

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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In time for Fireworks' night - no fizzers in here

From the Head of IIMS



Staff news

Another Professor

Great news: Associate Professor Mick Roberts has been promoted to Professor, with effect from the New Year. Congratulations, Mick - it is well-deserved. Mick is currently at the University Oxford as a Christensen Fellow at St Catherine's College, and will be back home in mid-December.

Lecturer of the Year

Dr Chris Scogings has been voted the 2005 Lecturer of the Year by the students of Massey University's Albany campus. An informal poll of approximately 400 students on campus was held by the ASA Advocacy Coordinator, Maree Dunlop. Chris's name clearly came out as the favourite with students, who mentioned his sense of humour, his approach to learning and his "a computer is just a computer" statement as reasons for picking him. A certificate is now decorating Chris's office (alongside his IIMS Teaching Award).

Congratulations, Chris. We are proud of you.

Fast movers from IIMS

IIMS was well represented at the Auckland Marathon/Half Marathon/10km event on Sunday 30 October. Heath James and Jo Mann both finished their first half marathons in good times. Martyn Smit ran the half marathon in a personal best time. Shaun Cooper and Winston Sweatman both completed the full marathon and, in the good conditions, posted personal best times, improving by several minutes on their times from last year.

Senior Lectureships in IS

The recent appointment process has resulted in two candidates indicating that they will accept offers of Senior Lectureships. We expect them to take up their positions early in the New Year.

Future goings and comings

Don't forget the traditional IIMS morning tea on 17 November to acknowledge the considerable contributions of Den Pain, Sue Pritchard and Vanessa Harris to the Institute.

2005 IIMS Postgraduate Conference

Congratulations to all who were involved with the Postgraduate Conference last Thursday. Those who were not there missed a very special event. It is clear that there is a good deal of high-quality research being undertaken by IIMS postgrads, and that their presentation skills are at a high level.

The Conference Committee of Jo Mann, Sam Alexander, Ramesh Lal and Dennis Viehland should feel proud of the result of their careful planning and preparation. Dennis did a fine job of opening and closing the meeting, while Jo, Sam and Ramesh, as session chairs, controlled the speakers very well. The Proceedings volume, designed by Jo and compiled by the postgrads on the Committee, is a lasting testament to an excellent set of papers, talks and posters.

Freda Mickisch, Stephen Ford and Nikki Luke did a fine job in support of the participants aspirations and hard work. The day ran smoothly, nicely punctuated by food and drinks, and ended with a small pizza party in the Staff Lounge.

Well done to all of the student presenters, and those who stood by their posters for discussion. 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. Also thanks to Pauline Larsen who reminded us all of the numerous funding opportunities available.

All in all, a great conference, and one that now establishes a tradition that our postgrads are making us proud of.

Robert McKibbin

News of the people

by Merrill Bowers



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

Travelogue from Mick Roberts and partner Lyndell...

The trip so far:-

We arrived in the Netherlands on September 10, and our bags got there two days later. We spent two weeks staying with Hans and Marion in den Bosch (aka s'Hertegenbosch), with Hans and me commuting to the University of Utrecht by train. During this time we did enough research for a joint paper, I gave a seminar and there was a lot of talk about bird flu. We had a pleasant evening with Odo Diekmann at an African restaurant on the canal banks at Utrecht.

We arrived in the UK on September 24 and picked up a car at Heathrow. We visited family in Bournemouth and Exmouth, and had a trip to Cornwall. The Eden project is outstanding, two huge biospheres one for the tropics and one for temperate regions. Mevagissey is a picturesque fishing village with very narrow streets, and Tintagel castle is steeped in the legend of King Arthur (yeah right!) but it's an interesting visit.

On October 3 we gave the car back to Avis and started life in Oxford. We have a large apartment, the top floor of an old house. I get meals in college, which means wearing a gown at high table and the butler pouring the wine. Lyndell gets baked beans back in the flat. I did take her to guest night and she passed the port. On Monday we spent the day in London, I visited Valerie Isham who is Professor of Statistics at UCL and Lyndell went to the Victoria and Albert museum. In the evening we were joined by Valerie's partner Howard and all went to the English national Opera to see The Magic Flute. We caught a very late train back to Oxford. Yesterday we went to Bath. I gave a

mathematics seminar and discussed work with the mathematical biology group, Lyndell went round the pump room and terraces. Lyndell returns to New Zealand at the end of next week, I am in Oxford until December 3.

Best wishes to all at IIMS...

Mick Roberts

2005 IIMS Post Graduate Committee activities

by Joanne Mann



Seminar Series

This marks the end of the second year of the IIMS post graduate/informal seminar series. The series got off to a bit of a late start compared to last year, but hit the ground running. Each week during semester, there were two talks from post graduate students and staff, with plenty of time for questions and discussion. Thanks to all those who presented and came to the sessions.

