25th Biennial Conference on Numerical Analysis

25 June - 28 June, 2013

Programme

Tuesday 25th June

Chair:	JA325: Davydov			
9:00-9:05	Opening Remarks			
9:05-10:05	**R Beatson** Radial basis functions applications and theory			
10:05-11:05	**A Abdulle** Numerical homogenization methods: beyond a story of sand			
11:05–11:30	COFFEE/TEA			
Chair:	JA325: M1	JA314: M2	JA317: M3	AR201: M4
11:30-11:55	**R Tappenden** M1 Inexact coordinate descent	**A Dedner** M2 Explicit methods and HPC: DG for meteorological applications	**R Kannan** M3 Using eigenvectors to detect and fix ill conditioning in structural finite element matrices	**D Duncan** M4 Convolution-in-time approximations of time dependent boundary integral equations (TDBIEs)
11:55-12:20	**P Richtárik** M1 Randomized lock-free methods for minimizing partially separable convex functions	**D Groen** M2 Multiscale simulation: an emerging approach for solving complex scientific problems	**P Smith** M3 The effects of plasticity on the condition number of the stiffness matrix	**L Banjai** M4 Fast methods for time-domain boundary integral equations
12:20-12:45	**O Fercoq** M1 Doubly Parallelized Coordinate Descent	**J Hogg** M2 Sparse Communication Avoiding Pivoting	**S Hendry** M3 Domain decomposition methods applied to problems in structural analysis	**T Betcke** M4 Solving time-domain wave problems with BEM++
12:45-14:00	LUNCH-Lord Todd			
Chair:	JA325: Mackenzie			
14:00-15:00	**P Monk** The solution of time harmonic wave equations using complete families of elementary solutions			
Chair:	JA325: M1	JA314: M2	JA317: M3	AR201: M4
15:05-15:30	**J Turner** M1 Preconditioned Newton-Krylov methods for Topology Optimization	**M Blatt** M2 Adapting DUNE's Parallel Algebraic Multigrid to Hybrid Architectures	**E Deadman** M3 Implementing Algorithms for the NAG Library	**M Payne** M4 A modified spectral element method for efficient time-stepping for the acoustic wave equation
15:30-15:55	**K Wei** M1 Alternating minimization method for matrix completion	**D Göddeke** M2 Energy efficiency aspects of high performance computing for PDEs	**J Cherrie** M3 Accessible algorithms and usable software	**M Georgoulis** M4 A posteriori error bounds for explicit and implicit methods for the wave equation
15:55-16:20	**M Takáč** M1 Alternating maximization: unifying framework for 8 sparse PCA formulations and efficient parallel codes	**M Giles** M2 Tsunami simulation using the OP2 parallel framework	**J Dobson** M3 Using PLASMA in the NAG library	**H Wang** M4 B-spline FEM approximation of wave equation
16:20-16:45	COFFEE/TEA			
Chair:	JA325: D Higham			
16:45-17:55	**I Sloan (A.R. Mitchell Lecture)** Lifting the Curse of Dimensionality: Numerical Integration in Very High Dimensions			
18:15-19:15	DINNER-Lord Todd			
20:00-21:00	RECEPTION-Glasgow City Chambers			

Tuesday 25th June

11:05–11:30	COFFEE/TEA			
Chair:	JA412 Chernov	JA327 Tisseur	JA505 England	JA507 Duff
11:30-11:55	**Z Dong** A multilevel sparse kernel-based stochastic collocation finite element method for elliptic problems with random coefficients	**L Taslaman** Exploiting low rank of damping matrices using the Ehrlich-Aberth method	**A Hill** Symmetric General Linear Methods	**K Soodhalter** Krylov Subspace Recycling for Families of Shifted Linear Systems
11:55-12:20	**T Zhou** On Dynamically Orthogonal Fields Approach for Time Dependent Stochastic PDEs	**L Lin** Covariance Structure Regularization via Entropy Loss Function	**O Koch** Local Estimates of the Time-Stepping Error for High-Order Splitting Methods	**S Gazzola** Generalized Arnoldi-Tikhonov Methods with Applications to Sparse Reconstruction
12:20-12:45	**S Cook** Multi Level Monte Carlo Methods for Atmospheric Dispersion Modelling	**D Simpson** Determinants, inverses and matrix functions: Modern iterative methods in computational statistics	**J Fatokun** A Class of L-Stable Implicit Trapezoidal-Like Integrators for the Solution of Parabolic Partial Differential Equations on Manifolds	**A Khabou** LU factorization with panel rank revealing pivoting
12:45-14:00	LUNCH-Lord Todd			

