Technical Sessions – Detailed

Monday, 16 March

08:30-09:00 Opening Remarks	Noble House A

09:00-10:30
Semi-Plenary Sessions

Semi-Plenary Session 1	MoMP1 Noble House A Chair: Chao-An Lin

Liquid-Vapor Phase Transitions: Thermomechanical Theory, Entropy Variable Formulation, and Boiling Simulations

Thomas Hughes, Ju Liu, Chad M. Landis and Hector Gomez

Particulate Flow with Free Surfaces

Peter Wriggers, Bircan Avci and Jan-Philipp Fürstenau

ST-VMS Computational Analysis of Bio-Inspired Flapping-Wing Aerodynamics of an MAV

Kenji Takizawa, Tayfun E. Tezduyar, Bradley Henicke, Nikolay Kostov and Anthony Puntel

Semi-Plenary Session 2	MoMP2 Noble House B Chair: Tony Sheu

Multi-Scale Fluid Flows with Moving Boundaries

Wei Shyy

Applications of GSM-CFD to Biomechanics and   Fluid-Structure Interaction Problems

Gui-Rong Liu and Jianyao Yao

Instabilities in Bluff Body Flows

Sanjay Mittal, Navrose and M. Furquan

10:30-10:50
Coffee Break

10:50-12:30, 16 March

Symposia

Biomedical Fluid Mechanics and FSI - 1	MoM01 Noble House A Chair: Tayfun Tezduyar

Keynote Lecture (20 minutes)

A-010 Clinical Data Assimilation and Uncertainty Quantification in Cardiovascular Simulations

Alison Marsden, Daniele Schiavazzi and Tain-Yen Hsia

Invited Lecture (20 minutes)

A-003 FSI Analysis of Blood Flow in the Aorta and Its Relationship to the Geometrical Characteristics

Hiroshi Suito, Kenji Takizawa, Viet Q. Huynh, Takuya Ueda and Tayfun E. Tezduyar

Invited Lecture (20 minutes)

A-014 Cell Adhesion in Microcirculation

Yang Liu, Weiwei Yan and Bingmei Fu

Invited Lecture (20 minutes)

A-002 Multiscale Thrombosis Simulations on Massively Parallel Computers

Kazuyasu Sugiyama, Satoshi Ii, Shu Takagi and Yoichiro Matsumoto

Invited Lecture (20 minutes)

A-013* Arterial Dynamics Computation with Surface-Extraction Medical-Image-Based Time-Dependent Anatomical Models and Element-Based Zero-Stress Estimates

Takafumi Sasaki, Kenji Takizawa, Tayfun E. Tezduyar, Hirokazu Takagi, Keiichi Itatani, Shohei Miyazaki and Kagami Miyaji

10:50-12:30, 16 March **Complex Fluids - 1**	MoM02 Noble House B Chair: Ching-Yao Chen

Keynote Lecture (40 minutes)

B-005 Simulations of Behavior of Magnetic Particles in Magnetic Functional Fluids by Using Hybrid Discrete Particle Method

Yasushi Ido, Hiroaki Tsutsumi and Hirotaka Sumiyoshi

Invited Lecture (20 minutes)

B-007 Investigation of shear-induced migration, ordering, and shape-morphing dynamics in soft particle and red blood cell suspensions

Yeng-Long Chen, Wei Chien, Chih-Tang Liao, Shih-Hao Wang, and Yi-Fan Wu

Invited Lecture (20 minutes)

B-002 Dynamics of Janus Magnetic Particles under the Influence of An Externally Applied Magnetic Field

Tae Gon Kang, M.A. Hulsen, J.M.J. den Toonder, and P.D. Anderson

Oral Presentation (20 minutes)

B-006* Micropolar Fluid to Model 2d Heat Transfer Enhancement in Nanofluids

Adel Sarmiento, Adriano Cortes, Daniel Garcia, Lisandro Dalcin, Nathan Collier and Victor M. Calo

10:50-12:30, 16 March	MoM03
High Performance Computing in Fluid Flow - 1	VIP Room 1 Chair: Feng-Nan Hwang

Keynote Lecture (20 minutes)

J-003 A New Framework of Iteratively Adaptive Multiscale Finite Element Methods

Feng-Nan Hwang

Invited Lecture (20 minutes)

J-002 An Adaptively Refined Least-Squares Finite Element Method for Non-Newtonian Fluid Flows

Hsueh-Chen Lee

Invited Lecture (20 minutes)

J-008 Parallel Simulating Flows Passing a Wind Turbine with a Fully Implicit Method on a Moving Domain

Rongliang Chen, Zhengzheng Yan, Yubo Zhao and Xiao-Chuan Cai

Invited Lecture (20 minutes)

J-012* Parallel Numerical Simulation of Non-Newtonian Blood Flows

Wen-Shin Shiu, Eric Haujuan Hu, Feng-Nan Hwang and Xiao-Chuan Cai

Oral Presentation (20 minutes)

