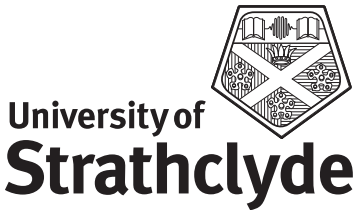

27th Biennial Conference on Numerical Analysis

27 June - 30 June, 2017

Programme

Tuesday 27th June

Chair:	JA325 Ramage			
9:00-9:05	Opening Remarks			
9:05-10:05	**C Lubich**	Dynamical low-rank approximation		
10:05-11:05	**V Simoncini**	Computational methods for large-scale matrix equations: recent advances and applications		
11:05–11:30	COFFEE/TEA			
	JA325 M1	JA314 M2	JA317 M3	JA412 M4
11:30-11:55	**M Stynes** M1 A graded-mesh finite difference scheme for a time-fractional diffusion equation	**A Lawless** M2 The conditioning of variational data assimilation with correlated observation errors	**B Stinner** M3 A diffuse interface approach to PDEs on networks and bubble clusters	**A Townsend** M4 Spectral methods for active biological fluid simulations
11:55-12:20	**E Jakobsen** M1 Numerical methods for nonlinear nonlocal PDEs and their convergence analysis	**M Roberts** M2 A robust convergent multigrid solver for PDEs with nonsmooth coefficients applied to selective segmentation models in 2D and 3D	**F Yang** M3 Experimentally-Driven Mathematics for Particle and Whole Cell Migration	**M Webb** M4 The plunge region in frame-based approximation
12:20-12:45	**F del Teso** M1 Discretisations of fractional powers of the Laplacian in bounded domains	**M Betcke** M2 Variational methods for dynamical photoacoustic imaging	**C Venkataraman** M3 Asymptotic limits of models for receptor-ligand dynamics	**L Tuckerman** M4 Bifurcation analysis for timesteppers
12:45-14:00	LUNCH-Urban Bean Jave Cafe			
Chair:	JA325 Pestana			
14:00-15:00	**D Keyes**	Algorithmic Adaptations to Extreme Scale Computing		
	JA325 M1	JA314 M2	JA317 M3	JA412 M4
15:05-15:30	**E Sousa** M1 Numerical method for a time-space fractional Fokker Planck equation	**M Ehrhardt** M2 Accelerated Stochastic PDHG by Non-Uniform Sampling	**J Mackenzie** M3 An Adaptive Moving Mesh Method for Geometric Evolutions Laws and Bulk-Surface PDEs	**J Chan** M4 Time-domain Bernstein-Bezier DG methods on simplices
15:30-15:55	**M López-Fernández** M1 Fast and oblivious convolution quadrature for wave problems	**D Green** M2 A low-rank approach to the solution of weak constraint variational data assimilation problems	**T Ranner** M3 Numerical methods for understanding nematode locomotion	**B Bonev** M4 Large-scale tsunami simulations using the discontinuous Galerkin method
15:55-16:20	**B Jin** M1 Time stepping schemes for fractional diffusion	**S Gazzola** M2 Transpose-free methods for linear inverse problems	**M Frittelli** M3 Numerical preservation of invariant regions for reaction-cross-diffusion systems on evolving surfaces	**G Wright** M4 A high-order meshfree method for advection dominated PDEs on surfaces
16:20-16:45	COFFEE/TEA			
Chair:	JA325 Higham			
16:45-17:55	**P Gill (Fletcher-Powell Lecture)** On the contributions of Roger Fletcher and Michael Powell to numerical optimization			
18:15-19:15	DINNER-Aroma Dinning Room-Lord Todd			
20:00-21:00	RECEPTION-Glasgow City Chambers			

Tuesday 27th June

11:05–11:30	COFFEE/TEA	
Chair:	JA505 Spence	JA507 Duncan
11:30-11:55	**H Chen** Backward error of the nonlinear eigenvalue problem expressed in non monomial basis	**A Hadji** Mathematical modelling and numerical results for bioglasses
11:55-12:20	**M Zemaityte** A Shift-and-Invert Lanczos Algorithm for the Dynamic Analysis of Structures	**B Lamichhane** A New MITC Finite Element Method for Reissner-Mindlin Plate Equations Using a Biorthogonal System
12:20-12:45	**N Jakovčević Stor** Accurate eigenvalue decomposition of rank-one modifications of diagonal matrices	**F Nouri** Dynamical behaviour of miscibles fluids in Porous Media
12:45-14:00	LUNCH-Urban Bean Java Cafe	

