

**THE INSTITUTE OF MATHEMATICS AND ITS  
APPLICATIONS**

**IMANA NEWSLETTER**

**Newsletter of the Numerical Analysis Group of the  
Institute of Mathematics and its Applications**

**Volume 31 Number 2  
January 2007**

## Contents

<b>1 Editorial Comments</b>	<b>1</b>
<b>2 13th Leslie Fox Prize</b>	<b>2</b>
<b>3 Who's Visiting Whom</b>	<b>2</b>
<b>4 Technical Reports</b>	<b>3</b>
<b>5 Diary of Seminars</b>	<b>6</b>
<b>6 Forthcoming Meetings and Conferences</b>	<b>7</b>
6.1 Diary date for CERFACS friends: CERFACS Anniversary Meeting . . . . .	9
<b>7 Highlighted Conferences</b>	<b>10</b>
<b>8 Theses</b>	<b>12</b>
<b>9 Postgraduate Courses</b>	<b>12</b>
<b>10 Recent appointments</b>	<b>15</b>
<b>11 Vacant positions and studentships</b>	<b>15</b>
<b>12 IMA Journal of Numerical Analysis</b>	<b>16</b>
<b>13 News from NAG</b>	<b>17</b>
<b>14 Acknowledgements</b>	<b>17</b>

# 1 Editorial Comments

As you will have seen in the last newsletter, after acting as the editor for 91 issues, Iain Duff is celebrating his 60th birthday by passing the editorship of the IMANA Newsletter to me. Iain is continuing to work as a CCLRC Senior Research Fellow at RAL but I am taking over as the Group Leader of the Numerical Analysis Group. As editor of the Newsletter, Iain will be a hard act to follow but I feel that now would be a good time to review the Newsletter and to think about whether any changes should be made, both to the contents and to how the Newsletter is produced and distributed. I do not wish to make changes for changes sake (and the current format has obviously been successful), but I would welcome your views and comments.

Looking at the editorial for the first issue, Iain stated ‘... the principal aim of this Newsletter is to inform people about what is happening in the numerical analysis world before the information is too old’. This has remained the main aim but communications are very different now than they were 30 years ago. Not only are they more rapid but it is much simpler to send information to specific individuals as well as making it more generally available. Thus, to avoid duplication, my feeling is that the Newsletter should aim to include information that is not readily and more immediately available by other means.

The first editorial went on ‘... this is a first issue and the form and content are not immutable but will be willingly moulded by comment, criticism, and contributions’. Presumably, Iain was not overwhelmed by criticisms or suggestions for change since, as he pointed out in his final editorial, the contents remained largely unchanged over the years. So what I would like to do now is to invite your feedback on the Newsletter by asking you to spend a few moments completing the questionnaire which is being sent out with this issue (on request, a copy can also be sent to you by email).

I have added a couple of new sections on recent UK appointments and vacant positions and studentships. In this issue, I have not included the email database; please refer to the last issue for this. If you feel the list is useful and important for you, please indicate this via the questionnaire. Comments on these changes and other suggestions on the future of the Newsletter are welcome.

I have switched to producing the Newsletter using latex. The pdf file for each issue will be made available via the IMA Interest Groups webpage ([www.ima.org.uk/learned\\_soc/interestgroups.htm](http://www.ima.org.uk/learned_soc/interestgroups.htm)). This is the last Newsletter that will be sent out to all subscribers via regular mail. To save paper and to reduce costs, subscribers may now request that they receive a printed paper version as in the past, or the pdf file as an attachment to an email, or simply to be notified via email whenever a new newsletter is available for download from the web. For the moment, if you do nothing, a paper copy will still be sent out to you but I hope very much that many of you will opt to receive instead either the pdf version or email notification. You can express your choice using the questionnaire or by emailing either me or Terry Edwards (Terry.Edwards@ima.org.uk).

Finally, I am delighted that a number of new contributors have submitted material for this issue of the Newsletter, including information on a range of postgraduate courses that are available within the UK. I would very much welcome contributions from other numerical analysis groups that do not currently supply information on their seminar series, technical reports, graduate courses etc. The Newsletter is one way that you can use to keep the UK Numerical Analysis community informed about the activities of your group or department. If you would like to receive a notification of when contributions for the next issue are required, please send me an email and I will be pleased to add you to my list.

With best wishes for 2007

Jennifer Scott  
Group Leader, Numerical Analysis Group  
Rutherford Appleton Laboratory.  
[j.a.scott@rl.ac.uk](mailto:j.a.scott@rl.ac.uk)

## 2 13th Leslie Fox Prize

13th LESLIE FOX PRIZE

CALL for PAPERS

<http://users.comlab.ox.ac.uk/endre.suli/fox/>

The Thirteenth Leslie Fox Prize meeting will take place on Friday, 22 June, 2007 at the Oxford University Computing Laboratory.

Any person who is less than 31 years old on January 1st 2007 and has not already won a first prize is eligible. Each entry should consist of a paper, describing some of the candidate's research, that is suitable for a 40-minute lecture at a numerical analysis symposium. Whether or not the work has been published or accepted for publication is irrelevant, but no person may submit more than one paper. Candidates from previous competitions are encouraged to enter.

The entries will be considered by the Adjudicating Committee:

Endre Suli (University of Oxford, Chairman),

Andrew Stuart (University of Warwick),

Nick Higham (University of Manchester).

Particular attention will be given to the originality and quality of each paper, and to the suitability of the material for a 40-minute talk to a general audience of numerical analysts. Papers will be selected by the Committee by mid-April 2007, for presentation at the Leslie Fox Prize meeting. Only the papers that are presented at the symposium will be eligible for awards but, subject to this restriction, the Adjudicating Committee may award any number of first and second prizes.

