


# *WiSENet*

*Journal*



*Still Interested,  
Still Approachable,  
Still Strong.  
Natasha meets  
WiSENET, ... p5*

**WiSENET JOURNAL  
VOLUME 61  
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# WOMEN IN SCIENCE ENQUIRY NETWORK

## OBJECTIVES

- to increase women's participation at all levels in the sciences where they are now under-represented;
- to examine the education and employment structures which currently restrict women's opportunities in the sciences;
- to gather and disseminate data on women in science, the sciences here including the physical, social and life sciences, mathematics, computing, medicine, engineering and associated technologies;
- to explore linkages between the different disciplines and promote communication between scientists and the community on social and environmental issues;
- to examine the relationship between scientific research and technology and promote research and technologies more appropriate for world needs;
- to explore programs for change in the sciences and support more democratic and participatory systems as an alternative to the male-dominated tradition;
- to build an active network of people interested in these issues and to liaise with other interested groups;
- to support appropriate action to achieve these objectives.

Women in Science Enquiry Network (WISENET) Inc was established to increase women's participation in the sciences and to link people in different branches of science and those who are working towards a more participatory and socially useful science.

WISENET was formed through the establishment of a series of state branches. Regional groups, such as those based in Wollongong and Lismore in NSW have also been formed. Interest groups, such as that responsible for the historical exhibition on Australian women in science, have also been active. State and regional branches act autonomously, focusing activities primarily at a local level but also joining with other groups for more general issues.

WISENET is open to women and men who are involved or interested in the sciences and are interested in working for change in line with the objectives. New members are welcome. If you would like to join please complete and return the application form at the back of this issue.



GPO Box 106, Canberra, ACT, 2601

WISENET'S NEW Web Site: <http://www.wisenet-australia.org>

# EDITORIAL

## CONTENTS

- 2 Objectives
- 3 Editorial
- 4 National Link back to Canberra
- 5 When Natasha came to lunch
- 6 A Day On (Under) The Hill
- 8 SMP, Another View
- 10 Science on the News - is there a better way?
- 11 You do What?
- 13 Ataturk's Daughters
- 16 The Sociobiology of Meetings
- 18 Euro-Science
- 20 In the Boardroom?
- 21 Women Achieving in Science
- 22 2002 Science Prizes
- 23 The Knowledge Economy and You
- 27 The search for new life forms?
- 27 Membership Form
- 28 Contact Information

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Avoid sexist or other discriminatory language. WISENET reserves the right to make editorial changes. Each article is the opinion of the author and not necessarily that of WISENET

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I am thrilled to be presenting to you my first WISEnet Journal as Journal Manager. I must, right up front, thank Anna Robinson for her immeasurable guidance and assistance in "showing me the ropes". There have been so many small though important bits and pieces to the process I could not have hoped to have done it successfully on my own. Thank you very much Anna. Thank you, also, to Karen Edwards and Juliet Lloyd-Smith for helping out with the editing. And a big thank you to everyone who has given their time and energy to write an article for this edition. I know you'll enjoy reading them.

As a relatively new member of WISEnet I am still finding out what it's all about. It has been so wonderful for me to come into contact with so many other women scientists. I feel that I must have been in a void for the past 10 years. The women in science and engineering whom I have come across have been few and far between. Perhaps I just haven't been getting out enough (highly probable). But then I am an engineer, with a background in electrical/electronic engineering at that, where the women are just as thin on the ground as when I graduated from my Bachelor's 11 years ago!

I have found the articles in this edition particularly inspiring. I was one of the fortunate ones who attended the awarding of the Prime Minister's Science Prizes. It was a thrill to see Frank Fenner and hear about his amazing achievements. And, to add to the excitement, it was fabulous to see that the Malcolm McIntosh Prize for a researcher in the physical sciences under the age of 35 went to a woman and the prizes for excellence in science teaching for both primary and secondary teaching also went to women. That one of the women had ostensibly retired and was so wrapped up in her teaching that she went back to it, still loving it and still being enthusiastically praised by her students, was inspirational.

I have noted that several of the articles directly address or at least touch on the public's perception of science and scientists. In general it seems that we are seen as out of reach, unapproachable. The question is how much is this our perception and, further, how much of it is brought about by our own attitudes? It seems to me that the problem is with us, the scientists (and engineers) and not with the public. If we condescendingly assume that people won't understand what we're doing and therefore don't put in the effort to explain it in an accessible way, then – they won't understand what we're doing! For instance, I am a telecommunications engineer and consider myself to be well-versed in that field. However, I am a member of the general public when it comes to, say, biology or even materials engineering. So, while I am a scientist it doesn't mean that I am knowledgeable in all areas of science. Anyway, from the initiatives and opinions described within, such as the Science Meets Parliament day, and a discussion of how to better communicate science to the general public, it looks as if things are improving. This can only be good for all of us and the future of science.

I hope you enjoy this edition of the WISEnet journal. Happy and inspirational reading.

Haley Jones

# WISENET NATIONAL LINK MOVES BACK TO CANBERRA

Hello everyone,

In accordance with the WISENET Constitution, the WISENET National Link has rotated again – this time back to Canberra. Enormous thanks are extended to the Sydney Link who attended to National WISENET business for the past ten years.

Transfer of roles took place at the ACT WISENET meet on 18th October, 2002. Our thanks to people who offered to accept the new positions -

Karen Edwards	<i>Treasurer</i>
Sally Stowe	<i>Membership Secretary</i>
Haley Jones	<i>Journal Manager</i>
Gina Newton	<i>Public Officer</i>

Our new postal address is GPO Box 106, Canberra, ACT 2601.

Link group convenors, committee members and advisers remain the same – although some would like to pass on their roles to others over time. If you would like a more structured role in WISENET, please let us know.

Some points for consideration in 2003:

- ❖ raising annual membership fees to \$50 (to be decided at the 2003 AGM). This would allow us to become fully affiliated members of FASTS (Federation of Australian Scientific and Technological Societies) with more influence; and provide for some paid administrative support as required
- ❖ developing a password protected web page for membership lists and contact details
- ❖ purchasing a MAC lap-top computer that can function as a rotating office. 'MAC', to avoid so many viruses; 'lap-top' so that WISENET business can be managed separately and readily passed on.

Your views and comments will be canvassed with membership renewal forms and be resolved at the 2003 AGM

See the website at [www.wisenet-australia.org/](http://www.wisenet-australia.org/) for details and continually updated information... and keep in touch.

Cheers,

Anna Robinson  
National Convenor.

*[www.wisenet-australia.org/](http://www.wisenet-australia.org/)*

# WHEN NATASHA STOTT DESPOJA CAME TO LUNCH,,,,,

*Anna  
Robinson*

On the 18th October, 2002, ACT WISENET had a lunchtime meet at the lovely Vivaldi's restaurant on ANU Campus. Our guest for the day was Senator Natasha Stott Despoja who is the Australian Democrats' Science and Biotechnology spokesperson. The Senator was accompanied by her adviser, Jo Pride, who was also fun to have along and made many envy her job.

