

OCIAM NEWSLETTER

October 2004

FUTURE EVENTS

The Alan Tayer Lecture
sponsored by
The Smith Institute

Dr David Acheson
University of Oxford

1089 and All That

22nd November 2004, St Catherine's College,
Oxford. The lecture will be held in the Bernard
Sunley Building at 5pm, tea from 4:15pm

24-28 January 2005

MISG2005

Massey University, Auckland.

<http://www.maths-in-industry.org/future/>

31 Jan – 4 Feb, 2005

52nd European Study Group with Industry

Virje Universiteit, Amsterdam -

<http://www.math.vu.nl/swi2005/>

21 Mar -24 Mar 2005

53rd European Study Group with Industry

University of Manchester

Contact: i.d.abrahams@ma.man.ac.uk

4 – 7 April 2005

British Applied Mathematics Colloquium

University of Liverpool

www.maths.liv.ac.uk/~colloquium

OLIVER SMITHIES LECTURES Michaelmas

Term 2004. Professor Kevin Burrage, University of Queensland, Modelling and Simulation Issues in Computational Cell Biology

Wednesday 24 November: Overview

Wednesday 1 December: Stochastic Modelling and Simulation

Venue: Computing Laboratory Lecture Theatre
Wolfson Building, Parks Road, Oxford 5.00 pm

NEW PEOPLE

Laura Mildenhall has moved over from the main building to be our new Assistant Administrator. She will be taking over some of Angela's duties (see News Section) as well as acting as OCIAM receptionist and looking after the library and the MSc.

Christoph Reisinger joined the Mathematical Finance Group in April from the Interdisciplinary Centre for Scientific Computing of the University of Heidelberg, where he worked on numerical techniques for high-dimensional option pricing problems. At OCIAM he will continue his research in computational finance with an emphasis on realistic multi-factor models for more exotic derivatives. He will also be doing some teaching on the part time Msc in Mathematical Finance.

Aytac Ilhan comes to OCIAM from Princeton University where she recently completed her Ph.D. in Operations Research and Financial Engineering with a concentration in financial mathematics. Her research interests are derivative valuation in incomplete markets, stochastic volatility models, exotic options, and optimal investment problems. She will be teaching on the part time MSc and Diploma in Mathematical Finance.

Roman Voskoboynikov has just arrived from Moscow via Liverpool University. He holds an EPSRC postdoctoral position on the initiation of fracture from microcracks in certain steels. Roman will be working on dislocation modeling with Jon Chapman and John Ockendon and will have close links with Steve Roberts and Angus Wilkinson in the Department of Materials.

ON THE MOVE

Paul Dellar has completed his 3 years as Glasstone Fellow and is moving to Imperial College, London as a lecturer. We will all miss him for giving his time so generously in (i) sorting out all our computing problems, (ii) keeping us up to date with the mathematical gossip worldwide and (iii) sharing his

wide knowledge of applied mathematics and applied mathematicians. Coffee time will not be the same without him (not to mention sessions in the Royal Oak).

David Mortimer completed his DPhil and has joined a number of previous OCIAM graduates working at Detica in Surrey.

CHANGING TACK

The following people will be staying on in OCIAM but working on a new project. [Is it a coincidence that they are all women and will now be working on medical applications?]

Congratulations to **Tiina Roose** who has been awarded a Royal Society University Research Fellowship. She plans to stay on in OCIAM/CMB and will be working on multiscale modelling of biological branching structures.

Carina Edwards has just handed in her thesis on 'Hypercritical Shallow Water Flows'. On October 1st, she will start work as an EPSRC Research Assistant on the polymer coating of viruses.

Katerina Kaouri has also just completed her thesis which is on 'Secondary Sonic Boom'. She has already started work as an EPSRC Research Assistant working with Jon Chapman and Philip Maini on the modelling of calcium waves in embryology. (See EPSRC Newline Issue 30 P22)

VISITING RESEARCH FELLOWS

OCIAM VRFs are a very varied and interesting collection of people who are all based elsewhere but who are 'beneficially involved with OCIAM's work beyond ordinary academic collaboration'. The involvement has certainly proved beneficial to OCIAM and we hope it is beneficial to the VRFs as well. We have added 2 new names to our list this year:

Philip Bond works for the hedge fund Brevan Howard and is in charge of the development of black box trading systems. He is also curious about many other matter and hopes to collaborate with us on such diverse topics as the effect of aerodynamics on Olympic sports and Darwinian evolution modelled as flows on an infinite dimensional diffeomorphism group.

Joyce Aitchison is a long time Study Group attendee who has recently retired from RMCS, Shrivenham (University of Cranfield). She plans to attend our industrial workshops on a regular basis and will bring her experience of both modelling and numerical analysis. In addition we hope to get her involved with some of the MSc students.