- Entries should be received, by the Chairman, by the deadline of **31 January 2007** either electronically as a PostScript or a pdf file or as three hard copies by regular mail.
- Each candidate should include a statement of her/his year of birth and should indicate that she/he would be available to present her/his paper at the symposium.
- A joint paper may be submitted by an individual candidate provided that it is accompanied by a statement from the co-authors agreeing to the submission and detailing the contribution of the candidate to the paper.
- Travel funds are not generally available to assist candidates who attend the symposium.
- The receipt of all entries will be acknowledged.

Any question on this notice should be addressed to a member of the Adjudicating Committee.

## 3 Who's Visiting Whom

Peter Lancaster (Calgary) MANCHESTER (Nick Higham. email: [nick.higham@manchester.ac.uk](mailto:nick.higham@manchester.ac.uk))  
Matrix analysis and applications. January – March 2007.

Maria Schonbek (UC, Santa Cruz) OXFORD (Endre Süli. email: [Endre.Suli@comlab.ox.ac.uk](mailto:Endre.Suli@comlab.ox.ac.uk))

## 4 Technical Reports

### **Brunel University**

Reports available from [http://people.brunel.ac.uk/~icsrsss/bicom/tech\\_rep.html](http://people.brunel.ac.uk/~icsrsss/bicom/tech_rep.html)

- BICOM 06/1: The hp-version of the boundary element method with quasi-uniform meshes in three dimensions. Alexei Bepalov and Norbert Heuer.
- BICOM 06/2: Computing the fundamental distortion mode in Coriolis mass flow meters. Robert Cheesewright and Simon Shaw.
- BICOM 06/3: Uncertainties associated with finite element modelling of Coriolis mass flow meters. Robert Cheesewright and Simon Shaw.
- BICOM 06/4: An extension theorem for polynomials on triangles. Norbert Heuer and Florian Leydecker.
- BICOM 06/5: The p-version of the FEM for slowly oscillating singularities in one dimension. Norbert Heuer and Clemens Purer.
- BICOM 06/6: An iterative substructuring method for the hp-version of the BEM on quasi-uniform triangular meshes. Norbert Heuer, Florian Leydecker and Ernst P Stephan.

### **University of Cambridge**

Reports available from <http://www.damtp.cam.ac.uk/user/na/reports.html>

- NA2006/09 Moment-free numerical approximation of highly oscillatory integrals with stationary points. Sheehan Olver.
- NA2006/08 On the linear stability of splitting methods. Sergio Blanes, Fernando Casas and Ander Murua.
- NA2006/07 From high oscillation to rapid approximation II: Expansions in polyharmonic eigenfunctions. Arieh Iserles and Syvert Nørsett.
- NA2006/06 Numerical approximation of vector-valued highly oscillatory integrals. Sheehan Olver.
- NA2006/05 From high oscillation to rapid approximation I: Modified Fourier expansions. Arieh Iserles and Syvert Nørsett.
- NA2006/04 B-series methods cannot be volume preserving. Arieh Iserles, Reinout Quispel and Priscilla Tse.
- NA2006/03 Fast evaluation of polyharmonic splines in 3-dimensions. R.K. Beatson, M.J.D. Powell and A.M. Tan.
- NA2006/02 A class of integrable geodesic flows on the symplectic group and the symmetric matrices. A. M. Bloch, A. Iserles, J. E. Marsden and T. S. Ratiu.
- NA2006/01 Joint diagonalization on the oblique manifold for independent component analysis. P.A. Absil and K.A. Gallivan.

**University of Manchester**

MIMS EPrints from <http://www.manchester.ac.uk/mims/eprints>

- 2006.409: Adaptive time-stepping for incompressible flow. Part I: scalar advection-diffusion. Philip Gresho, David Griffiths and David Silvester.
- 2006.407: Model-Updating for Symmetric Quadratic Eigenvalue Problems. Peter Lancaster.
- 2006.406: Scaling, Sensitivity and Stability in the Numerical Solution of Quadratic Eigenvalue Problems. Nicholas J. Higham, D. Steven Mackey, Franoise Tisseur and Seamus D. Garvey.
- 2006.397: A Study of the Matrix Exponential. Charles F. Van Loan.
- 2006.396: The Generalized Singular Value Decomposition and the Method of Particular Solutions. Timo Betcke.
- 2006.387: Quantum mushroom billiards. Alex H. Barnett and Timo Betcke.

**University of Oxford**

Reports available from <http://web.comlab.ac.uk/oucl/publications/natr/index.html>

- 06/20 Evaluating matrix functions for exponential integrators via Carathodory-Fejr approximation and contour integrals. T. Schmelzer and L. N. Trefethen.
- 06/19 Finite element methods for deterministic simulation of polymeric fluids. D. Knezevic.
- 06/18 A Gagliardo-Nirenberg inequality, with application to duality- based a posteriori error estimation in the L1 norm. E. Süli.
- 06/17 Summing curious, slowly convergent, harmonic subseries. T. Schmelzer and R. Baillie.

**Rutherford Appleton Laboratory**

Reports available from <http://www.numerical.rl.ac.uk/reports/reports.html>

- RAL-TR-2006-013 An out-of-core sparse Cholesky solver. J. K. Reid and J. A. Scott.
- RAL-TR-2006-016 Finding a point in the relative interior of a polyhedron. C. Cartis and N. I. M. Gould.
- RAL-TR-2006-026 HSL\_DF01, a virtual memory system in Fortran. J. K. Reid and J. A. Scott.
- RAL-TR-2006-027 The design and use of a sparse direct solver for skew symmetric matrices. I.S. Duff.
- RAL-TR-2006-031 Guidelines for the development of HSL software. J. K. Reid and J. A. Scott.

**Univeristy of Strathclyde**

- 3 (2006): Clustering Coefficients for Weighted Networks. G Kalna and D J Higham.
- 4 (2006): On the Use of Moving Mesh Methods to Solve PDEs. J A Mackenzie and W R Mekwi.

