Institute of Fundamental Sciences Newsletter — Issue 38

IFS & Bits

In this Edition of 13 September 2001

Deadline for Next Issue

12 October 2001

Editor

Terri Palmer

Messages from the Head of Institute

Funding Success for Englebretsen and Wright

Congratulations go to Darren Englebretsen for gaining a further grant from the Wellcome Trust. The amount awarded ($88 327) will be used to purchase a vacuum pump and both a large and small freezer drier. This fills a long wanted need and moves us a step closer to up-dating the scientific equipment needed to undertake cutting edge research in the Institute. Well done Darren!

Tony Wright was successful in the latest round of the Fund for Innovation and Excellence in Teaching (FIET). A grant of $7 099 was made to tackle "Visual Learning Objects for Flexible Learning". Tony's success is well merited and further emphasises his leading role in chemistry education not only at Massey University but also on a national basis.

Marsden Success

This year Massey only gained four Marsden awards. However, all were centred in IFS and IMBS. Mike Hendy was an Associate Investigator on David Lambert's grant and I was fortunate to succeed also. The overall level of success, however, was considerably lower than last year (perhaps not surprisingly). Congratulations are also in order for those who got into the second round. These include: Bruce van Brunt, Geoff Jameson, David Officer and Simon Hall. While all will be disappointed at not receiving funding I trust that their applications can be remodelled for other granting agencies or form the basis of a future application to the Marsden Fund. We have yet to hear about one other possible Marsden centred at a CRI in which we have an Associate Investigator involvement.

PVC Office to move to IFS

It seems highly probable that the PVC Office will move in its entirety (16 persons) to the Institute of Fundamental Sciences in the near future. Details are not yet finalised but it is probable that Terri, Vern and I will vacate our current area and move to level 3 in Tower B. Terri and I are likely to occupy space previously allocated to Paul Callaghan and Toni Wilson and Vern will move to an adjacent office. Clearly, other changes will be required but as things stand it is unlikely that this will involve many staff. I will provide further information as soon as matters become clearer.

Committee Changes

Two changes have been made to IFS Committees. Kee Teo has stepped down from the Publicity Committee and has been replaced by Marijcke Vlieg. Kee, however, has not escaped scot-free but has very kindly agreed to be the IFS representative on the College of Sciences On-line group, which is convened by Tony Wright. I would like to thank Kee, Marijcke and Tony for taking on these roles. Thanks also go to other staff who volunteered for the On-line Committee.

Tony Signal has agreed to be the physics representative on the Research Committee, where he replaces Paul Callaghan. My thanks go to Tony for undertaking this job as well as being the new Secretary of the New Zealand Institute of Physics.

Tracey Royds

Tracey will be commencing Parental Leave on 21 September 2001 and will be away for the next six months. I would like to wish Tracey and Mark well for the coming birth of their child and I trust that we will see them all within the Institute quite soon. Tracey has played a pivotal role since the formation of the Institute in 1998 and her ability to deal with a wide variety of matters in such an effective, efficient and above all helpful manner has been appreciated by all of the staff, especially me.

Toni Wilson has been appointed Acting Institute Administrator (Part-time) and will deal with all of the matters that Tracey currently handles. Tracey will be a hard act to follow but Toni has had wide experience as Head of Department Secretary and will, I am sure, do an excellent job for the Institute. I wish Toni well in her new role.

Gleneagles

The Project Manager, Barry Stevenson, visited the Institute several weeks ago to discuss in-depth our strengths and the academic offerings that we would be willing to provide. Barry planned to visit Singapore about this time and so we await with interest to see the outcome. Things have gone a little quiet from the Singapore end, which does give me some cause for concern, but I hope to be proven wrong.

HASNO Regulations

I would like to thank staff in the Chemistry Discipline for attending the recent HASNO meeting in which Doug Pringle gave us some information on the new regulations. Clearly these were written by a bureaucrat with zero knowledge of laboratory use in a teaching environment. It is likely that Massey University will have to develop its own Code of Practice or perhaps universities as a whole will produce such a document that would be accepted as appropriate under the Act. All of this will take time but we must continue in the interim to pay full attention to safety matters within the Institute. Until such time as the responsibilities of Laboratory Manager are clarified in writing I do not think it reasonable to ask staff to sign a document making them accountable when their responsibilities are unclear. We will continue to work with Doug Pringle and I hope that we can bring these matters to a successful conclusion in the not too distant future.

Physics Teachers Day

On Friday, 17 August 2001, the Physics Discipline organised two special events for teachers. During the morning and afternoon Jennie McKelvie ran an in-service course for less experienced teachers. This was almost totally based on practical work. From the discussion with teachers afterwards it was clear that they greatly appreciated the opportunity and felt that they gained much more than they could have reasonably expected from the days activities. Thanks go to Jennie for the organisation of the day. The assistance of the general staff, and in particular Brian Ford, was also much appreciated.

In the evening Malcolm Bowling organised a separate function for more experienced teachers. This comprised a number of talks by Physics staff (Malcolm Bowling, Bob O'Driscoll, Jennie McKelvie and myself), with a welcome break for dinner at Wharerata. Again, the evening went very smoothly and I would like to thank Malcolm for the efforts he put in for making the event such as success.

