

IIMS NEWS

*Being the newsletter of
The Institute of Information and Mathematical Sciences
Assembled with care by Freda Mickisch with the vital assistance of
Merrill Bowers, the contributors and readers*

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Time to start thinking about your item for the next issue...

From the Head of IIMS



Staff

I regret to let you know that Juna Pokhrel from the IIMS Office has left us for another position in Auckland. Her last day was 3 November. There was a gathering of IIMS general staff at a morning tea to say farewell to Juna. Best wishes for your new job, Juna.

Kelly Topliss will be helping out in the Office for a few weeks from 6 November. Kelly has worked in the Regional Facilities Management section here at Massey Albany, so she is no stranger to the campus. Welcome, Kelly.

Stats Chair

The Chair of Statistics application period has now closed. A short-listing meeting of the Selection Panel will be held on 6 November, with interviews tentatively scheduled for 19 December.

IIMS Summer Research Assistants

IIMS is funding four SRAs over the summer, in addition to those MURF-funded ones announced in the last IIMS News. There will be one in each of CS, IS, Maths and Stats. They will join the three MURF-funded SRAs announced in the last issue of IIMS News, and the two working with Alona Ben-Tal through her Marsden FastStart grant.

FIET

Congratulations to Rosemary Stockdale on successfully gaining a grant from the Fund for Innovation and Excellence in Teaching. She has been awarded \$13,000 for her project "Enhancing large-class first-year student learning through creative visual learning tools", and will lead a group from IS and CS that will undertake the project. Well done, Rosemary!

ARC (over the "ditch") success

Congratulations, too, to Paul Cowpertwait, who is included in a successful Australian Research Council (ARC) funding bid. Paul writes:

'I will be a partner investigator (with Assoc Prof Martin Lambert & Dr Andrew Metcalfe, University of Adelaide, and Prof George Kuczera & Dr Mark Thyer, University of Newcastle) working on "A stochastic space-time model of rainfall fields in large heterogeneous regions". The project is funded by the ARC (Australian Research Council) for 3 years and is part of the National Research Priority "An Environmentally Sustainable Australia" under the two priority goals of "Water - a critical resource" and "Responding to climate change and variability". There are sufficient funds to allow for 3 (2-week) trips to Adelaide/Newcastle (air fares and subsistence) to enable collaboration with the other partners and associated researchers.'

Well done, Paul!

IIMS Postgraduate Conference 2006

Congratulations to all who were involved with the third in the annual series of IIMS Postgraduate Conferences, held on 25 October. It confirmed my already-held conviction that the research, scholarship and presentation skills of our postgrads are at a very high level, and are evidence of the careful nurturing provided by their supervisors.

The Conference Committee of Jo Mann, Sam Alexander, Natalia Nehring and Hossein Sarrafzadeh should feel proud of their

organization and running of the meeting. The Proceedings volume, edited by Jo Mann and Maarten Jordens, is a fine record of the contributions. The posters will be seen around the Institute for further perusal over the coming months.

Freda Mickisch and Mike Yap did a fine job in support of the participants aspirations and hard work. The day ran smoothly, nicely punctuated by food and drinks.

A team of IIMS and Student Learning Centre staff provided valuable feedback on the talks and displays - many thanks to those who gave their time. We are all grateful, too, to the panellists, Dennis Viehland, Claire Jordan and Ken Hawick, for leading the stimulating session towards the end of the Conference.

The presentations of papers, talks and posters were of high standard. Congratulations to all presenters who had clearly spent a good deal of time in preparation. Ratneesh Suri carried off the prize for best paper, while Ravi Chemudugunta and Amanda Elvin tied for the best poster award - well done!

All in all, a great Conference, and one which now consolidates the tradition.

IIMS Postgraduate Coordinator

Because Dr Hossein Sarrafzadeh will be taking sabbatical leave for most of 2007, he will step down from his role as IIMS Postgraduate Coordinator. Hossein has made a nice contribution over the last 6 months and I thank him for that.

Dr Ian Bond has agreed to take over; the change will take effect from 1 December. Ian has a good deal of experience in research and postgraduate supervision, and I know that he, too, will fill the role in excellent fashion.

Examiners' Meetings - a reminder

The 2006 Semester 2 IIMS Examiners' Meetings will be held in IIMS3.27 as follows:

- Undergrad (100- to 400-level): Thursday 23 November 1:30 - 3:30 pm
- Postgrad (700-level): Friday 24 November 10:30 - 11:30 am

Robert McKibbin

News of the people

by Merrill Bowers



Merrill Bowers collates this material on general news relating to IIMS people.

Newsflash...

Congratulations go to Beatrix Jones and Danny Walsh on the birth of their son, Albert, on Monday 6 November at 7pm. Albert weighed in at 8lbs.

David Erbach (our IS visitor this semester) ...

Sends in a follow-up from last month's IIMS Newsletter. David played in the NZ Open Go Championships the week-end of September 30th. He won second place in the second division, as well as helping with the pairings in the championship division. David has been interested in international Go for many years. He has served as a Director of the International Go Federation in Tokyo, and as an official at the World Amateur Championships. He has also been Tournament Director of the Canadian Championships, and of the North American Computer Go Championships.



