Room Plan

- Plenary sessions are in room Berlin-Zeuthen-Henningsdorf.
- Parallel sessions are in rooms Berlin-Zeuthen-Henningsdorf, Gotha-Magdeburg, Meißen, and Döllinsee.
## Householder Symposium XVII – Program

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<th>Time</th>
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<th>Tuesday</th>
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<tr>
<td>08:30</td>
<td>Opening (8:45 – 9:05)</td>
<td>Mehrmann</td>
<td>Simoncini</td>
<td>Absil</td>
<td>Saad</td>
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<tr>
<td>09:05</td>
<td>Paige</td>
<td>Sorensen</td>
<td>Benzi</td>
<td>Tisseur</td>
<td>Demmel</td>
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<td>09:40</td>
<td>Trefethen</td>
<td>Benzi</td>
<td>Ernst</td>
<td>Koey (ILAS Speaker)</td>
<td>Householder Prize Talk</td>
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<td>10:15</td>
<td>Coffee Break</td>
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<tr>
<td>10:50</td>
<td>Tropp</td>
<td>Liesen</td>
<td>O’Leary</td>
<td>Dopico</td>
<td>Parallel 17-20</td>
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<tr>
<td>11:25</td>
<td>Vavasis</td>
<td>Elman</td>
<td>Stewart</td>
<td>Future of the Field (11:30 – 12:00)</td>
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<td>12:00</td>
<td>Lunch Break</td>
<td>Lunch Break</td>
<td>Lunch Break (11:30 – 13:15)</td>
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<td>14:00</td>
<td>Kilmer</td>
<td>Bai</td>
<td>Kressner</td>
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<td>14:35</td>
<td>Nagy</td>
<td>Dhillon</td>
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<td>Moro</td>
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<td>15:10</td>
<td>Elden</td>
<td>Frommer</td>
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<td>Embree</td>
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<td>15:45</td>
<td>Coffee Break</td>
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<td>16:30</td>
<td>Parallel 1-4</td>
<td>Parallel 9-12</td>
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<td>18:30</td>
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<td>21:00</td>
<td>Parallel 5-8</td>
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Monday, June 2

8.45 – 9.05 Opening
9.05 – 9.40 Chris Paige Orthonormal completion of an array of unit length vectors
9.40 – 10.15 Lloyd N. Trefethen Continuous analogues of QR, LU, SVD and Schur
10.15 – 10.50 Coffee Break
10.50 – 11.25 Joel A. Tropp Algorithms for matrix column selection
11.25 – 12.00 Stephen A. Vavasis Algorithms and complexity for nonnegative matrix factorization
12.00 – 14.00 Lunch Break
14.00 – 14.35 Misha E. Kilmer A multilevel, modified total least norm approach to signal and image deblurring
14.35 – 15.10 James G. Nagy Separable nonlinear least squares problems in image processing
15.10 – 15.45 Lars Eldén Solving ill-posed Cauchy problems using rational Krylov methods
15.45 – 16.30 Coffee Break
16.30 – 18.30 Parallel Sessions 1 – 4
19.00 – 21.00 Dinner
21.00 – 22.00 Parallel Sessions 5 – 8

Parallel Session 1, Eigenvalue problems (nonlinear), Room Berlin-Zeuthen

16.30 – 16.50 Timo Betcke Improving computed eigenpairs of polynomial eigenvalue problems by scaling and iterative refinement
16.50 – 17.10 Shreemayee Bora Structured eigenvalue condition number and backward error of a class of polynomial eigenvalue problems
17.10 – 17.30 David Bindel Error Bounds and Error Estimates for Nonlinear Eigenvalue Problems
17.30 – 17.50 Christian Schröder Numerical Solution of Palindromic Eigenvalue Problems
17.50 – 18.10 Steven Mackey Linearizations of Singular Matrix Polynomials and the Recovery of Minimal Indices
Parallel Session 2, *Iterative methods for linear systems*, Room Gotha-Magdeburg

16.30 – 16.50  *Ronald B. Morgan*  Solution of Linear Equations for Quantum Chromodynamics

16.50 – 17.10  *Luc Giraud*  Convergence in backward error of relaxed GMRES

17.10 – 17.30  *Chen Greif*  A Conjugate Gradient Method for Skew-Symmetric Matrices

17.30 – 17.50  *Karl Meerbergen*  Recycling Ritz vector for the solution of parameterized linear systems

17.50 – 18.10  *Petr Tichý*  On a New Proof of the Faber-Manteuffel Theorem

18.10 – 18.30  *Gérard Meurant*  New results on the Lanczos and Conjugate Gradient algorithms

