

FEMTEC 2013 - Monday, May 20

- 8:45 Conference opening
- **9:00 - 10:30 Keynote Session (Theatre)** (chairman A. Zhou)
 - 9:00 - 9:45 Charbel Farhat
FIVER: A Higher-Order Embedded Boundary Method For Multi-Material Compressible Flow and Flow-Structure Interaction Problems
 - 9:45 - 10:30 Gretar Tryggvason
Multiscale Considerations in DNS of Multiphase Flows
- 10:30 - 11:00 Coffee break
- **11:00 - 11:45 Keynote Session (Theatre)** (chairman E. Danovaro)
 - 11:00 - 11:45 Jonathan Cohen
GPU-Accelerated Algebraic Multigrid for Industrial Applications
- 11:45 - 14:00 Lunch break
- **14:00 - 15:20 Contributed Session I-A: Uncertainty Quantification in Security Science** (chairmans E. Machorro and A. Luttman)
 - 14:00 - 14:20 M. Fowler: Modeling Adversarial Intent With a POMDP
 - 14:20 - 14:40 E. Machorro: Estimating Dynamic Surface Position From Sparse Interferometric Measurements
 - 14:40 - 15:00 T. Wildey: Error Analysis of Surrogate Models for Improved Uncertainty Quantification
 - 15:00 - 15:20 A. Luttman: A Model-based Approach to Computing and Quantifying Uncertainty in the Energy Spectrum of Fusion Neutrons
- **14:00 - 15:20 Contributed Session I-B: Advances in Discontinuous Galerkin Methods for complex wave propagation problems** (chairman S. Schnepf)
 - 14:00 - 14:20 R. Léger: DGTD Method on Non-conforming Structured-unstructured Meshes for Nanophotonics
 - 14:20 - 14:40 S. Schnepf: Dynamical H_p -Meshes With Specifiable Error Tolerances for Discontinuous Galerkin Time-Domain Computations
 - 14:40 - 15:00 J. Niegemann: Adaptive Time-Integration for Discontinuous Galerkin Time-Domain Simulations of Maxwell's Equations
 - 15:00 - 15:20 F. Kretzschmar: The Discontinuous Galerkin Trefftz Method
- **14:00 - 15:20 Contributed Session I-C: Recent Developments in Adaptivity and A Posteriori Error Analysis** (chairman P. Houston)
 - 14:00 - 14:20 M. Yano: Anisotropic Simplex Mesh Adaptation by Riemannian Metric Optimization: Application to Parametrized Equations
 - 14:20 - 14:40 N. V. Roberts: Adaptivity in a Discontinuous Petrov-Galerkin Methodology Using Camellia
 - 14:40 - 15:00 P. Solin: Combined Adaptive hp-FEM/hp-DG with Dynamical Meshes for Time-Dependent Multiphysics Coupled Problems
 - 15:00 - 15:20 M. Larson: Adaptive Reduced Order Multiscale Finite Elements Methods
- 15:20 - 15:40 Coffee break

- **15:40 - 17:00 Contributed Session II-A** (chairman N. Govender)
 - 15:40 - 16:00 E. Danovaro: Heterogeneous Architectures for Computational Intensive Applications: A Cost-effectiveness Analysis.
 - 16:00 - 16:20 M. Nehmeier: On Implementing the IEEE Interval Standard P1788
 - 16:20 - 16:40 W. Zhang: Parallel Solvers for Large Scale Sparse Linear Systems
 - 16:40 - 17:00 K. Rupp: On Level Scheduling for Incomplete LU Factorization Preconditioners on Accelerators

- **15:40 - 17:00 Contributed Session II-B** (chairman J. Niegemann)
 - 15:40 - 16:00 E. Chung: Staggered Discontinuous Galerkin Methods for the Maxwell's Equations
 - 16:00 - 16:20 N. Olivares: Dispersive and Dissipative Errors in the DPG Method With Scaled Norms for Helmholtz Equation
 - 16:20 - 16:40 D. Kuzmin: Hierarchical Slope Limiting in Discontinuous Galerkin Methods
 - 16:40 - 17:00 M. Min: High-order DG Methods: Scalable Algorithms and Performance for Electromagnetics Applications

- **15:40 - 17:00 Contributed Session II-C: Numerical modeling of metamaterials** (chairman J. Li)
 - 15:40 - 16:00 J. Li: Recent Advances in Mathematical Modeling and Analysis of Wave Propagation in Metamaterials
 - 16:00 - 16:20 V. E. Ginting: Higher Order Multiscale Finite Element for Solving Problems With Heterogeneous Coefficients
 - 16:20 - 16:40 Y. Sun: Error Estimates of Finite Element Method With Kirchhoff Transformation for a Two-phase Transport Model of Proton Exchange Membrane Fuel Cell
 - 16:40 - 17:00 A. Sacconi: An Unfitted Finite Element Method for the Approximation of Void Electromigration