David playing Go

Howard Edwards (IIMS' claim to Jazz fame)...

As part of "Denise and X Factor" we played at the Whangarei Jazz Festival in October and made the front page of the Northern Advocate – World famous in Whangarei!

www.northernadvocate.co.nz/localnews/storydisplay.cfm?storyID=3704543

For staff information North Harbour Swing Band is playing at the Gables pub in Herne Bay on Wednesday 29th, as well as our usual RSA payout on Sunday November 26th.

The hum

by Tom Moir



It all started one day when I got a phone call from a local lady in Browns Bay who told me she had been in touch with all the local services to complain about a humming noise in her house. An electrician who tested the transformer on the road suggested she contact the University of Auckland (that's why she contacted us!!). I gave her a ring and arranged for myself and my colleague, Dr Fakhrul Alam, to visit the same afternoon. We thought we would be in and out in half an hour and that would be the end of the job. She told us that the humming noise was louder at night when there were less cars on the road and it got really bad around midnight and the wee small hours of the morning. I suggested she get her ears checked first before we did anything else and we had a bit of a wait for her to get an appointment and in any case, we were busy with other things. She got the all clear with the ear test a few weeks later. Eventually we returned to her house about 9 o'clock in the evening (I didn't fancy going out any later – we would be too tired!) with Vaitheki Yoganathan (IIMS PhD student in computer engineering) who we thought might hear it due to her younger age. We didn't know what frequency it was – high or low. She had difficulty explaining. We just did a simple recording onto digital tape via a high-gain amplifier and called it a night. Of course needless to say none of us heard the mysterious hum in the first place.

The next day when I analysed the waveforms, the recordings only had a noise level just above the standard noise floor (96dB down) – nothing there in other words. No peaks where we would expect a humming noise. I thought she must have ear problems which the ear people missed. However, just to be on the safe side I contacted the local paper to see if anybody else had had similar problems. This is where the story really begins...

The day after the story in the local paper I was inundated by emails and phone-calls from people all over the North Shore. I spent most of the day on the phone. All reported a similar humming sound but at this point we did not know what the frequency was. The vast majority said it was a very low pitched sound that they heard mainly in the house but if they opened a window it stopped. Some could hear it sitting in the car with the

engine off. Most had been troubled for some years. Now the ear problem known as Tinnitus is normally high frequency in nature – in fact I get it on the odd occasion myself – just a ringing sound which in my case goes away in a second or two. There does not appear to be much work done on whether a similar low-pitched sound can be due to Tinnitus since they don't test at frequencies below 150Hz. I checked with a local ear specialist. He said it could be the pumping of blood. Luckily one of the people who contacted us was Phil Strong, a local professional engineer who works at the Navy research centre nearby. He lives in Torbay and has heard the noise for about 5 years. I suggested to him that by playing a pure sine wave and sweeping it up and down the low frequency spectrum, he should be able to hear a beat frequency when he gets near to the actual frequency of the hum. This he did and came up with the figure of 56Hz. He provided us with a simulation file which we quickly distributed to the other sufferers. The vast majority of them said that they did hear something very similar to Phil's simulation. A few said they heard higher pitched sounds – which we put down to Tinnitus.

Now at last we knew where to look (ie the frequency). I developed a real-time spectral analysis program in LabVIEW so we could measure the spectrum in peoples houses instead of having to do recordings. Meanwhile the phones never stopped ringing and the story grew and grew. We did interviews with many local radio stations both here and abroad. As I am writing this I have just received another request from ABC radio in Australia for another interview (Fakhrul has already done one with them a few weeks ago!). New Zealand TV were phoning us and we even spent a day filming for the discovery Channel of Canada.

At this stage we have been unable to measure any acoustic signal other than background noise. Vibration Consultants (a local company) did some seismic tests in one of the houses and also drew a blank. My niece, wife and brother-in-law can all hear this sound in one of the houses. My brother-in-law was quite taken by it and my wife described it as 'spooky sounding'! We don't believe it to be electrical (50Hz – like the buzzing of a transformer) and Phil locked himself in an RF shielded room and could still hear it (this possibly rules out radio frequency sources though we need more work in this area). Could it be caused by magnetic fields? Well, we had two magnetometers when we did measurements with Vibration Consultants and their readings were normal too.



Torment of the Hum, by Rosemarie Mann.

Torment of the hum (by Rosemary Mann 2004)

Where does this leave us....? Well this area of study makes Astronomy look like an exact Science! We are chasing shadows. I have had dire warnings from another staff member (not at IIMS) to give up the work because it is both life threatening and for political reasons stay well clear. There are as many possible explanations as people suffering from this problem. I don't have time or space to tell the whole story, maybe sometime we will. However, we know it is a pure tone that goes on and off apparently at random almost like Morse code (but it isn't!). Phil thinks it is a pure tone and external noises beat with it to cause the on-off. All very well but what causes the pure tone in the first-place and why can't we measure it? I tested the hearing of some of our students when they were collecting their lab reports – could they hear this 56Hz tone I was playing at a similar level to the 'real' hum? None of them could except one. We took her to one of the houses and sure enough she started hearing the real hum. She has been hearing it ever since. Her description matches the others and she had never heard of the sound before. Yesterday I had a mysterious letter that told us that the real frequency of the Hum was in fact 55.9611023Hz! I assume it is a wind-up but who knows. Eat your heart out Dan Brown!

