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MATHEMATICAL SCIENCES IN AUSTRALIA: STILL LOOKING FOR A FUTURE

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Mathematics Sciences in Australia: Looking for a Future (FASTS Occasional Paper 3, http://www.FASTS.org) documented the state of the mathematical sciences in Australia prior to new funding initiatives for improving science and technology in Australia. As this paper documents, these initiatives have done nothing to stop the erosion of Australia's mathematical sciences base which remains in crisis. In particular, the brain drain continues.
Responsibility for this paper lies with the author and does not necessarily reflect the opinion of FASTS or the Australian Mathematical Society.

Introduction

> *"I got back to … and found that the readvertised Chair in Pure Maths at … has once again been frozen. In fact ALL positions in the School of Physical Sciences (maths, physics and earth sciences) are frozen for the next 4 years, to the end of 2005. This is all rather disastrous for pure maths, with imminent retirements etc. It also means that no one will ever take an ad for a position here seriously again, since this has now happened twice"*[1]

Mathematical Sciences in Australia: Looking for a Future[2] had three principal findings:

- A continued decline in the number of year 12 students studying advanced mathematical courses.
- An acute shortage of well-qualified mathematics teachers.
- Major problems in university mathematical sciences departments, especially in relation to staff losses.

It called for action while there was still some residual hope and energy left to address these inter-related problems. It noted that the recent reports had engendered some optimism in the science community but that the mathematical scientists did not share this. This lack of optimism is now shown to be justified. Some eighteen months later little has changed. If anything the situation has worsened, particularly in the universities.

This update will concentrate on the situation in the universities because, if that is not improved, there is little likelihood that the teacher supply situation can be improved. And unless the teacher supply problems can be overcome, many students will not have the option of advanced courses in year 12. The updated data[3] on movement of mathematical scientists shows some disturbing tends:

- The brain drain of experienced researchers continues.
- The trickle of experienced researchers coming into Australia continues. However, it now becomes apparent that those who do come show a tendency not to stay.
- The unfavourable imbalance between new researchers going overseas and those coming back continues.
- New researchers coming from overseas are also showing a tendency not to stay.

This is unsustainable—not only are the mathematical sciences in continued decline but it defies commonsense when other areas of science and technology which are dependent on advanced level mathematics are supported. These include biostatistics, advanced computing, and security systems. Non-scientific areas dependent on a sound mathematical sciences base include the various financial services.

Mathematical Sciences in the Universities

> *"We have been 'punching above our weight' in a small number of fields such as mathematics, astrophysics and agricultural sciences"*[4]

The above quote underlines the anger and frustration that currently exists about what has been allowed to happen to the mathematical sciences. Mathematics was one of the areas where

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[1] Personal communication

[2] www.FASTS.org

[3] Once again this was collected via email from the Heads of Mathematical Sciences Departments. ...Their help and support is gratefully acknowledged.

[4] Nelson, B. (2002). *Higher Education at the crossroads: Ministerial Discussion Paper,* p.24.

Australia had an excellent reputation. It doesn't require expensive infrastructure and provides a generic tool for research in many other areas, not exclusively in science and technology. The blame for the current situation lies with both governments and university administrators. Does a university deserve to be called a university if it doesn't have a single professor in any branch of mathematics or statistics? What can be said about a Go8 university that invests everything in biotechnology and freezes all positions in mathematics and statistics?

The brain drain data presented here shows a discipline in deepening crisis. Australia now has an international reputation for not caring about the mathematical sciences and this, combined with the effect of the fall in the dollar on salaries, makes it an unattractive place to come to. Any discipline needs the infusion of new ideas and perspectives. However, the mathematical sciences are losing their senior people to overseas or retirement. They are either not being replaced or are being replaced by expatriates whose main reason for coming back is often for family or other reasons unconnected with mathematics. The full effect of their leaving is sometimes hidden. Last year I received the following message:

> *A success story you might want to look into is Klaus Ecker at Monash who regularly attracts postgraduate students from Germany for periods up to a year. This builds on his close personal contacts and has the intangible benefit that many German students have experience in Australia. I found this particularly noticeable when visiting Tuebingen earlier this year.*

Professor Ecker recently accepted a chair in Berlin. He is one of Australia's best research mathematicians who also won a teacher of the year award in a competition where students had to write about the best mathematics teacher they had encountered.

