Conference Schedule

Third M.I.T. Conference on Computational Fluid and Solid Mechanics

June 14-17, 2005

The mission of the Conference:
To bring together Industry and Academia and
To nurture the next generation in computational mechanics

Chronological List of Sessions
(Titles only)

Tuesday 8:50am

Welcome and Opening of Conference
K.J. Bathe

Plenary Lectures
Chairperson: M.L. Bucalem

9:00 - 10:30am

Room: Kresge Auditorium (W16)

Lagrangian methods in fluids and combustion
A.F. Ghoniem, M.I.T.

Computational mechanics and natural draft cooling towers: From struggle for safety to designed life-duration
W.B. Krätzig, Krätzig & Partners

10:30 - 11:00am
Coffee Break

Tuesday 11:00am - 12:30pm

Reliability and robust design, Session 23 Part I; Room 1-135
Advances in the analysis of shells, Session 47 Part I; Room 1-190
Mechanics of woven fabrics and woven-reinforced composites, Session 80 Part I; Room 1-246
Formulations and algorithms for PDEs, Session 202 Part I; Room 1-273
Meshless and generalized finite element methods, Session 16 Part I; Room 1-277
Optimal design of bolted joints, Session 94 Part I; Room 1-371
Error control and mesh adaptation in FEA, Session 25 Part I; Room 1-375
Optimization - Research and applications, Session 22 Part I; Room 1-379
Discontinuous Galerkin methods for PDEs, Session 15 Part I; Room 2-105
Advances and applications of computational methods in aerospace, Session 4 Part I; Room 2-131
Computational multiscale modeling, Session 54 Part I; Room 2-132
Advanced analysis – Multiphysics, Session 28 Part I; Room 2-135
Advances in computational structural dynamics, Session 82, Part I; Room 2-136
Computational stochastic mechanics, Session 70 Part I; Room 2-139
Electro-magneto-mechanics of smart structures, Session 77 Part I; Room 2-142
Turbulence modeling for industrial CFD, Session 51 Part I; Room 2-143
Discrete and kinetic methods for modeling gas, fluid and ionized media flows, Session 3 Part I; Room 2-146
Modeling coupled and transport phenomena in nanotechnology, Session 45 Part I; Room 2-147
Advances in wave propagation analyses, Session 50, Part I; Room 2-151
Biomechanics of soft and hard tissues, Session 84 Part I; Room 4-270
Computational plasticity, Session 101 Part I; Room 4-370
Nonlinear dynamics and special problems of fluid-structure interactions, Session 20 Part I; Room 10-250
Computational fluid dynamics I, Session 222 Part I; Room 32-123
Computational fluid dynamics II, Session 200 Part I; Room 32-124
Computational fluid and solid geodynamics: Methods and challenges, Session 40 Part I; Room 5-234

Tuesday 2:00 - 4:00pm; 4:30pm - End

Reliability and robust design, Session 23 Part II; Room 1-135
Advances in the analysis of shells, Session 47 Part II; Room 1-190
Mechanics of woven fabrics and woven-reinforced composites, Session 80 Part II; Room 1-246
Formulations and algorithms for PDEs, Session 202 Part II; Room 1-273
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Computational fluid dynamics II, Session 200 Part II; Room 32-124
Computational fluid and solid geodynamics: Methods and challenges, Session 40 Part II; Room 5-234

Wednesday 9:00am

Plenary Lectures
Chairperson: F. Brezzi

9:00 - 10:30am

Room: Kresge Auditorium (W16)

Open problems in elasticity
J.M. Ball, University of Oxford

Fundamental and applicative challenges in the modeling and computations of shells
D. Chapelle, INRIA-Rocquencourt

10:30 - 11:00am
Coffee Break

Wednesday 11:00am - 12:30pm

Reliability and robust design, Session 23 Part III; Room 1-135
Advances in the analysis of shells, Session 47 Part III; Room 1-190
Interface capturing and multi-fluid dynamics, Session 92 Part I; Room 1-242
Mechanics of woven fabrics and woven-reinforced composites, Session 80 Part III; Room 1-246
Formulations and algorithms for PDEs, Session 202 Part III; Room 1-273
Meshless and generalized finite element methods, Session 16 Part III; Room 1-277
Vortex dominated flows, Session 48 Part I; Room 1-371
Error control and mesh adaptation in FEA, Session 25 Part III; Room 1-375
Optimization - Research and applications, Session 22 Part III; Room 1-379
Discontinuous Galerkin methods for PDEs, Session 15 Part III; Room 2-105
Advances and applications of computational methods in aerospace, Session 4 Part III; Room 2-131
Computational multiscale modeling, Session 54 Part III; Room 2-132
Advanced analysis – Multiphysics, Session 28 Part III; Room 2-135
Discretization methods with finite volumes, discontinuous Galerkin methods and the application in porous media, Session 91, Part I; Room 2-136
Computational stochastic mechanics, Session 70 Part III; Room 2-139
Electro-magneto-mechanics of smart structures, Session 77 Part III; Room 2-142
Advanced analysis – Solids, Session 26 Part I; Room 2-143
Meshing and mesh adaptation, Session 212 Part I; Room 2-146
Uncertainty in civil engineering and computational mechanics, Session 104 Part I; Room 2-147
Modeling and solutions for ductile fracture, Session 67 Part I; Room 2-151
Biomechanics of soft and hard tissues, Session 84 Part III; Room 4-270
Computational plasticity, Session 101 Part III; Room 4-370
Nonlinear dynamics and special problems of fluid-structure interactions, Session 20 Part III; Room 10-250
Computational fluid dynamics I, Session 222 Part III; Room 32-123
Computational fluid dynamics II, Session 200 Part III; Room 32-124
Computational fluid and solid geodynamics: Methods and challenges, Session 40 Part III; Room 5-234

Wednesday 2:00 - 4:00pm; 4:30pm - End

Reliability and robust design, Session 23 Part IV; Room 1-135
Advances in the analysis of shells, Session 47 Part IV; Room 1-190
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Numerical methods for fluid-structure interaction systems, Session 9 Part I; Room 4-270
Computational plasticity, Session 101 Part IV; Room 4-370
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Computational fluid and solid geodynamics: Methods and challenges, Session 40 Part IV; Room 5-234

Thursday 9:00am

Plenary Lectures
Chairperson: J.W. Tedesco

9:00 - 10:30am

Room: Kresge Auditorium (W16)

Simulations of particle-fluid suspensions with the Lattice-Boltzmann equation
A.J.C. Ladd, University of Florida

Applications of computational fluid mechanics at Sandia National Laboratories
T.C. Bickel and H.C. Morgan, Sandia National Laboratories

10:30 - 11:00am
Coffee Break

Thursday 11:00am - 12:30pm

Finite/discrete element methods and applications, Session 79 Part I; Room 1-135
Lattice Boltzmann methods for computational fluid dynamics, Session 63 Part I; Room 1-190
Turbulence modeling, Session 204 Part I; Room 1-242
Computational modeling of reacting flow, Session 57 Part I; Room 1-246
Neural networks and soft methods in computational mechanics, Session 90 Part I; Room 1-273
Fracture analysis and crack propagation, Session 209 Part I; Room 1-371
Discontinuous Galerkin methods for PDEs, Session 15 Part V; Room 1-375
Optimization of expensive black-box cost functions, Session 61 Part I; Room 1-379
Modeling of the cardiovascular system, Session 13 Part I; Room 2-105
Advances in algorithms and applications for incompressible and low-Mach number flows, Session 27 Part I; Room 2-131
Nonlinear dynamics - spanning the scales: Algorithms and applications, Session 38 Part I; Room 2-132
Analysis for earthquake resistant design, Session 226 Part I; Room 2-135
Multi-scale modeling of material behavior – Solids, Session 66 Part I; Room 2-136
Formulations in elasticity, Session 215 Part I; Room 2-139
Fast boundary element methods and applications, Session 17 Part I; Room 2-142
Advanced analysis – Solids, Session 26 Part III; Room 2-143
Computational modeling of ionized gas flows, Session 37 Part I; Room 2-146
Uncertainty in civil engineering and computational mechanics, Session 104 Part III; Room 2-147
Methods and modeling for analysis of concrete and related structures, Session 211 Part I; Room 2-151
Numerical methods for fluid-structure interaction systems, Session 9 Part II; Room 4-270
Computational plasticity, Session 101 Part V; Room 4-370
Nonlinear dynamics and special problems of fluid-structure interactions, Session 20 Part V; Room 10-250
Computational fluid dynamics I, Session 222 Part V; Room 32-123
Computational fluid dynamics II, Session 200 Part V; Room 32-124
Multiscale, multiphysics computational fluid dynamics, Session 19 Part I; Room 5-234

Thursday 2:00 - 4:00pm; 4:30pm - End

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Neural networks and soft methods in computational mechanics, Session 90 Part II; Room 1-273
Fracture analysis and crack propagation, Session 209 Part II; Room 1-371
Molecular methods in mechanics, Session 34; Room 1-375
Optimization of expensive black-box cost functions, Session 61 Part II; Room 1-379
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Computational plasticity, Session 101 Part VI; Room 4-370
Computational fluid dynamics II, Session 200 Part VI; Room 32-124
Multiscale, multiphysics computational fluid dynamics, Session 19 Part II; Room 5-234

Friday 9:00am

Plenary Lectures
Chairperson: E.N. Dvorkin

9:00 - 10:30am

Room: Kresge Auditorium (W16)

On the treatment of uncertainties in structural mechanics & analysis
G.I. Schuëller, University of Innsbruck

Integration of multidisciplinary analysis with Product Lifecycle Management on the Boeing 787
K.R. Fowler, The Boeing Company

10:30 - 11:00am
Coffee Break

Friday 11:00am - 12:30pm

Lattice Boltzmann methods for computational fluid dynamics, Session 63 Part III; Room 1-190
Computational modeling of reacting flow, Session 57 Part III; Room 1-246
Computational aspects for the design and the analysis of the Messina Strait Bridge, Session 68 Part I; Room 1-277
Pre-conditioned methods, applications and software environment, Session 32 Part I; Room 1-379
Modeling of the cardiovascular system, Session 13 Part III; Room 2-105
Advances in algorithms and applications for incompressible and low-Mach number flows, Session 27 Part III; Room 2-131
Multi-scale modeling of material behavior – Solids, Session 66 Part III; Room 2-136
Localized drug delivery, Session 49 Part I; Room 2-139
Multi-physics coupling in material processing, Session 76 Part I ; Room 2-146
Numerical methods for fluid-structure interaction systems, Session 9 Part IV; Room 4-270

Friday 2:00 - 4:00pm

Computational aspects for the design and the analysis of the Messina Strait Bridge, Session 68 Part II; Room 1-277
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Multi-physics coupling in material processing, Session 76 Part II ; Room 2-146
Numerical methods for fluid-structure interaction systems, Session 9 Part V; Room 4-270

End of Conference

Chronological List of Sessions
(with Details)

Each presentation (except for the Plenary Lectures) is scheduled to start at the hour or the half hour, and is to last 25 minutes.
Lunch is scheduled daily from 12:30-2:00pm.
Sessions held in the afternoon include a Coffee Break from 4:00-4:30pm.

Tuesday 8:50am

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A.F. Ghoniem, M.I.T.

Computational mechanics and natural draft cooling towers: From struggle for safety to designed life-duration
W.B. Krätzig, Krätzig & Partners

10:30 - 11:00am
Coffee Break

Tuesday 11:00am

23 - Reliability and robust design, Part I
Room: 1-135
Chairperson: K.-K. Choi

Prediction of probabilistic design models for uncertainty propagation
H.C. Gea

Replacing RMSE as the terrain roughness standard in Army programs
D.J. Gorisch and D.A. Lamb

Experimental testing of methods for decision under uncertainty by simulating engineering and business decisions
V. Pandey and E. Nikolaidis

Tuesday 11:00am

47 – Advances in the analysis of shells, Part I
Room: 1-190
Chairpersons: W. Wagner, W.B. Krätzig and S. Klinkel

Some solutions to the asymptotic bending problem of non-inhibited shells
D. Choï

A nonlinear piezoelectric mixed solid shell finite element formulation
S. Klinkel and W. Wagner

Reliable finite elements for the analysis of piezoelectric shells
R. Lammering, F. Yang and S. Mesecke-Rischmann

Tuesday 11:00am

80 - Mechanics of woven fabrics and woven-reinforced composites, Part I
Room: 1-246
Chairperson: J.-H. He

Improvement of fiber twisting and crimping in melt-blowing process
Y.-H. Qu, J.-H. He and Q.-F. Ke

A brief review on mathematical models for electrospinning
J.-H. He

Multi-scale modeling of liquid transport in fibrous materials
W. Zhong and N. Pan

TUESDAY

Tuesday 11:00am

202 - Formulations and algorithms for PDEs, Part I
Room: 1-273
Chairpersons: C.-N. Chen and D. Mijuca

In-time implicit-explicit algorithm for nonlinear finite element analysis
J.L.C. Sosa, E. de Souza Neto and D.R.J. Owen

Application of joint time-frequency representation method in transient analysis of semi-infinite media
A. Farahani and K. Konagai

Efficient absorbing boundary conditions for propagating and evanescent waves in dispersive media
M.A. Zahid and M.N. Guddati

Tuesday 11:00am

16 - Meshless and generalized finite element methods, Part I
Room: 1-277
Chairpersons: S. De, G. Orkisz and V. Kompis

A coupled EFGM-FEM approach for dynamic analyses of a halfspace including nonlinear effects
J. Quan and O. von Estorff

On higher order approximation in the MFDM method
J. Orkisz and S. Milewski

On meshfree computations of shells
S. Skatulla and C. Sansour

Tuesday 11:00am

94 - Optimal design of bolted joints, Part I
Room: 1-371
Chairpersons: J. Zarka and F. Maceri

Optimum design of bolted composite lap joints with genetic algorithm
E. Madenci

Elasto-plastic finite-element-analysis of stress and strain in bolt threads
R. Seybold and C. Berger

Intelligent optimal design of bolted joints
J. Zarka, H. Karaouni and J.-M. Monville

Tuesday 11:00am

25 - Error control and mesh adaptation in FEA, Part I
Room: 1-375
Chairpersons: T. Grätsch and F. Cirak

Detecting and countering instability in operator splitting methods for reaction-diffusion equations
D. Estep, T. King, D. Ropp and J. Shadid
(Keynote)

Error-estimation and adaptivity using operator-customized finite element wavelets
R. Sudarshan, K. Amaratunga and T. Grätsch

Size functions and mesh generation for high-quality adaptive remeshing
P.-O. Persson

Tuesday 11:00am

22 - Optimization - Research and applications, Part I
Room: 1-379
Chairpersons: F. Duddeck and K.-U. Bletzinger

Filtering and regularization shape optimization techniques for optimization with CAD-free parametrization
F. Daoud, N. Camprubi and K.-U. Bletzinger
(Keynote)

Design for reliability of stochastic dynamic systems by algebraically derived reduced order models
G. Weickum, M. Allen and K. Maute

Towards lifetime optimization of hangar connection plates for steel arch bridges
M. Baitsch and D. Hartmann

Tuesday 11:00am

15 - Discontinuous Galerkin methods for PDEs, Part I
Room: 2-105
Chairperson: B. Cockburn

DGM Seen as Weighted Residuals
F. Brezzi, B. Cockburn, L.D. Marini and E. Suli
(Keynote)

Local post-processing of the discontinuous Galerkin methods for nonuniform mesh
J.K. Ryan and C.-W. Shu

High-order RKDG methods for computational electromagnetics
M.-H. Chen, B. Cockburn and F. Reitich

Tuesday, 11:00am

4 - Advances and applications of computational methods in aerospace, Part I
Room: 2-131

Session 1: Unsteady Propulsion
Chairpersons: J. Bayandor and H.A. Stone

On swimming paramagnetic filaments
M. Roper and H.A. Stone
(Keynote)

The Ornicopter: A single rotor helicopter without reaction torque - short overview
Th. Van Holten and N.M. Heiligers

A revolutionary concept for adaptive unsteady rotor dynamics
J. Bayandor
(Keynote)

Tuesday 11:00am

54 - Computational multiscale modeling, Part I
Room: 2-132
Chairpersons: S.A. Meguid, K.M. Liew, L.S. Ong and T.Y. Ng

Adaptive variational multiscale methods for elliptic problems
M.G. Larson and A. Målqvist