Robert and Fiona's New Arrival

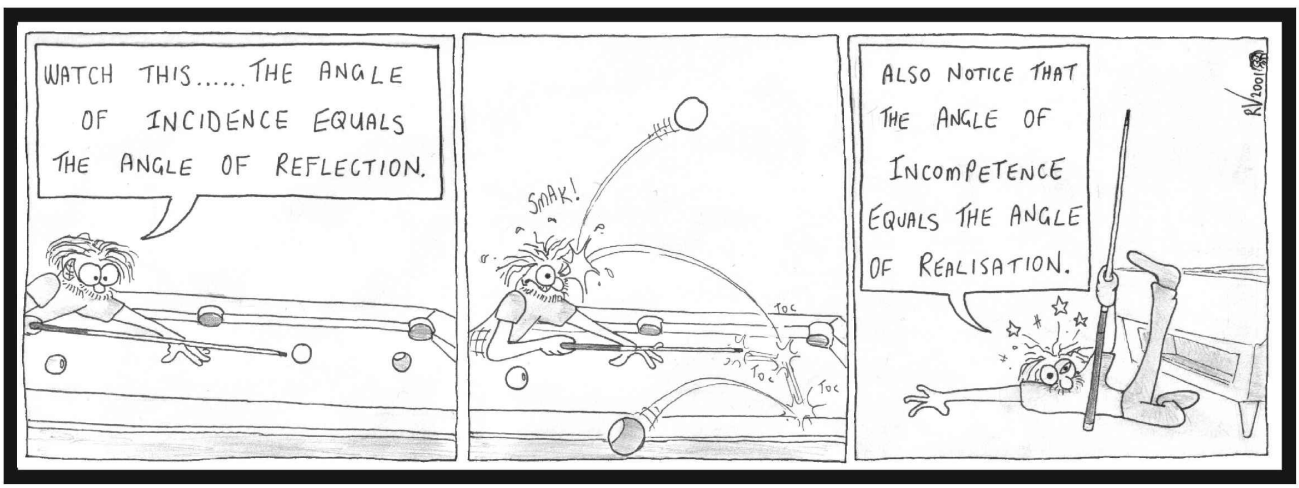
All of send our very best wishes to Robert and Fiona on the birth of their baby daughter, Helen, who was born at 6.00 pm on Thursday, weighing approximately 4 kg. Robert has produced some of his best work at odd places including beaches, trams and forests so we confidently expect that during the early hours of the morning when he is trying to get Helen back to sleep he will have the time to develop several theorems of international importance. Again, we are all thrilled by your news and wish you the very best.

Tony Burrell

The recommendation that Tony Burrell be appointed a Honorary Research Fellow at Massey University has been approved. We are delighted that a "formal" link with Tony has been maintained in addition to his continued involvement in the Nanomaterials Research Centre.

Manawatu Science Fair

I would like to congratulate Tony Wright in his role as Chief Judge for the Manawatu Science and Technology Fair held on Friday, 31 August 2001. Functions such as these take a great deal of time and effort if they are to run smoothly and Tony, as usual, did a superb job. Many other IFS staff contributed to the judging and again I would like to thank them for giving up their time to assist budding scientists to reach their potential. There were some superb exhibits. Everything that we can do to encourage Intermediate and Secondary School students to pursue a career in science and technology is good, not only for us but for the country as a whole. Fairs such as this contribute towards that goal and are very worthwhile.



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Fees Stabilisation

Staff will know that fees will be stabilised for 2002. Clearly, this is good news from the student perspective. From the staff point of view, however, it does mean that there will be little in the university coffers for pay rises. I must say that I share a sense of frustration with staff that the knowledge wave economy seems to place little monetary value on the contributions that universities can make. Salary scales in New Zealand now lag far behind those in other countries and there is an increasing issue with attracting staff from overseas and in maintaining New Zealanders in this country. Hopefully, the government will recognise this issue and move to address it in the next budget but I am cynical enough to feel that we are unlikely to gain the salary increases that staff justify.

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Millennium List Students

Terri Palmer has now prepared the CVs of our Millennium List students and has passed these on to potential employers and also to Discipline Leaders. Last year all of our 200- and 300-level students who wished to gain employment were successful as were most of the 100-level group. We hope for similar success again this year.

Tom Korner

Tom Korner, the 2001 Forder Lecturer, visited us from 19-20 July 2001. He gave a series of superb talks and I know that not only the Mathematicians but all those others who attended his presentations found them stimulating. Thanks go to Bruce van-Brunt for the organisation at the Massey end of his national tour. As usual, he did this with great enthusiasm and efficiency.

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Basel and Alpbach

I will be in Europe for two weeks commencing 9 September 2001. The first week will be spent at the Biozentrum in Basel, one of Europe's premier research institutions in structural biology. Whilst there I hope to continue my work on intermediate filament structure with Ueli Aebi and Sergei Strelkov and on coiled coil structure with Jürgen Engel.

This will be followed by a week at Alpbach in Austria where a colleague and I organise a workshop on "Coiled-coils, Collagen and Co-proteins" on a four-yearly basis. This is the third such meeting that we have organised. Unlike most conferences almost none of the speakers are pre-arranged. Each session chairman collects interested delegates immediately before the session starts. He/she then selects those who have something exciting to present. This results in brand new material being discussed and adds an air of excitement to the whole proceedings. The venue, up in the mountains and not far from Innsbruck, is idyllic but as we work so hard none of us notice this of course. A special edition of the Journal of Structural Biology will be prepared and my colleague and I will be the Editors.

David A D Parry

Physics Teachers Evening

This meeting was held on Friday, 17 August 2001 and fifteen teachers from as far afield as New Plymouth, Napier and Ohakune attended.

Our esteemed leader (David Parry) spoke on plans for development in Physics at Massey, followed by myself and Bob O'Driscoll. A meal at Wharerata made for a nice break in the evening and gave all present an opportunity to enjoy social contact with other physics educators - a very important part of professional life but in recent years severely restricted by a lack of appropriate in-service professional development for physics teachers.

A short discussion on the future format of these meetings was held at the end of the meeting. The general consensus was that such meetings are held in high regard and some mechanism for coordinating resource development, sharing of ideas and a discussion forum would be welcome.

Malcolm Bowling

Answer to Puzzle in Issue 37

Which one is the odd one out of the following illustrations?

(E) This is a left hand - all the others are right hands or feet.

From the Institute Office

Institute Scanning Facilities

The Institute Office now has a scanner for general use within the Institute. The Institute Secretaries will be happy to assist with any scanning requirements.

2002 Calendar Dates

The finalised Calendar dates for 2002 are available from the Institute Office.

Semester One 2002 Material

Deadline for Submission of Semester One 2002 Material to Printery is 21 December 2001.

