

## Emeritus Professor Roy Kerr awarded Einstein Medal

University of Canterbury Emeritus Professor Roy Kerr has become the first New Zealander to be awarded the Einstein Medal by the Albert Einstein Society in Switzerland.

Professor Kerr has earned the award for his 1963 discovery of a solution to Einstein's gravitational field equations. The Kerr Solution, as it has come to be known, provides an exact description of the space outside a rotating black hole. With over 100 million trillion black holes in the observable universe, his achievement has been of crucial importance for science.

Professor Kerr's solution has already been recognised by the Royal Society, which awarded him its Hughes Medal in 1984, and by the Royal Society of New Zealand which awarded him its Hector Medal in 1982 and its Rutherford Medal in 1993.

The medal is awarded annually by the Einstein Society, which is based in Bern, Switzerland, where Einstein completed his revolutionary work in the first decade of the 20th century.

The Einstein Medal will be awarded to Professor Kerr at a ceremony at the University of Bern in May next year.

Professor Kerr retired from his position as Professor of Mathematics at the University of Canterbury in 1993 after having been here for twenty-two years, including ten years as the head of the Mathematics department.

The medal was first awarded to Stephen Hawking in 1979 and, since then, many distinguished scientists have received the medal including six Nobel laureates.

### HOD's Foreword

Welcome to the second issue of our Mathematics and Statistics Alumni Newsletter. As the end of year approaches, we look back at a difficult but also a successful year: there were no significant seismic events, after nearly a year in temporary and shared offices department staff moved back into their old offices in February in time for the start of term 1, staff were successful with two new Marsden grants and a Rutherford Discovery Fellowship and received many other distinctions, and we had a great many outstanding students.

The following pages will keep you up to date with events and developments in the Department of Mathematics and Statistics during 2012. I thank you for your continued interest in and support of the department and wish you all a Happy New Year.

*Gunter Steinke*  
Acting Head of Department

### Congratulations

Congratulations to those students who graduated, or were eligible to graduate, in December 2011 & April 2012.

#### December 2011

Rachael Tappenden: PhD (Statistics)

Sanaa Bajri: MSc (Mathematics)

James Bartlett: BSc(Hons) Mathematics

Heyang Li: BSc(Hons) Mathematics

James Williams: BSc(Hons) Mathematics

James Hadfield: BSc(Hons) Mathematics

Nuradilla Azhari: BSc(Hons) Statistics

Fiona Morrison: BSc(Hons) Statistics

Timm Treskatis: BSc(Hons) Computational and Applied Mathematics

Yang Hu: Postgraduate Diploma in Science (Statistics)

Clyde Bowes: BSc (Mathematics)

Mason Giles: BSc (Mathematics)  
 Remi Pearce: BSc (Mathematics)  
 Farahanim Zahri: BSc (Mathematics)  
 James Hadfield: BSc (Mathematics)  
 Hao-Cheng Hsu: BSc(Mathematics)  
 Stacey Helm: BSc (Mathematics and Chemistry)  
 Robin Candy: BSc (Mathematics and Computer Science)  
 Steven Ridley: BSc (Mathematics and Electronics)  
 Rebecca Dames: BSc (Mathematics and Philosophy)  
 Nicholas McCartin: BSc (Mathematics and Philosophy)  
 Catherine Neill: BSc (Mathematics and Physics)  
 Mohamad Ainan Bin Mohamad Annual: BSc (Mathematics and Statistics)  
 Ryan Buchanan: BSc (Statistics)  
 Jiani Che: BSc (Statistics)  
 James Cho: BSc (Statistics)  
 Man Kwan Mok: BSc (Statistics)  
 Parin Piphatthakosonsuk: BSc (Statistics)

#### April 2012

Anna MacDonald: PhD (Statistics)  
 In Kang: PhD (Statistics)



James Duley: MSc (Mathematical Physics)  
 Edwin Flores: BSc(Combined Hons) Mathematics and Computer Science  
 Evan Williams: BSc(Hons) Statistics  
 Amanda Hughes: BSc(Hons) Statistics  
 Brendon Bycroft: BSc(Hons) Mathematics  
 Ilaisaane Vehekite: BSc (Statistics)  
 James Dyer: BSc (Computer Science and Mathematics)  
 Nicholas Stringer: BSc (Mathematics and Chemistry)

