

# Newsletter

## Mathematics & Statistics

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### GRADUATION – APRIL 2009



Congratulations to our graduates (L to R: Hamish Silverwood, Jessica Pawson, Piers Lawrence, Jayne Gulbransen, Joe Zhu, Sam Galbraith, Ash Lightfoot, Shakira Suwan and Kyoko Fukuda.  
(More photos inside)

## HoD NEWS

Welcome to Term 2! A big item this term will be to get the 15-point changes for our whole teaching programme discussed and through the Department, and then through the various faculties.

An ad hoc subcommittee of the Research Committee met recently to consider applications for research initiatives and I'm pleased to announce that the following applications were successful:

1. Douglas Bridges - support for joint work with Dr Hannes Diener
2. Jennifer Brown – research visit to the Université de Pau & Pays de 'Ardour, France
3. Ben Martin – partial support for visit by Professor Jasbir Singh Chahal
4. Charles Semple – support for joint work with Dr Peter Humphries
5. Phil Wilson – partial support for a research visitor

Ben Martin has already commented on the Academic Board this week, but one extra item of news from that meeting is that the Vice-Chancellor spoke on the continuing work on UC's strategic direction. The Senior Management Team and Council are working on this and, later in the year, maybe July or August, some of these ideas will be brought to the Board and the remainder of the university for comment. Dr Carr said that strategic plans involve hard choices – they change and redefine the institution but also have the potential to be wrong. This, of course, is not found out until some time later. He also pointed out that strategic plans differ from those operational and implementational plans, for which choices have to be made.

The other big event around the University this week was the NZi3 opening. It was quite a grand affair, with the Prime Minister John Key opening the building. We have one PhD student, Meghan Williams, working in that building.

Last, but by no means least, congratulations and thanks to Bob Broughton, who completed 42 years' service to the University last month. The Department will be holding retirement drinks and nibbles in the staff room on 28 April, followed by a formal dinner in May. Bob has now been appointed an Adjunct Senior Fellow and will continue his teaching and administrative roles for the remainder of this year.

- David Wall

## PAPER SUBMITTED

**Raazesh Sainudiin & Tanja Stadler:** *Markov lumpings of the Kingman-Tajima  $n$ -coalescent* - UCDMS Research Report 2009/4, pp1-53, 5 April 2009. (Submitted to Electronic Journal of Probability.)

## PAPER ACCEPTED

**Bradley B A & Lee D S:** *Accuracy of approximate methods of uncertainty propagation in seismic loss estimation* (Structural Safety)

**Lin J, Parente J D, Chase J G, Shaw G M, Blakemore A, Le Compte A J, Pretty C, Razak N, Lee D, Hann C E & Wang S H:** *Development of a model-based clinical sepsis biomarker for critically ill patients.* (7<sup>TH</sup> IFAC Symposium on Modelling and Control in Biomedical Systems, Aalborg, Denmark, 12-14 August 2009 – invited.)

## PAPERS PUBLISHED

**Josef Berger & Douglas Bridges:** *The fan theorem and positive-valued uniformly continuous functions on compact intervals* (New Zealand J. Math. 38, 129-135, 2008). Did not appear until March 2009.

**D S Bridges & L S Vita:** *A constructive theory of apartness on lattices* (Scientiae Math. Japon. 69(2), 187-206, 2009)

**Iris Loeb:** *Indecomposability of Negative Dense Subsets of  $R$  in Constructive Reverse Mathematics* (Logic Journal of IGPL 17: 173-177, 2009)

## **BOB BROUGHTON – LOOKING BACK ON 42 YEARS’ SERVICE**



Bob Broughton came to the University of Canterbury in November 1967 (by ship) from the University College of North Wales (Bangor), having been appointed as the ninth member of staff of this Department. There were still seven vacancies when he arrived so he was immediately put to work on five full courses at 1st, 2nd, 3rd and honours level. This was like being thrown in the deep end for a 24 year old straight from university. As a computational mathematician with a background in Algol on an Elliot 803 computer, he took on the role of IT co-ordinator and systems analyst, and, eventually, IT Manager. Bob has thoroughly enjoyed the many challenges involved in establishing, with limited funds, the Department IT system with his fellow IT fanatics and a great technical staff. He recalls the changes from punched paper tape and cards, serial terminals, hand-cranked calculators through solid state electronic calculators to HP scientific and then programmable calculators, a series of UNIX machines, and being presented with a roll of Ethernet cable to wire up the old building (including crawling round the under-floor space).

Bob recalls the enduring friendships he made through teaching Engineering Mathematics. In those days Dr Mary Harding ruled and was much beloved by the Engineering students. Bob taught accountants (in suits) in the evenings in the old room D on the town site (now the air space in the Court Theatre). He also recalls four 8am lectures a week with a computer science and a numerical course. Despite the workload, he found the Department to be a great place to work in and, as more staff arrived, it became a wonderfully collegiate environment.

In 1973 Bob went on leave to Essex University where he completed a second Masters degree, with Professor Charles Broyden, a world leader in numerical linear algebra. On his return to Canterbury, he introduced modern applied linear algebra courses to this Department. He notes that in many instances he worked up numerical course notes, often from journal articles, to be subsequently pleased when the numerical gurus produced textbooks mirroring his efforts.

