



Circus 2018

Numerical Mathematics and Computational Science
Aalto University, August 20-22, 2018



Conference programme

Monday, August 20

19:00 **Get together & registration**

Radisson Blu
Otaranta 2, Espoo

Tuesday, August 21

08:30 **Registration**

hall E
Otakaari 1, Espoo

09:00 **Welcome to BIT Circus 2018**

hall E

Rolf Stenberg, Aalto University
Gunilla Kreiss, Uppsala University

09:10 **Session 1**

hall E

Chair: *Antti Hannukainen*

A one-variable locking-free Reissner-Mindlin plate: variational formulations and isogeometric implementation

Loc Tran, Aalto University

NEP-PACK: A julia package for nonlinear eigenvalue problems

Elias Jarlebring, KTH Royal Institute of Technology

Electrical enclosures - Thermal design optimization

Ivo Dravins, Uppsala University

Lie-Poisson numerical schemes for isospectral flows

Milo Viviani, Chalmers University of Technology

Multiparametric shell eigenvalue problems

Mikael Laaksonen, Aalto University

Optimal $L^\infty(L^2)$ error analysis of a direct discontinuous Galerkin method for time-fractional reaction-diffusion problems

Chaobao Huang, Beijing Computational Science Research Center

10:50 **Coffee break**

11:20 **Session 2**

hall E

Chair: *Harri Hakula*

Solving eigenvalue Problems

Marko Huhtanen, University of Oulu

Heterogeneous multiscale methods for applications in magnetization dynamics

Lena Leitenmaier, KTH Royal Institute of Technology

Stress Reconstruction for mixed methods in Elasticity

Fleurianne Bertrand, Universität Duisburg-Essen

Conformal invariants and numerical conformal mappings

Antti Rasila, Aalto University

The analysis and application of Optimal Transport for Seismic Inversion

Yunan Yang, The University of Texas at Austin

Isogeometric analysis in structural mechanics and strain gradient elasticity

Viaceslav Balabanov, Aalto University

13:00 **Lunch**

Dipoli

Otakaari 24, Espoo

14:00 **Session 3**

hall E

Chair: *Anders Szepessy*

Iron loss estimation as an inverse problem

Lauri Perkkiö, Aalto University

Error analysis of a high-order numerical method on fitted meshes for a time-fractional diffusion problem

Hu Chen, Beijing Computational Science Research Center

Continuous transportation as a material distribution topology optimization problem

Eddie Wadbro, Umeå University

Finite Element Discretization for a Total Variation Model

Andreas Langer, University of Stuttgart

Approximation of Killing vector fields on the torus

Gaelle Brunet, University of Eastern Finland

Optimal quotients and iterations for large generalized eigenvalue problems

Vesa Kotila, University of Oulu

A density matrix approach to the convergence of the Self-Consistent Field iteration

Parikshit Upadhyaya, KTH Royal Institute of Technology

15:55 **Coffee break**

16:20 **Announcement of the Carl-Erik Fröberg Prize**

hall E

Olavi Nevanlinna, Aalto University

16:25 **Talk by the Fröberg prize winner Georg Muntingh**

hall E

Chair: *Olavi Nevanlinna*

Symbols and exact regularity of symmetric pseudo-splines of any arity

Georg Muntingh, SINTEF Digital

16:50 **Session 4**

hall E

Chair: *Daniele Boffi*

Best space of a fixed dimension

Andrea Bressan, University of Oslo

Continuum damage modelling within classical and strain gradient elasticity

Hoang Anh Tuan Nguyen, Aalto University

Stability property of hyperbolic equations with damping and time delay

Jianghao Hao, Shanxi University

Mean value interpolation for arbitrary polygons and polyhedra

Francesco Patrizi, University of Oslo (external partner SINTEF)

19:30

Conference dinner

Fat Lizard

Tietotie 1, Espoo

Wednesday, August 22

09:00

Session 5

hall E

Chair: *Antti Niemi*

Computing canonical quantum observables using molecular dynamics

Aku Kammonen, KTH Royal Institute of Technology

High order summation-by-parts finite difference operators for reentrant corners

Jonatan Werpers, Uppsala University

A Posteriori Error Estimates for Elliptic Eigenvalue Problems Using Auxiliary Subspace Techniques

Harri Hakula, Aalto University

Optimal spline spaces for L^2 n -width problems

Espen Sande, University of Oslo

Fast integral equation methods for the isotropic heat equation

Fredrik Fryklund, KTH Royal Institute of Technology

Local controllability for linear evolution equations with bilinear control

Cristina Urbani, Gran Sasso Science Institute, Université Pierre et Marie Curie

Flow-induced sound generation during voiced speech

Lukas Schickhofer, KTH Royal Institute of Technology

10:55	Coffee break	
11:20	Session 6 Chair: <i>Marko Huhtanen</i> On Bayesian inference of sparsely observed national scale epidemics <i>Robin Eriksson</i> , Uppsala University Perspectives on dynamic structural analysis of footbridges <i>Antti H. Niemi</i> , University of Oulu Symplectic integrators for the space- and time-dependent wave equation <i>Nikita Kopylov</i> , Universitat Politècnica de València Generalized approximate implicitization with prescribed conditions <i>Andrea Raffo</i> , University of Oslo A second-order numerical method for a scalar monotonicity-preserving nonlocal nonlinear conservation law <i>Adrian Montgomery Ruf</i> , University of Oslo	hall E
12:45	Closing words <i>Rolf Stenberg</i> , Aalto University <i>Kreiss Gunilla</i> , Uppsala University	hall E
13:00	Lunch & goodbyes	Dipoli Otakaari 24, Espoo