Report – General Assembly IMU by Gaven Martin



Report on the General Assembly of the International Mathematical Union

The 15th General Assembly of the International Mathematical Union (IMU) was held August 19 – 20 in Santiago de Compostela, Spain. It was

followed by the International Congress of Mathematicians (ICM) in Madrid which gained quite a bit of publicity due to the refusal by G. Perelman to accept the Fields Medal (the mathematics equivalent of the Nobel Prize) and his stated intention to refuse to accept the million dollar Clay prize for the proof of the Poincaré Conjecture. Discussions around these anticipated events in fact permeated many of the general conversations of the IMU.

The IMU Assembly began with the appointment of Committees - I was elected to the Nominations Committee perhaps the first time a New Zealander has even been on a major committee of the IMU (but not the last as noted below).

A major part of the meeting was taken up, in one way or another, regarding the ways and means to support the mathematical community (and indeed mathematics in general) in developing nations. The Spanish Government had provided considerable support for developing nations to be represented at both the IMU and ICM and so their views were heard. The major activities of the IMU in this regard are supported from grants from US foundations and various NGOs and a substantial report was received from the IMUs "Commission on the Development Exchanges and Developing Countries Strategy Group". There were many groups addressing quite related issues here and these were amalgamated at the meeting.

Perhaps the next most important issue was around the future development of the International Commission on Mathematics Instruction (ICMI) – a commission of the IMU. This group was seeking somewhat greater independence – justified by its size and activities. Overwhelmingly representation at IMU was by research mathematicians who it was felt are not necessary completely cognizant of the area (Mathematics Education) and its future desires, yet this group (more or less) elected the commission and set its agenda. After much (and sometimes heated) debate and an impassioned speech by Hyam Bass (a leading person in the area and a recent visitor to New Zealand) support was found for the future "independence" of ICMI and a new commission elected put together with much greater representation from Mathematics Education groups. Notable among the new council was Bill Barton from the Mathematics Department at the University of Auckland who was elected as a Vice President. This is a singular and distinguished achievement for Bill and a fine

acknowledgement of the strength of the Mathematics Education group in New Zealand.

There was a presentation regarding the activities, past and future, of ICSU by Sir Roger Elliot.

There was a discussion, of particular importance for New Zealand, which has been highly underrepresented in past ICMs, regarding the guidelines for future ICMs. In particular the issues around representation by developing nations and geographic distribution was discussed. This was to address the more or less complete dominance of ICM speakers by the US and to a lesser extent France and the UK. Admittedly many of the speakers from the US were not US nationals and there were difficult discussions around this point (where is a person really from?). Enquiring people will also want to know that the directives to the Fields Medal Committee have changed recently. From an expectation of two medals (possibly up to four), now there is a strong expectation of four medals. This new regime was implemented this year – note the medals are awarded ever 4 years- however as mentioned above, only three were claimed.

It was decided that the next general assembly of the IMU will be held in Hyderabad, India.

Dates in history by Chris Scogings



27th November 1095 – The First Crusade

In 1095 three significant religious groups held sway across the "civilised" areas ranging from Spain to India. Although there were many different religious groups in this area these three groups maintained large armies and along with them, political power.

The largest and most powerful of these groups was the *Byzantine Empire*. From about 300 the Roman Empire drifted into two parts – the Western Empire (ruled from Rome) and the Eastern Empire which included Hungary, the Balkans, all of the Black Sea coast, Armenia, Turkey and south through Syria and Israel to Egypt. In 330 the Emperor Constantine rebuilt the ancient Greek city of *Byzantium* (hence Byzantine Empire) to be the capital of the Eastern Empire. Constantine renamed the city Nova Roma (New Rome). After his death it was called *Constantinopolis* (the City of Constantine). Today the city is known as *Istanbul*.

The Byzantines were proud of their heritage as part of the Roman Empire. They called themselves *Roman*. One of the regions of their Empire is still called *Romania* today. The Western Europeans (who had their own Roman Empire) called them Byzantines. In 313 Constantine established Christianity as the official religion of the Empire. This original form of Christianity is called *Eastern Orthodox* and is still practised in many of these regions today. On 24th August 410 the Visigoths sacked Rome and the Western Empire descended into a period of chaos and barbarism known as the *Dark Ages*. For another 600 years the Eastern (Byzantine) Empire continued and prospered. By 1095 Constantinople was by far the leading city of Europe. Good roads, water and sewerage systems complemented universities, schools and fantastic palaces and cathedrals. The Byzantines introduced the use of a fork when eating, unlike Western Europeans who hacked at chunks of food with their daggers. The accumulated knowledge from the Greek, Persian and Roman Empires made the city the focal point for debate, learning, research and Christian teaching. But new forces were moving against the Empire.

