Newsletter
Mathematics & Statistics

UC | UNIVERSITY OF CANTERBURY
Te Whare Wānanga o Waitaha
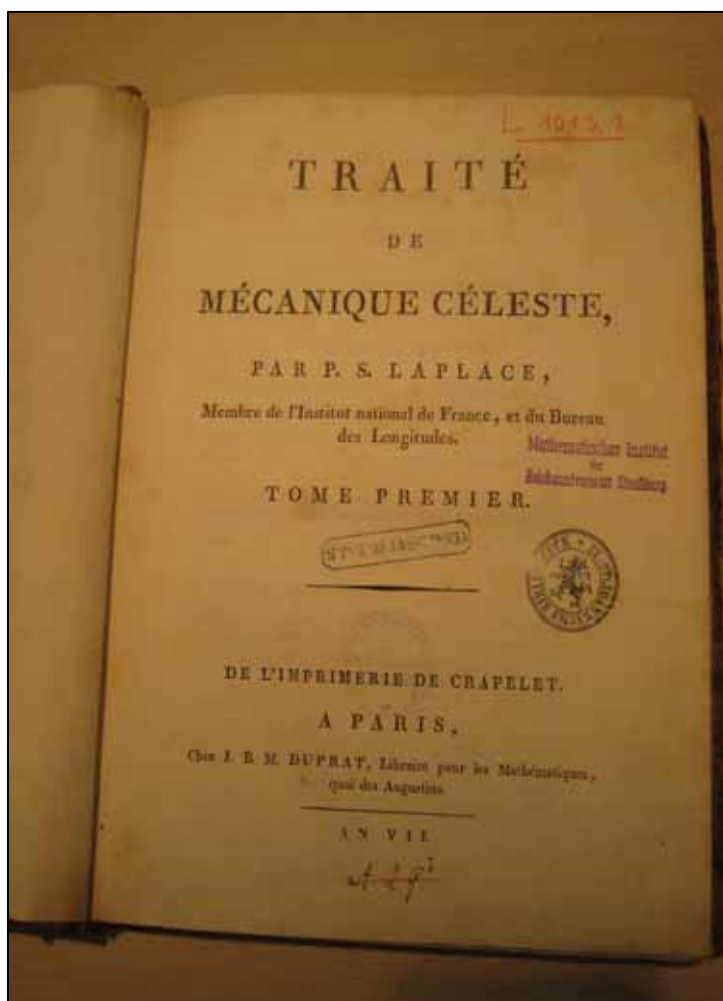CHRISTCHURCH NEW ZEALAND

UNIVERSITY OF STRASBOURG, FRANCE

The photo on the left is an old mathematical book from the University of Strasbourg's rare books collection. What is interesting is that in Strasbourg one can sense traces of the German occupation in the architecture, in the street names, in the food, in the local accent, but even more subtly in the title pages of the books in the library. You can see on this copy of Laplace's *Celestial Mechanics* that the original catalogue number at the bottom of the title page has been crossed out and the page restamped "Reichsuniversität Strasbourg" when the university was taken over during WWII by the Germans, and then recatalogued in red pencil and restamped at the top when it was reclaimed by the French.

- *Clemency Montelle*

Jennifer Brown was one of 6 invited speakers at the Women in Statistics Conference held on 20 October 2010, World Statistics Day. Her talk was titled *Going green: how statistics helps in how we manage New Zealand's environment.* The photograph above shows the Minister of Women's Affairs, the Hon. Pansy Wong, with five of the six speakers. Below is the press release that Jennifer wrote to mark World Statistics Day.

Today, 20 October, is World Statistics Day. Most New Zealanders will wake up and think it is just another ordinary day, but for the statistics community, this day is about celebrating statistics. It reminds us about our work and why it is so important. The United Nations is promoting World Statistics Day as an annual event, and this is the first year of what will become an annual date.