- 5 (2006): Strong Convergence Rates for Backward Euler on a Class of Nonlinear Jump-Diffusion Problems. D J Higham and P E Kloeden.
- 6 (2006): Nonnormality and Stochastic Differential Equations D J Higham and X Mao.
- 7 (2006): Solving Viscoelastic Free Surface Flows of a Second Order Fluid Using a Marker-and-Cell Method Approach.  
M F TomA, J L Doricio, A Castelo, J A Cuminato and S McKee.
- 8 (2006): The Sinkhorn-Knopp Algorithm: Convergence and Applications. P A Knight.
- 13 (2006): Adaptive Grid Methods for Q-Tensor Theory of Liquid Crystals: A One-Dimensional Feasibility Study. A Ramage and C J P Newton.
- 14 (2006): Adaptive Solution of a One-dimensional Order Reconstruction Problem in Q-Tensor Theory of Liquid Crystals.  
A Ramage and C J P Newton.
- 15 (2006): Numerical Solution of the Free-Surface Viscous Flow on a Horizontal Rotating Elliptical Cylinder. R Hunt.
- 16 (2006): A Posteriori Error Estimation for Discontinuous Galerkin Finite Element Approximation. M Ainsworth.
- 17 (2006): System Biology: unravelling complex networks?  
P Grindrod, D J Higham, J K Vass and A Spence.
- 18 (2006): Robust A Posteriori Error Estimation for the Non-Conforming Fortin-Soulie Finite Element Approximation. M Ainsworth and R Rankin
- 22 (2006): Dispersive Effects of Discontinuous Galerkin Fem for Acoustics. M Ainsworth.
- 23 (2006): A Posteriori Error Estimation for Lowest Order Raviart Thomas Mixed Finite Elements. M Ainsworth.
- 24 (2006): Error Bound for Radial Basis Interpolation in Terms of a Growth Function. O Davydov.
- 26 (2006): Convergence and Stability Analysis for Implicit Simulations of Stochastic Differential Equations with Random Jump Magnitudes.  
G Chalmers and D J Higham.

## 5 Diary of Seminars

**BIRMINGHAM** : Seminars take place on Thursdays at noon in LRC, Watson Building, Edgbaston Campus. A timetable is available at [http://www.mat.bham.ac.uk/research/applied/ona\\_seminar.htm](http://www.mat.bham.ac.uk/research/applied/ona_seminar.htm)

**CARDIFF** : Seminars take place on Mondays at 3pm in School of Mathematics room M/2.06. Contact: Tim Phillips ([phillipstn@cardiff.ac.uk](mailto:phillipstn@cardiff.ac.uk)).

**OXFORD** : Seminars take place on Thursdays at 2pm in the Lecture Theatre of Oxford University Computing Laboratory, Wolfson Building, Parks Road. A timetable is available from <http://web.comlab.ox.ac.uk/oucl/news/>

**RAL** : Seminars are held in the Atlas Centre, Rutherford Appleton Laboratory and start at 2.15pm. Contact: [s.dollar@rl.ac.uk](mailto:s.dollar@rl.ac.uk)

**READING** : Seminars take place on Fridays promptly at 3pm in room 113 of the Mathematics Department. Contact: [s.davis@reading.ac.uk](mailto:s.davis@reading.ac.uk)

### JANUARY 2007

January 18 : BIRMINGHAM. Raphael Hauser (Oxford). Relative Robustness in Quadratic Programming.

January 19 : READING. William Parnell (Manchester). Effective behaviour of thermoelastic and prestressed composite media.

January 25 : BIRMINGHAM. Bas Lemmens (Mathematics Institute Warwick), to be announced.

January 25 : OXFORD. Iain Duff (Rutherford Appleton Laboratory), to be announced.

January 26 : READING. Kieran Neylon (Schlumberger). Optimization of Hydrocarbon Reservoirs under Constraints Using Adjoint Gradients.

### FEBRUARY 2007

February 1 : RAL. Patrick Amestoy (ENSEEIH, Toulouse). Parallel sparse multifrontal solver in a limited memory environment.

February 2 : READING. Jemma Shipton (Reading). Modelling turbulence in complex shallow water flows.

February 5 : CARDIFF. Professor Frank Smith FRS (University College London), to be announced.

February 8 : OXFORD. Stefan Vadewalle (KU Leuven), to be announced.

February 9 : READING. Gennady El (Loughborough). Isospectral kinetic equation for a dense soliton gas.

February 16 : READING. Bo Zhang (Coventry). Decomposition methods for support vector machines.

February 22 : OXFORD. Marlis Hochbruck (University of Dusseldorf), to be announced.

February 23 : READING. Ian Thompson (Loughborough). Scattering by large arrays: a new approach.

### MARCH 2007

March 2 : READING. Mark Preston (Reading), to be announced.

March 8 : OXFORD. Christian Lubich (University of Tuebingen), to be announced.

March 9 : READING. Mark Matsen (Reading). Self-consistent field theory for complex liquids of diblock copolymer.

March 15 : RAL. Laura Grigori (INRIA), to be announced.

March 19 : CARDIFF. Professor Tim Pedley (Cambridge). Modelling populations of swimming micro-organisms.

## 6 Forthcoming Meetings and Conferences

### JANUARY 2007

#### **SIAM UK/IE one-day annual meeting, January 5**

Oxford University Computing Laboratory.

<http://www.personal.rdg.ac.uk/~sms03sl/UKIESIAM/index.html>

#### **ACM-SIAM Symposium on Discrete Algorithms (SODA07), January 7-9**

New Orleans, Louisiana.