- **17:15 - 20:00 Welcome reception (Tower)**

FEMTEC 2013 - Tuesday, May 21

- **9:00 - 10:30 Keynote Session (Theatre)** (chairman S. Li)
 - 9:00 - 9:45 Carlo de Falco
GNU Octave, a Free High-level Environment for Scientific Computing
 - 9:45 - 10:30 A. Zhou
First-Principles Electronic Structure Calculations Based on Finite Element Discretizations
- 10:30 - 11:00 Coffee break
- **11:00 - 11:45 Keynote Session (Theatre)** (chairman M. Fowler)
 - 11:00 - 11:45 Rainald Löhner
A General-Purpose Fortran to GPU Translator
- 11:45 - 14:00 Lunch break
- **14:00 - 15:20 Contributed Session I-A: Recent Developments in Adaptivity and A Posteriori Error Analysis** (chairman P. Houston)
 - 14:00 - 14:20 J. Chaskalovic: A Posteriori Error Analysis in Numerical Approximations of PDE's: A Pilot Study Using Data Mining Techniques
 - 14:20 - 14:40 J. S. Owall: A Posteriori Estimation of Hierarchical Type for the Schrodinger Operator With Inverse Square Potential on Graded Meshes
 - 14:40 - 15:00 B. Mitchell: Performance of H_p -Adaptive Strategies for Elliptic Partial Differential Equations
 - 15:00 - 15:20 A. Johansson: Error Analysis and Blockwise Adaptivity in Time of a Coupled PDE-ODE System
- **14:00 - 15:20 Contributed Session I-B: Applications of FEM in Theoretical Chemistry and Computational Physics** (chairman M. Braun)
 - 14:00 - 14:20 M. Braun: Hartree Fock Calculations for Atoms and Small Molecules Using a Three Dimensional Finite Element Basis
 - 14:20 - 14:40 K. Wong: Interoperable Executive Library for the Simulation of Biomedical Processes
 - 14:40 - 15:00 B. Re: Evaluation of the Vapor-liquid Equilibrium of Multi-parameter Thermodynamics Models Using Differential Algebra
 - 15:00 - 15:20 J. Vorel: Numerical Simulation of Ductile Fiber-reinforced Cement-based Composite
- **14:00 - 15:20 Contributed Session I-C: Coupled problems in electromagnetics** (chairman P. Karban)
 - 14:00 - 14:20 I. Doležel: Model of System Disk-Shaft Mutually Fixed by Induction Shrink Fit
 - 14:20 - 14:40 B. Sawicki: Higher-order Solver for Nonlinear Bioheat Equation Modeling Magnetic Fluid Hyperthermia
 - 14:40 - 15:00 F. Mach: Space-time Adaptive FEM Simulation of Corona Discharge Problems
 - 15:00 - 15:20 F. Assous: A Paraxial Asymptotic Model for the Coupled Vlasov-Maxwell Problem in Electromagnetics
- 15:20 - 15:40 Coffee break

• **15:40 - 17:00 Poster session** (chairman F. Mach)

- P. Brambilla: Two-dimensional Numerical Simulations of Normal Drop Impact on a Thin Liquid Film in Presence of a Boundary Layer
- I. Ciobanescu Husanu: Integral Analysis and Simulation of Wind Turbine Rotors
- E. Danovaro: Efficient Image Processing Elaboration on Parallel Resources
- I. Dolezel: Numerical Modeling of Induction Surface Hardening of Gear Wheels
- I. Dolezel: Numerical Modeling of Induction Heating of Metal in Cold Crucible
- O. Guerri: Numerical Simulation of the Turbulent Flow Around a Turbo-sail
- R. Jha: HMM-Based Adaptive Power Distribution by the BS in WiMAX Network
- L. Koudela: Numerical Solution of Acoustic Transient Phenomena and Calculating the Coefficients of Acoustic Diffuser
- P. Kropík: Optimization of an Actuator With Non-Linear Materials Using Evolutionary Algorithms and Higher-Order Finite Element Modeling
- W. Liao: On the Stability and Accuracy of a Compact Scheme for 3D Acoustic Wave Equation
- P. Pořízková: Numerical Solution of Compressible and Incompressible Unsteady Flows in Channel
- P. Svacek: On Numerical Simulation of Three-Dimensional Flow Problems by Finite Element and Finite Volume Techniques
- P. Svacek: On Mathematical Modeling of Fluid - Structure Interactions With Nonlinear Effects: Application of Finite Element Method.
- E. Sanchez: High-Performance Computing in Simulating Carbon Dioxide Geologic Sequestration