I admit, being a statistician doesn't appear to be a glamorous profession, and it's never a great conversation opener at a party. Let me explain why I think it is glamorous, and why it truly is a great conversation opener. Statistics underpins so many facets of our lives. Statistics is all about data – collecting data, exploring data, summarising data and reaching sensible conclusions from data. As we move through the computer age more and more data are being collected, stored, and hopefully with the skills of statisticians, are being put to good use. On a typical day many events have been well planned because of the underpinning statistics and available data. The food value of the cereal I eat for breakfast is described on the carton using easily-understood statistical summaries, the cost of the electricity to run my coffee maker has been carefully calculated from pricing-models that are based on data collected on electricity use, the school my children will attend this morning has a pupil-teacher ratio calculated from data on enrolment numbers, the traffic lights stay red for a length of time calculated from data on traffic volumes, and so on. Data are there in so many decisions that affect my everyday life. World Statistics Day is a reminder about the importance and power of collecting quality data and using them appropriately.

One example of where data has been used in a very informative way is the visual displays developed by Hans Rosling (from Sweden) with the free software, GapMinder (http://www.gapminder.org/). These simple but powerful statistical displays have had a big impact in understanding global change. Watch his remarkable public lectures on this website where Hans shows how simple summaries of averages can distort the impression that the poorer countries in the world are improving in their gross domestic product (GDP). On closer examination, tracking over the years the different income level-groups within these countries you can see that while the wealthier in society have got wealthier, the very poor have got poorer. This visual display of data is so informative and accessible no one can escape the message. It certainly is worth visiting the Gapminder website if you can – and do it today on World Statistics Day.

On a more local scene, the 4 September earthquake has been described in depth in The Press. The Press has shown an excellent data display where each aftershock is portrayed as a vertical bar. Each 24-hour period is marked off along the horizontal axis. This graphic brought home to me how much time in each day we are being shaken around. The initial earthquake was just the beginning of what people in Canterbury are going through. No wonder we feel so tired – we get shaken up each night!

Let us celebrate World Statistics Day with reflecting on two great New Zealand achievements. New Zealand is a world leader in giving statistics a strong place in the school curriculum. For about 20 years, our curriculum has asked for students to do active work with data, through all the ages from new entrants to school leavers. The new curriculum in New Zealand (2007) is probably the first in the world to have a subject called 'mathematics and statistics'. Other countries are impressed: they look to us for guidance. We've made this progress by having members of New Zealand's Statistical Association working together with New Zealand's very creative school mathematics educators. Together we are showing

that statistics in schools can be active, enjoyable, visual, relevant to school and daily life, and vitally important for good decision-making.

The other great New Zealand achievement is our internationally renowned research. One of New Zealand's finest researchers is Professor David Vere-Jones, a world leader in many areas of statistical research including the study of earthquakes. Professor Vere-Jones is known throughout the world for his research leadership yet remains a very humble person. Despite his humility I was reminded of his greatness last week in discussion with a scientist based in USA who experienced a large earthquake in another country. He said he wouldn't be alive today if it were not for David's work and our improved understanding of what damage an earthquake can do. David also contributed largely to statistical education both here in New Zealand, and overseas.

Some of the events planned for this day in New Zealand include a Women in Statistics Conference, being held at Victoria University sponsored by Victoria University, Statistics New Zealand, Canterbury University, Auckland University, the New Zealand Statistical Association and the New Zealand Institute of Mathematics and its Applications. Thank you to the statistics community for your good work, and for your positive contribution to society. Let's finish with a quote from Hal Varian, the Chief Economist from Google, "...the dream job for the next decade is to be a statistician".

CONGRATULATIONS

Four of the 13 College of Engineering nominees invited to the UCSA Lecturer of the Year awards evening were from this department. Congratulations to Alex James, Charles Semple (one of the top 3 College nominees), Phillipa Williams and Phil Wilson.

Congratulations to Peter Smith, who is not only one of this year's top ten College of Engineering contributors to the UC research repository but also one of the top ten for downloads.