We started lunch with a roundtable of introductions. Some notable moments: Suzy Close (Women-in-Medicine) spoke of the importance of leadership and encouraged the Senator to keep going and stay inspiring. It IS an achievement for Natasha to have attained such a high profile leadership role in a career like politics while still so young. Suzy's encouragement was resounding and supported by all. We continued around the table when Gina Newton (new WISENET Public Officer) described her position as 'going through a career crisis at the moment'. Natasha was like lightning with her empathic "tell me about it! so am I!". Much mirth! Alison Edwards told of her new appointment to the executive of NTEU and the process went on. We concluded with Haley Jones, Engineering Lecturer, who delighted us by remembering her time at Adelaide University when Natasha Stott Despoja was the Students' Association President. It was fun to have past and present merge.

Natasha then spoke to us about her background and interest in science. What seemed amazing was how one that is not trained in science can be so knowledgeable and erudite in discussing contemporary scientific issues. It was interesting and enlightening to hear how the political debates are carried out, about the political players and how they work, and how the politics that define our futures are decided. Natasha drew our attention to the stem cell debate, biotechnology, patents and intellectual property issues, GMOs and

matters relating to the Space Activities Bill. She welcomed the current debate in Parliament regarding biotechnology issues but pointed out it was long overdue. Natasha explained she has been calling for a ban on human cloning since at least 1997 and has introduced two Private Member's Bills relating to gene patenting and genetic privacy and non-discrimination.

We had some more very lively interactions with women scientists from France, Italy, Ireland, South Africa and the UK, joining in discussion on the attitudes to science in Australia and how we develop a voice! Natasha responded with suggestion, direction and great enthusiasm and inspiration... it is clear that there is much in politics that is paralleled in science. And it is clear that we have a very interested and approachable politician in Senator Natasha Stott Despoja to whom we can go with our concerns.

Our enormous thanks to Natasha and Jo for coming along to the lunch. Grateful thanks also to Gail Kelly, ACT WISENET Convenor, for organising the event. Most memorable.



*Senator Natasha Stott Despoja*

# A DAY ON (UNDER) THE HILL

*Juliet  
Lloyd-Smith*

On the 12th and 13th of November I attended Science Meets Parliament, an annual gathering of Scientist and Parliamentarians, now in its third year. The two days encompass a variety of events, aimed at increasing dialogue between scientists and policy makers.

The event kicks off with a National Press Club Luncheon, addressed on this occasion by Dr Keith Williams of Proteome Systems fame. The remainder of the first day was a varied schedule, with individual society meetings peppered with plenary talks from the scientific and policy making glitterati; Lord Robert May, and his antipodean alter ego Dr Robin Batterham, Wendy Jarvie from DEST, and politicians including Senators Carr and Stott-Despoja, and Mr Gary Nairn. A cocktail party held at parliament house was an opportunity to mingle with politicians in a more relaxed setting, including Minister's McGauran and Nelson.

The majority of day two was spent in or around Parliament House. What a lovely building! Wooden floors polished to opalescence, commissioned artworks littering the walls - the overall effect was grand and spacious, but still utilitarian



and the use of natural materials lends an organic quality. Very nice!

A highlight of day two was my meeting with Senator Ian Macdonald, and a chance to exchange with other charismatic mega fauna of politics. Minister McGauran, Minister Nelson, and Mr. Simon Crean were all very approachable, and encouragingly enthused about science. I was a little nervous at first, and armed with a lethal mix of Helpful Suggestions (“have a great opening hook”) and too much coffee, I was all primed to burst into Senator Macdonald’s office with an Irish Reel. Fortunately my assigned partner for the meeting, a level headed Scientist from CSRIO Plant Industry, advised against this. We spent a pleasant hour talking about different aspects of our work and science in general. Most politicians I spoke with also seemed interested in my age (27) and women’s lack of representation in science.

What interested me just as much as the politician’s curiosity about age and gender balances, was the reactions from fellow scientists about WISENET. Bar a few skeptics who dismiss anything involving women as “special interest” – (one scientist expressed surprise at the inclusion of “special interest” groups in FASTS) most of the interest in our organization came from men, generally young fathers finding it difficult to balance a 60-odd hour week with quality family and personal time. As noted at the end of this article, I think we should explore our options for a formal presentation at next year’s event.

I was also a little surprised at the attitudes of some fellow scientists towards the event itself. I was told on the first day from a number of colleagues “not to expect too much”. If it was going to be that bad, then why were they bothering at all? Perhaps chagrined by the previous year’s unfruitful meetings, some attending scientists were at great pains to project a sense of ennui, and the

need to water down your science so “the politicians could understand it”.

It is far easier for us to caricature politicians and a purported of scientific naïveté, than to shake off our misconceptions, and attempt to foster real and regular engagement between the political community and ourselves. Science Meets Parliament appears to be the first step to this end.

Historically, the relationship has perhaps been tenuous. The major complaint was that: “we” (scientists) bury our research in obfuscatory journal articles, hence locking it away from correct and proper scrutiny. Our perceived “honesty” has also been called into question relating to the information provided in the ongoing stem-cell debate. The pollies themselves displayed surprising candour during the scheduled meetings. (Although, this was the only downside to SMP thanks to one politician I spoke with. One man’s candour is another man’s rant, and here was someone with a powerful Intel-patent-worthy chip on his shoulder about factional infighting. He wasn’t interested in science, rather a sympathetic ear.) Overall, though, the cartoon manipulator who would kiss babies on Monday only to cut off their immunisation shots funding by week’s end simply didn’t exist. In fact they are all reassuringly human – and astonishingly busy with loads of conflicting priorities.

It broke down the notions of “them” and “us”; so rather than Agents Of The Dark Side and parliament being a portal to the gates of hell, I found a bunch of very nice people in a gobsmackingly lovely building buried into the side of a hill. Yes, they are agenda driven, but by necessity. Yes, they will try and get your vote with a little bit of politicking, but only because all pollies- independent of political colour - seemed to believe in the basics of democracy i.e. that every vote is valid and important. Ignoring the mildly appalling behaviour witnessed in question time, where hubris hangs like a heavy smog over two warring cities, the whole day was enlightening and most importantly, great fun. The result? I wouldn’t hesi-

tate to try and contact/involve/inform a politician.

Recommendations for next year’s WISEnet attendee?

1. We need to eliminate the impression that WISEnet – is a “special interest” group separate from our FASTS cousins. Not only is this erroneous – we are a professional organisation consisting mostly of women, not a women’s organisation – but furthers the calumny that anything, scientific or otherwise, of relevance to women in particular is special interest despite the fact that women represent over half of the population.
2. I would like to see WISEnet run a session on the first day of proceedings – there is so much interest in what we do and why we do it from women and men. The topics for a two-hour workshop/discussion are limitless.
3. Some scientists appeared disappointed with the results of their individual meetings. I am not entirely sure why, but don’t just tell the politicians about the technical aspects of your work. I am lucky enough to travel on a regular basis to localities all around Australia as part of my research. The politicians were interested in the reactions around the country to the work. Don’t go in expecting them to indulge a polemic concerning the finer aspects of global warming and ocean thermal expansion, but bear in mind they are all pretty switched on regarding scientific principles, and can digest a lot more than you may have been led to believe by the media.

