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NEWSLETTER

OF THE

NEW ZEALAND MATHEMATICAL SOCIETY

Contents

PUBLISHER'S NOTICE

This newsletter is the official organ of the New Zealand Mathematical Society Inc. This issue was edited by Steven Archer and printed at Victoria University of Wellington. The official address of the Society is:

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http://nzmathsoc.org.nz/ (Webmaster: bbaeumer@maths.otago.ac.nz)
The newsletter is available at: http://nzmathsoc.org.nz/?newsletter
Editorial enquiries and items for submission to this journal should be submitted as text or LaTeX files to steven.archer@vuw.ac.nz.

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PRESIDENT'S COLUMN

Yesterday I was discussing "recent" changes in the Applied Mathematics team in IRL, when I realised that I was the last of my cohort to be still employed within IRL. I'm the only over 60 year old left in full time employment in IRL from those originally employed in the old DSIR Applied Maths Division. But then looking at the Personal Directory list of IRL, I was really surprised to see that over one half of the permanent staff of the Applied Maths team is under 45. The comparison is even greater, when the post docs are considered. This contrasts with a comment around a decade ago, when a colleague mentioned that he was the youngest in his academic department, and he was over 50 years old.

It is very clear that the baby-boomers are moving out of the system, and that a new cohort is on the move. I hasten to add that this new cohort, while much younger, is very impactful. For example, the New Zealand Association of Scientists meeting 'Do Emerging Scientists have a Future in New Zealand?', which was held in Wellington on Monday 16th April, was attended by leaders in academia, business, politics and research. The Chair was Shaun Hendy, and Nicola Gaston led the tweeting. Both Shaun and Nicola are from the Applied Maths team. The conference featured both on TV, sciblogs and twitter.

Another really interesting demographic is the marked increase in mathematics graduates, and the increase in the fraction of female graduates in mathematics. Recently I was provided with data from the University of Auckland by Louise Sheryn of the UoA, for all graduates in mathematics from 1960 to 2008. During this time there has been a dramatic change in the number and fraction of female graduates in mathematics.

A lot can be said about this data, but here I will simply assert that a phase change appears to have occurred sometime between 1990 and 1995 when the fraction of female graduates roughly doubled, but has kept approximately constant thereafter. This is relevant today, because if it takes between around 15 to 20 years for graduates to move to leadership positions, then this change in female representation should start to be seen at around this time.

In 1960 there were 6 female graduates in mathematics from UoA, two obtaining BA and 4 obtaining BSc degrees, whereas in 2008, there were 293 degrees conferred to females in mathematics in the UoA, representing 36% of the total. However, in 2008, females graduated in mathematics from UoA with the degrees of PhD; PGDipSc; PGDipArts; MSc; MCom; GDipSci; BSc(Hons); BSc(Conjoint); BSc; BE (Conjoint); BE; BCom(Hons); BCom(Conjoint); BCom; BA(Conjoint) and BA. These degrees were obtained from the Mathematics, Statistics, Logic and Computation, Accounting, Finance, Engineering Science, Applied Mathematics, Bioinformatics, Computer Science, and Bioengineering departments. This proliferation of degrees and departments makes timeline comparisons difficult to define.

It is clear that these changes in age and female demographics should be impacting on the membership of the NZMS. How we respond will be important to maintaining a healthy NZMS. One challenge we face is how to include the new means of communication which is so much part of life for new graduates, into our society. I'm hoping that we can make progress on this challenge in the near future.

Graham Weir
President

EDITORIAL

Thank you to Kelsey, Prema and Sione in the MSOR office at Victoria University for helping get the previous issue printed and posted.

We will endeavour to include articles about current issues relevant to the New Zealand mathematical community. Following this editorial, we have an article by Mark Wilson, about the Elsevier boycott. There are further articles on this topic, for instance see the Newsletter of the London Mathematical Society (No 412) and the Gazette of the Australian Mathematical Society (Volume 39, Number 1).

I'd repeat Grahams request for your opinions on whether, and if so how, we might use social media. I'd envision that we would use them to contact members and keep people up to date with goings on, in the newsletter and about the society in general. Your opinions on whether to use social media at all, and if so which types of services (such as twitter, facebook, linked-in, a blog etc...) would be appreciated.

Finally, two apologies are due from me for editing mistakes in the previous issue. First, to Mihály Kovács for mangling his name, I sincerely apologise for that error. Second, the local news was presented in a very untidy manner, I apologise for that mistake also.

Steven Archer
Editor

CONTRIBUTED EDITORIAL

On the Elsevier boycott and beyond.

By Mark Wilson.

The following article/opinion piece reflects the views and opinion of the writer only and does not necessarily reflect the views and opinion of the New Zealand Mathematical Society.

The Elsevier boycott

On 21 January 2012, 1998 Fields medallist Timothy Gowers announced [1] that he was henceforth boycotting journals published by Reed Elsevier, as author, referee and editor. Very quickly a webpage appeared [2] allowing others to publicly declare the same. At the time of writing, about 10 000 researchers have signed up, including over 1500 in mathematics. The purpose of the present article is to explain this issue, a crucial one for our profession, in a broader context (disclaimer: I have signed the declaration). Space constraints mean this article is necessarily written tersely - more details are available from my homepage www.cs.auckland.ac.nz/~mcw/.

How bad is the current situation?

The Statement of Purpose [3] signed by Gowers and 33 other mathematicians lists three main reasons for discontent. These problems have been noted many times before over the last 15 years.

First, Elsevier charges extremely high prices for its journals, about a factor of 3 more than journals of comparable or higher quality published by learned societies, for example. Elsevier has an operating profit much higher in relative terms than Apple Computer, and this profit has been increasing steadily in recent years, despite the global financial crisis and cuts to library budgets. Libraries have seen serials consume an increasing fraction of their budgets, at the expense of monographs [4].

Second, Elsevier uses bundling in an anti-competitive manner. Bundling ("the Big Deal") is the practice of selling access to thousands of journals, many of rather low quality, at a low average cost but higher total cost than that which customers would incur if they bought only the journals they wanted individually. Bundle prices are usually kept secret, sometimes by threat of legal action [5].

Third, Elsevier has demonstrated clearly that its values are not well aligned with the goals of the research community. For example, the Elsevier journal Chaos, Solitons and Fractals published 58 papers in one year by its Editor-in-Chief (who later said in court "senior people are above this childish, vain practice of peer review") [6]. Elsevier was responsible for fake medical journals [7]. The Elsevier journals Applied Mathematics Letters and Computers and Mathematics with Applications have had more than one disastrous failure of peer review [8, 9]. Elsevier's support for the Research Works Act in USA, which would ban government agencies from mandating that publicly funded research findings be made freely available to the public (as is current NIH policy), was the last straw for many signatories of the petition.

Elsevier is not the only target of criticism — most commercial publishers have similar pricing and control access to decades of archives. The entire model of for-profit commercial publishers is now suspect, with any added value they provide no longer worth the price. This situation is highly suboptimal for researchers and for lay users of research. A wider distribution of research results (free-to-read, called "open access") would help both groups. In some fields, access to research can mean the difference between life and death [10].

Why is action necessary?

Normal market competition alone is unlikely to solve this problem. The main reason is bundling, which leaves library budgets committed and inflexible. Thus cancelling a single Elsevier journal does not free up any money to buy another, no matter how superior. There are several other reasons. Journals are not substitutable for readers, because each journal has a monopoly on its own papers, which leads to inelasticity of demand. Price signals on journals are not received by researchers, but by libraries. Journals are to some extent substitutable for authors, but there is considerable concern among researchers about the consequences for their career if they don't publish in "prestigious" journals.

It seems highly unlikely that Elsevier will change its business practices sufficiently to satisfy the demands of the boycotters. The changes made in response to the boycott have been rather symbolic and have certainly not addressed the main pricing issue seriously [11]. The real purpose of the boycott is to recognize that the research community must change attitudes and practices, be more active and united in pursuing its goals, and take back control of scholarly publishing.

Times are changing

Scholarly publishing is in turmoil [12], and the cost of journals is only one issue among many. I have learned much as a result of online discussions at Math 2.0 [13], which I recommend highly.

Traditional journals (ought to) perform several functions: dissemination, typesetting, archiving, quality control ("prepublication peer review"). These functions are in the process of being separated, and it is highly unclear what the scholarly publishing landscape will look like in 10 years. The first function is easily achieved now via the Internet, by sites such as arXiv.org. The second was essentially solved by Donald Knuth when he invented TeX. The third can also be handled by the research community, although it ought to receive more attention. The main remaining function of "name" journals is that of certifying correctness and significance of results. The former is important in mathematics because of the long life of papers and the way in which the subject builds on older work. The latter is particularly important for junior researchers because of the use of "impact factors" and other journal-level signals of quality which have been prevalent in research assessment exercises in recent years.

It is clear that a period of experimentation is needed in which differing models ("gold" open access, post-publication review, arXiv overlay journals, ...) compete. Even if the net effect of the boycott is simply to reduce the price of current journals while keeping the ownership unchanged, and the current importance of journals is maintained, it is clear that such journals should be run much more professionally (this is even more important for the huge number of recently founded pay-to-publish outlets). We need a clear code of conduct for journals and greater transparency, archiving of correspondence, etc. Some small steps in this direction are being taken by the IMU [14].

What we can do

All the content and most of the work of running a journal is provided for free by researchers, who thus should have substantial leverage over the publisher. Some of these actions require more coordination and perhaps more sacrifice than others, so I will start with the easy ones.

- Archive our own work systematically. The IMU has advocated [15] self-archiving by authors ("green OA") since 2002, yet not all papers by mathematicians are freely available on their homepages, arXiv.org, or the author's institutional repository. Perhaps surprisingly, many publishers allow the author's final corrected manuscript to be posted in this way [16], and the submitted draft (before referee corrections) is always allowed.

- Always question copyright forms. Experience shows that publishers usually grant concessions [17], for example when authors wish to post final manuscripts as above.

- Try to choose cheaper journals as author and referee. Doing this with no loss of quality or reputation (in fact, often a substantial increase) over journals published by the likes of Elsevier is often easy, using price and citation data [18] and directories of open access journals [19].

I consider all these actions to be the professional duty of every mathematical researcher.

Higher (perceived) cost individual actions include:

- Sign the petition, and refuse to give free labour to profit-making companies without extracting concessions
- (For editors) negotiate with publishers on price, and use the possibility of leaving for another publisher as a key bargaining chip. Resources are available to help with this process [20]. Such journals as *K-Theory*, *Topology* and *Journal of Algorithms* have followed this path.

Other actions require more coordination, probably using professional societies and the IMU. One possibility is an analogue of the SCOAP3 initiative [21], an attempt in particle physics to provide free-to-read journals by transferring money from libraries and granting agencies directly to journals for peer-review services.

We have reached a crisis point in scholarly publishing where the current model is unsunstainable. I urge all colleagues to get involved in the debate and help to shape the new system which will eventually emerge.

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LOCAL NEWS

AGRESEARCH

Amy Van Wey attended the Riddet Institute conference on Food Structures, Digestion and Health in Palmerston North in March and presented her work on a mathematical model of solid food degradation in the human stomach. Amy also presented her work on anisotropic nutrient transport within bacterial biofilms at the New Zealand Microbiology Conference in Palmerston North.

Tony Pleasants visited Singapore in March to discuss a joint project on epigenetics. Tony also gave a workshop on his work in this area.

Phuong Nguyen presented her work on a model for cortisol partitioning at the National Research Centre for Growth & Development (NRCGD) Science Symposium in Dunedin. Paul Shorten's work on the effect of post-term birth on the risk of obesity in adolescent males was also presented at the NRCGD Science Symposium.

Paul Shorten

INDUSTRIAL RESEARCH LIMITED

Krista Steenbergen has gone to the Freie Universität Berlin to do more research with Dr. Prof. Beate Paulus and Dr. Carsten Müller. She will be working on the method of increments, an algorithm allowing for the accurate calculation of the cohesive energy of many bulk (periodic) systems.

Warwick Kissling and John Burnell attended a joint US/NZ Geothermal Workshop in Rotorua, from 17-19 April. Warwick gave a talk (coauthored with Susan Ellis from GNS Science) entitled "Modelling the flow of hydrothermal fluid above an evolving continental rift." And Johns talk was "Geothermal reservoir modelling for the 21st century."

Finite element specialists Professor David Fletcher, Mr Sam Nardella and Mr Nick Goodall of LEAP Australia Pty Ltd visited IRL on Thursday 12th April. They presented a seminar about improvements to the latest release of ANSYS software, covering computational fluid dynamics and solid mechanics.

