Parametric Co-Optimization of Lifting Blunt Body Vehicle Concepts for Atmospheric Entry <i>Joseph Garcia¹, James Brown¹, David Kinney¹, Jeffrey Bowles¹, Loc Huynh²</i> ¹NASA Ames Research Center ²ELORET Corp.</p>

12:15pm–
2:00pm

Lunch
Location: AMES EXPLORATION CENTER



Thursday, May 21, 2009

2:00pm–
2:45pm

Invited Presentation
Dimitri Mavriplis, University of Wyoming
High Performance Computational Engineering: Putting the E Back in CSE
Location: EAGLE ROOM

2:45pm–
3:15pm

Coffee Break
Location: LOBBY

3:15pm–
3:45pm

	Session 5A: Enabling Computationally Based Acquisition Engineering of Aeronautical Defense Systems <i>Session Chair: Robert Meakin, DoD High Performance Computing Modernization Program</i> Location: EAGLE ROOM	Session 5B: Large-Scale Application Scaling <i>Session Chair: Suga Sugavanam, IBM Corporation</i> Location: WORLD ROOM	Session 5C: CFD on GPUs <i>Session Chair: Akin Ecer, Indiana University-Purdue University Indianapolis</i> Location: SPACE STATION ROOM
	<p>Computationally Based Engineering for Air Vehicle Acquisition: The CREATE-AV Project <i>Robert Meakin¹</i> ¹DoD High Performance Computing Modernization Program</p> <p>Computationally Based Engineering for Air Vehicle Acquisition: Conceptual Design <i>Gregory Roth¹</i> ¹U.S. Air Force Aeronautical Systems Center</p>	<p>Scaling Applications to 100,000 Cores and Beyond on IBM Systems <i>Jeffrey Fier¹, Jeff Zais¹</i> ¹IBM Corporation</p>	<p>A Fast Double Precision CFD Code using CUDA <i>Jonathan Cohen¹, Jeroen Molemaker²</i> ¹NVIDIA Corporation ²University of California, Los Angeles</p>
	<p>Kestrel - A Fixed Wing Virtual Aircraft Product of the CREATE Program <i>Scott Morton¹, David McDaniel¹, David Sears¹, Brett Tillman¹, Todd Tuckey¹</i> ¹Air Force SEEK EAGLE Office</p>	<p>Performance of CFD Applications on NASA Supercomputers <i>M. Jahed Djomehri¹, Dennis Jespersen¹, James Taft², Henry Jin¹, Robert Hood³, Piyush Mehrotra¹</i> ¹NASA Ames Research Center ²Sienna Software, Inc. ³Computer Sciences Corporation</p>	<p>Acceleration of a CFD Code with a GPU <i>Dennis Jespersen¹</i> ¹NASA Ames Research Center</p>
	<p>Computationally Based Engineering for Air Vehicle Acquisition: Airframe-Propulsion Integration <i>Robert Nichols¹</i> ¹University of Alabama Birmingham</p>	<p>General Performance Optimizations for Several Unstructured Mesh CFD Codes on NASA HPC Systems <i>James Taft¹</i> ¹Sienna Software, Inc.</p>	<p>Application of a Kinetic Theory Based Solver of the Euler Equations Using GPUs <i>Matthew Smith¹, Fang-An Kuo¹, Chau-Yi Chou¹, Jong-Shinn Wu², Hadley Cave³</i> ¹National Centre for High Performance Computing ²National Chiao Tung University ³University of Canterbury</p>
	<p>Computationally Based Engineering for Air Vehicle Acquisition: Rotary Wing Simulation <i>Venkateswaran Sankaran¹</i> ¹US Army Research, Development, and Engineering Command</p>		<p>Heterogeneous Parallelism of High-Order Residual Distribution Schemes Using Central and Graphics Processing Units <i>Stephen Guzik¹, Clinton Groth¹</i> ¹University of Toronto Institute for Aerospace Studies</p>

5:30pm–
9:00pm

Reception
Location: COMPUTER HISTORY MUSEUM
Live music provided by SpongeBop



Friday, May 22, 2009

8:45am–
9:00am

Announcements
Location: EAGLE ROOM

9:00am–
9:45am

Invited Presentation
Kazuhiro Nakahashi, Tohoku University
Building-Cube Method: A Block-Structured Cartesian Grid Approach for Near-Future Peta-Flops Computers
Location: EAGLE ROOM