J-005* A Comparative Study on the Computational Efficiency of Locally Conservative Finite Element Methods for Subsurface Flows

Justin Chang, Kalyana Nakshatrala and Lennart Johnsson

10:50-12:30, 16 March	MoM04
Stabilized, Multiscale, and Isogeometric Methods in CFD - 1	VIP Room 2 Chair: Thomas Hughes

Keynote Lecture (40 minutes)

U-010 The Method of Subgrid Vortices: An Isogeometric Structure-Preserving Approach to Variational Multiscale Modeling of Turbulence

John A. Evans

Invited Lecture (20 minutes)

U-012 PetIGA-MF: High-Performance Isogeometric Analysis for Multifields Models

A.M.A. Cortes, A.S. Rodriguez, L.D. Dalcin, L.F.R. Espath and V.M. Calo

Invited Lecture (20 minutes)

U-004 Geometrically Consistent Methods Based on Vorticity-Velocity Coupling

Maxim A. Olshanskii and Leo Rebholz

U-002 Stability and convergence results for Algebraic Flux Correction schemes

Gabriel R. Barrenechea, Volker John and Petr Knobloch

12:30-13:50

Lunch Break

13:50-15:10

Symposia

Biomedical Fluid Mechanics and FSI - 2	MoA01 Noble House A Chair: Hiroshi Suito

Keynote Lecture (20 minutes)

A-007 FSI Analysis of a Bioabsorbable Coronary Stent

Ryo Torii, Kenji Takizawa and Tayfun E. Tezduyar

Invited Lecture (20 minutes)

A-004 Patient-Specific CFD of Aortic Haemodynamics: Bringing Cardiovascular Virtual Reality to Clinical Bedside Practice

Alessandro Reali, F. Auricchio, M. Conti, C. Trentin, A. Lefieux, S. Morganti, A. Reali, F. Secchi, S. Trimarchi, A. Veneziani

Invited Lecture (20 minutes)

A-006 Rheology of A Red BLood CEll Suspension Computing with A Boundary Element-Finite Element Coupled Method

Toshihiro Omori, Yohsuke Imai and Takuji Ishikawa

Invited Lecture (20 minutes)

A-009* One-Dimensional Models for Blood Flow Applications

Etienne Boileau and Perumal Nithiarasu

13:50-15:10, 16 March **Complex Fluids - 2**	MoA02 Noble House B Chair: Manoranjan Mishra

Invited Lecture (20 minutes)

B-004 Incompressible N-Phase Flows: Physical Formulation and Numerical Algorithm

Suchuan Dong

Invited Lecture (20 minutes)

B-008 A Flow-Particle Interaction Model for the Onset of Quicksand

Fu-Ling Yang, Shin-Ruei Lin, Chuin-Shan Chen and Shang-Hsein Hsieh

Oral Presentation (20 minutes)

B-011* Simulation of Flows over Cylinders Influenced by a DBD Plasma Actuator

Tzu-Hsiang Lin and Yang-Yao Niu

Oral Presentation (20 minutes)

W-007 Effect of Longtudinal Alignment on Wake Flow Characteristics behind Side-by-Side Cylinders of Unequal Diameter at Small Gap

Chien-Chang Chen, Sheng-Yung Tseng, Shang-Wen Hsu and Cheng-Hsiung Kuo

13:50-15:10, 16 March	MoA03
GPU Applications in Fluid Flow - 1	VIP Room 1
	Chair: Jong-Shinn Wu

Keynote Lecture (20 minutes)

I-004 Highly Parallel Implicit CFD applied to GPU Computing with Unstructured Tetrahedral Grids

Matthew Smith and Yi-Hsin Lin

Oral Presentation (20 minutes)

I-001 A Research on Particle-Based Parallel Methods for Fluid Animation

Feng-Quan Zhang and Liu-Qing Xu

Invited Lecture (20 minutes)

I-003 Solving Euler Equation on Multiple Graphics Processing Units with Immersed Boundary Method

Fang-An Kuo and Jong-Shinn Wu

Invited Lecture (20 minutes)

I-006* Multi-Relaxation-Time Lattice Boltzmann Simulations on Multi-GPU Cluster

You-Hsun Lee, Li-Min Huang, You-Hsun Lee and Chao-An Lin

13:50-15:10, 16 March	MoMA04
Stabilized, Multiscale, and Isogeometric	VIP Room 2
Methods in CFD - 2	Chair: John Evans

Keynote Lecture (40 minutes)

U-009 Finite Element Approximation of the Viscoelastic Flow Problem: A Non-Residual Based Stabilized Formulation

Ramon Codina and Ernesto Castillo

Invited Lecture (20 minutes)

U-006 A Stabilized Cut Finite Element Method for the Convection Problem on a Surface

Erik Burman, Peter Hansbo, Mats G. Larson and Sara Zahedi

Invited Lecture (20 minutes)