Tracey Royds

Computer and Equipment News

New Laser Printer and Postscript Colour Printer

A new laser printer and postscript colour printer have now been installed and are in place in the Photocopy Room on Level 4, Science Tower B. Those members of staff who still require the printer drivers to be installed on their computers are requested to see either Peter Lewis (PC users) or Keith Whitehead (Mac users).

iMac Notebook and Laptop

An iMac notebook has been purchased and can be used for powerbook presentations on Campus in Lecture Theatres or for Conferences. The laptop donated by Professor Callaghan now has a new battery and CD drive and can be used for wordprocessing when off campus.

Both the iMac notebook and laptop can be booked through Electronics Services.

Bob O'Driscoll

Web CT

Are you getting started with WebCT, but need some help with a few of the features? I can highly recommend the 1 hour training sessions that are run on a Friday afternoon by the Instructional Design Team. Duncan O'Hara and Trevor Billany will provide guidance while you work on one particular WebCT feature.

The next round of courses starts in September, and you should book very soon if you want to attend. If a group would like a course tailored to specific needs, Duncan is happy to arrange a Monday course for 5 or 6 people.

I attended most of the courses in the last series and found them very useful; I also know just who to contact whenever I have WebCT problems!

Jennie McKelvie

How Many Students Online?

Preparing a talk last week, I made a quick survey of the Institute's use of online learning and was surprised at how far we have moved this year. Papers using WebCT: Chemistry (9); Physics (2) and Mathematics (4). Almost all chemistry students and a majority for mathematics and physics are involved (because the major first year papers have been the first registered). The change is very rapid. For the last two years there have been a couple of chemistry papers, but very little before that.

The other thing that made me stop and listen was a couple of recommendations about Duncan O'Hara's online learning sessions on Fridays at 1 pm. Comments such as "..really useful..." and "...just what I needed...." See Tracey if you want details.

Tony Wright

Worker Dead at Desk for Five Days

In the Birmingham Sunday Mercury (7 January 2001)

Bosses of a publishing firm are trying to work out why no one noticed that one of their employees had been sitting dead at his desk for FIVE DAYS before anyone asked if he was feeling okay.

George Turklebaum, 51, who had been employed as a proof-reader at a New York firm for 30 years, had a heart attack in the open-plan office he shared with 23 other workers. He quietly passed away on Monday, but nobody noticed until Saturday morning when an office cleaner asked why he was still working during the weekend. His boss Elliot Wachiaski said: "George was always the first guy in each morning and the last to leave at night, so no one found it unusual that he was in the same position all that time and didn't say anything. He was always absorbed in his work and kept much to himself." A post mortem examination revealed that he had been dead for five days after suffering a coronary. Ironically, George was proofreading manuscripts of medical textbooks when he died.

You may want to give your co-workers a nudge occasionally. And the moral of the story: Don't work too hard. Nobody notices anyway.

Seventh Form Visits

The Publicity Committee would like to thank all those who helped with the seventh form visits. Particular thanks to Geoff Barnes, Tony Wright, Simon Hall and Emily Parker for running the demonstrations, and Shona Yu, Graham Appleby and James Matheson for acting as Tour Guides.

Paul Buckley

Magnetised Target Fusion (MTF)

The basic requirements to sustain a fusion reaction are: high temperature (10 million C) high density, and long enough containment. The first two factors arise from the very small reactive cross section for fusion events and the last arises because the Coulomb scattering cross section is 3-4 orders of magnitude greater than the reactive cross section. Because of the high temperature required the reaction medium is completely ionised and therefore one must deal with a plasma of some sort. Methods for achieving fusion may be broadly categorised by the time of confinement and the method used to achieve this.

At one extreme it may be possible to compress a small amount of plasma to high enough temperature and pressure that the reaction rate is sufficient to overcome all the energy loss processes occurring. Here the method, called inertial confinement, relies on depositing a huge amount of energy into the target fuel on timescales less than about 50ns. The rate of energy deposition is much greater than the energy loss rate due to electron conduction and Bremsstrahlung radiation. The only option is for many very powerful lasers to be focused on the target, the resulting ablation force shock heats the target and then compresses it adiabatically to achieve the conditions required. Such a project is underway at a cost of over US$1Billion.

At the other extreme is a continuous confinement of a much less dense plasma. As the particles are all charged the can be confined by a magnetic field and hence can be insulated from the much cooler reaction vessel walls. The problem then becomes one of being able to inductively heat the plasma while it is confined by strong magnetic fields generated by superconducting magnets. The size of the plasma, which is several metres in diameter, is dictated by the fields available from existing superconductor technology. The device being pursued for this route to fusion is called a tokamak, with the leading international collaboration likely to cost US $10 Billion

Both the above two methods are technologically well advanced, with target parameters giving a net energy production and possibly ignition of the plasma, where the amount of energy release back into the plasma is sufficient to maintain the temperature.

Between the two extreme approaches illustrated above, lies a gap of around 12 orders of magnitude in the available parameter space. To access other regions of the parameter space requires the generation of magnetic fields above the known capability of all known materials. Indeed it is not likely that advances in superconductor technology will change this greatly, as the extreme magnetic forces required are sufficient to fracture all known materials. There are however a number of other promising routes to achieve fusion.

Massey University at Albany has been actively involved in one of these alternatives for around five years. Dr Francis Thio initiated a

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Magnetic Target Fusion (MTF) *continued...*

programme in Magnetised Target Fusion (MTF) when he came from the University of Florida to head the Mathematics section at Albany. With his colleagues at Los Alamos he began to theoretically explore an idea of his to use a spherical array of high velocity plasma jets (a plasma liner) to dynamically compress a pre-magnetised plasma. The results were so promising that the idea was picked up by NASA as a potential propulsion mechanism and two years ago Dr Thio left to initiate an experimental programme at NASA to explore the generation and merging of plasma jets.