After *Mathematical Sciences in Australia: Looking for a Future* was published, a French post-doctoral researcher working in Australia made some comments. She began by noting that the relatively low salary was not an issue for her. She didn't expect to stay because of the greater difficulty in getting a permanent position in Australia. She then made some telling remarks about the Australian situation. She thought that students in Australia witness the difficulties and the stressful, competitive working environment where they studied and they are scared away from choosing to continue in those areas. She considered they were turning to areas such as less hi-tech engineering and that they wouldn't promote a high level of technology once in their jobs. In contrast she considered France had students who knew mathematics and science were valued and who were not scared of a high degree of complexity.

One effect the continued brain drain is having is that Australia is increasingly seen as a poor destination for mathematical scientists. Salaries, especially in some areas such as biostatistics and financial mathematics, are an issue. The following message from an Australian currently overseas exemplifies the dilemma for many of the nation's top mathematical scientists.

> I was close to being a "classical case" of a person doing very well in the system but still falling well short of what could be done elsewhere and seriously considering a move. My success came at too high a price in long hours, ill-health at times, insulting salary compared with grants and offers from the USA and Europe that are 2-3 times my Australian university salary and other support that would enable me to develop a program/centre of excellence Only my childen's best interests and a sense of not giving up on Australia have kept me from leaving.
>
> You know the other stuff: we cannot attract staff in my applied area as it is a growth area and people can name their own salaries. Likewise in high performance computing, another major plank in our program. Finally, the mathematical sciences upon which our work rests is a very popular recruiting area for government and industry as the Australian students we produce are so good they are offered salaries overseas that they cannot resist. Even in Australia the salary offers mean that they are lost from the university sector to the public or private sector.
>
> The contrast in conditions here at the University of xxxx is stark. Objectively, I am "mad" to leave here, with the offers that have been made for me to stay. Counter offers from other institutions here in the US are even more attractive!

Expatriates sent comments about *Mathematical Sciences in Australia: Looking for a Future* that usually began with doubting that the politicians would lose any sleep over it. One suggested he would use it to make sure Germany didn't go down the same path of ideological ruin. Another suggested that Australians in Brunei could start a reverse Colombo Plan.

Currently there is nothing to attract mathematical scientists to Australia and plenty of expatriates to add discouragement. This has produced what I have called the 'moving hole phenomenon'. When a position is advertised it is invariably filled from within Australia or occasionally by an internal applicant on promotion. This produces another position to be filled. Some recent positions have caused intense competition between universities for the same candidate.

The brain drain is not the only problem facing the mathematical sciences departments. Staff-student ratios in mathematics and computing are amongst the highest in any discipline area[5]. In computing this is sometimes related to not being able to fill positions even if the money is available. In mathematics it is a combination of this and historical factors relating to the Relative Funding Model (RFM) that set a relative weighting for the cost of teaching in various disciplines some years ago. Mathematics was rated as a non-laboratory subject. Although small tutorials for a diverse student body are increasingly necessary, and computer-laboratory classes are now common, successive university administrators in different universities have used the RFM to claw back money from mathematics and support other areas[6]. Other discipline areas have reduced their laboratory component as mathematics has increased this form of teaching but this tends not to be reflected in budgets.

Other Issues

Issues outside the universities abound and will not be detailed here. However, it is clear that the situation in regard to the ***supply of teachers*** is worsening and that incentives tried so far have not been particularly successful. Scholarships have been paltry and have not attracted candidates. A very poor retraining system has been instigated in NSW that could not possibly prepare teachers with the depth of content required. The decline in supply of secondary mathematics teachers would be much worse except for the number of mature-age, career-change people currently applying. However this source will dry up, particularly if there continues to be no substantive support for them while they retrain[7].

The ***number of students doing advanced level mathematics courses*** cannot be addressed until the teacher supply problem is solved. Access to advanced level courses should not be restricted to students in the more affluent areas of our major cities but that is increasingly the case. The situation is being exacerbated by some very poor syllabus design in some States and a lack of knowledge about the level of mathematics required to complete many tertiary studies.

The ***business sector*** of mathematical services are also experiencing problems. The Managing Director of a data analysis company noted that the result of companies such as CRA closing most of their Australian research operations results in a work drain. He also commented that business has problems getting the right mathematical graduates. It would be expected that government agencies such as ***CSIRO*** would share these problems and that this would increase their difficulties in reaching external earnings targets.