U-013 Hourglass control by means of the Virtual Element Method

A. Cangiani, G. Manzini, Alessandro Russo and N. Sukumar

15:10-15:30, 16 March

Coffee Break

15:30-17:10, 16 March

Symposia

Fluid-Structure Interaction - 1	MoE01 Noble House A Chair: Alessandro Reali

Invited Lecture (20 minutes)
G-013 Simulations of Flow Past A Cylinder with Adaptive Nonconforming Spectral Element Method
Li-Chieh Hsu, Jian-Zhi Ye and Ching-Yao Chen

Oral Presentation (20 minutes)
G-016 CFD-CSD Approach to Evaluate the Aeroelastic Response of A Hypersonic Vehicle Wing
Jinan Lv, Zhanjun Chen, Yingyu Hou and Ziqiang Liu

Oral Presentation (20 minutes)
G-019 Hypersonic Aerothermoelastic Response Wimulation Using CFD/CSD Approach
Zhi Chen, Jinan Lv, Bangcheng Ai and Jijun Yu

Oral Presentation (20 minutes)
G-020* Incompressible Smoothed Particle Hydrodynamics Modelling for Solid-Fluid Interaction Based On Artificial Compressibility Method
Burniadi Moballa, Ming-Jyh Chern, and Symphony Chakrabort

Oral Presentation (20 minutes)
A-005* The Effect of Various Assist Levels of Left Ventricular Assist Device on Risk of Stroke
Kaiyun Gu, Yage Zhang, Bin Gao, Yu Chang and Yi Zeng

15:30-17:10, 16 March **Complex Fluids - 3**	MoE02 Noble House B Chair: Suchuan Dong

Keynote Lecture (40 minutes)
B-009 Interfacial Instability of Hele-Shaw/Porous Medium Flows by Diffuse Interface Approaches
Pei-Yu Yan and <u>Ching-Yao Chen</u>

Invited Lecture (20 minutes)
B-003* Computational Study on Miscible Viscous Fingering Dynamics with Non-Linear Adsorption
Manoranjan Mishra and Chinar Rana

Invited Lecture (20 minutes)
K-002 On the Simulation of Binary Droplet Collision with Surfactant
Yu-Hau Tseng, <u>Kuo-Long Pan</u> and Ming-Chih Lai

Oral Presentation (20 minutes)

B-010* Simulate Gravity-Current by Using Phase-Field Method

Yu-Sheng Huang, M.M. Nasr-Azadani, Eckart Meiburg and Ching-Yao Chen

15:30-17:10, 16 March	MoE03
	VIP Room 1
GPU and High Performance Computing	Chair: Matthew Smith

Invited Lecture (20 minutes)

I-002 Parallel Direct Simulation Monte Carlo Method Using Graphics Processing Units

Cheng-Chin Su, Ming-Chung Lo, Jong-Shinn Wu and Fang-An Kuo

Oral Presentation (20 minutes)

I-005* Comparison of Various Explicit CFD schemes applied to GPU Computing with Unstructured Tetrahedral Grids

Chieh-ming Chang and Matthew Ross Smith

Oral Presentation (20 minutes)

J-011* The Parallel Quiet Direct Simulation (QDS) method Applied to Unstructured Tetrahedral Grid Computation using the Intel Phi Coprocessor

Shawn (Kang-Bin) Ma and Matthew Smith

Oral Presentation (20 minutes)

W-011 A Multiphysic Implementation for Conjugate Heat Transfer and Compressible-Low Mach Coupling

Miguel Zavala, D. Mira, M. Vazquez and G. Houzeaux

Oral Presentation (20 minutes)

J-013* Parallel Implementation of Shur Compliment Based Pressure Poisson Equation

Sung Hua Chen, Feng-Nan Huang and Chao-An Lin

15:30-17:10, 16 March	MoE04
	VIP Room 2
Computational Biomedicine and Biofluids	Chair: Tony Sheu

Keynote Lecture (30 minutes)

D-010 A high Order DG Scheme for One-dimensional Blood Flow in Networks of Human Vessels

George Huang

Keynote Lecture (30 minutes)

D-006 Hemodynamic Analysis of the Development of Human Cerebral Aneurysms

Yuji Shimogonya, Shunichi Fukuda and Yasuhide Imoto

Invited Lecture (20 minutes)

D-008 Towards A Surgical Planning Platform for the Ablation of Liver Tumor by Focused Ultrasound

Maxim A. Solovchuk, Tony W.H. Sheu and Marc Thiriet

Invited Lecture (20 minutes)

D-021* Understanding Hydrocephalus using Multicompartmental Poroelasticity

John C. Vardakis, Dean Chou and Yiannis Ventikos

Tuesday, 17 March

09:00-10:30 Semi-Plenary Sessions	
Semi-Plenary Session 3	TuMP1 Noble House A Chair: Tayfun E. Tezduyar

Multi-scale Modelling and Simulation of Thrombus Formation
Yoichiro Matsumoto, Satoshi Ii, Seiji Shiozaki, Kazuyasu Sugiyama and Shu Takagi
Computational FSI: Methods Developed and Simulations Performed
Yuri Bazilevs
Space–Time Interface Tracking in Fluid Mechanics Computations with Contact between Moving Solid Surfaces
Kenji Takizawa, Tayfun E. Tezduyar, Austin Buscher and Shohei Asada

