

Householder Symposium XIX  
June 8-13, Spa Belgium



Schedule of the technical program

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## Lecture room plan

All plenary talks are in room **Pierre le Grand**

The parallel sessions take place in the following three rooms:

**Pierre le Grand** (room 1) for parallel sessions I-VIa

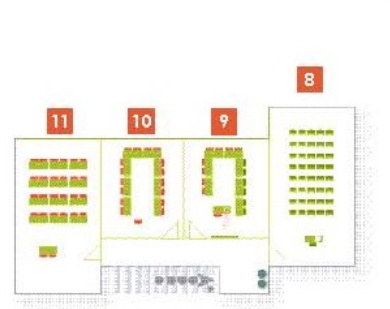
**Source de la Reine + Wellington** (rooms 2+3) for parallel sessions I-VIb

**Groesbeeck** (room 5) for parallel sessions I-VIc

The room **Pouhon Pia** (room 4) can be used for informal discussions or practice

The rooms at the second level are available for committee meetings

The conference site has an open **wireless network** named “solcressguest”.



Level 2

		m <sup>2</sup>	↑	↔	↕	⌂
1	Pierre Le Grand + scène	240 33,6	3,45 2,50-2,65	20	12	300
2	Wellington	60	2,75	8,1	7,4	60
3	Source de la Reine	60	2,75	8,1	7,4	60
2 + 3	Source de la Reine et Wellington	120	2,75	16,2	7,4	140
4	Pouhon Pia	60	2,75	8,1	7,4	60
5	Groesbeeck	60	2,75	8,1	7,4	60
8	Berizenne	32	2,6	8,15	4	30
9	Marie-Henriette	24	2,6	6	4	25
10	Le Tonnelet	24	2,6	6	4	25
11	Warfaaz	34	2,6	8,5	4	30

## Arriving on Sunday June 8:

- 16:00- Check in to your rooms  
If you arrive earlier, you can leave your luggage at the front desk
- 17:00-19:00 Registration desk for the conference material
- 17:30-19:00 Beer-tasting reception at the Bar Spaloumont
- 19:00-21:00 Buffet dinner

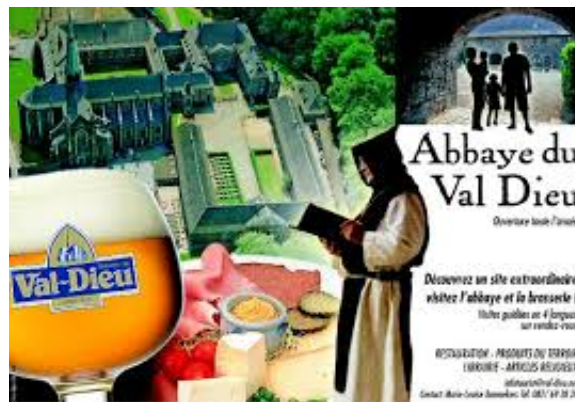
## Excursion on Wednesday June 11 :

On Wednesday afternoon, there will be an excursion to the **Abbey of Val-Dieu** (see [http://www.abbaye-du-val-dieu.be/1\\_EN/](http://www.abbaye-du-val-dieu.be/1_EN/)).

Val-Dieu is a former Cistercian monastery, founded in 1216, in the Land of Herve, located north-east of Liège. The site has been taken over by a small lay community since the last monks left in 2001. Guided tours will be organized in the abbey and its brewery, and we will get to taste some of their beer and cheese.

This excursion is free of charge and all participants are invited to join.

The coaches will be waiting for us in the main parking lot in front of the conference site by 2pm, and they will depart at **2:15pm**. For the return, the coaches are scheduled to depart from Val-Dieu at **5:45pm**. Make sure to reach the coaches well on time.