*Juliet Lloyd-Smith is a Canberra based scientist in the Resource Futures Program at CSIRO’s Division of Sustainable Ecosystems. She has an honours degree from Melbourne University in Meteorology, and is finishing her doctoral thesis in contaminant hydrology.*

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# SCIENCE MEETS PARLIAMENT (SMP) – ANOTHER VIEW

*Gina  
Newton*

I attended my first SMP this year on November 13 (also my birthday!). SMP is an initiative of FASTS, the Federation of Australian Science and Technology Societies which represents over 60,000 scientists from 60 societies. It is an event where scientists from all over Australia have the opportunity to meet with politicians and discuss science related issues. 2002 is the fourth time the Science Meets Parliament event has taken place. It has achieved great support from both politicians and scientists alike. This year some 130 politicians and about 165 scientists took part in the event.

Prior to the actual day on the Hill, the afternoon of the 12th was spent in a valuable briefing session at the National Press Club. The afternoon began with an enjoyable lunch followed by a speech by Dr Keith Williams, formerly Professor of Biology at Macquarie University and investigator of slime moulds. Keith is now CEO of Proteome Systems, a Sydney based company that has built world leadership in the field of protein structure research and employs around 110 staff (including 40 PhDs). Dr Williams and his team have pioneered a new approach to establishing the link between genes, proteins and disease, which has major implications for the design of new drugs – a great success story to inspire more scientist-entrepreneurs, which is what Australia needs! Unfortunately, despite a great record in scientific achievement, Australia's record of commercialising scientific discoveries is less than ordinary.

Following this inspiring introduction, the afternoon revolved around tips and traps for the bridge-building exercise between the scientists and the polys. We heard from Ministers advisers and Whips, and even from several of the horse's mouths, including a heated panel discussion, Chaired by the Sydney Morning Herald's Margo Kingston, between the Lib's John Lawrence, Labour's Kim Carr and the Democrats' Natasha Stott-Despoja. Without sounding biased, I would have to say that Natasha was the shining light of the trio – and the most articulate and knowledgeable! We also heard from the eminent heights of Sir Robert May, President

of the Royal Society, and our own Chief Scientist, Dr Robin Batterham.

Out of the afternoon's exchanges, the most prominent advice for scientists partaking in SMP appears to be: research your MP and have some idea of their pet interests and topics (ie. visit their website beforehand); be on time; be clearly focused about the issues you wish to discuss; try to link the issues to the MP's electorate if possible; deal with tangibles if possible (eg. number of maths teachers versus schools in their electorate); also presenting a national picture is good (eg. a Senator will have a broader brush); be aware of what government is already doing regarding your issue; leave some printed matter behind or a written summary of your issue with facts and figures. Another good strategy is to get the 'Opposition' interested in asking a question in Parliament (therefore, also being aware of parliamentary processes is very useful).

FASTS had conducted a survey of the politicians prior to the event. The 130 Parliamentarians registered for SMP voted on 20 discussion topics. The top five scoring issues were: water quality and salinity (37 votes); energy sources for the future (26); education and training (26); commercialisation, innovation and industry research (24); and climate, climate change and greenhouse (23). Issues of particular relevance to marine science rated as follows: environment and biodiversity (9th, 18 votes); sustainability and the triple bottom line (10th, 17); oceans and the Great Barrier Reef (19th, 10); and feral animals, noxious weeds and quarantine (20th, 9). FASTS encouraged the scientists to also promote (where possible) three key issues which were well-covered in an informative brochure to leave with the Parliamentarians. The three key issues were: 1) turning business R&D around – 100 new postdocs for industry; 2) securing our children's future – reduce HECS for science and mathematics teachers; and 3) reverse chronic university under-funding – invest in higher education.

On the day of the event, following an early breakfast and pep-talk at Old Parliament House, most scientists got to see at least two

politicians throughout the day spent on the Hill at New Parliament House. We also had some interesting interludes, with talks by Opposition leader Simon Crean (an ex-Science Minister and surprisingly impressive) and current Science Minister Peter McGauran (not so impressive, and very dependent upon his Whip). There was also an encouraging panel session of young scientists who spoke of their experiences as a young scientist in Australia today. It was heartening to hear that although most expected to have to take their talents overseas, the majority were determined to return.

I had two very worthwhile encounters with MPs. Early in the day, both Maria Byrne (immediate Past President, AMSA) and I met with the Shadow Minister for the Environment, Kelvin Thomson. Minister Thomson holds the electorate of Wills in Victoria (Coburg, Pascoe Vale, etc.). In his First Speech to Parliament (1996) Minister Thomson indicated his desire and commitment to working on the environment, and in fact stated that an interest in environment protection was his main reason for becoming a politician. The fact that his office coffee-table was strewn with World Wildlife Fund, Habitat, and other environmental magazines was certainly testament to his genuine interest.

The Shadow Minister for the Environment was very interested to hear about the issues surrounding Australia's ratification of its Exclusive Economic Zone, the implementation of Oceans Policy, and the status of the Great Barrier Reef Marine Park Authority's Representative Areas Program (RAP). In fact he specifically asked about the latter two topics. Lucky for AMSA, Maria Byrne sits on the National Oceans Advisory Group and is aware of the situation regarding Ocean's Policy; Maria had also just come from the annual Coral Reef Society meeting in Townsville where the GBR RAP was a hotly discussed topic. Thus AMSA was able to address the Minister's questions with the latest information. Minister Thomson was also very interested to learn of the serious position Australia is in regarding the lack of nationally consistent, standardised environmental and natural resource data with which to underpin decision-making, planning and environmental reporting. After a stimulating and involved discussion, it was heartening to have the Minister request follow-up information on all the issues discussed and to keep

him informed of further developments and important marine science issues.

Later in the day I met with the Interim Deputy Leader of the Democrats, Lyn Allison, Senator for Victoria. Senator Allison comes from a teaching background, so is keen to 'improve the lot of our education system'. She is also very committed to social justice issues, particularly in regional Australia. Senator Allison is particularly interested in the environmental damage that has been wrought on Australia. Originally a Councillor in Port Melbourne in the early 1990's, she is keenly aware of the effects of coastal developments. In her First Speech (1996) she stated that "the reluctance to protect the marine environment means the waters in our bays and ports are being strangled by weeds and pests introduced in ballast water..... Whilst reports fill the shelves, more and more marine rabbits enter our waterways, finding environment in which they can thrive". [Let's hope they don't find a marine version of the Calicivirus!!]. She has also recently been involved with a high-level Parliamentary Committee on Water. Like Minister Thomson, Senator Allison was very interested to hear of the fundamental issue of inconsistent national environmental data across jurisdictions, and also requested follow-up information and further contact with AMSA.