The second major religious group were the followers of the relatively new religion, Islam, which united the scattered tribes of the Arabian peninsular and they burst onto the international scene, capturing large tracts of land from the Byzantines in the relatively short period from 634 to 699. These areas stretched from Afghanistan to Libya and included Syria, Jordan and Israel. By 1095 the majority of the people in these areas were Muslim but scattered groups of Christians, Jews, Zoroastrians and others existed among them (and still exist today).

The third (and apparently least important) group were the Western Europeans. Only just emerging from their Goth and Vandal past, they were brutal, practically illiterate and without great traditions or rituals. Highly superstitious and easily swayed in spiritual matters, they practised a more recent form of Christianity and were known as *Roman Catholics* because they followed the Bishop of Rome (or Pope) who had declared himself the only true leader of the Christian church and was in opposition to the Orthodox Christianity practised throughout the Byzantine Empire.

By 1095 the Byzantine Empire was under pressure from Muslim armies pushing northwards into Eastern Turkey. Emperor Alexius sent a letter to Pope Urban II requesting armed forces to assist

him against the invaders. He probably expected the usual military assistance of *mercenaries* – hired professional soldiers (often from Switzerland). But Pope Urban II was an astute man with an agenda of his own. The Christians from every *natio* (Latin: “tribe” or “birth”) of Western Europe were endlessly fighting amongst themselves. The Pope wanted to unite his bickering followers into a powerful army that would obey him and he wanted to place the Byzantine Empire in a position where it would be indebted to him (and hopefully extend his religious power through out the East). The Pope came up with a novel idea to achieve his aims. On 27th November 1095 he made a speech in which he outlined the concept of a Holy War against enemies of the (Roman Catholic) Church. Western European armies had been at war with Muslim armies for centuries, mainly in Spain. But the Crusade – the Holy War – was a new idea. The Pope announced that any soldiers who participated in the Holy War would qualify for immediate entry into heaven: “if any man set out to liberate the church of god at Jerusalem, his journey shall be reckoned in place of all penance”. [*Penance*: an act of contrition, confession and absolution for past sins.] All crusaders would also wear the traditional symbol of Christianity – the cross. Initially the colour of the cross designated the *natio* of the wearer (red for French, green for Flemish, black for German which is why black crosses were painted on German aircraft in World War I, and so on) but as the French were always in the majority many other crusaders also took to wearing the red cross on a white background. Different groups also developed stylised crosses such as the Maltese Cross, the Cross Potent, the Cross Pommee, etc. (see <http://en.wikipedia.org/wiki/Cross>).

The English word crusade only appeared for the first time in 1757. In fact no English participated in the First Crusade for the simple reason that the English nobility at the time were actually French (see “1066 and All That”). The bulk of crusaders in 1095 were French who called themselves Franks – a term that the Muslim world would come to use for all crusaders. The crusaders called themselves *crucesignati* (Latin: “those marked with the sign of the cross”) . This led to the French *croisade* and hence crusade.

The task Pope Urban set his followers was nothing less than the recapture of the holy city of Jerusalem. A huge army of 200,000 men was gradually assembled in Europe. They marched (mostly on foot) over 4,000km. They fought

numerous battles against new enemies who used tactics they had never seen before. Turkish horse archers fired arrows that could pierce chain mail at 60m (at the right angle) while their rapid fire produced a terrifying and seemingly uninterrupted hail of missiles as they swept in to the attack and then wheeled away. Such horsemanship can still be seen today in parts of Arabia, Iran and Turkmenistan. The crusaders wore steel plate armour over leather quilted armour (in temperatures often over 40 degrees) which stopped almost all arrows. Many crusaders looked like walking pin cushions and the horse archers often found themselves in a position similar to that of someone throwing darts at a large tortoise.

Generally the crusaders found that they could forge ahead in most circumstances. Their first objective was the ancient city of Antioch (today Antakya) near the Syrian border which they captured in June 1098. Then they marched down the Mediterranean coast capturing cities on the way as the local Muslim forces were divided by petty rivalries. On 7th June 1099 they arrived in front of Jerusalem. They were faced with formidable fortifications and a city well supplied with provisions and water. In addition, the city garrison received reinforcements from an unexpected source. Jews had lived in Jerusalem for over 2,000 years. (Hebrew: "Yerushalayim": the City of Peace – a singularly unfortunate choice of name.) Many had left when the Romans destroyed the Temple in 70 but a significant Jewish community still lived there. Word had reached them of *pogroms* in various European countries – most notably in Germany. A pogrom was an organised wave of attacks against Jews including arson, assault and murder. They were fearful of Western Europeans and now decided to actively assist the (mainly Egyptian) garrison of the city. Thus it was that Jerusalem was defended by Jews and Muslims fighting side by side against Christians. On 15th July 1099, the crusaders dragged huge siege towers up to the walls and eventually succeeded in breaking into the city. They rampaged through the streets killing anyone in their path. The Jewish population were cut down as they stood praying in their chief synagogue.