OBITUARY

John Hammersley, who died in May, was one of the world's outstanding problem-solving mathematicians. OCIAM was fortunate indeed to have been able to benefit from his wisdom for a decade when neither the Mathematical Institute nor the Institute for Economics and Statistics could find space for him in his retirement. He will be especially remembered for those early coffee times when he would occupy the South West corner, wreathed in pipe smoke and, say, quaternions.

John really blossomed as a mathematician during WW2 when he realised the bad uses to which mathematics could be put, and in particular the futility of over-accurate gunnery tables. His encounters with so many problems in statistics and probabilistic simulation led him to develop the theory of Monte Carlo methods, so important even today in mathematical finance. But he is most famous for inventing percolation theory (when can you find an open pathway through a network of gates which are randomly open or closed?)

When you took John a problem, he would never take anything for granted; he either started from first principles or built on knowledge of which he was certain. He was happiest when his solutions were rigorous but he abhorred axiomatic superstructures, rigorous or otherwise, when they contributed nothing to the usefulness of mathematics. Hence his famous article "On the enfeeblement of mathematical skills by Modern Mathematics and by similar soft intellectual trash in Schools and Universities" (Bull. IMA, 1968), which was a courageous and successful challenge to those who were trying to do away with the very skills that are now most valuable to all OCIAM researchers.

JRO, (with acknowledgments to Geoffrey Grimmett for his beautifully written obituary in The Independent.)

VISITORS

Dr Ran Shenghong, comes from the Institute of Geographical Sciences and Natural Resources Research, Chinese Academy of Sciences, Beijing, and is visiting OCIAM for 3 months. He is building a multiscale model of the evolution of the Yuzuki River Catchment in Southwestern China. The aim is to estimate the future capacity of the Yuzuki ecosystem to meet human needs.

Dr Zorona Luzanin is visiting OCIAM for 6 weeks in October and November. She comes from the University of Novi Sad in Serbia and Montenegro and will be helping Hilary Ockendon with the MSc Modelling Classes. Her visit is sponsored by an EU Tempus project on Industrial Mathematics.

Ana Munoz is a visiting postdoctoral scientist from Universidad Rey Juan Carlos in Madrid, who is visiting Andrew Fowler for six months to work on environmental and biological problems involving river flow, drumlin formation and blood cell development.

Marta Perez-Gusinye is an NERC postdoctoral fellow in Earth Sciences, who will visit occasionally to work with Andrew Fowler on problems involving viscoplastic deformation of the Earth's crust.

NEWS

NETIAM

Smith Institute has now organised 3 workshops to explore new applications of mathematics and the last of the 4 themed workshops on 'Complexity at the Molecular Level' will be held in Eindhoven on 2, 3 December. The final Plenary Workshop in Oxford, on March 14th and 15th, 2005, will consolidate the findings of all 4 meetings into a form that will enable new research consortia to be taken forward under the European banner.

For further information on the NETIAM project, contact Melvin Brown at the Smith Institute (melvin@smithinst.co.uk), or consult the project website at www.netiam.net.

Angela Howard threatened to retire this year but luckily she has decided to reduce her hours instead and only come in 3 days per week. Angela has been secretary in OCIAM since it was founded in 1989 and we are not at all sure that OCIAM would function without her. Fortunately she is still on hand

to give us advice and remember where the files are even though she will now be mainly concerned with her administrative work for EJAM and AMF.

The OCIAM Library has recently received several gifts. We are very grateful to Isobel Spence for allowing us to have first choice of David Spence's books and we have thus acquired over a hundred classic tomes on continuum mechanics and mathematical methods. We are also very grateful to Dominic Donnelly for donating a number of his books on his retirement. The section on variational inequalities in particular has improved dramatically.

Katerina Kaouri was awarded the prize for the best short talk in the Oxford Mathematical and Physical Sciences Student 2004 Symposium on graduate research projects, for her talk "Modelling Sonic Boom".

Interdisciplinarity II

There have been some encouraging developments since the last Newsletter. Firstly, on the basis of a series of presentations on research in May, Oxford University attained "Ambassador Status" within Schlumberger's research programme. This was especially welcome since all the presentations involved an OCIAM component and since the Schlumberger Ambassador is Dr Mike Sheppard who is an ex-student of Roger Penrose. There have now been two in-house Schlumberger Study Groups and it seems that they have been well received; hopefully there will soon be even more mathematical collaboration with the company than the current bevy of studentships.

Secondly, the Maths Faraday is being increasingly bombarded with requests from the Dept of Trade and Industry and EPSRC about how to facilitate ID research between mathematics and industry. Thus there is also hope that ID mathematics will achieve greater respectability in the eyes of these two important organisations and even in the eyes of Brussels.