In February, Dion O'Neale and Shaun Hendy gave talks at the ANZIAM meeting held in Warrnambool, Australia. On the same trip, they visited the Maths Modelling group at CSIRO in Melbourne where Shaun spoke about homogenisation approaches to understanding catalysis.

In early February, Dion was an invited speaker at the Inaugural Science for Policy, Policy for Science conference, in Wellington, where he spoke about using mathematics to measure and model innovation.

Shaun and Nicola Gaston both spoke at ICONN2012 (International Conference on Nanoscience and Nanotechnology) in Perth in early February.

Comings and goings:

Gregor Neumayr joined the team in late 2011 and is working in the complex systems group under Shaun Hendy. Gregor comes from Tyrol in Austria, and did his PhD in computational chemistry at the University of Vienna.

We also welcome Catriona Sissons who will be doing a PhD based at IRL and supervised by Shaun Hendy and Dion O'Neale.

In February we also farewelled our summer students, Rebecca Sutton, Jessica Kerr and Michelle Cook.

And lastly, between trips overseas, (the retired) Kit Withers still comes into the office on a regular basis, and continues to publish papers on mathematical statistics. Here is a sample of the most recent ones (all in press!)

Adjusting Cornish-Fisher expansions and confidence intervals for the effect of roundoff, Statistics, CS Withers and S Nadarajah.

Warwick Kissling

THE UNIVERSITY OF AUCKLAND

DEPARTMENT OF COMPUTER SCIENCE

The Department's annual Gibbons Lectures are on in May-June with the theme of Alan Turing, whose centennial is being celebrated worldwide this year. It includes lectures by Cris Calude and Ian Watson. Ian was featured on Kim Hill's Saturday morning radio show, discussing artificial intelligence, Turing and his upcoming book *The Universal Machine*.

The department has recently made a big push in the area of publicity. In particular, we now have an official blog. The announcement says: "The new CS blog http://uoacomputerscience.blogspot.com is being run by Ian Watson, and will automatically receive relevant posts from his own blog, providing it with 1 - 2 posts every day. This will be complemented by posts written and suggested by staff and students.The intended audience of the blog are

interested members of the public, our students and alumni. The aim of the blog is to improve the public understanding of computer science. Topics may include anything of some relevance to computer science from theoretical maths to the latest smartphone app, stories in the news, and humour."

The department has had a major turnover in staff in the last year or so. Out: Professors John Grundy (to Swinburne UT, Melbourne), John Hosking (to ANU, Canberra), Brian Carpenter (retired, but visiting scholar at Cambridge), Associate Professors Emilia Mendes (believed to be working in UAE) and John Morris, and Dr John Hamer (Glasgow), In: Sr David Welch (from Penn State), Assoc-Prof Sebastian Link (from VUW), Dr Giovanni Russello (from Trento).

More details: David received a PhD in the Maths Department at Auckland with Allan Rodrigo, Geoff Nicholls, Wiremu Solomon, and works in bioinformatics. Sebastian works mostly on databases and Giovanni in computer security.

Cris Calude's 60th birthday was marked in February by a workshop WTCS2012 (see http://www.cs.auckland.ac.nz/research/conferences/wtcs2012/). A volume titled "Computation, Physics and Beyond", based on the workshop, will be published in the LNCS Festschrifts Series, see http://www.springer.com/computer/lncs?SGWID=0-164-12-73275-0 by Springer.

Mark Wilson

DEPARTMENT OF ENGINEERING SCIENCE

A service of the celebration & thanksgiving for the life of Professor Andrew Pullan, BSc (Hons), PhD, FRSNZ. 5 Dec 1963 0 7 March 2012. It is with great sadness that I announce an immeasurable loss to the Department of Engineering Science in our devoted HOD and beloved colleague, Prof. Andrew Pullan, in his battle against cancer. A service of over 600 people paid tribute to an exceptional academic but more importantly great human being. On behalf of the Department of Engineering Science I would like to convey our heartfelt sympathies to Patti, Andrews wife (and childhood sweetheart), Zeke and Xanthe (his two lovely children) and all his family members. Andrew was larger than life; we love him and will miss him dearly. For those of you that are reading the newsletter who did not know Andrew, I would like to quote 3 paragraphs from his sisters Eulogy, Heather Benn. These paragraphs are something that we can all relate to. She touched my heart that day when she revealed the essence of what Andrew was about:

I have often been asked, especially by his students, "What is it like having Andrew for a brother?" Well I want to answer that question today. Andrew was the type of brother who, at the age of 13 saved up his pocket money for weeks, just so he could take his 5 year old sister Catherine to the movies to watch Puff the Magic Dragon.

Andrew was the type of brother who, at the age of 16 saw me, his other little sister fall down at the start of a race. He came over to me, wiped away my tears and lifted me to his shoulders. He carried me there until I felt better.

Professor Andrew John Pullan. Yes, it is an impressive title, but I can honestly tell you that he placed more value on the other titles he was given in this life. Titles such as friend, son, brother, husband and father. It is for this reason we are here. In every way Andrew was exceptional and we will miss him very much.

The following is a Eulogy delivered by Prof. Andy Philpott, Department of Engineering Science, to a meeting of the University of Auckland Senate, on April 2nd, 2012. Andrew Pullan was born in 1963. He was dux of Aorere College in Mangere, won a University Scholarship, and completed a BSc at Auckland with first class honours in mathematics. Andrew joined the Engineering Science Department as a PhD student of Ian Collins in 1985. After receiving his doctorate in 1988, he spent a brief period working for Winstones/Fletcher Challenge, before returning to the University as a lecturer in 1989. Andrew then moved quickly up the academic ranks culminating in a personal chair in 2006.

Professor Mike O'Sullivan commented in his eulogy at Andrew's memorial service that Andrew never smoked cigarettes, nor drank alcohol, or coffee, or tea. Despite this virtuous existence, Andrew was an excellent mathematician. He made many mathematical contributions to bioengineering - I will mention one. This was his research on inverse problems - in simple terms, how can one estimate values for the hidden electrical data inside the human body from measurements taken on its surface? This is not only a problem of instrumentation, but involved some deep mathematics involving the estimation of under-determined systems. In Andrews own words, "It is impossible to recreate the electrical state of each cell in the heart from surface electrical recordings, no matter how many surface recordings are availablemultiple configurations of cellular activity can give rise to the same ECG signals". The contribution of Andrew and his team

was to use highly detailed mathematical models of human anatomy to narrow down the possibilities.

Andrews research began with the heart, but in later years focused on the stomach and intestinal tract, winning him a James Cook Fellowship in 2003, and a Fellowship of the Royal Society of New Zealand in 2009 for his pioneering work in this area. It is clear that he was destined for even higher honours, and his death is a great loss for the New Zealand scientific community.

Andrew's inaugural professorial lecture was a tour-de-force. A large monitor displayed electrical body measurements of Andrew himself, obtained in real time as he paced around the lecture hall. I now regret that this lecture was the only one of his that I saw in person, for he had a reputation with our students for being a fantastic teacher, engaging them with entertaining demonstrations, often at his own expense. He regularly appeared in the Engineering School's top 5 lecturer awards, and attracted the brightest graduates as PhD students. Andrew was an enthusiastic and generous PhD supervisor, and his students willingly repaid this generosity by helping him with his legendary house renovations.

Andrew was a hero of our Department, Engineering Science. Although he did most of his research in the Bioengineering Institute, his loyalties were to the Department, and he was a champion of the Engineering Science degree. I never thought to question him about this, but I suspect that one reason was that he could see the opportunity provided by the degree to students who are very clever but, like himself, come from less privileged backgrounds. As Head of Department from 2008-2010, Andrew committed himself to the task of promoting the Engineering Science degree throughout the country to maximize the potential for all students to benefit from the same opportunity that he had enjoyed. He created "New Zealand's next Engineering Scientist" Modelling Competition, which is carried out each year in over 100 New Zealand secondary schools. It offers scholarships (now called the Pullan Prize) to the winners and serves to attract some of the country's brightest mathematical talents to our programme. Along with his research, I think that this will be remembered as one of Andrew's great contributions to the University.

Andrew was a fitness fanatic, and was extremely competitive. Way back in 1989, I introduced Andrew to Ron Paterson from the Law Faculty, and the three of us used to run together after work. We used to try and break the record for a Hobson Bay pipeline run. After being told that Ron and I had done it in what we thought was a spectacularly unbeatable 35 minutes, Andrew went out the next evening on his own and proudly announced a time of 33 minutes, which was never bettered. Through Ron, Andrew established friendships with a lot of the Law faculty in the University. This might surprise some of you, as Andrew would not have been perceived as having much in common with lawyers. But I think that people like Mike Taggart and Julie Maxton could instinctively recognize Andrew's intellectual pedigree, and they all became Andrew's close friends. On top of this Andrew was very entertaining, and great company.

Andrew was a thoroughly decent human being. He was a devoted husband to Patti, and proud and supportive of his children Zeke and Xanthe. Andrew showed great kindness and generosity towards his friends, colleagues and students. He was a very courageous man in all respects. Senate will remember that he stood up for what he believed was right, without concern for his reputation.

Andrew died of a metastatic melanoma. He was hopeful of the success of a new BRAF drug discovery; his blog describing the ordeal of this treatment was called "Andrew's recovery". To help fund the treatment, David Ryan set up a trust which received contributions from Andrews friends from all around the world. The treatment appeared to be working well, though Andrew was in considerable pain. In early March, it was discovered that the cancer had mutated, and that the treatment would no longer work. He went into Mercy Hospice and died on March 7. He was 48.

Andrew's memorial service at the McLaurin Chapel was attended by nearly 600 people, and his death was mourned by many more, from all around the globe. The Department, School, University and country has lost a brilliant mind and a unique personality. Patti, Zeke and Xanthe have lost a loving husband and father, and those of us who knew Andrew have lost a true friend. We will all miss him more than I can say.

AWARDS & HONORS

Professorial Promotions The Department would like to congratulate Martyn Nash and Iain Anderson on their promotions. In February 2012, Martyn was promoted to Professor and Iain achieved promotion to Associate Professor.

Ryan wins RSNZ Pickering Medal, 16 Nov 2011 Prof. David Ryan was awarded the RSNZ Pickering Medal at the 2011 New Zealand Research Honours Dinner, in Wellington. The Pickering Medal recognises excellence and innovation in the practical application of technology, and has attached prize money of $15,000. The award was made to

David "for his world renowned research specialisation in mathematical programming and optimisation theory, and in particular scheduling, timetabling and combinatorial optimisation problems." David is best known for developing the innovative Ryan-Foster constraint branching technology which has become a fundamental component of optimisation software worldwide for solving complex logistics problems.

O'Sullivan wins Henry J. Ramey, Jr. Geothermal Reservoir Engineering award, Oct 2011 Prof. Michael O'Sullivan has been recognised for Outstanding Achievements in the field of Geothermal Reservoir Engineering at the Geothermal Reservoir Engineering 2011 Annual Meeting.

MARSDEN SUCCESSES

A cardiac myometer, $830,000 Primary Investigator, Andrew Taberner (DES/ABI) together with Associate Professors Poul Nielsen (DES) and Denis Loiselle, and Dr Marie Ward were awarded a full programme grant. They are looking for a way to measure force, contraction, heat production, oxygen consumption, and intracellular calcium ion concentration all at the same time, and propose to achieve this challenging objective by constructing an innovative miniaturised testing device, a cardiac myometer. With just one instrument. The new information will increase our understanding of heart muscle behaviour, and thereby improve our ability to treat common heart diseases.

Self-propelling, coalescing droplets, $337,696 Primary Investigator, Mathieu Sellier (Mechanical Engineering, University of Canterbury) and Rosalind Archer (an Associate Investigator of DES) have been awarded a Marsden grant. They will combine mathematical, computational and experimental work. In proof of concept experiments Mathieu has shown that a pre-deposited droplet of distilled water, can be pushed around a hydrophilic corner by a droplet of ethanol. The micromanipulation of discrete droplets on surfaces to emulate a "lab-on-a-chip" may enable biotechnology equipment to be downsized by orders of magnitude.

New Zealands Next Top Engineering Scientist 2011 In recognition of Andrew Pullans pivotal role in setting up New Zealands Next Top Engineering Scientist, the competitions top award has been named the Pullan Prize and worth $6000 to the winning team. This is a nationwide competition run annually by DES, and it has been highly successful, increasing in entrants each year. This competition has definitely helped promote the Department and attract future students.

117 teams from 65 schools all over New Zealand competed in October 2011. The competition question was "If a severe Tsunami warning was issued, how long would it take to evacuate the 13,000 people who live on Te Atatu Peninsula?". The Pullan Prize for first place was taken out by a team of three students from Garin College, Nelson. Benedict Morrissey (nephew of Simon Tavener, Class of 81), Matthew Ruffell and Michael Shanaher used an innovative approach of adapting software designed for modeling the evacuation of buildings and then applied it to a larger scale network. The runners up were from St Cuthberts College and Kings College. Highly commended teams came from St Peters College, Botany Downs College, St Kentigern College, Lincoln High School and ACG Sunderland.

