

Monday 23. 9. 2024

Modelling, PDE analysis
and computational mathematics
in materials science



9:00 – 9:10

Miroslav Bulíček & Sebastian Schwarzacher

Introductory remarks, brief description of the program and motivation for the conference

9:10 – 10:00

Enrique Zuazua

Qualitative numerics

10:00 – 10:20

Stefan Neukamm

Quantitative stochastic homogenization of convex integral functionals

10:20 – 10:50

Coffee

10:50 – 11:40

François Gay-Balmaz

Variational and thermodynamically consistent discretization for heat-conducting viscous fluids

11:40 – 12:00

Linus Behn

Boundary regularity for nonlinear systems with symmetric gradients

12:00 – 12:20

Ondřej Kreml

On time-periodic solutions to an interaction problem between compressible viscous fluids and viscoelastic beams

12:20 – 13:30

Lunch

13:30 – 14:20

Yibin Fu

Axisymmetric necking in a stretched circular membrane

14:20 – 14:40

Casey Rodriguez

Towards mathematically justifying nonlinear constitutive relations between stress and linearized strain

14:40 – 15:10

Coffee

15:10 – 16:00

Helmut Abels

Sharp interface limit of a Navier-Stokes/Allen-Cahn system with vanishing mobility

16:00 – 16:20

Paolo Antonelli

The relaxation-time limit of the quantum hydrodynamics equations for semiconductors

16:20 – 16:40

Pei Su

Conditional regularity for an elastic shell interacting with the Navier-Stokes equations

17:00 – 17:20

Coffee

17:20 – 18:00

Michael Zelina

On the Navier-Stokes like system with the dynamic slip boundary condition

Vicent Pallardó Julià

On the manifold-valued ROF model

Eylem Öztürk

On the solutions of nonlinear Robin boundary value problem

Tomáš Los

On three dimensional flows of viscoelastic fluids of Giesekus type

18:00 – 19:30

Poster presentation/exhibition

Tuesday 24. 9. 2024

Modelling, PDE analysis
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9:00 – 9:50

Vesa Julin

Regularity and asymptotical behavior of volume preserving geometric flows

9:50 – 10:10

Petr Kaplický

Stability of steady states to generalized Navier-Stokes-Fourier system

10:10 – 10:40

Coffee

10:40 – 11:30

Mária Lukáčová-Medvid'ová

Random compressible fluid flows

11:30 – 11:50

Christoph Allolio

Stress-mediated growth model for the evolution and architecture of the E. coli division site

11:50 – 12:10

Elfriede Friedmann

Continuum mechanics and computational modeling of ocular tissues for in silico therapies

12:10 – 13:30

Lunch

13:30 – 14:20

Patrick Farrell

Designing conservative and accurately dissipative numerical integrators in time

14:20 – 14:40

Karel Tůma

Efficient linear semi-implicit finite element scheme for fluid-shell interaction

14:40 – 15:10

Coffee

15:10 – 16:00

Matthieu Hillairet

Collisions in fluid/solid mixtures

16:00 – 16:20

Eduard Feireisl

Conditional regularity for the Navier-Stokes-Fourier system with applications

16:20 – 16:40

Yong Lu

Qualitative/quantitative homogenization of some non-Newtonian flows in perforated domains

17:00 – 17:20

Coffee

17:20 – 18:30

Fabian Rupp

Regularity of surfaces with nearly minimal bending

Malte Kampschulte

Variational aspects of fluid-structure interaction

Michele Ruggeri

Finite element methods for magnetoelastic materials

Erika Maringová Kokavcová

On different constitutive relations and boundary conditions for fluids

Alex Kaltenbach

Numerical methods for smart fluids

Jakub Cach

Flow around an obstacle: Various approaches to calculate pointwise traction

Ravi Sastri Ayyagari

Dynamic fragmentation of functional graded brittle materials in 1d

Wednesday 25. 9. 2024

Modelling, PDE analysis
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9:00 – 9:50

Claude Le Bris

Multiscale finite element method for heterogeneous materials: challenges, accomplishments and unsolved question

9:50 – 10:10

Barbora Benešová

Linearization in elastodynamics

10:10 – 10:40

Coffee

10:40 – 11:30

Juan José López Velázquez

Kinetic equations describing open systems

11:30 – 11:50

Agnieszka Świerczewska-Gwiazda

Cahn-Hillard and Keller-Segel systems as high-friction limits of gas dynamics

11:50 – 12:10

Stefan Frei

Modelling, simulation and benchmarking of fluid-structure interactions with contact

12:10 – 13:30

Lunch

Thursday 26. 9. 2024

Modelling, PDE analysis
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9:00 – 9:50

Joachim Schöberl

Distributional finite elements with applications for elasticity, fluids, and curvature

9:50 – 10:10

Jaroslav Hron

Numerical investigation of blood flows with slip boundary conditions

10:10 – 10:40

Coffee

10:40 – 11:30

Yann Brenier

Solving initial value problems by space-time convex optimization

11:30 – 11:50

Michal Bathory

Analysis of viscoelastic fluids

11:50 – 12:10

Anna Balci

Hodge decomposition in variable exponent spaces with applications to regularity theory

12:10 – 13:30

Lunch

13:30 – 14:20

Davide Bigoni

Architected materials implemented with unstable structural elements

14:20 – 14:40

Martin Kružík

Linearization of finite elasticity with surface tension

14:40 – 15:10

Coffee

15:10 – 16:00

Thomas Richter

Modeling and numerical analysis of sea ice

16:00 – 16:20

Jakub Fara

Remeshing strategy in ALE method: Contactless rebound simulation

16:20 – 16:40

Jan Zeman

FFT-accelerated solvers for computational micromechanics: A linear algebraic view

Friday 27. 9. 2024

Modelling, PDE analysis
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9:00 – 9:50

Laura De Lorenzis

Phase-field modeling of elastic microphase separation

9:50 – 10:10

Katharina Hopf

On the equilibrium solutions in a model for electro-energy-reaction-diffusion systems

10:10 – 10:40

Coffee

10:40 – 11:30

Sören Bartels

Babuska's paradox in linear and nonlinear bending theories

11:30 – 11:50

Stanisław Stupkiewicz

Towards a sharper phase-field method for microstructure evolution problems

11:50 – 12:10

Pablo Alexei Gazca-Orozco

A priori and a posteriori estimates for vectorial problems via convex duality

12:10 – 13:30

Lunch and closing