The fall of Jerusalem ushered in a new era of western European colonization. The crusaders established new Kingdoms in the areas they had conquered: The County of Edessa was centred on Sanliurfa (modern south-eastern Turkey). The Principality of Antioch covered the area around Antioch (Antakya). The County of Tripoli

consisted of modern Lebanon and the Kingdom of Jerusalem covered modern Israel and part of Jordan. For about 100 years most of these states were ruled by crusaders. Thousands of European settlers flocked to the new lands, drawn by stories of hardships heroically overcome, of holy relics to be found and of fortunes to be made. Well organised farms (mainly oil and wine) were established. During this time the great crusader Orders were established – the *Knights Templar* (dissolved in 1312), the *Teutonic Knights* (dissolved by Napoleon in 1809) and the *Knights Hospitaller* also known as the Order of St. John (still in existence in New Zealand today where the emblem of the Order is still the ancient symbol of the crusaders – the cross).

Interestingly the politics of these multicultural areas were far more pragmatic and ahead of their times than those in Europe. Jews and Muslims were not persecuted and had their own religious courts. Shocked Byzantine visitors tell of European women seen "riding not on palfreys or ponies but on fine warhorses, sitting the saddles astride like men." Muslim tourists to Jerusalem were startled to find that crusader women walked openly in the streets with their husbands and if they happened to meet a friend the husband would stand patiently by while the women chatted. Several of the crusader states were ruled by women in their own right – something unheard of in Europe at this time. New generations were born and grew up in the crusader states. But the Muslim world had not forgotten. Perceptive crusader leaders warned that without substantial military aid from Europe, the crusader lands could not be held. They were ignored.

[Author's note: this article was originally intended to cover all the Crusades. However, I find that I have already overstepped my allotted number of words. The history of the other Crusades will therefore appear in a future article.]

The calculus of long distance running

by Shaun Cooper



Several months ago I was selected by Athletics New Zealand to participate in the 100 km World Cup. I gladly accepted, even though I had recently sworn never to run a 100 km race again.

The NZ team, consisting of four runners and a manager, arrived in Seoul, South Korea, on Monday October 2. Our hotel was next to Olympic Park, site of the 1988 Seoul Olympic Games. The race was on the coming Sunday, so we had nearly a week to acclimatise, go sightseeing and make final preparations for the race – which mainly involved resting a lot.

On Wednesday we went to the Demilitarized Zone, or DMZ as it is called. This is a 4 km-wide strip that extends the length of the border between North and South Korea, and is reputedly the most heavily armed border in the world. The day after we visited, South Korean soldiers fired shots at some North Korean soldiers who had crossed over the boundary and weren't responding to requests to turn back. The North Koreans conducted a nuclear test while we were in South Korea, giving us more to think about.

Eventually race day came. We had breakfast at 3:00 am, boarded the bus at 4:00 for a 45-minute drive to the start, and began running at 6:00. The race was around a rowing canal, and followed a 10 km circuit. Ten laps makes 100 km.

It was hot and humid. An injury that I had been battling in the weeks before the race reared its unwelcome head after 40 km. For the next 20 km I was worried that I might not finish the race and did not smile. What a disaster that would be, I thought, to come all the way to Korea and drop out. When I reached 60 km, I knew I could finish and just had to carry on.

I crossed the finish line after 8 hours and 37 minutes. Not quite what I had been hoping for, but it was the best I could do on the day. I was 83rd out of 279, and third out of the four NZers. One of the NZ runners ran an incredible race, finishing 8th in 6 hours and 57 minutes. The NZ team was 9th out of 19 countries, achieving our goal of a top ten placing.

The race organisers couldn't get the national anthems of the winners to play over the loudspeakers at the prizegiving, so the French sang theirs, the Italians sang theirs louder using a microphone (they read the words from a page!), the Russians were too shy to sing anything, and for the British, the organisers managed to play Land of Hope and Glory! I often get asked why I enter ultramarathons, and what I think about when I am doing one. A lot of the time, the answer to the second question is to ask myself the first question. There is no good answer to "why?" except for it being a personal challenge. After the race I renewed my vow to not do another one. For

the time being I am taking a break from running to allow a full physical (and mental!) recovery.

(Well done Shaun. You deserve a rest! Freda)

Trip to Europe 2006

by Winston Sweatman



The first part of my leave was spent at the International Astronomical Union General Assembly in Prague (Monday 14th August – Friday 25th August) on which Ljiljana has already reported upon in the last IIMS news (September 2006). This stimulating conference provided a forum for meeting new colleagues working in my research area and for renewing contacts with old friends.

Two particularly important parts of the Conference for me were the Joint Discussion 6: "Neutron Stars and Black Holes in Star Clusters" and the Joint Discussion 14: "Modeling Dense Stellar Systems". These Joint Discussions together provided an overview of current thinking in the modelling of star clusters and the topics of particular present interest. The latest models have seen the incorporation of more realistic models of stellar evolution and interaction within star clusters. Further observations of exotic objects in star clusters are increasing our understanding of these systems. Computers and computer coding for stellar dynamics continue to progress. The format of the Joint Discussions included interesting and informative talks, discussion and poster displays. I presented a poster to the Joint Discussion 14: "Full Ionisation In Binary-Binary Encounters With Small Positive Total Energy".