Chair:	JA505 García-Archilla	JA507 Pearson
15:05-15:30	**I Muga** About the extension of the DPG method to Banach spaces	**D Hernández-Abreu** On the order of convergence of AMF-W-methods for the time integration of parabolic PDEs
15:30-15:55	**M Maischak** High order DGFEM in time for linear wave equations	**N Bosner** Parallel solver for shifted linear systems with application to model order reduction
15:55-16:20	**D Duncan** Efficient approximation of the 2nd order acoustic wave equation	
16:20-16:45	COFFEE/TEA	

Wednesday 28th June

Chair:	JA325 Barrenechea			
9:00-10:00	**D Estep**	A new approach to stochastic inverse problems for scientific inference		
10:00-11:00	**I Perugia**	Trefftz finite element methods		
11:00–11:30	COFFEE/TEA			
	JA325 M1	JA314 M5	JA317 M6	JA412 M7
11:30-11:55	**B Li** M1 Convergence of finite element solutions of stochastic time-fractional PDEs driven by a space-time white noise	**G Matthies** M5 Discontinuous Galerkin time stepping schemes applied to inf-sup stable spatial discretisations of evolutionary Navier–Stokes problems	**M Wathen** M6 Block Preconditioners for an Incompressible Magnetohydrodynamics Problem	**B Düring** M7 Inhomogeneous Boltzmann-Type Equations Modelling Opinion Leadership and Political Segregation
11:55-12:20	**B Baeumer** M1 Space Fractional PDEs on bounded domains	**G Lube** M5 Pressure-robust H(div)-conforming FEM for transient incompressible flow problems	**A Kleanthous** M6 Calderón preconditioning for electromagnetic scattering of dielectric objects	**H Ranetbauer** M7 On numerical simulations of nonlinear continuity equations for interacting particle systems
12:20-12:45	**M Kovács** M1 Numerical solution of fractional order elliptic equations with spatial white noise	**J Novo** M5 Error bounds for non inf-sup stable mixed finite elements for the Navier-Stokes equations with local projection stabilization	**A Ramage** M6 Iterative solvers for **Q**-tensor models of nematic liquid crystals	**M Zanella** M7 Opinion dynamics over kinetic networks
12:45-14:00	LUNCH-Urban Bean Java Cafe			
Chair:	JA325 Knight			
14:00-15:00	**G Plonka-Hoch**	Deterministic Sparse FFT Algorithms		
	JA325 M1	JA314 M5	JA317 M6	JA412 M7
15:05-15:30	**J Levesley** M8 The blessing of dimensionality and the curse of being a mathematician	**D Paredes** M5 Multiscale Hybrid Mixed Method for elliptic Problems	**S Ladenheim** M6 Multipreconditioned GMRES for Shifted Systems	**E Carlini** M7 A Semi-Lagrangian scheme for non linear Fokker-Planck equations and applications
15:30-15:55	**I Tyukin** M8 One-shot learning and knowledge transfer in Artificial Intelligence Systems	**S Roggendorf** M5 A non-linear Petrov-Galerkin method for convection-dominated problems	**N Spillane** M6 Adaptive Multipreconditioning for Domain Decomposition	**C Totzeck** M7 Consensus-Based Global Optimisation
15:55-16:20	**A Gorban** M8 Self-esteem and Social Networks of Neural Networks	**M Schedensack** M5 Error analysis of a variational multiscale stabilization for convection-dominated diffusion equations in 2d	**S Hon** M6 Circulant preconditioners for systems defined by functions of Toeplitz matrices	**S Knapp** M7 A pedestrian flow model with stochastic velocities: microscopic and macroscopic approaches
16:20-16:45	COFFEE/TEA			
	JA325 M8	JA314 M5/M9	JA317 M6	JA412 M7
16:45-17:10	**C Gilmour** M8 Self-Exciting Point Processes for Crime	**G Barrenechea** M5 A low-order stabilised finite element method for the Boussinesq problem	**T Rees** M6 Solving saddle point systems using short-term recurrences	**A Festa** M7 A semi-Lagrangian scheme for Hamilton-Jacobi equations on networks and application to traffic flow models
17:10-17:35	**N Jarman** M8 "Go with the flow"; Emergence of complex network structures	**L Baffico** M9 On the Stokes equation in a periodically perforated domain with slip boundary condition of friction type on the interface	**N Bootland** M6 Preconditioners for Two-Phase Incompressible Navier-Stokes Flow	**S Scialanga** M7 Decentralised control of interconnected systems: An interpolation-based approach
17:35-18:00	**V Makarov** M8 Generalized cognitive maps for decision-making in dynamic situations	**G Capodaglio** M9 Fluid-structure interaction simulations of magnetic drug targeting	**J Pestana** M6 Refined saddle-poiont preconditioners for discretized Stokes problems	**A Peters** M7 Direct Methods for Bidirectional Formation Control of Vehicle Platoons
18:15-19:15	DINNER-Aroma Dinning Room-Lord Todd			