Overall, the Science Meets Parliament (SMP) event is an excellent initiative and FASTS is to be congratulated on its success. SMP also provides a unique opportunity for scientists and Parliamentarians, not only to engage in dialogue, but also to forge fruitful, and perhaps long-term, relationships. There is nothing else quite like SMP. In fact, from the praise Sir Robert May was espousing about it, I wouldn't be surprised to see the event take off up over!

*Dr Gina Newton is Vice President of the Australian Marine Sciences Association (AMSA), and the new Public Officer for WISENET.*

# SCIENCE ON THE NEWS - IS THERE A BETTER WAY?

*Sarah  
Hatch*

This article looks at the perennial question of how best to educate the general public about science, and how science is reported on television.

There is widespread support for the need to educate and inform the public about science (for numerous reasons which I won't go into here). However, unless they have an active interest in science and seek out the information for themselves, most people's exposure to real-life science is restricted to the TV news, and maybe current affairs programs. Careful attention therefore needs to be paid to how science is reported on these programs.

So, what is the best way to portray science on the TV news so as to improve the public's knowledge and understanding of scientific research? I've noticed that a large majority of science reports on the news are about "world first discoveries" or an "amazing breakthrough" or the like. And of these, most appear to be about medical breakthroughs - it seems like I see a discovery of a new disease-causing gene on the news at least every week!

However, it seems to me there are several dangers in emphasising breakthroughs and world first discoveries. Some breakthroughs are hard to explain to the general public because you need to know a lot about the subject to understand its true importance. It also obviously excludes reporting on science that isn't in this category and, let's face it, a lot of research isn't an amazing breakthrough that drastically changes how we see the world.

There is also the danger that to attract the attention of journalists and news editors, you need to keep coming up with bigger and ever more exciting world first discoveries (obviously a lot easier said than done). It appears to me that this leads some journalists (or publicity officers perhaps) to exaggerate when it comes to scientific breakthroughs. Speculation about future possibilities seems especially prone to exaggeration - who can forget the "Star Trek" teleportation angle on the recent breakthrough about teleporting light. When this sort of exaggeration occurs, quite often the actual science behind the breakthrough can get overshadowed, and it seems unlikely many people would learn much from the report.

The emphasis on the "amazing breakthrough" on the TV news doesn't really reflect the day-to-day realities of scientific research, and probably does little to educate the public about how research really

happens. I think that reporting the "world first discoveries" is important and should continue, but we need something more.

So what are some good alternatives to this way of reporting scientific research on the news? Well, one way is to report on the start or early stages of a new project (for example, a new PhD student's or post-doc's project, a new grant or industry funding for particular projects). Obviously, it needs to have a "story" behind it to make it a news worthy item, such as why the project is being done, what methods will be used and what will be measured. As well as giving the specific reasons for doing the research, it is also important to put it into a wider context. The conclusions of a project could also be reported in a similar way, even if they aren't earth-shattering. Some great examples of this type of reporting science are shown on "Totally Wild", a children's program on Channel 10 which has been running for 10 years.

I think this is a better way to educate and inform the public about science for several reasons. Firstly, this means that a much wider variety of research projects could be reported on, which would give the public a better feel for the scope of scientific research. Secondly, this could show the public how big the gaps in our knowledge really are, and how much effort (money, time, manpower, etc.) is involved in filling in even small details.

This would potentially give a better understanding of how science is actually done, and perhaps give an insight into the processes that have led to some of the "amazing breakthroughs". There is a benefit in reinforcing the need for the pure or basic research that so often precedes unexpected discoveries - it's important for the general public (and politicians!) to understand that breakthroughs don't come out of thin air. Even people who have an active interest in science (but are non-scientists) often don't have a good grasp of these issues. So in my opinion, it can only be a good thing to improve how science is reported on the news. To make the changes that I have discussed, perhaps some scientists need to focus more on getting their everyday research into the mainstream media. Who knows, maybe one day politicians could even decide that campaigning for extra funding for science is a vote-winner.

*Sarah Hatch has a BSc (Hons) in Chemistry and has an active interest in science communication.*

# YOU DO WHAT?

## A WOMAN IN ENGINEERING?

*Haley Jones*

The reaction I am usually confronted with when I tell people that I am a lecturer in telecommunications engineering is a mix of surprise and bewilderment. The surprise goes with the word engineering - I don't fit into the box into which they would place a typical engineer. The bewilderment goes with the word telecommunications - it sounds jolly sophisticated and I apparently don't fit that image either. Things usually improve when I elaborate with the terms wireless communications and mobile phones. Everybody knows that there is plenty of room for improvement in mobile phones and goodness only knows somebody has to do it.

When I was an undergraduate, the proportion of women studying engineering was around 10%. Unfortunately, in the eleven years since I completed my undergraduate engineering degree the percentage of women studying the traditional engineering disciplines in Australia has not increased. The reason - image. Engineering does not have the prestige and glamour of medicine or law, for example. Both of these disciplines currently consistently attract greater than 50% women enrolments, having the benefit of many a high-profile prime-time television soap opera (Law and Order is one of my favourites, as was NYPD Blue until Jimmy Smits left...). Engineering, on the other hand, is a rather invisible discipline.

I once read a quote from a 1930s Institution of Engineers, Australia (IEAust) publication which lamented the image of engineering amongst the general public and recognized the need for improvement. Sadly, things have little changed.

When people do know what engineering actually is, they tend to see it as dirty and labour-intensive, in a word, masculine. A wander through nearly any current

Australian engineering department will actually support this view. Engineering culture is masculine. The reasons for this are obvious and understandable. However, engineering, despite its poor profile, underpins every possible aspect of the modern, "convenience" lifestyle. Hark back to the question raised in Monty Python's "Life of Brian", "What have the Romans ever done for us?". Replace "Romans" with "Engineers" and the answers are practically identical.

It is becoming widely recognized that diversity (in anything) is beneficial and integral to future success. With engineering playing such an essential role in our society it is important that women, constituting half of our society and therefore comprising our largest "diversity" group, have a say in what that role is and where it takes us as a society. There are two main issues concerning women in engineering. The first is how to attract them and the second is how to keep them there. These issues are, I think, quite distinct.

