

# DES News

## Department of Engineering Science

June 2012 | Alumni and Friends quarterly newsletter | Number 15

### Dear Alumni and Friends

Semester 1 has come to an end. There is a flurry of exam marking around the Department as grades are processed. Once all the grades are finalised many staff will travel overseas for research collaborations or conference presentations. Matthias beat me to the airport and is at a conference in Beijing so I am writing this as Acting HOD.

The semester started with 35 new students being welcomed into the Engineering Science degree. This fills our capacity in that program and we have a waiting list of students wanting places. The Biomedical Engineering degree also attracted a high quality cohort of students. The Department of Engineering Science also hosts the new Master of Energy degree, this being the second year it has been offered. That program enrolled a diverse group of 25 new students in Semester 1. In May we farewelled last year's Part IV class via the University graduation ceremony at the Aotea Centre. Several of our talented postgraduate students also graduated, including Peng Du who received a Best Doctoral Thesis award from the Vice Chancellor.

We are looking forward to staying in contact with them as their careers, travels or further study develop. Professor Jim Denier joined our staff recently. Jim was most recently the Head of the School of Mathematical Sciences at the University of Adelaide. You can read more about his interests in fluid dynamics on page 4 of this newsletter.

NZ's Next Top Engineering Scientist competition is on the horizon for Semester 2 and we are looking forward to challenging the problem solving skills of the best and brightest students in the country. More details on the contest will be in an upcoming newsletter.

Associate Professor Rosalind Archer  
Acting Head of Department  
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### Congratulations Autumn 2012 graduates

#### Master of Engineering in Engineering Science with First Class Honours

Yi Chung Lim - University Doctoral Scholar

#### Master of Engineering in Engineering Science with Second Class Honours First Division

Daniel Martens

#### Master of Engineering in Engineering Science with Second Class Honours Second Division

Joshua Koh

Catherine Roberts

#### Master of Operations Research with First Class Honours

Kim Frew - University Graduate Scholar

Alexander Wilson

Photo (left to right): Dr Tom McKay,  
Dr Angela Lee, Dr Peng Du

### In this issue

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### Upcoming events

#### 11th International Conference Flow Processing in Composite Materials

<http://www.facultyconferences.auckland.ac.nz/uoa/fpcm11>

### Do you have news to share?

News on current staff and students is easy to obtain, because they're right here. News on wider family members - alumni and former staff - doesn't necessarily reach us. If you have something to share, email it to [desnewsletter@auckland.ac.nz](mailto:desnewsletter@auckland.ac.nz)



## **Bachelor of Engineering (Honours) with First Class Honours**

### **Biomedical Engineering**

Xiaoxiao Feng, Senior Scholar  
Prashanna Khwaounjoo  
Nikini Puhulwelle Gamage  
Tzu-Chin Yu

### **Engineering Science**

Jesse Collis  
Tet Chuan Lee  
Jeremy Minton  
Jonathan Munden  
Nicholas Simmons  
Faisal Wahid  
Amelia White, Senior Scholar  
Zeng Zhuo

## **Bachelor of Engineering (Honours) with Second Class Honours First Division**

### **Biomedical Engineering**

Ho-Fung Chan  
Wilson Fok  
Zan Mazharullah  
John Hyun Park  
Renji Sun

### **Engineering Science**

Jason Drake  
Kathleen Gilbert  
Matthew Kingston  
Kwan-Ann Lim  
Uttara Nataraj  
Kien Seng Swee

## **Bachelor of Engineering (Honours) in Biomedical Engineering with Second Class Honours Second Division**

Chloe Irwin Whitney

Yicheng Xiao

## **Bachelor of Engineering**

### **Biomedical Engineering**

B Arthi Sunkari  
B Xiaoming (David ) Wang  
B Meng Ting Wu

### **Engineering Science**

Benjamin Chow  
Leighton Duke  
Zhenghui Han  
Hanieh Sanei  
Kevin Tang

## **Bachelor of Engineering (Honours) (Conjoint) with First Class Honours, Engineering Science**

Denis Helm (BCom BE Honours)  
Sherry Hsu (BA BE Honours)  
Scott Priestley (BCom BE Honours)

## **Bachelor of Engineering (Honours) (Conjoint) with Second Class Honours First Division, Engineering Science**

Min Gih Choi (BA BEH)

## **Bachelor of Engineering (Honours) (Conjoint) with Second Class Honours Second Division, Biomedical Engineering**

Anuprita Arora (BCom BE Honours)

## **Our alumni who studied within the Auckland Bioengineering Institute (most with DES staff) and elsewhere**

### **Doctor of Philosophy in Bioengineering**

Peng Du (BME, Class of 2007) - University Doctoral Scholar  
Angela Lee (BME, Class of 2006) - University Doctoral Scholar  
Thomas McKay (BME, Class of 2004)  
Yang (Vicky) Wang (BME, Class of 2006)



### **Featured Alumni**

#### **Sam Gordon, Class of 2006**

I've taken an unusual path since finishing my Engineering Science degree in 2006. I joined the interdisciplinary MSc in Environmental Change & Management at Oxford University, where I completed a dissertation on shipping, spent around a year and a half in the Environmental Team for Tesco, the largest supermarket chain in the UK, and now starting my own business to design and run graduate schemes in London. So I've moved around! But am still a problem-solver at heart.