VISITORS & SEMINARS The Operations Research group in the department is a partner in the project "Optimisation and its Applications in Learning and Industry (OptALI)" which is funded by the European Union and our (former) Ministry of Research Science and Technology under the International Research Staff Exchange Scheme of the 7th Framework Programme. This is a collaboration between the Universities of Canterbury and Auckland in NZ and University of Goettingen, Technical University of Kaiserslautern in Germany and the Danish Technical University.

The project is in its second year and in the first few months of 2012 we have hosted a number of visitors: Professor Horst Hamacher and PhD students Lara Turner, Bob Gruen, Florian Seipp from Kaiserslautern; PhD students Jonas Ide, and Marc Goerigk from the Goettingen, Germany and Tor Justesen from Technical University of Denmark.

The visitors kept us busy with new research ideas, a vigorous seminar programme, regular common lunches. A number of new research projects have been started and we are looking forward to the forthcoming joint publications. Details on OptALI can be found on the website www.optali.com.

4th April, Matthew Finn (University of Adelaide) - Hotspots in chaotically stirred chemical reactions

29th March, Ross Vennell, (Marine Science, University of Otago) - Is Giga Watt Generation from Large Tidal Turbine Farms Realistic?

21st March, Nikolaus Furian (Graz University of Technology) - Constrained Order Packing - Optimizing Concrete-Part Production Layouts

14th March, Marc Goerigk ,(University of Goettingen) - LinTim : An Optimisation Tool for Public Transport

14th March, Florian Sepp , (University of Kaiserslautern) - A polynomial time approach for the multiple objective minimum spanning tree problem

28th Feb, Bob Grun, (University of Kaiserslautern) - Organizing Teacher Education In German Universities: An Operations Research Approach

28th Feb, Lara Turner, (University of Kaiserslautern) - Variants of the Shortest Path Problem.

24th Feb, Prof. Horst W. Hamacher, (University of Kaiserslautern) - Operations Research Models in Evacuation Planning

22nd Feb, Tor Jestesen, (DTU), Aircraft Stand Allocation with Associated Resource Scheduling

Charles Unsworth

DEPARTMENT OF MATHEMATICS

Bill Barton attended the executive meeting of IMU at Rio de Janiero, on April 22-23. Steve Galbraith's large text on "Mathematics of Public-Key Cryptography" has been published by CUP. Public-key cryptography is a major interdisciplinary subject with many real-world applications. This book has been carefully written to communicate the major ideas and techniques in this subject to a broad audience of students and specialists. Vaughan Jones is now an Adjunct Professor in our Department. He continues to be based at UC-Berkeley, but will spend some of his time here. Jari Kaipio has been appointed as the convenor of the MIS panel of the Marsden Fund Council. This is a highly-prestigious appointment, and we congratulate Jari on his achievement. Alastair McNaughton retired in February, and he will be able to devote more of his time to restoring antique pianos. Hinke Osinga, at the Mathematics Colloquium 2011, gave a Plenary Lecture on "The role of global manifolds in the transition to chaos in the Lorenz system". Joel Schiff's book "Cellular Automata: A Discrete View of the World" was published in 2008 by Wiley, in their series in Discrete Mathematics & Optimization. Professor F. Peper, a Dutch scientist based in Japan, has translated Joel's extensive and multidisciplinary text into Japanese, and so it is now accessible to Japanese-language readers. The 2011 Mathematics colloquium was held here in December, and members of this Department gave the following talks: Bill Barton, "Videoing lectures research: Where has it taken me?". John Butcher, "Dealing with parasitic behavior in G-symplectic integrators". Sina Greenwood, "Connected generalised inverse limits". Stephanie Hittmeyer, "Interacting invariant sets in a 2D noninvertible map model of wild chaos". Mark Holmes, "Percolation without coffee". Gulshad Imran, "Effective order and symplectic integrators". Igor Klep, "Values of free noncommutative polynomials and Lie ideals". Dimitri Leemans, "Symmetric graphs and polytopes". Michael Lockyer, "Generalized inverse limits of tent maps". Alastair McNaughton, "Lagrange optimization of quartic forms". Ben Martin, "Lattices in automorphism groups of trees". Alexander Melnikov, "Isometric computability structures in metric spaces". Kate Patterson, "A mathematical model of the salivary duct". Edoardo Persichetti, "Coding theory and cryptography: New perspectives". Muhammad Amer Qureshi, "High-order explicit Runge-Kutta Nystrom pairs". Manfred Sauter, "A weak trace for Sobolev functions on rough domains". Philip W. Sharp, "Optimal extended explicit Runge-Kutta pairs for Volterra integral equations of the second kind". Ivo Siekmann, "Identity slip-Algebraic problems in aggregated Markov models". Tom ter Elst, "Partial Gaussian bounds for degenerate differential equations". Shixiao Wang, "Rotations; flow stability: from Rayleigh's theory (1916) to the nonlinear theory". On 2012 February 1 the Mathematics Education Unit at Auckland University celebrated its 20th birthday. Two events were held to mark the occasion. The first was a CULMs/CMCT lecture series on the day itself and the second was a dinner 10 days later. The event on the 1st was a series of 3 talks focussed on Conservation and Mathematics. The first speaker was Mojo Mathers, New Zealand's first deaf member of parliament. Her talk was "Personal Reflections as a Mathematics Graduate" She told the audience of about 80 how her career in politics had been founded on her mathematical understanding of a complicated environmental situation involving the damming of a river in the Canterbury region. The second speaker was Prof. John Montgomery who discussed "Modelling the Future of our Oceans". John is the Director of the Leigh Marine Laboratory. The event closed with a light-hearted presentation by Steven Galbraith on "The Conservation of Mathematics Educators". At the dinner Ivan Reilly, who was the 0.5 of the original 1.5 members of the Unit, spoke of the pleasure he took from the fact that the Unit had surpassed his dreams and the hopes he had for its future. The other original member Jill Ellis was unfortunately unable to attend. Tatiana Gvozdeva has completed her PhD on "Simple Games: Weightedness and Generalizations" (subject to minor revisions of her thesis). Mala Nataraj has completed her PhD on the development in Indian mathematics of methods for teaching place-value. Wenjun Zhang has completed his PhD (subject to minor revisions of his thesis), Recent visitors include Prof. Jeffrey Case (Princeton University),

Dr Allan Detinko (National University of Ireland, Galway), Prof. Edith Elkind (National Technological University, Singapore), Dr Dane Flannery (National University of Ireland, Galway), Dr Sebastian Jambor (RWTH Aachen), Prof. Dr Vladimir Matveev (University of Jena) and Prof. Barry Monson (University of New Brunswick, Canada).

Seminars

Dr Robert Bailey, "The metric dimension problem in geometry, algebra and graph theory".

Matthew Randall, "Local obstructions to 2-dimensional projective structures admitting skew-symmetric Ricci tensor".

Scott Parkins, "Quantum Optics with single atoms and single photons".

Annie Georgy, "Extrapolation based on Gaussian symmetrizers".

Kelly Murphy, "Inflammation and Wound Healing: A Mathematical Modelling Study".

Arkadii Slinko,
Geoffrey Pritchard (Statistics) &
Mark Wilson (Computer Science).
"CMSS seminar on referendum on electoral system in NZ".

Matthew Ryan, "Inference with ambiguous priors and an economic application".

Shaun Hendy (IRL), "The application of kinetic Monte-Carlo methods to phase-change problems in materials science".

Mark Agronowsky, "Spherical waves, nodal sets, and thermoacoustic tomography".

Andrew Waldron (UC-Davis), "Conformal geometry in the bulk".

Ferdinando Arzarello (Turin University), "Trying out, seeing that, knowing why: a route to proof in the classroom".

Josef Silhan (Mazaryk University, Brno), "Prolongation of overdetermined systems of PDE's in parabolic geometries".

Takenobu Toyota, "Size distribution of sea ice in the marginal ice zone".

Tanja Tarvainen, "Corrections to linear methods in diffuse optical tomography using approximation error modelling".

Gaven Martin (Massey University - Albany), "New approaches to modelling nonlinear phenomena".

Kevin McLeod (University of Wisconsin - Milwaukee), "The Milwaukee Mathematics Partnership; challenges, successes and next steps".

Victor Flynn (Oxford University), "Rational points on curves".

Dimitri Leemans (Brussels University), "Some constructions in incidence geometry".

Thomas Forster, "Topological set theory".

Fabien Montiel, "Theoretical and experimental analysis of ocean wave scattering by ice floes".

Andy Begg, "Mathematics, education, and silos".

Jamie Sneddon, "Nearly regular polyhedra and combinatorial curvature".

Janne Huttenen, "Unknown boundary data in electrical impedance tomography problems".

Judy Paterson & Jamie Sneddon, "Conversations about curriculum change: Mathematical thinking and Team Based Learning in a discrete mathematics course".

Bill Barton, "MACIMISE: Returning to my research roots".

Ross Parsonage (Department of Statistics), "Out with the normal, in with the bootstrap".

T. M. G. Ahsanullah, "Enriched lattice-valued topological groups and convergence groups".

Merrilyn Goos (Univ. of Queensland),
Mike Thomas & Sergiy Klymchuk (AUT),
"Transition from school to university education in mathematics: New Zealand and Australia perspectives".

Robert Panai, "Parallel (p+1)-forms on the metric cone and interpretation on the underlying manifold".

Sean Curry, "Einstein manifolds with a Killing vector field".

Tatyana Gvozdeva, "Simplicial complexes obtained from qualitative probability orders".

Simon Grant, "A matter of interpretation: ambiguous contracts and liquidated damages".

Ben Martin (University of Canterbury), "Fixed points in spherical buildings".

Ittay Weiss, "A survey of dendroidal sets", and "Broad posets, trees, and dendroidal sets".

Sinai Robins, "Tiling Euclidean space by translations of a polytope, with multiplicity".

Horst Malchow (Universität Osnabrück), "Noise and diffusion in models of population dynamics".

Garth Dales, "Injectivity of modules over group algebras".

Robert Corless (University of Western Ontario), "Mandelbrot polynomials and matrices".

Jurgen Wolfart, "Uniform dessins on Shimura curves".

Isabel Hubard (Universidad Nacional Autónoma de México), "Symmetries of cubical toroids".

Dima Pasechnik, "On the inverse moment problem for polytopes".

Grant Lythe, "Stochastic dynamics and the adaptive immune system".

Shixiao Wang, "Theory of vortex breakdown phenomenon".

Vladimir Matveev, "Parallel tensors for cone structures".

Pablo Aguirre, "Global invariant manifolds at orientable and nonorientable homoclinic bifurcations".

Aisling McCluskey (National University of Ireland, Galway), "What lies beneath? An exploration of the accessibility of proof and proving in the context of an advanced undergraduate mathematics module: a case study".

Michael Lockyer, "Generalized inverse limits of tent maps".

Jeffrey Case, "Smooth metric measure spaces and conformal geometry".

Bernd Krauskopf, "Canards in the dynamics of aircraft as ground vehicles".

Matthieu Jacquemet, "The discovery of hyperbolization of a knot complement - Part 1 : background".

Arkadii Slinko, "MMP review: what are the issues and what are the options?".

Garry J. Tee

AUCKLAND UNIVERSITY OF TECHNOLOGY

School of Computing and Mathematical Sciences

Between December 2011 and March 2012, a number of students majoring in mathematical sciences were awarded the Summer research assistantships by the Faculty of Design and Creative Technology, AUT University. Among them, Anuj Bhowmik worked with Dr Jiling Cao on a project concerning infinite dimensional economies, Sharlene Dohrman worked with Dr Guanghua Lian on a project concerning modelling microstructures of financial markets; while Katie Arthur, Michael Ourednik and Zhenwen Cai worked with Dr Jiamou Liu on various projects in mathematical logic and theoretical computer science.

In January 2012, Assoc Prof Jiling Cao accepted an invitation from Prof Maria Gabriella Graziano to visit the Centre for Studies in Economics and Finance at the University of Naples Federico II, where Jiling also participated in the 3rd Workshop on Equilibrium Analysis and presented his recent work on infinite dimensional economies with asymmetric information.

In January 2012, Dr Farnon Ellwood of the University of Cambridge visited AUT to conduct collaborative research with SCMS statistician Dr Robin Hankin. Dr Ellwood is an eminent ecologist who specializes in mathematical ecology and has published his influential research in top international journals. Farnon will visit AUT again in June to complete the joint project and work with Robin on an important new dataset which catalogues tens of thousands of insects living in the arboreal canopy of a rainforest in Borneo. Their work is expected to be relevant to the kauri forests of Northland".