At Val-Dieu we will be welcomed by four guides. Please take note of your group number according to the alphabetic order of last names:

- Group 1: A–D
- Group 2: E–K
- Group 3: L–R
- Group 4: S–Z

## Schedule of the talks and sessions

### Monday June 9:

- 8:45-9:00 Opening Remarks
- Chair : Paul Van Dooren
- 9:00-9:30 Charles Van Loan, Cornell University, USA  
*Rank-Revealing Decompositions for Matrices with Multiple Symmetries*
- 9:30-10:00 Pierre-Antoine Absil, Université catholique de Louvain, Belgium  
*Algorithms for the Nearest Correlation Matrix Problem with Factor Structure*
- 10:00-10:30 Coffee Break
- 10:30-12:10 Parallel Sessions I  
(3 streams of 5 talks each)
- 12:15-14:15 Lunch
- Chair : Zdeněk Strakoš
- 14:30-15:00 Zlatko Drmač, University of Zagreb, Croatia  
*A new Framework for Polynomial Filtering in Implicitly Restarted Arnoldi type Algorithms*
- 15:00-15:30 Stefan Güttel, University of Manchester, UK  
*Perfectly Matched Layers via the Iterated Rational Krylov Algorithm*
- 15:30-16:00 Gerard Meurant, Commissariat à l'Énergie Atomique, France  
*On the Convergence of QOR and QMR Krylov Methods for Solving Linear Systems*
- 16:00-16:30 Coffee Break
- 16:30-18:50 Parallel Sessions II  
(3 streams of 6 or 7 talks)
- 19:00-21:00 Dinner

**Parallel Session Ia (Room 1, Monday 10:30-12:10)**

- 10:30 : A.C. Antoulas and A.C. Ioniță  
*Model Reduction of Nonlinear Systems in the Loewner Framework*
- 10:50 : N.K. Nichols, A. El-Said, A.S. Lawless and R.J. Stappers  
*Conditioning and Preconditioning of the Weakly-Constrained Optimal State Estimation Problem*
- 11:10 : Eric de Sturler, Serkan Gugercin, Misha Kilmer, Chris Beattie, Saifon Chaturantabut, and Meghan O’Connell  
*Model Reduction Techniques for Fast Nonlinear Inversion*
- 11:30 : Saifon Chaturantabut, Christopher A. Beattie and Serkan Gugercin  
*Structure-Preserving Model Reduction for Nonlinear Port-Hamiltonian Systems*
- 11:50 : Kirsty Brown, Igor Gejadze and Alison Ramage  
*Efficient Computation of the Posterior Covariance Matrix in Large-Scale Variational Data Assimilation Problems*

**Parallel Session Ib (Room 2-3, Monday 10:30-12:10)**

- 10:30 : James Demmel  
*Communication Avoiding Algorithms for Linear Algebra and Beyond*
- 10:50 : Grey Ballard, James Demmel, Laura Grigori, Mathias Jacquelin, Hong Diep Nguyen, and Edgar Solomonik  
*Reconstructing Householder Vectors from Tall-Skinny QR*
- 11:10 : Erin Carson and James Demmel  
*Improving the Maximum Attainable Accuracy of Communication-Avoiding Krylov Subspace Methods*
- 11:30 : Pieter Ghysels, Xiaoye S. Li, Artem Napov, François-Henry Rouet and Jianlin Xia  
*Hierarchically Low-Rank Structured Sparse Factorization with Reduced Communication and Synchronization*
- 11:50 : E. Agullo, L. Giraud, P. Salas Medina and M. Zounon  
*Preliminary Investigations on Recovery-Restart Strategies for Resilient Parallel Numerical Linear Algebra Solvers*

**Parallel Session Ic (Room 5, Monday 10:30-12:10)**

- 10:30 : Marco Donatelli and Martin Hanke  
*Fast Nonstationary Preconditioned Iterative Methods for Image Deblurring*
- 10:50 : Matthias Bolten  
*Block-smoothing in Multigrid Methods for Circulant and Toeplitz Matrices*
- 11:10 : Julianne Chung, Misha Kilmer and Dianne O’Leary  
*A Framework for Regularization via Operator Approximation*
- 11:30 : Iveta Hnětynková, Marie Michenková and Martin Plešinger  
*Noise Approximation in Discrete Ill-posed Problems*
- 11:50 : Jakob Hansen, Michael Horst and Rosemary Renaut  
*Resolution Arguments for the Estimation of Regularization Parameters in the Solution of Ill-Posed Problems*