Even though student participation was higher than last year for presenting the talks, not many students attended the talks. Should the time be changed, the afternoon tea introduced or something else be brought in to encourage students? Suggestions are most welcome!

Conference

The second annual conference was a great success with 19 talks from post graduate students, and 10 posters on display throughout the day. All talks were accompanied by a paper and posters by a one page abstract that have been printed in a proceedings - which be available shortly via the library and on-line at www.massey.ac.nz/~iimspg.

Every presenter was given both written and verbal feedback from staff and the posters were critiqued by the Student Learning Centre – thank you all for your help! Each presenter was given 15-20 minutes to present, then 5-10 minutes for questions, discussion on the posters was encouraged at lunch time and morning/afternoon tea. The day started and ended with a brief talk by Dennis Viehland, and keynote addresses were given by Robert McKibbin and Pauline Larsen. The day ended with pizzas in the Study Centre staff lounge.

We hope that next year will see as successful a year for both the seminar series and the conference – volunteers for the committee are being sought!

2005 IIMS Post Graduate Committee: Sam Alexander, Ramesh Lal and Joanne Mann, with administrative and technical help from Freda Mickisch, Nikki Luke and Stephen Ford.

Perth conference

by Merrill Bowers



In September, I was fortunate enough to be able to attend the Tertiary Education Management Conference in Perth, Australia. This was a 3-day conference held at the Perth Convention Centre, and attended by 500 delegates, mostly from Universities all over Australia and New Zealand.

The theme of the conference was ‘Surviving or thriving – forging the way in a new landscape’. The conference was opened by the Governor of Western Australia, His Excellency Lieutenant General John Sanderson.

I attended various workshops over the 3 days and came back feeling more ‘emotionally (and hopefully intellectually) intelligent’.

I was amazed to find that in the sea of faces, there appeared a few staff from Albany and also staff from Massey Palmerston North campus, whom I have spoken with many times, but had never met.

The conference dinner was held at the Fremantle Prison – which was quite an eerie feeling, as it is exactly how it was when it was inhabited by inmates not so long ago. The Massey people sat together and a great time was had by all.

Another highlight for me was spending the day with friends of ours – Rob and Pat, who had left South Africa 18 years ago and now live in Perth. After a bit of a tearful reunion, Rob (always the joker) said that he was expecting me to now be a little fat old lady, wearing a perma pleated skirt (the younger people probably won’t even know what this is) and sporting a moustache, and worried that he would have to say to me ‘you have hardly changed!!’ He said he was relieved, so I guess that was a compliment. We spent a wonderful day reminiscing about old times and catching up with news.

Dates in history

by Chris Scogings



21st October 1805 – The Battle of Trafalgar – 200 years ago

There are many human skills that existed at some time in the past but have since been lost. For example, no living person is currently capable of controlling a four-horse light chariot although certain Romans were experts in this area. And no living person is currently capable of commanding a sailing warship in a naval battle. A 3-masted warship carried two acres of sail weighing up to 10 tons. It was this skill that made the difference at the Battle of Trafalgar in 1805. The Royal Navy of Great Britain was at the height of its power. Never before or since have naval personnel possessed such skill or experience. From the lowest seaman to the ships' officers they had spent years at sea, reading the changes in tide, wind and weather and had fought numerous battles in various formations against Egyptian, Barbary, Turkish, French, Spanish, Dutch and Danish foes. The captain of each ship had worked his way up from midshipman and knew the layout of his ship intimately. The French navy, on the other hand, was in disarray. Napoleon (like many other European leaders) was not interested in the sea and looked only towards the continent of Europe. The navy was ignored and underfunded. During the recent Revolution, many aristocratic (and experienced) naval officers were removed. New officers were "democratically elected" and were not always chosen for their seamanship. Their ally, the Spanish navy, was in even worse shape.

It was in the area of gunnery that the differences were really marked. British gun crews could fire a cannon, then swab it clean, reload it, run it out, aim it and fire it again within two minutes – and all this on the rolling deck of a sailing ship. The crews were repeatedly drilled until they worked together like a well-oiled machine. French gunners timed their shot to coincide with the upward roll of the ship thus damaging the masts and sails and reducing the mobility of the enemy. But the British gunners were trained to fire on the downward roll thus smashing the hull and causing casualties among the crew. And the Royal Navy was led by Horatio Nelson, probably the greatest admiral in naval history.

The veteran of many battles as well as an expert sailor, he always looked for the best combination of weather and position in order to maximise the chances of success.