Semi-Plenary Session 4	TuMP2 Noble House B Chair: Yen-Sen Chen

PSPIKE: A Parallel Hybrid Sparse Linear System Solver
Ahmed H. Sameh and Yao Zhu
Reduced Order Models for Real-Time Simulation and Control of Physiological Flows
Alfio Quarteroni, Andrea Manzoni and Federico Negri
Immersed Boundary Method and Its Applications
Chuan-Chieh Liao and Chao-An Lin

10:30-10:50 Coffee Break	
10:50-12:30 Symposia	

Fluid-Structure Interaction - 2	TuM01 Noble House A Chair: Yuri Bazilevs

Keynote Lecture (20 minutes)
G-002 FSI Simulation and Analysis of Flapping of Flexible Filaments in a Flow
Tomohiro Sawada
Invited Lecture (20 minutes)
G-009* Ringsail-Parachute Design Studies Based on Aerodynamic-Moment Computation
Yuki Tsutsui, Kenji Takizawa, Tayfun E. Tezduyar and Cody Boswell

Invited Lecture (20 minutes)

G-011* Geometric-Porosity Modeling for the NASA Drogue Parachute

Taro Kanai, Kenji Takizawa, Yuki Tsutsui, Tayfun E. Tezduyar and Ryan Kolesar

Invited Lecture (20 minutes)

G-012* Cable Dynamics in an Internal Flow with Obstacles

Hitoshi Hattori, Kenji Takizawa and Tayfun E. Tezduyar

Invited Lecture (20 minutes)

G-010* Contact Modeling of MAV Clapping Wings

Yuto Otoguro, Kenji Takizawa, Tayfun E. Tezduyar and Austin Buscher

10:50-12:30, 17 March **Environmental Fluid Mechanics - 1**	TuM02 Noble House B Chair: Y Kazuo Kashiyama

Keynote Lecture (40 minutes)

E-008 Recent Progress in Discontinuous Galerkin Methods for Shallow Water and Overland Flow

Ethan J. Kubatko

Invited Lecture (20 minutes)

E-010 A Three-Dimensional Discontinuous Galerkin Dynamical Core for Nonhydrostatic Atmospheric Simulations on the Sphere

Sébastien Blaise, Eric Deleersnijder and Jonathan Lambrechts

Invited Lecture (20 minutes)

E-004 Study on the Outflow Boundary Condition for Wildfire Simulation Based on the Fluid-Combustion Interaction Analysis

Hiroshi Hasebe, Tomoya Saito and Takashi Nomura

Invited Lecture (20 minutes)

E-009* Development of A Simulation Based Experience System for Tsunami Using VR Technology

Takeshi Kawabe, Kazuo Kashiyama, Hideo Miyachi and Yudai Iwatsuka

10:50-12:30, 17 March **Geometric Modeling & Mesh Generation - 1**	TuM03 VIP Room 1 Chair: Suzanne Shontz

Keynote Lecture (40 minutes)

H-005 Trimmed T-splines Conversion

Xin Li and Tom Sederberg

Invited Lecture (20 minutes)

H-003 IGA-suitable NURBS Parameterization of Computational Domain with Complex CAD Boundary by Domain Partition and Isogeometric Solving

Gang Xu, Ming Li, Bernard Mourrain and St´ephane P.A. Bordas

Invited Lecture (20 minutes)

H-008 Constructing Complex B-spline Solid with Representation of Material And Property

Long Chen

Invited Lecture (20 minutes)

H-002 New Advances in Volumetric T-Spline Construction for Isogeometric Analysis

Yongjie Jessica Zhang

10:50-12:30, 17 March **Immersed Boundary Methods in Fluid Flow - 1**	TuM04 VIP Room 2 Chair: Xiao-Dong Niu, Chuan-Chieh Liao

Keynote Lecture (40 minutes)

K-001 Numerical Simulations for A Leaky Dielectric Drop under DC Electric Field in Navier-Stokes Flow

Wei-Fan Hu, Ming-Chih Lai and Yuan-Nan Young

Invited Lecture (20 minutes)

K-005 Fraction Direct-Forcing Immersed-Boundary Method with Subgrid Enrichment

Jer-Fong Lin, Shin-Rhui Lin, Fu-Ling Yang, Shang-Hsien Hsieh and Chuin-Shan Chen

Invited Lecture (20 minutes)

G-003 Direct Forcong Immersed Boundary Modeling for Vortex-Induced Vibration with Ground Effect

Ming-Jyh Chern, Guan-Ting Lu, Yu-Hao Kuan and Tzyy-Leng Horng

Oral Presentation (20 minutes)

K-006* A Multiphase SPH Model for Simulating Interfacial Flows with Large Density Ratios