Periodic unit cell-based simulation of materials with random microstructure
J. Zeman

Simulations of alternate phases of space-filling graphene crystals under mechanical loads
P.W. Chung

TUESDAY

Tuesday 11:00am

28 - Advanced analysis – Multiphysics, Part I
Room: 2-135
Chairpersons: J.W. Bull, J.-W. Hong and T. Kalman

Assessment of simulation techniques for rotor loads prediction
R. Steijl, G. Barakos and K. Badcock

A numerical model of the resistance heating system for material tests on a Gleeble simulator
K. Solek, Z. Mitura and R. Kuziak

Thermo-mechanical analysis of a four chip CSP microelectronic circuit
D. Tourtelotte

Tuesday 11:00am

82 - Advances in computational structural dynamics, Part I
Room: 2-136
Chairpersons: G. Consolazio, J.W. Tedesco and J.T. Baylot

Explicit Newmark algorithm for rotational dynamics
P. Krysl
(Keynote)

On direct time integration in large deformation dynamic analysis
M.M.I. Baig and K.J. Bathe

Transient dynamics analysis over the low and medium frequency ranges for engineering structures
M. Chevreuil and P. Ladevèze

Tuesday 11:00am

70 - Computational stochastic mechanics, Part I
Room: 2-139
Chairpersons: G.I. Schuëller and A. Palmeri

Application of Markov Chain Monte Carlo method for structural reliability
K. Kolanek

A censored closure for predicting the extreme response of oscillators with non-linear damping
G. Muscolino and A. Palmeri

A new computational paradigm for the statistics of extreme events in nonlinear random seas
F. Fedele

Tuesday 11:00am

77 - Electro-magneto-mechanics of smart structures, Part I
Room: 2-142
Chairpersons: Y. Shindo, P. Gaudenzi and M.C. Dökmeci

Dynamic bending and domain wall motion in piezoelectric laminated actuators under ac electric fields
Y. Shindo, F. Narita, M. Mikami and K. Hayashi
(Keynote)

Repair of delaminated beams via piezoelectric patches
Q. Wang and S.T. Quek

Tuesday 11:00am

51 - Turbulence modeling for industrial CFD, Part I
Room: 2-143

Chairperson: B. Basara

Large eddy simulation in support of RANS modelling
M.A. Leschziner
(Keynote)

RANS models and their application to aerodynamic-type flows
T.B. Gatski

A near-wall, SMC-based eddy-viscosity turbulence model designed for engineering flow computations
S. Jakirlić and B. Basara

Tuesday 11:00am

3 - Discrete and kinetic methods for modeling gas, fluid and ionized media flows, Part I
Room: 2-146
Chairperson: O. Batishchev

Kinetic theory and computer simulations of non-equilibrium weak ionized plasma in strong electric field and external sources of ionization
E. Son
(Keynote)

Particle-in-cell simulations of laser-triggered ion acceleration
G. Dudnikova and T. Liseykina

Hybrid kinetic method for flows with sharp spatial gradients
A. Batishcheva, O. Batishchev and J. Fox

Tuesday 11:00am

45 - Modeling coupled and transport phenomena in nanotechnology, Part I
Room: 2-147
Chairpersons: R. Melnik and A. Povitsky

Modelling of quantum well semiconductor lasers based on Green's Functions
M.S. Wartak and P. Weetman

A general treatment of deformation effects in Hamiltonians for nanoscale systems
B. Lassen, M. Willatzen and R. Melnik

A viscous Cahn-Hilliard equation for nanoscale surface evolution in heteroepitaxial thin film growth
A. Rätz, A. Ribalta and A. Voigt

Tuesday 11:00am

50 - Advances in wave propagation analyses, Part I
Room: 2-151
Chairperson: C. Zhang and C.-Y. Wang

Crack problems with a NGF/OQM BEM formulation for the scalar wave equation
J.C.F. Telles and C.A.R.-V. Tudela
(Keynote)

Time-harmonic analysis of a planar crack in an elastic half-space by BEM
Ch. Zhang, V.V. Mykhas'kiv and V.Z. Stankevych

Dispersive behavior of waves in a pre-stressed elastic layer with constrained boundaries
A.C. Wijeyewickrema

Tuesday 11:00am

84 - Biomechanics of soft and hard tissues, Part I
(*In honor of Prof. Sidney Lees*)
Room: 4-270
Chairpersons: F.-J. Ulm and C. Hellmich

Bounding Uncertainty: computational mechanics used to analyze the structural correlates of early hominid locomotion
R.B. Eckhardt, K. Galik and J. Kuperavage
(Keynote)

Finite difference computation: a numerical tool for ultrasonic bone characterization
P. Laugier, E. Bossy, M. Talmant and F. Padilla

Investigating the role of molecular interactions on mechanics of bone biomaterials: Molecular dynamics and Fourier transform infrared spectroscopic studies
K.S. Katti, D.R. Katti, R. Bhowmik and D. Verma

Tuesday 11:00am

101 - Computational plasticity, Part I
Room: 4-370
Chairpersons: F.J. Montans and R.I. Borja

Anisotropic pile-up pattern at spherical indentation into a fcc single crystal - finite element analysis versus experiment
B. Eidel and F. Gruttman
(Keynote)

Fully implicit numerical integration of a hyperelastoplastic model for sands based on critical state plasticitiy
J.E. Andrade and R.I. Borja

A return mapping algorithm for isotropic and anisotropic large deformations
Z. Cheng and B. Jeremić

Tuesday 11:00am

20 - Nonlinear dynamics and computational fluid-structure interactions, Part I
(*in honor of Prof. M. P. Païdoussis*)
Room: 10-250
Chairpersons: M. Amabili and D. Weaver

Dynamics of clamped-clamped cylinders in axial flow: Theory and experiment
Y. Modarres-Sadeghi, M.P. Païdoussis, E. Grinevich and C. Semler
(Keynote)

O(2) symmetry constrained mode interactions in 2D cylinder wake flow
N.W. Mureithi

On the application of asymptotic reduction methods of slender structures to fluid-structure interaction problems
C.E.S. Cesnik and R. Palacios

Tuesday 11:00am

222 - Computational fluid dynamics I, Part I
Room: 32-123
Chairpersons : S. Ossia, D. Tang and G.J. Sheard

Nonsimilar solution of unsteady mixed convection flow on a moving slender cylinder
D. Anilkumar and S. Roy

Wake mode development of flow past low aspect ratio cylinders
G.J. Sheard, M.C. Thompson and K. Hourigan

Tuesday 11:00am

200 - Computational fluid dynamics II, Part I
Room: 32-124
Chairpersons: J. Iannelli and J.-M. Vaassen

The space-time upwind cell-vertex scheme (STU-CVS) for conservation laws -- a Riemann solver free approach
S. Tu and S. Aliabadi
(Keynote)

Three fast computational approximation methods in hypersonic aerothermodynamics
V.V. Riabov

High-resolution computational modeling of multi-material flows
E. Shapiro and D. Drikakis

Tuesday 11:00am

40 - Computational fluid and solid geodynamics: Methods and challenges, Part I
Room: 5-234
Chairperson: A. Ismail-Zadeh

Computational basin modelling: a Lagrangian approach
P. Massimi, F. Saleri and G. Scrofani

Modeling of block-and-fault dynamics of the lithosphere
A. Soloviev and A. Ismail-Zadeh

12:30 - 2:00pm
Lunch Break

Tuesday 2:00pm

23 - Reliability and robust design, Part IIa
Room: 1-135
Chairperson: D. Gorsich

Identifying and cascading probabilistic design targets in complex engineering design
W. Chen
(Keynote)

Application of tail model in high safety structure system design
N.-H. Kim, H. Wang and N.V. Queipo

Stochastic possibilistic design optimization method for design problems with both statistical and fuzzy input data
L. Du, K.K. Choi, B.D. Youn and D. Gorsich

Investigation on robust design optimization for occupant restraint system having highly nonlinear and noisy nature
B.D. Youn, Y. Fu and R.-J. Yang

Tuesday 2:00pm

47 – Advances in the analysis of shells, Part IIa
Room: 1-190
Chairpersons: W. Wagner, W.B. Krätzig and S. Klinkel

Creep influence on structural buckling resistance of concrete shells
J. Bockhold and Y.S. Petryna

Asymptotic models of curved interfaces in composite shells
J.F. Ganghoffer and B. Haussy

Avoiding geometric locking phenomena in finite element analysis of shells
K.-U. Bletzinger and M. Bischoff

Numerical simulation of soil-support interaction as basis for the day-to-day decision process in NATM tunnel excavations
Y. Spira, R. Lackner and H.A. Mang

Tuesday 2:00pm

80 - Mechanics of woven fabrics and woven-reinforced composites, Part IIa
Room: 1-246
Chairperson: J.-H. He and S. Socrate

Mechanical properties of a woven fabric
H. Sun and N. Pan

Nonlinear buckling of woven fabrics
R.D. Anandjiwala and J.W. Gonsalves

Analysis of instability in electrospinning
Y. Wu

Digital element method in textile fabric mechanics
Y. Wang, Y. Miao and D. Swenson

Tuesday 2:00pm

202 - Formulations and algorithms for PDEs, Part IIa
Room: 1-273
Chairpersons: C.-N. Chen and D. Mijuca

Computational models on graphs for nonlinear hyperbolic and parabolic system of equations
A.S. Kholodov and Y.A. Kholodov

Developments in extended differential quadrature based discrete element analysis methods and time integration schemes
C.N. Chen

About monotonic difference schemes criterions for hyperbolic type equations
A.S. Kholodov and Y.A. Kholodov

Conforming polytope finite elements for soil-structure interaction
E.A. Malsch

Tuesday 2:00pm

16 - Meshless and generalized finite element methods, Part IIa
Room: 1-277
Chairpersons: S. De, G. Orkisz and V. Kompis

Meshless domain decomposition schemes for nonlinear elliptic PDEs
P.P. Chinchapatnam, K. Djidjeli and P.B. Nair

On the use of genetic algorithms for numerical integration in meshfree methods
S. Banihani and S. De

Boundary Point Method and its multi-domain formulation
V. Kompiš and M. Štiavnický

An adaptive nodal generation for meshfree method
H.-J. Chung, G.-H. Lee, W.-H. Lee and T.-Y. Lee

Tuesday 2:00pm

94 - Optimal design of bolted joints, Part IIa
Room: 1-371
Chairpersons: J. Zarka and E. Madenci

Strength behaviour of aluminium bolts under static and cyclic loading
C. Berger and U. Arz

Computational strategy for the analysis of bolted joints taking into account variability
L. Champaney, P.A. Boucard and S. Guinard

Components of bending resistant bolted composite joints for high rotation capacity
C. Odenbreit

Three-dimensional finite element analysis of viscoelastic composite bolted joints
A. Caporale, R. Luciano and F. Maceri

Tuesday 2:00pm

25 - Error control and mesh adaptation in FEA, Part IIa
Room: 1-375
Chairpersons: T. Grätsch and F. Cirak

Efficient *a posteriori* error estimates for the wave equation
S. Adjerid
(Keynote)

***A Posteriori* bounds for linear functional outputs of coercive 2nd order PDEs using the local discontinuous Galerkin method**
J.S.H. Wong and J. Peraire

New recovery based error estimators based on solution enrichment and roughening
G. Maisano, S. Micheletti, S. Perotto and C.L. Bottasso

Modal-adaptive structural FEM computations for fluid-structure interaction
D. Scholz, A. Düster and E. Rank

Tuesday 2:00pm

22 - Optimization - Research and applications, Part IIa
Room: 1-379
Chairpersons: F. Duddeck and K.-U. Bletzinger

Crash optimization of car bodies in the concept stage of vehicle development
K. Volz and F. Duddeck
(Keynote)

Designing with topology and shape optimization - Closing the loop
U. Schramm

Shape optimization for improved vehicle crashworthiness
R.C. Averill

Tuesday 2:00pm

15 - Discontinuous Galerkin methods for PDEs, Part IIa
Room: 2-105
Chairperson: C.-W. Shu

Incompressible velocity approximations for incompressible fluid flow by using DG methods
D. Schötzau
(Keynote)

An operator splitting technique for incompressible flows
B. Riviere

Locking-free DG methods for Timoshenko beams
F. Celiker, B. Cockburn, H.K. Stolarski and K.K. Tamma

Discontinuous Galerkin approximation of eigenvalue problems
A. Buffa and I. Perugia

TUESDAY

Tuesday, 2:00pm

4 - Advances and applications of computational methods in aerospace, Part IIa
Room: 2-131

Session 2: Advanced Aerospace Structures
Chairpersons: J. Bayandor and P. Linde

Environmental effects on the damage behaviour of hybrid composites
P. Linde

An analytical formulation for the prediction of buckling and post-buckling of composite panels and shells
C. Bisagni

Experimental investigation of failure in Ti-6Al-4V
H. Sarsfield, L. Wang and N. Petrinic

High and low velocity impact of composite parts using progressive failure dynamic analysis
J. Bayandor, F. Abdi, V.S. Sokolinsky, J.M. Starbuck, D.L. Erdman and V. Kunc

Tuesday 2:00pm

54 - Computational multiscale modeling, Part IIa
Room: 2-132
Chairpersons: S.A. Meguid, K.M. Liew, L.S. Ong and T.Y. Ng

Computational method for mapping continuum deformations to crystal lattices containing defects
P.W. Chung and J.D. Clayton

Generalized micro-to-macro transitions of microstructures for the first and second order continuum
Ł. Kaczmarczyk

Mechanism-based constitutive modeling of L1-2 crystals
Y. Yuan and D.M. Parks

A tightly coupled particle-fluid model for DNA-laden flows in complex microscale geometries
D. Trebotich, G.H. Miller, P. Colella, D.T. Graves, D.F. Martin and P.O. Schwartz

Tuesday 2:00pm

28 - Advanced analysis – Multiphysics, Part IIa
Room: 2-135
Chairpersons: J.W. Bull , J.-W. Hong and T. Kalman

Multi-disciplinary simulation, FE CFD and multi-body
R. Sadeghi
(Keynote)

Multi-Physics simulation of sand erosion phenomena on turbine blade
M. Suzuki, K. Toda and M. Yamamoto

Analysis of residual stresses during heat treatment of diesel cylinder
I.-W. Bang, H. Chang and C.-E. Kim

Modeling bed-boundary layer exchange of dissolved and particle associated mercury
A. Massoudieh, T.R. Ginn and F.A. Bombardelli

Tuesday 2:00pm

82 - Advances in computational structural dynamics, Part IIa
Room: 2-136
Chairpersons: G. Consolazio, J.W. Tedesco and J.T. Baylot

Computational modeling of composite and functionally graded materials
J. Wang

Development of a numerically efficient analysis technique for modeling barge to bridge collisions
D. Gaylord-Cowan and G.R. Consolazio

Computational examination of fluid-structure interaction problems in dams
J.L. O'Daniel

Multi-bodies impacting a deformable structure
P.P. Papados

Tuesday 2:00pm

70 - Computational stochastic mechanics, Part IIa
Room: 2-139
Chairpersons: G.I. Schuëller and S.K. Sachdeva

Observations on Non-Gaussian Karhunen-Loeve expansions
L.B. Li, S.T. Quek and K.K. Phoon

Interval finite element analysis of large structures with uncertain parameters
H. De Gersem, D. Moens, W. Desmet, D. Vandepitte and K.U. Leuven

Dimension reduction at most probable point for higher-order reliability analysis
D. Wei and S. Rahman

On the analysis of finite deformations and continuum damage in materials with random properties
S. Acharjee and N. Zabaras

Tuesday 2:00pm

77 - Electro-magneto-mechanics of smart structures, Part IIa
Room: 2-142
Chairpersons: Y. Shindo, P. Gaudenzi and M.C. Dökmeci

Stress concentration near the corner point of a magnetoactive 2-D compound wedge
D. Hasanyan, L. Librescu and Z. Qin

A thermodynamically consistent formulation for transversely isotropic nonlinear ferroelectric hysteresis
H. Romanowski and J. Schröder

Explicit feedback control for a thermal convection loop
R. Vazquez and M. Krstic

Free vibration studies of simply supported functionally graded and layered magneto-electro-elastic cylindrical shells
R.K. Bhangale and N. Ganesan

Tuesday 2:00pm

51 - Turbulence modeling for industrial CFD, Part IIa
Room: 2-143
Chairperson: B. Basara