Prof Jeff Hunter spent some time in India in December and January following the acceptance of an invitation to present two lectures at the Workshop and deliver an invited presentation at the International Workshop and Conference on Combinatorial Matrix Theory and Generalized Inverses of Matrices held over the period 02-07 and 10-11 January at Manipal University. At the time of writing he is about to leave for an extended period in Europe visiting research colleagues at the National University of Ireland, the University of Ulster and the University of Nottingham. This research leave is also built around the Invited Mini Symposium on Markov Chains that has been instrumental in organising at the SIAM Applied Linear Algebra Conference at Valencia in June.

In January, Dr Jiamou Liu visited for two weeks the School of Computer Science and Engineering of the University of New South Wales, Sydney, for a joint project with Dr. Eric Martin on Automata-presentable logic programs. He then visited Prof. Rajeev Gore at Australian National University, Canberra. In both Sydney and Canberra, he gave a seminar on "Automatic structures and their isomorphism problems". Jiamou then attended the 18th Computing: Australasian Theory Symposium (CATS) at Melbourne, Australia. On the conference Jiamou presented his paper on "Efficient algorithms for Buchi games played on trees with back-edges". In February, Jiamou traveled to Germany and attended three conferences and workshops: Degree and Randomness-workshop in celebration of the 60th birthday of Klaus Ambos-Spies at Heidelberg, Oberwolfach Workshop on Computability Theory at Oberwolfach Institute of Mathematics, and the Workshop on Algorithmic Model Theory (AlMoTh) at Ilmenau. Jiamou then stayed in Ilmenau for 2 weeks to undertake joint research with Prof. Dietrich Kuske before coming back to New Zealand in March.

In February (13-17) 2012, Dr Alla Shymanska presented a paper "Application of Monte Carlo methods in charged particle optics" at the 10th International Conference on Monte Carlo and Quasi-Monte Carlo Methods in Scientific Computing, University of New South Wales, Australia.

Seminars

Cecilia Alicia Aguilar (Cengage Learning), "Cengage Learning-Digital Solutions"

Anuj Bhowmik (Auckland University of Technology), "Equilibria in Economies with Asymmetric Information"

Farnon Ellwood (University of Cambridge), "Beetles in the Mist"

Alexander Gavruskin (University of Auckland and University of Irkutsk), "Computable models of small theories"

Jiling Cao

MASSEY UNIVERSITY

Institute of Information and Mathematical Sciences (IIMS), Albany

We are pleased to welcome Dr Annalisa Conversano who has joined the mathematics group as a tutor on a fixed-term contract. Annalisa has a PhD in Mathematical Logic and Theoretical Computer Science from the University of Siena in Italy, and has held positions at the University of Konstanz in Germany and the Universidad Complutense de Madrid in Spain.

Winston Sweatman, Robert McKibbin, Graeme Wake, Alona Ben-Tal, Carlo Laing, Mick Roberts and PhD student Amjad Ali gave presentations at the ANZIAM conference in Warrnambool in Victoria, Australia. Robert received the 2012 ANZIAM Medal for his lifelong work in applied and industrial mathematics. The full citation appears elsewhere in this newsletter. Several delegates went on the tour to see the aboriginal site at Lake Condah where they saw ancient eel trapping sites . The trip then went to the Tower Hill reserve where they threw boomerangs and spears, sampled some bush tucker (purely vegetable – their throwing was not too proficient!), saw a wealth of animals including koala, kangaroos, echidna and emu and climbed to the volcanic crater! Carlo chaired the JH Michell Medal committee and presented this year's award to Matthew Simpson of the Queensland University of Technology.

At the ANZIAM meeting a Special Interest Group in Mathematical Biology was formed. It held its inaugural workshop at Melbourne University the following Friday, where Mick presented a paper on modeling measles in New Zealand.

The week after ANZIAM, MISG was held for the 3rd and last time at RMIT in Melbourne, Winston, Robert and Barry McDonald moderated on three of the four different problems. Graeme was an invited speaker and talked about Consulting for Industry about fires. Former PhD student Joanne Simpson (nee Mann) also participated, this time in the role of industry representative for Fonterra.

In mid-April Graeme travelled to Singapore for four days for his first full company meeting in the new role as a Research Scientist in the Singapore-based "Epigen", a company which is concerned with the development of genetic expression and commercial opportunities therein. The quantitative arm of this international company is based at the Liggins Institute in Auckland, in association with related activities in Singapore and Southampton. Professor Sir Peter Gluckman is one of the directors of this company. In December 2011 Graeme led a small team which completed a major research consulting project for the company Fonterra, which modelled the characteristics of powder flow. In-between he and Elizabeth were (and are) enjoying their sixth and newest grandchild—a two year boy adopted from southern China. Perhaps six is the perfect number!!

At the end of April Alona attended the Experimental Biology 2012 meeting in San Diego where she presented a poster entitled "A theoretical study of the physiological significance of respiratory sinus arrhythmia".

Carlo is now a reviewer for Zentralblatt MATH.

Seminars

Marti Anderson, How does heterogeneity of multivariate dispersions affect ANOSIM, PERMANOVA and the Mantel test?

Geoffrey Grimmett (Cambridge; Forder Lecturer), Stochastic pin-ball

Grant Lythe (Leeds), Stochastic dynamics and T cells

Mick Roberts (Massey University Professorial Lecture Series), The mathematics of epidemics and pandemics

Masato Wakayama (Kyushu University), The spectrum of non-commutative harmonic oscillators and zeta functions

Compiled by Shaun Cooper

UNIVERSITY OF OTAGO

DEPARTMENT OF MATHEMATICS AND STATISTICS

John Clark, together with Kevin O'Meara and Charles Vinsonhaler, has published the book "Advanced Topics in Linear Algebra: Weaving Matrix Problems through the Weyr Form" at Oxford University Press. The book presents novel topics linked through the Weyr matrix canonical form, in particular common applications including matrix commutativity problems, approximate simultaneous diagonalization, and algebraic geometry.

Mike Hendy has been accredited as a Fellow of the NZMS in "recognition of his contribution to mathematics and his professional standing in the New Zealand mathematical community". Congratulations Mike!

Astrid an Huef has been elected to the Council of the NZMS and will serve for three years.

Boris Baeumer has taken up the elected position of Executive Member of Australian and New Zealand Industrial and Applied Mathematics (ANZIAM).

Congratulations to John Harraway for being a recipient of an Academic Staff Member Appreciation Award from Disability Information & Support for "providing exceptional support for students".

Daniel Turek won the "Best Statistics Talk" prize at the 2011 New Zealand Mathematics and Statistics Postgraduate Conference in Wellington. The title of Daniel's talk was "Model-Averaged Wald Confidence Intervals".

The department and the University of Auckland have jointly organised the 1st New Zealand Phylogenetics Workshop on 7-10 February. The workshop, which aimed to provide postgraduates and researchers with advanced theoretical knowledge and practical skills to carry out molecular evolutionary analyses, was highly popular and over-subscribed.

The department hosted the 6th Australasian Conference on General Relativity and Gravitation in Queenstown on 8-11 February with about 50 participants, mainly from New Zealand and Australia. Florian Beyer, Jörg Frauendiener, Jörg Hennig, Robert Thompson and Ben Whale gave talks. Florian was a plenary speaker and invited the participants to a "Guided tour through AVTD regions of the BKL world".

Tim White, a new postdoc at the Department, has been awarded one of two student prizes of 1,000,000 CPU hours on the supercomputing facility BlueFern in the Fast Start Challenge for 2011. Tim was funded for his work on the project "Pushing the phylogenetics envelope".

The department was delighted to host the Forder Lecturer Geoffrey Grimmett in April. Geoffrey's excellent public lecture on "Probability, the science of uncertainty" was attended by a large number of staff and students.

VISITORS

Visitors over the last months have been Rob Corless (University of Western Ontario), Boris Dubrovin (SISSA, Trieste), Helmut Friedrich (Max-Planck-Institute for Gravitational Physics, Potsdam), Torbjørn Håkan Ergon (University of Oslo), Stig Larsson (Chalmers University of Technology/Göteborg University, Sweden), David

Liberles (University of Wyoming), Fredrik Lindgren (Chalmers University of Technology, Sweden), Woei Chet Lim (University of Waikato), Ákos Seress (The University of Western Australia and The Ohio State University) Katherine St. John (City University of New York), Paul Tupper (Simon Fraser University).

SEMINARS

Boris Dubrovin (SISSA, Trieste, Italy) "On geometrical structures and properties of solutions to Hamiltonian systems of partial differential equations"

Max Gunzburger (Florida State University) "Centroidal Voronoi tessellations: theory, algorithms, and applications"

Jonas Šukys (ETH, Zürich) "Multi-Level Monte Carlo finite volume methods for nonlinear systems of stochastic conservation laws in multidimensions"

Robert M. Corless (University of Western Ontario) "Mandelbrot polynomials and matrices"

Herbert Pfister (University of Tübingen) "Do rotating dust stars exist in general relativity?"

Paul Tupper (Simon Fraser University, Canada) "Modelling with state-dependent noise"

Ákos Seress (The University of Western Australia and The Ohio State University) "The diameter of permutation groups"

Sergio Morales (Department of Microbiology and Immunology) "Rapid turnover and high variability of functional gene and transcript abundance in soils: How do we integrate computational and analytical tools into microbial ecology?"

Dávid Csercsik (Centre for Economics and Regional Science, Hungarian Academy of Sciences) "Applications of partition function form transferable utility cooperative games"

Colin Fox (Department of Physics) "Polynomial accelerated MCMC ... and other sampling algorithms inspired by computational optimization"

Helmut Friedrich (Max Planck Institute for Gravitational Physics, Potsdam) "Conformal structures of static vacuum data"

Peter Green "Fast Bayesian climate reconstruction"

Wynton Moore (University of Chicago) "Mock theta functions, moonshine, and modular transformations"

Peter Jupp (University of St Andrews, Scotland) "Inference on population size in binomial detectability models"

Ting Wang "Can volcanic hazards be robustly estimated?"

Brendon J. Woodford (Department of Information Science) "Machine learning: concepts, relevance, and applications"

Geoffrey Grimmett (University of Cambridge; NZMS Forder Lecturer for 2012) "Conformality and universality in probability"

Geoffrey Grimmett (University of Cambridge; NZMS Forder Lecturer for 2012) "Probability, the science of uncertainty"

Woei Chet Lim (University of Waikato) "Numerical simulations of spherically symmetric spacetimes with dust and radiation"

Tim White (Institute of Fundamental Sciences, Massey University) "Finding multinomial modes quickly"

Jon Brown "Semisimplicity for graph algebras"

Paul Hansen (Department of Economics) "The PAPRIKA method for Multi-Criteria Decision-Making"

Harish Sankaranarayanan "Grünwald-type approximations of fractional derivatives and fractional powers of operators"

Jörg Hennig

More local news, after the centrefold and mathematical miniature

CENTREFOLD

Charles Semple

Conventional wisdom has it that mathematics is a young person's game. Given this, it is surprising the number of successful mathematicians who ventured out into the world at large for some time before settling down to mathematical research. Charles Semple is a case in point.

A proud native of Napier—where apparently the weather is always perfect—Charles studied mathematics at Massey University in Palmerston North. After successfully completing an honours degree there, he was invited by Graeme Wake to stay on to study for an MSc. However his friends were all leaving and he instead headed off to do a Diploma of Education at the Auckland College of Education. Charles' reports on this year are mixed. We'll focus on the highlights. He clearly enjoyed living on Waiheke Island and his two outdoor education courses were apparently brilliant, involving caving at Waitomo and kayaking the Tongariro River.

He then taught high school mathematics at Napier Boys and Christchurch Boys high schools for four years before heading off overseas for a year. He reports that it was in East Africa between standing for hours on end in an overcooked crowded bus on the road from Mombassa to Lamu, and walking in a mountain range bordering Uganda and Zaire with a three-feather sleeping bag that he thought about mathematics. Later, in Belfast he recalls skimming the mathematics textbooks at the Queens University bookshop.

After returning to New Zealand and teaching for another year at Christchurch Boys High he enrolled for an MSc at Victoria University. He chose VUW for apparently no other reason than that he fancied living in Wellington. He was attracted to combinatorics because the assignment questions involved proofs and you could sense that when you had solved the problem you really knew that you had nailed it. He did his MSc thesis and subsequently his PhD thesis in matroid theory under the supervision of Geoff Whittle. His research was in the difficult area of matroid representation theory and led to a number of publication in high quality journals. This work was quite remarkable, indeed seminal, and while over ten years old, Charles' papers from that time continue to accumulate citations. This early work also earned two prizes from the Royal Society of New Zealand - the Hatherton Award and the Hamilton Memorial Prize.