My time in the department still influences me in two ways. The first is through STEPS, the voluntary mentoring scheme that I set up while I was here. The success of that concept prompted me to try something similar at Oxford, in the form of alumni-student mentoring, and a small scheme is now running there as well. The STEPS experience is also a major driver behind the business I'm currently building - First Year In.

The second and more direct influence is the ability to solve complex problems. Being able to understand both the big picture and the detail of a problem is extremely rare, and a part of Engineering Science teaching that has been incredibly valuable. Environmental problems have subtle and multi-faceted drivers, and so you need both a breadth and depth of understanding to be able to make an impact.

Right now I'm pursuing two passions: personal development and sustainable development. Please do drop me a line if you'd like to chat about either.

[motivated.sam@gmail.com](mailto:motivated.sam@gmail.com)

## Master of Engineering in Bioengineering with First Class Honours

Evan Blumgart (BME, Class of 2009)

Elizabeth Theakston (BME, Class of 2009)

## Master of Engineering with Second Class Honours Second Division in Bioengineering

Helvin Lui (BME, Class of 2009)

## Master of Engineering Studies with Second Class

## Honours First Division

Ana Basabas in Medical Devices and Technologies (BME, Class of 2010)

### Notes:

University of Auckland Graduate Scholarships are for the highest achieving postgraduate students at Doctoral, Masters, Honours, Postgraduate Diploma level.

Senior Scholar Awards are for the top students in each undergraduate degree programme who have achieved the highest overall grades.



Above: Mass of St Cecilia performance, St Peters Anglican church, photo credit Ruth Ames

## The Secret Life of an Associate Professor

At the Department of Engineering Science Rosalind Archer lectures on Matlab to undergraduate classes of 350 students or more and sometimes describes it as "theatre". What many people don't realise is that Rosalind frequents the stage in quite a different context. Rosalind is an avid contemporary dancer and is often involved in classes and rehearsals four (or more!) times a week. She attended dance classes in New Plymouth until age 16 when injury and illness meant dance vanished from her life. Rosalind returned to dance class as a "mature student" a year after returning to New Zealand to start work as a lecturer in the department. Since then she's trained to teach children's creative contemporary dance classes which she runs in Mt Eden (Arioso Dance Studio). In 2011 Rosalind used a day's annual leave to donate time to the Sacre project. She worked with the project's choreographic team for a day as they created a unique dance work to Stravinsky's Rite of Spring which was performed by 180 children on stage at the Aotea Centre. Many of the children had never listened to classical music or taken a contemporary dance class before.

Rosalind attends Saturday morning dances at Unitec which are predominantly attended by professional performers. In the past few years Rosalind has performed publically at a number of venues including Maidment Studio Theatre, the gardens of the Pah Homestead, St Peters Anglican church and the Auckland Performing Arts Centre at Western Spring. Many of these performances have been as part of Poyema Dance Company (run by Jennifer De Leon).

## Training Teaching Assistants

### Jim Greenslade

Engineering Science was one of three engineering departments involved in a pilot program to train and accredit Teaching Assistants within the Faculty of Engineering. Director Undergraduate, Martin Shepherd, coordinated staff from Chemical and Materials Engineering, Electrical and Computer Engineering, the Centre for Academic Development and Faculty Administration during the full day course, which was held on 20 February.

Over 90 Graduate and Part IV Teaching Assistants attended and reported a high level of appreciation for what they had learned. They were encouraged to continue to develop teaching skills through practice and to remain reflective about their roles as markers, tutors and lab teachers.

The day began with a welcome from the Dean, who thanked the attendees for their willingness to contribute to teaching within the Faculty and emphasised that their role was a very important part of the overall teaching effort.

Four Faculty Teaching Award winners then spoke about their experiences, not only as lecturers but also about how time spent as teaching assistants had helped in the

development of the academic career paths they have since followed. Two of these presenters were Engineering Science lecturers Associate Professor Rosalind Archer and Peter Bier.

Parallel workshops were then conducted covering the three areas of Marking and Formative Assessment, Tutoring, and Teaching in Labs. These one hour sessions were repeated three times as participants were expected to attend all areas in order to receive their accreditation. Each workshop was facilitated by an academic from Engineering and an Academic Advisor from CAD. One of the facilitators for the marking sessions was Jim Greenslade, who manages Teaching Assistants for Engineering Science.

A closing plenary session was convened by our Associate Dean Teaching and Learning, Dr Gerard Rowe, and Head of the Academic Practice Group, Dr Ian Brailsford. The session concluded with the presentation of Teaching Assistant Accreditation Certificates (one participant quipped "it looks more impressive than my degree from back home") and refreshments. The next accreditation day will be held in the week prior to Semester 2.





## New Staff

### Professor Jim Denier

I was educated at the Universities of Melbourne and UNSW and have been variously employed in Universities in the UK and Australia.