Synergy of RANS and LES: Prospects for high Re and Ra numbers
K. Hanjalic
(Keynote)

Partially Averaged Navier-Stokes (PANS) method for turbulence: A seamless RANS to DNS bridging model
S.S. Girimaji

Transition modeling for general CFD applications in aeronautics and turbomachinery
R.B. Langtry and F. R. Menter

Advanced turbulence modeling for industrial CFD
J. Schneider and B. Basara

Tuesday 2:00pm

3 - Discrete and kinetic methods for modeling gas, fluid and ionized media flows, Part IIa
Room: 2-146
Chairperson: O. Batishchev

Improved hybrid PIC/MC model for simulating Hall-effect thrusters
J. Fox, A. Batishcheva, O. Batishchev and M. Martinez-Sanchez

Advances in ICRF modeling of VASIMR rocket
A.V. Ilin, F.R.C. Díaz, J.P. Squire and M.D. Carter

Fluid simulation of Hall thruster plumes
S. Cheng

Steady-state, self-consistent kinetic modeling of high-voltage 2-D sheaths in flowing plasmas applied to bare tethers for radiation belt remediation
É. Choinière and B.E. Gilchrist

Tuesday 2:00pm

45 - Modeling coupled and transport phenomena in nanotechnology, Part IIa
Room: 2-147
Chairpersons: R. Melnik and A. Povitsky

Numerical discretization of a fully quantum drift-diffusion model
P. Degond, S. Gallego and F. Mehats

Efficient quantum-mechanical model based on drift-diffusion approach for simulations of modern nanoscale devices
A. Fedoseyev, A. Przekwas, M. Turowski and M.S. Wartak

Transport, growth and stability of disturbances in weakly rarefied channel flows
F. Fedele and D.L. Hitt

Inviscid and viscous CFD modeling of plume dynamics in laser ablation
K.A. Pathak and A. Povitsky

Tuesday 2:00pm

50 - Advances in wave propagation analyses, Part IIa
Room: 2-151
Chairperson: C. Zhang and A.C. Wijeyewickrema

Borehole cuspidal modes and dual arrivals in a transversely isotropic formation
C.-Y. Wang, R. Burridge, J. Pabon and M. Schoenberg
(Keynote)

Simulation of a coupled system of long wave - short waves with a slight detuning in group velocities
C.K. Poon, D.W.C Lai and K.W. Chow

A comparative study on two time-domain BEM/BIEM for transient wave propagation analysis in cracked anisotropic solids
S. Hirose, C. Zhang and C.-Y. Wang

Dynamic Green's functions and time-domain BIE formulations for piezoelectric solids
C.-Y. Wang and C. Zhang

Tuesday 2:00pm

84 - Biomechanics of soft and hard tissues, Part IIa
(*In honor of Prof. Sidney Lees*)
Room: 4-270
Chairpersons: F.-J. Ulm and C. Hellmich

Nanoscaled universal mechanical building blocks and their interactions in biological materials: bone and wood
C. Hellmich, K. Hofstetter, C. Kober and F.-J. Ulm
(Keynote)

Simulations of Coupled Mechanics and Transport in Growing Soft Tissue
H. Narayanan, K. Garikipati, E.M. Arruda and K. Grosh

A new approach of validation and interpretation of bony organ simulation demonstrated for the case of a human mandible
C. Kober, B. Erdmann, C. Hellmich, R. Sader and H.-F. Zeilhofer

3D vessel shape reconstruction using level set method for human atherosclerotic plaques
Y. Li and D. Tang

Tuesday 2:00pm

101 - Computational plasticity, Part IIa
Room: 4-370
Chairpersons: F.J. Montans and J.E. Andrade

A three-invariant hardening cap plasticity for computational modeling of powder compaction process
A.R. Khoei and A.R. Azami
(Keynote)

Modeling response of unsaturated silty sand in three-invariant stress space
L.R. Hoyos and P. Arduino

Embedding frictional models in an enhanced strain element for modeling failure in geomaterials
C. Foster, R. Borja and R. Regueiro

Numerical model for the integration of the elastoplastic potential in finite deformations anisotropic elastoplasticity
M. Cuomo and M. Fagone

Tuesday 2:00pm

20 - Nonlinear dynamics and computational fluid-structure interactions, Part IIa
(*in honor of Prof. M. P. Païdoussis*)
Room: 10-250
Chairpersons: B.I. Epureanu and F. Pellicano

Effects of unsteady aerodynamics on the dynamic response of mistuned bladed disks
Z. He, B.I. Epureanu and C. Pierre
(Keynote)

Dynamic instability of circular cylindrical shells
F. Pellicano and M. Amabili

Reduced-order modeling of MEMS
A.H. Nayfeh, M.I. Younis and E.M. Abdel-Rahman

20 years of FSI experiments in Dundee
A.S. Tijsseling and A.E. Vardy

TUESDAY

Tuesday 2:00pm

222 - Computational fluid dynamics I, Part IIa
Room: 32-123
Chairpersons : S. Ossia and G.J. Sheard

Numerical approximation of the spectra of Poiseuille flow of two Phan-Thien Tanner liquids
A.S. Palmer and T.N. Phillips

Fully developed two-phase liquid-liquid flow in finned duct
E.V. Son, E.N. Tarasova and P.T. Zubkov

Benchmark experimental data for radiative heat transfer prediction
M.R. Vujić, N.P. Lavery and S.G.R. Brown

Study of unsteady flow past a circular cylinder using a new computational approach at the outflow boundary
S.F. Anwer, N. Hassan and S. Sanghi

Tuesday 2:00pm

200 - Computational fluid dynamics II, Part IIa
Room: 32-124
Chairpersons: J. Iannelli and H. Kohno

An implicit high order cell-centered finite volume scheme for the solution of three-dimensional Navier-Stokes equations on unstructured grids
D. Vigneron, J.-M. Vaassen and J.-A. Esers
(Keynote)

An efficient algorithm for the detection of neighbouring particles: prediction of the behaviour of a bubbling fluidised bed
M. Chiesa and Jens A. Melheim

On the flow-condition-based interpolation approach for incompressible fluids
H. Kohno and K.J. Bathe

The force/work differencing of exceptional points in the compatible formulation of Lagrangian hydrodynamics
E. Caramana and R. Loubere

Tuesday 2:00pm

40 - Computational fluid and solid geodynamics: Methods and challenges, Part IIa
Room: 5-234
Chairperson: H. Mühlhaus

Computational models of magma dynamics in subduction zones
R.F. Katz, M. Spiegelman, M. Knepley and B. Smith

Mixing in a convecting viscous fluid: Application to Earth's mantle
J.B. Naliboff and L.H. Kellogg

Stirring in 3-D spherical models of convection in the Earth's mantle
K. Gottschaldt, U. Walzer, R. Hendel, D. Stegman, J. Baumgardner and H. Mühlhaus

Numerical reconstruction of the initial temperature of diapiric structures in the Earth: Effect of the heat diffusion
A. Ismail-Zadeh, A. Korotkii, G. Schubert and I. Tsepelev

4:00 - 4:30pm
Coffee Break

Tuesday 4:30pm

23 - Reliability and robust design, Part IIb
Room: 1-135
Chairperson: P. Decker and N. Hoyle

Critical stochastic modeling aspects for reliability prediction of complex vehicle systems
D.M. Ghiocel

Load tolerance estimation in fatigue reliability design
H. Wang, N.-H. Kim and Y.-J. Kim

A new approach for system reliability-based design optimization
M.A. Ba-abbad, R.K. Kapania and E. Nikolaidis

Tuesday 4:30pm

47 – Advances in the analysis of shells, Part IIb
Room: 1-190
Chairpersons: W. Wagner, W.B. Krätzig and S. Klinkel

Structural performance of foam-filled metal sandwich plates under quasi-static and dynamic loadings
A. Vaziri, Z. Xue and J.W. Hutchinson

Modeling resin infusion of composite sandwich structures by the VARTM process
X. Song, A.C. Loos, B.W. Grimsley and R.J. Cano

A precis on computational mechanics of functionally graded beams, plates and shells
T. Kant and C.V. Subbaiah

Study of interaction curves for composite laminate with cutout
V. Anil, C.S. Upadhyay and N.G.R. Iyengar

Tuesday 4:30pm

80 - Mechanics of woven fabrics and woven-reinforced composites, Part IIb
Room: 1-246
Chairperson: S. Socrate

A micromechanical model for the onset of tearing at slits in stressed coated woven fabrics
T.A. Godfrey, J.N. Rossettos and S.E. Bosselman

A study of the thermostamping process for a woven-fabric composite
X. Li, J.A. Sherwood, J.L. Gorczyca, J. Chen and L. Liu

Computational modelling of textile composites for industry
P. de Luca and A.K. Pickett

Micromechanical modelling of compaction of woven fabric preforms
Z.-R. Chen and L. Ye

Tuesday 4:30pm

202 - Formulations and algorithms for PDEs, Part IIb
Room: 1-273
Chairpersons: C.-N. Chen and D. Mijuca

Discontinuous Galerkin spectral element simulation of a type of wave propagation with large source items
S. Mao and C.A. Luongo

A multi-time-step coupling method for structural dynamics
A. Prakash and K.D. Hjelmstad

A finite-element alternative to infinite elements
M.N. Guddati

Tuesday 4:30pm

16 - Meshless and generalized finite element methods, Part IIb
Room: 1-277
Chairpersons: S. De, G. Orkisz and V. Kompis

On the use of hybrid finite element – wave based methods for steady-state acoustic analysis
B. Pluymers, W. Desmet, D. Vandepitte and P. Sas

A wavelet based spectral finite element for analysis of coupled wave propagation in composite beam
M. Mitra and S. Gopalakrishnan

Tuesday 4:30pm

94 - Optimal design of bolted joints, Part IIb
Room: 1-371
Chairpersons: J. Zarka and E. Madenci

Bolted and pin joints in solid rocket boosters
V. Sivakumar, R. Palaninathan, A.Y. Arasu, T. Kurian and S. Murugesan

Tuesday 4:30pm

25 - Error control and mesh adaptation in FEA, Part IIb
Room: 1-375
Chairpersons: T. Grätsch and F. Cirak

Structured adaptive mesh refinement in the virtual test facility
R. Deiterding

Reduced-basis approximation and *a posteriori* error estimation for Navier-Stokes
S. Deparis, K. Veroy, G. Rozza and A.T. Patera

On goal-oriented error estimation in practical finite element analysis
T. Grätsch and K.J. Bathe

Tuesday 4:30pm

22 - Optimization - Research and applications, Part IIb
Room: 1-379
Chairpersons: F. Duddeck and K.-U. Bletzinger

Multidisciplinary optimisation of a vehicle systems using geometrical parameters
C. Baeuerle
(Keynote)

Constrained multi-objective performance optimization of structures using a gradient-based algorithm
C.J.K. Lee, T. Furukawa and H. Noguchi

Shape optimization of an IC-engine maniverter design under structural, fluid dynamic and cost aspects
M. Usan and H. Wenzel

Tuesday 4:30pm

15 - Discontinuous Galerkin methods for PDEs, Part IIb
Room: 2-105
Chairperson: S. Adjerid

Domain decomposition preconditioners for C-0 interior penalty methods
S.C. Brenner and K. Wang

A new discontinuous Galerkin method for Hamilton-Jacobi equations
S. Osher and J. Yan

An interior penalty method for the reduced time-harmonic Maxwell equations
F. Li, S.C. Brenner and L.-Y. Sung

Tuesday, 4:30pm

4 - Advances and applications of computational methods in aerospace, Part IIb
Room: 2-131

Session 3: Control
Chairpersons: J. Bayandor and C. Bisagni

Real time prediction of ship motion using artificial neural networks
A.A. Khan, C. Bil and K.E. Marion

Computational procedures for the simulation of maneuvers
C.L. Bottasso, A. Croce, D. Leonello and L. Riviello

Sequential quadratic programming in optimal forced landing trajectory with obstacle avoidance in atmospheric disturbances
S. Prasad, P. Tong and C. Bil

Tuesday 4:30pm

54 - Computational multiscale modeling, Part IIb
Room: 2-132
Chairpersons: S.A. Meguid, K.M. Liew, L.S. Ong and T.Y. Ng

Micromechanics of axial tensile deformation in micro-layered ductile/brittle polymeric laminates
R. Sharma, S. Socrate and M.C. Boyce

Nonlinear modeling of historical masonry structures on meso-scale
J. Novák

Linking Meso- and Macroscale simulations: crystal plasticity of HCP metals & yield surface
S. Graff

Tuesday 4:30pm

28 - Advanced analysis – Multiphysics, Part IIb
Room: 2-135
Chairpersons: J.W. Bull, J.-W. Hong and T. Kalman

Restoration of original ecosystem in the part of Aral sea
I. Atabekov

Tuesday 4:30pm

82 - Advances in computational structural dynamics, Part IIb
Room: 2-136
Chairpersons: G. Consolazio, J.W. Tedesco and J.T. Baylot

Coupled Euler-Lagrange modeling of buried structure response to blast loading
G.C. Bessette

On the numerical computation of strain softening in explicit dynamic finite element analysis
K.T. Danielson and M.D. Adley

A methodology for modeling the response of steel cables to blast loads
D. Pelssone, J.C. Ray and J.T. Baylot

Tuesday 4:30pm

70 - Computational stochastic mechanics, Part IIb
Room: 2-139
Chairpersons: G.I. Schuëller and D. Wei

Bounds on structural system reliability in the presence of interval variables
P.R. Adduri, R.C. Penmetsa and R.V. Grandhi

A new projection scheme for linear stochastic problems
S.K. Sachdeva, P.B. Nair and A.J. Keane

Tuesday 4:30pm

77 - Electro-magneto-mechanics of smart structures, Part IIb
Room: 2-142
Chairpersons: Y. Shindo, P. Gaudenzi and M.C. Dökmeci

Vibrations of an axially graded porous piezoelectric ceramic rod
G. Altay and M.C. Dökmeci
(Keynote)

Gap waves in ferro-magneto-elastic materials
D. Hasanyan, P. Marzocca and S. Harutyunyan

Tuesday 4:30pm

51 - Turbulence modeling for industrial CFD, Part IIb
Room: 2-143
Chairperson: B. Basara

Accounting for near-wall effects in an explicit algebraic stress model using elliptic blending
G. Karlatiras and G. Papadakis

Compound wall treatment for RANS computation of complex turbulent flows
M. Popovac and H. Hanjalic

On the application of symmetry methods turbulence modelling
S. Guenther and M. Oberlack

Matching pursuit with POD dictionaries in the analysis of 2D turbulence signals and images
Ch. H. Bruneau, P. Fischer, Z. Peter and A. Yger

Tuesday 4:30pm

3 - Discrete and kinetic methods for modeling gas, fluid and ionized media flows, Part IIb
Room: 2-146
Chairperson: O. Batishchev

Modeling of a local radiation shielding for special conditions
V.V. Tselikov, A.V. Ilyin, V.K. Papin and Y.Y. Kloss

Kinetic simulation of mixed-collisional gas flows in thrusters
O. Batishchev and A. Batishcheva

Superconducting magnet technology at Kurchatov Institute
V.E. Keilin

Tsunami wave transportation as effect of the self-consistent capture of water by gravitational wave
B. V. Alexeev

Tuesday 4:30pm

45 - Modeling coupled and transport phenomena in nanotechnology, Part IIb
Room: 2-147

Chairpersons: R. Melnik and A. Povitsky

A computational heat transfer and fluid dynamics model for laser ablation of carbon
N. Mullenix and A. Povitsky

2D modeling of carrier transport through semiconductor heterostructure nanowires
N. Radulovic, M. Willatzen, R.V.N. Melnik, L.C. Lew Yan Voon

A computational approach to direct simulation of realistic sized single and multiwall carbon nanotubes
A. Pantano, D.M. Parks, M.C. Boyce and M. Nardelli

Forced convection in microducts: Effects of initial conditions and disturbances
L. Wang

Tuesday 4:30pm

50 - Advances in wave propagation analyses, Part IIb
Room: 2-151
Chairperson: C. Zhang and A.C. Wijeyewickrema

2D time domain boundary element analysis of an anisotropic piezoelectric solid with a finite crack
A. Tan, S. Hirose and C. Zhang

Tuesday 4:30pm

84 - Biomechanics of soft and hard tissues, Part IIb
(*In honor of Prof. Sidney Lees*)
Room: 4-270
Chairpersons: F.-J. Ulm and C. Hellmich

