

ESCO 2012 - Monday, June 25

- 8:45 Conference opening
- **9:00 - 10:40 Keynote Session** (chairman L. C. McInnes)
 - 9:00 - 9:50 J. Butcher: Some Numerical Methods for Stiff Problems
 - 9:50 - 10:40 C. Baker: An Overview of the Trilinos Project
- 10:40 - 11:00 Coffee break
- **11:00 - 12:00 Contributed Session I-A: Modern Numerical Methods for ODE** (chairman J. Butcher)
 - 11:00 - 11:20 R. Norton: Higher Order Splitting Methods for Semi-Groups
 - 11:20 - 11:40 H. Podhaisky: On the Construction of General Linear Methods for Stiff Ordinary Differential Equations
 - 11:40 - 12:00 P. Šolín: Using Butcher's Tables in Transient PDE Solvers
- **11:00 - 12:00 Contributed Session I-B** (chairman L. C. McInnes)
 - 11:00 - 11:20 M. Möller: A Comparative Study of Conforming and Nonconforming High-Resolution Finite Element Schemes
 - 11:20 - 11:40 A. Dimier: Experience with Open Source Coupling and Python on T-H-M-C Modeling
 - 11:40 - 12:00 A. DiCarlo: An *Ab-initio* Approach to Geometric and Physical Modeling with Cellular Decompositions
- **11:00 - 12:00 Contributed Session I-C** (chairman E. Hall)
 - 11:00 - 11:20 M. Braun: Comparing Different Approaches to the Numerical Solution of the Poisson Equation in 3D via the Method of Finite Elements
 - 11:20 - 11:40 M. Urev: The Method of Regularization of Quasi-Stationary Maxwell Equations in Inhomogeneous Conducting Medium
 - 11:40 - 12:00 J. Chleboun: On an Optimal Node and Degree Distribution in the *hp*-FEM
- 12:00 - 13:30 Lunch
- **13:30 - 15:30 Contributed Session II-A: Computational dynamics** (chairmans K. Padberg-Gehle and O. Junge)
 - 13:30 - 13:50 K. Padberg-Gehle: Entropy-Based Numerical Investigation of Transport and Mixing in Flows
 - 13:50 - 14:10 O. Junge: Lazy Global Feedbacks for Quantized Nonlinear Event Systems
 - 14:10 - 14:30 P. Koltai: Global Stability Design for Non-Linear Dynamical Systems
 - 14:30 - 14:50 Ch. Horenkamp: Efficient Approximation of Coherent Pairs
 - 14:50 - 15:10 J. Rieger: Semi-Implicit Euler Schemes for Ordinary Differential Inclusions
 - 15:10 - 15:30 R. Norton: Planewave Expansion Methods for Photonic Crystal Fibres
- **13:30 - 15:30 Contributed Session II-B** (chairman P. Brambilla)
 - 13:30 - 13:50 M. Bittl: An *hp*-adaptive FEM-FCT Algorithm for Convection-Dominated Transport Problems
 - 13:50 - 14:10 N. Zander: The Finite Cell Method for Transient, Non-linear Heat Conduction
 - 14:10 - 14:30 J. Lang: Adaptive Moving Meshes in Large Eddy Simulation for Turbulent Flows
 - 14:30 - 14:50 V. Fuka: Simulation of Convection in the Atmospheric Boundary Layer using GPU
 - 14:50 - 15:10 J. Trommler: Thin-Sheet Modeling in Frequency Domain using Local Analytic Solutions - Applied to Low-Frequency Examples
 - 15:10 - 15:30 B. Metsch: Algebraic Multigrid for Saddle Point Systems

- **13:30 - 15:30 Contributed Session II-C** (chairman J. Starzynski)
 - 13:30 - 13:50 R. Weber dos Santos: Parallel and Adaptive Numerical Techniques Applied to Cardiac Modeling
 - 13:50 - 14:10 M. Matyka: Abdominal Aorta Flow: The Lattice Boltzmann and Finite Volume Methods
 - 14:10 - 14:30 R. Golab: Development of Distributed Cellular Automata Modeling Framework
 - 14:30 - 14:50 R. Cimrman: Mechanical Model of Plant Cell Tissue with Water Transport
 - 14:50 - 15:10 M. Hanuš: Adaptive Finite Element Solution of Second-Order Approximations of Neutron Transport
 - 15:10 - 15:30 I. Georgiev: Hybrid V-Cycle Multilevel Preconditioning of Non-Conforming Bilinear FEM Systems
- 15:30 - 16:00 Coffee break
- **18:00 - 21:00 Welcome reception (Spilka)**
 - Includes demonstration of historical firearms, historical fencing, and a flame show (by the Kargen group).

