OCIAM

BULLETIN FOR MATHEMATICS IN INDUSTRY

MESSAGE FROM THE OCIAM DIRECTOR

OCIAM Know Yourself!

OCIAM has been growing tremendously over the last few years. Between students, faculty, researchers, and visitors, the Centre has now around 80 active members and many friends and collaborators around the world. The danger that we face is that we may lose contact between different groups. Over the next few issues of the Bulletin we will introduce some of the (informal) research groups that make up OCIAM. Because of the collaborative nature of all the research it is difficult to divide OCIAM into neat groups and even harder to fit any of its members into a single group but dividing by application area we can list the following:

- Physical Applied Mathematics
- Biology, Biomechanics, and Medicine
- Data and Networks
- Geosciences and the Environment
- Industry and Technology.

Underpinning these areas, we want to make sure that we keep developing theoretical tools and mathematical methods that cut across all these applications. These can be roughly divided into

- Continuum models and asymptotics
- Scientific computing
- Discrete mathematics

Since the inception of the Centre for Doctoral Training INFOMM in 2014 the interactions with industry have become much more extensive and more organised and in the next issue we will offer a glimpse of the huge variety of projects that these students have been working on. **AG**

CONGRATULATIONS TO...

Professor Sarah Waters, whose **Royal Society Leverhulme Trust Senior Research Fellowship** has just begun.

Professor Dominic Vella who won a **Philip Leverhulme Prize**. Dominic says, "The prize is nice recognition of some of the work that my group have been doing on elastic instabilities such as wrinkling and snap-through. It will allow me to focus a bit more on research in the next few years, since it provides for some teaching replacement."

OCIAM Visiting Professor Tom Mullin who has been awarded a two year Leverhulme Emeritus Fellowship. The project is on 'The effect of porosity on a scaffold in a rotating bioreactor' and began in September. He was also awarded an Honorary Professorship at the LSE in London this year.

Doctoral student **Roxana Pamfil** who was awarded second place, and **Helen Fletcher, Kristian Kiradjiev, Fede Danieli** were runners up in the **Take Aim competition** for UK.

Kristian Kiradjiev who was awarded the **Catherine Richards Prize for Early Career Mathematicians** for his excellent article 'Exploring Steiner Chains with Möbius Transformations'. The essay was published in 'Mathematics Today' Vol 53 No 6 December 2017 on page 272

EVENTS

PUBLIC LECTURES

Michael Bonsall
Professor of Mathematical Biology at the University of Oxford will talk on 'Scaling the Maths of Life' on **Wednesday 7th February at 5pm** in the Andrew Wiles Building, Mathematical Institute, (Lecture Room 1). To register and for more details click **here.**

The Reddick Lecture will be given by Lincoln Wallen Chief Technology Officer (CTO) of DreamWorks Animation. He will talk on 'Effective Mathematics: a disruptive technology in the era of the cloud' on **Friday 16th of February at 5pm** in the Andrew Wiles Building, Mathematical Institute, (Lecture Room 1). To register and for more details click **here**.

CONFERENCES

InFoMM's CDT Annual Meeting, will take place on **Friday 16th March** at St. Catherine's College. To celebrate InFoMM research this year there will be three talks by Oxford Academics, student talks, a poster session, and a keynote lecture by Alan Champneys. The day will conclude with drinks and dinner (for all who want to come). We hope that you'll sign up to come along, especially if you are supervising students. To register and for more details click **here**.

The 20th European Conference on Industrial Mathematics 2018, will be held in Budapest, from **18th – 22nd June**. The deadline for submissions of mini-symposia is January 19th - but contact Andreas Muench if you need more time. Further deadlines are 28th February for submission of posters, contributed talks, and 15th April for early bird registration. See **here** for details.

Oxford Summer School in Economic Networks' to be held in Oxford from **25th - 29th June**. The school, hosted by the University of Oxford Mathematical Institute and the Institute of New Economic Thinking, aims to bring together graduate students from a range of disciplines (maths, statistics, economics, policy, geography, development) to learn about the techniques, applications and impact of network theory in economics and development. To register and for more details click **here**.

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Mathematics and Mechanics: Natural Philosophy in the 21st Century. Notable mathematicians will discuss critical problems that arise in the modeling, analysis and predication of material behaviour. A conference hosted by OCIAM and Oxford Solid Mechanics (**OSM**) at the Mathematical Institute 24th – 27th June 2018. To register and for more details click **here**

DAVID CRIGHTON LECTURE

Will be delivered by **Professor David Abrahams** on the INI Cambridge on **'Mathematics, Metamaterials and Meteorites'** at 6:30pm on March 15th at the Royal Society, 6-9 Carlton House Terrace, London SW1Y 5AG. Register **here.**

STUDY GROUPS WITH INDUSTRY

Jan 29 - Feb 2	135th ESGI, Eindhoven University of Technology, The Netherlands.
Jan 29 - Feb 2	Mathematics in Industry, University of South Australia, Adelaide.
May 14-18	136th ESGI, Gran Sasso Science Institute, University of L' Aquila, Italy.
June 4-8	140th ESGI, Polytechnic Institute of Setúbal , Portugal. Email to register **here**.
June 11-15	137th ESGI, and first Danish-Norwegian Study Group, Norwegian University of Science and Technology, Alesund, Norway.
June 25-29	141st ESGI, University College Dublin, Ireland. Email to register **here.**
June 25-29	34th Annual MPI Workshop, Claremont Center for Mathematical Sciences, California.
June 26-30	Mathematics in Industry NZ (MINZ) Massey University, New Zealand.
July 16-20	138th ESGI, University of Bath, UK. Email to register **here**

Latest information is available at **Mathematics in Industry**

WELCOME

New Faculty Georgy Kitavtsev.
"I was born in Moscow where I did my undergraduate studies. I obtained my Phd in Mathematics from the Humboldt University of Berlin and Berlin Mathematical School. I continued my research as a postdoc at the Max Planck Institute for Mathematics in Sciences, Leipzig and the Bristol University before recently moving to Oxford as a Departmental Lecturer. My research interests are in the mathematics of complex fluids and materials science with applications to thin flows, nonlinear elasticity and nematic liquid crystals. Recently, I started to investigate related models in mathematical biology."