Sensitivity analysis of 3D MRI-based models with fluid-structure interactions for human atherosclerotic coronary and carotid plaques
D. Tang, C. Yang, J. Zheng, P.K. Woodard, G.A. Sicard, J.E. Saffitz and C. Yuan

Modeling of anisotropic hyperelasticity and discontinuous damage in arterial walls based on polyconvex stored energy functions
D. Balzani, J. Schröder and D. Gross

Multi objective shape optimization of the human carotid artery
K.V. Bhaskar, N.W. Bressloff and P.B. Nair

Tuesday 4:30pm

101 - Computational plasticity, Part IIb
Room: 4-370
Chairpersons: F.J. Montans and J.E. Andrade

An embedded cohesive crack model for fracture of quasi-brittle materials
J.M. Sancho, J. Planas, J.C. Gálvez, E. Reyes and D.A. Cendón
(Keynote)

Strain localization analysis for fast transient dynamics in thermoplastic solids using a strong discontinuity approach
I.M. Díaz and J.J.L. Cela

Rheological-dynamical analogy: Cyclic visco-plasticity and constant amplitude fatigue
D.D. Milašinović

Tuesday 4:30pm

TUESDAY

20 - Nonlinear dynamics and computational fluid-structure interactions, Part IIb
(*in honor of Prof. M. P. Païdoussis*)
Room: 10-250
Chairpersons: E.H. Dowell and J. Horáček

Experimental/theoretical correlation study of nonlinear aeroelasticity for a wing-store model with freeplay
D. Tang, P.J. Attar and E.H. Dowell
(Keynote)

Numerical simulation of human voice production using aeroelastic model of self-oscillations of the vocal folds and FE model of the vocal tract
J. Horáček, P. Šidlof, J.G. Švec and F. Griffond-Boitier

Concurrent multi-scale and multi-physics simulations of biological systems
X.S. Wang

Tuesday 4:30pm

222 - Computational fluid dynamics I, Part IIb
Room: 32-123
Chairperson: S. Ossia and G.J. Sheard

3D numerical modelling of curved open channel using nonhydrostatic turbulent finite element solver for free-surface flows
C. Leupi, E. Miglio and M.S. Altinakar

Compressible effects on ice particle growth in turbulent jets
E. Maglaras and F. Garnier

Numerical investigation of the flow instability in the rotating cavities
E. Tuliszka-Sznitko, E. Serre and P. Bontoux

Simulation of polymer flow in rotating die-slot
A. Rawal and P.J. Davies

Tuesday 4:30pm

200 - Computational fluid dynamics II, Part IIb
Room: 32-124
Chairpersons: J. Iannelli and J.-M. Vaassen

A new numerical scheme for transonic flows with shape flexibility and memory efficiency using CIP-MLSM with HGA method
T. Jimbo and T. Tanahashi

A nodal high-order spectral finite volume shallow water model on the cubed-sphere
V. Cheruvu, R.D. Nair and H.M. Tufo

Bubble function application in the finite element modelling of flow through a highly permeable porous medium
M. Parvazinia and V. Nassehi

Tuesday 4:30pm

40 - Computational fluid and solid geodynamics: Methods and challenges, Part IIb
Room: 5-234
Chairperson: A. Ismail-Zadeh

Non-Newtonian effects in simple models of mantle convection
H.-B. Mühlhaus, M. Davies, L. Gross and L. Moresi

Challenges in the visualization of a 2D mantle dynamics simulation using one billion tracers
M.L. Rudolph, T.V. Gerya and D.A. Yuen

Three-dimensional numerical simulations of thermo-chemical multiphase convection in Earth's mantle
T. Nakagawa and P.J. Tackley

WEDNESDAY

Wednesday 9:00am

Plenary Lectures
Chairperson: F. Brezzi

9:00 - 10:30am

Room: Kresge Auditorium (W16)

Open problems in elasticity
J.M. Ball, University of Oxford

Fundamental and applicative challenges in the modeling and computations of shells
D. Chapelle, INRIA-Rocquencourt

10:30 - 11:00am
Coffee Break

Wednesday 11:00am

23 - Reliability and robust design, Part III
Room: 1-135
Chairpersons: D. Gorsich

Design optimization of an engine air intake
N. Hoyle, N.W. Bressloff and A.J. Keane

Robust design of nonlinear transient dynamic problems by the optimal location of structural fuses
S. Missoum

Morphing technology on design and development process of a vehicle
H.-G. Kim and J.-W. Jeon

Wednesday 11:00am

47 – Advances in the analysis of shells, Part III
Room: 1-190
Chairpersons: W. Wagner, W.B. Krätzig and S. Klinkel

Numerical simulation on propagation of singularities through edges in thin hyperbolic shells
P. Karamian-Surville

A parametric study of bulging factors for unstiffened and stiffened cylindrical shells
C.H. Furukawa, M.L. Bucalem and C.E. Chaves

Nonlinear vibrations of viscoelastic orthotropic plates of composite materials
B.H. Eshmatov

Wednesday 11:00am

92 - Interface capturing and multi-fluid dynamics, Part I
Room: 1-242
Chairpersons: T. Yabe and F. Xiao

Simulating liquid interfaces interacting with thin solid shells
E. Guendelman, A. Selle, F. Losasso and R. Fedkiw
(Keynote)

Modeling of three-dimensional bubbly flows with a mass-conserving level-set method
S. P. van der Pijl and A.S.C. Vuik

A FEM Navier-Stokes solver coupled to a front-tracking algorithm for two-phase flows
S. Manservisi, E. Aulisa, M. Marra and R. Scardovelli

Wednesday 11:00am

80 - Mechanics of woven fabrics and woven-reinforced composites, Part III
Room: 1-246
Chairperson: S. Socrate

Multi-scale modelling of woven fabrics with 3D elastica
P. Potluri and R. Ramgulam

A solid mechanics shear model of commingled glass/polypropylene woven fabrics
L. Liu and J. Chen

Continuum modeling of woven fabrics
M.J. King and S. Socrate

Wednesday 11:00am

202 - Formulations and algorithms for PDEs, Part III
Room: 1-273
Chairpersons: C.-N. Chen and D. Mijuca

On a new multifield finite element approach in a semi-coupled thermo-mechanical analysis
D. Mijuca

On the low order tests of the novel mixed finite element in steady state heat transfer analysis
B. Medjo and D. Mijuca

Wednesday 11:00am

16 - Meshless and generalized finite element methods, Part III
Room: 1-277
Chairpersons: S. De, G. Orkisz and V. Kompis

Softening cohesive interface analysis via boundary integral equations
M. Dilligenti and F. Freddi

Free-Lagrange simulations of plastic deformation in aluminium induced by shock-bubble interaction
C.K. Turangan

A hybrid element-free Galerkin and natural element meshfree method for direct imposition of essential boundary conditions and faster three-dimensional computations
J. Yvonnet and F. Chinesta

Wednesday 11:00am

48 - Vortex dominated flows - Computational, analytical and experimental studies of viscous or inviscid vortical flows and applications, Part I
Room: 1-371
Chairpersons: E. Krause, L. Ting and D. Blackmore

Breakdown revisited
E. Krause
(Keynote)

Fuel-stratification in automotive DI-engines with vortical flow structures - development process with numerical and experimental methods
A. Abdelfattah, W. Kern, J. Fischer, B. Durst, E. Schuenemann, C. Landerl and C. Schwarz

Influence of the voritcal wake behind wind turbines using a coupled Navier-Stokes/vortex-panel methodology
S. Schmitz and J.-J. Chattot

WEDNESDAY

Wednesday 11:00am

25 - Error control and mesh adaptation in FEA, Part III
Room: 1-375
Chairpersons: T. Grätsch and F. Cirak

Adaptive simulation of multiphysics problems
M.G. Larson
(Keynote)

The shift of Green's functions and the domain of influence
F. Hartmann and T. Kunow

Combined discretization and model errors in computational meso-macro-scale material modeling
F. Larsson and K. Runesson

Wednesday 11:00am

22 - Optimization - Research and applications, Part III
Room: 1-379
Chairpersons: F. Duddeck and K.-U. Bletzinger

Topology optimization using the finite volume method
A. Gersborg-Hansen, M.P. Bendsøe and O. Sigmund
(Keynote)

Evolutionary shape optimization of plates with reinforcements
R. Górski and P. Fedeliński

Shape optimization algorithms using wavelet-based BEM
K. Eppler

Wednesday 11:00am

15 - Discontinuous Galerkin methods for PDEs, Part III
Room: 2-105
Chairperson: D. Schötzau

***A posteriori* error estimates and adaptive methods for a discontinuous Galerkin method**
O. Karakashian and F. Pascal
(Keynote)

Superconvergence of the local discontinuous Galerkin method applied to diffusion problems
S. Adjerid and D. Issaev

Superconvergence of hp-Discontinuous Galerkin methods for convection-diffusion problems
F. Celiker and B. Cockburn

Wednesday, 11:00am

4 - Advances and applications of computational methods in aerospace, Part III
Room: 2-131

Session 4: Numerical Modelling
Chairpersons: J. Bayandor and N. Kolev

Thermal fluid-structure interaction on re-entry vehicles TPS
S. Borreca, G. Tumino and P. Gaudenzi

Gas release driven dynamics in research reactors piping
N. Kolev, I. Roloff-Bock and G. Schlicht

Interlaminar damage analysis and prediction in aerospace composite replacement panels
J. Bayandor, R.S. Thomson, P.J. Callus and M.L. Scott

Wednesday 11:00am

54 - Computational multiscale modeling, Part III
Room: 2-132
Chairpersons: S.A. Meguid, K.M. Liew, L.S. Ong and T.Y. Ng

Constitutive modeling of the stress-stretch behavior of membranes possessing a triangulated network microstructure
M. Arslan, M.C. Boyce

Stress-driven material migration in Cu interconnects during thermal annealing
V. Grychanyuk, I. Tsukrov and T.S. Gross

Influence of continuous nucleation of secondary voids upon growth and coalescence of cavities in porous ductile materials
K. Enakoutsa, J.-B. Leblond and B. Audoly

Wednesday 11:00am

28 - Advanced analysis – Multiphysics, Part III
Room: 2-135
Chairpersons: Chairpersons: J.W. Bull, J.-W. Hong and T. Kalman

Validation process for road noise analysis
J.-U. Lee, J.-K. Suh and S.-K. Jeong

A fast matrix-free implicit unstructured-hybrid algorithm for modelling non-linear heat conduction
A.G. Malan and J.P. Meyer

Wednesday 11:00am

91 - Discretization methods with finite volumes, discontinuous Galerkin methods and the application in porous media, Part I
Room: 2-136
Chairperson: J. Geiser

***A posteriori* error estimates for the heterogeneous multiscale finite element method for elliptic homogenization problems**
M. Ohlberger

Operator-splitting methods for transport equations with nonlinear reactions
R.E. Ewing, J. Geiser and J. Liu

Modified discretization methods with embedded analytical solutions based on Finite Volume and Discontinuous Galerkin Methods and some applications in porous media
J. Geiser

Wednesday 11:00am

70 - Computational stochastic mechanics, Part III
Room: 2-139
Chairpersons: G.I. Schuëller and D. Wei

The interval finite element method for static structural analysis
L. Farkas, D. Moens and D. Vandepitte

Numerical Karhunen-Loève expansion of a covariance function on a multidimensional domain via finite elements method
S. Recek, M. Lemaire and A. Millard

A formulation for evaluation of uncertain response due to multiple uncertain material properties in in-plane and plate structures
H.C. Noh

Wednesday 11:00am

77 - Electro-magneto-mechanics of smart structures, Part III
Room: 2-142
Chairpersons: Y. Shindo, P. Gaudenzi and M.C. Dökmeci

A nonlinear piezoelectric 3D-beam finite element formulation
A. Butz, S. Klinkel and W. Wagner

Damping properties of steel frame equipped with traditional and shape-memory alloy braces
D. Fugazza

Optimal control using second order automatic differentiation
M. Furumi and M. Kawahara

Wednesday 11:00am

26 - Advanced analysis – Solids, Part I
Room: 2-143
Chairpersons: C. Gantes, M.L. Bucalem and M. Kaminski

Towards physically based failure criteria of fibrous composites. A micromechanical study
F. París, V. Mantic and E. Correa
(Keynote)

Positional description for nonlinear 2-D static and dynamic frame analysis by FEM with Reissner kinematics
D.N. Maciel and H.B. Coda

Wednesday 11:00am

212 - Meshing and mesh adaptation, Part I
Room: 2-146
Chairpersons: C. Hüttig and M.M.I. Baig

Quadrilateral mesh adaptation by area functional
S.K. Khattri

A Laplacian-based grid manipulator for ALE calculations in screw compressors
J. Vande Voorde, J. Vierendeels and E. Dick

Wednesday 11:00am

104 - Uncertainty in civil engineering and computational mechanics, Part I
Room: 2-147
Chairpersons: B. Möller and S. Chen

Inclusion properties for random relations under the hypothesis of stochastic independence and non-interactivity
S. Chen and F. Tonon

Reliability evaluation using nonlinear finite element method under dynamic loading
A. Haldar and J. Huh

Stochastic analysis of steady-state aeroelastic instabilities
M. Löhr and D. Dinkler

Wednesday 11:00am

67 - Modeling and solutions for ductile fracture, Part I
Room: 2-151
Chairperson: L. Zheng

A review of advances in mixed mode ductile fracture
X. Deng and M.A. Sutton

A relation for mesh size effect in ductile fracture
D.G. Karr and Y. Li

Development and calibration of a new 3-D fracture criterion for ductile metals
T. Wierzbicki, Y. Bao, Y.-W. Lee and Y. Bai

Wednesday 11:00am

84 - Biomechanics of soft and hard tissues, Part III
(*In honor of Prof. Sidney Lees*)
Room: 4-270
Chairpersons: F.-J. Ulm and C. Hellmich

A nature-inspired model for fibre-reinforced membranes at finite strains
B. Chiaia and M. Borri-Brunetto

FSI model of the spinal cord and implications for syringomyelia
E. Kyriakou, L. Bilston, M. Stoodley and A. Brodbelt

Finite element model of the lung and chest wall to predict internal motion
E. Kyriakou, P.A. Robinson, R. Fulton and C. Baldock

Wednesday 11:00am

101 - Computational plasticity, Part III
Room: 4-370
Chairpersons: F.J. Montans and R.I. Borja

Intrinsic stress computation and algorithm linearization for isotropic plasticity models
N. Valoroso

Continuum Model for Metal Sandwich Cores
Z. Xue, A. Vaziri and J.W. Hutchinson

Applications of planar isotropic yield criteria to porous sheet metal under a deep drawing simulation
K.-C. Liao

Wednesday 11:00am

20 - Nonlinear dynamics and computational fluid-structure interactions, Part III
(*in honor of Prof. M. P. Païdoussis*)
Room: 10-250
Chairpersons: P.B. Gonçalves and M. P. Païdoussis

Large amplitude vibrations of doubly curved shallow shells
M. Amabili
(Keynote)

Non-linear modal interactions in free-edge thin spherical shells: measurements of a 1:1:2 internal resonance
O. Thomas, É. Luminais and C. Touze

Nonlinear vibrations of clamped circular cylindrical shells
K.N. Karagiozis, M. Amabili, M.P. Païdoussis and A.K. Misra

Wednesday 11:00am

222 - Computational fluid dynamics I, Part III
Room: 32-123
Chairpersons : S. Ossia, D. Tang and G.J. Sheard

Flowing into the mainstream: The emerging role of CFD in CAE and PLM
D.A. Nagy
(Keynote)

Axisymmetric model for finite element analysis of particle transport on rotating flow
S.P. Ferro, M.E.C. Cardozo and M.B. Goldschmit

Determining bed shear stress distributions in a rotating circular flume using ADINA-F model
C. Inkratas, A. Fata, B. Gharabaghi, B.G. Krishnappan and C. He

WEDNESDAY

Wednesday 11:00am

200 - Computational fluid dynamics II, Part III
Room: 32-124
Chairperson: J. Iannelli and H. Kohno

Higher order weighted compact scheme
M.L.B. Oliveira
(Keynote)

A locally conservative projection scheme for incompressible flow
B. Bejanov, J-L. Guermond, and P.D. Minev

Wednesday 11:00am

40 - Computational fluid and solid geodynamics: Methods and challenges, Part III
Room: 5-234
Chairperson: P. Tackley