It had been the tradition for centuries for navies to fight each other in "line of battle" formation. The opposing ships formed two parallel lines moving in the same direction and hurled cannon balls at each other until one side withdrew. No complex manoeuvres were required and each ship merely had to hold its place in the line. Battles were lengthy and inconclusive. Nelson had other ideas. He wanted to fling his ships directly at the enemy line, close in to point blank range and rely on superior and rapid gunnery to pulverise the enemy. Britain needed to rule the seas – not simply drive the French into port so that they could fight again another day.

On the 21st October 1805, the Franco-Spanish fleet of 33 ships was sailing north from Cadiz in south-western Spain. Its orders were to meet up with Napoleon's army at Boulogne and then carry the army across the Channel to invade England. When the British fleet of 27 ships was sighted near Cape Trafalgar, the French assumed that the usual parallel lines would be formed. But Nelson had noticed that if he attacked only the rear half of the combined fleet, the van (front half) would not be able to rapidly assist as they would have to turn around and sail into the wind to join the battle. Thus the French were astounded to see the British line charging straight at them perpendicular to the line of battle.

As the ships raced towards each other, the British gun crews stood at their guns. Shirts were removed in case a spark should set them on fire and sand was spread over the decks to avoid them becoming slippery with blood. His captains reminded Nelson that the Admiral's ship should not be leading the line as it would be subjected to the heaviest fire. He appeared to agree and ordered two other ships to move up but promptly followed this by ordering his own ship, the Victory, to carry full sails. As the other ships struggled in vain to take the lead Nelson signalled to them to fall in behind him and continued to lead the charge towards the enemy with the Victory flying the signal flags spelling out "Engage the enemy more closely". The time was about 12 noon.

The French and Spanish fleets opened fire at long range and for 15 minutes the British ships were under fire and could not reply as their guns, facing to starboard and larboard*, were

not facing the enemy. At least 50 British sailors were killed during this time. Then the Royal Navy ships, displaying superior seamanship, steered through the enemy line, raking the ships on either side as they passed. In raking fire, the cannon balls were fired down the length of a ship instead of across it and the solid shot would smash through main timbers causing a storm of splinters similar to modern shrapnel. Certain guns (carronades) were specifically designed for raking fire and could be loaded with a keg of 500 musket balls in place of the usual round shot. One French ship lost 400 sailors in the first blast of raking fire. The British ships then manoeuvred into position close alongside selected opponents, and poured shot after shot into them. The Royal Sovereign fired three broadsides in just over 3 minutes – an all-time record. The area became a mass of flame and billowing smoke. By 2pm most Franco-Spanish ships in the rear of the line had surrendered after being smashed into useless hulks and taking heavy casualties. A typical example was the French ship, the Indomitable, which lost 1,250 men from a crew of 1,400.

As Nelson had predicted the front half of the French and Spanish line spent most of the battle trying to turn their ships into the wind. Some lowered rowing boats to help pull the ships around faster. It was after 3pm by the time these ships had turned and formed a line and they then attacked the British but were then beaten off with further losses. The Franco-Spanish fleet lost 27 of its 33 ships along with 4,408 men killed and 2,545 wounded. The British lost no ships but 449 men were killed and 1,241 wounded. One of the dead was Nelson, shot in the chest by a French marine.

The Battle of Trafalgar was one of the major turning points in history. It prevented a French invasion of England and gave Britain control of the oceans of the world for over 100 years. It allowed India, Australia and Canada to become unified countries instead of splitting them into English and French areas of control – or possibly becoming entirely French dominated. The world we know today would be a very different place if Admiral Nelson had not won the Battle of Trafalgar.

[* Note: the right-hand side of a ship (as one faces forward) is called the starboard derived from “steer” and “bord” (the Old English word for ship or boat – hence also overboard) as on old ships the rudder or steering paddle was on the right-hand side of the ship. The opposite of

starboard in Nelson’s time was larboard derived from “laden” (meaning to load) and “bord” because the left-hand side was usually the side of the ship placed next to the dock for loading. The problem was that starboard and larboard were too similar when shouting commands so in the 1840s the Royal Navy changed larboard to port, again because the left-hand side of the ship is usually next to the dock when in port.]

Egypt and New Zealand - Nobel prize ***by Samir Bishay***



The Nobel Peace Prize 2005

Shared, in two equal parts, between the International Atomic Energy Agency (IAEA) and its Director General, Mohamed ElBaradei.