The progress of all variants of MTF was examined at last weeks 2nd International MTF workshop in Reno, Nevada. There were around 50 attendees representing all active groups in this area, as well as staff from the Nevada Terawatt facility. There are three main experiments being conducted: A group from VNIIEF - the Russian equivalent of Los Alamos, which uses explosive devices to generate a high current pulse of 30MA , which is then used to compress a magnetised plasma (MAGO). A group from Los Alamos is developing a promising target plasma (called a compact toroid) with plans to compress this by injecting it inside an aluminium cylinder and then imploding the cylinder with a current pulse of >10MA on the latest pulsed power facility (the Atlas facility - currently nearing completion). The third, is the NASA experiment, led by Dr Thio, of which we are a part. Other notable attendees were two programme directors (The director of fusion energy research for the US Department of Energy; and the director of the Advanced Propulsion section of NASA) and a representative of the world's fourth richest person, looking to see if MTF would be a worthy philanthropic cause. I was the only representative from a non-American or non-Russian institution.

The Russian and Los Alamos approaches are aimed at demonstrating the feasibility of the MTF approach. There are difficulties harnessing the energy released in these approaches because the energy released (around 1GJ) per pulse is enough to obliterate all materials in the immediate vicinity. This appears a difficult task, but not impossible as a number of research programmes are investigating strategies to absorb this much energy at close range with few enough recyclable components required that it may well be economical to attempt this. The plasma liner approach, in part, alleviates this problem because of the ability to put the drivers in a stand-off manner, away from the area of main energy release. All MTF approaches require careful analysis of the possible instabilities that are inherent with high velocity and density gradients. However, the lessons learnt from Tokamak research and from the laser inertial confinement fusion programmes indicate that the idea of working at timescales of the order of microseconds should make life easier, not more difficult, when it comes to instabilities.

Where do we fit in? It is our responsibility to develop the pulsed gas injection system for the plasma accelerators. The design is such that we must design an injector to deliver around 2mg of hydrogen gas in a pulse around 10 microseconds long. Added complications are that the intensity of this pulse should be very reproducible and it must be able to be synchronised within a few nanoseconds to the accelerator ignition device. This requires development of technology that has been used in a variety of laboratories for over ten years to generate molecular beams. In particular, within the next week an instrument capable of measuring angular resolved temporal beam pulse characteristics is due to arrive at Albany. This instrument, which consists of four differentially pumped ultra-high vacuum sections, pumps (including a turbopump) was designed by myself during my sabbatical at the University of Zurich last summer, and has been donated to us. A 25kJ plasma accelerator will be donated by NASA to assist our development of the injectors. Ian Shinton's PhD is concerned with developing the hardware and a theoretical description of the plasma accelerator. The NASA project is a collaboration of around 15

Continued page 9...

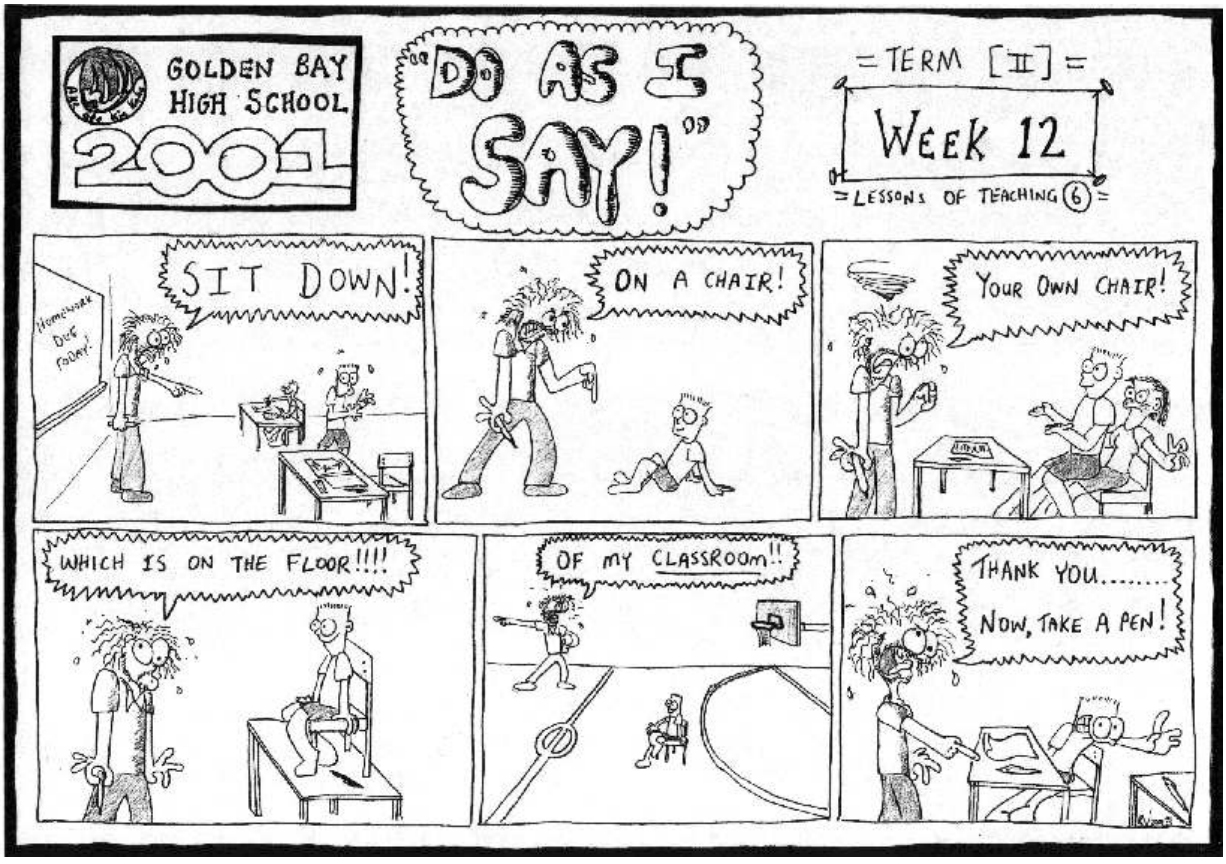
Magnetic Target Fusion (MTF) *continued...*

scientists from NASA, Los Alamos (one of whom, incidentally, went to university with Beatrice Tinsley), University of Nevada Terawatt facility, University of Alabama, and Massey. The immediate plan is to examine the behaviour of a cylindrical array of 12 plasma jets as they merge. Each individual plasma jet is driven by a 100kJ low inductance capacitor bank to produce a plasma "slug" travelling between 80 and 200 km per second. This will be undertaken within the next two years.