Since then Charles has continued to work in matroid theory having significant collaborations with James Oxley, Dominic Welsh and Geoff Whittle amongst others. But what is more remarkable is that matroid theory is only one aspect of Charles' research. After completing his PhD in 1998, Charles obtained a Post Doctoral Fellowship at Canterbury and moved to Christchurch to work with Mike Steel on problems in phylogenetics. While still in combinatorics, this involves a radical shift. Nevertheless, Charles has gone on to become one of the leaders in this field, where discrete mathematics is used to reconstruct and analyse evolutionary trees and networks. His work in this field began by developing new theory for combing trees into 'supertrees'. This involved not just mathematics but close interaction with biologists so he could carry out the required 'chicken scratchings' (as they call it) to help prove or disprove their latest conjecture.

In 2003, Charles co-authored a book that was the first to set out a comprehensive mathematical framework for the study of phylogenetic trees, now a standard reference in the field with 580 citations so far. More recently, he has turned his attention in phylogenetics from trees to directed networks, which seem to more faithfully represent the complexities of biological evolution. This is a field that is currently very active, and Charles has solved some outstanding problems in it, as he continues in his other roles of teaching discrete maths, and the more rarefied life as a matroid theorist. So far the two fields – phylogenetics and matroid theory – have had little or no intersection, but rumors are that this may be about to change!

Charles' move to Christchurch was productive in other ways – he and wife Brigitte have two sons and a daughter. In 2001, near the end of his postdoc at Canterbury, he secured a lectureship within the department of mathematics and statistics. In 2010, Charles was awarded the *Mathematical Research Award* by the NZ Mathematical Society for "his landmark contributions to combinatorics, and in particular matroid theory, as well as leading work in phylogenetics and computational biology," and he served as president of the New Zealand Mathematical Society over 2010-2011. In 2010, he was promoted to Professor.

Earlier we observed the Charles breaks the stereotype that mathematics is a young person's game. He also breaks the stereotype that mathematicians are quiet introverted types. Charles is invariably outgoing, talkative, good humored and cheerful. Some might even say too cheerful! Nonetheless all would agree that those who have had Charles as a student or who have worked with him as a colleague have been lucky indeed.

Geoff Whittle

Mathematical miniature number 28

In my few years on the staff of the University of Canterbury, about 50 years ago, one of my colleagues was a strong supporter of the duodecimal numbering system. I don't remember all the arguments in favour of his point of view, but the fact that packets of eggs came in dozens was part of it, as was the observation that $\frac{1}{3}$ could be neatly written in base twelve. Coming out of this colleague's deciphobia was a view that sticking to what was called the Imperial System would be better than changing to metric units.

It was at that time that I bought my first house, or rather the land on which it was to be built. From the title documents the section looked approximately rectangular; but was this exactly true? One test would be to multiply the length by the breadth and see if this came out to be the same as the area. This calculation would be easy today and even a lawyer, not trained in mathematics, would be able to do it, working in metres and square metres. What complication there was came about because lengths were measured in links and chains and areas were measured in perches (or rods or poles which were different name for the same unit area of $30\frac{1}{4}$ square yards.) A link was 7.92 inches (that is 1/100 of the chain of 22 yards). I remarked to the lawyer handling the conveyancing that the section was far from rectangular because the length times the breadth was not equal to the area. This man of the law was impressed and said that I was the first person he had met who would have been able to do the calculation.

When I started writing miniatures many years ago I had the hope that they would perpetuate themselves as I tried to handle the correspondence they would generate. But I don't remember ever getting any reaction of this sort at all. Now that I am starting again I have decided to write about insultingly elementary things in the hope that this time I do receive some comments about them.

As my grandchildren get older, I often give them birthday cards with puzzles built in. Here is a typical set of puzzles for when one of them turns 16.

1. What is the total: $1 + 2 + 3 + \cdots + 16$?

2. The number of divisors of 6 is 4 because $1, 2, 3, 6$ divide exactly into 6. How many divisors of 16 are there?

3. The sum of the divisors of 6 is $1 + 2 + 3 + 6 = 12$. What is the sum of the divisors of 16?

4. What is the value of 2^{16}?

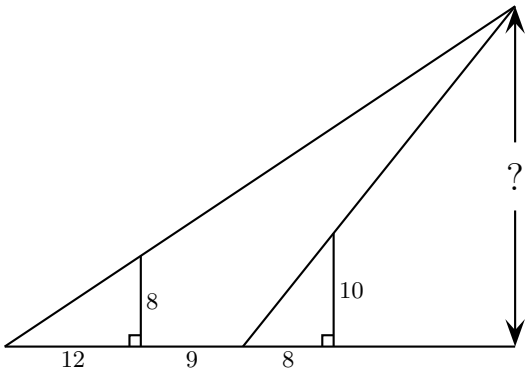
5. If today is Monday, what day of the week will it be after 16^{16} days?

6. What is the last decimal digit in 16 to the power of 16^{16}?

7. There are 11 partitions of 6. These are
   6, $5 + 1$, $4 + 2$, $4 + 1 + 1$, $3 + 3$, $3 + 2 + 1$,
   $3 + 1 + 1 + 1$, $2 + 2 + 2$, $2 + 2 + 1 + 1$, $2 + 1 + 1 + 1 + 1$,
   $1 + 1 + 1 + 1 + 1 + 1$.
   How many partitions of 16 are there?

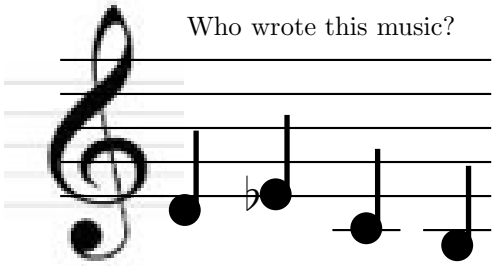
There are three more grandchildren lined up to reach the age of 16 but, judging by the older 4, I don't expect many attempted answers. However, I have one further hope from my *collegial* family. An American friend is expecting a son to be born quite soon and some friends suggested a novel celebration, even at this early stage. Friends were asked to send postcards adressed to the child, yet to be born, for him to read when he is old enough. I managed to squeeze two mathematical puzzles onto my postcard and at the same time I used the address lines to hold an easy musical question. Both the parents are musically as well as mathematically inclined, so who can tell what their son will be interested in, in another 16 years.

Postcard puzzles



Do there exist whole numbers a and b such that $a^2 + b^2 = 419731$?

Who wrote this music?



As a competition for next time, I ask for suggested birthday card questions for a 13 year old.

J. C. Butcher
butcher@math.auckland.ac.nz

LOCAL NEWS continues

UNIVERSITY OF CANTERBURY

DEPARTMENT OF MATHEMATICS AND STATISTICS

After nearly a year in temporary and shared offices department staff moved back into their old offices in two stages in early February. As can be expected for such an enterprise, a certain level of mayhem ensued. Furniture, equipment and boxes went to the wrong rooms or even the wrong department. Many of us still have boxes, filled with notes and other material, stacked in their rooms, waiting for a quieter time to sort them out and put their contents back onto shelves. Our technical and administration staff did a marvellous job at getting computers and other equipment up and running in offices and of tracking down missing items or getting things fixed that did not turn out as they should. We are now looking forward to a more normal academic year.

The department welcomed Robin Tiffen as a Teaching Fellow for the year. Robin is Head of Mathematics at St Margarets College in Christchurch. She worked as a mechanical engineer before completing a Diploma in Teaching at the Christchurch College of Education. Her teaching experience includes both NCEA and International Baccalaureate, committee membership of the Canterbury Mathematics Association and NCEA marking. The teaching fellowship is an ideal opportunity to better understand the transition from high school to first-year university.

Maarten McKubre-Jordens took up a two-year fixed term lecturing position in the department in February this year. His research interests are in non-classical analysis and para-consistent logic. Maarten is well known in the department. He did his undergraduate studies here and had been on a post-doctoral fellowship with Douglas Bridges since February 2010.

We farewelled Richard Brown who, after many years in various roles in the department, left in February. He stayed within the university though and took up a postdoc position with Tim David in the Bluefern High Performance Computing Centre and Biomathematics Research Centre.

Raaz Sainudiin has received a 14-day research visitor award that covers all local expenses to work on a project "Toward Spatially Explicit and Behaviourally Sensitive Population Pedigrees of the Rangatira Black Robins" at the Centre for Mathematics and its Applications (CMAP), Ecole Polytechnique, Palaiseau, France. He has also been awarded a Visiting Scientist award to help complete his book co-authored with Dominic Lee on Computational Statistical Experiments for November 2012. The award, from the Theoretical Statistics and Mathematics Unit of the Indian Statistical Institute, Bengaluru, India, will cover all local expenses.

Congratulations to Rosalie Hosking, who finished her MA thesis "Context-dependence of mathematical Activity: A case study concerning Edo period Japan" under the supervision of Clemency Montelle. Rosalie has been granted a study award from the Canterbury Branch of the New Zealand Federation of Graduate Women towards her PhD research in Mathematics and Philosophy. She also accepted a Department PhD Scholarship from the 2011 end-of-year round. Another of Clemency's Masters' students, Sanaa Bajri, graduated at the end of 2011. Her thesis title is "Arithmetic, induction, and the algebra of polynomials: Al-Samaw'al and his "Splendid book of algebra" ". Three other students, Abdul Haq, Chitrika Wickramarachchi and E Thavanayagam, were awarded UC doctoral scholarships at the end of 2011.

Qui Bui has been invited to join the Editorial Board of the Journal of Function Spaces and Applications.

Steve Manion has been awarded a highly competitive Korea Foundation (KF) Postgraduate Studies Fellowship for research students in Australia and New Zealand. The fellowship is for postgraduate students undertaking research related to Korea. The research Steve is completing in his PhD programme in the field of Computational and Applied Mathematics tackles disambiguation problems in the fields of Natural Language Processing and Machine Translation. In brief, the goal of his research is to ensure a machine is able to select the most appropriate vocabulary in a given context. The target language pair that he is focusing on for translation is Korean-English as these are the two languages he speaks most fluently. Steve has been studying Korean for the past 6 years, in particular at Sungkyunkwan and more recently at Oxford University as a PhD exchange scholar from UC. Over the Summer, Steve completed an internship at Pingar, a New Zealand-based company building technologies based on semantic text analysis to help companies organise their unstructured data. Steve worked on Pingars API for analysing Japanese documents to enable Pingars roll-out into the Japanese market. He also participated in a joint research project between Pingar and the University of Waikato, sponsored by the Ministry of Science and Innovation.

Conferences, workshops and visits

James Dent attended a NZIMA workshop on 14 December and to gave a talk "An Introduction to Constructive Reverse Mathematics" at the 12th Asian Logic Conference, 15-20 December, in Wellington.

Marco Reale attended the MODSIM 2011 Conference in Perth, 12-16 December, and CFE11 (Computational and Financial Econometrics) at the University of London, 17-19 December.

Xin Zhao attended the 4th International Conference of the ERCIM WG on Computing and Statistics, University of London, 17-19 December.

Maarten McKubre-Jordens gave talks at the NZ Maths Colloquium in Auckland, 6-8 December, the Australasian Association of Logic meeting in Wellington (Algebraic Inconsistent Topology), 14-15 December, and the 12th Asian Logic Conference (Constructing Solutions to the Dirichlet Problem) in Wellington, 15-20 December. He also attended the JAIST (Japan Advanced Institute of Science and Technology) Spring School on Formal Reasoning: Theory and Application, and workshop on Mathematical Logic: Development and Evolution into Various Sciences , Japan 5-10 March 2012.

Douglas Bridges was in Cambridge for 9 days in January, taking part in the programme 'Semantics and Syntax: A Legacy of Alan Turing' at the Isaac Newton Institute. In addition, he spent three weeks at Stockholm University, working with Erik Palmgren, experiencing temperatures as low as -19C, and going for a walk on the frozen sea.

The successful ConstruMath South 2012 meeting was held from 26-28 January 2012, at the Westport Field Station of the University of Canterbury, and organized by Maarten McKubre-Jordens and Raazesh Sainudiin. It was aimed at fostering the exchange of ideas between various disciplines, emphasizing the links between Mathematics, Computer Science, Philosophy and Statistics. Tutorials and talks on various aspects of non-classical logics were run, with a view to using these aspects in other areas of research. Thanks to the widerang-ing nature of the research interests of the group, the meeting proved to be very conducive to generating cross-disciplinary ideas and constructive critique. Participants also enjoyed the opportunity to explore the seal colony near Westport and walked from the colony to the lighthouse.