9:45am–
10:15am

Coffee Break
Location: LOBBY

<p style="text-align: center;">Session 6A: Parallel and Meshfree: New Frontiers of CFD <i>Session Chair: David Emerson, STFC Daresbury Laboratory</i> Location: EAGLE ROOM</p>	<p style="text-align: center;">Session 6B: Parallel Software Development <i>Session Chair: Hasan Akay, Indiana University-Purdue University Indianapolis</i> Location: WORLD ROOM</p>	<p style="text-align: center;">Session 6C: Other Applications <i>Session Chair: Anil Deane, University of Maryland</i> Location: SPACE STATION ROOM</p>
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10:15am–
10:45am

<p style="text-align: center;">Parallel and Meshfree: New Frontiers of CFD <i> Lorena Barba¹</i> <i>¹Boston University</i></p>	<p style="text-align: center;">Porting to Cell/B.E. the Alya System, a High Performance Computational Mechanics Code <i>Raúl de la Cruz¹, Mauricio Araya-Polo¹, Mariano Vázquez¹, Guillaume Houzeaux¹, Mohammad Jowkar¹, José María Cela¹</i> <i>¹Barcelona Supercomputing Center</i></p>	<p style="text-align: center;">Numerical Modeling of Nonequilibrium Driven Cavity Gas Flow with a High-order Moment Approach <i>Xiao-Jun Gu¹, David Emerson¹, Gui-Hua Tang¹, Charles Moulinec¹</i> <i>¹STFC Daresbury Laboratory</i></p>
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10:45am–
11:15am

<p style="text-align: center;">Hybrid OpenMP-MPI Approach for Smoothed Particle Hydrodynamics <i>Charles Moulinec¹, Reza Issa², David Latino³, Pascal Vezolle³, David Emerson¹, Xiao-Jun Gu¹</i> <i>¹STFC Daresbury Laboratory</i> <i>²National Hydraulics and Environment Laboratory</i> <i>³IBM Corporation</i></p>	<p style="text-align: center;">Using XML with Large Parallel Datasets: Is There Any Hope? <i>Renato Elias¹, Vanessa Braganholo², Jerry Clarke³, Marta Mattoso¹, Alvaro Coutinho¹</i> <i>¹Alberto Luiz Coimbra Institute Graduate School and Research in Engineering</i> <i>²Instituto de Matemática</i> <i>³US Army Research Laboratory</i></p>	<p style="text-align: center;">Development of a Virtual Mesh Refinement Algorithm in a Parallel Unstructured-grid DSMC Code <i>Cheng-Chin Su¹, Kun-Chang Tseng², Jong-Shinn Wu¹, Jeng-Peng Yu³, Yu-Yong Lian²</i> <i>¹National Chiao Tung University</i> <i>²National Space Organization</i> <i>³Ming Chuan University</i></p>
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11:15am–
11:45am

<p style="text-align: center;">Parallel Implementation of Panel-free Boundary Conditions for the Vortex Particle Method <i>Felipe Cruz¹, Christopher Cooper², Rio Yokota¹, Lorena Barba³</i> <i>¹University of Bristol</i> <i>²Universidad Técnica Federico Santa María</i> <i>³Boston University</i></p>	<p style="text-align: center;">Accelerating Clean Coal Gasifier Designs with Hybrid MPI/OpenMP High Performance Computing <i>Aytekin Ge¹, Sreekanth Panna², Ramanan Sankaran³, Chris Guenther¹, Madhava Syamlal¹, Thomas O'Brien¹</i> <i>¹National Energy Technology Laboratory</i> <i>²ALPEMI Consulting, LLC</i> <i>³Oak Ridge National Laboratory</i></p>	<p style="text-align: center;">Numerical Simulation of Scattering of Helioseismic MHD Waves by Sunspots <i>Konstantin Parchevsky¹, Alexander G. Kosovichev¹</i> <i>¹Stanford University</i></p>
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11:45am–
12:15pm

<p style="text-align: center;">DNS of Homogeneous Turbulence Using Vortex Methods Accelerated by the FMM on a Cluster of GPUs <i>Rio Yokota¹, Tetsu Narum², Ryuji Sakamak², Shun Kameoka², Kenji Yasuoka², Shinnosuke Ob²</i> <i>¹University of Bristol</i> <i>²Keio University</i></p>	<p style="text-align: center;">Report on the Development of a Generic Discontinuous Galerkin Framework in .NET <i>Florian Kummer¹</i> <i>¹Technischen Universität Darmstadt</i></p>	
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12:15pm–
1:00pm

Lunch (For registered tour attendees only)
Location: LOBBY

1:00pm–
2:30pm

Optional NASA Ames Supercomputing Tour
Location: NASA ADVANCED SUPERCOMPUTING FACILITY

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