Another aspect of research is a collaboration between Massey and one of the staff at the Paul Scherrer Institute in Zurich, Switzerland. Using the technique of pulsed reactive crossed beam laser ablation (PRCLA) we are looking at several promising thin film coatings as an internal lining in the plasma accelerators. It is crucial that the amount of electrode material introduced into the plasma is minimised. The PRCLA technique offers an unique method of generating coatings of ultra-hard (40% that of diamond to date), conducting, low atomic number containing materials. In particular we are examining TiBCN as a candidate coating. The method is extremely specific, with the ability to vary the composition over a few atomic layers. A number of these materials are also of interest in their own right, as possible high T superconductors, and are being looked at by the University of Zurich, Physics department. It is one long term goal to bring a scaled up version of this technology to NZ to deposit the films on some components in the plasma accelerator. My collaborator in this is the co-inventor of the PRCLA technique - PD Dr Phil Willmott, who is currently materials science beamline scientist at the New Swiss Synchrotron at the Paul Scherrer Inst. in Zurich and he has part use of the beamline for his own use.

This is an exciting project, with plenty of scope for collaboration and expansion. I would be interested to hear from anyone who could make a contribution.

John Harrison



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Travels to Sweden

In June I took the chance to escape Palmerston's winter frosts and head up, up and away to Mid Sweden University - Sundsvall. Vince Moultan had in a drunken moment during his stay at Massey last summer, expressed willingness to spend some of his STINT grant on a plane ticket for me. The goal of the visit being to devote three weeks to finishing off a couple of joint projects that had been ticking over since my last jaunt overseas. I had an additional motive for wanting to get to Europe, having recently been offered a postdoc in Bochum, Germany, I decided that this would be an excellent opportunity to check the place out.

Scorning the idea of a stop-over I managed to touch down in Wellington - Auckland - Singapore - Frankfurt - Stockholm - and finally Sundsvall all in the space of 36 hrs. Immediately on disembarking the plane Vince whisked me off to an expresso bar to grill me on recent progress. The next three weeks seemed to blur into one long, productive working day - partly because they were one long day. At 65 degrees north it doesn't get dark at all during June. The sun traversed its way around the horizon occasionally dipping beneath for a few hours of twilight.

My stay overlapped with a one week visit by Mike Steel (Canterbury), and a two day visit from Anthony Poole (IMBS, Massey) so at one stage the Kiwi population of Sundsvall reached three, presumably an all time high. Vince organised a one day minisymposium on "Midsummer phylogenetics". Two talks that stood out for me were: Mike Steel on how any fully-resolved phylogenetic tree can be uniquely defined by just 5 multi-state characters, and Niklas Eriksen on his new software Yggdrasil that computes trees based on gene order data.

I finished my trip with a two day stop-off in Bochum, Germany. The Ruhr-Universitat-Bochum (the RUB for short) is a massive institution with over 35,000 staff and students. Despite its daunting concrete exterior the people within seemed very pleasant. The postdoc position will be within the 'Lehrstuhl fuer Spezielle Zoologie', a section of the biology department. My job description involves developing new methods and software for phylogenetic analysis, and looking for answers to the question "Why are trees constructed from morphological features different from trees constructed from sequences?".

So with a job to start in October I better get back to writing that thesis...

Barbara Holland

IFS People Page

The IFS people page on the web http://IFS.massey.ac.nz/ifsstaff.htm now has a phone and email lookup link which will give phone extensions and email addresses for all members of the institute who are Users on the CoSER site. Please check to see what details are there for you.

If you are not on the list or some details are missing please update your details on the site as soon as possible so your contact details will appear correctly on these lists. (This same contact information (for the paper coordinator) will appear on printed versions of the Paper Outlines from CoSER.)

If you already use the CoSER site for paper outline information go to http://sciences-intra.massey.ac.nz/CoSER/default.asp and take the Update Staff Details link.

If you have not used the site please go to http://sciences-intra.massey.ac.nz/

Judy Edwards

Dean Halford: The Euro Looks Good ...

But the New Zealand Dollar was bad! On our visit to the UK and Europe in 1998 Anne and I struck a very poor exchange rate and in May – July this year it was no better against a strong GB Pound and the Euro. Nevertheless (a euphemism for "it cost a lot, but what the hell!"), we fulfilled our aim of spending time with Deanne and family in Adelaide and Leon in the UK, and toured around part of England, Wales and Europe. We were treated to ten weeks of marvellous weather, encountering only three part-days of rain.

Catching up, figuratively and literally, with three young grandchildren in Adelaide kept us on our toes. We spent some time re-acquainting ourselves with the city, and discovered that nearby McLaren Vale produces wine at least as good as that from the Barossa. A visit to picturesque Hahndorf just east of Adelaide satisfied our appetite for decent German sausages.

A brief stopover in Singapore with a half-day sortie into Malaysia was enough to break the long journey to London. Being based in Bishop's Stortford, near Stansted Airport, we began by exploring the counties of Hertfordshire and Essex besides day-tripping into London. Our visit to the Royal Opera House, Covent Garden, to see *Giselle* was a highlight. The Webber-Elton show *The Beautiful Game* was enjoyable; this musical deserved a longer season than it eventually got. One is truly uplifted by the "London Eye" experience – magnificent views of the city are to be had from the giant millennium wheel. Of galleries and museums, a sample: My definition of art was reviewed after a visit to the Tate Modern, while the Victoria and Albert Museum demanded another visit to see more of the fabulous collection therein. Too little time to see London's treasures. We have to go back again.