“for their efforts to prevent nuclear energy from being used for military purposes and to ensure that nuclear energy for peaceful purposes is used in the safest possible way”



Mohamed ElBaradei
of Egypt

Born 1942

The Nobel Prize in Chemistry 1999

"for his studies of the transition states of chemical reactions using femtosecond spectroscopy"



Ahmed H. Zewail
of Egypt and USA
(California Institute of
Technology (Caltech)
Pasadena, CA, USA)

Born 1946

The Nobel Prize in Literature 1988

"who, through works rich in nuance - now clear-sightedly realistic, now evocatively ambiguous - has formed an Arabian narrative art that applies to all mankind"



Naguib Mahfouz

of Egypt

Born 1911

The Nobel Peace Prize for 1978

Shared, in two equal parts, between Anwar al-Sadat, President of Egypt, and Menachem Begin, Prime Minister of Israel, for their contribution to the two frame agreements on peace in the Middle East, and on peace between Egypt and Israel, which were signed at Camp David on September 17, 1978.



Mohamed Anwar al-Sadat

Born 1918 – died 1981

Samir writes...

In Egypt I studied the theories of Ernest Rutherford, the New Zealander who won the Nobel prize in Chemistry 1908. When I arrived to live in New Zealand in 2000, I heard the name MacDiarmid a lot. Alan G. MacDiarmid, from New Zealand, won the Nobel prize in Chemistry 2000. An Egyptian, Mohamed ElBaradei won the Nobel Peace prize this year, 2005 while I am living in New Zealand. Whenever Egypt comes to anybody's mind, an image or information about the Pyramids, Sphinx or Pharaohs is associated with it.

Do you know how many Egyptians won the Nobel prize in the recent years?

I have listed all four of them.

Nominations for 2006 round are thought to be included in the following list ...

http://nobelprize.org/search/all_laureates_yd.html

Academic matters

by Howard Edwards



Exams

The end of semester is upon us and with it comes exam marking. By the time you read this you may have already received the latest version of the College of Sciences Guidelines to RPS which outlines the process to be followed including details such as guidelines for awarding grades and how to handle aegrotat applications. Please feel free to consult me (or in the case of Engineering papers, Ian Maddox) if you have any queries about the process.

You may well wonder why exam results go through a two-stage approval process, firstly at Institute level and then at College (i.e. programme) level. One reason is that papers for a student's programme may be delivered by more than one Institute, and another is that not all Institutes have an approval process - these reasons apply to Palmerston North especially. A further reason is that many papers are taught across more than one campus and one mode (e.g. extramural) and the programme examination committees have a responsibility to monitor these results under the various equivalence policies.

BSc and BInfSc papers have passing grade guidelines that vary by level, and in most cases papers whose results conform to these guidelines are approved (as are papers outside the guidelines where acceptable reasons are given for doing so). These exam committees are also supposed to check that, over time, the grade percentages for a paper vary about the midpoints of the prescribed grade ranges and are not consistently either above or below them over time. We tried to do this for the BInfSc papers some years ago but in a rather ad hoc fashion. However we have now developed a process control methodology (which appears in the latest volume of RLIMS) which has been applied historically to all BInfSc paper results over the last few years. You will be pleased to know that the vast majority of papers across all campuses and modes show no signs of being out of control (in a process control sense at least!)

Introducing Information Technology and Computing Booklet

The principal print marketing tool used by the university to attract potential students to its programmes are the Introducing booklets, which are widely distributed to schools and used extensively by Massey's liaison staff and by secondary school guidance teachers in helping potential students make their study decisions. Some booklets are programme based and others are based on a general area of study. You can download the 2006 booklets in pdf format from Massey's website at:

http://study.massey.ac.nz/student_booklets2006Intro.html

There is general agreement that the Introducing Information Technology and Computing Booklet is not working well and in need of revision. I am asking staff on all three campuses to help in revising and improving the booklet so please have a look at the current version and pass on your suggestions to your discipline leader or to me. In particular some of the graduate testimonials need updating, so if you know of any recent graduates who might be willing to say something nice about their Massey degree and major then please let me know. We have a December deadline for the first draft of the 2007 version.

Copyright

Massey University has a website containing information about copyright and how it applies to our teaching and research environment. Go to

<http://copyright.massey.ac.nz>

Academic Changes for 2007

Changes to papers generally go through the formal university process in March and April (although larger changes involving new programmes and majors need much earlier notice), so if you are thinking of making any minor changes to a paper, e.g. a change of title or editing its prescription, then now is the time to start discussing this with your discipline colleagues. In most cases changes will affect staff on other campuses as well so allow time to consult them too. More substantial changes should be generated by discipline groups rather than individuals and usually as part of a major review (for example Information Systems is currently doing this). Once again, talk to your discipline leader or myself or Ian Maddox if you need advice about this.

Research news and views

by Ken Hawick



It has been another good month for research in the Institute. One particular highlight was the IIMS Postgraduate Conference. The Student Presentations and Posters have attracted a lot of interest and praise - well done to all involved.