Micheal Dolan: BSc (Mathematics)  
 Scott Thomas: BSc (Astronomy, Biochemistry and Mathematics)  
 Mihai Tataru: BSc (Computer Science and Mathematics)  
 Steven Job: BSc (Mathematics)  
 Kieran McCartin: BSc (Mathematics)  
 Rosalia Rohwer: BSc (Mathematics)  
 Safa Osman: BSc (Mathematics)  
 Guowei He: BSc (Mathematics and Physics)  
 Daniel Lau: BSc (Statistics)

## Recognition of Academic Excellence

Rutherford Discovery Fellowship Awarded to Maths Academic.



Dr Clemency Montelle (seen here with the Hon Stephen Joyce) has been awarded a 5-year \$800,000 Rutherford Discovery Fellowship to look at the benefits of historical Mathematics, Astronomy and Science in India.

Despite an intellectual history spanning almost 3,000 years and 30 million manuscripts having been produced over this time, India's intellectual contribution to science remains largely absent from mainstream historical accounts. Clemency's expertise in ancient languages including Sanskrit, coupled with her mathematical background, will enable her to work with those ancient documents to make them accessible to researchers around the world.

With New Zealand seeking to strengthen its relations with India, the ramifications of contributing to that country's heritage and the accessibility of its historic resources cannot be overestimated. Her project is in line with recent governmental strategies to enhance educational links with India. For example, the Government has welcomed the new NZ-India Research Institute. Also, the India-New Zealand Education Council recently held its inaugural meeting in Delhi to discuss how to boost co-operation between the two countries.

In a recent interview, Clemency said that "this is a unique opportunity for the University of Canterbury to assume a lead role in such research and she looks forward to forging new and important relationships with key Indian tertiary institutions such as IIT-Mumbai and the Chennai Mathematical Institute".

This is the second time a researcher associated with the department has been awarded this prestigious fellowship. Dr Chris Hann, a former student and PhD graduate of the department was a recipient of the Rutherford Discovery Fellowship in 2010.

## Congratulations to our 2011 and 2012 Department Prize Winners

### 2011

Heyang Li (Cook Memorial Prize)  
 Matthew Grice (Page Memorial Prize)  
 Alex Warnaar (Peter Bryant Memorial Prize 100-level)  
 James McKay (Peter Bryant Memorial Prize 200-level)  
 Sophia Di (Gordon Petersen Memorial Prize)  
 Irene van Woerden (Helen Wily Memorial Prize)  
 Simon Todd (W B Wilson Memorial Prize)  
 Robert Prendergast (Statistics New Zealand Undergraduate Prize)

### 2012

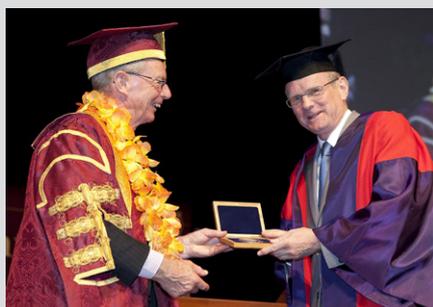
Benedict Morrissey (Page Memorial Prize)  
 Yun Hee Choi (Peter Bryant Memorial Prize 100 level)  
 Amy Rice & Lawrence Dam (Peter Bryant Memorial Prize 200 level- shared)  
 Hadleigh Frost (Gordon Petersen Memorial Prize)  
 Sophia Di (Helen Wily Memorial Prize)  
 Jamie de Jong (W B Wilson Memorial Prize)  
 James Spray (Statistics New Zealand Undergraduate Prize)  
 Simon Todd (Cook Prize)

## Top UC Accolade for Mathematician

Professor Douglas Bridges was awarded the 2011 University of Canterbury Research Medal, the university's premier research award, in December 2011.

University of Canterbury mathematician Professor Douglas Bridges was awarded one of the University's highest honours during UC's Dec 2011 graduation events.