<http://www.siam.org/meetings/da07/>

#### **Midlands Numerical Analysis Group (MIDNAG) meeting : Advances in Finite Element Methods, January 10**

University of Birmingham. <http://www.mat.bham.ac.uk/research/applied/midnag/>

### FEBRUARY 2007

#### **SIAM Workshop on Combinatorial Scientific Computing (CSC07), February 17-19**

Costa Mesa (Orange County), CA, USA. <http://www.siam.org/meetings/cse07/csc07.php>

#### **SIAM Conference on Computational Science and Engineering, February 19-23**

Costa Mesa (Orange County), CA, USA. [www.siam.org/meetings/cse07/](http://www.siam.org/meetings/cse07/)

### MARCH 2007

#### **13th Copper Mountain Conference on Multigrid Methods, March 18-23**

Copper Mountain, Colorado, USA. <http://amath.colorado.edu/faculty/copper>

#### **9th International Conference on Numerical Methods for Fluid Dynamics, March 26-29**

University of Reading. <http://www.icfd.reading.ac.uk/ICFD2007>

#### **8th IEEE International Workshop on Parallel and Distributed Scientific and Engineering Computing (PDSEC-07), March 26-30**

Long Beach, California. <http://cs.stfx.ca/~lyang/ipdps07-pdsec/>

#### **STANFORD 50: State of the Art and Future Directions of Computational Mathematics and Numerical Computing, March 29-31**

A conference celebrating the 50th anniversary of George Forsythe's arrival at Stanford and the 75th birthday of Professor Gene Golub. Stanford University, California.

<http://www.stanford.edu/group/compmath50/>

### APRIL 2007

#### **31st South African Symposium on Numerical and Applied Mathematics (SANUM 2007), April 2-4**

University of Stellenbosch, South Africa. <http://dip.sun.ac.za/sanum>

#### **Workshop on Advances in Optimization, April 19-21.**

Tokyo Institute of Technology, Tokyo, Japan.

<http://www.cas.mcmaster.ca/~deza/tokyo2007.html>

#### **International Symposium on Health Informatics and Bioinformatics (HIBIT'07), April 30 - May 2**

Belek, Antalya, Turkey <http://hibit.ii.metu.edu.tr/07/index.html>

**MAY 2007****Fifth International Workshop on Computer Algebra Systems and Their Applications, CASA'2007, May 27-30**

Graduate University of Chinese Academy of Sciences, Beijing, China.

<http://personales.unican.es/iglesias/CASA2007/>

**International Conference on Computational Science, ICCS 2007, May 27-30**

Beijing, China. <http://www.iccs-meeting.org/iccs2007>

**12th International Conference on Mathematical Modelling and Analysis, May 30 - June 2**

Trakai, Lithuania. <http://www.vtu.lt/rc/mma2007>

**JUNE 2007****BICS Workshop Multi-resolution and High Oscillation for Evolutionary Problems, June 11-12**

University of Bath. <http://www.bath.ac.uk/math-sci/BICS/multi-res/>

**Fourth International Conference on Computation and complexity in analysis, June 16-18**

Siena, Italy. <http://cca-net.de/cca2007/>

**Workshop on Eigenvalue Problems, Software and Applications (EPSA2007), June 27-29**

Faculty of Sciences, University of Porto, Portugal. <http://www.fep.up.pt/epsa2007>

**22nd Biennial Conference on Numerical Analysis, June 26-29**

University of Dundee, Scotland. <http://www.maths.dundee.ac.uk/naconf/index.shtml>

**SIAM Conference on Control and Its Applications, June 29 - July 1**

San Francisco, California. <http://www.siam.org/meetings/ct07/>

**JULY 2007****Joint EUROPT-OMS Meeting, July 4-7**

Prague, Czech Republic. <http://cio.umh.es/europt-oms/>

**EURO-CBBM Workshop Workshop on OR in Computational Biology, Bioinformatics and Medicine, July 8**

Prague, Czech Republic. <http://euro-cbbm.ku.edu.tr/>

**22nd European Conference on Operational Research (EURO XXII), July 8-11**

Prague, Czech Republic. <http://euro2007.vse.cz>

**von Neumann Symposium on Sparse Representation and High-Dimensional Geometry, July 8-12**

Snowbird, Utah. <http://www.ams.org/meetings/vonneumann07.html>

**International Conference on Preconditioning Techniques for Large Sparse Matrix Problems, July 9-12**

Toulouse, France. <http://www.precond07.enseiht.fr>

**6th International Congress on Industrial and Applied Mathematics, ICIAM 2007, July 16-20**

Zurich, Switzerland. <http://www.iciam07.ch/index>

**Computational Methods in Finance, July 26-27**

University of Waterloo, Canada. [http://www.iqfi.uwaterloo.ca/call\\_for\\_papers.shtml](http://www.iqfi.uwaterloo.ca/call_for_papers.shtml)

**International Symposium on Symbolic and Algebraic Computation (ISSAC),**

**July 29 - August 1**

Waterloo, Canada. <http://www.cs.uwaterloo.ca/issac2007/>

**AUGUST 2007****Second Mathematical Programming Society International Conference on Continuous Optimization, August 12-17**

McMaster University, Hamilton, Ontario, Canada. <http://iccopt-mopta.mcmaster.ca/>

**Computational Methods with Applications, August 19-25**

Harrachov, Czech Republic. <http://www.cs.cas.cz/~harrachov>

**SEPTEMBER 2007****BICS conference on numerical analysis: multiscale methods, adaptivity and complexity, September 4-7**

University of Bath. <http://www.bath.ac.uk/math-sci/BICS/nammac/>

**Workshop on Numerical Analysis of Stochastic PDEs, September 3-4**

The University of Manchester. <http://www.ma.man.ac.uk/shardlow/naspde.html>

**Seventh International Conference on Parallel Processing and Applied Mathematics (PPAM 2007), September 9-12**

Gdansk, Poland. <http://ppam.pcz.pl>

**IMA Conference on Numerical Linear Algebra and Optimisation, September 13-15**

University of Birmingham. <http://www.ima.org.uk/Conferences/confdiary.htm>

**6th UK Conference on Boundary Integral Methods, September 17-18**

Durham, UK. <http://www.durham.ac.uk/engineering/ukbim6>

**Fourth International Workshop on Meshfree Methods for Partial Differential Equations, September 17-20**

Bonn, Germany. <http://wissrech.ins.uni-bonn.de/meshfree>

**13th Czech-French-German conference on optimization, September 17-21**

Heidelberg, Germany. <http://cfg07.uni-hd.de>

**Summer School: Approximate GCD Computations and New Methods for Solving Polynomial Equations of High Degree with Multiple Roots, September 17-21**

