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# Workshop on scientific computing

## Programme

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### Thursday 12. 6.

13:55 – 14:00 *Opening*

**Chairman: Daniel Ševčovič**

- 14:00 – 14:30 Kenji Tomoeda Repeated support splitting and merging phenomena in the initial-boundary value problem for a porous media equation
- 14:30 – 15:00 Michal Sněhota Experimental investigation of the entrapped air redistribution in near-saturated soil
- 15:00 – 15:30 Robert Straka Lattice Boltzmann Method - An Introduction for JM

15:30 – 15:50 *Coffee break*

**Chairman: Kenji Tomoeda**

- 15:50 – 16:10 Simon Praetorius A continuous theory for active polar liquid crystals
- 16:10 – 16:30 Wieland Marth A mechanism for cell motility by active polar gels
- 16:30 – 16:50 Marco Salvalaglio Phase Field Modeling of Pillar-like Crystal Surface Morphology

16:50 – 17:10 *Coffee Break*

**Chairman: Robert Straka**

- 17:10 – 17:30 Jan Šácha Temporal and spatial distribution of water and air during ponded infiltration on a sand sample recorded by neutron imaging
- 17:30 – 17:50 Tomáš Princ TOUGH2 Simulation of water and air flow in heterogenous porous media
- 17:50 – 18:10 Francesco Alaimo Passive Transport in Neurons

## Friday 13. 6.

07:30 – 09:00 *Breakfast (Hotel Faust)*

**Chairman: Michal Beneš**

09:00 – 09:30 Jaromír Kukal Small Details of Fractal Dimension Estimation  
09:30 – 10:00 Hynek Lavička Sand in the Wheels or Wheels in the Sand? Tobin Taxes and Market Crashes  
10:00 – 10:30 Pavel Strachota A Quasi-1D Model of Biomass Co-Firing in a Circulating Fluidized Bed Boiler

10:30 – 11:00 *Coffee break*

**Chairman: Jaromír Kukal**

11:00 – 11:20 Michal Kollár Creation of Digital Terrain Models using surface evolution  
11:20 – 11:40 Marek Macák Up-wind principle in geodetic computations  
11:40 – 12:00 Róbert Špír Nonlinear PDE based numerical methods for cell tracking in 4D biomedical images  
12:00 – 12:20 Viera Kleinová Velocity Field Extraction from Image Sequences

12:20 – 14:00 *Lunch*

**Chairman: Jiří Mikyška**

14:00 – 14:20 Roman Kukumberg Two approaches for solving optimal topology design problems  
14:20 – 14:40 Miroslav Kolář Computational Analysis of the Conserved Mean-Curvature Flow for Open and Closed Curves in the Plane  
14:40 – 15:00 Siqi Ling Parallel multi-mesh method on AMDiS  
15:00 – 15:20 Vít Hanousek Introduction to the hardware and software architecture of the Hyperion cluster at FNSPE CTU Prague

15:20 – 15:50 *Coffee break*

**Chairman: Radek Fučík**

15:50 – 16:10 Jakub Solovský Mixed-Hybrid Finite Element Method for Modeling Two-phase Compositional Flow in Unsaturated Porous Media  
16:10 – 16:30 Jakub Jánský Interval Arithmetics for Global Optimization  
16:30 – 16:50 Barbora Planková Mathematical modeling of spherical phase interfaces using density gradient theory and capillary waves

16:50 – 19:30 *Free time*

19:30 – 23:59 *Conference dinner (Zlatá Koruna)*

## Saturday 14. 6.

07:30 – 09:00 *Breakfast (Hotel Faust)*

**Chairman: Pavel Strachota**

09:00 – 09:30 Hynek Lavička Fluctuation analysis of high frequency electricity power load in the Czech Republic

09:30 – 19:00 *Hiking excursion*

## Sunday 15. 6.

07:30 – 09:00 *Breakfast (Hotel Faust)*

**Chairman: Petr Pauš**

09:00 – 09:30 Michal Beneš TBA

09:30 – 10:00 Vítězslav Žabka GPU implementation of the finite element method

10:00 – 10:20 Vladimír Klement Multigrid method for linear complementarity problem on GPU

10:20 – 10:40 *Coffee break*

**Chairman: Hynek Lavička**

10:40 – 11:00 Hung Hoang Dieu Anisotropic Surface Diffusion in Relative Geometry

11:00 – 11:20 Ondřej Polívka Compositional Simulation of Two-Phase Flow in Porous Media Using VT-Flash

11:20 – 11:40 Ondřej Pártl Numerical Simulation of Gas Flow and NAPL Vapor Transport in Soil

11:40 – 12:00 Alexandr Žák Modeling of Structural Behavior of Saturated Soil Induced by Freezing