Planetary and stellar dynamo simulations: methods and examples
G.A. Glatzmaier

Application of grid computation to numerical geodynamo simulation
W. Kuang

Control volume approach to the geodynamo
M. Reshetnyak

12:30 - 2:00pm
Lunch Break

Wednesday 2:00pm

23 - Reliability and robust design , Part IV
Room: 1-135
Chairperson: K.-K. Choi and N. Hoyle

Using computational models with different levels of abstraction to design a new borehole sonic logging tool
J. Pabon, C.-J. Hsu, and H. Sugiyama

Optimal design of a lightweight fiber reinforced composite robotic manipulator
G. Qi and L.B. Lessard

Wednesday 2:00pm

47 – Advances in the analysis of shells, Part IVa
Room: 1-190
Chairpersons: W. Wagner, W.B. Krätzig and S. Klinkel

Thermal buckling and dynamic analysis of functionally graded truncated conical shells conveying hot liquid sodium
R.K. Bhangale and N. Ganesan

Assumed thickness and shear strain shell element for incompressible hyperelastic analysis
M. Tanaka and H. Noguchi

Variational formulation and numerical treatment of a surface-related solid-shell element
R. Schlebusch and B.W. Zastrau

Free vibration of a plate with crack: Inverse problem
T. Yeghiazaryan

Wednesday 2:00pm

92 - Interface capturing and multi-fluid dynamics, Part II
Room: 1-242
Chairpersons: T. Yabe and F. Xiao

Description of complex bodies by almost mesh-free Soroban Grid
T. Yabe

Development of Front Tracking Method and its application to Computational Fluid Dynamics
B. Fix, J. Glimm, X. Jia and X. Li

Numerical method for moving solid objects in flows
K. Yokoi

A robust and practical numerical model for multi-fluid simulations
F. Xiao

Wednesday 2:00pm

80 - Mechanics of woven fabrics and woven-reinforced composites, Part IV
Room: 1-246
Chairperson: J.F. Ganghoffer

Nonlinear behavior of 3D regular and irregular open cell structures
M.H. Luxner, J. Stampfl and H.E. Pettermann

FEA of the high strain mechanical response of a wet Kelvin model of a polyurethane open-cell foam
N.J. Mills

Wednesday 2:00pm

202 - Formulations and algorithms for PDEs, Part IV
Room: 1-273
Chairpersons: C.-N. Chen and D. Mijuca

A comparison of mixed-enhanced finite elements
R. Piltner and L. Li

High accuracy numerical methods for incompletely parabolic problems in fluid dynamics I: Formulation
M.M. Cecchi and M.A. Pirozzi

Stochastic generalized differential quadrature formulation
M. Meštrović

Wednesday 2:00pm

48 - Vortex dominated flows - Computational, analytical and experimental studies of viscous or inviscid vortical flows and applications, Part IIa
Room: 1-371
Chairpersons: E. Krause, L. Ting and D. Blackmore

Numerical analysis of two distinct types of vortex dislocations in wake-type flows with different spanwise nonuniformities
G.C. Ling and J.Y. Niu
(Keynote)

Monte Carlo simulations of Baroclinic vortices
S.M. Assad and C.C. Lim

Numerical analysis of 3D lid-driven cavity flows with different spanwise aspect ratios
K. Ishii, T. Nihei and S. Adachi

On the influence of diabatic effects on the motion of 3D - mesoscale vortices within a baroclinic shear flow
E. Mikusky, A.Z. Owinoh and R. Klein

WEDNESDAY

Wednesday 2:00pm

25 - Error control and mesh adaptation in FEA, Part IVa
Room: 1-375
Chairpersons: T. Grätsch and F. Cirak

***A posteriori* error estimates based on polynomial gradient recovery**
Z. Zhang
(Keynote)

Variational mesh adaptation methods using balance of space-time configurational forces
G. Zielonka and M. Ortiz

***A posteriori* error control in a parallel finite element code**
C.K. Newman, K.D. Copps, and S.W. Bova

Recent results in *a posteriori* error estimation for solid dynamics
I. Romero and L.M. Lacoma

Wednesday 2:00pm

22 - Optimization - Research and applications, Part IV
Room: 1-379
Chairpersons: F. Duddeck and K.-U. Bletzinger

Comparative studies of two PDD methods for airfoil design optimization
X. Cai and F. Ladeinde

Structural topology optimization using a moving superimposed finite element method
S. Wang, M.Y. Wang, Q. Xia and S. Chen

Optimising thickness profiling of plate structures
W.C. Christie and J.W. Bull

Wednesday 2:00pm

15 - Discontinuous Galerkin methods for PDEs, Part IVa
Room: 2-105
Chairperson: J.-F. Remacle

The heterogeneous multi-scale method based on the discontinuous Galerkin and the finite volume methods for hyperbolic problems
S. Chen, E. Weinan and C.-W. Shu
(Keynote)

Superconvergence of linear functionals by discontinuous Galerkin approximations
B. Cockburn and D. Ichikawa

A high-order limiter for the discontinuous Galerkin method
L. Krivodonova

An hp-adaptative space-time discontinuous Galerkin method for free boundary problems
J.J. Sudirham, J.J.W. van der Vegt and R.M.J van Damme

Wednesday, 2:00pm

4 - Advances and applications of computational methods in aerospace, Part IV
Room: 2-131

Session 5: Dynamics
Chairperson: J. Bayandor

Buckling conducting wires and instabilities of electrodynamic space tethers
G.H.M. van der Heijden and J. Valverde

Solenoidal invariance of the dynamics for stability calculations
J.I.H. López, J.R. Meneghini, J.A.P. Aranha and F. Saltara

Stability and bifurcation analysis of a two-degree-of-freedom system with clearances
N. Kranjcevic, M. Stegic and N. Vrankovic

A nonlinear stability analysis of the support structure of a particle detector
D. Mladenov

Wednesday 2:00pm

54 - Computational multiscale modeling, Part IV
Room: 2-132
Chairpersons: S.A. Meguid, K.M. Liew, L.S. Ong and T.Y. Ng

Scale-independent constitutive law for quasi-brittle materials in compression
G. Ferro

Parameter identification of Young's modulus based on dynamic response
H. Komine and M. Kawahara

Wednesday 2:00pm

28 - Advanced analysis – Multiphysics, Part IV
Room: 2-135
Chairpersons: J.W. Bull, J.-W. Hong and T. Kalman

Modeling of debris deposition on an extrusion filter medium
E.W. Jenkins, C.L. Cox and P.J. Mucha

Thermo-transient and thermo-mechanical finite element modeling of a diesel four stroke engine piston for variable engine speed conditions
E.M.R. Bueno, M.L. Bucalem and C.B. Zabeu

A new approach for analysis of hydro thermomechanical problems
H. Gholibeigian and A. AmirShakarami

Wednesday 2:00pm

91 - Discretization methods with finite volumes, discontinuous Galerkin methods and the application in porous media, Part IIa
Room: 2-136
Chairperson: J. Geiser

Towards a parallel anisotropic Cartesian grid adaptation framework for steam injection processes
J. Nilsson, M. Gerritsen and R. Younis

Impact of wind breaks & trees on wind environment around buildings utilizing computational fluid dynamics analysis
N. Al-Khalidy and C. Pregnalato

Adaptive numerical methods for convection-dominated fluid transport equations based on piecewise linear polynomials
J. Liu and R.E. Ewing

Discretisation methods for nonlinear elliptic optimal control problems
J. Geiser and I. Chryssoverghi

Wednesday 2:00pm

70 - Computational stochastic mechanics, Part IV
Room: 2-139
Chairpersons: G.I. Schuëller and S.K. Sachdeva

Dynamic analysis of stochastic structures using random factor method
W. Gao

Stochastic modeling of bacterial attachment-detachment
A. Massoudieh, K.E. Nelson and T.R. Ginn

Continuum mechanics and finite elements in stationary stochastic fields: the formulation
C.F. Li, Y.T. Feng and D.R.J. Owen

Continuum mechanics and finite elements in stationary stochastic fields: Computational issues
Y.T. Feng, C.F. Li and D.R.J. Owen

Wednesday 2:00pm

26 - Advanced analysis – Solids, Part IIa
Room: 2-143
Chairpersons: C. Gantes, M.L. Bucalem and M. Kaminski

On the modeling of the Mannesmann piercing process
D.A. Berazategui, M.A. Cavaliere, L. Montelatici and E.N. Dvorkin (Keynote)

Numerical investigation of the deformation of a ground station antenna (ESA)
T. Bornkessel and M. Schäfer

Modeling and macroscopic examinations of TiN ceramic thin layers deposited on polymer elements
R. Major and P. Lacki

Containment scale model post-test analysis
P. Varpasuo

Wednesday 2:00pm

212 - Meshing and mesh adaptation, Part IIa
Room: 2-146
Chairpersons: C. Hüttig and S.K. Khattri

ALE technique with the spectral element methods: mesh deformation
N. Bodard and M.O. Deville

3D spherical gridding based on equidistant, constant volume cells for FV/FD methods
C. Hüttig

The advantages of polyhedral meshing for CFD
S. Ferguson

Enhancing mesh-distortion tolerance of isoparametric elements
S. Rajendran and E.T. Ooi

Wednesday 2:00pm

104 - Uncertainty in civil engineering and computational mechanics, Part IIa
Room: 2-147
Chairpersons: B. Möller and S. Chen

Fuzzy arithmetical modeling and simulation of structures with uncertain properties
K. Willner

Design of structures – solving the inverse problem
M. Liebscher and B. Möller

Fuzzy multi body systems and fuzzy probabilistic multi body systems and their application for numerical simulation of controlled demolitions of structures
B. Möller and M. Liebscher

***In situ* determination of the residual load-bearing capacity of bridges using fuzzy set theory**
N. Gebbeken and A. Baumhauer

Wednesday 2:00pm

67 - Modeling and solutions for ductile fracture, Part IIa
Room: 2-151
Chairperson: T. Wierzbicki

A Cohesive Zone Model for ductile crack propagation in thin-walled structures
P.D. Zavattieri

A brittle failure model for tungsten long rod penetrators
S. Hiermaier, P. Weidemaier and I. Rohr

The calibration of the three-dimensional damage percolation model
O.S. Orlov, S.L. Winkler, M.J. Worswick, D.J. Lloyd and M.J. Finn

The displacement discontinuity method for modeling fracture in the semi-circular bending test
B. Birgisson, A. Montepara, R. Roque, E. Romeo and G. Tebaldi

Wednesday 2:00pm

9 - Numerical methods for fluid-structure interaction systems, Part Ia
Room: 4-270
Chairperson: L. Gastaldi

GSMAC-FEM analysis of largely-deformed fluid-structure interface
G. Hashimoto and T. Tanahashi

Loosely- versus strongly-coupled staggered solution procedures for aeroelastic problems
P. Geuzaine and F. Thirifay

Liquid motion assessment for partially filled horizontal cylindrical tanks with flat and non-flat heads
L. Dai and L. Xu

Wednesday 2:00pm

101 - Computational plasticity, Part IVa
Room: 4-370
Chairpersons: R.I. Borja and C. Foster

Constitutive modeling of anisotropy and microstructural evolution during superplastic deformation
F.K. Abu-Farha

An efficient numerical modelling of anisotropic structural behaviour in large strain plasticity
I. Karšaj, C. Sansour and J. Sorić

A new Arbitrary Reference Configuration (ARC) formulation for computational finite strain transient applications
X. Zhou, K.K. Tamma and D. Sha

An influence of the material discontinuity on the die forging process -- numerical simulation
J. Adamus and P. Lacki

Wednesday 2:00pm

20 - Nonlinear dynamics and computational fluid-structure interactions, Part IVa
(*in honor of Prof. M. P. Païdoussis*)
Room: 10-250
Chairpersons: C. Dalton, A.H. Nayfeh and A.S. Tijsseling

An overview of vortex shedding and acoustic resonance in heat exchanger tube arrays
D.S. Weaver
(Keynote)

A numerical investigation of the near wake structure in the varying frequency forced oscillation of a circular cylinder
S. Atluri and C. Dalton

Global stability of empty and fluid-filled imperfect cylindrical shells
P.B. Gonçalves, Z.J.G.N. Prado and F.M.A. Silva

Computational and experimental study of active vibration control of a rectangular plate coupled to liquid
S. Carra, M. Amabili, R. Ohayon and P.M. Hutin

Wednesday 2:00pm

222 - Computational fluid dynamics I, Part IVa
Room: 32-123
Chairpersons : S. Ossia, D. Tang and G.J. Sheard

Modelling of flow in gas turbine pre-swirl systems
A.C. Benim

Simulation of advective-diffusive problems by using a hyperbolic model
H. Gómez, I. Colominas, F. Navarrina and M. Casteleiro

(Not) lost in translation: PLM enabled CFD
S. Ferguson

Modeling moving boundary hydrodynamic problems of shallow water flow over complex topography
D. Farshi and S. Komaei

Wednesday 2:00pm

200 - Computational fluid dynamics II, Part IVa
Room: 32-124
Chairperson: J. Iannelli and J.-M. Vaassen

A multi-dimensional acoustics-convection upstream resolution Euler solver
J. Iannelli
(Keynote)

The use of real-valued evolutionary algorithms as a tool to combat divergence in non-Newtonian fluids flow simulations
D.A. Kaminski and R.I. Bourisli

Simulation of free-surface flows using moving-grid techniques with spectral element methods
R. Bouffanais and M.O. Deville

Wednesday 2:00pm

40 - Computational fluid and solid geodynamics: Methods and challenges, Part IV
Room: 5-234
Chairperson: G. Glatzmaier

Numerical simulations of low Prandtl number rotating magnetoconvection in cylindrical and spherical geometries using a finite volume multigrid method
P.J. Tackley

A finite-volume scheme for thermal convection and dynamo problems in spherical shells
U. Hansen, H. Harder and K. Stemmer

Yin-Yang grid and geodynamo simulation
A. Kageyama

4:00 - 4:30pm
Coffee Break

Wednesday 4:30pm

47 – Advances in the analysis of shells, Part IVb
Room: 1-190
Chairpersons: W. Wagner, W.B. Krätzig and S. Klinkel

Numerical procedure of simultaneously determining of the hydraulic properties of porous media
A.G. Fatullayev

Analysis of characteristic equations by generalized Newton's method
I.M. Landman

Micropolar Theory of Elastic Thin Plates
S.H. Sargsyan

Wednesday 4:30pm

48 - Vortex dominated flows - Computational, analytical and experimental studies of viscous or inviscid vortical flows and applications, Part IIb
Room: 1-371
Chairpersons: E. Krause, L. Ting and D. Blackmore

Perturbed three point vortex dynamics
D. Blackmore, O. Knio and L. Ting

Topology change of vortices using stochastic differential equations
N.K.-R. Kevlahan

Vortex dipole coordinates on the sphere
P.K. Newton and H. Shokraneh

Wednesday 4:30pm

25 - Error control and mesh adaptation in FEA, Part IVb
Room: 1-375
Chairpersons: T. Grätsch and F. Cirak

An MWLS based Zienkiewicz-Zhu *a posteriori* error estimation without Superconvergent Theory
J. Krok

On efficiency of a posteriori error estimates for the Stokes problem
E. Gorshkova, P. Neittaanmäki and S. Repin

Wednesday 4:30pm

15 - Discontinuous Galerkin methods for PDEs, Part IVb
Room: 2-105
Chairperson: J.K. Ryan

Dynamic load balancing for heterogeneous and hierarchical computing environments
J.D. Teresco, J. Faik, J.E. Flaherty and L.G. Gervasio

A discontinuous Galerkin spectral/hp method for high order Boussinesq equations
A. Engsig-Karup, H. Bingham, J. Hesthaven and P. Madsen

P-adaptivity used as a time step optimizer
N. Chevaugeon, J.-F. Remacle and E. Marchandise

Wednesday 4:30pm

91 - Discretization methods with finite volumes, discontinuous Galerkin methods and the application in porous media, Part IIb
Room: 2-136
Chairperson: J. Geiser

A new stable discontinuous Galerkin approximation for non-linear conservation laws on adaptively refined grids
A. Dedner, C. Makridakis and M. Ohlberger

Wednesday 4:30pm

26 - Advanced analysis – Solids, Part IIb
Room: 2-143
Chairpersons: C. Gantes, M.L. Bucalem and M. Kaminski