Oxford University Computing Laboratory. [http://www.dcs.shef.ac.uk/ml/summer\\_school/](http://www.dcs.shef.ac.uk/ml/summer_school/)

**The 8th Hellenic European Research on Computer Mathematics and its Applications, September 20-22**

Athens University of Economics and Business. <http://www.aueb.gr/conferences/hercma2007/>

**6.1 Diary date for CERFACS friends: CERFACS Anniversary Meeting**

CERFACS will be celebrating its 20th Anniversary on October 11-12. There will be general CERFACS activities on Thursday 11th and the Parallel Algorithms Team will have a one-day meeting on Friday 12th. More details will be available early next year but you should note the dates in your diary now.

Iain Duff ([duff@cerfacs.fr](mailto:duff@cerfacs.fr)) and Serge Gratton ([gratton@cerfacs.fr](mailto:gratton@cerfacs.fr))

## 7 Highlighted Conferences

**INSTITUTE OF NON-NEWTONIAN FLUID MECHANICS  
CONFERENCE ON WHITHER RHEOLOGY?  
Lake Vyrnwy Hotel, Mid Wales  
April 2-4, 2007**

The theme of the Conference will be Whither Rheology? Each Plenary Lecture will outline the main thrusts and highlights in the field hitherto, followed by a discussion of where the field is heading (or ought to be heading) in the future. Distinguished rheologists who have already agreed to give plenary lectures include: D V Boger (Melbourne, Australia), Igor Emri (Slovenia), G G Fuller (Stanford, USA), A J Giacomini (Madison, USA), J C Hyun (Korea), T C B McLeish (Leeds), J R A Pearson (Schlumberger, Cambridge), T N Phillips (Cardiff), R I Tanner (Sydney, Australia) and M H Wagner (Berlin).

The meeting will be held at the Lake Vyrnwy Hotel near the village of Llanwddyn in Mid Wales. The hotel is situated in a 24,000 acre country estate with magnificent views overlooking the lake and the Berwyn mountains. It offers excellent accommodation with full conference facilities.

The total cost of the meeting (with meals and accommodation from Monday lunch to Wednesday breakfast) will be 380. Participants registering before 20 February 2007 will receive a 30 discount on their registration fee. Accompanying persons sharing a room with a participant will be charged 100.

The meeting will be organized by Dr G W Roberts and Professor K Walters FRS on behalf of the INNFM. Those wishing to present lectures should contact Professor Walters ( kew@aber.ac.uk ). Hotel bookings and registration matters should be addressed to Dr Roberts (g.w.roberts@bangor.ac.uk ).

\*\*\*\*\*

**ICFD CONFERENCE ON NUMERICAL METHODS FOR FLUID DYNAMICS:  
READING 2007**

The 9th ICFD International Conference on Numerical Methods for Fluid Dynamics organised by the ICFD (Institute for Computational Fluid Dynamics) will be held at the University of Reading from 26 - 29 March 2007.

The following have agreed to give invited talks:

- Andrew Barlow (AWE Aldermaston)
- Luca Formaggia (EPFL)
- Mohamed Iskandarani (Miami)
- Peter Jimack (Leeds)
- Dominique Laurence (Manchester)
- Len Margolin (Los Alamos)
- Matthew Piggott (Imperial)
- Phil Roe (Michigan)
- Chi-Wang Shu (Brown),
- Andrew Stuart (Warwick)
- John Thuburn (Exeter)
- Stphane Zaleski (LMM)

In addition to invited lectures the programme will include contributed talks of twenty minutes and poster sessions. There will be no parallel sessions. A feature of the meeting will be the fifth award of The Bill Morton Prize for a paper on CFD by a young research worker.

Further details on the conference are available at <http://www.icfd.reading.ac.uk/ICFD2007>

\*\*\*\*\*

**22nd Biennial Conference on Numerical Analysis  
University of Dundee  
June 26–29 June, 2007**

The special invited lecture in honour of A. R. Mitchell will be presented by Professor Roger Fletcher FRS, University of Dundee.

The other Principal Speakers will include

- Douglas Arnold, University of Minnesota
- Dugald Duncan, Heriot-Watt University
- Bengt Fornberg, University of Colorado
- Gene Golub, Stanford University
- Paul Houston, University of Nottingham
- Angela Kunoth, Universitat Bonn
- Jeremy Levesley, University of Leicester
- Sven Leyffer, Argonne National Laboratory
- Volker Mehrmann, Technische Universitat Berlin
- David Silvester, University of Manchester
- Zdenek Strakos, Academy of Sciences of the Czech Republic
- Denis Talay, INRIA

Further information will be available at the conference web site:  
<http://www.maths.dundee.ac.uk/naconf/index.shtml>  
 with online registration early in the new year.  
 David Griffiths / Alistair Watson (dfg@maths.dundee.ac.uk)

\*\*\*\*\*

**IMA Conference on Numerical Linear Algebra and Optimisation  
University of Birmingham  
September 13–15, 2007**

The success of modern codes for large-scale optimisation is heavily dependent on the use of effective tools of numerical linear algebra. On the other hand, many problems in numerical linear algebra lead to linear, nonlinear or semidefinite optimisation problems. The purpose of the conference is to bring together researchers from both communities and to find and communicate points and topics of common interest. This is the first IMA Conference of this theme, and if it is successful, it could be the first in a series.