My main research area is in fluid mechanics and I'm particularly interested in boundary-layer flows and how they transition to a turbulent state.

Until recently I was Head of the School of Mathematical Sciences at the University of Adelaide where I also led the Theoretical and Applied Mechanics group.

I've represented Australia on the General Assembly of the International Union of Theoretical and Applied Mechanics for a number of years but now, having moved countries, have to find something else to do with my time.

## Jim Denier - Research Interests

Although I work in the broad area of fluid mechanics a particular focus, and one I keep finding myself returning to again and again, is the issue of how fluid flows become turbulent. Turbulence is ubiquitous in many of our interactions with the material world, whether it be turbulent gusts of wind we feel on our skin, in the turbulent flow over cars and planes or even in the turbulent flow of blood within parts of our body. In many cases, turbulence is seen as detrimental (for example, through an increase in drag) and something to be controlled. Before we can control turbulence (or its generation) we must first understand how fluid flows change from a laminar state to a turbulent state. Much of my research has been focussed around this very problem, seeking to understand how small environmental disturbances (such as a slight imperfection on an otherwise perfectly smooth surface) may help to promote turbulence. Through a detailed understanding of how such "instabilities" develop we will be able to develop programs of active control of turbulence.

There are, of course, other areas where active control is not possible but where similar questions arise. One such problem that my group is currently working on comes from interactions with colleagues in one of the major hospitals in Adelaide where pathologists are interested in developing a deeper understanding of the effect of coiling in the umbilical cord on such things as mortality and fetal development. Our involvement is to model the flow of blood through the umbilical cord, which often exhibits complex coiling geometries, and to use this model to explore the effect of the coiling (both the geometry and amount of coiling) on the flow. Our aim is to develop an understanding of how coiling affects the fluid transport and to use this to provide insight into many of the, as yet, poorly understood known pathologies.

Footnote: This umbilical cord project is being undertaken with a PhD student at the University of Adelaide.

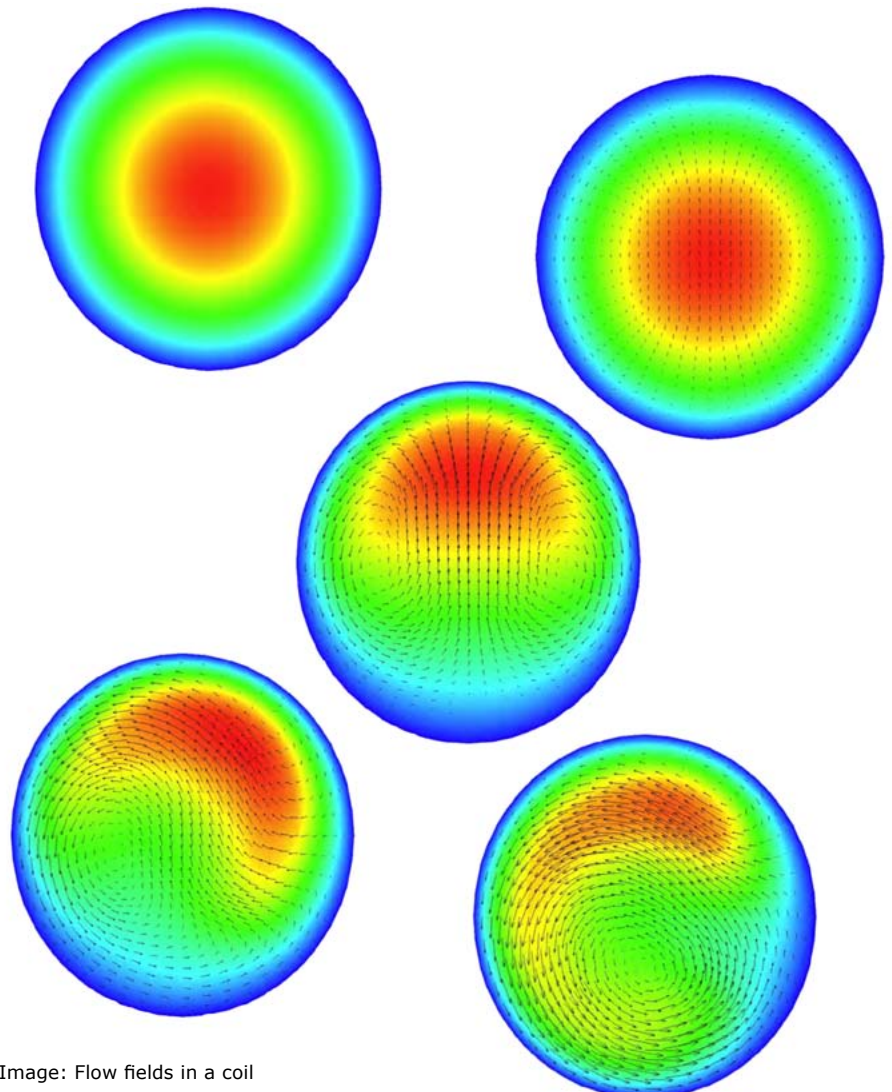


Image: Flow fields in a coil