Zhen Chen, Chang Shu

12:30-13:50, 17 March **Lunch Break**

13:50-15:10, 17 March

Symposia

Fluid-Structure Interaction - 3	TuA01 Noble House A Chair: Yoichi Ogata

Keynote Lecture (20 minutes)

G-004 Development of the Efficient Approach for the Fluid-Structure Interaction Problems and the Comparison between Experiment and Computation

Yasushi Nakabayashi, Shinsuke Nagaoka, Yoshiaki Tamura and Genki Yagawa

Invited Lecture (20 minutes)

F-009 A Numerical Study of Linear and Nonlinear Undulatory Fish with the DSD/SST Method

Fang-Bao Tian

Invited Lecture (20 minutes)

G-018* Simulating the Interaction of Two Differential-Size Sedimenting Spheres

Chuan-Chieh Liao, Wen-Wei Hsiao, Ting-Yu Lin and Chao-An Lin

Invited Lecture (20 minutes)

G-005 Numerical Analysis of Seepage-Induced Erosion by the Darcy-Brinkman Equations

Kazunori Fujisawa

13:50-15:10, 17 March **Higher-Order and DG Methods - 1**	TuA02 Noble House B Chair: Harald van Brummelen

Keynote Lecture (40 minutes)

J-007 Simulating Complex Flows in the Earth Mantle

Wolfgang Bangerth

Invited Lecture (20 minutes)

F-005 A Space-Time Cut Finite Element Method for Convection-Diffusion Problems on Time Dependent Domains

Peter Hansbo, Mats G. Larson and Sara Zahedi

Invited Lecture (20 minutes)

X-004 A Cut Discontinuous Galerkin Method for the Laplace-Beltrami Operator

Erik Burman, Peter Hansbo, Mats G. Larson and André Massing

13:50-15:10, 17 March **Geometric Modeling & Mesh Generation - 2**	TuA03 VIP Room 1 Chair: Jessica Zhang

Keynote Lecture (20 minutes)

H-001 Automatic Generation and Direct Editing of Hexahedral Mesh

Shuming Gao

Invited Lecture (20 minutes)

H-006 Fast and Parallel Unstructured Mesh Generation for Large-Scale Aerodynamics Simulations

Jianjun Chen, Yao Zheng, Zoufang Xiao, Dawei Zhao and Jianjing Zheng

Invited Lecture (20 minutes)

H-009 Adaptive Anisotropic Meshing and Implicit Boundary for General Multiphase Computation

Thierry Coupez, Luisa Silva and Hugues Digonnet

Invited Lecture (20 minutes)

H-007 A Parallel Log Barrier-Based Mesh Warping Method for Distributed Memory Machines

Suzanne M. Shontz and Thap Panitanarak

13:50-15:10, 17 March	TuA04
	VIP Room 2
Mathematical Methods in CFD - 1	Chair: Norikazu Saito

Keynote Lecture (40 minutes)

O-015 Error Estimates of Stabilized Galerkin-Characteristics Finite Element Schemes for Incompressible Flow Problems

Hirofumi Notsu and Masahisa Tabata

Invited Lecture (20 minutes)

O-012 A Pressure-Stabilized Lagrange-Galerkin Finite Element Scheme for an Oseen-Type Diffusive Peterlin Model

Masahisa Tabata, Maria Lukacova, Hana Mizerova and Hirofumi Notsu

Invited Lecture (20 minutes)

O-013 Pressure-Stabililzed Finite Element Methods for Viscoelastic Flow Problems

Daisuke Tagami

13:50-15:10, 17 March	TuA05
Optimization, Flow control and Industrial	VIP Room 8
Applications	Chair: Sanjay Mittal

Oral Presentation (20 minutes)

P-003* Shape Optimization of Corrugated Airfoils

Sambhav Jain, Varun Bhatt and Sanjay Mittal

Oral Presentation (20 minutes)

P-004 An Optimized dynamical Design of Aircraft Belly Shell

Liu-Qing Xu, Feng-Quan Zhang and Li-Li Guo

Oral Presentation (20 minutes)

W-014* Properties of Hydrodynamic Porous Bearing with External Pressure

Dein Shaw, Hui-An Hsieh and Chi-Yu Lo

Oral Presentation (20 minutes)

W-010* Numerical Simulations of a Swirled-Liquid Impinging Thermoelectric Cooler (Slitec)

Kuan Sung Hsu, Mark Christian E. Manuel and Po Ting Lin

15:10-15:30, 17 March
Coffee Break

15:30-17:10, 17 March
Symposia

Flows With Moving Boundaries and Interfaces - 1	TuE01 Noble House A Chair: Takashi Nomura

Keynote Lecture (20 minutes)
C-002 FEM Prediction of Particle Erosion in Turbomachinery Cooling
Franco Rispoli, D. Borello, L. Cedola, A. Salvagni, P. Venturini and T. E. Tezduyar
Invited Lecture (20 minutes)
F-006* Fluid-Structure Interaction Dealing with Thin Objects
Suguru Miyauchi and Takeo Kajishima
Invited Lecture (20 minutes)
F-004 Investigation of the Propulsion Mechanism of Swimming Killifish
Yoichi Ogata, Takayuki Azama and Keiya Nishida
Invited Lecture (20 minutes)
F-008 Simulations of the Three-Dimensional Hydraulic Transient Process of Francis Turbine with an Immersed Boundary
Wenquan Wang and Fang-Bao Tian