**Key date:** 31 March 2007, submission of abstracts.

Complete list of invited speakers:

- Paul Van Dooren (Catholic University of Louvain)
- Roger Fletcher (University of Dundee)
- Michael Overton (New York University)
- Jorge Nocedal (Northwestern University)
- Valeria Simoncini (University of Bologna)
- Zdenek Strakos (Academy of Sciences of the Czech Republic)
- Philippe Toint (University of Namur)
- Nick Trefethen (Oxford University)

Further details from: <http://www.ima.org.uk/Conferences/numlinalg/numlinalghome.htm>

## 8 Theses

### University of Reading : PhD Thesis

Laura Watkinson (nee Stanton).

The Effect of constraints in four-dimensional variational data assimilation for Hamiltonian problems.

Martin Thomas.

Analysis of rough surface scattering problems.

Martin Hunt.

Unique extension of extreme functions of  $JB^*$ -triples.

## 9 Postgraduate Courses

### University of Birmingham

The School of Mathematics offers a twelve-month MPhil course in Mathematics and an MSc in Mathematical Finance, which is run jointly with the Department of Economics. In addition, the School offers a standard three-year PhD programme. The MPhil is an ideal preparation for entry into the PhD programme.

More details are available at <http://www.mat.bham.ac.uk/Postgraduate/mphil.htm>

### Brunel University

The School of Information Systems, Computing and Mathematics offers a 1-year M.Sc course in Computational Mathematics with Modelling, which is designed to acquaint Honours graduates in Mathematics or a related discipline such as Engineering or Physics, with up-to-date numerical analysis. The course is mathematically oriented, but the use of computers is emphasized throughout.

Topics covered include the numerical solution of partial differential equations with focus on the finite element method, integral equations, linear algebra, functional analysis, approximation theory, stochastic models, mathematical finance, and modelling.

Further information is available from <http://www.brunel.ac.uk/about/acad/siscm/maths/postgrad/msc>

### University of Edinburgh

The School of Mathematics offers a 1-year Dip/MSc course in Operational Research. The programme has themes in: Risk, Finance and Computational Optimization. EPSRC funding is available for suitably qualified UK/EU candidates.

More details are available from <http://www.maths.ed.ac.uk/~ormsc/>

### University of Greenwich

The School of Computing and Mathematical Sciences offers a one-year full time MSc Programme in Applied Mathematical Modelling and Scientific Computing. This is a completely new programme sponsored by EPSRC in the area of applied mathematical modelling with emphases on the use of computer and algorithms development. This programme intends to provide interdisciplinary background with very focused applications chosen by the students to suit their interests. EPSRC bursaries are available for suitably qualified candidates.

The programme is also offered on a two-year part-time basis and to students who may wish to enroll and start in January.

For full details see <http://cse.gre.ac.uk>

Enquires may be sent to: Professor Choi-Hong Lai, School of Computing and Mathematical Sciences, University of Greenwich (c.h.lai@gre.ac.uk).

### Heriot-Watt University

We offer taught MSc courses and PhD by research. Our Applied Mathematical Sciences MSc provides modern mathematical and numerical skills geared to careers in both research and industry. To achieve this we offer a solid theoretical and practical foundation through a broad range of modules. We have

a related MSc in Applied Mathematical Sciences with Biological and Ecological Modelling which offers specialisation in the life sciences.

These MSc courses are available as a 1 year full-time MSc as well as on a part-time basis. Some EPSRC financial support is available for suitably qualified home/EU students.

Further details may be found at <http://www.ma.hw.ac.uk/mscapmasc/>  
Enquiries should be addressed to: Allison Kerr (amase@ma.hw.ac.uk)

### **University of Manchester**

Starting in September 2007, the School of Mathematics at the University of Manchester is running an MSc in Mathematics and Computational Science that provides training in applied mathematics, numerical analysis, and computational science. It is suitable for students wishing to enter PhD programmes in mathematics, computer science, or the applied sciences. The programme also develops many schools valued by industry and it is possible to complete an MSc dissertation with an industrial partner.

It is anticipated that a number of bursaries will be available for highly qualified students (subject to confirmation).

The course starts in September and lasts one year. It comprises lectures and coursework, with exams in January and April/May, followed by a dissertation carried out and written up between April and September. The dissertation counts for one half of the credits and is chosen from a range of available projects, including projects suggested by industrial partners.

Enquiries should be addressed to: Tony Shardlow (shardlow@maths.man.ac.uk)

### **University of Nottingham**

From September 2007 the University of Nottingham will be offering a suite of seven MSc courses in Scientific Computation:

- MSc in Scientific Computation;
- MSc in Scientific Computation with Computational Fluid Dynamics (CFD);
- MSc in Scientific Computation with Electromagnetics;
- MSc in Scientific Computation with Finance;
- MSc in Scientific Computation with Industrial Mathematics;
- MSc in Scientific Computation with Mathematical Medicine and Biology;
- MSc in Scientific Computation with Solids and Structures.

These courses offer a solid grounding in advanced scientific computation that will prepare students for either a career in business or industry, or for research in an area where computational techniques play a significant role. All seven MSc degree courses are centred around a common taught core comprising the following modules: Variational Methods, Computational Linear Algebra, and Algorithm Design and Operational Research. Optional topics can be selected from the general areas of Computational Fluid Dynamics, Electromagnetics, Finance, Industrial Mathematics, Mathematical Medicine and Biology, and Solids and Structures. In addition to the taught modules, students will undertake a three month summer project.

The courses will be taught by mathematicians, computer scientists, engineers and staff from the Nottingham Business School, fully reflecting the multidisciplinary nature of scientific computation.