The Smith Institute will be exhibiting at the **CBI Showcase** on 8th & 9th November 2004 at the International Convention Centre, Birmingham. <http://www.smithinst.ac.uk/>

John Allen has been awarded a visiting professorship at Imperial College, London.

Jon Chapman is spending this term in Canterbury University, Christchurch, New Zealand on the new Oxford/Canterbury Exchange programme. While in

New Zealand he will also be visiting Graeme Wake in Auckland before coming home via Australia.

The **Mathematical Finance Group** has cannily managed to employ two people on one appointment! They are:

Jeff Dewynne, who has been organizer of the part time MSc in Mathematical Finance since 1999, has handed over this onerous role to William Shaw and will now combine a little light lecturing on the MSc with a research position in Sydney (very convenient for Bondi Beach!). We expect to see him for three months each year.

Henrik Rasmussen was employed by J P Morgan until a few months ago but now combines teaching on the MSc with working for his own financial consulting company. He plans to spend about half his time in Oxford – divided between OCIAM and the Department of Continuing Education.

Next stop the Oscars

The Dartington House seminar room was transformed into a film studio recently when Aytac Ilhan, who has just joined the Mathematical Finance Group, recorded a lecture on options in incomplete markets. The reason was that she had been shortlisted for the FSS Best Student Research Paper award at the Informs 2004 Annual Meeting, an OR conference. Unfortunately the meeting was in Denver and clashed with important events here. So Aytac appealed to the organisers who asked her to send her presentation on a DVD instead. We filmed her talk and Tom Ralphs Laman edited it into a slick 20-minute video. Aytac is awaiting news of the competition, and now that documentary is mainstream cinema, she will doubtless be besieged by Hollywood agents looking for a blockbuster expose of the seamy world of equivalent martingale measures...

CHAT

Spider-Man 2 was released in June of this year. Did you all spot the brilliant but evil ‘Doc Ock’! Thank you to Christopher Viney who quickly alerted us the presence in our midst. A picture has now been posted on doors in the department to warn unsuspecting non-comic-book reading students.

Doc Ock has also been spotted in Puzzlemaster Chris Maslanka’s page in the Oxford Times. Could this be related to Chris’ afternoon visits to OCIAM, where

delicious mathematical cakes are wheeled in to facilitate brainstorming brain twisters?

‘Trials and graduate transfer rituals’

With a second slice of the best fruit cake¹ I have ever tasted, a cup of quite good coffee and surrounded by first class mathematical models, this should be heaven. But I am not happy, the door is shut and we cannot get out: Andrew Fowler and I are trapped by door handles that do not communicate with the bolt! Fear not, we have tools and many friends who begin to arrive along the corridor and try their respective bests. Bruce Malamud uses plastic, then over a metre of ace garroting wire [do not cross this guy – he produced the cable within seconds!], then a screwdriver. Time is passing, and the action man is not maladroit – the bolt has moved a little. Even surrounding timbers are removed by this very competent man. Hope rises, coffee and screwdrivers are exchanged between offices 10 metres vertically above a surface of death. Simultaneous action on the bolt from both sides of the door, but no further movement. Shall I have a sly go at a puzzle or an equation? Prof Turcotte’s talk and lunch are looming, and the “heavies” arrive from across the way. Locksmiths will cost both much time and money. A hammer is swung, heavily again, and one more direct clout succeeds where the finesse failed (a bridge too far). Andrew and I are out of jail (was it really an hour and a quarter). The secret ingredient is Guinness, whose bubbles are appreciated here for many reasons –but that is another story.

P.S. don’t tell the safety police that only a finger tip belayed our intrepid coffee relay over the precipice, but thanks guys, perhaps we should do this again!

¹cake supplied by Rachel Zammatt

John Norbury.

OCIAM - Comlab cricket match 2004

After many years of losing in the final over, the Smith willow has finally made its way into the OCIAM trophy cabinet. On a lovely summer's afternoon at the Lincoln ground we put the Comlab in to bat first. Some accurate bowling from Shehzad Ashraf, Charles Oakley, and Ben Hambly made life difficult for them at first. But then David Gavaghan and his partner built an innings off our captain's rather loose spin-bowling, and the francophone duo of Nicolas Jeannequin and Sadok Lamine brought them up to a total of eighty from twenty overs.

After excellent refreshments, organised by Marcus Tindall, we hoped that the Comlab would be sluggish in the field. However, our openers Robert Leese and

Charles Oakley found the going hard, with a difficult wicket and a slow outfield, and after eight overs the relatively small total was starting to look rather large. Things thankfully picked up after that, with Robert scoring thirty and retiring. Jon Chapman subsequently notched up a quick twenty, and although it came down to the last over the OCIAM side were ultimately victorious.