**Parallel Session IIa (Room 1, Monday 16:30-18:30)**

- 16:30 : Peter Benner, Heike Faßbender, and Chao Yang  
*On complex  $J$ -symmetric eigenproblems*
- 16:50 : Shreemayee Bora and Ravi Srivastava  
*Distance Problems for Hermitian Matrix Pencils*
- 17:10 : Emre Mengi, Emre Alper Yildirim and Mustafa Kilic  
*Numerical Optimization of Eigenvalues of Hermitian Matrix-Valued Functions*
- 17:30 : Daniela Calvetti, Lothar Reichel and Hongguo Xu  
*A CS Decomposition Method for Eigenvalues of Orthogonal Matrices*
- 17:50 : Frederico Poloni and Christian Schröder  
*Computing the Nearest Pencil  $A - \lambda A^T$  without Unimodular Eigenvalues*
- 18:10 : Cleve Moler  
*Resurrecting the Symmetric Generalized Matrix Eigenvalue Problem*

**Parallel Session IIb (Room 2-3, Monday 16:30-18:30)**

- 16:30 : Michael W. Mahoney  
*Recent Results in Randomized Numerical Linear Algebra*
- 16:50 : Petros Drineas and Abhisek Kundu  
*Identifying Influential Entries in a Matrix*
- 17:10 : Ilse Ipsen  
*Randomized Algorithms for Numerical Linear Algebra*
- 17:30 : Haim Avron, Michael Mahoney, Vikas Sindhwani and Jiyan Yang  
*Randomized and Quasi-Randomized Algorithms for Low-Rank Approximation of Gram Matrices*
- 17:50 : Christos Boutsidis and David Woodruff  
*Optimal CUR Matrix Decompositions*
- 18:10 : Josef Sifuentes, Zydrunas Gimbutas and Leslie Greengard  
*Randomized Methods for Computing Null Spaces, with Applications to Rank-deficient Linear Systems*

**Parallel Session IIc (Room 5, Monday 16:30-18:50)**

- 16:30 : Jared Aurentz, Thomas Mach, Raf Vandebril and David S. Watkins  
*Fast, Stable, Computation of the Eigenvalues of Unitary-plus-rank-one Matrices*
- 16:50 : Claude-Pierre Jeannerod and Siegfried M. Rump  
*Wilkinson-Type Error Bounds Revisited*
- 17:10 : Beresford N. Parlett  
*The Fiedler Companion Matrix*
- 17:30 : Chris Paige, Ivo Panayotov, Wolfgang Wüiling and Jens-Peter Zemke  
*Augmented Error Analyses of Vector Orthogonalization and Related Algorithms*
- 17:50 : Jiří Kopal, Jennifer Scott, Miroslav Tůma and Miroslav Rozložník  
*Enhancing Incomplete Cholesky Decompositions*
- 18:10 : Jeff Bezanson, Alan Edelman, Stefan Karpinski, Viral Shah and the greater community  
*Julia: A Fresh Approach to Technical Computing*
- 18:30 : Paolo Bientinesi, Diego Fabregat and Yurii Aulchenko  
*Can Numerical Linear Algebra make it in Nature?*

**Tuesday June 10:**

- Chair : Valeria Simoncini
- 8:30-9:00 Michele Benzi, Emory University, USA  
*Numerical Analysis of Quantum Graphs*
- 9:00-9:30 Daniel Kressner, Ecole Polytech. Fed. Lausanne, Switzerland  
*On the Convergence of the Residual Inverse Iteration for Nonlinear Eigenvalue Problems*
- 9:30-10:00 Inderjit Dhillon, University of Texas Austin, USA  
*Parallel Asynchronous Matrix Factorization for Large-Scale Data Analysis*
- 10:00-10:30 Coffee Break
- 10:30-12:10 Parallel Sessions III  
(3 streams of 5 talks each)
- 12:15-14:15 Lunch
- Chair : Pierre-Antoine Absil
- 14:30-15:00 Melina Freitag, Bath University, UK  
*New Algorithms for Calculating the  $H_\infty$ -norm and the Real Stability Radius*
- 15:00-15:30 Per-Christian Hansen, Technical University Denmark Lingby, Denmark  
*Rotational Image Deblurring with Sparse Matrices*
- 15:30-16:00 Yuji Nakatsukasa, University of Tokyo, Japan  
*Zolotarev's High-Order Rational Approximation*
- 16:00-16:30 Coffee Break
- 16:30-18:30 Parallel Sessions IV  
(3 streams of 6 talks each)
- 19:00-21:00 Dinner
- 21:00-22:30 Poster session 1 (16 posters)