Prague is a beautiful city. I stayed in the old town in the midst of historic buildings. It is possible to ascend one of the towers on the ancient Charles IV bridge and look over the dark of the river and lights across town. At the weekend in the middle of the conference I climbed the Petrin tower, a small replica of the Eiffel tower, which overlooks the city from above the river, the view was tremendous. There was also a marvellous maze full of mirrors nearby, with a painting at its heart commemorating the defence of the old town a few centuries ago against the invading Swedish army.

I had a week's holiday with my parents in England during which I caught up on some more history. We spent three days staying at a hotel that was several hundred years old in Marlborough and visited plenty of prehistoric remains including

Stonehenge, the Uffington Castle and White Horse, Silbury Hill and Avebury. We managed to see some new parts of the monuments that we had not explored before: the Cursus at Stonehenge and the Avenue at Avebury. As always, I was impressed by the scale of the effort and organisation that must have gone into creating these monuments when they were constructed all those millennia ago

From 4th to 25th September, I was a Research Visitor at the University of Edinburgh.

Specifically, I visited Professor Douglas Heggie and his N-body research group. Douglas is my former PhD supervisor and main research collaborator in Stellar Dynamics and is one of the World's leading researchers in this area. Douglas and I spent time discussing various aspects of research including the four-body research on which I have been working and its possible extensions.

There were several old friends at the University of Edinburgh. One of my unexpected meetings was with Associate Professor Tim Marchant visiting from the University of Wollongong. Tim is Graeme Wake's successor as the Director of the MISG.

I also visited Glasgow Caledonian University for a day and presented a seminar there: "Interplay orbits in gravitational few-body systems". I met with Professor Bonnie Steves who has also done several investigations involving symmetrical four-body problems. We discussed several projects that could provide scope for collaboration and a useful sharing of our experiences.

I kept busy at the weekends. The first weekend, I went to watch Christian Lindberg, the trombonist, playing at the Proms in the Park concert in Glasgow and the next day walked in the Scottish hills. The second weekend, I caught up with my nephew and niece at my sister's house in Manchester. They are a similar age to my own children and had grown quite a bit since I last saw them four and a half years ago. On my last weekend, I went on a boat trip at the Falkirk Wheel. The Wheel, a millennium project, is the novel and innovative solution for joining two canals which differ by 24 metres in height. Apparently it uses an electricity supply similar to that of two electric showers (22.5 kilowatts) and loses about a cupful of water each time it turns. For our day water was not in short supply -- a few cupfuls must have come into the boat whenever I opened the window to get a better look.

Overall the trip to Europe was both enjoyable and profitable for advancing my research and for extending and renewing links.

IIMS Post Graduate Conference

by Joanne Mann (IIMS PhD student)



Last month IIMS hosted yet another successful post graduate students' conference with presentations from 15 students and 13 posters on display throughout the day. The day started with an opening address by Robert McKibbin, followed by presentations from our post graduate students until the afternoon when there was a panel discussion led by Dennis Viehland with Claire Jordan and Ken Hawick on why and how to get an academic job. Prizes were then awarded by Robert McKibbin and Heath James. Congratulations go to Ratneesh Suri who was awarded a \$500 travel grant for the best paper and presentation "Optimal harvesting in fisheries: a sensitivity analysis", and congratulations to Amanda Elvin and Ravi Chemudugunta who both won prizes for best poster. A closing address was give by Hossein Sarrafzadeh. The proceedings from the conference will be on the IIMS Post Graduate website and in the library soon, and the posters will be on display in the IIMS building and in Quad A. Thank you to all our judges and to the students who participated in the conference.

Great Google gathering

by Natalia Nehring (IIMS MInfSc postgrad student)



Google scholars: Natalia Nehring (top left)

I was sitting in the car on the way home from Auckland airport. I had just come back from a conference in San Diego, US, and was feeling a little tired, but excited. It was my first visit to the US. The time flew by so quickly. It was very exciting. What a fantastic experience.

The purpose of this visit was to attend a huge US conference. The conference was called the Grace Hopper Celebration for Women and Computing. It was difficult to imagine that there were 1300 people attending. They were from the US and 13 other countries. Even though the conference name implied this was a women's event, there were some men attending as well.

America is big country, and they do really well at organising such events but this number of attendees were really impressive. Other statistics such as:

Students represented forty-two percent of attendees, not only postgraduates but undergraduates as well. There were more than 200 presenters, the conference lasted two and half days. There were 66 technical posters that were presented at a poster session given by students and researchers. The conference organisers did a really amazing job to find 36 corporate sponsors, they provided nearly \$400,000 in conference funding.

The presentation topics covered a wide spectrum, from careers in computing to robotics.

The most inspiring presentation was from Sally K. Ride, PhD, a former NASA Astronaut and the first American woman in space. When you see a person like that, you realise how much can be achieved in your lifetime. I don't mean that everybody should try to go into Space but that if you have a dream and aim for it, it can be achieved.