ESCO 2012 - Tuesday, June 26

- **9:00 - 10:40 Keynote Session** (chairman J. Butcher)
 - 9:00 - 9:50 F. Courteille: GPU Progress in Sparse Matrix Solvers for Applications in Computational Mechanics
 - 9:50 - 10:40 L. C. McInnes: Multiphysics Challenges and Recent Advances in Composable Solvers
- 10:40 - 11:00 Coffee break
- **11:00 - 12:00 Contributed Session I-A** (chairman M. Emans)
 - 11:00 - 11:20 B. Sawicki: Improving User Experience for 3D HTML5 Viewer
 - 11:20 - 11:40 A. Galizia: A QoS-Aware Broker for Hybrid Clouds
 - 11:40 - 12:00 J. Starzynski: Bioelectromagnetic Simulation for Everyone
- **11:00 - 12:00 Contributed Session I-B** (chairman R. Cimrman)
 - 11:00 - 11:20 A. DiCarlo: How to Metrize Chains: A Numerical Study
 - 11:20 - 11:40 P. Brambilla: Automatic Tracking of Corona Propagation in Three-dimensional Simulations of Non-normal Drop Impact on a Liquid Film
 - 11:40 - 12:00 J. Kruis: Coupled Heat and Moisture Transport Solved by Modified Kunzel's Model
- **11:00 - 12:00 Contributed Session I-C** (chairman A. Dimier)
 - 11:00 - 11:20 Z. Kubík: Using *hp*-adaptive Methods in Shielding Effectiveness Calculations
 - 11:20 - 11:40 L. Koudela: Modeling of Loud-Speaker with *hp*-Adaptive Methods
 - 11:40 - 12:00 L. Voráček: Calibration of FEM Based Computational Model For Thermoelastic Actuator
- 12:00 - 13:30 Lunch
- **13:30 - 15:30 Contributed Session II-A** (chairman P. Zaspel)
 - 13:30 - 13:50 M. Emans: GPU Implementation of K-cycle AMG for General Purpose Fluid Flow Solvers
 - 13:50 - 14:10 L. Barash: Parallel Pseudorandom Number Generators for Monte Carlo Simulations: Using Most Reliable Algorithms and Applying Parallelism of Modern CPUs and GPUs to Accelerate Computations
 - 14:10 - 14:30 M. Liebmann: Flux Vector Splitting Methods for the Euler Equations on 3D Unstructured Meshes for CPU/GPU Clusters
 - 14:30 - 14:50 A. Neic: Parallelization of a PCG-AMG Solver in Multi-CPU/GPU Environments
 - 14:50 - 15:10 T. Valkonen: GPU-Accelerated Regularisation of Large Diffusion Tensor Volumes
 - 15:10 - 15:30 K. Gugala: Fast Parallel Random Generator with High Entropy for a Biological Processes Simulations
- **13:30 - 15:30 Contributed Session II-B: Adaptive Methods for Eigenproblems** (chairman S. Giani)
 - 13:30 - 13:50 S. Giani: An Iterative Finite Element Method with Adaptivity for Multiple Eigenvalues
 - 13:50 - 14:10 H. Hakula: *hp*-Adaptive Eigensolution: Benchmark Studies
 - 14:10 - 14:30 K. Schmidt: Modelling of TE and TM Modes in Photonic Crystal Wave-Guides
 - 14:30 - 14:50 J. Gedicke: An Optimal Eigenvalue Solver
 - 14:50 - 15:10 Ch. Engström: A Posteriori Error Estimation for Rational Eigenvalue Problems Arising in Photonic Band Structure Calculations
 - 15:10 - 15:30 L. Grubišic: Robust A-Posteriori Error Estimates for Semi-definite Eigenvalue Problems With Known Null Spaces