And Visitors…

Fei Jia, (Dec 2018) visiting from South Western University Department of Engineering, China. He works on wrinkling instabilities in solids with Alain Goriely.

Julia Gog, (Mar 2018) Professor of Mathematical Biology at DAMTP, Cambridge, will be working with collaborators in Zoology in Oxford on infectious disease dynamics and hopes to help make connections between our departments.

Daniele Cassese (Oct 2018)**, Malbor Asslani** (Jul 2018), and **Mridul Seth,** (Mar 2018) University of Namur, Belgium, join Professor Renaud Lambiotte. Daniele's research focuses on hypergraphs and homology for networked data. Malbor's research is on the extraction of information from Wikipedia.
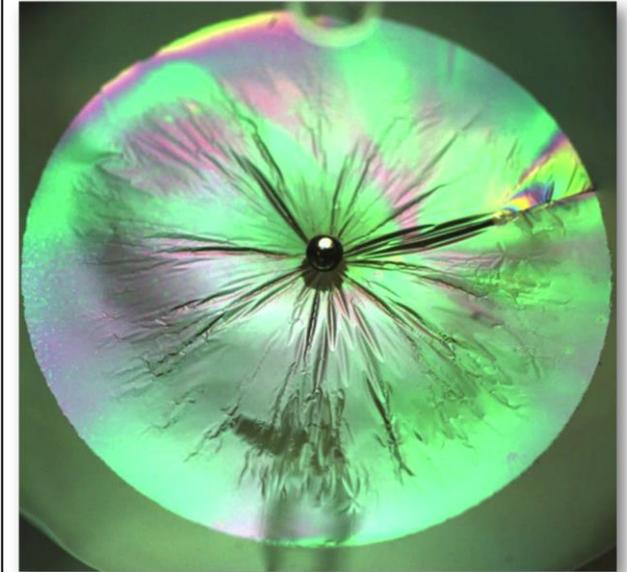
Dr. Roger Cropp (Feb 2018), Griffith University, Australia, is conducting research with Dr. John Norbury and Professor Irene Moroz on plankton modelling and Antarctic ecosystems.

Peng Wang (Mar 2018 – Mar 2019)**,** University of Jinan, China, is working on the integrability of mechanical systems with Professor Alain Goriely.

Julia Alberca Monzon (May – Jul 2018), École Supérieure de Physique et Chimie Industrielles, Paris, will work on the dynamic wrinkling of inflated sheets with Dominic Vella.

Welcome to our OCIAM Visiting Fellows, Apala Majumdar, Christian Bick, Philip Bond and **Mariano Beguerisse-Diaz**.

An entry from the **Maths Observatory** entitled "Wrinkly Impact" won a video competition held by the UK Fluids Network on the theme "The interface between fluid and solid mechanics". The video can be viewed **here.**

Book Review

The Calculus Story by David Acheson was published by OUP last year. Subtitled *A Mathematical Adventure,* this small book is a personal and very accessible introduction to calculus and hence much of applied mathematics. The chapters are very short and the material is presented in a deceptively simple way – often referring back to how and why ideas were first discovered. Newton and Leibniz become old friends of the reader as do many of the other characters that crop up. By the end it has gone from first steps in differentiation to the idea of chaos. David is always honest about the rigour of his methods but his approach is that of an applied mathematician – and most of those early mathematicians who developed calculus 'because it worked'.

OPPORTUNITIES

InFoMM CDT Call for Project Proposals. The EPSRC Centre for Doctoral Training in Industrially Focused Mathematical Modelling in Oxford is now looking for proposals for projects starting in 2018. All projects need to involve both an industrial partner and one or more Oxford academics. We are looking for around forty ten-week mini-projects and twenty three-year research projects. Interested industrialists should contact Jonathan Mason **masonj@maths.ox.ac.uk**. Examples of mini projects can be found **here.**

MI-NET is a European network which doles out small sums of money to support European activity in industrial maths. They are not receiving many applications so the chances of success (if your project satisfies the rules) are high. The next deadline is 28th February for funding conference grants, industrial workshops, training weeks and study group activities. Click **here** for details .

David Crighton Fellowships The David Crighton Fund provides support for research students and postdoctoral fellows working in applied mathematics and concerned with fluid mechanics, acoustics, waves and vibration to make short visits (2-3 months) to DAMTP, Cambridge. The deadline for applications is January 31. Click **here** for details .

The UK Fluids Network Short Research Visit scheme is open to any UK-based fluids researcher - academic or industrial, student to PI - who wishes to visit another individual or group around the UK for 1-2 weeks to initiate a collaboration, develop an idea or share expertise. Grants are up to £1,000 and cover costs of accommodation, travel and subsistence. The deadline for proposals is 31st January. The following round will close on 31st March.
The application process is quite simple, consisting of a short proposal and a letter of support from your host. See details **here**

Comments or contributions for the next Bulletin can be sent to ociam-admin@maths.ox.ac.uk by 15th April.