As promised, in this issue we have the second part of Dennis Viehland's article on implications of the PBRF. Also as promised, we have the first of a series of articles on tools, methods and technologies you may find useful in your research. The first of these articles is on the Macintosh Operating System - OS X, and is written by Heath James.

Operating Systems are usually huge pieces of software that if they do their job right, run unobtrusively and make our computers usable. We all tend to take operating systems much for granted and often forget what a long history of development has gone into making them the polished and rarely-crashing products of modern times. You may not be aware of some of the capabilities of modern operating systems. Heath's article describes some of their features, that are an ideal basis for organising research data, calculations and simulations. I am often amazed at our present generation of students, busy clicking away with their mice, but unaware of some of the built-in capabilities of most modern operating systems. Contrary to popular belief, there can actually be more to using a computer than cutting and pasting between Word, Excel and email. After reading Heath's article there is no excuse for continuing to treat your computer as just a modern version of a typewriter. Future articles in this series will look at other operating systems and tools that you can run on them.

Postgraduate Study in a PBRF World

by Dennis Viehland



Last month I shared a few insights into how I think PBRF – the Performance Based Research Fund – has changed academic reward structures and its differential impact on measures of research productivity. PBRF impact on postgraduate study is not so apparent because

PBRF provisions in this area haven't hit us yet. But they will, and the change will be equally profound.

Postgraduate students will benefit from PBRF. With the 2006 PBRF review nearly upon us, our attention has understandably been focused on our individual research productivity. So, you may not be aware of the PBRF provisions for funding postgraduate education. From 2007 onwards, universities will be mostly funded for Masters and PhD completions, not enrolments. I don't have space to explain the funding formula here, but the bottom line is that Massey University will lose \$1,000's for every masters student that doesn't complete and \$10,000's for every PhD non-completion.

A recent Education Review article observed that the impact is that "tertiary institutions have more incentive than ever to nurture and support their postgraduate students with an eye to ensuring that as many as possible make it to completion, and in a timely fashion." The same article reported that some New Zealand universities are already introducing a number of measures to encourage thesis completion – reduced PhD completion time (Canterbury), postgraduate support centers (Canterbury), fewer part-time students and, especially, stipends or scholarships to encourage on-time completion (Otago, Canterbury and probably Waikato).

The bottom line here is that once a university admits a postgraduate student, the institution will do all it can to support and encourage the student toward completion. Otherwise the university's own bottom line is impacted negatively.

More postgraduate research will get published. The sciences have a long tradition of publishing postgraduate research results, early and often. In the sciences, a doctoral student and supervisors might produce a half dozen pieces of co-authored scholarly research from doctoral work, and only slightly less from a masters thesis. With the PBRF focus on increasing staff research productivity, it is likely that staff in the humanities and more applied areas will start looking for ways to leverage postgraduate research into academic publications.

Postgraduate student admission will be more selective. As a result of the fund-upon-completion rule, universities will become more selective about who they admit for postgraduate study. For some time now I have raised concerns about the quality and motivations of some of the

students who we admit for masters and PhD study. Based on their previous academic performance, I don't see any hope of them completing a thesis or dissertation. Regretfully, too often they have proven me right.

The benefits of master study for these marginal students is a forlorn chance to complete their desired degree and, in at least one case, continuation of her student visa. Similarly, sometimes staff pursue PhD study for the opportunity of a reduced teaching load, more than a desire to actually complete the degree. New Zealand universities have had minimal concerns about this because we collect their fees and Government payment on a pay-as-you-go basis. However, the downside is that staff waste precious time coaxing research out of incapable students, with no research outputs to show from it at the end.

In a PBRF world, there will be sharply reduced benefits for the University to admit students who are unlikely to complete. Accordingly, we can expect more rigorous selection procedures for postgraduate enrolment, especially at the masters level.

Postgraduate student progress will be more closely monitored. Not only will admission be more selective, but monitoring of student progress will become more rigorous. We have already seen this happen at the PhD level with the more detailed and challenging requirements for doctoral candidates to pass from provisional to full enrolment. Next in queue: research masters degrees.

As long ago as 1997, an academic audit complimented Massey University for its excellent quality assurance programme for doctoral work but that "the support for masters students requires more attention." A 2003 Vice Chancellor Executive Committee resolution (VCEC 03/103) addressed this issue, citing PhD enrolments and research theses of 75 points or more should be treated similarly "as these criteria are the same as those required by PBRF". The Graduate Research School explicitly argues that "in the PBRF environment it [is] desirable for Massey University to provide more central management of Research Masterate degrees."

Academic and administrative authority for research masters degree has always rested with the colleges. The colleges have shifted into turf-protecting mode, showing some resistance to proposals to bring administrative authority for

these degrees under the Graduate Research School.