**Parallel Session IIIa (Room 1, Tuesday 10:30-12:10)**

- 10:30 : Nicola Mastronardi and Paul Van Dooren  
*The Anti-Triangular Factorization of Symmetric Matrices*
- 10:50 : Nicola Mastronardi, Paul Van Dooren and Raf Vandebril  
*On Solving KKT Linear Systems arising in Model Predictive Control via Recursive Anti-Triangular Factorization*
- 11:10 : Jen Pestana and Andy Wathen  
*Antitriangular Factorization for Saddle Point Matrices and the Null Space Method*
- 11:30 : Daniel Ruiz, Annick Sartenaer and Charlotte Tannier  
*Using Partial Spectral Information for Block Diagonal Preconditioning of Saddle-Point Systems*
- 11:50 : Miro Rozložník, Felicja Okulicka-Dłużewska and Alicja Smoktunowicz  
*Numerical Behavior of Indefinite Orthogonalization*

**Parallel Session IIIb (Room 2-3, Tuesday 10:30-12:10)**

- 10:30 : B. Kågström  
*Stratification of some Structured Matrix Pencil Problems: how Canonical Forms Change under Perturbations*
- 10:50 : Andrii Dmytryshyn, Stefan Johansson and Bo Kågström  
*Changes of Canonical Structure Information of Matrix Pencils associated with Generalized State-space Systems*
- 11:10 : Fernando De Terán and Françoise Tisseur  
*Backward Error and Conditioning of Fiedler Companion Linearizations*
- 11:30 : Froilán M. Dopico, Yuji Nakatsukasa and Vanni Noferini  
*New Properties of Vector Spaces of (Quasi) Linearizations*
- 11:50 : D. Steven Mackey, F. De Terán, F. Dopico, Vasilije Perović and Françoise Tisseur  
*Quasi-Canonical Forms for Quadratic Matrix Polynomials*

**Parallel Session IIIc (Room 5, Tuesday 10:30-12:10)**

- 10:30 : Peter Benner and Ludwig Kohaupt  
*The Riccati Eigenproblem*
- 10:50 : Chun-Hua Guo, Changli Liu and Jungong Xue  
*Performance Enhancement of Doubling Algorithms for a Class of Complex Nonsymmetric Algebraic Riccati Equations*
- 11:10 : Luka Grubišić and Daniel Kressner  
*Rapid Convergence for Finite Rank Approximations of Infinite-dimensional Lyapunov Equations*
- 11:30 : Nguyen Thanh Son and Tatjana Stykel  
*Reduced Basis Method for Parameterized Lyapunov Equations*
- 11:50 : Meiyue Shao  
*The Finite Section Method for Computing Exponentials of Doubly-Infinite Skew-Hermitian Matrices*

**Parallel Session IVa (Room 1, Tuesday 16:30-18:30)**

16:30 : Laurent Sorber, Mikael Sorensen, Marc Van Barel and Lieven De Lathauwer  
*Coupled Matrix/Tensor Decompositions: an Introduction*

16:50 : Karl Meerbergen  
*Tensor Padé Krylov Methods for Parametric Model Order Reduction*

17:10 : Edgar Solomonik, Devin Matthews and James Demmel  
*Fast Algorithms for Symmetric Tensor Contractions*

17:30 : André Uschmajew  
*Convergence of Optimization Schemes on Sets of Low-rank Matrices and Tensors*

17:50 : Laurent Sorber, Marc Van Barel and Lieven De Lathauwer  
*Structured Data Fusion with Tensorlab*

18:10 : Weiyang Ding, Yimin Wei and Liqun Qi  
*Fast Hankel Tensor-Vector Products and Application to Exponential Data Fitting*

**Parallel Session IVb (Room 2-3, Tuesday 16:30-18:30)**

16:30 : Iain Duff and Mario Arioli  
*The Solution of Least-Squares Problems using Preconditioned LSQR*

16:50 : Edmond Chow and Yousef Saad  
*Preconditioned Methods for Sampling Multivariate Gaussian Distributions*

17:10 : Melina Freitag and Patrick Kürschner  
*Preconditioning for Inexact Inner-Outer Methods for the Two-sided, Non-Hermitian Eigenvalue Problem*

17:30 : Kirk M. Soodhalter  
*Minimum Residual Methods for Shifted Linear Systems with General Preconditioning*

17:50 : Pieter Ghysels, Wim Vanroose and Karl Meerbergen  
*High Performance Implementation of Deflated Preconditioned Conjugate Gradients with Approximate Eigenvectors*