Wednesday 28th June

11:00–11:30	COFFEE/TEA	
Chair:	JA505 Bespalov	JA507 Gould
11:30-11:55	**E Almoalim** Solving convection-diffusion and Burgers' equations with random data by stochastic collocation	**F Wechsung** Shape Optimization with Geometric Constraints Using Moreau-Yosida Regularization
11:55-12:20	**C Newsum** An efficient reduced basis method for the stochastic groundwater flow problem	**B Szekeres** Numerical methods for the fractional diffusion equation
12:20-12:45	**A Crowder** CBS constants & their role in error estimation for stochastic Galerkin finite element methods	**L Roberts** Derivative-Free Optimisation Methods for Nonlinear Least-Squares Problems
12:45-14:00	LUNCH-Urban Bean Java Cafe	
Chair:	JA505 Silvester	JA507 Weideman
15:05-15:30	**T Shardlow** A walk-outside-spheres for the fractional Laplacian	**G Nino** Elliptical contour based inversion of Laplace transform and application to Black&Scholes and Heston equations
15:30-15:55	**L Rocchi** An adaptive stochastic Galerkin FEM for parametric PDEs with singular solutions	**S Islam** Numerical simulation of pure diffusion and reaction diffusion models by Haar wavelets
15:55-16:20	**M Feischl** Foundations and Numerics of the Maxwell-LLG equations	**O Egbelowo** 'Exact' finite difference scheme to single-compartment pharmacokinetic models
16:20-16:45	COFFEE/TEA	
Chair:	JA505 Brunner	JA507 Eiermann
16:45-17:10	**P Davies** Stacked frequency wave inversion for MR elastography	**Z Anastassi** Numerical simulations of a nonlinear Schrödinger model with gain and loss
17:10-17:35	**M Scroggs** Solving integral equations for electromagnetic scattering using BEM++	**D-L Sun** Flexible and deflated variants of the block shifted GMRES method
17:35-18:00	**H Erbay** Convergence of a Semi-Discrete Numerical Method for a Class of Nonlocal Nonlinear Wave Equations	**T Gergelits** Rank deficiency and nearness to Krylov subspaces in finite-precision computations