Another woman, who could be considered an excellent role model for many people was Helen Greiner, Co-founder and Chairperson of the Board of iRobot Corporation. iRobot Corp develops and supplies robots, not only for academic and military projects, but also for the consumer market as well. One of their products is a vacuum cleaner- robot (Roomba). The interesting feature of this product is that it has an open interface and everybody can add functionality to it. There were even articles and books focusing on hacking this vacuum cleaner.

To see such a large number of women, who work in the fields of Computing and Information Technology gathered together in the same place was an amazing experience. You can understand

that success stories are not an exclusive event. It is something that can happen every day and it can happen in everybody's life.

Time flew by so quickly, that I did not even have time to buy a couple of toy-tractors that were ordered by my 2 ½ year old twins. I had to purchase them on the way home from Auckland airport.

And...Natalia has sent us some computing 'light relief' in a joke that she has found:

A helicopter was flying around above Seattle when an electrical malfunction disabled all of the aircraft's electronic navigation and communications equipment.

Due to the clouds and haze, the pilot could not determine the helicopter's position. The pilot saw a tall building, flew toward it, circled, and held up a handwritten sign that said "WHERE AM I?" in large letters.

People in the tall building quickly responded to the aircraft, drew a large sign, and held it in a building window. Their sign said "YOU ARE IN A HELICOPTER."

The pilot smiled, waved, looked at his map, determined the course to steer to SEATAC airport, and landed safely. After they were on the ground, the co-pilot asked the pilot how he had done it.

"I knew it had to be the Microsoft Building, because they gave me a technically correct but completely useless answer"

Research news and views

by Ken Hawick



It has been another busy month for IIMS on the research front. The IIMS annual postgraduate student conference was once again a great success and the student presentations and posters were of a high quality. Congratulations and thanks to all involved.

Research at IIMS

IIMS research news reported at September 2006

Category 1 – Refereed journal paper

Cooper, S. (2006). The quintuple product identity. *International Journal of Number Theory*, 2(1), pp 115—161.

<http://www.worldscinet.com/ijnt/ijnt.shtml>

Cooper, S. (2006). Cubic elliptic functions The Ramanujan Journal, 11 pp 355—397. Online: <http://www.springerlink.com/content/1572-9303/>

Cooper, S. (2006). The 26th power of Dedekind's η -function Advances in Mathematics, 207, pp 532—543. Online: www.elsevier.com/locate/aim

Roberts, M. G. 2006 Modeling strategies for containing an invading infection. Mathematical Population Studies 13, 205-214.

Category 5 – Refereed paper in a conference / meeting / symposia proceedings

Hawick, K.A., James, H.A., & Scogings, C.J. (2006). Grid-boxing for spatial simulation performance optimisation. Proceedings of the 39th Annual Simulation Symposium (pp 98-106). April 2-6, Huntsville, Alabama USA: Institute of Electrical and Electronics Engineers.

Hawick, K.A., James, H.A., & Scogings, C.J. (2006). A zoology of emergent patterns in a predator-prey simulation model. In H. Nyongesa (Ed.), Proceedings of the 6th International Conference on Modeling, Simulation and Optimization (IASTED) (pp 8489). September 11-13, Gaborone, Botswana., USA: ACTA Press.

Hunter, J. J. (2006). Perturbed Markov chains. In Peter Brown, Shuangzhe Liu and Dharmendra Sharma (Eds.), Contributions to Probability and Statistics - Applications and Challenges: Proceedings of the International Statistics Workshop, University of Canberra, 4-5 April 2005, (pp 99-112). World Scientific, Singapore. (ISBN 981-270-391-8)

Scogings, C.J., Hawick, K.A., & James, H.A. (2006). Tools and techniques for optimisation of microscopic artificial life simulation models. In H. Nyongesa (Ed.), Proceedings of the 6th International Conference on Modeling, Simulation and Optimization (IASTED) (pp 90-95). September 11-13, Gaborone, Botswana., USA: ACTA Press.

Category 14 – Address to professional body

Hunter, J.J. (2006). "Variances of first passage times in a Markov chain with application to mixing times" Institute of Information Sciences and Technology, Massey University, Palmerston North, October 18.

Sweatman, W.L. (2006). Full ionisation in binary-binary encounters with small positive total energy. Joint Discussion 14: Modeling Dense Stellar Systems, (poster presentation), August 21 - 25, In

the 26th General Assembly of the International Astronomical Union, Prague, Czech Republic.

Sweatman, W.L. (2006). Interplay orbits in gravitational few-body systems. Computing and Mathematical Science Seminar Series, September 20, Glasgow Caledonian University.

Papers accepted

Ryu, H. Collective Web Usability analysis, International Journal of Web Engineering and Technology Ryu, H., Wong, A. Texting on TV: Perceived Usefulness and Human Behaviour in TV viewing, Computers in Human Behaviour

Papers submitted

Roberts, M. G., Baker, M., Jennings, L. C., Sertsou, G. & Wilson, N. A model for the spread and control of pandemic influenza in an isolated geographical region. Submitted to Journal of the Royal Society Interface.