A numerical model for predicting the dynamic behavior of an iced cable subjected to mechanical shocks
T. Kalman, G. McClure, M. Farzaneh and L.E. Kollar

Vibration analysis and drop test of hearing aid
S. Sundermurthy, D. Tourtelotte and T. Burns

Development of a general three-dimensional L-section beam finite element for elastoplastic large deformation analysis and its application to the analysis of a transmission tower
P.-S. Lee, X.H. Zhang and G. McClure

Stresses near doors and windows of the Boeing 777 aircraft
V.G. Ukadgaonker

Wednesday 4:30pm

212 - Meshing and mesh adaptation, Part IIb
Room: 2-146
Chairpersons: C. Hüttig and M.M.I. Baig

A variationally consistent mesh adaptive explicit method for Lagrangian dynamics in solid mechanics
S.K. Lahiri, J. Bonet and J. Peraire

Unstructured mesh generation for wind flow simulation
K. Nojima and M. Kawahara

Wednesday 4:30pm

104 - Uncertainty in civil engineering and computational mechanics, Part IIb
Room: 2-147
Chairpersons: B. Möller and S. Chen

Simulation of fuzzy random variables
M. Beer

Neural networks in process simulation
M. Beer and P.D. Spanos

Sensitivity analysis with Green's functions
O. Carl and F. Hartmann

Wednesday 4:30pm

67 - Modeling and solutions for ductile fracture, Part IIb
Room: 2-151
Chairperson: T. Wierzbicki

Numerical simulation of the polyurethane foam expansion during moulding at microscopic and macroscopic scales
J. Bikard, J. Bruchon, L. Silva and T. Coupez

Experimental and numerical studies of springback in air V-bending process for cold rolled TRIP steels
D. Fei and P. Hodgson

Metal forming of a tractor idler wheel
Y.K.K. Liao

Wednesday 4:30pm

9 - Numerical methods for fluid-structure interaction systems, Part Ib
Room: 4-270
Chairperson: D. Boffi

A 3-dimensional fluid-solid interaction model of the left ventricle
D. Deserranno, M. Kassemi and J. Thomas

An algorithm for modeling the interaction of a flexible rod with a two dimensional highspeed flow
D.S.-W. Tam and R. Radovitzky

An efficient numerical approach for modeling acoustic emission using higher-order elements -- An application to a unidirectional fiber-reinforced composite sample
R.-R. Naber and H. Bahai

Wednesday 4:30pm

101 - Computational plasticity, Part IVb
Room: 4-370
Chairpersons: Chairpersons: R.I. Borja and C. Foster

Large strain anisotropic plasticity including effects of plastic spin
F.J. Montans and K.J. Bathe
(Keynote)

Analytical approximations for solving the plane stress problem in finite hyper-elasticity and finite elasto-plasticity
T. Wenzel

Numerical modeling of penetration into compressible rigid-viscoplastic media
O. Cazacu, I.R. Ionescu and T. Perrot

Modeling of strain rate history effects in BCC metals
S. Simunovic and P.V.K.K. Nukala

Wednesday 4:30pm

20 - Nonlinear dynamics and computational fluid-structure interactions, Part IVb
(*in honor of Prof. M. P. Païdoussis*)
Room: 10-250
Chairpersons: C.E.S. Cesnik and S. Kaneko

On the compliance of thick-walled elastic tubes
A. Marzo, X.Y. Luo and C.D. Bertram

Analysis of the pulse wave velocity of human artery and its application to the blood pressure meter
S. Kaneko, T. Nakamura, Y. Chang and T. Watanabe

Simulation of a nonhomogeneous flexible filament moving in a flowing viscous fluid by the immersed boundary method
L. Zhu

Immersed Finite Element Method and its applications
L. Zhang

Wednesday 4:30pm

222 - Computational fluid dynamics I, Part IVb
Room: 32-123
Chairpersons : S. Ossia, D. Tang and G.J. Sheard

Numerical investigation of periodically-driven flows
C. Olah and Y. Bourgault

Wednesday 4:30pm

200 - Computational fluid dynamics II, Part IVb
Room: 32-124
Chairperson: J. Iannelli and H. Kohno

Energy trasfer in internal waves generated by tidal flow over topography
A. Korobov and K. Lamb

THURSDAY

Thursday 9:00am

Plenary Lectures
Chairperson: J.W. Tedesco

9:00 - 10:30am

Room: Kresge Auditorium (W16)

Simulations of particle-fluid suspensions with the Lattice-Boltzmann equation
A.J.C. Ladd, University of Florida

Applications of computational fluid mechanics at Sandia National Laboratories
T.C. Bickel and H.C. Morgan, Sandia National Laboratories

10:30 - 11:00am
Coffee Break

Thursday 11:00am

79 - Finite/discrete element methods and applications, Part I
Room: 1-135
Chairpersons: D.R.J. Owen, J.R. Williams and G. Mustoe

A .NET grid computing system applied to Lattice-Boltzmann
X. Lin and J.R. Williams

Contact detection between axially-asymmetric ellipsoids in discrete element modeling
S.M. Johnson, J.R. Williams and B.K. Cook

Modelling of impact using adaptive discrete element techniques
M.G. Cottrell and D.R.J. Owen

Thursday 11:00am

63 - Lattice Boltzmann methods for computational fluid dynamics, Part I
Room: 1-190
Chairpersons: S. Ubertini and S. Succi

Lattice Boltzmann method for computational fluid dynamics
S. Succi
(Keynote)

Applications of the mean-field Lattice Boltzmann method for solid-fluid interfaces to study interfacial phenomena
J. Zhang and D.Y. Kwok

A Lattice Boltzmann study on trade-off between mixing and flow efficiency for electromagnetic flow in heterogeneous microchannels with nonuniform surface potentials
F. Tian and D.Y. Kwok

Thursday 11:00am

57 - Computational modeling of reacting flow, Part I
Room: 1-246
Chairperson: H.N. Najm

Nitrogen chemistry controlling steps in methane-air premixed flames
D.A. Goussis and G. Skevis
(Keynote)

Chemical kinetics mechanism simplification via CSP
M. Valorani, F. Creta, D.A. Goussis, H.N. Najm and J.C. Lee

On chain branching and its role in homogeneous ignition and premixed flame propagation
J.C. Lee, H.N. Najm, J. Ray, M. Frenklach, M. Valorani and D.A. Goussis

Thursday 11:00am

90 - Neural networks and soft methods in computational mechanics, Part I
Room: 1-273
Chairpersons: L. Ziemianski and B.H.V. Topping

Coupled evolutionary algorithm and artificial neural network in defects identification
T. Burczynski and A. Skrobol
(Keynote)

Neural prediction of response spectra from mining tremors using recurrent layered frameworks and Kalman filtering
A. Krok and Z. Waszczyszyn

Intelligent finite element method
A.A. Javadi, T.P. Tan and A.S.I. Elkassas

Thursday 11:00am

209 - Fracture analysis and crack propagation, Part I
Room: 1-371
Chairperson: D. Pantuso

Numerical simulation of dynamical fracture in heterogeneous materials
F. Perales, Y. Monerie, F. Dubois and L. Stainier

Constraint effects in shallow surface crack analysis in a elbow by a three-term asymptotic approach
F. Labbe and J.R. Donoso

Application of fracture mechanics to the study of wear processes
N. Repčić

Thursday 11:00am

15 - Discontinuous Galerkin methods for PDEs, Part V
Room: 1-375 (note different room number)
Chairperson: B. Riviere

The local discontinuous Galerkin method and component design integration for 3D elasticity
S. Siddarth, J. Carrero, B. Cockburn, K.K. Tamma and R. Kanapady

On the simulation of two-phase flows with a quadrature-free discontinuous Galerkin method for the level set equation
E. Marchandise, J.-F. Remacle and N. Chevaugeon

A hybrid Galerkin atmospheric model
S.J. Thomas, A. St.-Cyr and R.D. Nair

Thursday 11:00am

61 - Optimization of expensive black-box cost functions, Part I
Room: 1-379
Chairpersons: M. Meyer and M. Krosche

A modular approach for simulation-based optimization of technical systems
P. Schneider, A. Schneider and P. Schwartz

Condor, a parallel, direct, constrained optimizer for high-computing-load, black-box objective functions
F. Vanden Berghen

Evaluation of optimization algorithms for crash and NVH problems
F. Duddeck and K. Volz

Thursday 11:00am

204 - Turbulence modeling, Part I
Room: 1-242
Chairperson: A.C. Benim

Large-eddy simulation of turbulent gas-particle flows in the duct induced by the wall injection
K.N. Volkov

A two-grid finite volume method for variational multiscale large eddy simulation of turbulent flows
V. Gravemeier

T-RANS based analysis of turbulent swirling flows
A.C. Benim, A. Nahavandi and K.J. Syed

Thursday 11:00am

13 - Modeling of the cardiovascular system, Part I
Room: 2-105
Chairpersons: D. Chapelle, J.-F. Gerbeau and Y. Bourgault

Fiber architecture of the heart, and its role in cardiac mechanics and electrophysiology
C.S. Peskin
(Keynote)

Confronting a mathematically derived constitutive law for the myocardium with experimental data
D. Caillerie, A. Mourad and A. Raoult

Data assimilation for cardiac electromechanical modeling
P. Moireau and D. Chapelle

Thursday 11:00am

27 - Advances in algorithms and applications for incompressible and low-Mach number flows, Part I
Room: 2-131
Chairpersons: M.A. Christon, D.K. Gartling and M.J. Martinez

GLS-type finite element methods for viscoelastic fluid flow simulation
M. Behr, D. Arora, O. Coronado-Matutti and M. Pasquali
(Keynote)

A modified conservation law approach to improved finite element Navier-Stokes algorithm
S. Sahu and A.J. Baker

Recent developments in spectral element simulations of convection-dominated flows
P.F. Fischer

Thursday 11:00am

38 - Nonlinear dynamics - spanning the scales: Algorithms and applications, Part I
Room: 2-132
Chairpersons: A. Ibrahimbegovic and N. Saha

Nonlinear dynamics of structures and multibody systems
A. Ibrahimbegovic
(Keynote)

Transfer operator based on diffuse interpolation and energy conservation for damage materials
D. Brancherie, P. Villon, A. Ibrahimbegovic, A. Rassineux and P. Breitkopf

Time-space field transfer for impact dynamics
G. Hervé, A. Ibrahimbegovic and P. Villon

Thursday 11:00am

226 - Analysis for earthquake resistant design, Part I
Room: 2-135
Chairperson: P. Komodromos and D.G. Lignos

Modal pushover analysis as a tool for evaluation and design of irregular frames
D.G. Lignos and G.J. Gantes

Sliding mode control for civil structures based on complex Fourier coefficients of the earthquake
N.G. Pnevmatikos and C.J. Gantes

Thursday 11:00am

66 - Multi-scale modeling of material behavior – Solids, Part I
Room: 2-136
Chairpersons: R. Radovitzky and A. Cuitino

Multiscale modeling of materials: application to mechanochemistry of metals
E. Kaxiras
(Keynote)

A multiscale modeling approach to fatigue damage in discontinuous fibre polymer composites
B.N. Nguyen, B.J. Tucker and M.A. Khaleel

Novel strategies for the transition from discrete to continuous modelling of materials
J.F. Ganghoffer , B. Ben Boubaker, B. Haussy, and M. Magno

Thursday 11:00am

215 - Formulations in elasticity, Part I
Room: 2-139
Chairperson: P.-S. Lee and S.K. Khattri

On adaptive finite volume methods for elliptic problems with discontinuous coefficients
S.K. Khattri

Numerical simulation of the dynamics of a nonlocal inhomogeneous infinite bar
O. Weckner and E. Emmrich

An elastic-damage nonlocal interface model
G. Borino, B. Failla and F. Parrinello

Thursday 11:00am

17 - Boundary element methods and applications, Part I
Room: 2-142
Chairpersons: F. Duddeck and O. Steinbach

Periodic conduction problems: the fast multipole method and convergence of integral equations and lattice sums
G.J. Rodin and J.R. Overfelt
(Keynote)

Application of fast multipole methods to the analysis of MEMS
A. Frangi, A. di Gioia and G. Novati

Developments of multi-level boundary element methods for steady heat diffusion problems
M.M. Grigoriev and G.F. Dargush

Thursday 11:00am

26 - Advanced analysis – Solids, Part III
Room: 2-143
Chairpersons: C. Gantes, M.L. Bucalem and M. Kaminski

Modeling of the overhead power line post spring-damper using ADINA
A.B. Peabody and G. McClure

A comprehensive methodology for the modeling of diesel four stroke engine pistons for variable engine speed conditions
E.M.R. Bueno and M.L. Bucalem

Flexibility analysis of smooth orthotropic pipe bend
K.M. Gupta and S.J. Pawar

Thursday 11:00am

37 - Computational modeling of ionized gas flows, Part I
Room: 2-146
Chairpersons: S. Roy and D. Gaitonde

Numerical studies of laser-induced energy deposition for supersonic flow control
R. Kandala and G.V. Candler

The hypersonic quasineutral gas discharge plasma in magnetic field
S.T. Surzhikov and J.S. Shang

Scaling laws for the high-pressure inductively coupled plasma torch under thermochemical non-equilibrium
D. Vanden-Abeele and G. Degrez

Thursday 11:00am

104 - Uncertainty in civil engineering and computational mechanics, Part III
Room: 2-147
Chairperson: P.M. Mariano

Dynamic coupling between phonon and phason modes in quasiperiodic alloys
M. Gei and P.M. Mariano
(Keynote)

Addressing variability and uncertainty to improve product design
G. Allen

Medium frequency computations of structures including interface uncertainties
C. Blanzé and P. Rouch

Thursday 11:00am

211 – Methods and modeling for analysis of concrete and related structures, Part I
Room: 2-151
Chairperson: P. Grassl

Plasticity with nonlocal damage, with application to concrete cracking
P. Grassl and M. Jirasek

“Transient thermal creep” of concrete: intrinsic behaviour or structural effect?
G. Mounajed, H. Boussa, F. Grondin and A. Menou

Finite element stress analysis of reinforced high-strength concrete columns in severe fires
J.H. Chung, G.R. Consolazio and M.C. McVay

Thursday 11:00am

9 - Numerical methods for fluid-structure interaction systems, Part II
Room: 4-270
Chairperson: L. Gastaldi

An algorithm for distributed immersed boundary computations
E. Givelberg

Shell-fluid coupled simulation of detonation-driven fracture and fragmentation
F. Cirak and R. Deiterding

Fluid-structure-soil interaction in time domain
S. Küçükarslan

Thursday 11:00am

101 - Computational plasticity, Part V
Room: 4-370
Chairpersons: F.J. Montans and R.I. Borja

Finite element analysis coupled with strain gradient plasticity
J.-W. Hong, B. Birgisson and J.W. Tedesco
(Keynote)

Elastoplastic damage analysis of n-phase hybrid composites
E.T.Y. Ng and A. Suleman

Numerical analysis of a quasistatic viscoplastic contact problem with friction and damage
M. Campo, J.R., Fernandez and T.-V. Hoarau-Mantel

Thursday 11:00am

20 - Nonlinear dynamics and computational fluid-structure interactions, Part V
(*in honor of Prof. M. P. Païdoussis*)
Room: 10-250
Chairpersons: H. Matthies and R. Ohayon

Structural-acoustic vibration and transient problems with interface damping: Symmetric variational formulation and finite element results
J.-F. Deü, W. Larbi and R. Ohayon
(Keynote)

A coupled meshfree/meshbased method for complex fluid-structure interaction problems
T.-P. Fries and H.G. Matthies

An immersed interface method for the incompressible Navier-Stokes equations in irregular domains
D.V. Le, B.C. Khoo and J. Peraire

Thursday 11:00am

222 - Computational fluid dynamics I, Part V
Room: 32-123
Chairpersons : S. Ossia, D. Tang and G.J. Sheard

Particle tracking: From raindrops in 1940 to drug dissolution in 2005
N.M. McMahon, M. Crane, H.J. Ruskin and L.J. Crane

Assessment of hydrodynamic performance of microfluidic peristaltic pumps
C.Y. Park, C.F. Dewey Jr.