FEMTEC 2013 - Wednesday, May 22

- **9:00 - 10:20 Contributed Session I-A** (chairman B. Sawicki)
 - 9:00 - 9:20 M. Ragulskis: Visual Cryptography Based on Chaotic Oscillations
 - 9:20 - 9:40 H. Cho: Study of the Stochastic Inviscid Burgers Equation With the Joint Response-excitation PDF Equation
 - 9:40 - 10:00 X. Yang: Generalized Polynomial Chaos: Approximation Through Change of Measure
 - 10:00 - 10:20 M. Blatt: The Distributed and Unified Numerics Environment (DUNE)
- **9:00 - 10:20 Contributed Session I-B** (chairman M. Yoshikawa)
 - 9:00 - 9:20 E. Danovaro: Hybrid Clouds as Hydro-Meteorological Simulation Enablers
 - 9:20 - 9:40 W. Larbi: Control of Sound Radiation From Vibrating Structures With a Piezoelectric Shunt Damping: A Coupled FE/BE Formulation
 - 9:40 - 10:00 J. Novak: On Integration of Synthesized Microstructural Enrichment Functions in Partition of Unity and Trefftz Method
 - 10:00 - 10:20 M. Thomas: A Cyberinfrastructure-Based Computational Environment for the Unified Curvilinear Ocean Atmospheric Model (UCOAM)
- **9:00 - 10:20 Contributed Session I-C** (chairman J. S. Owall)
 - 9:00 - 9:20 L. Korous: Computational Comparison of Various FEM Adaptivity Approaches
 - 9:20 - 9:40 M. Kuraz: An Application of the Schwarz Domain Decomposition Method on the Nonlinear Richards Equation Problem
 - 9:40 - 10:00 J. Heys: Weighted Least-Square Finite Element Methods for PIV Data Assimilation
 - 10:00 - 10:20 M. Bittl: Algebraic Flux Correction and Hp-adaptivity for Hyperbolic Conservation Laws
- 10:20 - 10:40 Coffee break
- **10:40 - 12:00 Contributed Session II-A** (chairman K. Rupp)
 - 10:40 - 11:00 E. Danovaro: A Parallel Isosurface Extraction Component for Visualization Pipelines Executing on GPU Clusters
 - 11:00 - 11:20 N. Govender: BLAZE-DEM: A GPU Based Polyhedral DEM Particle Transport Code
 - 11:20 - 11:40 Z. Wei: A Fast and Interactive Heat Conduction Simulator on GPUs
 - 11:40 - 12:00 S. Su: Solving a Large Scale Thermal Radiosity Problem on GPU-Based Parallel Computer
- **10:40 - 12:00 Contributed Session II-B** (chairman F. D. Witherden)
 - 10:40 - 11:00 S. Basting: A Hybrid Level Set / Front Tracking Approach
 - 11:00 - 11:20 C. Basting: Optimal Control of Level Sets
 - 11:20 - 11:40 J. Weinbub: Increasing Flexibility and Reusability of Finite Element Simulations With ViennaX
 - 11:40 - 12:00 F. Rudolf: ViennaMesh - a Highly Flexible Meshing Framework
- **10:40 - 12:00 Contributed Session II-C** (chairman V. E. Ginting)
 - 10:40 - 11:00 S. Dong: Efficient Algorithm for Incompressible Two-phase Flows Involving Large Density Ratios
 - 11:00 - 11:20 S. Li: Multi-scale Simulations for Dusty Gas Flows
 - 11:20 - 11:40 M. Neda: Advances of Leray Regularization for Fluid Flow Problems
 - 11:40 - 12:00 Y. Yu: A Penalty Method for Coupling Fluid-structure Interactions
- 12:00 - 14:00 Lunch break

- **14:00 - 17:45 Software Workshop**

- 14:00 - 14:45 Pavel Solin: **NCLab** - Public Cloud Computing Platform
- 14:45 - 15:30 Bill Mitchell: **Phaml** - The Parallel Hierarchical Adaptive MultiLevel Project
- 15:30 - 16:15 Pavel Karban: **Agros2D** - Multiplatform C++ Application for the Solution of Partial Differential Equations (PDE) Based on the Hermes Library
- 16:15 - 17:00 Alberto Paoluzzi: **PLaSM** - Programming Language of Solid Modeling
- 17:00 - 17:45 Mary Thomas: **CyberWeb** - The Cyberinfrastructure Web Application Framework