The Dutch, to over-generalise, are a tall race in a small space. But they have produced some of the world's best. Amsterdam, this occasion: Anne Frank's house, open air dining, Leon's flat, Vondelpark, Begijnhof, efficient transport systems, fascinating architecture, … Then Alkmaar cheese market – where else could you see this? Our holiday was planned to take in three major floral events, the first of which was Keukenhof and the tulips. Astounding! No other word for it. Visiting "A Bridge Too Far" at Arnhem and the nearby cemetery and museum at Oosterbeek commemorating the WW II battle was, for me, unforgettable.

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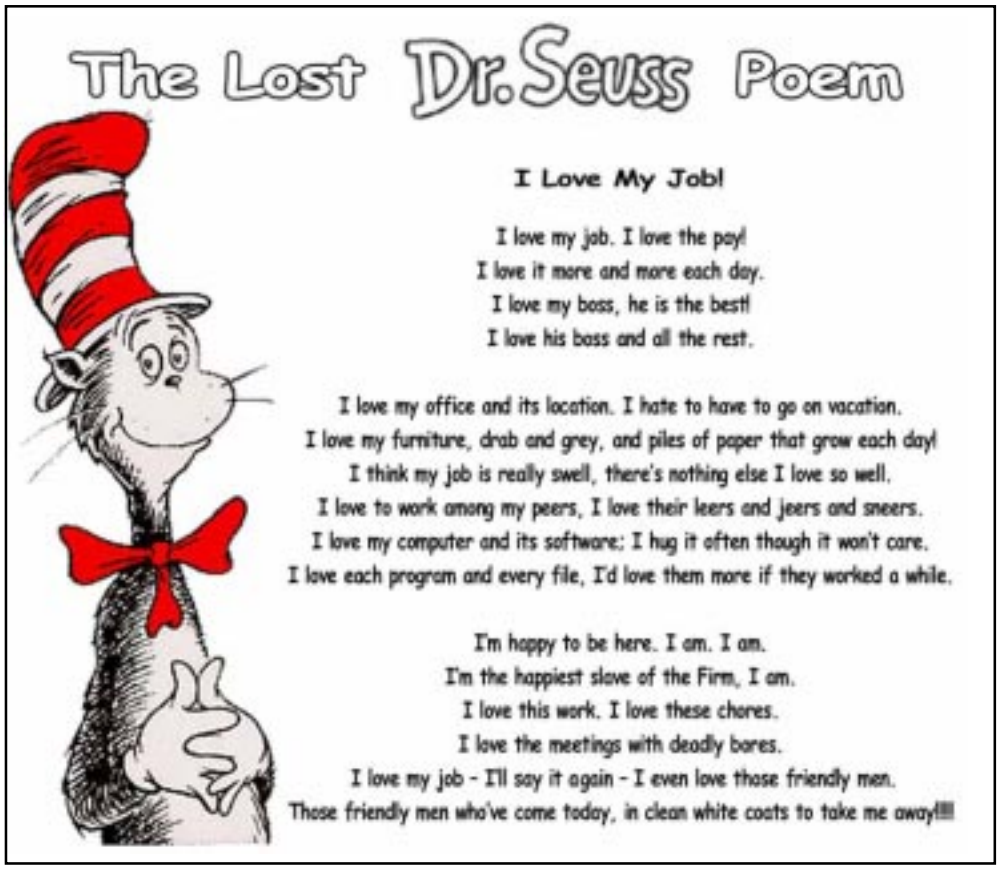


Dean Halford: The Euro Looks Good ... *continued...*

Down to Brussels by train, where we took a tour of the city then explored parts on foot. One remembers that the Atomium was built for the 1958 World Fair. That long ago? The inner city is a fascinating mix of the old and the, well, old. Fabulous chocolates – they don't get old! Another tour, to the Grand Duchy of Luxembourg where nobody is out of work and goods are very cheap; on the way, more WW II history at Bastogne where the "Battle of the Bulge" was fought. Eurostar first class to London is a great way to travel but it was over all too quickly.

The Chelsea Flower Show was the next major attraction. Of its type, it was indeed the Queen of Shows. The crowd crush was something else, but we arrived at 8 am when it was possible to see the exhibits without using a periscope.

Germany and Austria were on our "return" list, so we took a 12-day bus tour through southern Bavaria and country roads of Osterreich with idyllic mountain farms (hay-making farmers sweating over their pitchforks may have used a different adjective) and grand alpine peaks. The top of the Zugspitze afforded a panoramic view of the Alps in three countries, and the deep snow at Hitler's Eagles Nest balanced the other (Nazi) chilling effect. We got to Klagenfurt and expected to take an excursion into Slovenia but according to our tour guide "civil unrest", real or imagined, prevented it. Salzburg and Vienna were their usual charming selves. We indulged in superb Viennese cakes and a couple of Mozart/Strauss concerts. More of these, please.

After the bus tour we trained down to Budapest and were impressed by its history, churches and monuments, bridges, and thermal baths. Szentendre up-river is a picturesque village, and the boat trip back down the Danube was relaxing. Another train hop to Bratislava brought us face to face with contrasts: the beautiful old centre and the ugly suburban high-rises of the last 50 years, the struggling Slovakian economy and the wealth across the border in Austria a few kilometres away. The food in Bratislava is excellent, and inexpensive. Some of their wines compare well with the neighbouring Hungarian ones (and some don't!).

Back to Vienna and then to London. Leon took some leave and joined us on a three-week car tour of the Peak District, Wales, the Marches, Cotswolds, Avon. Many fine country houses, gardens, castles, farms, villages, cathedrals and cities later, and we are very conscious at what we *haven't* yet seen there. Foot and Mouth disease has seriously affected the livelihood of many people. We had B & B accommodation on several farms, some of which had only just re-opened after a lengthy closure. The restriction on access to walkways was lifted a couple of days before we left Wales, so we had the good fortune to see a little of the magnificent coastal path around Pembrokeshire.