- **13:30 - 15:30 Contributed Session II-C: Uncertainty Quantification for PDE** (chairman U. Römer)
 - 13:30 - 13:50 U. Römer: Sensitivity Analysis Techniques for the Quantification of Uncertainty in Electromagnetic Simulations
 - 13:50 - 14:10 B. Schieche: Analysis and Application of PDEs with Random Parameters
 - 14:10 - 14:30 B. Rosic: Bayesian Parameter Identification for Nonlinear Systems
 - 14:30 - 14:50 E. Ullmann: Multilevel Monte Carlo Methods and Applications to Uncertainty Quantification in Subsurface flow
 - 14:50 - 15:10 H. Harbrecht: A Fast Deterministic Method for Stochastic Interface Problems
 - 15:10 - 15:30 R. Patterson: Stochastic Methods for Particle Populations in Flows
- 15:30 - 16:00 Coffee break
- 16:00 - 17:00 Poster session (chairman F. Mach)

ESCO 2012 - Wednesday, June 27

- **9:00 - 9:50 Keynote Session** (chairman J. Lang)
 - M. Gee: Algebraic Multigrid in Fluid-Structure Interaction and Convection Dominated Problems
- 9:50 - 10:10 Coffee break
- **10:10 - 11:30 Contributed Session I-A** (chairman E. Holzbecher)
 - 10:10 - 10:30 J. Butcher: Stepsize and Order Control in Ordinary Differential Equation Solvers
 - 10:30 - 10:50 P. Sehnalová: Predictor-Corrector Obreshkov Pairs
 - 10:50 - 11:10 J. Principe: Hybrid Parallel Solvers for Finite Element Approximation of PDEs
 - 11:10 - 11:30 M. Manguoglu: New Advances in Parallel Solution of Large Sparse Linear Systems
- **10:10 - 11:30 Contributed Session I-B** (chairman L. Beneš)
 - 10:10 - 10:30 M. Hokr: Comparison of Finite Volume Method and Particle Tracking Method on the Solution of Complex Solute Transport Problem
 - 10:30 - 10:50 D. Frydrych: Groundwater Flow Simulation with Combinations of Discrete Fractures and Continuum - Model Scale and Discretisation Issues
 - 10:50 - 11:10 E. Rohan: Modeling of Heterogeneous Large Deforming Perfused Media Using Homogenization-based Preconditioning
 - 11:10 - 11:30 O. Kolditz: OpenGeoSys: An Open Source Initiative for Numerical Simulation of Thermo-Hydro-Mechanical/Chemical (THM/C) Processes in Porous Media
- **10:10 - 11:30 Contributed Session I-C: Recent Advances in Computational Fluid Dynamics** (chairman J. Lang)
 - 10:10 - 10:30 L. Korous: Adaptive *hp*-DG Method with Dynamically Changing Meshes for Compressible Euler Equations
 - 10:30 - 10:50 E. Hall: Adaptive Discontinuous Galerkin Methods for Eigenvalue Problems Arising in Incompressible Fluid Flows
 - 10:50 - 11:10 P. Louda: Numerical Solution of Unsteady Incompressible Flows
 - 11:10 - 11:30 P. Zaspel: Computationally Challenging Two-Phase Incompressible Flow Problems on Multi-GPU Systems
- 11:30 - 13:00 Lunch
- **13:00 - 16:45 Software Workshop**
 - 13:00 - 13:45 P. Solin: NCLab's New Additions - Octave, Scipy and Finite Elements in the Cloud
 - 13:45 - 14:30 O. Kolditz: OpenGeoSys - Simulation of Thermo-Hydro-Mechanical-Chemical Processes in Porous and Fractured Media
 - 14:30 - 15:15 L. Korous: Hermes - C++ Library for Rapid Development of Adaptive *hp*-FEM / *hp*-DG Solvers
 - 15:15 - 16:00 P. Karban: Agros - Multiplatform Interactive Graphical Application for the Solution of Engineering PDE Problems
 - 16:00 - 16:45 J. Brezina: TULFlow123D - Simulation of Water Flow and Reactionary Solute Transport in Heterogeneous Porous and Fractured Media