### **So, (1) how do we make engineering attractive to women?**

A common suggestion is that the culture must change. The expectation behind this suggestion is that if we change the culture first then the women will come. However, any culture is necessarily a reflection of the people of which it consists. If the "typical person" profile doesn't change, the culture is unlikely to change. The key is to make the image more attractive to bring more women in and the culture will change as a matter of course. Yet a culture will largely not affect you until you are a part of it. So what image appeals to women? It is well known that women tend to be more attracted to careers in which they can feel that they are making a worthwhile contribution to society. I have already emphasized how much engineering contributes to our society. It would take very little effort to capitalize on this aspect. For example, electrical engineering benefits the environment through design of more efficient ways of generating and using electric power (solar energy, more efficient appliances and technologies); telecommunications is about enabling us as a society to



*Dr Haley Jones from the Faculty of Engineering, ANU*

communicate more easily, cheaply and conveniently, leading to greater understanding between different cultures and peoples of the world; mechanical engineering is about building machines and devices to cut our workload and make our lives easier, meaning that we can spend more time with our families and friends, doing the things we enjoy; and biomedical and environmental engineering sell themselves under this premise. Women also tend to prefer a “clean” working environment. This is easy to accommodate in the information age where technology has taken over a lot of the “dirty work” for us.

Further, as far as I can recall the other women with whom I did my undergraduate degree all had parents or siblings who were either engineers or who worked in the industry. (One of the parent engineers was even a mother.) This is a telling example of how important a profile is. That is, if you know someone who has a particular job then the occupation’s profile is raised your mind. As I mentioned before, everyone knows about medicine and law – television has given them high profiles – and so they are often considered as potential careers by people of both sexes. Those careers with lower profiles don’t get the same interest in large part because they are not known about. This concept was confirmed and supported in the ACT SET report on teenager’s career choices, (discussed in the article in J59).

**(2) Now, our second issue: how to *retain* women in engineering.**

This is definitely to do with the culture. And I don’t think the answer is quite so simple. I suspect that we need a few brave souls who are willing and able to cope with the masculine culture, to act as role models to attract more women, gradually changing the culture as a matter of course, as stated above. However, while I dislike the constant implication that children come under “women’s issues” (men are parents too) family friendly policies such as flexible work hours, better access arrangements and recognition of a female presence wouldn’t hurt. To that end, I’m pleased to say that at least the days of strip-club lunches are over (I hope).

Beyond this, I currently don’t have much in the way of answers. Certainly I need female company at times and fortunately have other women lecturers in my Department with whom I can chat about anything from

domesticities to my latest research – and this is very important. Having other women only in service roles in one’s workplace, as essential and important as these roles are, is not quite the same as having other women as peers and mentors in immediate contact.

Having heard all this, you might be asking what attracted ME to engineering? Ironically it was glamour that attracted me, in a round-about way. I wanted to be an astronaut – still an occupation with a very glamorous image. There not being any “degree for being an astronaut” at the time, I had to find out what degree was most likely to get me there. I decided that electrical/electronic engineering was the way to go. It certainly couldn’t hurt to know what to do if any of those flashing lights or warning buzzers went off in the deep dark recesses of space. Furthering my study into the specific field of telecommunications engineering was fuelled by a combination of interests. Firstly, the idea of being able to explain the aspects of our world in a mathematical sense and to use these mathematical models to produce something useful was rather appealing and, secondly, I have always had a fascination with the idea of having all knowledge at our fingertips. The world wide web is well on the way to fulfilling this vision and it would not be possible without telecommunications.

I haven’t quite made it to being an astronaut, and at this stage, don’t intend to. The glamour image has somewhat worn off for me. I am very happy where I am. I love the contact I have with undergraduate students. I have had a wonderful group of people in my classes in my first year of teaching and am convinced that this is where I need and want to be, at least for now. The feeling of successfully helping students to understand the often challenging concepts that telecommunications engineering presents is very satisfying. I am also now in a great position to be able to help with attracting a more diverse group of young women into engineering. I look forward to the challenges and potential rewards that this must bring.

*Dr. Haley Jones is a Lecturer in Telecommunications Engineering in the Department of Engineering, ANU, Canberra.*

# ATATURK'S DAUGHTERS ...AND HIS GRANDDAUGHTERS, TOO,

*Heather  
 Rossiter*

In Istanbul, Heather Rossiter went looking for women scientists

When the corrupt, moribund and defeated Ottoman Empire was overthrown in 1923, Mustafa Kemal Ataturk became the first President of the Republic of Turkey. Among his many reforms none was more significant than his recognition of the rights and abilities of Turkish women. Throw off your headscarves, come out of your seclusion, he told them, and participate on equal terms with men in building a new secular society and a new nation. Edicts decreed that a woman's head should be uncovered in classroom, university and government office. Scholarships were made available for women to undertake further study at European universities. Women became full citizens and much was expected of them. The change in their status and expectations was revolutionary. They did not disappoint; their achievements were incredible.

Three generations on and progress has been neither smooth nor uninterrupted. Determined attempts have been made to reverse women's liberation and to overturn other aspects of Ataturk's contribution to the foundations of modern Turkey. Even now, fundamentalists threaten women's rights and freedoms. The women I met in Istanbul will have none of it.

They take as given the right to a full education and equal participation in a non-discriminatory environment. They are educated, accomplished and confident. The disparity between these sophisticated,

cultured, high-achieving women and those in the backward agricultural areas of Anatolia is striking, yet, potentially, girls from the country areas can access education and the status and possibilities that education brings. Only cultural attitudes hold them back and limit their expectations.

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Born in 1934, Bayhan Çubukçu could be considered a daughter of that first wave of women sent abroad to access a western education and, like them, she studied in Europe. She was a pre-doctoral research fellow in the Department of Pharmacognosy at Paris University 1959-62. In 1962 she returned to the University of Istanbul as an Assistant, until 1976 when she was appointed Professor, Department of Pharmacognosy, Faculty of Pharmacy. Although her absences from Istanbul were many, essentially she remained with that department until her retirement from the position of Director last year.

Her research into the medicinal properties of native plants earned her many fellowships and awards. In 1965 a NATO Fellowship took her to the UK for three months, in 1969 a Scientific and Technical Research Council of Turkey Fellowship sent her back to Paris for 5 months, in 1971 and again in 1972 she was at the Free Berlin University as a Research Fellow. In 1977 a 4-month Fellowship took her to the University of London with a fifth month in Paris. She returned to London in 1988 on a British Council Fellowship. She has chaired many



*Professor Dr Bayhan Çubukçu and Professor Dr Aysel Gursoy with Professor Dr Nur Serter in the Vice-Rector's study*

bodies, such as the Aegean University's Department of Pharmacognosy, and has been an invited speaker at Congresses from Copenhagen to Beijing. She has participated at conferences organised by UNESCO and IFUW and been an adviser to the Ministry of Health in Ankara. She has twice been President of the Turkish Association of University Women and has represented them at international conferences. She has several good friends in the Sydney Australian Federation of University Women.

I spoke to Professor Dr Bayhan Çubukçu in the staff dining room at the Beyazıt campus of the University of Istanbul, formerly the senior officers' mess of the Ottoman Ministry of War. (I was pleased this baby had not been ditched with the bathwater; it is a magnificent room, HR).

HR: What is the biggest problem for women scientists in Turkey?

BÇ: The biggest problem is the same for women and men - financial. The Turkish economy is not strong, inflation is 85%, funding for research is very hard to get.