Parallel Session 3, *Model reduction, DAEs*, Room Meißen

16.30 – 16.50  *Thanos Antoulas*  Model reduction by means of fast frequency sweep

16.50 – 17.10  *Ulrike Baur*  Control-oriented Model Reduction for Parabolic Systems

17.10 – 17.30  *Andras Varga*  Numerical Methods for Continuous-time Periodic Systems

17.30 – 17.50  *Nancy Nichols*  Model Reduction in Variational Data Assimilation

17.50 – 18.10  *Elena Virnik*  Positive Descriptor Systems

18.10 – 18.30  *Bo Kågström*  Product Eigenvalue Problems in Applications: Computing Periodic Deflating Subspaces Associated with a Specified Set of Eigenvalues

Parallel Session 4, *Direct methods, Eigenvalues*, Room Döllnsee

16.30 – 16.50  *Jennifer A. Scott*  The World of (HSL) Sparse Direct Solvers

16.50 – 17.10  *Sue Dollar*  Sparse direct methods need not suffer under dense rows

17.10 – 17.30  *Ian Duff*  Practical Rank Determination for Square and Rectangular Sparse Matrices

17.30 – 17.50  *Julien Langou*  Reduce factorizations

17.50 – 18.10  *Charles Johnson*  A question about Eigenvalues of Tridiagonal Matrices and Motivation for it

18.10 – 18.30  *Zdeněk Strakoš*  Sensitivity of Gauss-Christoffel quadrature, and sensitivity of the Jacobi matrix to small perturbations of the spectral data
Parallel Session 5, *Eigenvalue problems*, Room Berlin-Zeuthen

21.00 – 21.20 *Achiya Dax*  From Eigenvalues to singular values: The Rectangular Quotients Equality and Related Issues

21.20 – 21.40 *Hongguo Xu*  Perturbation of Purely Imaginary Eigenvalues of Hamiltonian Matrices under Structured Perturbations

21.40 – 22.00 *Robert Granat*  Parallel Eigenvalue Reordering in Real Schur Forms

Parallel Session 6, *Matrix functions*, Room Gotha-Magdeburg

21.00 – 21.20 *James V. Lambers*  Robust Computation of Off-Diagonal Elements of Functions of Matrices

21.20 – 21.40 *Mario Arioli*  Matrix square root and interpolation spaces

21.40 – 22.00 *Nick Higham*  Computing the Fréchet Derivative of the Matrix Exponential, with an application to Condition Number Estimation

Parallel Session 7, *Miscellaneous*, Room Meißen

21.00 – 21.20 *Christos Kravvaritis*  On the Growth Factor for Hadamard Matrices

21.20 – 21.40 *Ioana Dumitriu*  Fast Linear Algebra is Stable

21.40 – 22.00 *Alan Edelman*  Mathematical Software Going Forward

Parallel Session 8, *Miscellaneous*, Room Döllnsee

21.00 – 21.20 *Herman Mena*  Numerical Solution of Large-Scale Differential Riccati Equations

21.20 – 21.40 *Serkan Gugercin*  Structured perturbation theory for inexact Krylov projection methods in model reduction

21.40 – 22.00 *Nicola Mastronardi*  On Things of Little Interest: How to Compute Low Paying Annuities
Tuesday, June 3

8.30 – 9.05  Volker Mehrmann  Numerical computation of Sacker-Sell exponents for differential-algebraic equations
9.05 – 9.40  Danny C. Sorensen  Computation and application of balanced model order reduction
9.40 – 10.15 Peter Benner  Solving algebraic Riccati equations for stabilization of incompressible flows
10.15 – 10.50 Coffee Break
10.50 – 11.25 Jörg Liesen  On nonsymmetric saddle point matrices that allow conjugate gradient iterations
11.25 – 12.00 Howard C. Elman  Preconditioners for eigenvalue problems arising in linear stability analysis
12.00 – 14.00 Lunch Break
14.00 – 14.35 Zhaojun Bai  Robust and efficient methods for multi-length scale matrix computations and applications in quantum mechanical simulations
14.35 – 15.10 Inderjit Dhillon  The log-determinant divergence and its applications
15.10 – 15.45 Andreas Frommer  Algebraic multigrid methods for Laplacians of graphs
15.45 – 16.30 Coffee Break
16.30 – 18.30 Parallel Sessions 9 – 12
19.00 – 21.00 Dinner