RADIO NZ INTERVIEW

On 30 September, Mike Steel and Charles Semple were interviewed on Radio New Zealand's Changing World on Mathematical Approaches to Evolution. Hear them on:
http://www.radionz.co.nz/national/programmes/ourchangingworld

SCHOLARSHIP PREPARATION DAY

On Sunday 17 October, we ran our first (ever?) scholarship preparation day for senior high school students studying calculus. About 120 students and a dozen or so teachers attended, and feedback was overwhelmingly positive. This was a great team effort and thanks go to all of the following for their outstanding efforts: teachers Graham Gracie (Riccarton High School), John Wilkes and Tim Schumacher (Burnside High School), who talked about problem-solving strategies for the students; undergraduate students Lisa Hall and Simon Todd, who talked about their own experience of preparing for the scholarship exam; postgraduate students Anna MacDonald and Rachael Tappenden, who talked to the students about life after scholarship; Lisa Kulczycki, the College Marketing and Outreach Coordinator, who looked after all the logistical issues (coordinating enrolments and bookings either side of the earthquake, organizing refreshments and so on) and who made sure everything ran smoothly on the day; Ben Martin for being our presence on the ground yesterday morning; and Helen Williamson, president of the Canterbury Mathematical Association, for helping me to find the local scholarship experts.

– John Hannah

WELCOME TO OUR DEPARTMENT VISITORS						
Visitor	Organization	Host	From	To	Room	Extn
James Oxley (Erskine Fellow)	Louisiana State University	C Semple	4/9/10	1/12/10	620	7431
Helmut Schwichtenberg	Ludwig-Maximilian Univ.	D Bridges	28/9/10	15/11/10	605	8028
Richard Law	University of York	M Plank	29/9/10	7/1/11	710	7694
Roberto Baragona	University of Rome	M Reale	29/9/10	11/12/10	720	8337
Sebastian Boecker	Friedrich-Schiller University	M Steel	7/10/10	29/3/11	616	8876
Eldon Bjarki	Oxford University	J Degnan	23/10/10	7/11/10	516	45558

Calling all lecturers, school teachers and educators who are interested in senior secondary school and undergraduate mathematical sciences! You are invited to a meeting to discuss a vision document for mathematical sciences education for ages 16 – 20.

This meeting is a continuation of a 2-day conference that was held at the University of Auckland earlier this year as part of an NZIMA-funded workshop to improve mathematical sciences in New Zealand. It will be chaired by Prof. Bill Barton from the University of Auckland. Details of the original conference and more information about this project can be found at http://www.math.auckland.ac.nz/CULMS/projects/.

Location: UC Mathematics & Statistics Department (Erskine Building, room 446, level 4) from 4.30 – 6.30pm on Friday 5 November. Refreshments will be provided. If you are interested in attending, could you please contact Alex James (a.james@math.canterbury.ac.nz). If you would like more information about the project, please contact Louise Sheryn (l.sheryn@math.auckland.ac.nz).

CAPTION CONTEST

It's a tie! The editor, whose decision is final, couldn't decide between the following:

"Crop and neuro-scientists announce joint new GM breakthrough." (Prof. Ben du Boulay, University of Sussex, UK).

"It appeared that Penny had little prior experience of desert camouflage". (Dennis Mills, Student Health Services)

Chocolate fish will therefore be despatched (in one case with some difficulty) to the winners!

PAPERS SUBMITTED

Ezzat, S.: *Counting Irreducible Representations of the Discrete Heisenberg Group over the Integers of a Quadratic Number Field* (submitted to the Journal of Algebra).

Lawrence, P., Stuart, M., Brown, R., Tucker, W. & Sainudiin, R.: *A Mechatronically Measurable Double Pendulum for Machine Interval Experiments* (Indian Statistical Institute Technical Report, isibang/ms/2010/11, 25 October 2010, 40 pages).

McKubre-Jordens, M. & Weber, Z.: *Real Analysis in Paraconsistent Logic*

Smith, F.T. and Wilson, P.L.: *Fluid-body Interactions: Clashing, skimming, Bouncing* (submitted to Philosophical Transactions of the Royal Society A).