18:10 : Laura Grigori, Remi Lacroix, Frederic Nataf, and Long Qu  
*Direction Preserving Algebraic Preconditioners*

**Parallel Session IVc (Room 5, Tuesday 16:30-18:30)**

16:30 : Mario Arioli and Daniel Loghin  
*A Spectral Analysis of a Discrete two-domain Steklov-Poincaré Operator*

16:50 : Stefano Giani, Luka Grubisić, Agnieszka Miedlar and Jeffrey S. Owall  
*A Posteriori Error Estimates for hp-Adaptive Approximations of Non-selfadjoint PDE Eigenvalue Problems*

17:10 : John W. Pearson, Martin Stoll and Andrew J. Wathen  
*The Development of Preconditioned Iterative Solvers for PDE-Constrained Optimization Problems*

17:30 : Martin J. Gander  
*50 Years of Time Parallel Time Integration*

17:50 : Krystyna Ziętak  
*The Dual Padé Family of Iterations for the Matrix  $p$ -Sector Function and one topic more on a Specific Procrustes Problem*

18:10 : Panayot S. Vassilevski  
*Assigning Weights to Graph Edges for Community Detection*

**Poster Session 1 (Tuesday 21:00-22:30)**

*GMRES Convergence Bounds that Depend on the Right-Hand Side Vector*

David Titley-Peloquin, Jennifer Pestana and Andrew Wathen

*Fast Generation of Random Orthogonal Matrices*

Nicholas J. Higham, Amal Khabou and Françoise Tisseur

*Triplet Representations for Solving Matrix Equations in Queuing Theory*

Giang T. Nguyen and Federico Poloni

*Arnoldi-Tikhonov Methods for Sparse Reconstruction*

Silvia Gazzola, James Nagy and Paolo Novati

*Global Convergence of the Restarted Lanczos Method and Jacobi-Davidson Method for Symmetric Eigenvalue Problems*

Kensuke Aishima

*An Efficient Estimator of the Condition Number of the Matrix Exponential*

Awad H. Al-Mohy

*Numerical Methods for Computing the  $H_\infty$ -Norm of Large-Scale Descriptor Systems*

Peter Benner, Ryan Lowe and Matthias Voigt

*Error Bounds and Aggressive Early Deflation for Extended QR Algorithms*

Thomas Mach, Raf Vandebril and David Watkins

*Convergence of Restarted Krylov Subspace Methods for Matrix Functions*

Andreas Frommer, Stefan Güttel and Marcel Schweitzer

*Stable Discrete Empirical Interpolation Method based Quadrature Schemes for Nonlinear Model Reduction*

Russell L. Carden and Danny C. Sorensen

*The Two Sided Arnoldi Algorithm*

Axel Ruhe

*A Schur Logarithmic Algorithm for Fractional Powers of Matrices*

Bruno Iannazzo and Carlo Manasse

*Preconditioning Linear Systems arising in Constrained Optimization Problems*

Tyrone Rees

*The Geometric Matrix Mean: an Adaptation for Structured Matrices* Dario A. Bini, Bruno Iannazzo,

Ben Jeuris and Raf Vandebril

*Two Methods for Computing the Matrix Sign Function*

Jie Chen and Edmond Chow

*The Quest for a General Functional Tensor Framework for Blind Source Separation in Biomedical Data Processing*

Sabine Van Huffel

**Wednesday June 11:**

- Chair : Heike Faßbender
- 8:30-9:00 Françoise Tisseur, University of Manchester, UK  
*Exploiting Tropical Algebra in Numerical Linear Algebra*
- 9:00-9:30 Howard Elman, University of Maryland College Park, USA  
*Efficient Solution of Stochastic Partial Differential Equations*
- 9:30-10:00 Chen Greif, University of British Columbia, Canada  
*Numerical Solution of Indefinite Linear Systems Arising from Interior-Point Methods*
- 10:00-10:30 Coffee Break
- Chair : Jim Nagy
- 10:30-11:00 Misha Kilmer, Tufts University, USA  
*Model Correction using a Nuclear Norm Constraint*
- 11:00-11:30 Jörg Liesen, Technische Universität Berlin, Germany  
*Matrix Iterations and Ptaks Method of Nondiscrete Induction*
- 11:30-12:00 Stephen Vavasis, University of Waterloo, Canada  
*On the Relationship Between Nesterov's Optimal Convex Optimization Algorithm and Conjugate Gradient*
- 12:15-14:15 Lunch
- 14:15-18:30 Excursion
- 18:45-19:00 Conference picture
- 19:00-22:00 Banquet (banquet speech by Nick Higham)