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[5] http://www.avcc.edu.au/ (Fact Sheet 4)

[6] In different universities the income from external earnings and full-fee paying international students ...have been affected by application of the RFM in addition to core budgets..

[7] One candidate this year noted that if he had stayed in the Postal Service, professional development ...costs would be tax deductible. However, the costs associated with retraining as a teacher are not seen ...as 'work related' and are not tax deductible.

A Possible Solution

Mathematical Sciences in Australia: Looking for a Future called for the establishment of a Mathematical Sciences Institute similar to the Fields and Pacific Institutes in Canada. Currently Australia has no special initiatives in mathematics and this is at odds with all other developed nations. Under the Bush administration in America, mathematical sciences are the only new initiative in the National Science Fund (NSF). Further, Canada and the NSF are jointly supporting a mathematical facility in a beautiful setting at Banff for completion of research papers, summer institutes for teachers and other activities. In the region, Singapore opened a mathematical sciences institute a year or so ago and New Zealand recently funded one. Australia is not only losing its mathematical sciences base at home but it is missing out on opportunities for international collaboration, especially within the region.

The Australian mathematical sciences community has taken advantage of Victorian Government Infrastructure funding and applied for a grant for an Australian Mathematical Sciences Institute (AMSI). The commitment to AMSI is such that universities from four States and the ACT, as well as CSIRO and the Australian Mathematics Trust, have supported the proposal. However, if this initial grant is obtained, AMSI needs the Federal and the other States to get behind it. The very successful Canadian Institutes operate on a mix of the equivalent of Federal, State and Industry funding with the latter increasing considerably after the first year or two of operation.

AMSI's business plan states:

The ***principal aim*** of the formation of the Australian Mathematical Sciences Institute (AMSI) is to improve the mathematical sciences base in Australia by collaboration across a number of universities, government agencies and industry. It will achieve this by:

- Enabling areas of expertise to be drawn upon to meet the divergent needs of different business sectors, other research institutes and users of mathematical sciences, and to improve educational outcomes in both schools and universities.
- Providing leverage for pursuing Federal, State and industry funding to extend its activities to meet emerging and apparent needs in this area.
- Providing a focus for improving collaboration at an international level and a mechanism for attracting mathematical scientists to Australia for short and long-term periods.

The need for a collaborative approach to solving the problems underpinned by the data presented here is now urgent.

Final Comments

As I said earlier, both governments and university administrators must share much of the blame for the current state of the mathematical sciences. If they seriously believe that Australia can be at the cutting edge of science and technology without a strong mathematical sciences base, that it is sensible to continually downsize mathematics and statistics departments, or that the mathematical content of many degrees can continue to reduced and still produce graduates who are 'world-class', it is time they were honest enough to say so. As the data shows, mathematical scientists are valued elsewhere—they would like to be valued here but, if they aren't, then there are opportunities elsewhere.

If Australia is to have a strong mathematical sciences base it needs a national initiative now—not after the review of higher education and not after the research priority setting exercise—but NOW. The alternative is that the moves to overseas and early retirements will continue, and there will be insufficient resources to rebuild this fundamental discipline.

The mathematical sciences community has identified the way it wants to go forward. This will not happen unless there is leadership from the Federal government.

Brain-drain data update

Caveats and explanations:

Changed and new entries have been highlighted. A new entry may be someone who was missed the first time and this is more likely to be the case for new researchers leaving. Experienced researchers from other countries and new researchers returning are likely to be nearly complete as it is easier to extract good news from departments. The final category is far from complete—data on senior people retiring or going on to other positions and not being replaced is difficult to extract.

Assigning categories remains problematic, especially over time. However, the bottom line is that there should be some kind of balance over those leaving and coming. Clearly this is not the case and the continued loss of experienced people to overseas at the same time as many others are reaching retirement, is alarming to say the least.

The data only refers to universities and is movement post 1995.