What changes can we expect? First, a central database to track progress of all research masters students from enrolment to examination is almost a given. Second, and most significantly, a scaled down version of the doctoral monitoring process is likely to be applied to research masters degrees within the next few years. Soon, perhaps, in addition to Six Month Progress Reports for our doctoral students, we will be completing Three Month Progress Reports for our masters students. Third, expect co-supervision of masters theses to become more commonplace, as an additional check to insure both selective admission and timely, successful completion.

One could reasonably argue that increased scrutiny of masters degree progress was inevitable, given anecdotal evidence, audit reports, etc. However, incoming PBRF provisions are forcing more rigorous procedures than what might be expected and these changes will happen sooner rather than later. The only question left unanswered is whether the colleges will self-regulate themselves to tighten and strengthen selection and monitoring processes now, or whether the Graduate Research School will eventually be given a large portion of this authority. Watch this space.

OS X

by *Heath James*



Ever since the people at Apple first adopted the Graphical User Interface (developed by Parc Xerox in 1970 and adopted by Apple circa 1979) that has now become ubiquitous, the Apple Macintosh, in its various incarnations, has been regarded with an equal mixture of fascination and apprehension. Partly because of the unique styling of the actual computer, partly because of the distinctive interface of the operating system.

Various models of the Macintosh have come and gone, but the latest models are arguably at home in the high performance computing laboratories in the World.

This document is primarily about the operating system, not the hardware on which it runs, so let us start with its name: OSX, a pseudonym for OS version 10, the successor to OS version 9. There have been a few different versions of

OSX available, including Jaguar, Panther and now Tiger. In this document I'll use the term OSX to refer to the latest (Tiger) version of OSX.

OSX is a significant change from previous versions of the Macintosh operating system family: OSX is based on UNIX, one of the operating systems that has been driving supercomputers and mainframes since time immemorial. So, UNIX provides the basic low-level operating system and the Macintosh-specific libraries add on the extra graphical functionalities that most people associate with Macintosh computers. Part of this document will be a brief description of UNIX and then the Macintosh-specific libraries.

UNIX is an operating system that relies on a large number of small, purpose-built programs that each do a job efficiently. It is available, under different guises, for a large number of hardware platforms, including Intel/AMD x86 machines (e.g. Linux which we run on Helix, the Sisters, Double Helix). One advantage of developing programs under OSX is that once the program is developed and tested under OSX it can (fairly easily) be ported to one of our computer clusters. In fact, when resources such as Helix are stretched, we have also been known to harness the power of our OSX machines to provide extra processing power!

For the geeks, Unix provides a pre-emptive multi-threaded operating system that is memory safe: no more "blue screens of death" caused by one of your programmes crashing. If allowed, multiple users can log into a Unix machine and execute programmes concurrently, something that can't be done on a Windows machine. Tiger also allows 64-bit memory addressing meaning that individual processes can access more than 2GB of memory.

From a programmer's viewpoint, Unix features many programmes that are incredibly useful including: emacs, vi, gcc, gdb, gprof, cut, grep and xfig, not to mention the free-ware and open source programs that are available for downloading and compiling under Unix. Unix also supports shell scripting well: the ability to write quite powerful programmes that are comprised of many separate, smaller, executables. But I'll discuss all the useful programmes that Unix features in a separate document that will appear in a future newsletter.

Unix also features a set of powerful monitoring tools including the ability to see what your

operating system is doing and which ports are being used for what protocols. OSX machines can also read disks written in different formats, including DOS and Windows -- the reverse of which is not true!

OSX layers an optimised graphical library and user interface on top of the Unix operating system layer. This graphical library, called Quartz, is the side of OSX that most people see: the friendly icons and the intuitive way of performing most common operations. This leads us to possibly the most beneficial feature of using an OSX machine: the ability to run Industry standard software such as the Microsoft Office suite of programs, and commercial desktop publishing software.

However, there are some useful programmes on the market that are only available for the Windows operating system. If you *really* have to, you can use an emulator to allow you to run a registered copy of the Windows operating system.

Through the Apple Developer Connection all OSX users can download the Developers Toolkit, including programs to optimise the performance of applications and the system itself.

So, using a Unix-based OSX machine means you have the ability to use Industry-standard software while having access to the powerful programming and monitoring tools of Unix.

Research at IIMS

Reported for September 2005.

Cat 1 - Refereed Journal Papers

Adiga, C., Cooper, S., & Han, J. H. (2005). A general relation between sums of squares and sums of triangular numbers. *International Journal of Number Theory*, 1(2), pp175-182.