Parallel Session 9, Eigenvalue problems, Room Berlin-Zeuthen

16.30 – 16.50 Andreas Stathopoulos  An un restarted, one-pass Lanczos with on-the-fly updating of eigenvectors
16.50 – 17.10 Wolfgang Wülling  On clustered Ritz values in the Lanczos Method
17.10 – 17.30 Karen Braman  Middle Deflations in the QR Algorithm
17.30 – 17.50 Raj Vandebril  A Rational Generalization of the QR-algorithm
17.50 – 18.10 Alastair Spence  Preconditioning the shift-invert transform in large sparse eigenvalue computations
18.10 – 18.30 Melina A. Freitag  Inexact Preconditioned Shift-and-Invert Arnoldi’s Method and Implicit Restarts for Eigencomputations
Parallel Session 10, *Iterative methods for linear systems*, Room Gotha-Magdeburg

16.30 – 16.50 *Kees Vuik*  On complex shifted Laplace preconditioners for the vector Helmholtz equation
16.50 – 17.10 *Reinhard Nabben*  Multilevel Krylov Methods based on Projections derived from Deflation, Domain Decomposition, and Multigrid Iterations
17.10 – 17.30 *Yogi A. Erlangga*  Multilevel Krylov-Multigrid Method for the 2D Indefinite Helmholtz Equation
17.30 – 17.50 *Matthias Bollhöfer*  Algebraic multigrid for Helmholtz equations
17.50 – 18.10 *Owe Axelsson*  An additive subspace correction method combined with an ADI-type splitting
18.10 – 18.30 *Martin Gander*  An Optimal Complexity Algorithm for Non-Matching Grid Projections

Parallel Session 11, *Matrix approximation*, Room Meißen

16.30 – 16.50 *Petros Drineas*  The Column Subset Selection Problem
17.10 – 17.30 *Marc Van Barel*  A Generalization of the QR-algorithm for Semiseparable plus Diagonal Matrices
17.30 – 17.50 *Krystyna Ziętak*  On Some Known and Open Matrix Nearness Problems
17.50 – 18.10 *Charles Van Loan*  Multilinear Algebra Computations in Quantum Chemistry
18.10 – 18.30 *Efstratios Gallopoulos*  Linear Algebra Tools for Link Analysis and Dimensionality Reduction

Parallel Session 12, *Least squares*, Room Döllnsee

16.30 – 16.50 *Xiao-Wen Chang*  Solving Integer Linear Least Squares Problems
16.50 – 17.10 *Esmond G. Ng*  Solving Sparse Least-Squares Problems Using Perturbed QR Factorizations
17.10 – 17.30 *Brian D. Sutton*  Computing the Complete CS Decomposition
17.30 – 17.50 *David Titley-Peloquin*  Stopping Criteria for LSQR
17.50 – 18.10 *Archara Pacheenburawana*  A One-sided Jacobi Method for Computing the Symplectic SVD
18.10 – 18.30 *Åke Björk*  Band Householder/Lanczos Methods for Least Squares with Multiple Right Hand Sides
Wednesday, June 4

8.30 – 9.05  Valeria Simoncini  Approximating functions of large matrices:
              Computational aspects and applications
9.05 – 9.40  Michele Benzi  Localization phenomena in matrix functions:
              Theory, algorithms, applications
9.40 – 10.15 Oliver G. Ernst  A Posteriori error estimators for Krylov subspace
              approximations of matrix functions
10.15 – 10.50 Coffee Break
10.50 – 11.25 Dianne P. O’Leary  Regularization by residual periodograms
11.30 – 13.15 Lunch Break
13.15 – 17.00 Excursion
18.30 – 22.30 Barbeque
Thursday, June 5

8.30 – 9.05  Pierre-Antoine Absil  Differential-geometric foundations of Jacobi-Davidson methods
9.05 – 9.40  Françoise Tisseur  How to detect and solve hyperbolic quadratic eigenvalue problems
9.40 – 10.15 Plamen Koev  (ILAS speaker)  Computing eigenvalues of random matrices
10.15 – 10.50 Coffee Break
10.50 – 11.25 Froilán M. Dopico  An orthogonal and symmetric high relative accuracy algorithm for the symmetric eigenproblem
11.25 – 12.00 G. W. Stewart  Analysis of the residual Arnoldi method
12.00 – 14.00 Lunch Break
14.00 – 14.35 Daniel Kressner  Computation of structured pseudospectra
14.35 – 15.10 Julio Moro  Structured condition numbers for multiple eigenvalues
15.10 – 15.45 Mark Embree  Damped mechanical systems: Spectra, pseudospectra, structured perturbations
15.45 – 16.30 Coffee Break
16.30 – 18.30 Parallel Sessions 13 – 16
19.30 – 23.30 Banquet
   After dinner talk: Jim Varah  A historical look at Householder Meetings