Mike Steel and Charles Semple with assistance from Dietrich Radel organised the 16th NZ Phylogenetics Meeting in Kaikoura from 28 January to 3 February. The conference brought together 50 participants selected from those who applied, with about half from overseas and half from New Zealand. Raaz Sainudiin and PhD student Joe Zhu also attended the meeting.

The following week, 4-10 February 2012, Raaz Sainudiin organised a workshop at the Cass field station in the Southern Alps, entitled ABaCASS (Algebraic Biology at Cass). The meeting at Cass, which was supported by the Marsden Fund, saw a very productive research week with 12 participants from 7 countries. The objective of AbaCass 2012 was to facilitate uninterrupted and balanced Face-to-Face Transmissions in Contemporary Algebraic Biology, where Algebraic Biology is nothing more than algebraically flavoured mathematical communications in Biology.

Irene David was invited to talk to the people in the Christchurch Statistics NZ office about alternatives to lectures for delivering training to their employees. Her talk was also presented to their people in Wellington and Auckland via video-conferencing. Irene reports that "Key people at Statistics NZ" are very interested in alternative methods of providing statistical training. There was a lively discussion of the various means we use for engaging and assessing the students through "Learn".

Günter Steinke attended the conference and Magma workshop Symmetries of Discrete Objects 2012 (SODO2012) in Queenstown, 13-17 February, where he presented the talk "2-transitive finite circle geometries".

Charles Semple gave a talk "What is a Typical Matroid?" at the 2012 Spring Eastern Section AMS Meeting at George Washington University, Washington DC, 17-18 March, in the Special Session on Matroid Theory. He also made a research visit to Louisiana State University.

Raaz Sainuddin and Phil Wilson spoke at the Canterbury Mathematics Association
mini-conference for local high school teachers, held in the department on Saturday 24 March. Around 30 teachers attended their two talks on "Introducing the Math Explorers' Club of Ithaca New York for high schools in Christchurch" and "Narrative Mathematics", and gave extremely positive feedback.

Clemency Montelle attended a week long live-in workshop at the Centre International de Recontres Mathématiques (CIRM) in Marseilles, France, for the session "Histoire des tables numériques", 26-30 March 2012.

As part of his sabbatical year, John Hannah spent March at Quest University in Canada. While there, he taught a whole course (51 contact hours in three and a half weeks) on Mathematics for Liberal Arts students. Quest uses a block system, so students do one course at a time, one per month,

and John had 15 students with 3 contact hours per day, 5 days a week, and they were working only on his course. Exhausting for the lecturer but mind broadening too! The students were keen and inquisitive. In one class they spent almost two hours arguing about various proofs that root 2 was irrational. If only all students would argue like that! Quest recently topped all 5 categories in Canadas 2011 National Survey of Student Engagement i.e. level of academic challenge, inclusion of enriching educational experiences, intensity of student-faculty interaction, use of active and collaborative learning, and existence of a supportive campus environment. So it was interesting to see how differently they do things from the Canterbury way. The weather was organized to ensure minimum distraction for students (unless they were skiers) but John and his host, Glen van Brummelen, still managed to visit a couple of local attractions.

Michael Plank, in conjunction with Erskine visitor Richard Law, organised a workshop on body size, food webs and ecosystem dynamics (thanks to funding from a Marsden grant). The workshop was held from 2-4 April in the Department of Mathematics and Statistics. Mike says that they were fortunate to be able to entice 5 highly regarded invited speakers from overseas. The NZ contingent included researchers from NIWA (Wellington and Christchurch) as well as staff and postgraduate students from the School of Biological Sciences and our own Department. As well as a great mix of local and visiting participants, the meeting had a mixture of mathematicians, statisticians, theoretical and applied ecologists, and fisheries biologists. The range of talks was excellent and the workshop has sparked many an idea for future research, so hopefully several fruitful collaborations will ensue. The workshop also had a field trip, kindly organised by Helen Warburton and Hamish Greig from SBS, to the Cass Field Station. Hamish and Helen showed us some of their field sites and methods, and their passion, knowledge and skill in their research were fantastic to see. Our overseas guests also appreciated the chance to see some of NZ's beautiful scenery.

James Degnan gave a seminar talk "Gene Trees in Species Networks" at the National Institute of Mathematics and Biological Synthesis (NIMBioS) at the University of Tennessee on 10 April.

Raaz Sainudiin gave a talk "Posterior Expectation of Regular Paved Random Histograms" (Gloria Teng, Jenny Harlow, Dominic Lee and Raazesh Sainudiin), at the Stochastic Networks Workshop, Auckland, 12-13 April 2012.

Rua Murray attended a 5-day workshop on Open Dynamical Systems at the Banff International Research Station, 9-13 April, 2012. An open system is one where orbits persist only for finite time, leaving the domain of interest and rendering irrelevant the usual asymptotic objects of study in dynamical systems (attractors, invariant manifolds, invariant measures etc). The new theoretical and computational techniques presented at the meeting find application in a diverse range of areas, including oceanography, ozone hole dynamics, reliability of networks of neurons, relationship between microscopic dynamics and diffusion, efficient mixing in micro-fluids. give a talk titled "Numerical Approximation of Conditionally Invariant Measures"

Visitors

Distinguished probability theorist David Aldous FRS, from UC Berkeley (Statistics) visited the department 27 February - 2 March. This was the first time he has visited NZ. David's work ranges from Mathematical Probability to applications of Statistics in Biology, Finance, Physics and other areas. He has been awarded the Loeve Prize and the Rollo Davidson Prize and in 1994 was elected a Fellow of the Royal Society of London. A conference in his honour was held last year at the University of Provence.

After many previous visits, Simone Linz from the University of Tübingen, Germany, returned to the department earlier this year. She will be here for the next two years. Simone has been awarded a prestigious Marie Curie International Outgoing Fellowship. The fellowships are for 3 years, two of which are spent at an institution outside Europe. Simone's associated project is in the broad area of phylogenetic networks.

Recent visitors include: Paul Wright (Austin Community College, Texas), Ana-Maria Magdalina (University of Bucharest, NCRE Visitor), Iain Martyn (Simon Fraser University, Canada), Richard Law (York University, Erskine visitor), David Liberles (Wyoming University), Frank D'Amico (Université de Pau & Pays de l'Adour, France, Erskine visitor), Martina Gallenberger (Institute of biomathematics and biometry, Munic, Germany), Joel Cohen (Rockefeller University. NY), Jeppe Kolding (University of Bergen, Norway), Julia Blanchard (University of Sheffield, UK), Celina Wong (University of York, UK), Shijie Zhou (CSIRO Brisbane), David Liberles (Wyoming University), Michael Matschiner (University of Basel, Switzerland), Rebecca Killick (University of Lancaster, UK).

Seminars

Rebecca Killick (University of Lancaster) "Efficient Detection of Multiple Changepoints with an Oceanographic Time Series"

Geoffrey Grimmett (University of Cambridge) "Probability, the Science of Uncertainty" (Forder Lecture, 2012)

Iain Raeburn (University of Otago) "Representations of Semigroups and Equilibrium States"

Frank D'Amico (University of Pau & Pays Adour, France) "Detection of Significant Changes in Short Time Series: Applied Issues in Ecology"

Thomas Lumley (University of Auckland) "Design and Analysis Issues in a Two-phase DNA Resequencing Study"

Rick Beatson (University of Canterbury) "Approximation Theory: Analysis, Algorithms and Applications"

In Kang (University of Canterbury) "Wavelets, ICA and Statistical Parametric Mapping: with Applications to Agitation-Sedation Modelling, Detecting Change Points and to Neuroinformatics"

Martina Gallenberger (Institute of Biomathematics and Biometry Helmholtz Zentrum Mnchen, Germany) "Parameter Estimation for ARX-Hammerstein Models based on Matrix-valued Kernels"

Vince Bidwell (Private consultant, formerly at Lincoln Ventures Ltd) "The Eigenstructure Representation of Groundwater Dynamics, as a Precursor for Aquifer Management"

Jeroen Schillewaert (Free University of Brussels) "A Geometric Approach to the Freudenthal-Tits Magic Square"

David Aldous (UC Berkeley) "The Top Ten Things that Mathematical Probability says about the Real World"

Ian Wanless (Monash University) "Latin Squares"

Tony Dale (NZi3, University of Canterbury) "Massively Parallel Computing on CPU Supercomputers"

Anna MacDonald (University of Canterbury) "'Black-Box' Solution for Threshold Estimation in Extreme Value Modelling"

Günter Steinke

UNIVERSITY OF WAIKATO

DEPARTMENT OF MATHEMATICS

Emeritus Professor Achim (Teddy) Zulauf has generously given a gift to the University to create the A Zulauf Trust Scholarship for promoting the study of Mathematics. The scholarship is awarded annually and gives funding support to the value of $5000 for a student undertaking the research portion of a Master's degree. Teddy took up the Chair of Mathematics at the University in 1969 and was Head of Department from then until 1986. He retired about a year later. More information about Teddy may be found in the Centrefold of the August 1987 issue of this Newsletter. This article is also available from the NZMS website.

As reported in the last column, we have two new staff members. Daniel Delbourgo arrived in April while Woei Chet Lim started in January. More information about these two colleagues is in the New Colleagues section of this Newsletter.

Woei Chet went to Queenstown in February to attend the Sixth Australasian Conference on General Relativity and Gravitation. He presented a talk titled "Dynamics near spacelike singularities are more inhomogeneous than conjectured by BKL". In April, Woei Chet visited the University of Otago and gave a seminar titled "Numerical simulations of spherically symmetric spacetimes with dust and radiation".

This semester Nick Cavenagh and Yuri Litvinenko are on study leave. Nick will be overseas most of the time and will visit collaborators in Iran, Czech Republic (Prague), Canada, and Australia (Melbourne and Brisbane). Yuri has already made a trip to Bochum in Germany and will be travelling across the Tasman at a later stage.

Travellers who have crossed the Tasman recently have been Tim Stokes who spent two months over there and Stephen Joe who attended the one week 10th International Conference on Monte Carlo and Quasi-Monte Carlo Methods in Scientific Computation held in Sydney in February. Chaitanya Joshi from the Dept of Statistics also attended this conference.

February seems to have been a popular time for conference attendance. Ernie Kalnins travelled to Cuernavaca in Mexico to attend a conference on Superintegrability, Exact Solvability, and Special Functions. Ernie was on the International Organising Committee for this conference.

William Crump recently submitted his MSc thesis in Mathematics. He has received a scholarship from the Australian Government to undertake doctoral studies in mathematical physics at Monash University (in the Department of Physics).

Seminars

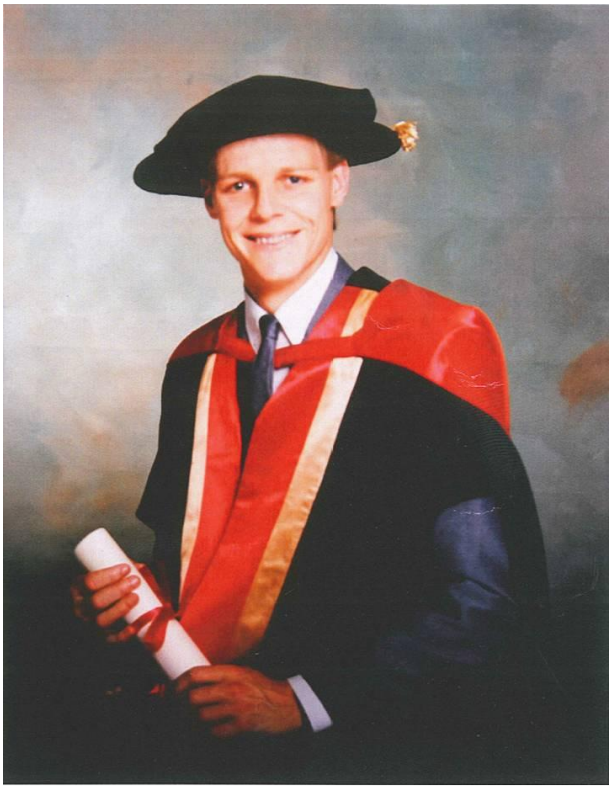
W. Crump, "Maxwell's equations on a 10-dimensional manifold with local symmetry so(2, 3)".

J. Toomre (University of Colorado), "Touching the inside of a convecting star and its magnetic dynamo".

Stephen Joe

OBITUARIES

ANDREW JOHN PULLAN



Andrew Pullan was born in 1963. He was dux of Aorere College in Mangere, won a University Scholarship, and completed a BSc at Auckland with first class honours in mathematics. Andrew joined the Engineering Science Department as a PhD student of Ian Collins in 1985. After receiving his doctorate in 1988, he spent a brief period working for Winstones/Fletcher Challenge, before returning to the University as a lecturer in 1989. Andrew then moved quickly up the academic ranks culminating in a personal chair in 2006.