15:30-17:10, 17 March **Environmental Fluid Mechanics - 2**	TuE02 Noble House B Chair: Ethan Kubatko

Invited Lecture (20 minutes)
E-001 Sequential Analysis of Steel Frame Building Subjected to Seismic Excitation, Tsunami and Debris Collision
Daigoro Isobe and Yuan Qi Dong
Invited Lecture (20 minutes)
E-002* Large-Scale Palallel Fluid-Structure Interaction Simulation Using MPS-FE Partitioned Coupling Method
Naoto Mitsume, Shinobu Yoshimura, Kohei Murotani and Tomonori Yamada
Invited Lecture (20 minutes)
E-003 Fluid-Structure Interaction Analysis with Finite Cover Method
Shinsuke Takase, Takuma Kotani, Shuji Moriguchi, Kenjiro Terada, Kazuo Kashiyama, Mitsuteru Asai and Mao Kurumatani
Invited Lecture (20 minutes)
E-007* Large Scale Simulation for Tsunami Waves Using the 3D parallel VOF method
Taiki Fumuro, Seizo Tanaka and Kazuo Kashiyama
Invited Lecture (20 minutes)
E-006* Development of a 2D-3D Hybrid Tsunami Numerical Model Based on Stabilized Finite Element Method
Guoming Ling, Junichi Matsumoto and Kazuo Kashiyama

15:30-17:10, 17 March	TuE03
Immersed Boundary Methods in Fluid Flow - 2	VIP Room 1
	Chair: Ming-Chih Lai, Ming-Jyh Chern

Keynote Lecture (40 minutes)

K-003 Developing LES/DNS Simulation Capability Based on Immersed Boundary Method Coupled with FCAC Multigrid and AMR Techniques

Hongyi Xu

Invited Lecture (20 minutes)

G-007 A Momentum Exchange-Based Immersed Boundary-Lattice Boltzmann Method for Simulating Fluid-Structure Interaction Problem in an Incompressible Flow

Xiao-Dong Niu

Invited Lecture (20 minutes)

K-004 Influence of Prandtl Number on Instability of Buoyancy Induced Flows at Moderate Rayleigh Number

Chuan-Chieh Liao and Chao-An Lin

Oral Presentation (20 minutes)

G-008* An Immersed-Boundary-Type Simulator Based on the Spectral Eelement Method for 2D Fluid-Structure Interaction Problems

Li-Chieh Chen, Chien-Ta Lin and Mei-Jiau Huang

Oral Presentation (20 minutes)

K-007* An Immersed Boundary-Explicit Gas Kinetic Scheme for Simulation of Incompressible Flows

Yu Sun, C. Shu, C.J. Teo

15:30-17:10, 17 March	TuE04
	VIP Room 2
Mathematical Methods in CFD - 2	Chair: Daisuke Tagami

Keynote Lecture (40 minutes)

O-010 A Unilateral Boundary Condition for the Stokes Equations with Application to Numerical Outflow Boundary Conditions

Norikazu Saito, Guanyu Zhou and Yoshiki Sugitani

Invited Lecture (20 minutes)

O-014* Application of an Integral Vorticity Boundary Condition to Solve the Vorticity-Streamfunction Equations

Yannick Deleuze, Yasunori Maekawa and Tony W.H. Sheu

Invited Lecture (20 minutes)

O-011 Hybrid Discountinuous Galerkin Methods for Anisotropic Diffusion Equation

Masaru Miyashita and Norikazu Saito

15:30-17:10, 17 March	TuE05
Phase-Field Modeling in Fluids and Fluid-Solid Systems	VIP Room 8 Chair: Hector Gomez, Chien-Chou Tseng

Keynote Lecture (20 minutes)

R-003 Modeling of Coupled Systems of Complex Fluids and Solids Using Phase Fields

Hector Gomez

Invited Lecture (20 minutes)

S-001 CFD Analysis of Wet Flue Gas Desulphurisation with Perforated Sieve Tray

Chien-Chou Tseng, Kuang-C Lin and Chieh-Sen Huang

Invited Lecture (20 minutes)

R-007* Chan-Hilliard Equation Based Lattice Boltzmann Simulations of Two-Phase Flow

Tzu-Chun Huang, Yi-Ting Lin and Chao-An Lin

Oral Presentation (20 minutes)

R-002* Optimizing the Spray Drying Parameters for Powdered Eggs with 20% Tapioca Starch Additive Using Computational Fluid Dynamics Simulations