Chair:	JA412: Costabel	JA327: Rees	JA505: Hill	JA507 Le Borne
15:05-15:30	**G Vainikko** Product quasi-interpolation method for weakly singular integral equations	**M Aprahamian** The Matrix Unwinding Function	**W Auzinger** Defect-based error estimates for exponential splitting methods	**T-X Gu** Matrix-Free Physics-Based Preconditioned Krylov Subspace Methods for 2D Particle Transport Problem
15:30-15:55	**V Noferini** Computing the common zeros of two bivariate functions via Bézoutians	**M Sharify** Locating the Eigenvalues of Matrix Polynomials	**T Norton** A Fresh Start For Leapfrog	**A Wathen** Preconditioning for PDE-constrained optimization
15:55-16:20	**J Blake** Solving the neutron transport equation within a diffusive regime		**T. Roldán** Construction of robust and efficient Implicit-Explicit Runge-Kutta methods	**O Kardani** Application of Preconditioned Conjugate Gradient Method to Some Challenging Large Scale Problems in Computational Geomechanics
16:20-16:45	COFFEE/TEA			

Wednesday 26th June

Chair:	JA325: Davies			
9:00-10:00	**H Brunner** Numerical analysis and computational solution of integro-differential equations			
10:00-11:00	**M Powell** On the symmetric Broyden formula in optimization calculations			
11:00–11:30	COFFEE/TEA			
Chair:	JA325: M6	JA314: M7	JA317: M2	AR201: M4
11:30-11:55	**M Inglesias** M6 Evaluation of Gaussian approximations to Bayesian inverse problems in subsurface models	**S Loisel** M7 Efficient algorithms for large-scale problems	**W Śmigaj** M2 Boundary-element calculations with BEM++	**E Spence** M4 Is the Helmholtz equation really sign-indefinite?
11:55-12:20	**S Cotter** M6 A Bayesian Approach to Shape Registration	**W Subber** M7 Domain Decomposition Preconditioners for the Spectral Stochastic Finite Element Method	**A Bolis** M2 A hybrid-algorithm parallelisation approach for the solution of 3D problems	**D Shanks** M4 Shifted Laplace DDM preconditioners for the Helmholtz equation
12:20-12:45	**C Farmer** M6 Variational Smoothing Filters for Sequential Inverse Problems	**S Güttel** M7 Rational Krylov methods for transient electromagnetic geophysical forward modeling	**N Dingle** M2 Investigating the convergence of asynchronous iterative methods	**O Laghrouche** M4 Locally enriched finite element method for 3D elastic wave problems
12:45-14:00	LUNCH-Lord Todd			
Chair:	JA325: Ramage			
14:00-15:00	**D O'Leary** Image Restoration and Uncertainty Quantification			
Chair:	JA325: M6	JA314: M7	JA317: M8	AR201: M4 and M5
15:05-15:30	**F Tesei** M6 Multi Level Monte Carlo methods with Control Variate for elliptic SPDEs	**V Dolean** M7 Optimized Schwarz Methods for curl-curl time-harmonic Maxwell's equations	**M Freitag** M8 Data assimilation as an inverse problem: theory and computational challenges	**S Groth** M4 Hybrid numerical-asymptotic approximation for high frequency scattering by penetrable convex polygons
15:30-15:55	**M Park** M6 A new variance reduction technique for multilevel Monte Carlo methods *coarse grid variates*	**F Kwok** M7 Coarse grid correction for the Neumann–Neumann waveform relaxation method	**A Lawless** M8 Instability and regularization in data assimilation	**E O'Riordan** M5 Pointwise accuracy of numerical approximations to the scaled partial derivatives of the solutions to singularly perturbed elliptic problems
15:55-16:20	**R Scheichl** M6 Multilevel Markov Chain Monte Carlo with Applications in Subsurface Flow	**H Nguyen** M7 An Efficient Preconditioner for Parallel Adaptive Finite Element	**P van Leeuwen** M8 Nonlinear data-assimilation in high dimensions: Merging probabilistic and optimisation techniques	**J Quinn** M5 Experiments with a Shishkin Algorithm for a Singularly Perturbed Quasilinear Parabolic Problem with a Moving Interior Layer
16:20-16:45	COFFEE/TEA			
Chair:	JA325: M6	JA314: M7	JA317: M8	AR201: M5
16:45-17:10	**I Graham** M6 Quasi-Monte Carlo finite element methods for elliptic PDEs with log-normal random coefficients	**H Berninger** M7 The 2-Lagrange Multiplier Method Applied to Nonlinear Transmission Problems for the Richards Equation in Heterogeneous Soil with Cross Points	**S Jenkins** M8 The Effects of Numerical Model Error in Data Assimilation	**N Madden** M5 A boundary layer preconditioner for a singularly perturbed problem
17:10-17:35	**A Chernov** M6 Convergence analysis for multilevel variance estimators in Multilevel Monte Carlo Methods and application for random obstacle problems	**A Karangelis** M7 Solving Large systems using the 2-Lagrange multiplier methods	**I Gejadze** M8 On practical observability of nonlinear dynamical systems in the variational data assimilation framework	**M Schopf** M5 Convergence in balanced norms for reaction-diffusion problems
17:35-18:00	**E Ullmann** M6 Multilevel Estimation of Rare Events	**J Michaud** M7 Fuzzy Domain Decomposition: a new perspective on heterogeneous DD methods	**V Shutyaev** M8 Analysis error covariance and posterior covariance in variational data assimilation	**N Kopteva** M5 Linear Finite Elements may be only First-Order Pointwise Accurate on Anisotropic Triangulations

