



PARNUM 2017

International Workshop on Parallel Numerics

19 – 21 April 2017

Fraunhofer Research Campus

Waischenfeld, Germany

PROGRAM



Program

Wednesday, April 19

12:00 – 13:00	Participants' arrival, registration, and reception drink
13:00 – 14:00	Lunch at Research Campus
14:00 – 14:20	Conference opening
14:20 – 15:55	Keynote session
14:20 – 15:10	Iain Duff (Keynote talk) <i>"Direct solution of sparse linear equations on parallel computers"</i>
15:10 – 15:55	Lois Curfman McInnes (Invited talk) <i>"Community software ecosystems for high-performance computational science: Opportunities and challenges"</i>
15:55 – 16:30	Coffee break
16:30 – 18:10	Scheduling and communication aspects of high performance computing
16:30 – 16:50	Imad Kissami <i>"HPC as a service for computational fluid dynamics problems"</i>
16:50 – 17:10	Michael Hofmann <i>"Transparent execution of numerical libraries on distributed HPC platforms"</i>
17:10 – 17:30	Michael Obersteiner <i>"A highly scalable MPI parallelization of the Fast Multipole Method"</i>
17:30 – 17:50	Elias Wimmer <i>"Is Gossip-inspired reduction competitive in high performance computing?"</i>
17:50 – 18:10	Roman Trobec <i>"Impact of interconnection network topology on parallel performance – a survey"</i>
18:30	Discussion "Gender and minority issues in scientific computing" with invited speakers, followed by joint barbecue

Thursday, April 20

07:15 – 08:30	Breakfast
08:30 – 10:35	Advanced parallel methods for solving partial differential equations
08:30 – 09:15	Linda Stals (Invited talk) <i>“Use of domain decomposition for the solution of the Thin Plate Spline saddle point problem”</i>
09:15 – 09:35	Axel Klawonn <i>“Computing on the extreme scale in nonlinear solid mechanics”</i>
09:35 – 09:55	Martin Lanser <i>“A framework for nonlinear FETI-DP and BDDC methods”</i>
09:55 – 10:15	Jonas Thies <i>“Employing HPC for analyzing nonlinear PDE systems beyond simulation”</i>
10:15 – 10:35	Michael Rippl <i>“Efficient transformation of the general eigenproblem with symmetric banded matrices to a banded standard eigenproblem”</i>
10:35 – 11:00	Coffee break
11:00 – 13:00	Matrix factorization methods and applications
11:00 – 11:20	Yusaku Yamamoto <i>“Roundoff error analysis of the CholeskyQR2 and related algorithms”</i>
11:20 – 11:40	Miroslav Rozložník <i>“The factors in the SR decomposition and their conditioning”</i>
11:40 – 12:00	Gabriel Okša <i>“Convergence of the parallel Block-Jacobi EVD algorithm for Hermitian matrices”</i>
12:00 – 12:20	Rade Kutil and Markus Flatz <i>“Convergence and parallelization of nonnegative matrix factorization with Newton iteration”</i>
12:20 – 12:40	Mária Lucká <i>“Parallel multi-density based clustering”</i>
12:40 – 13:00	Robert Spir <i>“Workflow for parallel processing of biomedical images”</i>
13:00 – 14:15	Lunch at Research Campus
14:15 – 15:00	Fluid-particle interaction simulations
14:15 – 15:00	Katarina Gustavsson (Invited talk) <i>“Large scale simulations of fibers in Stokes flow”</i>
15:10	Trip to Bamberg (UNESCO World Heritage) including guided city tour and dinner at “Mahr’s Bräu”

Friday, April 21

07:15 – 08:30	Breakfast
08:30 – 10:35	Iterative solvers, preconditioners, and matrix inversion techniques
08:30 – 09:15	Selime Gürol (Invited talk) <i>“Parallelization in the time dimension of geophysical data assimilation problems”</i>
09:15 – 09:35	Miroslav Tůma <i>“Mixed sparse-dense linear least squares and preconditioned iterative methods”</i>
09:35 – 09:55	Thomas Huckle <i>“Parallel solution of tridiagonal matrices”</i>
09:55 – 10:15	Louise Spellacy <i>“Partial inverses of block tridiagonal non-Hermitian matrices”</i>
10:15 – 10:35	Zdeněk Strakoš <i>“On the numerical stability analysis of pipelined Krylov subspace methods”</i>
10:35 – 11:00	Coffee break
11:00 – 12:40	Programming techniques for GPUs and hybrid architectures
11:00 – 11:20	Tim Werner <i>“Efficient GPU-based Smoothed Particle Hydrodynamics”</i>
11:20 – 11:40	Stefan Rosenberger <i>“OpenACC parallelization for the solution of the Bidomain equations”</i>
11:40 – 12:00	Thomas Heller <i>“Asynchronous integration of CUDA/OpenCL within HPX for utilizing full cluster capabilities”</i>
12:00 – 12:20	Kamil Halbiniak <i>“Exploring programming models for accelerating scientific applications on hybrid CPU-MIC platforms”</i>
12:20 – 12:40	Alban Lumi <i>“Energy aware computations on manycore systems”</i>
12:45 – 14:15	Lunch at Research Campus
14:15 – 15:15	Data layout and vectorization approaches for modern architectures
14:15 – 14:35	Manfred Liebmann <i>“Explicit vectorization as a design tool for parallel algorithms on modern hardware architectures”</i>
14:35 – 14:55	Ivan Kotenkov <i>“Design of cache-efficient multithreaded sparse matrix format for modern era”</i>
14:55 – 15:15	Jean-Matthieu Gallard <i>“Code generation for a high order ADER-DG solver in a hyperbolic PDE engine”</i>
15:15 – 15:30	Conference closing and participants’ departure