Joanna Tess Masilungan-Manuel, Mark Christian E. Manuel and Po Ting Lin

Wednesday, 18 March

09:00-10:30	
Semi-Plenary Sessions	

Semi-Plenary Session 5	WeMP1 Noble House A Chair: Jong-Shinn Wu

Virtual Element Methods for Advection-Diffusion Problems
L. Beirão da Veiga, F. Brezzi, L.D. Marini, A. Russo
Fluid-Structure Interaction Modeling of Transient Nozzle Flow
Yen-Sen Chen and Gary C. Cheng
High-Order Moment-Closure Approximations of the Boltzmann Equation
Harald van Brummelen and Michael Abdel Malik

Semi-Plenary Session 6	WeMP2 Noble House B Chair: Ming-Chih Lai

Cell and Nanoparticle Transport in Tumor Microvasculature: the Role of Size, Shape and Stiffness
Wing Kam Liu and Ying Li
Performance Evaluation of Hovering Flight of Deformable Flapping Wing Using Partitioned FSI Analysis
Shinobu Yoshimura, Tomonori Yamada, Shunji Kataoka, Shinya Tsukahara and Giwon Hong
Virtual Element Spaces
L. Beirão da Veiga, F. Brezzi, L.D. Marini, Alessandro Russo

10:30-10:50 **Coffee Break**

10:50-12:30 **Symposia**

Flows With Moving Boundaries and Interfaces - 2	WeM01 Noble House A Chair: Kenji Takizawa

Keynote Lecture (40 minutes)
C-001 Finite Element LES of a Wave-Energy Air Turbine Using Discontinuity-Capturing Directional Dissipation
M. Bassetti, L. Cardillo, A. Corsini, F. Rispoli and Tayfun E. Tezduyar
Invited Lecture (20 minutes)
F-002 Numerical Simulation of a Falling Sphere in Air
Takashi Nomura and Takuma Motohashi

Invited Lecture (20 minutes)

F-007* Multiscale Thermo-Fluid Analysis of a Tire under Road Conditions
Takashi Kuraishi, Kenji Takizawa, Shohei Asada and Tayfun E. Tezduyar

10:50-12:30, 18 March **Iterative Methods and Parallel Computing - 1**	WeM02 Noble House B Chairs: Shinobu Yoshimura, Tomonori Yamada

Keynote Lecture (40 minutes)

M-007 Development of an Iyerative Method for Finite Element Analysis of High Frequency Electromagnetic Fields
Masao Ogino, Amane Takei, Hirofumi Notsu, Shin-ichiro Sugimoto and Shinobu Yoshimura

Invited Lecture (20 minutes)

M-001 Preconditioners in Domain Decomposition Analysis for Magnetostatic Problems
Hiroshi Kanayama, Masao Ogino and Shin-ichiro Sugimoto

Invited Lecture (20 minutes)

M-003 Code Development of Finite Element Based MIG for Flow Applications
Chin-Cheng Wang

Invited Lecture (20 minutes)

M-008 Performance Tuning of Parallel Structural Analysis Code Based on Iterative Substructuring with BDD Pre-conditioner for Peta-scale Supercomputers
Hiroshi Kawai, MasaoOgino, RyujiShioya,Tomonori Yamada and Shinobu Yoshimura

10:50-12:30, 18 March **Recent Advances in Meshfree and Particle Methods**	WeM03 VIP Room 1 Chair: Seiichi Koshizuka

Keynote Lecture (20 minutes)

T-001 High Viscosity Flow Analysis Using Moving Particle Simulation Methods
Seiichi Koshizuka, Shogo Kaito, Tasuku Tamai, Kohei Murotani and Kazuya Shibata

Invited Lecture (20 minutes)

D-001* Simulation of Endolymph Flow Dynamics in the Human Semicircular Canals based on Magnetic Resonance Images using the Moving Particle Semi-implicit Method
Chieh Chen, Tasuku Tamai, Kazuya Shibata, and Seiichi Koshizuka

Invited Lecture (20 minutes)

T-002 Basic Discussion of Condition for Fluid Structure Interaction Analysis Using SPH Method
Seiya Hagihara, Tomohiro Shirahama and Satoyuki Tanaka

Invited Lecture (20 minutes)

T-003* Convergence Study and Recent Advances of Least Squares Moving Particle Semi-Implicit Method

Tasuku Tamai and Seiichi Koshizuka

Invited Lecture (20 minutes)

T-004 A Monolithic Lagrangian Meshfree Approach for Thermo-Fluid-Structure Interaction problems

Bo Li

10:50-12:30, 18 March **Kinetic Methods in Fluid Flow - 1**	WeM04 VIP Room 2 Chair: Jong-Shinn Wu

Keynote Lecture (40 minutes)

N-001 A Review of Boltzmann-Based CFD Schemes

Rho Shin Myong

Invited Lecture (20 minutes)

N-003 Boltzmann-BGK-Based Monte-Carlo Simulation of Phonon Flow

Mei-Jiau Huang

Invited Lecture (20 minutes)

N-007 A Gas Kinetic Scheme for Continuum and Rarefied Flows

Juan-Chen Huang

Oral Presentation (20 minutes)

W-016* A Physically Based Temporal Multiscale Algorithm for Modeling Gas Discharges

