

Newsletter

Mathematics & Statistics

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SPRINGTIME ON CAMPUS!



"Not everything that can be counted counts, and not everything that counts can be counted."

- Albert Einstein

DEPARTMENT VISITORS

Professor Dominic Welsh from the University of Oxford is visiting the department for three months (September-December). Officially, Dominic is a Visiting Oxford Fellow at the University of Canterbury. He has a broad range of interests that include combinatorics, cryptography, codes and complexity. Dominic is in MSCS 620.

Charles Semple

Welcome to Tanja Gernhard (Rm 616) who is currently visiting from the University of Munich as part of her diploma degree and working with Charles Semple and Mike Steel.

Mike Steel

TALKS

Marco Reale and Dominic Lee gave talks at the workshop on Statistics and Probability in Communications Engineering organized by Peter Smith on 1 September 2005. Marco's talk was on *Graphical Modelling of Time Series* and Dominic's talk, which was partly based on work done last Summer with 3rd year student Gavin Bell, was entitled *Introduction to Particle Filters and an Application in Change-Point Detection*.

MATH406 FIELD TRIP

The MATH406 field trip was a storming success - honeydew was sampled, beetles were examined, and expensive refractometers were broken! Ironically, the prize for best data collector went to Ben Martin, the only Pure Mathematician in attendance. To find out the results of the work, come along to the end of term Bio-Engineering Seminar, which the class is giving as part of their assessed work for the course.

Alex James



PAPERS ACCEPTED FOR PUBLICATION

Jotun Hein & Mike Steel: *Reconstructing Pedigrees: a Combinatorial Perspective*, Journal of Theoretical Biology

Mike Steel & Kurt-Milton Pickett: *On the Impossibility of Uniform Priors on Clades Molecular Phylogenetics and Evolution*

PAPERS PUBLISHED

D S Bridges, H Ishihara, P M Schuster, L S Vita: *Products in the Category of Apartness Spaces*, Cahiers de Topologie et Geometrie Differentielle 46, 139-153, 2005.

D S Lee, A D Rudge, J G Chase & G M Shaw: *A new Model Validation Tool using Kernel Regression & Density Estimation*, Computer Methods and Programs in Biomedicine 80, 75-87, ISSN 0169-2607

GRANTS & SCHOLARSHIPS

Jennifer Brown has been awarded a University Summer Scholarship for Gavin Bell to work with her on adaptive sampling.

Ben Martin has been awarded a 3-year Marsden Grant for a standard proposal entitled "*A Geometric Approach to Reductive Algebraic Groups*." He will be working with Professor Gerhard Roehrle (University of Southampton, England) and Michael Bate (University of Oxford, England). The aim of this research is to study an important class of groups which can be realized concretely as groups of matrices given by continuously varying parameters. Classically, these parameters are real or complex numbers but this research will consider the more exotic case when the parameters come from so-called fields of positive characteristic, where the behaviour is much richer and more complicated. New geometric techniques will be used to study the properties of these matrix groups and the way in which they act on objects called "buildings". This will involve applying ideas from algebraic geometry – the geometry of polynomials – in a novel way to prove algebraic results.

STAFF vs STUDENTS SOCCER MATCH

This annual fixture was a closely fought battle, but victory went to the students by the narrowest of margins! After a cagey opening, Paul Mullaney opened the scoring for the staff with a fine strike that left the keeper standing. The lead was shortlived, however, as Ahmad Obaid equalized for the students before Mike Plank restored the advantage to the staff with an opportunistic shot from close range. Parity was once again restored as Daniel Lond completed a fine move with an easy finish. The teams remained locked at 2-2 for the majority of the second half, until Damian Campbell finally managed to break the deadlock with a nonchalant right-foot volley! Not even the dreaded call of "next goal wins" could save the staff, and the students claimed a deserved win.

Staff: Broughton, Chan (Sutherland 27), Martin, Mullaney, Plank, Reale and Semple

Students: Baben, Campbell, Diener, Hartman, Humphries, Lond & Obaid.

Mike Plank



IN-HOUSE HUMOUR

Joke

e^x and a constant were walking down the street. Suddenly the constant notices a differential operator walking along the other side of the street. "Oh no!" exclaims the constant, "I've got to run away! You've got to hide me! There's a differential operator...he could reduce me to nothing!"

"Hmmmph!" came the haughty reply. "I'm an e^x . He can't do anything to me." So e^x walked across the street and introduced himself. "Hi, how are you doing? I am e^x ," he said confidently. "Pleased to meet you," smiled the differential operator. "I'm d/dy ."

Doreen Bestmann

The Value of Infinity

Don Brash has revealed the value of infinity. In an interview on election night, he was asked about the possibilities of forming a coalition. He said that the possibilities were 'almost infinite'. On election night figures, 8 parties are represented in Parliament, so, disregarding ideological clashes, there are $2^8 = 256$ possible coalitions. These can be grouped into 128 complementary pairs. It is possible that in a few pairs both groupings have 61 seats, which explains the 'almost'. Otherwise exactly one of each pair commands an absolute majority in the House. So there are almost 128 possible majority coalitions and the Brash value for infinity is 128.

David Robinson

Blondes have more...?

We are pleased to announce that our Sarah received a B+ for her first university essay!

4.

BRAIN TEASERS

For a subset A of the natural numbers define the (Cesaro) density to be

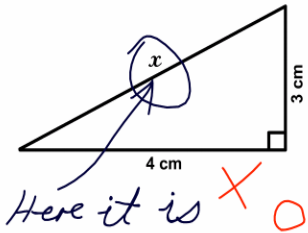
$$\lim_{n \rightarrow \infty} \left\{ \frac{|A \cap \{1, 2, 3, \dots, n\}|}{n} \right\}$$

Find sets A and B such that this limit exists for both, but not for $A \cap B$.

Bill Taylor

When all else fails.....

3. Find x.



Ocular Trauma - by Wade Clarke ©2005
Julian Visch

Anagram Extravaganza

Alice M.D. mailed C. (mild ace, i/c lamed male C. I .D.) "I'm laced! I clad me medical dim lace. Mac lied, claimed lice mad! Die calm, lad – mice."

And I failed to work in decimal, declaim, idle cam, lid came or D. C. e-mail...

David Robinson

Current Visitors	Name of Organization	From	To	Room	Extn
Dr John Holt	Massey University, NZ	15 March 05	31 March 06	502	7663
Prof Dominic Welsh	University of Oxford, England	1 Sep 2005	1 Dec 2005	620	7431
Ms Tanja Gernhard	University of Munich, Germany	24 Sep 2005	24 Dec 2005	616	8876
Dr Granville Tunnicliffe-Wilson	Lancaster University, England	25 Sep 2005	15 Nov 2005	710	7431
Dr Emily Lane	University of California, USA	1 Oct 2005	31 Mar 2006	502	7663
Dr John Newell	University of Ireland, Galway	19 Dec 2005	24 Jun 2006		
Visitors due to arrive	Name of Organization	From	To	Room	Extn
Dr Jon Pitchford	University of York, England	15 Oct 2005	15 Jan 2006	607	8875
Dr David Borchers	Univ. of St. Andrews, Scotland	23 Jan 2006	11 Aug 2006		
Prof. Domenica Piccolo	Univ. of Napoli Federico II, Italy	7 Feb 2006	6 May 2006		
Prof. Daniel Huson	Tuginben University, Germany	15 Feb 2006	15 Jun 2006		
Prof. Stephen Gardiner	University College Dublin, Ireland	01 July 2006	31 Aug 2006		
Prof. Jeremy Levesley	University of Leicester, England	9 July 2006	14 Sept 2006		