**Thursday June 12:**

- Chair : Jim Demmel
- 8:30-9:00 Bart Vandereycken, Princeton University, USA  
*Robust Integrators for the Dynamical Low-Rank Approximation using Rank-Structured Tensors*
- 9:00-9:30 David Bindel, Cornell University, USA  
*Music of the Microspheres: from Eigenvalues Perturbations to Gyroscopes*
- 9:30-10:00 Martin Stoll, Max Planck Institute Magdeburg, Germany  
*Fast Iterative Solvers for Fractional Differential Equations*
- 10:00-10:30 Coffee Break
- Chair : Volker Mehrmann
- 10:30-11:00 Householder Prize Talk
- 11:10-12:10 Parallel session V (3 streams of 3 talks each)
- 12:15-14:15 Lunch
- 14:30-16:10 Parallel session VI (3 streams of 5 talks each)
- 16:10-16:40 Coffee Break
- 16:40-18:10 Poster session 2 (16 posters)
- 19:00-21:00 Dinner
- 22:00-24:00 Dance

**Parallel Session Va (Room 1, Thursday 11:10-12:10)**

11:10 : Martin H. Gutknecht

*Is There a Market for Modified Moments?*

11:30 : Gérard Meurant and Petr Tichý

*A new Algorithm for Computing Quadrature-based Bounds in CG*

11:50 : Carl Jagels, Miroslav Pranić and Lothar Reichel

*Rational Orthogonal Functions and Rational Gauss Quadrature with Applications in Linear Algebra*

**Parallel Session Vb (Room 2-3, Thursday 11:10-12:10)**

11:10 : Andrew Knyazev

*Numerical Linear Algebra and Matrix Theory in Action*

11:30 : Lijing Lin, Nicholas J. Higham and Jianxin Pan

*Covariance Structure Regularization via Entropy Loss Function*

11:50 : Nicolas Boumal and P.-A. Absil

*Preconditioning for Low-Rank Matrix Completion via Trust-Regions over one Grassmannian*

**Parallel Session Vc (Room 5, Thursday 11:10-12:10)**

11:10 : D.C. Sorensen and M. Embree

*A DEIM Induced CUR factorization*

11:30 : Michiel Hochstenbach and Ian N. Zwaan

*Field of Values type Eigenvalue Inclusion Regions for Large Matrices*

11:50 : Volker Mehrmann, Sarosh Quraishi and Christian Schröder

*Numerical Solution of Large Scale Parametric Eigenvalue Problems arising in the Analysis of Brake Squeal*

**Parallel Session VIa (Room 1, Thursday 14:30-16:10)**

- 14:30 : Esmond G. Ng and Barry W. Peyton  
*Revisiting Greedy Ordering Heuristics for Sparse Matrix Factorizations*
- 14:50 : Jennifer Scott and Miroslav Tůma  
*Memory-Efficient Incomplete Factorizations for Sparse Symmetric Systems*
- 15:10 : Iveta Hnětynková, Martin Plešinger and Diana M. Sima  
*The Core Problem within a Linear Approximation Problem with Multiple Right-Hand Sides*
- 15:30 : Andrej Muhič and Bor Plestenjak  
*Computing all Values  $\lambda$  such that  $A + \lambda B$  has a Multiple Eigenvalue*
- 15:50 : Nicolas Gillis and Stephen A. Vavasis  
*Semidefinite Programming Based Preconditioning for More Robust Near-Separable Nonnegative Matrix Factorization*

**Parallel Session VIb (Room 2-3, Thursday 14:30-16:10)**

- 14:30 : Nicola Guglielmi, Michael L. Overton and G. W. Stewart  
*An Efficient Algorithm for Computing the Generalized Null Space Decomposition*
- 14:50 : Jesse L. Barlow  
*Block Gram-Schmidt Downtdating*
- 15:10 : Edvin Deadman and Nicholas J Higham  
*Testing Matrix Functions Using Identities*
- 15:30 : Daniel B. Szyld  
*Classical Iterative Methods for the Solution of Generalized Matrix Equations*
- 15:50 : Roel Van Beeumen, Karl Meerbergen and Wim Michiels  
*Compact Rational Krylov Methods for the Nonlinear Eigenvalue Problem*