Sertsou, G., Wilson, N., Baker, M., Nelson, P. & Roberts, M. G. Estimation of key transmission parameters of an institutional outbreak during the 1918 influenza pandemic by mathematical modelling. Submitted to Theoretical Biology and Medical Modelling.

...

(As we've recently learnt there has been a new office set up to collect staff research at Massey University – Academic Output Office. Research will be collated and reported in the new categories that equate with those of the PBRF.

The URL below has details of this change:

<http://www.aod.massey.ac.nz>)

π prose...

submitted by Graeme Wake



Have a look at this song about Pi. Its great!

www.vvc.edu/ph/TonerS/mathpi.html

(Another reference to a song about Pi, was in the NovDec 2005 IIMS Newsletter. The item was sent in by Shaun Cooper.)

Laughter lines

submitted by Merrill
Bowers



The Bathtub Test

It doesn't hurt to take a hard look at yourself from time to time, and this should help get you started. During a recent psychological test a job applicant was asked this question by the interviewer: "Well," said the interviewer, "we fill up a bathtub, then we offer to you a teaspoon, a teacup and a bucket and ask you to empty the bathtub." "Oh, I understand," said the applicant. "A normal person would use the bucket because it's bigger than the spoon or the teacup."

"No." said the Interviewer, "A normal person would pull the plug. ??????!!!!!!"

DID YOU PASS THE TEST!

Merrill also sent in this snippet of advice she found whilst browsing through a book recently...

The best way to be successful is to follow the advice you give others

An officer in the navy had dreamed from childhood of commanding a great battleship one day. He finally achieved his dream and was given commission of the newest and proudest ship in the fleet.

One stormy night, the captain was on duty on the bridge when he spotted a strange light rapidly closing in on his own vessel. As his ship plowed through the giant waves, the light rose and fell just above the horizon of the sea. He ordered his signalman to flash a message to the unidentified craft on his port side, "Alter your course ten degrees to the south."

Within seconds a reply came, "Alter your course ten degrees to the north." Determined that his ship would never take a backseat to any other, the captain snapped a second order, "Alter course ten degrees – I am the CAPTAIN!" The response was beamed back, "Alter your course ten degrees – I am Seaman Third Class Smith." By this time, the light was growing ever brighter and larger.

Infuriated, the captain grabbed the signal light and personally signalled, "Alter course. I am a

battleship." The reply came just as quickly, "Alter your course. I am a lighthouse."

Acronyms & numbers puzzle

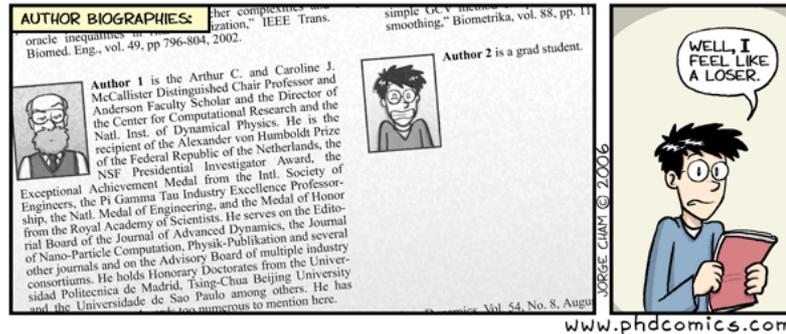
submitted by Robert
McKibbin



Solutions for about half of the "Acronyms and Numbers" puzzle in the last IIMS News, with the rest (plus a few extras) repeated below:

- O F A D *Out For A Duck*
 O F T R *One For The Road*
 O T B M S *One, Two, Buckle My Shoe*
 T I C, T I A C *Two Is Company, Three Is A Crowd*
 (T B M)2 *Three Blind Mice, Three Blind Mice*
 F A T B B B I A P *Four And Twenty Black Birds Baked In A Pie*
 P O E *Pieces Of Eight*
 T M I A B *Three Men In A Boat*
- T S F
 T-O T, T-O T, (S)H G T K O T D, N B T-O B
 L B A F
 S S A N B K
 G M F!
 T F-N
 H A T
- S H
 T D D
 A B D (= T)
 H T
 F D I T W
 O F O T C N
 T S W O T W

PhD woes...
submitted by
Sam Alexander



Caption contest



Last Month
Thanks for the fun

Tony Norris....



“I was rather hoping for a virtual mobile learning package, but I suppose this will do”...sent in by Merle Turner (Office of the Deputy Vice-Chancellor, Auckland - great to have a non-IIMS member join in the fun.)

We will have ‘People puzzle’ and ‘Caption contest’ from time to time but not each issue.

The Editor would like to receive suggestions from readers for future content in our Newsletter. Please contact Freda or Merrill with your thoughts. We’d love to hear from you.

IIMS End of Year Lunch

Friday, 8 December 2006

(RSVP as below)



Vanessa Harris has been very creative with the invitations this year.

(In your mailbox now!)

Please remember to RSVP to Vanessa with your menu choice by

20 November 2006.

Thank you.