Wednesday 26th June

11:00–11:30	COFFEE/TEA		
Chair:	JA412: Berrut	JA505: Wathen	JA507 Trefethen
11:30-11:55	**J Van lent** Numerical Integration on the Sphere using an Equal Area Mapping from the Regular Octahedron	**P Farrell** RBF Multiscale Collocation for Second Order Elliptic Boundary Value Problems	**E Sousa** Implicit methods for fractional diffusion problems
11:55-12:20	**N Chaulet** Asymptotic analysis of interior transmission eigenvalues for a perfect conducting body coated by a thin dielectric layer	**O Dang** Optimal Scaling Parameters for RBF-FD Aproximation of Poisson Equation	**A Khan** Numerical solution of fourth order parabolic partial differential equation using exponential sextic splines
12:20-12:45	**M Costabel** On the volume integral equation in electromagnetic scattering	**M Rebelo** A meshfree method for elasticity problems with interfaces	**T Ratnanather** IIPBF - a Matlab toolbox for computing infinite integrals of products of Bessel functions of the 1st and 2nd kind
12:45-14:00	LUNCH-Lord Todd		

Chair:	JA412: Diogo	JA505: Chen	JA507 Vainikko
15:05-15:30	**S Laurens** How to compute the reflection and transmission coefficients of a plane acoustic wave by a low-porosity perforated plate?	**M Ibrahim** Fourth Order Variational Formulation for Image Registration	**D Occorsio** Approximation of Hadamard finite-part integrals on the semiaxis
15:30-15:55	**W Yeo** Refinable C^2 Piecewise Quintic Polynomials on Powell-Sabin-12 Triangulations	**A Thompson** A tree projection algorithm for wavelet-based sparse approximation	**A Pedas** Regularity of the solution to a class of nonlinear weakly singular integral equations
15:55-16:20	**V Gopal** An Off-step Discretization for the Solution of Two-space Dimensional Second Order Quasi-linear Hyperbolic Equations	**B Williams** Mathematical Deblurring of Images for Non-Blind and Blind Restoration	**M Russo** Numerical methods for Fredholm integral equations defined on the square
16:20-16:45	COFFEE/TEA		
Chair:	JA412: E Spence	JA505: Gould	JA507 Duncan
16:45-17:10	**M Kumar** A New Fifth-Order Derivative Free Newton-type Method for Solving Nonlinear Equations	**B Bah** Model-based Sketching and Recovery with Expanders	**S Seyedallaei** On the Jacobi-collocation method for some nonlinear singular Volterra integral equations
17:10-17:35	**A Srivastava** Positive solutions of semi-linear elliptic equation using finite element approximation	**N Yadav** Artificial Neural Network Technique for solving Troesch's problem	**M-C De Bonis** Remarks on two integral operators and numerical methods for Cauchy Singular Integral Equations
17:35-18:00		**A Yadav** Convergence of Gravitational Search Algorithm	**C Laurita** On the evaluation of some integral operators with Mellin type kernel

Thursday 27th June

Chair:	JA325: Barrenechea			
9:00-10:00	**T Tang** High-Order and Adaptive Time Stepping Methods for Energy Gradient Flows			
10:00-11:00	**P Bochev** Optimization-based modeling - a new strategy for predictive simulations of multiscale, multiphysics problems			
11:00–11:30	COFFEE/TEA			
Chair:	JA325: M6	JA314: M9	JA317: M10	AR201: M8