HR: Would you accept the appellation of 'a daughter of Atatürk'?

BÇ: With pride.

HR: After your father\* died in Bursa when you were 14, your mother brought you to Istanbul. I have been told you and your cohort at High School bonded very closely and that many of the women have had careers of great distinction. What fields did they enter, those young women of the late forties?

BÇ: Everything. Medicine, law, pharmacy, chemical engineering, electrical engineering. And we are still friends.

HR: In establishing a career, were there problems associated with being a woman?

BÇ: There were many changes, many reforms for men and women. Attitudes lingered, they did not change overnight.

HR: Is the political dynamism of the present a problem for Turkish women scientists?

BÇ: There is a threat. We are aware.

HR: What proportion of scientists in Turkey are women?

BÇ: More than 50%.

HR: Is this figure a constant? Has it changed in recent years and is it the same at all levels?

BÇ: It has grown. There is a university crèche now, but there are still barriers, tradition, to senior appointments.

HR: I see this long list of achievements and distinctions in your CV. Which of these makes you most proud?

BÇ: In 1983 I founded the Scientific and Technical Research Centre of Traditional Medicine of Istanbul University. I thought it was important that we find out which of our plants had been used medicinally in the past and how they had been used. We don't want this ancient lore to disappear. Our native plants are very important as potential sources of new drugs. I became the Centre's first Director. I still work there.

HR: Even though you've retired?

BÇ: And I am very busy with the move. I am sorting files, packing.

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Professor Dr Aysel Gursoy, Dean of the Faculty of Pharmacy and Professor of Pharmaceutical Chemistry joined us for lunch. Her field is the synthesis of heterocyclic compounds, her current major problem is organising the move from the Faculty's building into temporary accommodation while the damage done by the 1999 earthquake is repaired. 'This could take years,' she said. 'It is very expensive.'

Professor Gursoy and Dr. Çubukçu had arranged an after-lunch appointment for me with a Vice-Rector of the University. Although the Rector (equivalent to our Vice-Chancellor) is elected, the three Vice-Rectors are appointed by the Rector. The way to Professor Dr Nur Serter's office was strewn with Hellenic sculpture. Like Professors Gursoy and Çubukçu, one of Dr Serter's problems is temporary relocation while structural damage to her suite, caused by the earthquake, is repaired. Her new quarters are sunny and full of pot plants.

Dr Serter is an economist; perhaps for this specialty she was chosen in a time of financial stringency for the university. Her statistics came easily and presented a very positive picture of female representation in all faculties. She saw no barriers to female achieve-



Professor Dr Bayhan Çubukçu and Professor Dr Aysel Gursoy in the garden of Beyazıt campus, Istanbul University

ment. Turkish women have never had it better, in her view. There must be at least 26,000 of them at the several campuses of the University of Istanbul, if her proportions are correct. Who could doubt them? This Vice-Rector is very well regarded by women members of staff. 'She is very quick,' they say. 'Dr Serter analyses the problem and gets things moving at once.'

\* Bayhan's father was a doctor with the Turkish Military Forces at Gallipoli in 1915

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Dr Refika Ersu-Hamutcu lives in Asia and works in Europe. Every morning and every evening, she drives between the two continents, via the Bogaziçi Bridge. It was in a third continent, North America, that this brilliant Turkish daughter made her professional reputation.

I caught Refika in Istanbul on my last night there and on her first day back from presenting a paper at a conference in Texas. On the way home she had dropped in on former colleagues in Los Angeles.

Born in 1968 in western Turkey, Refika attended Izmir High School, where in 1985 she won an American Field Service scholarship to Hampton High School, Pittsburgh, USA. Returning to Turkey in 1986, she enrolled in medical school in Istanbul and on graduation in 1992 took up a Pediatrics Residency at the Marmara University Medical School. In 1997 Refika was in the USA again, on a Rotating Fellowship -



*Dr Refika Ersu-Hamutcu*

Nashville, Tennessee, to study Pediatric Endocrinology, University of Arizona for Pediatric Intensive Care and, later, Pediatric Pulmonology. In 1998, with European Respiratory Society research fund support, Dr Ersu-Hamutcu accepted a Research Fellowship in London and very soon afterwards was awarded a Research Fellowship in Pediatric Pulmonology at the Children's Hospital, Los Angeles, USA. Her three years in Los Angeles were most productive. Paper after paper appeared; she was an invited

speaker at four significant conferences; 12 Poster Presentations at conferences were subsequently published in prestigious journals; she won 4 Research Awards.

It must have been difficult to resist the pressure to stay in the USA, but, to Turkey's gain, her decision was to return to Istanbul. Now an Assistant Professor at Marmara University, she will become an Associate Professor within the year.

Research is now more difficult. Funding in Turkey is almost non-existent, the program depends on unfunded work by herself and her students. Bench research has become clinical research, equipment is a problem, but there are positive elements. She is hopeful of getting a children's sleep laboratory this year and the low level of technical support encourages more patient cooperation. Obviously Refika will not be stopped, not even slowed by these difficulties.

Her reply to my perennial enquiry: To what extent has your career been helped or hindered by being a woman? was interesting. She turned the question on its head.

The actual problem for her had been not gender, but foreigners' perception of Turks and Muslims. Their attitude was sceptical, even condescending. They doubted the calibre of her education, questioned her abilities. Being quietly self-confident, she adopted a patient approach and saw their attitudes change. Perhaps being a woman had helped, she said, as it gave her a personality that could be patient rather than aggressive. Refika must indeed have been an education for many ignorant, perhaps bigoted, people.

I wondered if the predominance of women in medicine and pharmacy in Turkey has caused a downgrade in status in those professions, as it has in, say, Russia.

'Not at all,' was her reply, 'They are still highly regarded.' In her pre-graduation year, which she had to spend in a country town, as all Turkish medical undergraduates do, she was often moved by the gratitude and respect of the population.

Statues of Ataturk stand in every town, city and village in Turkey. His legacy is often debated, but there is no doubt that what he did for Turkish women is only matched by what they do for Turkey.

# THE SOCIOBIOLOGY OF MEETINGS

*Sally  
Stowe*

In the course of more than a decade spent developing an open access microscopy facility, I have encountered a number of forms of group decision making and would like to share my confusion.

My curiosity became piqued years ago when I needed a particular decision from a committee, and worked very hard to get it by what I thought were the rules as we all know them...have an unanswerable case, do the homework, prepare the ground in one-to-one discussions with individuals so there are no surprises and you know you have the numbers, take account of any opposition and alliances— I had it all covered, this one was going to be a shoo-in, this was fun, I thought I was Graham Richardson. (For readers under thirty, Richardson was a somewhat colourful ALP numbers man).

Well, it blew up in my face more comprehensively than anything before or since. When a conflict arose everyone got very agitated and my unanswerable case was dust. Sure, I got the result a few months later — but only by breaking just about every rule in the book, which is not something to do too often. It left me realising that I did not understand the behaviour of the group, the book was unreliable, I was not Graham Richardson and I should definitely never try to do that again.