Numerical simulation of two-dimensional ceramic candle filter flow
M.H. Al-Hajeri

Thursday 11:00am

200 - Computational fluid dynamics II, Part V
Room: 32-124
Chairperson: J. Iannelli and J.-M. Vaassen

Finite element method for CFD based on Helmholtz-decomposition
J. Imamura and T. Tanahashi

Thursday 11:00am

19 - Multiscale, multiphysics computational fluid dynamics, Part I
Room: 5-234
Chairpersons: Y. Zhang and J. Glimm

Numerical study of the breakup of a fluid thread surrounded by a more viscous fluid
M. Siegel

Tracked flame simulation for Type Ia supernova
Y. Zhang, J. Glimm and S. Dutta

The jet simulation in a diesel engine
J. Glimm, M.N. Kim, X.-L. Li, R. Samulyak and Z.-L. Xu

12:30 -2:00pm
Lunch Break

Thursday 2:00pm

79 - Finite/discrete element methods and applications, Part IIa
Room: 1-135
Chairpersons: D.R.J. Owen, J.R. Williams and G. Mustoe

Simulation of an Extensive Underground Structure Subjected to Dynamic Loading Using the Distinct Element Method
J.P. Morris and M.P. Bonner

An energy based polyhedron to polyhedron contact model
Y.T. Feng, K. Han and D.R.J. Owen

Towards one billion particle systems
A. Munjiza, E. Rougier and N.W.M. John

Virtual experimentation in the service of theoretical and experimental science
A. Munjiza, E. Rougier and N.W.M. John

Thursday 2:00pm

63 - Lattice Boltzmann methods for computational fluid dynamics, Part IIa
Room: 1-190
Chairpersons: S. Ubertini and S. Succi

Image-based computational hemodynamics with the Lattice Boltzmann method
A.G. Hoekstra

Extension of the LBM to 3D fully unstructured grids
S. Ubertini, N. Rossi, G. Bella and S. Succi

General theory of Galilean-invariant entropic Lattice Boltzmann models
B.M. Boghosian

Efficient immiscible multiphase flow simulations on hierarchical grids based on the Lattice-Boltzmann method
S. Freudiger, J. Toelke and M. Krafczyk

Thursday 2:00pm

57 - Computational modeling of reacting flow, Part IIa
Room: 1-246

Chairperson: H.N. Najm

Uncertainty quantification in reacting flow computations
H.N. Najm
(Keynote)

A quasi-one-dimensional unsteady laminar flame formulation with independent strain rate and curvature
R.L. Speth, Y.M. Marzouk and A.F. Ghoniem

Consistent hybrid LES-FDF simulation of turbulent reactive flows
V. Raman and H. Pitsch

Rigorous error control in reacting flow simulations using reduced chemistry models
O. Oluwole and W.H. Green

Thursday 2:00pm

90 - Neural networks and soft methods in computational mechanics, Part IIa
Room: 1-273
Chairpersons: L. Ziemianski and B.H.V. Topping

Genetic algorithm transformations for non-orthogonal models
R. Obiała, G.M. Seed, B.H.V. Topping, P. Iványi and D.E.R. Clark
(Keynote)

Identification of stiffness reductions in beams using parameter-dependent frequency changes and neural networks
A. Borowiec and L. Ziemianski

Wing shape optimization by using the dynamic mesh and genetic algorithm
E. Vatandaş and I. Özkol

Augmenting genetic algorithm with neural network and implementation to the airfoil design
A. Hacıoğlu

Thursday 2:00pm

209 - Fracture analysis and crack propagation, Part IIa
Room: 1-371
Chairperson: D. Pantuso

Numerical evaluation of combined branching and closure effects on fatigue crack growth
M.A. Meggiolaro, A.C.O. Miranda, J.T.P. Castro and L.F. Martha

Lower bound to Low Cycle Fatigue life time and its application to safe design of elastic viscoplastic structures
B. Druyanov and I. Roman

Tri-dimensional finite element modelling of fatigue crack closure
A. González-Herrera and J. Zapatero

Thursday 2:00pm

34 - Molecular methods in mechanics
Room: 1-379
Chairperson: N.G. Hadjiconstantinou and H. Al-Mohssen

A variance reduction technique for Monte Carlo solutions of the non-linear Boltzmann equation
L.L. Baker and N.G. Hadjiconstantinou
(Keynote)

An atomistic study of ductile fracture in a single crystal
S. Xu and X. Deng

Molecular dynamics approach for investigation of grain boundary response with applications to continuum simulation of failure in nano-crystalline materials
B. Ganapathysubramanian, V. Sundararaghavan and N. Zabaras

Uniaxial tensile test on an amorphous solid with embedded quasi-crystallites: A molecular dynamics study
Y.F. Shi and M.L. Falk

Thursday 2:00pm

61 - Optimization of expensive black-box cost functions, Part IIa
Room: 1-379
Chairpersons: M. Meyer and M. Krosche

Towards automated optimization
A. Junghanns, D. Petzoldt, J. Dageförde and M. Meyer

An abstract interface for surrogate optimization in the PLATON framework
A.K.M. Fahimuddin, M. Krosche and G. Matthies

Strategies for efficiency in inverse modelling of material parameters for predictive modelling of aerospace alloys
B. Elliott and N. Petrinic

Managing models for simulation-based design optimization, Part 1
N.M. Alexandrov and R.M. Lewis

Thursday 2:00pm

204 - Turbulence modeling, Part II
Room: 1-242
Chairperson: A.C. Benim

Large-eddy simulations of fluid structure interaction problems
J. Yang, S. Preidikman and E. Balaras

A definition for Large Eddy Simulation approximations of the Navier-Stokes equations
J.-L. Guermond and S. Prudhomme

Improving RANS solvers for LES on unstructured meshes: Application to the flow past a sphere
L. Georges , E. Marchandise and P. Geuzaine

Large eddy simulation of wall bounded flows by the variational multiscale finite element method
C.E. Colosqui and A.A. Oberai

Thursday 2:00pm

13 - Modeling of the cardiovascular system, Part IIa
Room: 2-105
Chairpersons: D. Chapelle, J.-F. Gerbeau and Y. Bourgault

Comparison of numerical schemes for the bidomain model
Y. Bourgault and M. Ethier

A finite volume method for the coupled heart-torso bidomain model in electro-cardiology
Y. Coudière, C. Pierre and R. Turpault

Weak and strong coupling in Fluid-Structure Interaction in blood flows
J.-F. Gerbeau

RANS computations of artery flows
G. Medic

Thursday 2:00pm

27 - Advances in algorithms and applications for incompressible and low-Mach number flows, Part IIa
Room: 2-131
Chairpersons: M.A. Christon, D.K. Gartling and M.J. Martinez

Mach-uniformity through the coupled pressure and temperature correction algorithm
K. Nerinckx, J. Vierendeels and E. Dick

A dynamically adaptive wavelet method applied to incompressible flows
D. Wirasaet and S. Paolucci

The local variational multiscale method
S.S. Collis and S. Ramakrishnan

Approximate projection methods and time integration stability
C.D. Moen, S.P. Domino and G.J. Wagner

Thursday 2:00pm

38 - Nonlinear dynamics - spanning the scales: Algorithms and applications, Part IIa
Room: 2-132
Chairpersons: C.L. Bottasso, D. Brancherie and G. Hervé

A simple way to improve the sensitivity to perturbations in the numerical solution of high index stiff differential algebraic equations
C.L. Bottasso and O.A. Bauchau
(Keynote)

Modeling active muscles behavior for emergency braking situations
M. Behr, P.J. Arnoux, T. Serre, K. Kayvantash and C. Brunet

Mass minimization of vehicle structure subject to varying crashworthiness constraints: a prediction-correction approach
Ch. Wauquiez, K. Kayvantash, S. Masfrand, T. Bekkour and F. Arnaudeau

Effect of forming on crash performance of automotive structure - an analytical study
M.O. Faruque, K. Mallela, D. Zeng and N. Saha

Thursday 2:00pm

226 - Analysis for earthquake resistant design, Part II
Room: 2-135
Chairpersons: D.G. Lignos and P. Komodromos

Cost-Benefit analysis of conventional and seismic isolated R/C buildings
E.C. Vassilas and V.K. Koumousis

Impact effects on the behavior of seismically isolated buildings
P. Komodromos

Thursday 2:00pm

66 - Multi-scale modeling of material behavior – Solids, Part IIa
Room: 2-136
Chairpersons: R. Radovitzky and A. Cuitino

Theoretical and numerical study of the result of an applied load on pores in solids
V. I. Betechtin, Yu. M. Dahl, A.G. Kadomtsev and S. Yu. Veselkov

Model Reduction via Parameterized Invariant Manifolds: Some Examples
A. Sawant and A. Acharya

Quantum-mechanics-based nonlinear elastic energy densities for martensitic materials over a large range of deformations
A. Lew

Measurement of Nye dislocation density tensor and geometrically necessary dislocation density based upon lattice rotation measurements
J.W. Kysar and Y.X. Gan

Thursday 2:00pm

215 - Formulations in elasticity, Part IIa
Room: 2-139
Chairperson: P.-S. Lee and S.K. Khattri

The generalized quasi-variational principles of non-conservative systems of elasto-dynamics
L. Liang, T. Fan and H. Li

Elastic wave propagation on Cartesian grids with embedded boundaries
S. Nilsson

Integral equations and their numerical solution for graded materials elasticity
V. Minutolo

Thursday 2:00pm

17 - Boundary element methods and applications, Part IIa
Room: 2-142
Chairpersons: F. Duddeck and O. Steinbach

The Fourier boundary element method and its singularities
F. Duddeck
(Keynote)

An accelerated boundary element method using Fast Fourier Transform on multipoles
K.-M. Lim, E.-T. Ong and H.-P. Lee

Fast Galerkin BEM by a Precorrected-FFT
S.N. Fata, L.J. Gray and T. Kaplan

Boundary element methods for interface cracks with complex stress intensity factors
A.R. Hadjesfandiari and G.F. Dargush

Thursday 2:00pm

26 - Advanced analysis – Solids, Part IVa
Room: 2-143
Chairpersons: C. Gantes, M.L. Bucalem and M. Kaminski

Determining stress intensification factor for smooth orthotropic pipe bend
K.M. Gupta and S.J. Pawar

Using collision physics and Cosserat rod theory to model the transient behavior of drilling tool strings
J. Pabon and D. Pafitis

Inelastic lateral-torsional buckling of castellated beams with an elastic lateral restraint
A. Mohebkhah

Thursday 2:00pm

37 - Computational modeling of ionized gas flows, Part IIa
Room: 2-146
Chairpersons: K. Chatterjee and D. Gaitonde

Nonequilibrium relaxation in high temperature gas flows
E. Josyula and K. Xu

Implicit, approximately-factored upwind scheme for glow discharge modeling
J. Poggie

Finite element modeling of a two fluid RF plasma discharge
H. Kumar and S. Roy

Thursday 2:00pm

104 - Uncertainty in civil engineering and computational mechanics, Part IV
Room: 2-147
Chairperson: P.M. Mariano

Cavitator design for a supercavitating torpedo using Evidence Theory for reliability estimation
E. Alyanak, R.V. Grandhi and H-R. Bae
(Keynote)

A probabilistic approach to improve the static performance of a composite wing
R. d'Ippolito, S. Donders, N. Tzannetakis, J. Van de Peer and H. Van de Auweraer

Aeroelastic response of rectangular cylinders: influence of indicial function parameters
C. Borri and C. Costa

Stochastic clustering and self-organisation of phonon and phason modes in quasicrystals
P.M. Mariano, F.L. Stazi, M. Gioffré and G. Augusti

Thursday 2:00pm

211 – Methods and modeling for analysis of concrete and related structures, Part IIa
Room: 2-151
Chairpersons: B. Birgisson and W. Buttlar

Numerical simulation of the creep phenomenon of steel fiber reinforced concrete
S.A. Saif Eldeen and T. Taniguchi

Nonlinear finite element analysis of post-peak behavior of reinforced concrete considering bond-slip effect
Y. Wu and A.K.H. Kwan

Methods of increasing fatigue life and reducing runway deflections following and explosion beneath a cement concrete runway
J.W. Bull and C.H. Woodford

Thursday 2:00pm

9 - Numerical methods for fluid-structure interaction systems, Part IIIa
Room: 4-270
Chairperson: D. Boffi

Finite element methods for moving surfaces and applications
R.H. Nochetto
(Keynote)

A semi-implicit projection-based algorithm for fluid-structure interaction problems with strong added-mass effect
M.A. Fernández, J.-F.Gerbeau and C. Grandmont

Stability results for the finite element approach to the immersed boundary method
D. Boffi, L. Gastaldi and L. Heltai

A posterior error estimates for an eigenvalue problem arising from fluid-structure interaction
F. Gardini

Thursday 2:00pm

101 - Computational plasticity, Part VIa
Room: 4-370
Chairpersons: F.J. Montans and J.C. Gálvez

Length scales evolutions and localization phenomenon in sand
M.I. Alsaleh, G. Voyiadjis and K.A. Alshibli
(Keynote)

Localization analysis for overconsolidated Kaolin clay behavior
A. Prashant and D. Penumadu

Special Session: Nano-and micromechanics of particulate materials
Chairperson: S.J. Antony

Experimental and computational thermomechanical study of a shape memory alloy micro-actuator: Aspects of antagonist type behavior
R. Velázquez, M. Hafez, J. Szewczyk and E. Pissaloux

A hybrid DEM model suitable for micro and nano particulate systems incorporating long-range force contributions
F. Sarangi, S.J. Antony and M.R. Kuhn

Thursday 2:00pm

200 - Computational fluid dynamics II, Part VIa
Room: 32-124

Special Session: Nonlinear Dynamics of Fluids
Chairpersons: G. Haller, C.W. Rowley and E. Schuckburgh

Microfluidic mixing and particle motion control
I. Mezic
(Keynote)

Quantifying eddy diffusivities in geophysical flows
E. Shuckburgh

Coherent structures and low-order models of transitional and turbulent channel flow
C.W. Rowley and M. Green

The mathematical analysis of mixing of fluids
F.M. Allan

Thursday 2:00pm

19 - Multiscale, multiphysics computational fluid dynamics, Part IIa
Room: 5-234
Chairpersons: Y. Zhang and J. Glimm

Particle simulation of vortex sheet roll-up
R. Krasny

Resolution of a foundational multiscale problem in classical energy-enstrophy theories on a rotating sphere
C.C. Lim

Thermonuclear supernovae: Multiscale and multiphysics in astrophysical fluid dynamics
T. Plewa

Numerical methods for multiscale fluid mechanics
S. Chen

4:00 - 4:30pm
Coffee Break

Thursday 4:30pm

63 - Lattice Boltzmann methods for computational fluid dynamics, Part IIb
Room: 1-190
Chairpersons: S. Ubertini and S. Succi

A thermal model based on the Lattice Boltzmann method for low Mach number compressible flows
J. Toelke and M. Krafczyk

A coupled approach for the simulation of bidirectional fluid-structure interaction based on the Lattice Boltzmann and the finite element method
S. Geller, J. Toelke and M. Krafczyk

Lattice and discrete Boltzmann equations for fully compressible flow
P.J. Dellar

Lattice Boltzmann models for hydrodynamics and microflows
I.V. Karlin

Thursday 4:30pm

57 - Computational modeling of reacting flow, Part IIb
Room: 1-246
Chairperson: H.N. Najm

Using ISAT in simulations of unsteady reacting flows
M.A. Singer, S.B. Pope and H.N. Najm

Improved Navier-Stokes characteristic boundary conditions for direct simulations of compressible reacting flows
C.S. Yoo, H.G. Im, Y. Wang and A. Trouvé

Thursday 4:30pm

90 - Neural networks and soft methods in computational mechanics, Part IIb
Room: 1-273
Chairpersons: L. Ziemianski and B.H.V. Topping

Thermal optimisation of the squeeze forming process using genetic algorithms
R. Ahmad, D.T. Gethin, R.W. Lewis, R.S. Lansing and E.W. Postek

A two stage adaptive genetic algorithm for structural topology optimization
C.V. Ramakrishnan and R. Balamurugan

Thursday 4:30pm

209 - Fracture analysis and crack propagation, Part IIb
Room: 1-371
Chairperson: D. Pantuso

Numerical Simulations of Fracture Propagation in Heterogeneous Geomaterials Based on Digital Image Modeling Method
S. Chen, Z.Q. Yue and L.G. Tham

The effects of lattice orientation on a microstructurally short, kinked crack in 316L steel
I. Simonovski, K.-F. Nilsson and L. Cizelj

Thin film crack propagation using the enriched displacement method
B. Voinov and D. Pantuso