11:30-11:55	**A Onwunta** M6 Low Rank Solution of Unsteady Diffusion Equation with Stochastic Coefficients	**N Trefethen** M9 What would "Diskfun" look like?	**E de Sturler** M10 Recycling Preconditioners for Sequences of Systems	**K Brown** M8 Efficient Computation of the Posterior Covariance Matrix in Large-Scale Variational Data Assimilation Problems
11:55-12:20	**E Tzitzili** M6 Approximation of Stratonovich SDEs and Travelling Waves	**A Townsend** M9 Chebfun2: An extension of Chebfun to two dimensions	**S Le Borne** M10 Hierarchical preconditioners for higher-order FEM	**F Le Dimet** M8 Sensitivity Analysis in Variational Data Assimilation
12:20-12:45	**S Adhikari** M6 Fast and accurate uncertainty quantification (UQ)	**N Hale** M9 Fast Chebyshev to Jacobi transforms using asymptotic expansions	**S Hajian** M10 How DG Discretizations Influence the Convergence of Block Jacobi Preconditioning	**P Browne** M8 A simple method for using a complex model within a particle filter
12:45-14:00	LUNCH - Java Cafe			
Chair:	JA325: Dolean			
14:00-15:00	**J Meza** Mathematical Challenges and Opportunities in Energy and the Environment			
Chair:	JA325: M6	JA314: M9	JA317: M10	AR201: M11
15:05-15:30	**A Kundu** M6 Stochastic Finite Element Method for dynamical systems with random boundary topology	**A Birkisson** M9 Computing multiple solutions of nonlinear ODEs with Chebfun	**T Rees** M10 Block Diagonal Preconditioners for Optimization Problems	**A Larcher** M11 Residual-based adaptive turbulence modelling with quantitative *a posteriori* error control
15:30-15:55	**D Silvester** M6 A posteriori error estimation for stochastic Galerkin approximation	**M Webb** M9 Computing Complex Singularities of Differential Equations with Chebfun	**J Pearson** M10 Fast Iterative Solution of PDE-Constrained Optimization Problems	**J Lang** M11 Adaptive Moving Meshes in Large Eddy Simulation for Turbulent Flows
15:55-16:20	**C Powell** M6 Efficient Solvers for Steady-State Navier–Stokes Equations with Random Data	**K Xu** M9 Computing Inverse Functions	**X He** M10 On some preconditioning techniques for incompressible Navier-Stokes equations	**M Picasso** M11 Anisotropic error estimates and space adaptivity for a semi-discrete finite element approximation of the transient transport equation
16:20-16:45	COFFEE/TEA			
Chair:	JA325: M12	JA314: M9	JA317: M10	AR201: M11 and M5
16:45-17:10	**A Spence** M12 Perturbation Theory for Eigenvalues of Symmetric Matrices arising in Network Analysis	**J-P Berrut** M9 The linear barycentric rational quadrature method for Volterra integral equations	**J Pestana** M10 GMRES convergence bounds that depend on the right-hand side vector	**M Braack** M11 Model and mesh adaptivity for transient problems
17:10-17:35	**A Mantzaris** M12 Bridges in Twitter Networks	**G Klein** M9 Rational integration of analytic functions from equispaced data	**J Duintjer Tebbens** M10 Do Ritz values influence the convergence behavior of restarted GMRES ?	**T Linß** M5 Maximum-norm a posteriori error estimates for parabolic equations
17:35-18:00	**A Alsayed** M12 Betweenness Centrality Measures for Dynamic Networks	**F di Tommaso** M9 An extension of Shepard interpolation with quadratic approximation order	**V Simoncini** M10 Solving Ill-posed Linear Systems with GMRES	**M Stynes** M5 A priori bounds for a variable-coefficient elliptic convection-diffusion problem
19:00 for 19:30	DRINKS RECEPTION and CONFERENCE DINNER-Lord Todd			