But I've always wondered why I got it so wrong.

These days any city bookshop has shelves of trendy recipes for success in the corporate world. My less than exhaustive research has not uncovered a treatment based on evolutionary psychology - but it's a promising line. Whether we are pushing ourselves or pushing an idea, we manoeuvre within large institutions using psychological tools developed in small groups engaged in gathering, hunting, co-existing, merging or fighting with other tribes. The results are far from ideal - while the world is making some progress towards cooperative behaviour, it often seems as if our forebrains are having to fight the rest of us at every step.

So — in a spirit of idle curiosity - can an evolutionary approach shed some light on the behaviour of the committees that are the preferred sub-unit of university administrative structures?

For the sake of argument, let's make the assumption that the behaviour of men in interdependent but not necessarily close familial groups, such as hunting parties and warbands, was for much of human history under pretty heavy selection pressure for teamwork, differentiation of roles and a clear behavioural difference between leaders and followers. Let's make the further assumption — why not? - that over the same period many of women's group activities were focused on gathering, weaving, and suchlike activities where the group provided company and safety, and an opportunity for transfer of knowledge, but there was less emphasis on concerted, cooperative effort or hierarchy.

Most decision-making in universities is still controlled by men, even if women are beginning to approach a critical mass. If committees mimic a grouping men tend to find comfortable, this helps to answer the most obvious question -why committees are so ubiquitous, when nobody admits to liking them. Certainly they are a superb mechanism for diffusing responsibility. If there is no real conflict of interest, and hence no difficult decisions to be taken, a committee can serve a worthwhile bonding role as a communication and consensus mechanism, and at any rate is likely to do no harm. But while it is almost always true that several informed people concentrating on a problem can make a better, quicker job of it than one person, the committee is rarely the best means to perform a task. If the desired outcome is an action, then a team or task-force with a defined job, resources and time frame is the way to go. If the desired outcome is a report assessing a situation, then one person taking responsibility, seeking advice from others and producing a synthesis is much better — and is usually used when a higher authority is serious about getting an answer. Notice how an influential report or commission will be referred to by the name of the Chair, even if it is formally produced by a panel.

So what actually happens in a committee, framed in terms of group dynamics? It's worth examining the possibility that the accepted wisdom of the way to go about getting decisions made by a group doesn't necessarily work well for women, because it may depend on interactions that are intrinsically male-to-male.

One of the most obvious factors in a male-dominated group is that a pecking order is quickly established, usually mirroring status outside the committee. The business of the meeting proceeds in parallel with constant subtle affirmations, courtly or irritable, of relative status. University committees are almost always structured so that this is straightforward – the Chair will be of higher status outside the context of the committee. Otherwise things can get very complicated.

Solidarity can of course be very important, particularly if there is any sense of crisis. If a group feels threatened, they will tend to become defensive and make safe rather than innovative decisions. This makes sense in many ways – in an immediate crisis, indecision is the worst option, so taking a decision

that nobody violently opposes may be the only way to proceed. However, it may be that heated argument over an issue is itself seen as a threat to the cohesiveness of the group. Unless the Chair is skilled enough to keep things cool, a feedback situation preventing almost any action can develop whenever an argument becomes emotive. This can include not only innovative issues, but also actions that disadvantage any member of the group. In a really dysfunctional committee, it can include actions that would advantage any member of the group.

The take home message – I think – is to keep the anxiety level down so that the forebrain has a chance. So if you want to engineer a “bold” decision, you may do better from a state of close to absolute boredom than by trying to fire up enthusiasm!

*Dr. Sally Stowe is Head of the Electron Microscopy Unit at the Research School of Biological Sciences, ANU, Canberra.*

## ‘THE AIR THAT WE BREATHE’

*Hilary  
Cadman*

FASTS produces Occasional Papers to bring significant issues to the attention of the community, government and bureaucracy. I attended the launch of the fifth in the series of Occasional Papers called “Indoor Air Quality in Australia: a strategy for action”.

Most of us equate air pollution with outdoor pollutants like exhaust fumes and wood smoke, but equally unhealthy toxins are found in our homes, offices, schools and hospitals. Given that Australians spend about 90% of their time indoors, this is a major problem.

Len Ferrari, President of the Clean Air Society of Australia and New Zealand (CASANZ), pointed out that although outdoor air quality is governed by national enforceable standards, Australia doesn't have comparable standards for indoor air. He highlighted the fact that every home has a

mix of possible sources of pollution such as new furnishings, pets, a gas stove or flueless gas heater, particle floor boards or someone who smokes. The problem is being made worse by the push for energy efficiency in house design, because sealing buildings to conserve heat reduces ventilation, trapping pollutants inside. Environment Minister, Dr David Kemp, had reservations about setting standards for indoor air, but talked about government funding for various research projects on indoor air pollutants. We all took home a ‘personal air monitor’ from CSIRO, to find out how much formaldehyde and nitrogen oxide we are exposed to in a week – I'm waiting with some trepidation for the result!

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.biotext.com.au

# MANAGING SCIENCE IN A EUROPEAN SETTING AFTER AN AUSTRALIAN PHD

*Carolann  
Wolfgang*

I have worked in The Netherlands for a year now, moving from Australia after completing my PhD at the ANU, Canberra. I moved here because I wanted a new challenge after the PhD, plus I met my (now) husband who is Dutch. I currently work at \*TNO as an international project manager. TNO does a variety of research; I specialize in implementing environmental programs for the European Union. My main project is entitled WELCOME, which is developing an integrated management system to apply at complex hazardous waste sites in western and eastern Europe. The department I work in does a lot of bioremediation projects and wastewater management around the European Union.

The context difficulty is the languages, work is in Dutch, German, English and I work with partners in Belgium, Poland and other countries. This has taken a lot of energy to move from a single, native language to listening to and interpreting so many languages in one meeting, for example. So the intellectual challenge for me continues in this way. I'm still learning Dutch and taking periodic classes. I can now empathise with so many people who come to America and Australia to work but

had to reach such a high standard of English before they could adequately practice their science.

What have I found as a female scientist here in Europe? I wish I could say it is all superbly professional and we can all now relax. Instead I have had some very opposing experiences – there are so many conflicting signals coming in at once that it is clear there is much work to be done – still!

On the one hand, most of the people I deal with are men, and I am treated very much

like a woman in traditional terms. For example, when I deal with my Polish colleagues I am introduced as Dr. Wolfgang and my hand gets kissed by a bowed head, my drinks get bought, and chairs pulled out for me. In Italy, well, I just get kissed no matter how I'm introduced. All so different from the way we are treated in America and Australia. This is good in that it focuses on the longer term relationships but on the other hand is very informal and things move more slowly. A difference is that I miss the cues, the way to tell that I am accomplishing a positive, forward moving relationship. In America they can hide the true feelings, but soon it comes out whether or not they like you, and pretty much will do business with you no matter what in the end. In Australia I felt an immediate, initial acceptance and then a kind of "we'll go from there" attitude. But here I can go for months asking and probing people again and again, discussing things, and either get silence or agreement, but then all of a sudden a burst of total disagreement after moving in a particular direction for months. This is what I have to get used to.