Experienced Researchers to Other Countries

Name	Destination	Changes
Prof Lee White	Carnegie-Mellon	
Prof Walter Neumann	Columbia	
Dr Danny Ralph (Senior Lecturer)	Cambridge	
Dr Marcelo Laca (Senior Research Associate)	U of Muenster (Germany)	
Dr Neil Fowler (lecturer B, originally recruited from USA)	USA	
Prof Alan Welsh	Southampton	
Dr Matthew Wand	Harvard	Returned to Chair
Prof Roger Grimshaw FAA	Loughborough	Resigned, was LWP
Dr JimWright	Edinburgh	
Professor Richard Brent	Oxford	
Dr David Stewart (Research Fellow)	Iowa	
Dr A. Dimca	France	
Dr A Parusinski	France	
Dr V.Zheligovsky	Russia	
Dr Gita Mishra, (Australian PhD)	Cambridge	
Dr Russell Rimmer (reader)	Scotland.	
Prof Roger Hosking	University of Brunei	
Prof Peter Kloeden	Frankfurt	
Dr Maciej Kocan (Research Fellow)	Frankfurt	
Prof Kewei Zhang (Research Fellow)	Sussex	
Dr Jeff Hogan (Research Fellow/lecturer)	Arkansas	
Dr Owen Jones	Southampton	
Dr Marek Musiela (Sen Lecturer - declined Chair in Aust)	Paribas London	
Dr Bob Griffiths (Reader)	Oxford (Chair)	
Prof Warren Ewens FRS, FAA	University of Pennsylvania	
Prof Peter Brockwell	Colorado State	
*Prof K.L. Teo	Chair at HK Poly U	
A/Prof CJ Goh	Private business, 1998	See last category
Dr X. Zhou	HK Poly U	
Prof Murray Aitkin (ARC Senior Research Fellow)	Chair, Newcastle UK	
Dr X.Q. Yang (ARC res fellow, 50+ papers!, young)	HK Poly U	

Dr Anthony Kuk (Senior Lecturer)	University of Singapore	
Dr Grace Chan (Lecturer)	University of Iowa	
Prof William Dunsmuir	University of Minnesota	Returning
Dr David Broutman	Naval Res Lab., Wash DC	
Assoc. Prof. Liqun Qi	HK Poly U	Resigned, was LWP
Dr X. Chen (ARC Research Fellow)	Japan	
Dr Massoud Bazargan-Lari	Embry-Riddle Aeronautical U	
Dr Malcolm Anderson	Uni of Brunei	
Dr D. Andrew Barry (maths PhD)	Chair /Civil Eng. at Edinburgh	
Dr Song Chen (senior lecturer)	Singapore	
Dr Gary Davis (reader)	Southampton, U.K.	
Dr Murray Elder	University of Texas, USA	
Dr Anthony Brockwell	Carnegie-Mellon University	Not Harvard as previously shown
Dr Lisa Carbone (Assistant Prof)	Harvard	Tenure-track, Rutgers
Dr Kevin McAvaney	Oman	
Dr Matthew Emerton	Was Michigan now Northwestern (tenure-track)	
Dr Ian Wanless	Oxford University, UK	
Dr Tao Qian	Macau	Resigned, was LWP
Dr Jeff Hogan	University of Arkansas, USA	Duplicated entry
Prof Graham Wood	Massey NZ	
Dr Peter Miller	USA	
Dr Glenn Fulford	AgResearch, New Zealand	Returned to AGSO
Dr Genkai Zhang (Research Associate)	Chalmers Inst of Tech Sweden	
Prof Ray Chambers	Southampton	
Dr David Scott	Auckland	
Dr M. Faddy.	Birmingham Uni, UK	
Dr P. Burton	Dubia, Arab Emirates	
Dr Dawei Huang (Senior Lecturer	Beijing, Lucent Technologies	
Dr Nicolai Leonenko (Research Fellow)	Cardiff	
Dr Rod Gover (QEII Fellow)	Auckland	
Dr Kim Anh Do (medical statistician)	USA	
Dr John Stillwell	San Francisco	New
Prof Klaus Ecker	Frei Univ Berlin	New (from Aug 02)
A/Prof Werner Ricker	Germany – Chair at Eichstatt	New
Dr Simon Watt	U of Birmingham	New
Dr Mark Kisin	U of Muenster	New
*Prof Phil Broadbridge	University of Delaware	New
*A/Prof Song Ping Zhu	USA	New
Dr Graham Sander	Loughorough – Reader + Oxford - visiting res fellow	New

