Parallel-in-time algorithms for exascale applications

Monday 7 – Friday 11 July 2025

The programme is subject to change. All times are British Summer Time (BST).

MONDAY 7 JULY 2025	
10.00 – 10.30	Registration
10.30 - 12.00	Training session *(optional)*
12.00 - 13.30	Lunch *(and registration if not attending training session)*
13.30 - 14.30	Josh Hope-Collins, Imperial College London *ParaDiag preconditioners for nonlinear and variable-coefficient problems*
14.30 - 15.00	Ryo Yoda, University of Wuppertal *Toward efficient solvers using block-epsilon circulant preconditioning on modern integrated CPU-GPU systems*
15.00 - 15.30	Refreshments
15.30 – 16.00	Andreas Schafelner, Johannes Kepler University Linz *A parallel-in-time solver for nonlinear degenerate time-periodic parabolic problems*
16.00 - 16.30	Alexander Schell, University of Münster *Towards Vectorised Block Krylov Parallel in Time Methods*
16.30 – 17.30	Welcome Reception

TUESDAY 8 JULY 2025	
09.15 – 10.15	**Juliane Rosemeier**, Freie Universität Berlin *Multilevel Parareal Methods and Standard Form Transformations for Weakly Nonlinear Problems*
10.15 – 10.45	**Werner Bauer**, University of Surrey *Accurate solutions of highly oscillatory systems under large time steps using higher-order phase averages*
10.45 – 11.15	Refreshments
11.15 - 11.45	**Martin Gander**, Université de Genève *Parareal for hyperbolic problems just does not work, or does it?*
11.45 - 12.15	**Stephan Rave**, University of Münster *A Parareal Algorithm with Spectral Coarse Solver*
12.15 - 12.45	**Joao Guilherme Caldas Steinstraesser**, University of Sao Paulo *Stability and numerical study of Parareal and MGRIT applied to the shallow water equations on the rotating sphere*
12.45 – 14.15	Lunch
14.15 – 14.45	**Daniel Ruprecht**, Hamburg University of Technology *Machine learning based coarse propagators for Parareal*
14.45 - 15.15	**Massimiliano Tamborrino**, University of Warwick *ProbParareal: A Probabilistic Numerical Parallel-in-Time Solver for Differential Equations*
15.15 – 15.45	Refreshments
15.45 - 16.15	**Abdelouahed Ouardghi**, Jülich Supercomputing Centre/ Forschungszentrum Jülich *Space-Time Parallelism using Spectral Deferred Corrections and Finite Elements for Incompressible Navier–Stokes Equations*
16.15 - 16.45	**Thomas Baumann**, Forschungszentrum Juelich *Diagonal Spectral Deferred Correction for 3D Rayleigh-Benard convection*
16.45 - 17.15	**Alex Brown**, Met Office/ University of Exeter *A comparison of time-parallel "across the method" deferred correction schemes for atmospheric modelling*

WEDNESDAY 9 JULY 2025	
09.15 – 10.15	**Giancarlo Antonino Antonucci**, UKAEA *Time-parallel algorithms for chaotic systems*
10.15-10.45	**Sriramkrishnan Muralikrishnan**, Jülich Supercomputing Centre/ Forschungszentrum Jülich GmbH *A Massive Space-Time Parallel Particle-In-Fourier Framework for Kinetic Plasma Simulations*
10.45 – 11.15	Refreshments
11.15 - 11.45	**Thibaut Lunet**, Hamburg University of Technology *Spectral Deferred Correction: from theoretical analysis to design of new time-parallel algorithms*
11.45 - 12.15	**Lisa Wimmer**, Bergische Universität Wuppertal *On the application of spectral deferred corrections to differential-algebraic equations*
12.15 - 12.45	**Hans Johansen**, Lawrence Berkeley National Laboratory *New approaches to space-time splitting with higher accuracy*
12.45	Lunch and free afternoon

THURSDAY 10 JULY 2025	
09.15 – 10.15	**Rob Falgout**, Lawrence Livermore National Laboratory *Parallel-in-Time Solution of Hyperbolic PDE Systems via Characteristic-Variable Block Preconditioning*
10.15 – 10.45	**David Vargas**, Sandia National Laboratories *Parallel multigrid in time for chaos with timescale-independent convergence*
10.45 – 11.15	Refreshments
11.15 - 11.45	**Arne Naaegel**, Goethe University Frankfurt *Scalable parallel-in-time solvers for linear poroelasticty*
11.45 – 12.15	**Wiebke Drews**, TU Dortmund University *Stabilized Finite Element Multigrid Techniques for Space-Time Parallelism in Convection-Diffusion Problems*
12.15 – 12.45	**Julius Ehigie**, University of Lagos *Parallelizing Internal Stages in High-Order Two-Derivative DIRK Methods with applications*
12.45 – 14.15	Lunch
14.15 – 15.15	**Felix Kwok**, Université Laval *Optimized Schwarz methods in time for discrete transport control*
15.15 – 15.45	**Sebastian Götschel**, Hamburg University of Technology *Parallelization in time for inverse problems*
15.45 - 16.15	Refreshments
16.15 – 16.45	**Nick Janssens**, KU Leuven *Parallel-in-time multiple shooting using large-eddy simulation for flow reconstruction in the atmospheric boundary layer*
16.45 – 17.15	**Bernhard Heinzelreiter**, University of Edinburgh *A Diagonalization-Based Parallel-in-Time Preconditioner for Instationary Flow Control Problems*
19.00 onwards	Workshop Dinner at Apex Grassmarket Hotel *The Heights Room, Apex Grassmarket Hotel, 31-35 Grassmarket, Edinburgh EH1 2HS*

FRIDAY 11 JULY 2025	
09.15 – 09.45	**Magnus Appel**, University of Southern Denmark *Towards Fast Topology Optimisation of Transient Heat Conduction Using Space-time Multigrid Methods*
09.45 – 10.15	**Sean Hon**, Hong Kong Baptist University *An optimal parallel-in-time preconditioner for parabolic optimal control problems*
10.15 – 10.45	**Mahadevan Ganesh**, Colorado School of Mines *Parallel-in-time-and-space simulation for a class of models with non-local operators*
10.45 – 11.15	Refreshments
11.15 - 12.30	Closing discussion
12.30	Lunch