PAPERS ACCEPTED

Hannah, J.: *Conventions for Recreational Problems in Fibonacci's 'Liber Abbaci'* (Archive for History of Exact Sciences)

Montelle, C. & Keller, A. (report): *Workshop on the History of Numerical Tables* (Indian Journal for the History of Science, 5pp)

PAPER PUBLISHED

Montelle, C. (book review): *Mathematics of the Heavens and Earth: the early History of Trigonometry* by Glen van Brummelen (Princeton University Press) for Astimatio, vol. 6 (2009) 6pp.

CONFERENCES & VISITS

Jennifer Brown: keynote speaker on *Adaptive and Unequal Probability Survey Designs for Monitoring Animal and Plant Distributions* at the Palmerston North Statistics conference on 22 October 2010.

James Degnan: to give a talk entitled *Identifying Species Trees from Clade Probabilities* at Phylomania in Tasmania, 4 -5 November 2010.

Shannon Ezzat: to give a talk entitled *Representation Growth and Exceptional Primes* at the NZ Mathematics & Statistics Postgraduate Conference at the Westport Field Station from 22 – 25 November 2010 and the Colloquium at the University of Otago from 6-10 December 2010.

Peter Jaksons: to give a talk entitled *Estimating the Force of Infection of Malaria using Serological Antibody Markers* at the NZ Mathematics & Statistics Postgraduate Conference at the Westport Field Station from 22-25 November 2010.

Maarten McKubre-Jordens: to give a talk entitled *Real Analysis in Paraconsistent Logic* at the NZMS Colloquium, University of Otago, 6 – 10 December 2010.

Clemency Montelle: invited speaker on *Arithmetic Meets Astronomy: Hypsicles of Alexandria and his Little Work on Rising Times* at the Wissenschaftshistorisches Kolloquium, Goethe-Universität, Frankfurt am Main, Germany, 26 October 2010; invited speaker on *Lining It Up: Spatial Liaisons in Sanskrit Computational Sources,* Histoire des Sciences, Histoire du Texte, Séminaire Sphere, Rheseis Institute/CNRS, Paris France, 2 November 2010; and invited participant of a colloquium entitled *Courants Actuels en Histoire des Mathématiques* at the Institut de Recherche Mathématique Avancée, Université de Strasbourg, France, 21-23 October 2010.

Wen Ong: to give a talk entitled *Reconstruction with Blobby Shapes* at the 15th Biennial Computational Techniques and Applications Conference in Sydney from 28 November – 1 December 2010.

Agate Ponder-Sutton: to attend the NZ Mathematics & Statistics Colloquium, University of Otago, from 6 – 10 December 2010, the AMSI Summer School course from 10 January to 4 February 2011 at La Trobe University, Victoria, and the collocated ANZIAM Conference in South Australia.

Marco Reale: to organise a session and give a talk entitled *Long Memory Time Series Sometimes Suffer from Amnesia* at the 4th CSDA International Conference on Computational and Financial Econometrics (CFE 10) at the University of London, and to undertake a research visit to the 3rd University of Rome, 13 November – 16 December 2010.

Sabariah Saharan: to give a talk entitled *Learning with Imbalanced Data Sets* at the NZ Mathematics & Statistics Postgraduate Conference at the Westport Field Station from 22-25 November 2010.

Charles Semple: to give a talk entitled *Submodular Functions and Biodiversity Conservation* at Phylomania in Tasmania, 4-5 November 2010.

Gunter Steinke: to give a talk entitled *On Kleinewillinghofer types of Laguerre Planes* at the 34th Australasian Conference on Combinatorial Mathematics and Combinatorial Computing (34ACCMCC) at the Australian National University, Canberra, from 6 – 10 December 2010.

Neil Watson: to give a talk entitled *A Unifying Definition of a Subtemperature* at the NZMS Colloquium, University of Otago, 7 – 9 December 2010.

Joe Zhu: to present a poster entitled *Effect of Taxon Sampling on Constructing Species Tree from Gene Trees* at the NZMS Postgraduate Conference at the Westport Field Station from 22 – 25 November 2010.

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