Thursday 29th June

Chair:	JA325 Mackenzie			
9:00-10:00	**A Tornberg**	Accurate evaluation of layer potentials in integral equations		
10:00-11:00	**E Süli**	Finite element approximation of implicitly constituted fluid flow models		
11:00–11:30	COFFEE/TEA			
	JA325 M10	JA314 M9	JA317 M6	JA412 M13
11:30-11:55	**S Rodrigues** M10 On the feedback stabilization to trajectories for semilinear parabolic equations	**A Khan** M9 A-posteriori error estimator for a strongly conservative finite element method for Stokes-Darcy coupling equation	**T Roy** M6 Two-Stage Preconditioners for Reservoir Simulation	**B García-Archilla** M13 Fully-discrete methods for mixed finite-element approximations of the time-dependent Navier-Stokes equations with grad-div stabilization
11:55-12:20	**J Pearson** M10 Preconditioned Iterative Methods for Optimal Transport Problems	**H Gimperlein** M9 Boundary elements for contact problems: stabilisation and time domain	**G Bornia** M6 Field-of-Values analysis of preconditioned Rayleigh-Bénard convection problems	**E O'Riordan** M13 Singularly perturbed convection-diffusion problems posed on an annulus
12:20-12:45	**A Allendes** M10 A posteriori error estimation for finite element approximations of a PDE–constrained optimization problem in fluid dynamics	**C González** M9 A stabilised finite element method for a fictitious domain problem allowing small inclusions	**Pranjal** M6 Optimal solvers for linear systems with stochastic PDE origins 'Balanced black-box stopping test'	**A Hegarty** M13 Numerical solution of convection-diffusion problems on annular domains
12:45-14:00	LUNCH - Urban Bean Java Cafe			
Chair:	JA325 Davies			
14:00-15:00	**A Stuart (A R Mitchell Lecture)** Large Graph Limits of Classification Algorithms			
	JA325 M10	JA314 M11	JA317 M12	JA412 M13
15:05-15:30	**S Dolgov** M10 Low-rank solution of the optimal control problem for random Navier-Stokes equations	**A Teckentrup** M11 Gaussian process emulators in Bayesian inverse problems	**I Sloan** M12 High-dimensional integration of kinks and jumps – smoothing by preintegration	**J-C Jorge** M13 Numerical resolution of time dependent diffusion-reaction systems: a splitting by components
15:30-15:55	**K Sturm** M10 Approximation of normal vector fields with applications to shape optimisation	**H Wendland** M11 Multiscale Radial Basis Functions	**D Silvester** M12 Stochastic collocation methods for stability analysis of dynamical systems	**S Russell** M13 Balanced-norm error estimates for sparse grid finite element methods
15:55-16:20	**D Kalise** M10 Proximal methods for stationary Mean Field Games with local couplings	**H Tyagi** M11 Learning Sparse Additive Models with Interactions in High Dimensions	**A Gilbert** M12 Applying quasi-Monte Carlo integration to a parametrised elliptic eigenproblem	**N Kopteva** M13 Anisotropic flux equilibration on anisotropic meshes
16:20-16:45	COFFEE/TEA			
	JA325 M14	JA314 M11	JA317 M12	JA412 M13
16:45-17:10	**P-H Tournier** M14 Microwave tomographic imaging of cerebrovascular accidents by using High-Performance Computing with FreeFem++	**C Rieger** M11 Kernel methods for parametric pdes	**C Powell** M12 A Reduced Basis Solver for Stochastic Galerkin Matrix Equations	**T Linß** M13 Collocation for singularly perturbed boundary-value problems
17:10-17:35	**M Bonazzoli** M14 Solving numerically large scale electro-magnetism problems using FreeFem++: high order methods and parallel computing	**W Yoo** M11 Learning functions from data under supremum loss: Wavelets, basis splines and uncertainty quantification	**A Bespalov** M12 On the design and performance of adaptive stochastic Galerkin methods	**N Madden** M13 Parameter robust solvers for singularly perturbed differential equations
17:35-18:00	**I Danaila** M14 Finite-element tools for the simulation of Bose-Einstein condensates		**S Chrétien** M12 Lower set supported sparse estimation and application to uncertainty quantification for PDEs using compressed sensing	
19:30 for 20:00	DRINKS RECEPTION and CONFERENCE DINNER-Trades Hall			

Thursday 29th June

11:00–11:30	COFFEE/TEA	
Chair:	JA505 Betcke	JA507 Trefethen
11:30-11:55	**J A C Weideman** A Gauss-Hermite Quadrature Method for the Inversion of the Laplace Transform	**R Gower** Linearly Convergent Randomized Iterative Methods for Computing the Pseudoinverse
11:55-12:20	**S Naqvi** Condition numbers for Yang-Baxter matrix equation	**J Meng** Two improved iteration methods for the nonlinear matrix equation $X = R + M^T(X^{-1} + B)^{-1}M$
12:20-12:45	**J Hook** Tropically linear regression and low rank matrix approximation	**P Nadukandi** Stable computation of the matrix functions $\cosh\sqrt{A}$ and $\mathrm{sinhc}\sqrt{A}$
12:45-14:00	LUNCH - Urban Bean Java Cafe	