FEMTEC 2013 - Thursday, May 23

- **9:00 - 10:20 Contributed Session I-A** (chairman D. Kuzmin)
 - 9:00 - 9:20 J. Rossmanith: Energy-Conserving Semi-Lagrangian Discontinuous Galerkin Schemes for the Vlasov-Poisson System
 - 9:20 - 9:40 B. McCaskill: A Galerkin Finite Element Domain Decomposition Technique and Its Application in Conservation Problems
 - 9:40 - 10:00 D. I. Papadimitriou: Bayesian Estimation of Turbulence Model Parameters Using High-Order Sensitivity Analysis
 - 10:00 - 10:20 F. Vignati: Numerical Investigation on the Reshaping of Cylindrical Converging Shocks in Real Gas by Means of Aerodynamic Obstacles
- **9:00 - 10:20 Contributed Session I-B** (chairman I. Doležel)
 - 9:00 - 9:20 P. Kůs: Solution of Transient Partial Differential Equations Using Time-adaptive Methods in General-purpose Software
 - 9:20 - 9:40 Z. Kubík: Optimization of Electrical Properties of Parallel Plate Antenna for EMC Testing
 - 9:40 - 10:00 S. Juntivasarakij: Towards Crowdsourcing for Enterprise Innovation on Social Media Technology: The Social Technical Perspective
 - 10:00 - 10:20 M. Choi: Time-dependent Karhunen-Loeve Decomposition Methods for SPDEs: Dynamically-Orthogonal and Bi-Orthogonal Conditions and Its Equivalence
- **9:00 - 10:20 Contributed Session I-C** (chairman C. Basting)
 - 9:00 - 9:20 Y. Gorb: Discrete Network Approximation for Dirichlet-to-Neumann Map for High Contrast Problems
 - 9:20 - 9:40 M. Aydogan: Some Results on a Starlike Log-harmonic Mappings of Order Alpha
 - 9:40 - 10:00 M. El-Borai: An Inverse Fractional Abstract Cauchy Problem With Nonlocal Conditions
 - 10:00 - 10:20 S. Chandrasekaran: A Minimum Sobolev Norm Numerical Technique for PDEs
- 10:20 - 10:40 Coffee break
- **10:40 - 12:00 Contributed Session II-A** (chairman M. Neda)
 - 10:40 - 11:00 M. Nini: Numerical Analysis of the Flowfield Around a Vertical Axis Wind Turbine
 - 11:00 - 11:20 I. Ciobanescu Husanu: Stochastic-Probabilistic Modeling of the Wind Turbine Power Output
 - 11:20 - 11:40 M. Bergander: Simulation of Fluid Flow Through a System of Chambers for Active Vibration Control of Rotating Structures.
 - 11:40 - 12:00 F. D. Witherden: PyFR: An Open Source Python Framework for High-Order CFD on Many-Core Platforms
- **10:40 - 12:00 Contributed Session II-B** (chairman P. Solin)
 - 10:40 - 11:00 M. Yoshikawa: Hybrid Power Analysis Attack in Frequency Domain for Security Modules
 - 11:00 - 11:20 O. R. Esmaili Motlagh: A Genetic Algorithm for Optimization of Scheduling of Container Handling Equipment
 - 11:20 - 11:40 A. Sukul: Design and Development of Mobile Access for DSpace Open Source Institutional Repository on Hybrid Cloud Computing
 - 11:40 - 12:00 A. Paoluzzi: Algebraic Extraction of Topology and Geometry From 2D/3D Images

- **10:40 - 12:00 Contributed Session II-C** (chairman J. Weinbub)
 - 10:40 - 11:00 J. L. Chan: DPG: A Robust, Higher Order Adaptive Method for Convection-dominated Diffusion Problems
 - 11:00 - 11:20 S. Miller: Riemann Solutions for Spacetime Discontinuous Galerkin Methods
 - 11:20 - 11:40 M. Zayernouri: Fractional Spectral Element Method
 - 11:40 - 12:00 M. Aydogan: A Certain Class of Starlike Log-harmonic Mappings
- 12:00 - 14:00 Lunch break
- **14:00 - 17:45 Software Workshop**
 - 14:00 - 14:45 Markus Blatt: **DUNE** - The Distributed and Unified Numerics Environment
 - 14:45 - 15:30 Lukas Korous: **Hermes** - C++ Library for Rapid Development of Adaptive hp -FEM / hp -DG Solvers
 - 15:30 - 16:15 Karl Rupp: **ViennaCL & PETSc** - Portable, Extensible Toolkit for Scientific Computation
 - 16:15 - 17:00 Eduardo J. Sanchez Peiro: **MTK** - The Mimetic Methods Toolkit
 - 17:00 - 17:45 Florian Rudolf: **ViennaMesh** - Highly Flexible Meshing Framework