Thursday 27th June

11:00–11:30	COFFEE/TEA		
Chair:	JA412: Georgoulis	JA505: N Higham	JA507: Graham
11:30-11:55	**G Barrenechea** Stabilised finite element methods for a bending moment formulation of the Reissner-Mindlin plate model	**J Hook** Tropical Eigenvalues	**F Yang** Towards the development and application of optimal solvers for continuum models of tumour growth
11:55-12:20	**Z Guo** Energy Law and Its Numerical Preservation for Quasi-Incompressible Navier-Stokes Cahn-Hilliard (NSCH) System with Variable Density	**C Schröeder** A priori convergence bounds for Hermitian inexact Krylov methods for eigenspaces	**Y Chen** The Closest Point Method and Multigrid solvers for elliptic equations on surfaces
12:20-12:45	**O Davydov** Numerical Solution of Monge-Ampère Equation on Domains Bounded by Piecewise Conics	**A Struthers** Evaluation and Design of Quadrature for Contour Integral Based Eigenvalue Algorithms	**S Takacs** An abstract multigrid framework applied to a Stokes control problem
12:45-14:00	LUNCH - Java Cafe		

Chair:	JA412: Stynes	JA505: Fletcher	JA507: O'Riordan
15:05-15:30	**B Garcia-Archilla** Stabilization of convection-diffusion problems by Shishkin mesh simulation. Recent developments	**C Cartis** On the evaluation complexity of constrained smooth optimization	**K Brabazon** Comparison of Multigrid Methods for the Solution of Nonlinear Diffusion Equations: Nonlinear vs. Newton
15:30-15:55	**R Andreev** Stability of space-time Petrov-Galerkin discretizations for parabolic evolution equations	**A El-Said** Optimisation and conditioning in variational data assimilation	**N Bird** High Order Nonlinear Diffusion: A Moving Mesh Finite Difference Method
15:55-16:20	**G Andriamaro** Bernstein-Bézier Vector Finite Elements	**J Fowkes** Branching and Bounding Improvements for Lipschitz Global Optimization	**M Hubbard** Space-Time Residual Distribution Schemes on Moving Meshes
16:20-16:45	COFFEE/TEA		
Chair:	JA412: Kumar	JA505: Cartis	JA507: Hubbard
16:45-17:10	**F Nouri** A Discontinuous Galerkin Approach for Flows in Porous Media	**N Gould** A practical dual gradient-projection method for large-scale, strictly-convex quadratic programming	**S Zhu** Convexity and solvability of radial basis functions with different shapes
17:10-17:35	**M Uzunca** Adaptive Discontinuous Galerkin Methods for Nonlinear Diffusion-Convection-Reaction Models	**R Fletcher** On the matrix algebra of Lorentz transformations	**S Korkut** A New Splitting Method and its Analysis for Non-autonomous Systems
17:35-18:00	**F Karakatsani** A posteriori error analysis for fully discrete Crank – Nicolson schemes	**Y Yan** Optimal active-set prediction for interior point methods	**S Metcalfe** Adaptive discontinuous Galerkin methods for non-stationary convection-diffusion problems