Dr Henry Tuckwell	CNRS Paris	New
Dr Bob Sullivan	Oman (Head of Mathematics)	Returned (0.5 appointment)
Dr Vasu Mangalam	University of Brunei	New
Dr Eugene Cordero	San Jose State, USA	New
Dr Stephen Bigelow	UC Santa Barba (tenure track)	New – soon
A/Prof Alan Easton	U of PNG (Professor)	New
Dr Joseph Steiner (senior lecturer)	Israel (Professor)	New
Dr Peter Chesson	Davis, USA	New
Dr Dong Wang	Wellington, NZ	New
* A/Prof Yaping Shao	Hong Kong	New
Professor Alistair Mees	USA – private company	New

* Leave without pay or other long term leave - may return

Comments added:

• We have replaced none of our retiring or retrenched staff.
• The first two caused us considerable problems as they were the best researchers of our younger mathematicians at the time.
• One aspect of the brain drain, which is difficult to capture, is the number applying for positions overseas-- from what I hear there are many in this category.
• Please emphasise that in particular Griffiths, Ewens and Brockwell are absolutely top-flight people who left Oz because of the unsatisfactory state of academia here.
• Alan Welsh won the Moran medal awarded by the Australian Academy of Science in 1990 …. He is a great loss.
• … there is a fair bit of head hunting going on. In the last year I have had serious approaches for three jobs in the UK. They were better paid and in a better research or professional environment- one paid 100,000 pounds, i.e. more than A$250,000. I didn't pursue them because I actually like living here and I didn't want to disrupt my children's education
• White, Neumann, Ralph, Elder, Brockwell (jnr), Wanless all left Melbourne in the last few years – not only two of our biggest stars in White and Neumann, but Ralph, Elder, Brockwell and Wanless are all really enormously talented young people. In either case, is this anything but a big loss for the country.
• Australia used to have world-class strength in Statistical Science. Almost a whole generation of Australian talent has emigrated in the last 5-10 years. Recently expatriate Australians occupied the editorial (Editor-in-Chief) positions in ***all*** *of the top 5 international journals in mathematical statistics.*
• It is also worth noting that over the last couple of years, 6 full-time positions (including the Professorial position) have not been filled after relocation, retirement and people moving into other career paths.
• I know there are many other senior people who have only stayed for family reasons.
• I should like to point out that many talented mathematicians also live in physics or other departments. I know of one, Dr Bill Spence, who left MU theoretical Physics to go to IC in London. Such people may be missed out from your survey.
• He will work in USA at cutting edge of Financial maths with a private company.

Experienced Researchers from Other Countries

Name	From	Changes
Prof Lynn Batten	Canada	
Dr Paddy McCrudden, (ex- Australian - Research Fellow)	McGill	
Dr Ken Palmer (ex-Australian)	Miami U.S.A.	To Taiwan
Dr Martin Hazelton	Imperial College	
Prof Sever Dragomir	Timisora Romania & Transkei, South Africa	
Dr Estate Khmaladze (Senior Lecturer)	Georgian Academy of Sciences	Chair in Stats - Wellingtom
Dr Leigh Brookshaw (ex-Australian)	Los Alamos	
Dr Victor Korotkich	Russia	
Dr Mark Nelson	Leeds, UK	
Dr Oleg Derjo	Russia	Now Res Fellow UK
Dr Donna Salopek	York U - Canada	New
Dr Dorothy Anderson (senior lecturer)	England, public service statistics	New – now returned
Dr Anatoli Ivanov	Penn State	New – back in USA
Dr Hassen Mutlak	USA	New – now Saudi Arabia
Prof Alexei Porkovski	? – 6 years in Aust	New – now Cork, Ireland
Prof Alex Rubinov	Russia/Israel	New
Prof Barry Quinn (ex-Australian)	UMIST UK	New – soon
Dr Fuchun Huang	Tokyo	New
Dr Andrew Metcalfe	U of Newcastle-on-Tyne	New
Dr Branka Pavlovic	Trinity College, Dublin	New (fractional – 0.6)
Dr Jiti Gao	China	New
Professor Alexander Novikov	Russia	New
Dr Sally Wood (ex-Australian)	Norhtwestern, USA	New

Comments added:

• We have a letter on file from a senior professor in statistics in the US stating that Australian salaries provide no attraction for even junior staff to come from the USA to a position here.