Further details can be found at <http://www.maths.nottingham.ac.uk>

Enquiries should be addressed to: Andrew Cliffe (andrew.cliffe@nottingham.ac.uk)

### **University of Oxford**

Oxford University Computing Laboratory and the Mathematical Institute offer a one-year full time M.Sc. course in Mathematical Modelling and Scientific Computing. This course aims to provide training in the applications of mathematics to a wide range of problems in science and technology. It is intended for graduates in mathematics or related disciplines wishing to pursue a career in industrial or commercial research or in academia.

The course consists of both taught courses and a dissertation. Topics covered include analytical and numerical solution of ordinary and partial differential equations, numerical linear algebra, numerical optimisation, mathematical ecology and biology, fluid dynamics and mathematical physiology,

The course is supported by EPSRC with 10-12 studentships being available each year.

For further details see <http://www.comlab.ox.ac.uk/oucl/courses/grad/mmsc>

Enquiries may be addressed to the Graduate Admissions Secretary, Oxford University Computing Laboratory, Wolfson Building, Parks Road, Oxford, OX1 3QD, Email: [MMSA-Admissions@comlab.ox.ac.uk](mailto:MMSA-Admissions@comlab.ox.ac.uk).

### University of Plymouth

The School of Mathematics and Statistics offers one-year full-time MSc/MRes courses in Applied and Computational Mathematics. The courses provide in-depth knowledge and advanced skills that are of broad relevance for careers in a wide range of areas, including technology, finance and consulting. Students will be able to develop a critical awareness of the application of modern mathematical techniques to a variety of problems and the ability to use a range of computational tools and packages. Modules studied are chosen from - Mathematical Modelling I: Discrete and Continuous Dynamical Systems; Mathematical Modelling II: Random Systems and Systems Control; Financial Mathematics and Statistics; Nonlinear Systems; Partial Differential Equations; Personal and Professional Skills; Research Skills and Project Development; Project.

Applicants should have a good honours degree, or equivalent, in Mathematics or a numerate discipline such as Engineering.

Further information is available from [www.plymouth.ac.uk](http://www.plymouth.ac.uk) or contact Dr Tom Heinzl, School of Mathematics and Statistics, University of Plymouth, Drake Circus, Plymouth, Devon, PL4 8AA, UK. Tel: +44 (0)1752 232754, Fax: +44 (0)1752 232780, e-mail: [Thomas.Heinzl@plymouth.ac.uk](mailto:Thomas.Heinzl@plymouth.ac.uk)

### University of Reading

The Department of Mathematics at the University of Reading offers two one-year taught Masters postgraduate training courses, commencing on 1st October. A new MSc in the Mathematics of Scientific and Industrial Computing (formerly Numerical Solution of Differential Equations) awaiting an EPSRC Collaborative Training Award. An MSc in the Mathematical and Numerical Modelling of the Atmosphere and Oceans, run jointly with the Meteorology Department, which is fully funded by NERC. Applications are invited from candidates holding, or expecting to obtain, a minimum of a lower second class honours degree in mathematics or joint degree with mathematics, physics or engineering (with a significant mathematical content). Most qualified UK students would be eligible to receive funding of fees and stipend from the relevant research council, and most qualified EU students would be eligible for funding of fees. Both courses are available on a part-time basis over two years.

For further details see <http://www.maths.rdg.ac.uk/> or contact Sue Davis, Postgraduate Secretary, Department of Mathematics, The University of Reading, Whiteknights PO Box 220, Reading RG6 6AX, UK. Tel: 0118 378 8991, email: [S.Davis@reading.ac.uk](mailto:S.Davis@reading.ac.uk)

### University of Strathclyde

The Department of Mathematics offers 1-year MPhil and 3-year PhD research degrees. A PhD takes 4 years when linked to a Graduate Teaching Assistantship.

Research within the Department of Mathematics covers a wide range of applied and applicable mathematics with a prominent commitment to nonlinear mathematics and the solution of industrial problems reflecting current emphasis within EPSRC. The main research activities are grouped into four sections: Applied Analysis, Continuum Mechanics, Industrial Mathematics and Numerical Analysis. The Numerical Analysis Group is the largest and one of the strongest in the UK. Research interests are diverse, including the construction and analysis of methods for numerical solution of nonlinear differential equations, and on computational solution of problems of practical interest. There is also related research activity in several aspects of numerical linear algebra and approximation theory.

Funding is obtained from several sources, including EPSRC, Graduate Teaching Assistantships, University Awards, Carnegie Trust, Overseas Research Student Awards Scheme, UK industry and the EU.

For further information contact Dr Oleg Davydov ([oleg.davydov@strath.ac.uk](mailto:oleg.davydov@strath.ac.uk))  
<http://www.maths.strath.ac.uk/applying/postgraduate/>

## 10 Recent appointments

### **Brunel University**

Dr. Matthias Maischak, Senior Lecturer Mathematical Sciences.

### **University of Manchester**

Timo Betcke, Research Associate.

Sven Hammarling, Senior Honorary Research Fellow.

### **University of Oxford**

Nick Gould, Professor of Numerical Optimisation.

### **Rutherford Appleton Laboratory**

Coralia Cartis and Sue Dollar, Numerical Analysis Group.

## 11 Vacant positions and studentships

### **University of Birmingham**

The School of Mathematics has currently one position available in Computational Mathematics for a lecturer/senior lecturer. Informal inquiries should be addressed to Professor D. J. Needham, email: [needham@maths.bham.ac.uk](mailto:needham@maths.bham.ac.uk) (tel.: 0121 414 6593). Full details are available from <http://www.mat.bham.ac.uk/>

**Closing date: 15 January, 2007.**

### **Cardiff University**

Post: Research Associate.

Duration: 3 years

Location: Schools of Mathematics and Earth Sciences, Cardiff University.

Project: Modelling of Mantle Convection.