Hunter, J. J. (2005). Stationary distributions and mean first passage times of perturbed Markov chains. *Linear Algebra and its Applications*. In Simo Puntanen, George P.H. Styan and Hans Joachim Werner (Eds.), *Tenth Special Issue (Part 2) on Linear Algebra and Statistics*, 410, pp 217-243 [Online:

<http://www.sciencedirect.com/science/issue/5653-2005-995899999-608799>]

Ryu, H., & Monk, A. (2005). Will it be a capital letter: Signalling case mode in mobile phones.

Interacting with Computers, 17, pp 395-418 Fong, B., Fong, A. C. M., Hong, G. Y., & Ryu, H. (2005). Measurement of attenuation and phase on 26GHz wideband point-to-multipoint signals under the influence of Rain IEEE. *Antennas & Wireless Propagation Letters*, 4, pp 20-21.

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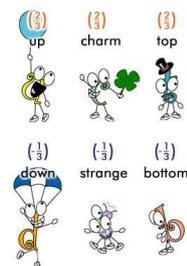
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Poetry corner

submitted by Freda Mickisch

Quark Dance

by Cilla McQueen



here come the colours
to settle on our lips and eyes
and rainbow lighting all the edges
the boundaries are unstable
trust love not logic
light falls
never the same way twice
I can if you can too
barefoot balance and free fall
without scary death in our mouths

just plain delight
 learning to nudge the wind
 dance falling exploding symmetry
 stretching the space
 pulse slow arm elbow up
 whip spine twist
 thigh knee toe out
 the current passes
 nowadays science is pure poetry
 all the particles bounce and decay
 sweetly and sure as seeds
 and quarks come in such colours and flavours
 as beauty charm and strangeness
 it's all so weird and simple
 the world's made up of tiny little energetic
 multicoloured irrational jelly beans
 so dance
 quark dance

...

McQUEEN, Cilla (1949–), poet, born in Birmingham, England, arrived in New Zealand in 1953. She was educated at Dunedin's Columba College and University of Otago (MA Hons 1970). She is accomplished and popular as a performer of her poetry.

(Please send in a poem or two that you would like to share.)

Laughter lines



sent in by Freda Mickisch...

Two men dressed in Pilots' uniforms walk up the aisle of the airplane. Both are wearing dark glasses, one is using a guide dog, and the other is tapping his way along the aisle with a cane. Nervous laughter spreads through the cabin, but the men enter the cockpit, the door closes, and the engines start up.

The passengers begin glancing around nervously, searching for some sign that this is just a practical joke.

None is forthcoming.

The plane moves faster and faster down the runway, and the people sitting in the window seats realize they're headed straight for the water at the edge of the airport territory.

As it begins to look as though the plane will plough into the water, panicked screams fill the cabin.

At that moment, the plane lifts smoothly into the air. The passengers relax and laugh a little sheepishly, and soon all retreat into their magazines, secure in the knowledge that the plane is in good hands.

In the cockpit, one of the pilots turns to the other and says,

"You know, Bob, one of these days, they're gonna scream too late and we're all gonna die."

and another...

I DON'T KNOW WHAT DOCTOR WROTE THIS, BUT I LIKE HIM!

HEALTH QUESTION & ANSWER SESSION

Q: I've heard that cardiovascular exercise can prolong life; is this true?

A: Your heart is only good for so many beats, and that's it... don't waste them on exercise. Everything wears out eventually. Speeding up your heart will not make you live longer; that's like saying you can extend the life of your car by driving it faster. Want to live longer? Take a nap.

Q: Should I reduce my alcohol intake?

A: No, not at all. Wine is made from fruit. Brandy is distilled wine, that means they take the water out of the fruity bit so you get even more of the goodness that way.

Beer is also made out of grain.

Bottoms up!

Q: How can I calculate my body/fat ratio?

A: Well, if you have a body and you have fat, your ratio is one to one. If you have two bodies, your ratio is two to one, etc.

Q: What are some of the advantages of participating in a regular exercise program?

A: Can't think of a single one, sorry. My philosophy is:

No Pain...Good!

Q: Aren't fried foods bad for you?

A: YOU'RE NOT LISTENING!!!. Foods are fried these days in vegetable oil. In fact, they're permeated in it. How could getting more vegetables be bad for you?

Q: Will sit-ups help prevent me from getting a little soft around the middle?

A: Definitely not! When you exercise a muscle, it gets bigger. You should only be doing sit-ups if you want a bigger stomach.

Q: Is chocolate bad for me?

A: Are you crazy? HELLO ... Cocoa beans! Another vegetable!!! It's the best feel-good food around!

Q: Is swimming good for your figure?

A: If swimming is good for your figure, explain whales to me.

Q: Is getting in-shape important for my lifestyle?