Chair:	JA505 Lawless	JA507 Paredes
15:05-15:30	**R Brunet** Domain decomposition for Navier equations in frequency regime	**X Meng** A sharp maximum principle for a two-point boundary value problem with a Caputo fractional derivative
15:30-15:55	**M Al-Johani** Multilevel Solution Algorithms for a Numerical Model of Thin Film Flows	**K Xu** Spectral approximation of convolution operator
15:55-16:20	**A Jumaat** An Optimization Based Multilevel Algorithm for Selective Variational Image Segmentation Models	**J Delgado** Accurate and fast algorithms for some sub-classes of totally positive matrices
16:20-16:45	COFFEE/TEA	
Chair:	JA505 Maischak	
16:45-17:10	**L Pinto** Approximating Coupled Hyperbolic-Parabolic Systems Arising in Enhanced Drug Delivery	
17:10-17:35	**D Devaud** Exponential convergence in $H^{1/2}$ of hp-approximation for parabolic equations	
17:35-18:00	**K Burrage** Unlocking datasets by calibrating populations of models to data density: a study in atrial electrophysiology	

Friday 30th June

Chair:	JA325 Dolean			
9:00-10:00	**F Tisseur**	Exploiting Tropical Algebra in Numerical Linear Algebra		
10:00-11:00	**D Gleich**	Spectral graph clustering with motifs and higher-order structures		
11:00–11:30	COFFEE/TEA			
	JA325 M15	JA314 M16	JA317 M14	JA412 M12
11:30-11:55	**L Trefethen** M15 From random functions to SDEs	**F Arrigo** M16 Non-backtracking walk centrality for directed networks	**H Yorston** M14 A new stabilised finite element method for a mixed formulation of the convection-diffusion equation	**J Li** M12 Analysis and application of stochastic collocation methods for Maxwell's equations with random coefficients
11:55-12:20	**Y Nakatsukasa** M15 The AAA algorithm for barycentric rational approximation	**P Knight** M16 Numerical Analysis of Dynamic Centrality	**F Hecht** M14 Multiphysics and HPC with FreeFem++	**J Rynn** M12 Using Surrogate Models to Accelerate Bayesian Inverse Uncertainty Quantification
12:20-12:45	**S Filip** M15 Improvements to the rational Remez algorithm	**M Paton** M16 Centrality Analysis for Modified Lattices	**A Le Hyaric** M14 FreeFem++-js : FreeFem++ with Javascript	**I Graham** M12 A high dimensional UQ problem for neutron transport and its solution using multilevel sampling

Number	Title	Organiser(s)
M1	Numerical Methods for Nonlocal Problems	M Kovács and B Jin
M2	Recent Advances in the Numerical Solution of Large-Scale Inverse Problems	S Gazzola
M3	Numerical Methods for Coupled Bulk-Surface Problems	J Mackenzie and A Madzvamuse
M4	Fast Spectral Methods for Fluid Dynamics	A Townsend and G Wright
M5	Numerical Methods for Convection-Dominated Problems	G Barrenechea and G Lube
M6	Preconditioning	M Wathen and J Pestana
M7	Numerical Approximation and Optimization of Agent-based Models	A Festa and D Kalise
M8	Models and Algorithms for Human Data	D Higham and I Tyukin
M9	Numerical Methods for Interface and Multiphysics Problems	G Barrenechea and H Gimperlein
M10	Numerical Methods for PDE-Constrained Optimization	D Kalise and T Rees
M11	Learning Functions from Data	A Stuart and A Teckentrup
M12	Recent Developments in Uncertainty Quantification	I Graham
M13	Advances in the Robust Solution of Singularly Perturbed Differential Equations	N Kopteva, T Linß and N Madden
M14	Numerical Modelling with Freefem++	V Dolean and P-H Tournier
M15	New Algorithms Related to Chebfun	N Trefethen
M16	Networks	F Arrigo