Professor Bridges was presented with the University of Canterbury Research Medal, the University's highest recognition for an



outstanding contribution to academic and scholarly research, during the graduation ceremony on the afternoon of 14 December 2011.

Professor Bridges has made prolific contributions to mathematics, placing him at the forefront of academic excellence in that discipline, both in New Zealand and internationally. During his career Professor Bridges has established himself as a leading authority in the field of constructive mathematics.

A graduate of Edinburgh, Newcastle and Oxford universities in the United Kingdom, Professor Bridges is Professor of Pure Mathematics at UC. He joined the staff at the University in 1999 after holding chairs at the University of Buckingham, England, and at the University of Waikato.

Professor Bridges' work has been recognised worldwide. In 2000 he was appointed a Fellow of the Royal Society of New Zealand and four years later was elected a Corresponding

Fellow of the Royal Society of Edinburgh. In 2006 an international conference was held in Bavaria in his honour and further tribute was paid through a special edition of the Journal of Universal Computer Science. However, perhaps the strongest international endorsement of Professor Bridges' work came in 2000 when he was awarded a higher doctorate, a Doctor of Science, from Oxford University.

Professor Bridges' enthusiasm for his subject has resulted in a prolific output of more than 170 research papers and eight books. Two of his books – Constructive Analysis (published in 1985) and Varieties of Constructive Mathematics (published in 1987) - are regarded as indispensable references for those working in the field of constructive analysis and are widely cited.

More recently, Professor Bridges has been working in a relatively new area of mathematics, constructive reverse mathematics.

## Marsden Grants 2012

In the 2012 round of the Royal Society of NZ/Marsden Fund Awards, Professors Mike Steel and Charles Semple secured 3 years' funding for their project on *Genetic jigsaws with missing pieces; mathematical challenges for piecing together evolution from patchy taxon coverage*.

Dr Maarten McKubre-Jordens was also successful with his Fast-Start Grant proposal *Non-classical foundations of analysis*.

In late 2011, Dr Michael Plank received a grant over three years for his project on cell invasion. His research will develop new mathematical theory for the microscopic interactions underpinning physiological processes.



Professors Charles Semple and Mike Steel

## Student Successes



**James Williams**, seen here with US Ambassador Huebner, graduated BSc(Hons) in Mathematics last year and is now studying for a PhD in Applied Mathematics at Yale University after receiving a Fulbright Ministry of Science & Innovation Graduate Award.



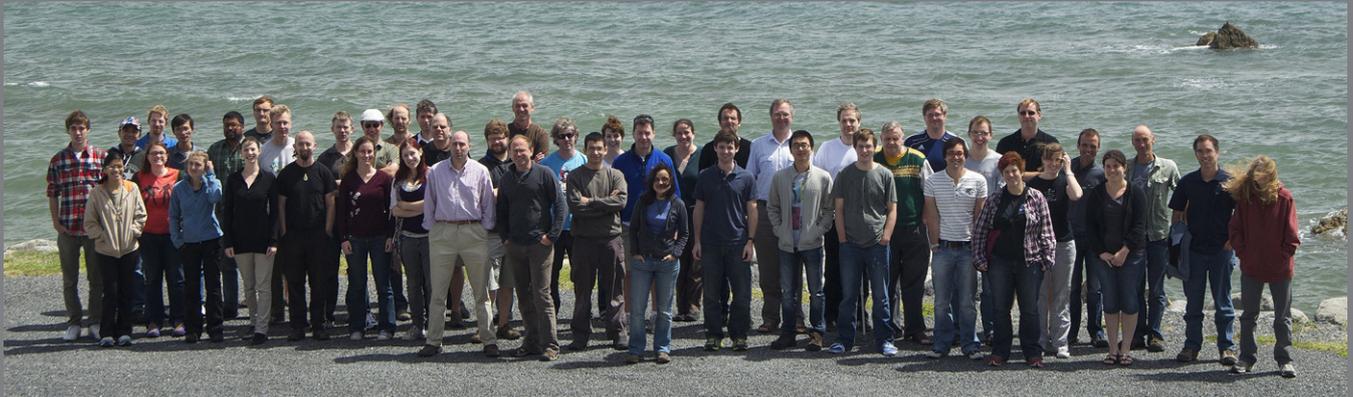
**Dr Anna MacDonald**, with supervisor Dr Carl Scarrott on the occasion of her graduation in April. Anna is now working for Statistics New Zealand.