Bi-Ren Gu, C.-C. Chiou, M.-H. Hu, C.-T. Hung, J.-S. Wu and Y.-S. Chen

12:30-13:30
Lunch Break

13:30-15:10
Symposia

Wind Turbines and Renewable Energy	WeA01 Noble House A Chair: Yuri Bazilevs

Keynote Lecture (40 minutes)

V-004 Flow Prediction of Offshore Wind Turbine with Rotating Flexible Blades

Shiu-Wu Chau, Nian-Ze Lee

Keynote Lecture (20 minutes)

V-002 Computational Simulation of Wind Turbine Rotor-Tower-Wake Interaction

Ming-Chen Hsu, Carolyn N. Darling and Michael C. H. Wu

Invited Lecture (20 minutes)

V-001* Effect of the Wind Turbine Fluid–Structure Interaction on the Tower Design

Michael C. H. Wu, Chenglong Wang, Dominik Schillinger and Ming-Chen Hsu

13:30-15:10, 18 March **Iterative Methods and Parallel Computing - 2**	WeA02 Noble House B Chair: Hiroshi Kawai

Keynote Lecture (40 minutes)

M-004 ABCD-Solver : A Hybrid Method for Solving Large Sparse Systems

Iain Du, Ronan Guivarch, <u>Daniel Ruiz</u> and Mohamed Zenadi

Invited Lecture (20 minutes)

M-006 Modulus-Type Inner Outer Iterative Methods for Nonnegative Constrained Least Squares Problems

Ning Zheng, <u>Ken Hayami</u> and Jun-Feng Yin

Invited Lecture (20 minutes)

M-009 Robust Incomplete Factorization Preconditioning for Domain-Decomposition Parallel FEM

<u>Hiroshi Okuda</u>, Naoki Morita and Gaku Hashimoto

Invited Lecture (20 minutes)

M-005 Balancing Domain Decompositon Method with Addtive Schwartz Framework and Diagonal Scaling for Peta Scale Computing

<u>Tomonori Yamada</u> and Shinobu Yoshimura

13:30-15:10, 18 March **Higher-Order and DG Methods - 2**	WeA03 VIP Room 1 Chair: Mats G. Larson

Invited Lecture (20 minutes)

O-007 A Local Discontinuous Galerkin Method for the Navier-Stokes-Korteweg Equations

<u>J.J.W. van der Vegt</u>, Lulu Tian, Yan Xu and J.G.M. Kuerten

Invited Lecture (20 minutes)

X-005* Extended Hybridizable Discontinuous Galerkin (X-HDG) for Bimaterial Problems

<u>Ceren Gurkan</u>, S. Fernández-Méndez, E. Sala-Lardies and M. Kronbichler

Invited Lecture (20 minutes)

O-001 A Review of Residual Distribution Methods for Compressible Fluid Dynamics

R. Abgrall and <u>Dante de Santis</u>

13:30-15:10, 18 March **Kinetic Methods in Fluid Flow - 2**	WeA04 VIP Room 2 Chair: Mei-Jiau Huang

Keynote Lecture (40 minutes)

N-002 Modeling Rardfied Gas Dynamics Using Direct Simulation Monte Carlo Method

Cheng-Chin Su, Ming-Chung Lo and <u>Jong-Shinn Wu</u>

Invited Lecture (20 minutes)

N-005* Development of the Implicit Quiet Direct Simulation (QDS) Scheme and its   Parallelization

Yi-Hsin Lin and Matthew Ross Smith

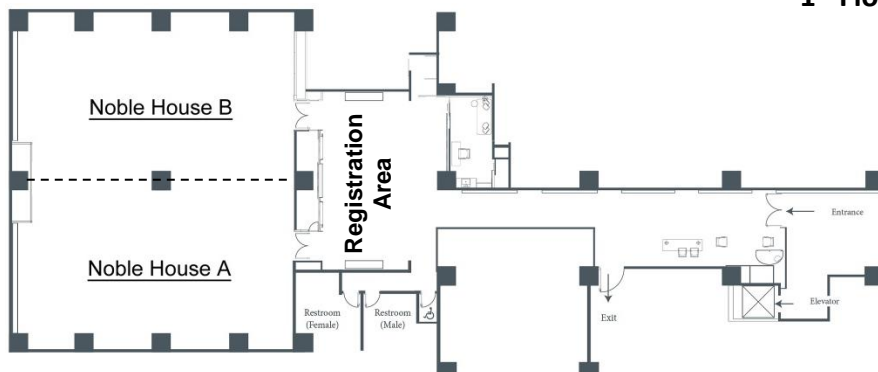**Invited Lecture (20 minutes)**

N-006* High-Order Kinetic Solver of Semi-classical Boltzmann-BGK Equation for Rarefied Gases of Arbitrary Statistics and Arbitrary Flow Regimes

Manuel A. Diaz and Jaw-Yen Yang

* Student Presentation

Floor Plan

1ˢᵗ Floor

4ᵗʰ Floor