• I approached an outstanding Australian for the Chair in Mathematics of Finance. He replied that his salary in the US is $184K Aus. and that he can add to that as much consulting as he wants to do. We are uncompetitive.

• We're moving back mainly because of homesickness. We're certainly not moving back because of the high salaries. I'll be taking a large cut.

New Researchers to Other Countries

Name	Destination	Changes
Dr Mathai Varghese (AustMS Medal 2000)	MIT	Returned as SRF
Dr Siye Wu (QE II)	San Diego	Tenure-track, U of Boulder,

		Colorado
Dr David Adams (ARC postdoc)	Taiwan	Post-doc at Duke
Dr Justin Sawon (honours in Aust/PhD overseas)	Oxford	Now Stonybrook, New York
Dr May Nilsen (Australian PhD)	Texas A&M	
Dr Astrid an Heuf (honours in Aust/PhD overseas)	University of Denver	Returned-lecturer
Dr Philip Charlton (Australian PhD)	California Institute of Tech	
Dr Johnathan Kress (Australian PhD)	University of Waikato	
Adam Piggot (Uni medallist)	Oxford - scholarship	
Gaurav Raina (Hons I)	Cambridge	
Ha Viet Hoang, (Uni medallist)	Cambridge	
Dong Vu To (4 year degree in 3 years)	PhD at Buffalo	
Dr Peter Tritscher, (PhD and post doc)	University of Brunei	
Dr Andrew Rechnitzer.	Canada (post-doc)	Returning (post-doc)
Dr Denis Labutin , (ARC Res.Assoc, Aust PhD)	ETH, Zurich	
Michael Giudici	Queen Mary & Westfield PhD study	Returned – ARC research associate
Akshay Venkatesh	Princeton PhD study	Now MIT
Dr Yanqun Liu (recent PhD/ postdoc)	HK Poly U	
Dr Gek Lim (PhD)	Silicon Valley high tech company	
Dr Robert Mclaughlin	Robotics lab, Oxford	
Mr Jason Hutchens (still to complete PhD)	Senior position Israeli start-up company	
Dr Paul Armsworth (Aust PhD - originally UK)	Stanford	
Dr Danny Arrigo (post doc)	Univ of Central Arkansas	
Dr J. Grotowski (BSc hon Aust/PhD New York U	Germany, Uni of Freiburg (?)	
Dr M. Simon (PhD Aust)	University of Freiburg, Germany	
Dr Andrew van Deth (PhD)	University of Waterloo, Canada	
Paul Hannah (PhD Aust - to be submitted)	Manchester (post-doc type work)	
Brett Parker (PhD studies)	Stanford	
Selena Ng (PhD studies)	Cambridge	
Dr J.Crisp (Aust Ph D)	France	
Dr Danny Calegari (postdoc)	Harvard	Tenure-track, Caltech
Frank Calegari (PhD studies)	Berkeley	
Emma Carberry (PhD studies)	Princeton	
Dr S. McCue	U Nottingham UK	
Dr A. Koerber	U Nottingham UK	
Dr B. Maenhaut	Open Uni UK	
Dr B. Chan	ABN AMRO Bank Hong Kong	
Dr Andrew George (PhD)	Edinburgh	
Dr Monica Hurdal (PhD)	Florida	
Dr Sarah Ratcliffe (Aust PhD)	Pennsylvania State	
Dr James Murray (postdoc)	Leicester Uni, UK	
Dr Jarrod Hurley (PhD in UK, now postdoc)	USA	
Dr Robin Humble (postdoc)	CITA, Toronto	
David Wong (PhD studies)	Uni of Texas	
Dr Dorota Doherty	Houston	Returned
Dr Francis Benyah	West Cape, Sth Africa	New

