



FACULTY  
OF MATHEMATICS  
AND PHYSICS  
Charles University



EUROPEAN  
UNIVERSITY  
ALLIANCE

# Workshop Mathematics of High-Performance Computing 2021



Faculty of Mathematics and Physics, Charles University,  
Sokolovská 83, Lecture hall K1

## Program for Monday, September 20

13:00	<b>Opening</b>
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Chair: *Petr Tichý*

13:10	Erin Carson: <i>The hazards and challenges of low-precision computation</i>
13:35	Jan Papež: <i>Linear algebraic solvers in Cosmic Microwave Background data analysis</i>
14:00	Stefano Pozza: <i>The <math>*</math>-product and its numerical approximation</i>
14:25	Dorota Šimonová: <i>When does the Lanczos algorithm compute exactly?</i>
14:50	Martin Ladecký: <i>Acceleration of FFT-based homogenisation by low-rank tensor approximations</i>

15:15	<b>Coffee break</b>
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Chair: *Ivana Pultarová*

15:45	Karel Tůma: <i>Large-scale finite element simulations of stress-induced martensitic microstructure in shape memory alloys</i>
16:10	Chupeng Ma: <i>Novel design and analysis of generalized FEMs with locally optimal spectral approximations</i>
16:35	Jakub Šístek: <i>Towards a parallel domain decomposition solver for immersed boundary FEM</i>
17:00	Monika Balázsová: <i>Space-time discontinuous Galerkin method for problems in time-dependent domains</i>
17:25	Miloslav Feistauer: <i>On finite element, discontinuous Galerkin and level-set methods for numerical simulation of two-phase flows</i>

# Program for Tuesday, September 21

Chair: *Stefano Pozza*

9:00	Robert Scheichl: <i>High performance uncertainty quantification with parallelized multilevel Markov chain Monte Carlo</i>
9:25	Petr Vacek: <i>Multilevel methods with inexact solver on the coarsest level</i>
9:50	Elise Grosjean: <i>Optimization of a non-intrusive reduced basis method</i>

10:15	<b>Coffee break</b>
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Chair: *Robert Scheichl*

10:45	Marek Pecha: <i>HPC approaches to machine learning and applications</i>
11:10	Martin Doškář: <i>A priori enrichments as a basis for constructing microstructure-informed reduced modes for problems with explicitly resolved microstructural details</i>
11:35	Jaroslav Hron: <i>Computational study of hemodynamical flows in patient specific geometries</i>
12:00	Shin Hyun-Geun: <i>A numerical setting for computation of tropical cyclone drift</i>

12:25	<b>Lunch break</b>
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Chair: *Erin Carson*

13:35	Ole Klein: <i>Fast and exact generation of stationary Gaussian random fields</i>
14:00	Jiří Kopal: <i>A note on multilevel factorized approximate inverse preconditioners</i>
14:25	Tomáš Lubner: <i>Block preconditioners for poroelasticity</i>
14:50	Vít Dolejší: <i>Several remarks on the numerical solution of partial differential equations</i>

15:15	<b>Coffee break</b>
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Chair: *Ole Klein*

15:45	Vít Průša: <i>Elastic turbulence</i>
16:10	Suncica Sakic: <i>Stability and convergence of a class of RKDG methods for Maxwell's equations</i>
16:35	Nicat Aliyev: <i>Estimation of large-scale structured real stability radius by a greedy subspace method</i>
17:00	<b>Closing remarks</b>

## Internet Access

Eduroam is available at the conference venue. In case you are not able to connect, please contact the organizers for assistance.

## Organising Committee

Iveta Hnětynková  
Miroslav Tůma  
Vít Dolejší

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Faculty of Mathematics and Physics  
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