**Parallel Session VIc (Room 5, Thursday 14:30-16:10)**

- 14:30 : Yogi A. Erlangga and Reinhard Nabben  
*Multilevel Krylov Methods*
- 14:50 : Ron Morgan  
*A Multigrid Arnoldi Method for Eigenvalues*
- 15:10 : Jurjen Duintjer Tebbens and Gérard Meurant  
*On the Convergence Curves that can be generated by Restarted GMRES*
- 15:30 : Christian Schröder and Leo Taslaman  
*Why does Shift-and-Invert Arnoldi work?*
- 15:50 : Elias Jarlebring and Olof Runborg  
*The Infinite Arnoldi Method for the Waveguide Eigenvalue Problem*

**Poster Session 2 (Thursday 16:40-18:10)**

*Structured Low-Rank Approximation with Missing Data*

Ivan Markovsky and Konstantin Usevich

*Improved Divide-and-Conquer Algorithms for the Eigenvalue and Singular Value Problems*

Shengguo Li, Ming Gu, Lizhi Cheng and Xuebin Chi

*Computing the Rank and Nullspace of Rectangular Sparse Matrices*

Nick Henderson, Ding Ma, Michael Saunders and Yuekai Sun

*Computing Linear Combinations of  $\varphi$  Functions*

Antti Koskela and Alexander Ostermann

*Hierarchical Preconditioners for Higher Order FEM*

Sabine Le Borne

*A Numerical Linear Algebraic Approach to Compact Multi-Frame Blind Deconvolution*

James G. Nagy, Stuart Jefferies and Helen Schomburg

*The Sylvester Equation and Interpolatory Model Reduction of Linear/Bilinear Dynamical Systems*

Serkan Gugercin and Garret Flagg

*Extensions of the Symmetric Tridiagonal Matrix Arising from a Finite Precision Lanczos Computation*

Anne Greenbaum

*On the Sensitivity of Matrix Functions to Random Noise*

Serge Gratton, David Tittley-Peloquin, Philippe Toint and Jean Tshimanga Ilunga

*Computing the Exponential of a Large Block Triangular Block Toeplitz Matrix*

D.A. Bini, S. Dendievel, G. Latouche and B. Meini

*Matrix Functions and Their Krylov Approximations for Large Scale Wave Propagation in Unbounded Domains*

Vladimir Druskin, Alexander Mamonov, Rob Remis and Mikhail Zaslavsky

*Variational Principles and Scalable Solvers for the Linear Response Eigenvalue Problem*

Zhaojun Bai, Ren-Cang Li, Dario Rocca and Giulia Galli

*Computing Fréchet Derivatives in Partial Least Squares Regression*

Lars Eldén

*Hierarchical QR Factorization Algorithms for Multi-Core Cluster Systems*

Julien Langou

*The Hyperbolic Quadratic Eigenvalue Problem*

Ren-Cang Li and Xin Liang

*From PDEs through Functional Analysis to Iterative Methods, or there and back again*

Josef Máleka and Zdeněk Strakoš



**Friday June 13:**

Chair : Andy Wathen

- 8:30-9:00 Froilán Dopico, Universidad Carlos III Madrid, Spain  
*The Inverse Complex Eigenvector Problem for Real Tridiagonal Matrices*
- 9:00-9:30 Christopher Beattie, Virginia Tech, USA  
*Diffusion Models for Covariance Estimation*
- 9:30-10:00 Mark Embree, Rice University Houston, USA  
*The Life Cycle of an Eigenvalue Problem*
- 10:00-10:30 Coffee Break
- Chair : Ilse Ipsen
- 10:30-11:00 Christian Mehl, Technische Universitaet Berlin, Germany  
*Generic Rank-One Perturbations: Structure Defeats Sensitivity*
- 11:00-11:30 Michael Overton, New York University, USA  
*Investigation of Crouzeix's Conjecture via Optimization*
- 11:30-12:00 Nicholas Higham, University of Manchester, UK  
*How and Why to Estimate Condition Numbers for Matrix Functions*
- 12:15-14:15 Lunch