Dr Michael Small	Hong Kong	New
Jian He (PhD studies)	Stanford	New
Dr Isaac Towers	Tel Aviv (post-doc)	New
Dr Bryan Wang (ARC post-doc)	Max Planck Inst (post-doc)	New
Dr Lydia Outhred	USA	New
Dr Sarah Ratcliffe	USA	New
Dr Thomas Lee	USA	New
Dr Todd Lane	NCAR, Boulder (post-doc)	New
Dr James Lee	UK (post-doc)	New
Dr Noel Keenlyside	Germany (post-doc)	New
Dr Shuhua Li	NASA (research ass)	New
Dr Tahl Kestin	USA (post-doc)	New
Dr Laird Breyer	Rome and Lanchaster (post-docs), now banking industry in New York	New
Dr Andrew Hart	Chile (post-doc)	New
Dr Ben Martin	Israel (post-doc)	New
Dr Evan Jones (Univ Medallist)	PhD Cambridge, now IT Israel	New
Dr Nicholas Hamilton	Gent, Belgium	New
Dr Ivano Pinneri	Gent, Belgium	New
Dr Tim Boykett	Linz, Austria	New
Dr Blair Williams	London	New
Masha Law (completing PhD)	Napoli, Italy (June 2002)	New
Dr David Allingham	United Kingdom	New
Dr Mirko Paskota	Derby, UK	New
Matt West (Honours Aust)	Cal Tech (PhD studies)	New
Rachel Thomas (MSc)	UK	New
Bob Yunken (Honours Aust)	Penn State (PhD studies)	New
Robert Foxall (Honours Aust)	Newcastle, UK (PhD studies)	New
Motiwalla Zohair (Honours Aust)	Actuarial studies, Wisconsin	Deloitte Touche, USA
Scott Morrison	Berkeley (PhD studies)	New
Thomas Lam	MIT (PhD studies)	New
Anne Thomas	U of Chicago (PhD studies)	New – Aug 2002
Tran Tung To (UNSW hons – Vietnamese national	Colombia U (PhD studies)	New
Dr Andrew Rixon	USA company	New

Comments added:

• We have sent our top honours undergraduates overseas to do a PhD almost every year now for ages. None have returned.

• We have also lost two exceptionally talented young researchers, not to other countries, but to industrial positions offering very much higher salaries, share options and significantly more positive prospects for the future than we can possibly offer them in Universities.

• … 1st class Hons & University Medal: -- PhD Cambridge but now working for an IT company in Israel and unlikely to return to Australia. (Lets face it; in his first year he was receiving nett more than an Oz professor gets gross)

Australian Born New Researchers returning from Other Countries

Name	From	Changes
Dr Catherine Greenhill (ARC post-doc)	PhD and post-doc in UK	
Dr Ben Andrews (ARC PDF)	Postdoc at Stanford	
Dr Andrew Hassell, (ARC PDF)	PhD at MIT	
Dr Gary Froyland	Postdoc in Germany	Returned – BHP Billiton
Dr Sarah Maddison	France	
Dr Morwenna Griffiths	Reading UK	
Dr Simon Clarke	London	
Dr Duncan Farrow (post-doc)	Norwich	
Dr Ross Taplin (PhD studies)	Washington	
Dr Andrea Codd (Univ medallist)	PhD Colorado	New – post-doc
Dr Daniel Chan (lecturer)	U of Michigan	New – arriving July
Dr Jonathan Kress (lecturer A)	Waikato	New
Dr James Risbey	Carnegie Mellon	New - Research Fellow
Dr Matthew Brown	Belgium (post-doc)	New
Dr Linda Stals	Norfolk, Va and NASA	New – lecturer
Dr Robin Balean	TU-Darmstadt	Software development - Sydney

Comments added:

• The main problem is staff losses through "encouraged" retirement and not being given permission to recruit to replace them. Hence very limited opportunities in the university system for good young researchers or attracting expat Aussies back here. Our research students get good jobs in the finance sector, but are lost to the national research effort.
• In fact this is a great weakness of the Chief Scientists proposals - universities have destroyed a lot of the base of science … so it is pretty unlikely that having either more ARC funds or more post docs would attract such people back here.

New Researchers from Other Countries

Name	From	Changes
Janny Lindiarni (PhD study)	Indonesia	
Dr Alankar Karol (Came as PhD student)	India— casual employment 2000	
Mr Markus Voege (PhD study)	Germany	
Mr Henry Wong (PhD study)	New Zealand	
Dr Iwan Jensen (Post-Doc/ARC Fellowship)	Denmark	
Dr Christoph Richard (post-doc)	Germany, largely funded by Germany	Returned to Germany
Dr Ole Warnaaar (ARC Fellow)	Holland	
William Joyce (Research Ass)	Univ. Canterbury	
Tian Khoon Lim (PhD study)	Singapore	
Sanming Zhou (PhD study, now post-doc)	PR China	
Dr Sergey Suslov (new PhD graduate	Uni of Notre Dame, USA	
Mr Kazimir Kolossovski (PhD study)	Russia	