Thursday 4:30pm

61 - Optimization of expensive black-box cost functions, Part IIb
Room: 1-379
Chairpersons: M. Meyer and M. Krosche

Managing models for simulation-based design optimization, Part 2
N.M. Alexandrov and R.M. Lewis

Optimization of discrete event stochastic systems using the PLATON system
M. Krosche

Active control and drag optimization for flow past a cylinder at high Reynolds number using genetic algorithms
S.B. Talla, K. Deb and T.K. Sengupta

Thursday 4:30pm

13 - Modeling of the cardiovascular system, Part IIb
Room: 2-105
Chairpersons: D. Chapelle, J.-F. Gerbeau and Y. Bourgault

Computational study of shocked blood flows within an elastic atherosclerotic aorta
J. Iannelli

Application of vascular CFD for clinical evaluation of cerebral aneurysms
M.A. Castro, C.M. Putman and J.R. Cebral

Numerical simulation of flow alterations after carotid artery stenting from multi-modality image data
J.R. Cebral, M.A. Castro and C.M. Puttman

Thursday 4:30pm

27 - Advances in algorithms and applications for incompressible and low-Mach number flows, Part IIb
Room: 2-131
Chairpersons: M.A. Christon, D.K. Gartling and M.J. Martinez

Computational stability study of 3D flow in a differentially heated 8:1:1 cavity
A.G. Salinger

Modeling of coupled conduction and convection under dehumidifying conditions
G. Comini, C. Nonino and S. Savino

FEM simulation of unsteady viscous incompressible fluid flows
A. Tralli and P. Gaudenzi

Thursday 4:30pm

38 - Nonlinear dynamics - spanning the scales: Algorithms and applications, Part IIb
Room: 2-132
Chairpersons: C.L. Bottasso, D. Brancherie and G. Hervé

Folded airbag deployment examples using RADIOSS
V. Faucher, F. Arnaudeau and G. Winkelmuller

Metallic and non-metallic fracture under impact loading and the state of the analytical capabilities
N.K. Saha and M.O. Faruque

Receptivity of a low Reynolds number Bickley jet to harmonic oscillations
S.K. Sircar and T.K. Sengupta

Thursday 4:30pm

66 - Multi-scale modeling of material behavior – Solids, Part IIb
Room: 2-136
Chairpersons: R. Radovitzky and A. Cuitino

Evaluation of material strength in inelastic heterogeneous microstructures: A toolbox for virtual experimentation
M.E. Thompson, V. Sundararaghavan and N. Zabaras

Estimating rubber friction from interactions at the asperity level
Q.V. Bui and J.-P. Ponthot

A consistent framework for viscoplastic deformations of fcc metals
F.H. Abed and G.Z. Voyiadjis

Thursday 4:30pm

215 - Formulations in elasticity, Part IIb
Room: 2-139
Chairperson: P.-S. Lee and S.K. Khattri

Polyconvex strain energy functions for materials with cubic symmetry
N. Kambouchev, J. Fernandez and R. Radovitzky

Determination of Green's tensor for a micropolar elastic medium
M. Mitra and R.K. Bhattacharyya

Thursday 4:30pm

17 - Boundary element methods and applications, Part IIb
Room: 2-142
Chairpersons: F. Duddeck and O. Steinbach

Highly convective flows via boundary element methods: Recent advances and challenges
G.F. Dargush and M.M. Grigoriev

Fast BEM methods for the efficient treatment of elliptic shape optimization problems
K. Eppler

Thursday 4:30pm

26 - Advanced analysis – Solids, Part IVb
Room: 2-143
Chairpersons: C. Gantes, M.L. Bucalem and M. Kaminski

Polymeric-composite bandages for damaged steel pipes
B. Kopey and V. Kopey

A direct boundary integral method for viscoelastic-elastic composite materials
Y. Huang, S.L. Crouch and S.G. Mogilevskaya

A diversity of computer approaches in homogenization of random composites
M. Kaminski

Thursday 4:30pm

37 - Computational modeling of ionized gas flows, Part IIb
Room: 2-146
Chairpersons: E. Josyula and J. Poggie

Flow control simulations of stalled airfoils with electrohydrodynamic body forces
D.V. Gaitonde, M.R. Visbal and S. Roy

A two-dimensional floating random-walk algorithm for the solution of the nonlinear Poisson-Boltzmann equation: Application to the modeling of plasma sheaths
K. Chatterjee and J. Poggie

Development of a multiscale ionized gas flow code for plasma applications
S. Roy and D.V. Gaitonde

THURSDAY

Thursday 4:30pm

211 – Methods and modeling for analysis of concrete and related structures, Part IIb
Room: 2-151
Chairpersons: B. Birgisson and W. Buttlar

Smeared crack approach for asphalt concrete
R. Wu and J. Harvey

A two-dimensional elastic model of pavements wit thermal failure
H.M. Yin, W.G. Buttlar and G.H. Paulino

A virtual testing procedure for the evaluation of cracking performance of hot mix asphalt
V. Subramanian, Z. Feng, P. Zhang, M. Guddati, and Y.R. Kim

Three-layered hot-mix asphalt mixture
B. Huang, G. Li and X. Shu

Thursday 4:30pm

9 - Numerical methods for fluid-structure interaction systems, Part IIIb
Room: 4-270
Chairperson: L. Gastaldi

From immersed boundary method to immersed continuum method
X.S. Wang

A three-field computational methodology for fluid-structure interaction
E. Swim and P. Seshaiyer

Proper orthogonal decomposition in the frequency domain to characterize the dynamics of coupled structural-acoustical systems
C.I. Papadopoulos and I.T. Georgiou

Thursday 4:30pm

101 - Computational plasticity, Part VIb
Room: 4-370

Special Session: Nano-and micromechanics of particulate materials (*continued*)
Chairperson: S.J. Antony

Statistical weighting in simulation of aggregate particle formation and growth
R.I.A. Patterson and M. Kraft

Tri-axial deformation characteristics of Si-based particulate assemblies: A comparative study using DEM and atomistic simulations
M. Amin and S.J. Antony

Thermodynamically accurate particle-based mesodynamics
A. Strachan

Thursday 4:30pm

200 - Computational fluid dynamics II, Part VIb
Room: 32-124

Special Session: Nonlinear Dynamics of Fluids
Chairpersons: G. Haller, C.W. Rowley and E. Schuckburgh

Large-scale transport and stirring in geophysical flows
B. Legras and F. d'Ovidio
(Keynote)

Vortex induced chaotic transport and mixing on a sphere
P.K. Newton and S.D. Ross

Numerical simulations of air entrainment by a plunging liquid jet
A.Y. Galimov, K. Jansen, R.T. Lahey Jr., F.J. Moraga

Thursday 4:30pm

19 - Multiscale, multiphysics computational fluid dynamics, Part IIb
Room: 5-234
Chairpersons: Y. Zhang and J. Glimm

Level set method for simulating multi-phase multi-component dendritic solidification
L. Tan and N. Zabaras

FRIDAY

Friday 9:00am

Plenary Lectures
Chairperson: E.N. Dvorkin

9:00 - 10:30am

Room: Kresge Auditorium (W16)

On the treatment of uncertainties in structural mechanics & analysis
G.I. Schuëller, University of Innsbruck

Integration of multidisciplinary analysis with Product Lifecycle Management on the Boeing 787
K.R. Fowler, The Boeing Company

10:30 - 11:00am
Coffee Break

Friday 11:00am

63 - Lattice Boltzmann methods for computational fluid dynamics, Part III
Room: 1-190
Chairpersons: S. Ubertini and S. Succi

Displacement of a three-dimensional immiscible droplet in a duct
Q. Kang, D. Zhang and S. Chen

A rotational invariant Lattice Boltzmann method for high Knudsen number flow simulation
R. Zhang, H. Chen and I. Staroselsky

A coarse Newton approach for steady solutions of the Boltzmann equation
H.A. Al-Mohssen, N.G. Hadjiconstantinou and I.G. Kevrekidis

Friday 11:00am

57 - Computational modeling of reacting flow, Part III
Room: 1-246
Chairperson: H.N. Najm

Effects of heat and momentum losses on the flame stability in a narrow channel
S.H. Kang, S.W. Baek and H.G. Im

Multi scale numerical simulation of the dispersed reacting flow, using a mathematical model for the chemical vapor deposition of alumina
A.A. Markov

Friday 11:00am

68 - Computational aspects for the design and the analysis of the Messina Strait Bridge, Part I
Room: 1-277
Chairperson: F. Bontempi

Computational aspects for the design and the analysis of the Messina Strait Bridge: Global strategies and problem organization
F. Bontempi

Load scenarios and serviceability tests for the Messina Strait Bridge by time-history simulations
F. Giuliano, F. Petrini and K. Gkoumas

Analysis of the serviceability performances of a long suspension bridge by genetic algorithm approach
L. Sgambi

Friday 11:00am

32 - Pre-conditioned methods, applications and software environment, Part I
Room: 1-379
Chairperson: G.A. Gravvanis and J. Zhang

Normalized implicit preconditioned methods based on normalized finite element approximate factorization procedures
G.A. Gravvanis and K.M. Giannoutakis
(Keynote)

Parallel normalized implicit preconditioned conjugate gradient methods for solving biharmonic equations on symmetric multiprocessor system
G.A. Gravvanis and K.M. Giannoutakis

Performance of ILUT preconditioners in modeling bioheat and mass transfer in skin thermal injury
W. Shen, J. Zhang and F. Yang

Friday 11:00am

13 - Modeling of the cardiovascular system, Part III
Room: 2-105
Chairpersons: D. Chapelle, J.-F. Gerbeau and Y. Bourgault

Real time reduced basis techniques in real life arterial bypass surgery
G. Rozza

Estimation of hemolysis in centrifugal blood pumps using morphology tensor approach
D. Arora, M. Behr, O. Coronada-Matutti and M. Pasquali

Closed-loop simulation of a ventricular assist device coupled with a circulatory system model
M.G. Doyle, S. Tavoularis and Y. Bourgault

Friday 11:00am

27 - Advances in algorithms and applications for incompressible and low-Mach number flows, Part III
Room: 2-131
Chairpersons: M.A. Christon, D.K. Gartling and M.J. Martinez

Simulating dendritic growth with convection
J.C. Heinrich, D.R. Poirier and P. Zhao
(Keynote)

Computing three-dimensional, steady-state, incompressible flows in melt crystal growth systems using a new, higher-order, mixed-formulation, Galerkin finite element method
Y.-I. Kwon, P. Sonda, A. Yeckel and J.J. Derby

A balanced-force, volume tracking algorithm for surface tension driven flows
M.M. Francois, J.M. Sicilian, D.B. Kothe, and S.J. Cummins

Friday 11:00am

66 - Multi-scale modeling of material behavior – Solids, Part III
Room: 2-136
Chairpersons: R. Radovitzky and A. Cuitino

Quasicontinuum study of void growth and coalescence in Al
J. Marian, J. Knap and M. Ortiz

An explicit formulation for multiscale modeling of bcc metals
S.N. Kuchnicki, R.A. Radovitzky and A.M. Cuitiño

A study on heterogeneous deformation behaviors in aluminum oligocrystals
Z. Zhao, J. Smith and R. Radovitzky

FRIDAY

Friday 11:00am

49 - Localized drug delivery, Part I
Room: 2-139
Chairpersons: A.R. Tzafriri and G. Ledezma

Three dimensional geometries and grids for the numerical simulation of drug diffusion through the stratum corneum
D. Feuchter

Modeling and numerical simulation of drug diffusion through stratum corneum
M. Heisig

Analysis of cell-growth and angiogenesis in 3-dimensional scaffolds
J. Lowengrub

Friday 11:00am

76 - Multi-physics coupling in material processing, Part I
Room: 2-146
Chairpersons: F. Bay and J.-L. Chenot

Modelization and numerical approximation of ferromagnetic materials at microscopic scale
M. Bernadou, S. Depeyre, S. He, and P. Meilland
(Keynote)

Numerical modeling of electromagnetic couplings in material forming processes
F. Bay and J.-L. Chenot

Modeling melt crystal growth processes via a self-consistent coupling of multiple scales and physics
A. Pandy, L. Lun, P. Sonda, A. Yeckel and J.J. Derby

Friday 11:00am

9 - Numerical methods for fluid-structure interaction systems, Part IV
Room: 4-270
Chairperson: D. Boffi

Toward a definition of LES
J.-L. Guermond and S. Prudhomme

On the opening time of a pipe break on a main steam line in a nuclear power station
J. Sundqvist, B. Olsson and T. Sussman

Thermo-mechanical fluid-structure-interaction for hypersonic applications
R. Niesner, M. Haupt and P. Horst

12:30 - 2:00pm
Lunch Break

Friday 2:00pm

68 - Computational aspects for the design and the analysis of the Messina Strait Bridge, Part II
Room: 1-277
Chairperson: F. Bontempi

The design process of complex structural system with regard to the dependability
F.Bontempi and K. Gkoumas

Seismic action modeling and long suspension bridge response computation
L. Sgambi

Computational and structural aspects in the assessment of the aerodynamic behavior of long suspension bridge deck sections
F. Giuliano and F. Petrini

Friday 2:00pm

32 - Pre-conditioned methods, applications and software environment, Part II
Room: 1-379
Chairperson: G.A. Gravvanis and U.F. Meissner

Dynamically distributed and p-adaptive FE-simulation of soil-structure-interaction based on multi-agent-systems
U.F. Meissner, M. Mueller and J. Ruben
(Keynote)

Investigation of nozzle stability for the first ovalization mode by numerical solution of the fluid structure interaction problem
R. Schwane and Y. Xia

Improving productivity for parallel finite element codes through software engineering
D.R. Shires and B.J. Henz

Partitioned versus global Krylov subspace iterative methods for FE solution of 3D Biot's problem
X. Chen, K.C. Toh and K.K. Phoon

Friday 2:00pm

27 - Advances in algorithms and applications for incompressible and low-Mach number flows, Part IV
Room: 2-131
Chairpersons: M.A. Christon, D.K. Gartling and M.J. Martinez

Fractional step methods for the Navier-Stokes equations
S.W. Armfield

A finite element projection method for low-Mach number reacting flows
M.A. Christon and R.S. Patil

Friday 2:00pm

66 - Multi-scale modeling of material behavior – Solids, Part IV
Room: 2-136
Chairpersons: R. Radovitzky and A. Cuitino

Diffusion mechanism at grain boundaries in two-dimensional metals
G.M. Poletaev, R.Y. Rakitin and M.D. Starostenkov

Hierarchical multiscale computer simulation of microstructure evolution in nanocrystalline materials
D. Moldovan, K. Rastogi, V. Yamakov and D. Wolf

Friday 2:00pm

49 - Localized drug delivery, Part II
Room: 2-139
Chairpersons: A.R. Tzafriri and G. Ledezma

Strut position, blood flow, and drug deposition: implications for single and overlapping drug-eluting stents
B. Balakrishnan

Modeling interstitial infusion in anisotropic regions of the spinal cord
M. Sarntinoranont

Modeling and design of drug delivery to solid tumors
R. Tzafriri

FRIDAY

Computational fluid dynamics simulations for drug delivery applications
C.-H. Wang

Friday 2:00pm

76 - Multi-physics coupling in material processing, Part II
Room: 2-146
Chairpersons: F. Bay and J.-L. Chenot

Coupled phenomena in hot and warm deep drawing of quenchable steels, of aluminium and of magnesium alloys
Y. Chastel
(Keynote)-

A discrete homogenization technique for graphene sheets
D. Caillerie, A. Mourad and A. Raoult

Freckle suppression in directional solidification of binary and multicomponent alloys using magnetic fields
D. Samanta and N. Zabaras

A coupled thermomechanical, thermal transport and segregation analysis of the solidification of aluminum alloys on molds of uneven surface topographies
L. Tan, D. Samanta and N. Zabaras

Friday 2:00pm

9 - Numerical methods for fluid-structure interaction systems, Part V
Room: 4-270
Chairperson: L. Gastaldi

Variations on a theme of immersed boundaries
C.S. Peskin
(Keynote)

Finite-element time-domain simulations of bridge aeroelasticity: Implementation and profiling
C. Borri, L. Salvatori and W. Zahlten

Studies of fluid-structure interaction on light-weight structures
A. Kupzok, R. Wüchner and K.-U. Bletzinger

On the forced dynamics of floating plates
K.M. Dempsey and I.V. Vasileva

End of Conference