ESCO 2012 - Thursday, June 28

- **9:00 - 10:00 Contributed Session I-A: Discontinuous Galerkin Methods for Electromagnetics**
(chairman S. Schnepf)
 - 9:00 - 9:20 F. Rapetti: About Quasi-Static Approximations of Maxwell's Equations
 - 9:20 - 9:40 S. Schnepf: An Efficient Dynamic hp -Discontinuous Galerkin Formulation for Time-Domain Electromagnetics
 - 9:40 - 10:00 M. Lilienthal: Goal-Oriented hp -Adaptive DGFEM for the Time-Dependent Maxwell Problem
- **9:00 - 10:00 Contributed Session I-B** (chairman A. DiCarlo)
 - 9:00 - 9:20 L. Beneš: Numerical Modeling of the Flow Structures around Thin Body in the Stratified Fluid
 - 9:20 - 9:40 M. Urev: Maxwell Equations with New Dissipative Memory Boundary Conditions
 - 9:40 - 10:00 V. Kučera: Error Estimates for Nonlinear, Purely Convective Problems in Finite Element Methods
- **9:00 - 10:00 Contributed Session I-C** (chairman A. Kosík)
 - 9:00 - 9:20 M. Kuráž: Domain Decomposition Method for the Nonstationary Richard's Equation Problem
 - 9:20 - 9:40 V. Kotlan: Mechanical Conditions in Rotating Disk of General Cross-Section
 - 9:40 - 10:00 J. Šístek: Application of Multilevel BDDC Method to Elasticity Analysis
- 10:00 - 10:20 Coffee break
- **10:20 - 12:00 Contributed Session II-A: Discontinuous Galerkin Methods for Electromagnetics**
(chairman S. Schnepf)
 - 10:20 - 10:40 S. Descombes: High Order DGTD Method with Local Time Stepping for the Solution of the First Order Maxwell Equations
 - 10:40 - 11:00 A. Moiola: Trefftz-Discontinuous Galerkin Methods for Time-Harmonic Maxwells Equations
 - 11:00 - 11:20 J. Niegemann: Efficient Time-Integration for Discontinuous Galerkin Discretizations of Maxwell's Equations
 - 11:20 - 11:40 J. Nunez: Spectral Discontinuous Galerkin Methods for Magnetohydrodynamics
 - 11:40 - 12:00 S. Giani: High-Order/ hp -Adaptive Discontinuous Galerkin Finite Element Methods for Compressible Fluid Flows Analysis and Simulation
- **10:20 - 12:00 Contributed Session II-B: Fluid Structure Interaction: Methods and Applications**
(chairman P. Sváček)
 - 10:20 - 10:40 P. Sváček: On Mathematical Modeling of Flow Induced Vibrations of an Airfoil with Three Degrees of Freedom
 - 10:40 - 11:00 P. Furmánek: Deterministic Unsteady and Aeroelastic Simulations with High-Order FVM Schemes
 - 11:00 - 11:20 P. Pořízková: Flows in Convergent Channel - Comparison of Numerical Results of Different Mathematical Models
 - 11:20 - 11:40 J. Hasnedlová-Prokopová: Numerical Simulation of Fluid-Structure Interaction of Compressible Flow and Elastic Structure
 - 11:40 - 12:00 A. Kosík: Numerical Solution of Coupled Problems of Fluid Flow and Elastic Structure