A pilgrimage to my ancestral homelands in Warwickshire and Leicestershire brought much satisfaction. Then, to complete the trilogy, we spent a day at the Hampton Court Flower Show. Another very worthwhile occasion, rather more commercialised than Chelsea, and once again the people pressure *extraordinaire*. By contrast, on our last day in England we visited the Royal Horticultural Society HQ at Wisley - peaceful and park-like. That same evening we dined at the Royal Saracens Head in Beaconsfield, our umpteenth pub meal, but with meaning because the village in New Zealand where I spent my early years was named after the Earl of Beaconsfield, Benjamin Disraeli – and, yes, we visited his house in High Wycombe.

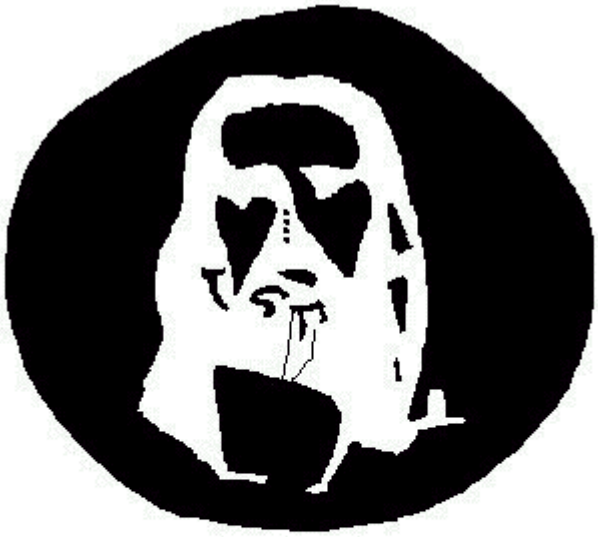
The long flight back to Palmerston North was broken by a three hour stop in Singapore (should have been two hours; the delay meant a mad scramble at Auckland airport on the final leg). Cold temperatures and idiotic driving on the roads in PN – we were home!

This Issue's Puzzle

PC-Related Illusion

Follow the instructions and see what happens!

1. Relax and lazily stare at the 4 tiny dots in the picture below, for at least 30-45 seconds.
2. Slowly, shift your gaze from the screen to a wall near you.
3. You will see a circle of light formed on the wall.
4. Start blinking and continue till you see a figure within the circle.
5. What do you see? Rather whom do you see?



Bits and Bobs

I have just returned from two weeks annual leave before attending the ISMAR Conference on Rhodes Island. The main reason for the Rhodes trip was to promote the Rheo-NMR Cell developed by Paul Callaghan's research group.

Science Towers

Some more redial work has been carried out on Science Tower A. New external fire escape doors will be installed shortly but heating is still a problem which I have discussed with Regional Facilities Management.

No further information has been received regarding the access Cards to the Science Towers.

Social

A successful evening was had by all that attended "42nd Street" at the Regent Theatre and after work drinks at Wharerata

Date for Diaries

A Happy Hour will be held on Wednesday, 19 September 2001, in the Common Room. Other events being looked at are a Marlborough Wine Tour and a Cup of Tea (Kapiti) Island day

Bob P

Physics Winter School 2001

Eleven year thirteen students from Wairoa to Waverley to Wellington converged on Palmerston North in mid July for this year's Physics Winter School. Research presentations were given by David Parry, Craig Eccles and Tony Signal. Laboratory experience was also provided by Craig Eccles, Bob O'Driscoll, Udo von Mulert, Keith Whitehead, Tony Signal and Geoff Barnes. The assistance of John Hudson in arranging supervised access to the Mathematics Laboratory was most welcome.

A social was held on the Thursday evening, the pool table being well utilised to the strains of clearly audible CDs.

The Saturday tour of Mid Central Health was a highlight of the two and a half day School, as was the visit to Audible Technologies, makers of PLINIUS top end of the market sound equipment.

Once again we are grateful to Dick Smith Electronics, the Winter School sponsors, and to our secretarial and technical support.

Geoff Barnes

From the IFS Publicity Committee

As usual the Committee has been busy on many fronts simultaneously. Brochures on our first year courses have been updated and printed, and the research booklets are being revised at present. Publicity material about our Semester 3 offerings are being handed out at every opportunity to High Schools and High School Students, who can now take these summer courses by provisionally enrolling at Massey. A major project is under way to replace the Physics Boards with display boards that fully represent the range of disciplines in the Institute. The first draft designs should be available in the next few days. Feedback will be welcome.

We are building up portfolios of the demonstrations, experiments and displays that have been used in the Institute during High School visits, with the aim of having on hand a resource that will make it easy to respond to future requests for High School visits. If you have not done so already please forward your protocols to the Institute Administrator.

The Institute is trying to build up a data base of past students and where they are working at present, so please if you come into contact with one of your ex-students check if they are willing to be included and get the essential biographical details to the Institute Administrator. We would like our records to be as complete as possible.

The Committee would like to thank all staff for their efforts in gaining publicity for the Institute of Fundamental Sciences, whether through their own research efforts, through organising High School Teachers evenings or helping during the many visits of High School students. The Publicity Committee is here to assist and facilitate, and to prepare publicity material, but the Institute as a whole must take responsibility for promoting chemistry, physics and mathematics at every opportunity.

If members of staff are visiting schools or hosting school visits could they please advise the Institute Administrator in advance. Publicity material and information packs can be provided for these visits if they are known.

Paul Buckley

Thanks from Palmerston North Boys High School

Research Funding Opportunities

Unless otherwise specified guidelines for contract applications under this programme are available from Miralie Thomas Vincent on extn 5945 or e-mail your request to M.E.Thomas@massey.ac.nz.

Embassy of France

Science Project Proposals 2002

Project proposals for the coming year are now invited under the France-New Zealand Cultural Agreement. Finance is provided on a yearly basis, but preference will be given to new projects which can be completed with the year 2002. Projects are funded on a reciprocal basis, with each country contributing roughly 50%. There are no priority areas for funding. Proposals should demonstrate benefits to both New Zealand and France and scientists should find a counterpart in France with whom to undertake the project.