**Dr Rachael Tappenden** with her supervisors (L to R) Ian Coope, Peter Renaud and Bob Broughton. Since her graduation last December, Rachael has been working in a research position at Edinburgh University.

Former student **Dr Tim Candy** (MSc 2009) was awarded a Chapman Fellowship at the Imperial College London after completing his PhD at the University of Edinburgh.

2012 Mathematics and Physics Honours student **James Bonifacio** has been awarded a Rhodes Scholarship to study for a PhD in Theoretical Physics at Oxford University.



## 16<sup>th</sup> Annual Phylogenetics Conference in Kaikoura

The 16<sup>th</sup> Annual NZ phylogenetics conference, with 55 participants from 11 countries, was held at the University of Canterbury's Edward Percival Marine Laboratory in Kaikoura from 28 January – 3 February.

It was organised by Mike Steel and Charles Semple. The conference brought together leading experts and students to discuss the latest questions on how best to use genetic data to understand the history and interconnectedness of life on the planet.

About half the participants are mathematicians or statisticians and the other half are biologists.

## Staff News

### Comings & Goings

**Patrick Saart** joined us in 2011 as a fixed term lecturer in Statistics, which was converted to a continuing position in 2012. A resident of Christchurch, he obtained a PhD in statistics at the University of Western Australia. His specialty is in Econometric Theory and Financial Mathematics.

**Ngin-Tee Koh** came to us from the U.S. He is a PhD graduate of the University of Illinois in Urbana-Champaign, and held postdoc positions at University of Syracuse and Ohio State University. He specialises in complex and geometric analysis.

After holding a joint appointment in Electrical & Computer Engineering and Statistics for a number of years, **Peter Smith** has returned full time to the Department of Electrical and Computer Engineering.

**Richard Brown** finished a fixed term lecturing position in the department at the end of 2011. He is currently at Bluefern Computing based elsewhere on campus.

**Julie Daly**, our former Administration Manager, has departed for pastures new after a lengthy association with the department.

**Xin Zhao** held a post-doctoral fellowship with Marco Reale, but decided to leave the department to take up a new position at JADE earlier this year.

**Ben Martin** left us late last year to take up an Associate Professorship at The University of Auckland.

## 1<sup>st</sup> Annual Canterbury Statistics Open Day



The 1<sup>st</sup> Annual Canterbury Statistics Open Day was held at the Department of Mathematics and Statistics, University of Canterbury on 2<sup>nd</sup> November 2012.

It was organized by Patrick Saart, Jennifer Brown and Peter Jaksons. The event brought together more than 60 statisticians, mathematicians and biometricians from all over Canterbury region, who work on various areas of statistics. There were 12 presenters including an invited speaker, Professor Thomas Lumley of Auckland University. As it was the first time such an event was organized in Canterbury, the purpose was to give people in the area opportunity to interact and to introduce themselves and their research to enable further collaborations.

### Promotions

Congratulations to our academic promotions candidates, all of whom were promoted: **Marco Reale** to Associate Professor; **Mike Plank** to Senior Lecturer above the bar; **Miguel Moyers** to Senior Lecturer.

### Congratulations

Congratulations to Professors **Mike Steel** and **Jennifer Brown** on their elections to international bodies.

Mike Steel has been elected to the Council of the Society of Systematic Biologists (by the largest number of votes). The Society of Systematic Biologists is an international scientific body that helps to organize the annual Evolution meetings, normally held in North America;

manages the journal Systematic Biology; and awards prizes and grants to students and Postdoctoral Fellows.

Jennifer Brown has been elected as a new International Statistical Institute member. Elected membership involves being nominated by another elected member and being supported by three other elected members. There are 14 elected members from New Zealand.

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