Professor Mike O'Sullivan commented in his eulogy at Andrew's memorial service that Andrew never smoked cigarettes, nor drank alcohol, or coffee, or tea. Despite this virtuous existence, Andrew was an excellent mathematician. He made many mathematical contributions to bioengineering - I will mention one. This was his research on inverse problems - in simple terms, how can one estimate values for the hidden electrical data inside the human body from measurements taken on its surface? This is not only a problem of instrumentation, but involved some deep mathematics involving the estimation of under-determined systems. In Andrew's own words, "It is impossible to recreate the electrical state of each cell in the heart from surface electrical recordings, no matter how many surface recordings are available...multiple configurations of cellular activity can give rise to the same ECG signals". The contribution of Andrew and his team was to use highly detailed mathematical models of human anatomy to narrow down the possibilities.

Andrew's research began with the heart, but in later years focused on the stomach and intestinal tract, winning him a James Cook Fellowship in 2003, and a Fellowship of the Royal Society of New Zealand in 2009 for his pioneering work in this area. It is clear that he was destined for even higher honours, and his death is a great loss for the New Zealand scientific community.

Andrew's inaugural professorial lecture was a tour-de-force. A large monitor displayed electrical body measurements of Andrew himself, obtained in real time as he paced around the lecture hall. I now regret that this lecture was the only one of his that I saw in person, for he had a reputation with our students for being a fantastic teacher, engaging them with entertaining demonstrations, often at his own expense. He regularly appeared in the Engineering School's top 5 lecturer awards, and attracted the brightest

graduates as PhD students. Andrew was an enthusiastic and generous PhD supervisor, and his students willingly repaid this generosity by helping him with his legendary house renovations.

Andrew was a hero of our Department, Engineering Science. Although he did most of his research in the Bioengineering Institute, his loyalties were to the Department, and he was a champion of the Engineering Science degree. I never thought to question him about this, but I suspect that one reason was that he could see the opportunity provided by the degree to students who are very clever but, like himself, come from less privileged backgrounds. As Head of Department from 2008-2010, Andrew committed himself to the task of promoting the Engineering Science degree throughout the country to maximize the potential for all students to benefit from the same opportunity that he had enjoyed. He created "New Zealand's next Engineering Scientist" Modelling Competition, which is carried out each year in over 100 New Zealand secondary schools. It offers scholarships (now called the Pullan Prize) to the winners and serves to attract some of the country's brightest mathematical talents to our programme. Along with his research, I think that this will be remembered as one of Andrew's great contributions to the University.

Andrew was a fitness fanatic, and was extremely competitive. Way back in 1989, I introduced Andrew to Ron Paterson from the Law Faculty, and the three of us used to run together after work. We used to try and break the record for a Hobson Bay pipeline run. After being told that Ron and I had done it in what we thought was a spectacularly unbeatable 35 minutes, Andrew went out the next evening on his own and proudly announced a time of 33 minutes, which was never bettered. Through Ron, Andrew established friendships with a lot of the Law faculty in the University. This might surprise some of you, as Andrew would not have been perceived as having much in common with lawyers. But I think that people like Mike Taggart and Julie Maxton could instinctively recognize Andrew's intellectual pedigree, and they all became Andrew's close friends. On top of this Andrew was very entertaining, and great company.

Andrew was a thoroughly decent human being. He was a devoted husband to Patti, and proud and supportive of his children Zeke and Xanthe. Andrew showed great kindness and generosity towards his friends, colleagues and students. He was a very courageous man in all respects. Senate will remember that he stood up for what he believed was right, without concern for his reputation.

Andrew died of a metastatic melanoma. He was hopeful of the success of a new BRAF drug discovery; his blog describing the ordeal of this treatment was called "Andrew's recovery". To help fund the treatment, David Ryan set up a trust which received contributions from Andrew's friends from all around the world. The treatment appeared to be working well, though Andrew was in considerable pain. In early March, it was discovered that the cancer had mutated, and that the treatment would no longer work. He went into Mercy Hospice and died on March 7. He was 48.

Andrew's memorial service at the McLaurin Chapel was attended by nearly 600 people, and his death was mourned by many more, from all around the globe. The Department, School, University and country has lost a brilliant mind and a unique personality. Patti, Zeke and Xanthe have lost a loving husband and father, and those of us who knew Andrew have lost a true friend. We will all miss him more than I can say.

Note: This eulogy was delivered by Prof. Andy Philpott, Department of Engineering Science, to a meeting of the University of Auckland Senate, on April 2nd, 2012.

– Posted By Andrew to Andrew Pullan http://andrewsrecovery.blogspot.com/2012/04/eulogy-andy-philpott.html on 4/09/2012 07:40:00 PM

Andy Philpott

FEATURES

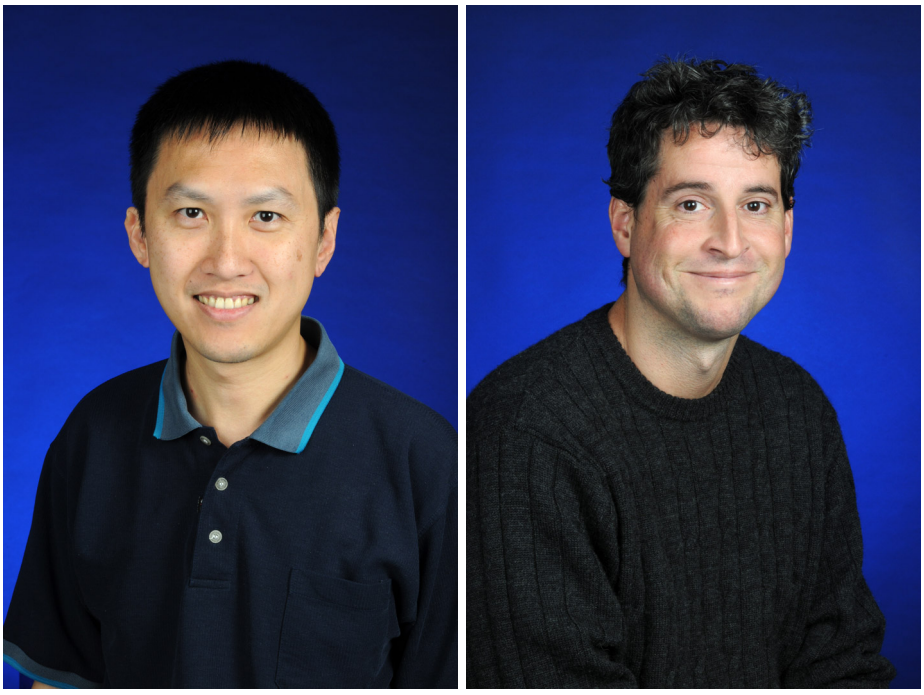
New Colleagues

Daniel Delbourgo

Daniel Delbourgo joined the Department of Mathematics at the University of Waikato in April 2012. His main interests are in arithmetic geometry and number theory. After completing his PhD with John Coates at Cambridge, he undertook postdocs at Paris XI and at Universite Louis Pasteur. He returned to England in 2001 to take up a lectureship at Nottingham University, before moving to Monash University in late 2007. He hopes to continue his research on elliptic curves and modular forms, with an emphasis on the new field of non-commutative Iwasawa theory.

Woei Chet Lim

Woei Chet Lim joined the Department of Mathematics at the University of Waikato in January 2012. His research interests are in general relativity and cosmology. He completed his BMath (Joint Applied Mathematics and Computer Science), MMath (Applied Mathematics), and PhD (Applied Mathematics) at the University of Waterloo. He was a postdoc for seven years at four institutes: Dalhousie University, University of Alberta, Princeton University, and Max Planck Institute for Gravitational Physics. He is continuing his research on structure formation in cosmology, and innovation in numerical solutions of the Einstein equations.



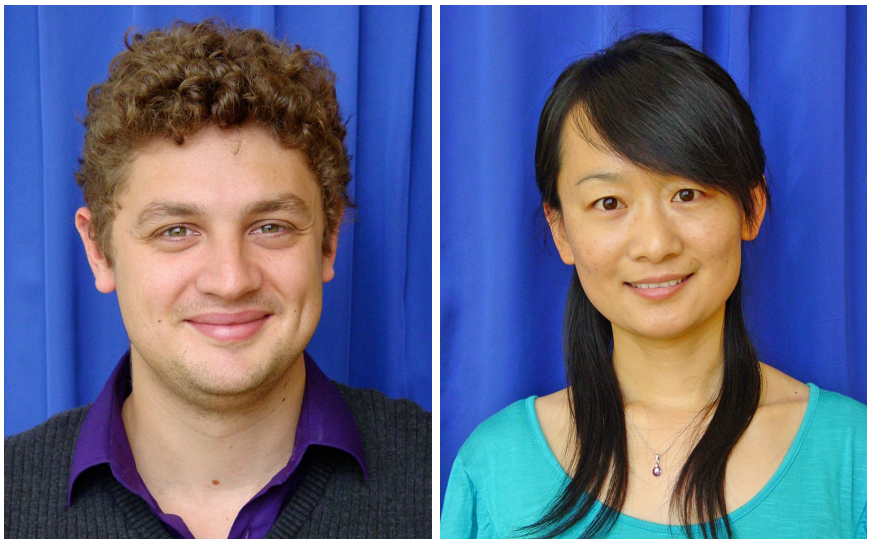
Woei Chet Lim and Daniel Delbourgo

TILMAN DAVIES

Tilman Davies joins the Department as a new Lecturer in Statistics shortly after submitting his PhD (Massey University) for review. He has spent time working in Australia at Melbourne's Commonwealth Scientific and Industrial Research Organisation (CSIRO), as well as in the USA near Washington DC as a researcher at a biostatistical consulting firm. His research interests revolve around applied spatial statistics with an epidemiological slant, including kernel smoothing, computational statistics, and point processes.

TING WANG

Ting Wang has been appointed as a Lecturer in Statistics at the University of Otago in early January 2012. After obtaining her PhD in Statistics from Massey University (under the supervision of Mark Bebbington at Massey University, David Harte and David Vere-Jones at Victoria University of Wellington), Ting spent 18 months in a Research Fellowship working on robust estimation of volcanic hazards with the Volcanic Risk Solutions research group at Massey. Before obtaining her PhD, she spent a month in Tokyo as a Visiting Fellow at the Institute of Statistical Mathematics. Her main research interests span across statistical theories (including robust statistics, stochastic models, especially in geophysics, point process theory, and survival analysis) and applications (mainly in epidemic processes such as earthquake and volcanic hazards).



Tilman Davies and Ting Wang

A DISTINGUISHED MATHEMATICAL GENEALOGY

Marston Conder reports that:

Jennifer Huang showed my son Jonathan the mathematical genealogy website http://genealogy.math.ndsu.nodak.edu, which traces lineage of PhD supervision, e.g. Supervisor of X was Y, whose supervisor was Z, whose students also included U, V, W ...

Many of us have known about this website for a while, and some of us are proud to have Euler or Gauss (or both) as our mathematical ancestors.

But Jonathan just pointed out to me the heritage of Jianbei:

* Jianbei An was supervised by Paul Fong

* Paul Fong was supervised by Richard Brauer

* Richard Brauer was supervised by Issai Schur and Erhard Schmidt.

Now

* Issai Schur was supervised by Frobenius and Fuchs

* Frobenius was supervised by Kummer and Weierstrass

* Kummer was supervised by Scherk, who was supervised by Brandes and Bessel, who was supervised by Gauss, while

* Weierstrass was supervised by Gudermann, who was supervised by Gauss.

On the other hand,

* Erhard Schmidt was supervised by Hilbert

* Hilbert was supervised by Lindemann

* Lindemann was supervised by Klein

* Klein was supervised by Plücker, and apparently also Lipschitz [see http://en.wikipedia.org/wiki/Rudolf_Lipschitz]

* Plücker was supervised by Gerling, who was supervised by Gauss

* Lipschitz was supervised by Dirichlet and Ohm

* Dirichlet was supervised by Poisson and Fourier

* Poisson was supervised by Lagrange and Laplace

* Laplace was supervised by d'Alembert

* Lagrange was supervised by Euler.

That seems difficult to beat.

Congratulations on your mathematical heritage, Jianbei!

The 2012 ANZIAM Medal

This article is from the ANZIAM website, see http://www.anziam.org.au/The+2012+ANZIAM+Medal. Thank you to Julia Piantadosi for permission to reproduce the article here.