Parallel Session 13, Matrix approximation, Room Berlin-Zeuthen

16.30 – 16.50 Serge Gratton  Quasi-Newton formula, matrix nearness problems and preconditioning
16.50 – 17.10 Carla D. Martin  A Tensor SVD
17.10 – 17.30 Gilbert Strang  Compressed Sensing and Random Matrices
17.30 – 17.50 Eugene Tyrtyshnikov  Tensor rank estimates and tensor-based algorithms
Parallel Session 14, *Eigenvalue problems*, Room Gotha-Magdeburg

16.30 – 16.50 *Ilse Ipsen*  
Perturbation Bounds for Determinants and Characteristic Polynomials

16.50 – 17.10 *Michiel Hostenbach*  
On the computation of real and purely imaginary eigenvalues of large sparse matrices

17.10 – 17.30 *Bor Plestenjak*  
Jacobi-Davidson Method for Two-Parameter Eigenvalue Problems

17.30 – 17.50 *Luka Grubišić*  
Numerical linear algebra for spectral theory of block operator matrices

17.50 – 18.10 *Elias Jarlebring*  
Some perturbation results for nonlinear eigenvalue problems

18.10 – 18.30 *Andrew V. Knyazev*  
Rayleigh-Ritz majorization error bounds with applications to FEM and subspace iterations

Parallel Session 15, *Iterative methods for linear systems*, Room Meißen

16.30 – 16.50 *Martin Van Gijzen*  
IDR(\(s\)): a family of simple and fast algorithms for solving large nonsymmetric systems of linear equations

16.50 – 17.10 *Miroslav Tuma*  
Balancing Incomplete Factorizations for Preconditioning

17.10 – 17.30 *Jurjen Duintjer Tebbens*  
An Updated Preconditioner for Sequences of General Nonsymmetric Linear Systems

17.30 – 17.50 *Maya Neytcheva*  
Exploiting the Finite Element framework to construct two-by-two block preconditioners

17.50 – 18.10 *Miro Rozlozník*  
Numerical behavior of saddle-point solvers

18.10 – 18.30 *Michael Overton*  
Preconditioning for Semidefinite Programming

Parallel Session 16, *Applications*, Room Döllnsee

16.30 – 16.50 *Marco Donatelli*  
The antireflective algebra with applications to image deblurring

16.50 – 17.10 *Mariela Rojas*  
LSTRS: MATLAB Software for Large-Scale Trust-Region Subproblems and Regularization

17.10 – 17.30 *Michael M. Mahoney*  
Statistical Leverage and Improved Matrix Algorithms

17.30 – 17.50 *John M. Conroy*  
The Linear Algebra of a Multi-document Summarization System

17.50 – 18.10 *Stefano Serra-Capizzano*  
Google PageRanking problem: the model and the analysis

18.10 – 18.30 *Eric de Sturler*  
Matrix Analysis Problems arising in Fast Implementations of the Quantum Monte Carlo Method
Friday, June 6

8.30 – 9.05  Yousef Saad  Efficient linear algebra methods in data mining
9.05 – 9.40  Jim Demmel  Communication avoiding algorithms for linear algebra
9.40 – 10.15 Householder Prize Talk
10.15 – 10.50 Coffee Break
10.50 – 11.30 Parallel Sessions 17 – 20
11.30 – 12.00 Future of the field
12.00 – 14.00 Lunch Break

Parallel Session 17, Linear systems, Room Berlin–Zeuthen

10.50 – 11.10 Thomas Huckle  Frobenius Norm Minimization and Probing for Preconditioning
11.10 – 11.30 Anne Greenbaum  Upper and Lower Bounds on Norms of Functions of Matrices

Parallel Session 18, Miscellaneous, Room Gotha-Magdeburg

10.50 – 11.10 Emre Mengi  From Wilkinson distance to nearest non-minimal dynamical systems : Lipschitz-based optimization of singular values
11.10 – 11.30 Paul Van Dooren  A manifold approach for comparing two matrices

Parallel Session 19, Linear systems, Room Meißen

10.50 – 11.10 Chun-Hua Guo  Convergence Rate of the Cyclic Reduction Algorithm for a Nonlinear Matrix Equation
11.10 – 11.30 Justin Wan  Iterative Methods for Solving Partial Integro-Differential Equations Arising from Option Pricing

Parallel Session 20, Linear systems, Room Döllnsee

10.50 – 11.10 Bruno Iannazzo  Rational Matrix Iterations in Numerical Linear Algebra
11.10 – 11.30 Alicja Smoktunowicz  Block Classical Gram–Schmidt Algorithm with Reorthogonalization