A: Hey! 'Round' is a shape!

Well, I hope this has cleared up any misconceptions you may have had about food and diets.

And remember: "Life should NOT be a journey to the grave with the intention of arriving safely in an attractive and well preserved body, but rather to skid in sideways - Chardonnay in one hand - chocolate in the other - body thoroughly used up, totally worn out, and screaming "WOO HOO, What a Ride!

and...



sent in by Tom Moir...

Tom spotted a sign out of its usual place:

Seen in the Gents toilet, 2nd floor IIMS building

A sticker normally used for PCs..

Are you sitting correctly?

Remember to take your micro breaks.

Relax-limber up exercise.

Maximise your comfort.

Gives a new meaning to repetitive strain injury!

Tom

Thought for the month:

"Aim for success, not perfection. Never give up your right to be wrong, because then you will lose the ability to learn new things and move forward with your life."- Dr. David M. Burns.

Always wanted to know the meaning behind your name? Try this link:

<http://www.bostonuk.com/names/>

Pun fun**found on the internet**

Two atoms are walking down the street and they run in to each other. One says to the other, "Are you all right?" "No, I lost an electron!" "Are you sure?" "Yeah, I'm positive!"

There was a man who entered a local paper's pun contest. He sent in ten different puns, in the hope that at least one of the puns would win. Unfortunately, no pun in ten did.

A neutron goes into a bar and asks the bartender, "How much for a beer?" The bartender replies, "For you, no charge."

A mushroom walks into a bar, sits down and orders a drink. The bartender says, "We don't serve mushrooms here." The mushroom says, "Why?! I'm a fun guy!"

Daffynitions**found on the internet****Diplomat**

Something a dinosaur uses to cover his living-room floor.

Forlorn

The patch of grass at the front of your home.

Pharmacist

Someone who helps out with harvesting the crops.

Window

What you hope to do when you visit a casino.

Assault Course

Where your doctor prescribes a tablet of sodium chloride to be taken every day for a month

Isolate

How I apologise for my tardiness

Fanatic

Where you store fans in the winter

Punish

- (1) Someone from the land of Puns.
 - (2) Also a language, consisting entirely of bad jokes.
-

That's all folks – more fun next issue.



People puzzle
submitted by someone



Last Month (September 2005)

Had a rest...

This Month (October 2005)

Lots of frantic searching in their attics by IIMS staff produced the photo below, so come onhave a go - guess!



Please send me an email and let me know who you think this well-dressed boy is!
f.mickisch@massey.ac.nz

Caption contest



Last Month

Thanks to 'anonymous' for this month's captions...

Farhad and Ian (plus innocent bystander) ...



Farhad is saying, "Sooooo Ian, from which of your newly discovered planets did this 'tripodal alien' originate?"

Hope you find some interesting photos of our staff for the Caption contest. If you do please send them to f.mickisch@massey.ac.nz or m.bowers@massey.ac.nz

So be on the lookout and keep the digital cameras clicking....

Notices

Postgraduate Diary

- 18 November: All research reports (Honours, Postgrad Diploma, Masters(?)) are due. This is a hard deadline, extensions should only be given with a grade penalty and then only for a short period of time.
- 23 November: All postgraduate examination results to Peter Kay (to be confirmed)
- 25 November (10.30am): Postgraduate Examinations Committee
- 27 February 2006: Postgraduate Orientation for 2006 academic year
-

Notices

Not too long now...

IIMS Christmas Dinner



15 December 2005

at 12 noon

Long Bay Restaurant

IIMS Newsletter contributions...

For the next issue (November/December issue), please forward items to either Freda or Merrill by 30 November 2005.

Thank you



2006 Poster Competition

Emerging research and technology scholars are invited to enter a poster in the 2006 MacDiarmid Awards poster competition. Posters should use clear simple language and imaginative graphics to explain research in a way that everyone from your little brother to your grannie can understand!

Entries close 28 February 2006.

These prestigious awards recognise the excellence of New Zealand's young research and technology scholars.

The winner in each category will receive a cash prize of \$2,000. From the category winners there will be an overall winner of the event who will receive a travel grant to either America, Europe or the United Kingdom to attend a conference related to their field and/or science communication. The overall runner-up will receive a travel grant to attend a similar event in Australasia.

All category winners will be special guests of the Foundation at the Gala Awards Dinner in Auckland on 21 June 2006.

During the day on 21 June there will be a practical seminar on enhancing your career prospects. Sessions will include topics such as writing grant applications, and getting your message across through improved communication skills as well as many other "hands on" sessions. Further details of the seminar will be available early in 2006.

For further information please go to: <http://www.frst.govt.nz/students/macdiarmid.cfm>