Preamble:

The ANZIAM Medal is the premier award for Applied and Industrial Mathematics in our region, the first award being made in 1995 to Professor Renfrew Potts and it is awarded biennially. This year the committee comprised myself, Professor Graeme Wake and Dr Bob Anderssen. Unlike many other medals, the ANZIAM medal is a little unusual in that it is not just for research achievement, but is based upon overall wide ranging contributions to the discipline, and the selection criteria specify that the ANZIAM medal be awarded on the basis of a combination of:

> Research achievements,
>
> Activities enhancing Applied or Industrial Mathematics, or both, and
>
> Contributions to ANZIAM.

ANZIAM Medal citation for Professor Robert McKibbin

McKibbin holding medal and certificate It gives me much pleasure to announce that the ANZIAM Medal for 2012 goes to Professor Robert McKibbin. Robert is Professor of Applied Mathematics at the Institute of Information and Mathematical Sciences, Massey University, on the Auckland campus in New Zealand. Robert was born in New Zealand and did his first degrees in Mathematics, up to the Masters degree, at the University of Canterbury. After some teaching in Papua New Guinea, he then completed his PhD in 1982 in the area of Geothermal Modelling in the Department of Theoretical and Applied Mechanics (now the Department of Engineering Science) at the University of Auckland, where he subsequently became a Senior Lecturer. Robert moved to Massey University in 1991, first to Palmerston North, and later transferring to Massey Universitys expanding Auckland campus in 2001. He was appointed Professor of Applied Mathematics in 1996.

Over the past two decades, Robert has been one of the pre-eminent Applied Mathematicians in New Zealand, with a particular focus on geophysical, geothermal and industrial applications. His mathematical work ranges from geothermal fluid dynamics and hydrothermal eruptions, to the modelling of ground subsidence and aluminium smelting cells. He is highly regarded for his early work in the 1980s in hydrothermal eruptions that appeared in the Journal of Geophysical Research, and presented in a way that made his research accessible to practitioners. His work has attracted significant funding, and national and international recognition through numerous invitations to speak at international Applied Mathematics conferences.

He has made significant impact in the modelling of the distribution of volcanic dust from eruptions, and has many strong Japanese research collaborators. He has visited Japan on many occasions and in 2007 as part of the New Zealand-Japanese Scientist Exchange Program. His work in this area is based on accurately modelling the fundamental physical processes with novel and original uses of the advection-diffusion equation. The same modelling arises from other industrially-based problems, such as pollen distribution and spray drift and its capture by shelter belts. The practical impact of his research can be seen in many of the reports from the Mathematics-in-Industry Study Group meetings. He has also been extremely active in extending the Mathematics-in-Industry Study Group activities to other countries in South East Asia, notably Indonesia and Thailand.

Robert has supervised 23 PhD and MSc students, in many diverse areas of Applied Mathematics, all with a strong Industrial Applied Mathematical focus. He has also supervised a large number of under graduate industrial projects to inspire a whole generation of New Zealand Applied Mathematics students. He is an extremely supportive mentor, and very much a team player in collaborative activities. Throughout Australia and New Zealand, there are many active Applied Mathematicians who attest to have been strongly influenced by Robert. He has been a leader in ANZIAM for many years and was Chair 2004-6, and his commitment to both ANZIAM and the Royal Society of New Zealand is seen through the large amounts of his time that he devotes to these organisations. His participation in the Mathematics-in-Industry Study Group meetings is one of the central reasons that they have been so successful. He has been the Director of the Centre for Mathematical Modelling and the Centre for Mathematics in Industry at Massey University, for a total of 12 years, and one of the major forces that have steered New Zealand Applied Mathematics towards industrial applications. There are few other Applied Mathematicians in New Zealand who have shown more devotion and service to the field than has Robert. Through his enthusiasm, energy, and sustained achievement, he has demonstrated a life long commitment to the Applied and Industrial Mathematics profession, to the extent that he well and truly meets the criteria for this award. The selection panel unanimously recommends that Professor Robert McKibbin be awarded the ANZIAM Medal for 2012.

Professor James Hill

Professor Graeme Wake

Dr Robert Anderssen

(2012 ANZIAM Medal Selection Committee).

CONFERENCES

Australasian Conference on Combinatorial Mathematics and Combinatorial Computing

- Dates are 10-14 December 2012.
- At University of New South Wales, Sidney, Australia.
- See http://conferences.science.unsw.edu.au/36accmcc/

The 36th Australasian Conference on Combinatorial Mathematics and Combinatorial Computing (36ACCMCC) will be held at the University of New South Wales in Sydney, Australia, 10-14 December 2012. The webpage is http://conferences.science.unsw.edu.au/36accmcc/

ACCMCC is the annual conference of the Combinatorial Mathematics Society of Australasia. The conference covers all areas of combinatorics in mathematics and computer science. The following is a list of confirmed invited speakers.

- Ron Aharoni, Technion, Israel
- Marston Conder, University of Auckland, New Zealand
- Daniel Horsley, Monash University, Australia
- Christine O'Keefe, CSIRO, Australia
- Chris Rodger, Auburn University, USA
- Frank Ruskey, University of Victoria, Canada
- Carsten Thomassen, Danish Technical University, Denmark
- Anders Yeo, Royal Holloway, University of London, UK

Attendees are invited to give contributed talks. Contributed talks will be 20 minutes in length with an additional 5 minutes for questions. The CMSA Student Prize will be awarded to the best student talk at the conference.

The CMSA offers travel support for students to attend the ACCMCC conferences. More detail will be posted on the 36ACCMCC website closer to the conference date.

For more information about 36ACCMCC or to be added to a mailing list for future announcements, please contact the organisers at mailto:accmcc2012@unsw.edu.au

New Zealand Statistical Association 2012 Conference

- Dates are 29-30 November 2012
- At University of Otago, Dunedin, New Zealand
- See http://www.maths.otago.ac.nz/nzsa2012/ for details.

Australasian Applied Statistics Conference 2012 (GenStat & ASReml)

- Dates are 3-7 December 2012
- At Queenstown,New Zealand
- See http://www.aasc2012.com/ for details.

46th Annual ORSNZ Conference

- Dates are tentative. Currently Wed 5 Dec (Welcome), Thu 6 - Fri 7 Dec, 2012.
- At Victoria University of Wellington, Wellington, New Zealand
- See https://secure.orsnz.org.nz/conf46/ for details.

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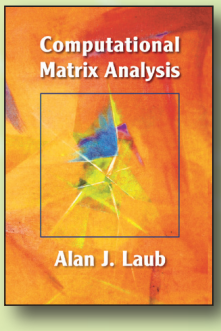
Computational Matrix Analysis

Alan J. Laub



Using an approach that its author calls "matrix analysis for grown-ups," this new textbook introduces fundamental concepts of numerical linear algebra and their application to solving certain numerical problems arising in state-space control and systems theory. It provides readers with a one-semester introduction to numerical linear algebra; an introduction to statistical condition estimation in book form for the first time; and an overview of certain computational problems in control and systems theory.

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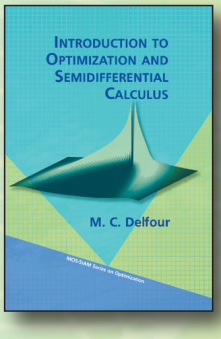
Introduction to Optimization and Semidifferential Calculus

Michel Delfour

MOS-SIAM Series on Optimization 12



This primarily undergraduate textbook focuses on finite-dimensional optimization. It offers an original and well integrated treatment of semidifferential calculus and optimization, with an emphasis on the Hadamard subdifferential. The book also includes complete definitions, theorems, and detailed proofs, along with commentaries that put the subject into historical perspective and numerous examples and exercises throughout each chapter, with answers to the exercises provided in an appendix.

2012 • xvi + 354 pages • Hardcover • ISBN 978-1-611972-14-6
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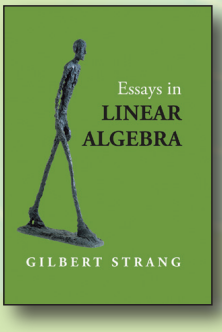
Essays in Linear Algebra

Gilbert Strang

Wellesley-Cambridge Press 11



This book brings together 27 classic articles by Gilbert Strang on linear algebra, computational science, applied mathematics, and calculus, each introduced by a new essay. The essays present historical background, the current state, and unsolved problems.

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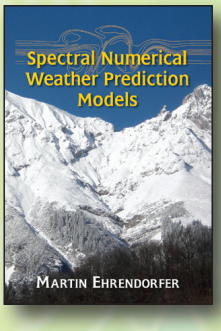
Spectral Numerical Weather Prediction Models

Martin Ehrendorfer



This book provides a comprehensive overview of numerical weather prediction (NWP) focusing on the application of the spectral method in NWP models. The author illustrates the use of the spectral method in theory as well as in its application to building a full prototypical spectral NWP model, from the formulation of continuous model equations through development of their discretized forms to coded statements of the model. The book provides readers with information necessary to construct spectral NWP models; a self-contained, well-documented, coded spectral NWP model; and theoretical and practical exercises, some of which include solutions.

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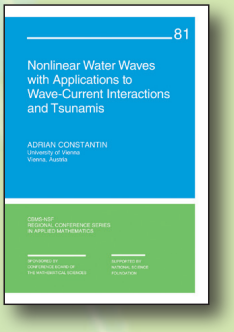
Nonlinear Water Waves with Applications to Wave-Current Interactions and Tsunamis

Adrian Constantin

CBMS-NSF Regional Conference Series in Applied Mathematics 81



This overview of some of the main results and recent developments in nonlinear water waves presents fundamental aspects of the field and discusses several important topics of current research interest. It contains selected information about water-wave motion for which advanced mathematical study can be pursued.

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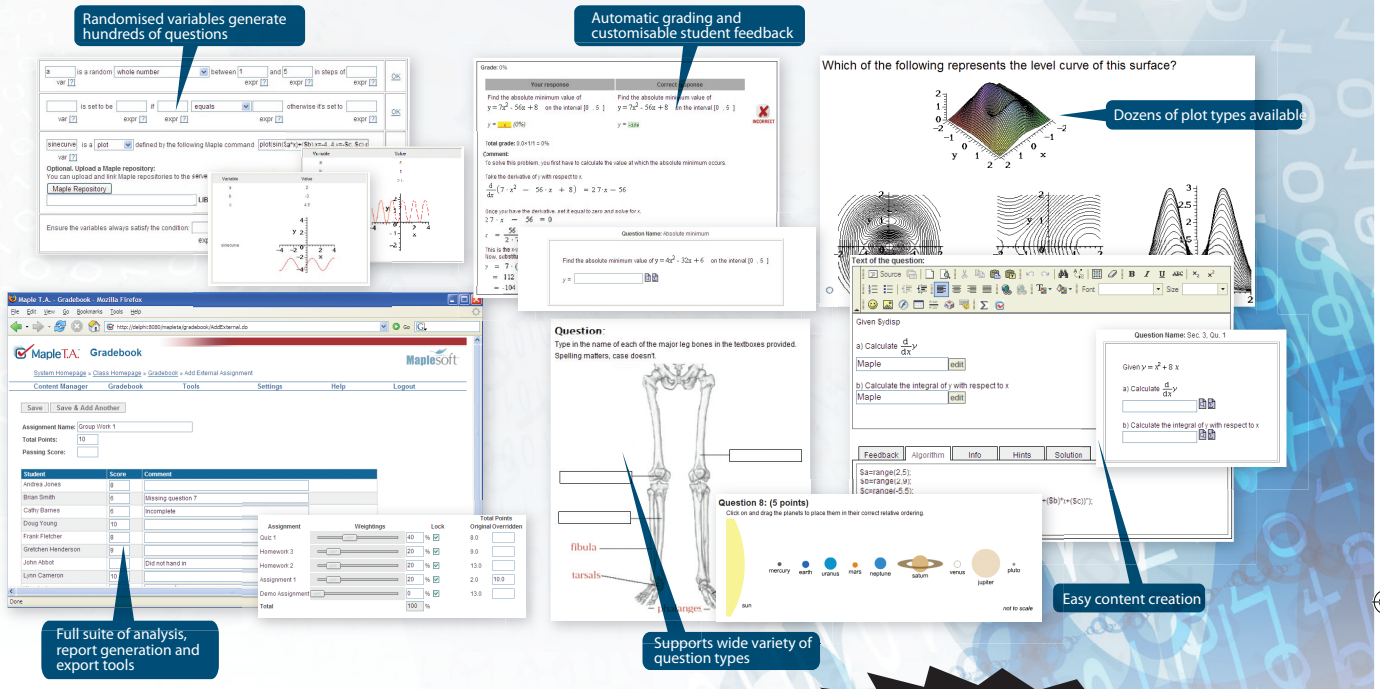

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