Mr Vladimir Gubernov (PhD study)	Russia	
Mr Isaac Towers (PhD study)	New Zealand	
Dr Anton Betten	Germany	Now to USA
Dr Pavel Grabarnick	Russia	New, ARC Res associate
Dr Rohana Jani (PhD study)	Malaysia	Now returned Malaysia
Dr Halima Awang (PhD study)	Malaysia	Now returned Malaysia
Dr Jiying Yin	China	New
Dr Andreas Aigner	Germany (PhD in Aust)	Now post-doc UK
Dr Maria Lugaro	Italy (PhD in Aust)	Now post-doc UK
Dr Onno Pols	Holland (Post-doc Aust)	Now returned Holland
Dr Will Orrick	France (US citizen)	New
Dr Paul Mercat	France (post-doc)	Now to Germany
Dr Jan de Gier	Holland (post-doc)	New
Markus Voege	Germany (PhD studies completed)	Returning to Germany
Dr Csaba Schneider	Hungary, ANU PhD	New, research associate
Mr Kevin Murray (MSc)	England	New – Stats consulting/lecturing

Comments added:

• *We are still getting some overseas PhD students, notably from Russia.*
• *Our fee and university structure make it very difficult for us to attract the best people from overseas as research students. We cannot compete with the support available in the USA through their waiving of fees and the availability of Teaching Associate positions. I have repeatedly seen the best students from Asia, South Africa, and Europe RECRUITED to do PhD's in America. Providing high-level research training to overseas students should not be seen as way to raise revenue, but rather as a powerful device for establish strong links between Australia and the future leaders of business, industry and government in foreign countries. This is certainly how the United States has used it, and very effectively.*

******New Category*** Senior People retired, early retirement, moved to mainly administrative position in university, or to other employment within Australia***

Name	**Status**	**Replaced? And if yes, what level?**
A/Prof Mike Fisher	Early retirement	Not replaced
Professor Richard Jarrett	CSIRO	Not replaced
A/Prof CJ Goh	Private business, 1998	Not replaced. Doing research and honours units for free
Professor Tim Brown	Dean of Science	Advertised – professorial level
Professor Colin Thompson	Early retirement	Not replaced
Professor Bert Mond	Retired	Not replaced
A/Prof Bill Henderson	Early retirement	Not replaced?
Dr Margaret Mackisack (SL)	Private consultant	Not replaced
A/Prof Paul Lochert	Early retirement	Not replaced
A/Prof Neil Cameron	Retired	Not replaced

Dr Michael Deakin (SL)	Retired	Not replaced
Professor Graeme Ross	Retired	Not replaced
A/Prof Sheila Williams	Early retirement	Not replaced
Dr Neil Williams (SL)	Early retirement	Not replaced
Dr Keith Matthews (SL)	Early retirement	Not replaced
Dr Nick McConnell (SL)	DSTO	Not replaced
Dr Salam Mahammad	Medical program	Not replaced
Prof Ed Smith	Pro-V-C	Not replaced
Prof Charles McGilchrist	Retired	Replaced by Prof Niels Becker
Prof Niels Becker	See previous entry	Not replaced at previous post

Note: Not included in above is movement within the Centre for Mathematics and its Applications at ANU. At the beginning of 1996 there had been one retirement and one death not replaced. There have been four retirements and one move to another university since. There have been four replacements so a net loss of three.

Comments added:

- *… was highly regarded for her teaching and research. She resigned her position in 1997 to work part time as a statistical/mathematical consultant. She was not replaced. She has since proved that she can earn (in her own words) more in two days [now] than she did in a whole week [as an academic].*

- *For the last few years we have had no chair in either Maths or Stats. Hence we cannot lose any professors to other activities! No-one else from here has recently left for overseas: instead we've had one resignation and two retirements in the last year, none of whom have been replaced. This doesn't fit into your data set, but is of concern.*

- *More bizarre plans from …. There are 7 staff in what might be loosely described as the mathematics analysis area who are collectively responsible for (among other things): 3 first year courses with enrolments over 600 students in each, 1 of 500+, one of 400+; 5 third year courses of around 40 students each. In two years 5 of the 7 will retire and NONE are to be replaced.*