- **10:20 - 12:00 Contributed Session II-C** (chairman B. Sawicki)
 - 10:20 - 10:40 Ch. Basting: An Optimal Control Approach to Enforcing the Eikonal Equation
 - 10:40 - 11:00 P. Kůs: Optimization of the System for Induction Heating of Nonmagnetic Cylindrical Billets in Rotating Magnetic Field Produced by Permanent Magnets
 - 11:00 - 11:20 V. Havlíček: Combination of Genetic Programming and Conceptual Models in Runoff Modeling
 - 11:20 - 11:40 K. Segeth: Some Computational Aspects of Smooth Approximation
 - 11:40 - 12:00 H. Klimach: Aero-Acoustic Simulation on Massively Parallel Octree Meshes
- 12:00 - 13:30 Lunch
- **13:30 - 14:50 Contributed Session III-A** (chairman J. Principe)
 - 13:30 - 13:50 A. Zubov: Dynamic Model of Processes in Spatially 3D Reconstructed Column for Inverse Gas Chromatography (iGC)
 - 13:50 - 14:10 D. den Ouden: Application of the Level-Set Method to a Mixed-Mode Driven Stefan Problem
 - 14:10 - 14:30 M. Korek: Electronic Structure of the Nanodiatomic Compounds CdS
 - 14:30 - 14:50 R. Papřok: Numerical solution of turbulent plasma models using PETSc parallel libraries
- **13:30 - 14:50 Contributed Session III-B** (chairman E. Rohan)
 - 13:30 - 13:50 R. Pokorný: Towards New Polymer Foam Insulation Material by the Use of Mathematical Modeling
 - 13:50 - 14:10 M. Vonka: Mathematical Modeling of Morphology Evolution in Heterophase Polymers
 - 14:10 - 14:30 J. Lev: The Mathematical Model of Experimental Sensor for Detecting of Plant Material Distribution on the Conveyor
 - 14:30 - 14:50 M. Štork: State-Space Energy Based Structure of Generalized Brayton-Moser Nonlinear Network Representations
- **13:30 - 15:10 Contributed Session III-C** (chairman J. Trommler)
 - 13:30 - 13:50 I. C. Husanu: Adaptive Models of Micro-Turbine for Distributed Generation Integration
 - 13:50 - 14:10 S. H. Han: Radiative Slab Heating Analysis for Various Fuel Gas Compositions in an Walking Beam Type Reheating Furnace
 - 14:10 - 14:30 A. Mussa: Magnetohydrodynamics Propulsion System Mathematical Models
 - 14:30 - 14:50 M. Tezer-Sezgin: BEM Solution of MHD Flow in a Pipe Coupled with Magnetic Induction of Exterior Region
 - 14:50 - 15:10 Q. Zhao: Numerical Methods for Studying Magnetic Flux Compression Generators
- 15:10 - 15:30 Coffee break
- **18:00 - 21:00 Farewell reception**
 - Includes demonstration of temperamental gypsy dances and a tomboys show (by the Equet group).

ESCO 2012 - Friday, June 29

- **9:00 - 10:00 Contributed Session I-A** (chairman P. Šolín)
 - 9:00 - 9:20 F. Abed-Meraim: New Quadratic Solid-Shell Elements and their Evaluation on Popular Benchmark Problems
 - 9:20 - 9:40 T.-L. Horng: An Error Minimized Pseudospectral Penalty Direct Poisson Solver
 - 9:40 - 10:00 O. Fernandez: Fractional Dynamics and Anomalous Diffusion, Case Studies Simulations
- **9:00 - 10:00 Contributed Session I-B** (chairman M. Štork)
 - 9:00 - 9:20 N. Alsoy-Akgün: Dual Reciprocity Boundary Element Solution of Mixed Convective Heat and Solutal Transport
 - 9:20 - 9:40 R. Alassar: Transient Heat Conduction in a Spherical Annulus with Eigenvalue-Dependent Boundary Conditions
 - 9:40 - 10:00 A. G. Karacor: A Predictive Artificial Neural Network Model for Distribution of Aquatic Microbial Community in Kucukcekmece Lagoon Turkey
- 10:00 - 10:20 Coffee break
- **10:20 - 11:40 Contributed Session II-A: Multiphysics and Multiscale Problems in Civil Engineering** (chairman J. Kruijs)
 - 10:20 - 10:40 J. Sýkora: Modeling of Degradation Processes in Historical Mortars
 - 10:40 - 11:00 T. Krejčí: Modeling of Moisture Transfer in Soils
 - 11:00 - 11:20 A. Kučerová: Comparison of Optimal Designs of Experiments Suitable for Inverse Analysis
 - 11:20 - 11:40 M. Lepš: Sequential Space-Filling Design Strategies
- **10:20 - 11:40 Contributed Session II-B** (chairman P. Karban)
 - 10:20 - 10:40 J. Halama: Numerical Simulation of Transonic Flow of Wet Steam in Nozzles and Turbines
 - 10:40 - 11:00 J. Fürst: Numerical Simulation of Transitional Flows
 - 11:00 - 11:20 R. Keslerová: Numerical Study of Steady and Unsteady Flow for Generalized Newtonian Fluids
 - 11:20 - 11:40 V. Prokop: Numerical Simulation of Generalized Oldroyd-B and Generalized Newtonian Flows
- **11:45 Conference closing**
- 12:00 - 14:00 Lunch