This is an interdisciplinary research project funded by the Leverhulme Foundation involving the Schools of Mathematics and Earth Sciences at Cardiff University. All of Earth's geological activity, including plate tectonics, earthquakes, volcanism and mountain building, is ultimately driven by convection in the mantle. To better understand this activity we need a means to realistically model the mantle convection. While there have been recent significant advances in modelling mantle convection, no realistic models exist in spherical geometry which mimic both plate tectonics and temperature dependent viscosity at Earth-like vigour. The primary objective of this project is to develop a robust implementation of temperature dependent viscosity, stable at Earth-like vigour. A secondary objective is to incorporate more sophisticated rheology for the cold near surface boundary layer to generate self-consistent plates. The ability to have self-forming plates is absolutely critical for correctly modelling mantle dynamics.

Informal enquiries to Professor Tim Phillips ([PhillipsTN@cf.ac.uk](mailto:PhillipsTN@cf.ac.uk), Tel. 02920 874194). Application details will be included on the Cardiff University website early in 2007.

### **University of Dundee**

The University seeks to appoint a suitably qualified outstanding candidate to a Chair in Numerical Analysis or Computational Mathematics. The Division has a long-standing history of research excellence in Numerical Analysis (particularly in the area of differential equations) which it seeks to maintain and develop through this appointment. There is also a commitment to complement and interact with the other existing research areas within the Division which are Mathematical Biology, Magnetohydrodynamics and Applied Analysis. The successful candidate should therefore have an international research reputation in Numerical Analysis or Computational Mathematics and show an enthusiasm for inter-disciplinary research.

Informal approaches concerning this appointment may be made to: Professor MAJ Chaplain, email: [chaplain@maths.dundee.ac.uk](mailto:chaplain@maths.dundee.ac.uk)

**University of Edinburgh**

The School of Mathematics invites applications for a lectureship in Applied Mathematics. Candidates with a background in computational mathematics and/or experience with topics in biology/medicine or materials science are particularly encouraged to apply. Applications are also invited for a lectureship in Operational Research or Statistics. The School will also consider candidates with outstanding records for appointment to a readership. For further information, see <http://www.maths.ed.ac.uk/news/vacancies.html>

**Closing date: 2 February 2007.**

## 12 IMA Journal of Numerical Analysis

Contents of Volume 27, Number 1

Z.-Z. Bai and G.H. Golub.

Accelerated Hermitian and skew-Hermitian splitting iteration methods for saddle-point problems.

G.N. Milstein and M.V. Tretyakov.

Discretization of forward-backward stochastic differential equations and related quasi-linear parabolic equations.

J.J. Coughlan, A.T. Hill, and H. Logemann.

The Z-transform and linear multistep stability.

T. Sorokina and F. Zeilfelder.

Local quasi-interpolation by cubic C1 splines on type-6 tetrahedral partitions.

L. Boulton.

Non-variational approximation of discrete eigenvalues of self-adjoint operators.

P. Houston, I. Perugia, and D. Schötzau.

An a posteriori error indicator for discontinuous Galerkin discretizations of  $H(\text{curl})$ -elliptic partial differential equations.

L. El Alaoui, A. Ern, and E. Burman.

A priori and a posteriori analysis of non-conforming finite elements with face penalty for advection-diffusion equations.

R. Araya, G.R. Barrenechea, and F. Valentin.

A stabilized finite-element method for the Stokes problem including element and edge residuals.

B. Ayuso, J. de Frutos, and J. Novo.

Improving the accuracy of the mini-element approximation to Navier-Stokes equations.

For further details see: [www.imanum.oupjournals.org](http://www.imanum.oupjournals.org)

## 13 News from NAG

It is always good to be able to announce new products and offerings, especially at Christmas time! Yesterday I had the welcome news that the Maple-NAG Connector had passed the internal quality assurance at MapleSoft and as therefore poised for release. This product will enable Maple users to enjoy the quality numerical capabilities of the NAG C library and its associated documentation from within the Maple environment.

A similar project, to link the NAG Fortran routines to MatLab, is very advanced and internal testing at NAG will proceed over Christmas. We are very confident that this product will be rolled out in the very early part of next year. Like the Maple connector product, documentation will be provided via the native help system.

New routines are being prepared for the next library releases. Most advanced in its preparation is software for global minimisation. If anyone wants to become part of NAG's beta testing panel for the new materials then they should contact NAG at [mike.dewar@nag.co.uk](mailto:mike.dewar@nag.co.uk).

Mike will in fact be quite busy over the next few months should all go according to plan. NAG has been named as the preferred bidder for the computational science and engineering support part of HECToR, the new high performance computing facility for U.K. researchers (a Cray XT4 with an initial peak performance of 60 teraflops, being increased to 200 teraflops after two years), and Mike has a key technical role to play in managing this support facility. For further details please see: <http://www.epsrc.ac.uk/researchfunding/facilitiesandservices/highperformancecomputing/hector/projectstatus/projectstatusat1december2006.htm>

In the light of this and NAG's increasing successes in the technical marketplace, we do advertise from time to time to fill any vacancies that arise. Please keep an eye on <http://www.nag.co.uk/about/careers.asp> if you feel that a career at one of our offices might appeal to you.

David Sayers ([David.Sayers@nag.ac.uk](mailto:David.Sayers@nag.ac.uk))

## 14 Acknowledgements

I would like to thank the following people for contributing to this issue of the Newsletter.

Andrew Cliffe (Nottingham)  
 Sue Davis (Reading)  
 Oleg Davydov (Strathclyde)  
 Shirley Day (Oxford)  
 Iain Duff (RAL)  
 Kathryn Gillow (Oxford)  
 Jacek Gondzio (Edinburgh)  
 Norbert Heuer (Brunel)  
 Nick Higham (Manchester)  
 Daniel Loghin (Birmingham)  
 Gabriel Lord (Heriot-Watt)  
 Tim Phillips (Cardiff)  
 Alison Ramage (Strathclyde)  
 David Sayers (NAG)  
 David Wilton (Plymouth)