FEMTEC 2013 - Friday, May 24

- **9:00 - 10:20 Contributed Session I-A** (chairman S. Miller)
 - 9:00 - 9:20 H. Fekrmandi: An Approximate Formula for the Maximal SIF for an Infinite Array of Longitudinal Coplanar Internal Surface Cracks in an Autofrettaged Cylindrical Pressure Vessel
 - 9:20 - 9:40 I. Alolyan: Algorithm for Interval Linear Programming Involving Interval Constraints
 - 9:40 - 10:00 E. H. J. De Doncker: Multivariate Integration Algorithms and Applications on GPUs
 - 10:00 - 10:20 O. R. Esmaeili Motlagh: A New Strategy for Relationship Modelling of Complex Systems Using Self-Evolving Semantic Networks
- **9:00 - 10:20 Contributed Session I-B** (chairman S. Basting)
 - 9:00 - 9:20 G. Aguilera: An Accelerated-Time Simulation for Traffic Flow in a Smart City
 - 9:20 - 9:40 G. S. Thakur: Fuzzy Soft Traffic Accident Alert Model
 - 9:40 - 10:00 M. Garcia: Data Assimilation for Hydrodynamical Modeling of San Quintin Bay, B.C., Mexico
 - 10:00 - 10:20 J. L. Galan: Estimating Radial Railway Network Improvement With a CAS
- **9:00 - 10:20 Contributed Session I-C** (chairman J. Heys)
 - 9:00 - 9:20 M. He: Two-grid Method for a 3D Two-phase Mixed-domain Non-isothermal Model of PEM Fuel Cell
 - 9:20 - 9:40 S. Koranne: Application of Sparse Tensors for Optimizing Multi-Dimensional VLSI Electromagnetic Analysis
 - 9:40 - 10:00 N. Akkari: Mathematical and Numerical Study of the ROM-POD Sensitivity for a 2D Incompressible Fluid Flow
 - 10:00 - 10:20 K. Nafa: Equal-Order Approximation of Coupled Stokes-Darcy Problems
- 10:20 - 10:40 Coffee break
- **10:40 - 12:00 Contributed Session II-A** (chairman S. Dong)
 - 10:40 - 11:00 D. Yang: A Fully Coupled Multiphase Flow and Geomechanics Solver for Highly Heterogeneous Porous Media.
 - 11:00 - 11:20 N. Mohd Razali: Genetic Algorithm for Multi-objective Flowshop Scheduling Problem
 - 11:20 - 11:40 H. Manap: A Potential Development of Halitosis (Bad Breath) Gas Sensor Using an Open Path Fibre Technique
 - 11:40 - 12:00 P. K. Yadav: Creeping Motion of an Assemblage of Porous Cylindrical Shells
- **10:40 - 12:00 Contributed Session II-B** (chairman H. Cho)
 - 10:40 - 11:00 M. El-Borai: Stochastic Control Theory and the Brain Cancer
 - 11:00 - 11:20 M. Abdollahzadehsangroudi: Two Dimensional Numerical Modeling of Micro-shock Wave Creation in Nanosecond Plasma Actuators
 - 11:20 - 11:40 R. Jha: A Mathematical Model for Bandwidth Attack Based on Game Theory for WiMAX Network
 - 11:40 - 12:00 S. Rahman: Regularity Criterion for 3D MHD Equations Passing Through the Porous Medium in Terms of Gradient Pressure

- **10:40 - 12:00 Contributed Session II-C** (chairman K. Wong)
 - 10:40 - 11:00 N. Hussen Al-Khalidy: Designing Better Buildings With Computational Fluid Dynamics Analysis
 - 11:00 - 11:20 K. Alhussan: Smooth Particle Hydrodynamics of High Velocity Impact: Anti-meteorite Protection of Space Apparatuses of Normal Impact of Aluminium Ball on the Shield Made of Two Aluminium Screens
 - 11:20 - 11:40 S. K. Srivastava: Trigonometric Approximation of Periodic Functions Belonging to $Lip(\xi(t), P)$ -Class
 - 11:40 - 12:00 B. Kalpakli : A High Resolution Interface Capturing Method With Discrete Conservation Equations for Compressible Multi-fluid Flows
- **12:00 Conference closing (Tower)**
- 12:15 - 14:00 Lunch