Applications should be sent directly to the Embassy of France (with a marked file copy to Research Services) before **SUNDAY, 23 SEPTEMBER 2001**.

Royal Society of New Zealand

Science and Technology Awards

This fund has been established to assist science and/or technology students who are undertaking a PhD to attend their first overseas scientific conference. Funds are limited, however, and grants to individual scientists are unlikely to exceed $1,000. Students are therefore expected to seek other funding to assist with their conference attendance.

Applications should be forwarded directly to the Royal Society (with a copy to Research Services) by **MONDAY, 1 OCTOBER 2001**.

Health Research Council of New Zealand (HRC)

Strategic Development Grants (replacing Limited Budget Grants)

These proposals are limited to a maximum value of $100,000 fully costed and are usually for research lasting 12 months. In 2001/2002, funding will only be available to support feasibility studies, first grants for post-doctoral fellows or emerging researchers and Maori/Pacific Islands health research.

Project Grants

These proposals are not restricted in value and are usually for a maximum of three years. They are available for an individual or group of researchers working on a clearly defined research project which may comprise several small, closely related studies.

Programme Grants

These grants provide support for the long-term development of a research field by a multidisciplinary group of established investigators. Approximately $4.5 million is available for new research programmes, with contracts being of six years' duration. (A research programme is intended to be a strategic endeavour, rather than merely a collection of research projects). **Please note two additional HRC requirements for this upcoming round:** To minimise error in data entry of proposal titles and details, researchers must submit a floppy disk with their application in addition to the full number of hard copies.

To effectively secure assessing committee membership and initiate assignment of proposals to referees, applicants are required to submit the following to Research Services by **MONDAY, 1 OCTOBER 2001**: Programme Application Forms: • Section 1A (excluding Total Cost of Research) • Section 17 - Applicant Referee Nominations. Project Application Forms: • Section 1A (excluding Total Cost of Research) • Section 14 - Applicant Referee Nominations. These pages will then be submitted in advance of the external deadline to the HRC. Please remember, however, that final applications must also contain these pages fully completed. Members of the Palmerston North Research Committee are available to meet with those candidates who would like to discuss their submissions (recommended for first-time applicants). Please provide **FOUR (4) copies** of the application to Mrs Rae Dewe, PNRC Secretary, Research Services, by **THURSDAY, 4 OCTOBER 2001**. Interviews will take place on **THURSDAY, 18 OCTOBER 2001**. Applicants from Albany and Wellington campuses should also contact Mrs Dewe (extn 5383) to request an interview. Those who do not wish to avail themselves of the above process should forward **TWENTY-SEVEN (27)** copies (Project and Strategic Development proposals) and **THIRTY-TWO (32) copies** (Programme proposals) of the application form to Research Services by **MONDAY, 29 OCTOBER 2001** for University authorisation and dispatch.

Research Funding Opportunities *continued...*

Wellcome Trust, UK

Grant Schemes

Following recent publication of its Corporate Plan, the Wellcome Trust has decided to evaluate and refocus its activities in Australia and New Zealand. Some schemes will be discontinued in the coming year (as shown below) and the Trust will now be looking for opportunities to fund internationally where there is clear evidence of "added value" and will seek new forms of support where joint funding with national agencies is a high priority. Consequently, support for researchers from Australasia will now be funded as follows (deadlines bracketed): Travelling Research Fellowships (anytime); International Senior Research Fellowships (final round 21 May 2001); Research Leave Fellowships in South-East Asia and Pacific (anytime); Research Training Fellowships for Nationals of Small Pacific Island States (anytime); Biomedical Research Collaboration Grants (anytime); Collaborative Research Between Australia/New Zealand and Developing Countries of South-East Asia and Pacific - Travelling Fellowships - Research Development Fellowships - Research Initiative Grants (anytime); Travel Grants (two months prior to departure); Short-term Travelling Research Awards (anytime); Major Equipment Awards for Biomedical Research in Australia/ New Zealand (final round 1 October 2001).

Details of the above schemes can be downloaded from the following web site address: http://www.wellcome.ac.uk/en/1/biosfgintintfunaus.html or e-mail: international@wellcome.ac.uk In addition, amendments to grant conditions for institutions based overseas have been forwarded to Research Services. Please phone Miralie Thomas Vincent on extn 5945 or e-mail at M.E.Thomas@massey.ac.nz for a copy of this information.

Royal Society of New Zealand

James Cook Research Fellowships 2002

The above awards are made to senior researchers who are recognised leaders in their respective fields, have the requisite qualifications and experience, and are able to demonstrate that they have achieved national and international recognition in their areas of scientific or technological research. Applications are currently sought in the following research categories: * Biological sciences * Physical sciences (including chemical, mathematical, information and geosciences) * Research of relevance to the peoples of New Zealand and/or the South-West Pacific. The normal term of the fellowship is two years and the usual stipend is at a rate equivalent to an Associate Professor in a New Zealand university. Tenure shall commence on the date on which the Fellow enters upon his/her programme of research.

ELEVEN (11) copies of the application must be forwarded to Research Services by **TUESDAY, 30 OCTOBER 2001** for University authorisation and dispatch.

$5 Million Package to Encourage People into Teaching

Education Minister Trevor Mallard has announced a $5 million package to encourage people into teaching, particularly into the secondary sector.

The key points of this package are:

- An unlimited number of allowances (of up to $10 000) for people to teach in hard to staff secondary school subjects including mathematics, computing, physical education and Maori
- Funding to help secondary trainees gain practical experience in isolated schools
- More Teach NZ rural scholarships
- Increasing the International Relocation Grant to encourage New Zealand trained teachers to return to New Zealand.

Students finishing degrees in mathematics, physics, computing, physical education or te reo Maori and wanting to teach in secondary schools can apply for these allowances now.