Bob has had a long connection with mathematical education and served on the former National Curriculum Steering Committee for many years, being heavily involved in syllabus construction for the Mathematics Bursary courses. He co-authored textbooks and was an examiner for Bursary Applied Mathematics and Chief Examiner for the NZEST Scholarship Mathematics with Statistics paper for 5 years. He also introduced the innovative Keller Plan teaching programmes in his courses and recalls the exceptional student response.

In 1982, as a result of attending an international workshop on numerical mathematics in Toronto, Bob brought MATLAB to New Zealand and instituted a teaching programme using MATLAB here at Canterbury.

In addition to his teaching duties, Bob has been our Library Liaison Officer for the past 30 odd years and takes considerable satisfaction at the current state of the Mathematics and Statistics collection. As Chair of the Facilities Committee, Bob has been heavily involved in the administration of this building, including the planning and monitoring of the Erskine building project itself. He has also been secretary of the staff club. On the sporting side, he has had many years of involvement with soccer, as a player, coach and administrator, and is still actively involved in social tennis.

Memorable characters during Bob's time with the Department range from the larger-than-life HoD Professor Gordon Petersen to Hubert, the equally large cat who lived in the old Maths Building alongside an English sheepdog and sundry rats, courtesy of the neighbouring Psychology Department! He remembers a very social department with regular tennis sessions, office cricket, interdepartmental cricket and bridge contests, and on a more cultured note, morning and afternoon tea breaks in the old common room with such doyens of the NZ art world as Bill Sutton, Doris Lusk, Don Peebles and Tom Taylor. On a sadder note Bob recalls the pain felt with the tragic losses of colleagues who passed well before their time – Peter Bryant, Brent Wilson and Derrick Breach.

Bob feels the years have flown by and suddenly it is time. He bows out in the knowledge that the Department is in good hands with the enthusiasm and abilities of the new generation of staff. Despite his official retirement, Bob is not lost to us yet. He remains as an Adjunct Senior Fellow and will continue with teaching and administrative commitments for the rest of this year in a temporary capacity.

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## CONFERENCES & VISITS

**Rick Beatson:** research visit to Ross Vennell and conference talk, Otago University, 31 March 2009

**Ian Coope:** to give a talk at the 1<sup>st</sup> PRIMA Congress, University of NSW, Sydney, 6-10 July 2009

**Liene Daukste:** to give a talk entitled *A multi-compartment, two-population model of cancer cell growth; transfer from in vivo to in vitro* at the Workshop of Mathematical Modelling in Biology and Medicine, Interuniversity Centre, Dubrovnik, Croatia, 27 April – 2 May 2009

**Miriam Hodge:** to give a talk entitled *Improving the calculation of observation rate bias* at the International Workshop of Statistical Modelling, Ithaca, New York, 20-24 July 2009

**Rua Murray:** to give a talk at the 1<sup>st</sup> PRIMA Congress, University of NSW, Sydney, 6-10 July 2009

**Peter Renaud:** to give a talk entitled *On the interpretation of spin  $\frac{1}{2}$  Dirac particles in Clifford algebras* at the 1<sup>st</sup> PRIMA Congress, University of NSW, Sydney, 6-10 July 2009

**Raazesh Sainudiin:** invited by the research group CAPA (Computer Aided Proofs in Analysis) at the Department of Mathematics, Uppsala University, Sweden, to work on the project *Rigorous parameter estimation in non-linear systems with machine-representable sub-sigma algebras*. The invitation covers subsistence costs for up to a month. This is a formal collaboration between CAPA and our Department's LMSE (Laboratory for Mathematical Statistical Experiments) <http://www.math.canterbury.ac.nz/lmse/>.

**Peter Smith:** to give a talk at the ICC conference, Dresden, 14-18 July 2009

## GRADUATION



*Phil Wilson and PhD graduate Kyoko Fukuda*



*PhD graduate Jean Gong*

## GRADUANDS' AFTERNOON TEA



*David Wall & Hamish Silverwood*



*Friends and Supporters*



*Jayne Gulbransen, Joe Zhu & Scott Graybill*



*Piers Lawrence & Ash Lightfoot*



*Sam Galbraith & friends*

**CONGRATULATIONS** to Mareike Fischer on her successful PhD oral examination earlier this month. Mareike, who had four offers of postdoctoral fellowships in different parts of the world, has accepted a postdoctoral position commencing in June at the University of Vienna with Professor Arndt von Haessler's bioinformatics group. In the meantime, she is attending the Mathematics and Evolution meeting in Port Elliot (a beach near Adelaide) and spending some time exploring Australia.



L to R: Phil Wilson, Rua Murray, Mark Hickman and David Wall

### **PROBLEM CORNER**

The last problem, proving that a rational-sided equi-angular pentagon must be regular, was very skilfully solved by student Thomas Heyang Li. Well done, Thomas!

This week's problem is an oldie but a goodie:

Draw a diagram with three unit squares abutting in a line (making a 3 x 1 rectangle). Sequentially label the lower vertices A, B, C, D and the top ones E, F, G, H.

Prove that:  $\text{angle HCD} = \text{angle HBD} + \text{angle HAD}$ .

Of course, this is easily solved by trigonometry. The problem is to solve it using only Euclidean geometry.

The chocolate fish will go to the LEAST TRIGONOMETRICAL proof!

- W Taylor