Friday 28th June

Chair:	JA325: Kopteva		
9:00-10:00	**J Tanner** Sparse compressed sensing and matrix completion		
10:00-11:00	**M Dauge** Old and New on eigenvalues of the Schur complement of the Stokes operator		
11:00–11:30	COFFEE/TEA		
Chair:	JA325: M12	JA314: M13	JA317: Hogg
11:30-11:55	**E Dombi** M12 Developing an evolving network model based on an extension of the triadic closure concept	**C MacDonald** M13 An adaptive moving mesh method for a Q-tensor liquid crystal model	**S Fang** Loosely Coupled Parallel Computation of Leading Part Singular Value Decomposition
11:55-12:20	**P Knight** M12 The How and Why of Balancing	**E Gartland** M13 Some numerical aspects of liquid-crystal director modeling: motivation and Newton-like methods	**M Jehl** A Parallel Solver for the Forward Problem in Electrical Impedance Tomography using DUNE FEM
12:20-12:45	**D Higham** M12 Gone in 20 Minutes	**A Ramage** M13 Some numerical aspects of liquid-crystal director modeling: stability and preconditioning	**E Mueller** Algorithmic and Parallel Scalability of Elliptic Solvers in Atmospheric Modelling
12:45-14:00	LUNCH - Foyer outside JA325		
	END OF CONFERENCE		

Friday 28th June

11:05–11:30	COFFEE	
Chair:	JA327: Simoncini	JA412: García-Archilla
11:30-11:55	**F Fairag** Preconditioning Technique of Darcy's Law in Porous Media	**A Wachtel** A C^0 interior penalty method for a singularly-perturbed fourth-order elliptic problem on layer adapted meshes
11:55-12:20	**M Betcke** A method for solution of linear inverse problem with nonlinear regularization term	**J Mackenzie** On the computational modelling of cell migration and chemotaxis
12:20-12:45	**A Austin** Projection-Based Methods for Eigenvalue Problems	**A Husain** Least squares $h-p$ spectral element method for boundary layer problems on non-smooth domains
12:45-14:00	LUNCH - Foyer outside JA325	
	END OF CONFERENCE	

Number	Title	Organiser(s)
M1	Recent Advances in Big Data Problems	Martin Takac and Rachael Tappenden
M2	Scientific Software and HPC	Timo Betcke and Andreas Dedner
M3	Numerical Analysis Software in Industry	Stephen Hendry and Ramaseshan Kannan
M4	Numerical Approximation of Wave Propagation Problems	Lehel Banjai and Penny Davies
M5	Numerical Methods for Layer Phenomena	Torsten Linß
M6	Fast and Accurate Uncertainty Quantification	Catherine Powell and Rob Scheichl
M7	Scalable Solvers for Large-Scale Partial Differential Equations	Sebastien Loisel, Waad Subber and Hieu Nguyen
M8	Mathematics for Data Assimilation	Igor Gejadze and Melina Freitag
M9	Mathematics and Algorithms Related to Chebfun	Nick Hale
M10	Developments in Preconditioners and Iterative Methods for Linear Systems	Jennifer Pestana and Eric de Sturler
M11	Adaptive Methods in Fluid Mechanics	Malte Braack
M12	Algorithms for Networks and Collective Behaviour	Alastair Spence and Des Higham
M13	Some Numerical Methods in Liquid Crystals	Chuck Gartland