Also there is a strong expectation of respect for Professors in Germany for example. If I tried to treat my professor in Australia like he was a god he would get seriously annoyed and tell me "that's a bit how ya goin', mate". Whereas here sometimes a Professor will not even deal directly with me, let alone look at me in a meeting situation, I am too below him in this way. This is not my style, so it is also unnerving to my ego.

I do not have any trouble being taken seriously at TNO, despite there being few women, particularly in management. Further, I find the PhD title well worth it and gain a lot of respect with that. My husband and I live just over the border in Germany now, because of the housing shortage in The Netherlands. Here he gets my title by default and becomes Mr. Dr. van Calker - without having to go through all the trouble of obtaining a PhD! I would like to point out that this custom is very non-discriminatory and I would be Mrs. Dr. van Calker if he had the PhD.

As you can imagine, there are lots of new experiences and responses to deal with!



*Dr Carolann Wolfgang in full ceremonial dress after receiving her doctorate at ANU*

Initially, these experiences made me want to investigate and write an article on statistics from the European Union on women and research. Instead, I would like to share my reactions to a recent cover feature I saw in a Dutch career-focused newspaper, called *Intermediair*. The article was entitled (in Dutch) “Bitches breken door” (bitches break through) and was accompanied by a large photo of smiling Jolanda Tjihuis, 40 years, director of Delta Lloyd Schade, a company in the Netherlands. While ‘bitches’ seems to be an acceptable phrase for ambitious women here in The Netherlands, I must admit I still don’t know how to feel about this typical straightforward Dutch title or the section that followed listing “example bitches”. As an international person here, the feelings it engendered caused me much concern – quite justified as I read on.

The cover page continued (more or less loosely translated), “how goes the glass ceiling?” and answers “Usually 70 hour work weeks and not complaining”. The article claimed that “top women are just men” and listed several success factors for a ‘top woman’. These aren’t so surprising. They include: ambition, networking, getting on well with the management, intelligence, and a partner who helps with the house tasks. I was glad the latter had been included. I thought this meant that we don’t have to be superwomen any more. But I changed my mind again when I read the tips for career women. Yeah, you do have to be a superwoman. You have to not be afraid to compete, not to doubt yourself, work to bring yourself closer to a higher position by interesting side routes, plus spread the word about your own capacity; make your career wishes known and don’t listen to friends that call you a workaholic. I found the comment concerning networking quite disturbing. The article says that top male managers do not want to be associated with female networks, because they don’t like the image of women who have problems in a male culture.

As a ‘career woman’ in her mid 30’s I have to ask, what happened to all of those books and advice that came out in the 90’s that suggested “the female advantage” and promoted the feminine traits of management? Now it seems we’re trying to be, as the subtitle stated, just men again. This was also reflected in a comment made by a company-president friend from San Francisco who attended a prestigious

executive MBA program recently. He said about his MBA-mate; “she’s great, she’s really made it, Vice President of such and such, she makes a 6-figure salary, she plays golf with the clients because she knows what it takes”.

I’m not complaining, but, well, I don’t like golf. Will I ever then be a company-woman with a 6-figure salary?

Some data on working women in The Netherlands was included in the article : (The Netherlands, Ireland, and Denmark are the lowest in Europe in this last area)

Women in the workforce	1999	54%
Women in the workforce with children	1999	45%
Women in higher functions at work	2001	18%
Women on boards of directors	2001	4%
Women as university professors	2001	6%

As you can see, the number of women on boards of directors and as university professors is quite small. I believe the number is about the same, just over 50%, for working women in 2002. Many women I know here are either part time workers or not working. I’m not sure how these numbers compare with those in Australia but it would be interesting to see an analysis of trends.

In conclusion I wanted to share these data and some points from this article with you in the hope that it brings interesting discussion points from a European perspective around the tables. To be honest, to have to deal with all this after trying to combine science and management fields in America and Australia for over 15 years, I get a bit confused. Despite this, I will never change from a commercial industry management track with a science focus because I love it. And I am very determined and ambitious as the article says I should be. But I will just never play golf!

*Dr. Carolann Wolfgang*  
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*International Project Manager*  
*Environmental Biotechnology*

*\*TNO Environment, Energy and Process Innovation*  
(The Netherlands Organisation for Applied Scientific Research)

# SO, YOU WANT TO BE INVOLVED IN THE BOARDROOM?

*Anna Robinson*

On Monday, 23rd September 2002, in Canberra, the YWCA and ACT Office for Women held a joint symposium called "Women as Decision Makers". The organisers had over 100 registrants and had to turn away an equivalent number of enquirers. Five speakers told us about their experiences of being on a Board and how they went about being appointed. They addressed five significant areas.

## 1. How to get on a Board?

Do the Australian Company of Directors Course (see website address below) people are looking for qualifications – obtain them. Different courses are available but they all cost several thousands of dollars – be prepared

- ❖ get some experience – try to get onto some not-for-profit Boards as volunteers or observers – learn to talk the talk
- ❖ network, network and network – make yourself known and that you are interested ❖ in being on a Board
- ❖ investigate and research
- ❖ develop a value statement – work out what value you could bring to a Board and tell it; incorporate this into your Career Plan and apply the same attitude and mechanisms to achieve your goals
- ❖ register with as many organisations as possible (Office of Status of Women; State Women's Organisations). Contact the 'head-hunters' – ask the companies you are interested in as to who they use

## 2. The benefits of being on a Board

- ❖ Ability to influence decisions and direct
- ❖ obtaining skills not otherwise readily available (management, negotiating, finance, governance; corporate knowledge; policy development; public speaking; strategic aims)
- ❖ sometimes payment (fees can be anywhere from \$4000 – \$25,000 and over)

## 3. What you can expect from a Board

- ❖ generally, lively discussion, exchange of ideas, debate; conflicting agendas; challenges, responsible decision making
- ❖ hard work and giving a lot of time = equivalent of a second job (involves reading reports, minutes, financial statements; doing

your homework on issues that you are being expected to bring to the meeting)

- ❖ male domination (ALL SPEAKERS MENTIONED THIS AS SOMETHING THAT MUST BE DEALT WITH)
- ❖ confidentiality – give and take
- ❖ ethics

## 4 Experiences on Government/non-government boards and committees

- ❖ Good and bad. for example, patronising behaviour; Suggestions and advice not given recognition until taken and presented by another Board Member; straight out abuse in trying to change attitudes to women (eg in the legal area).
- ❖ almost all are Boards are male dominated and participants experienced the need to adjust to the specific type of culture that goes with the Board (eg law enforcement, navy, law reform, community work; sporting events and marketing) from a traditional point of view

## 5. Strategies to overcome challenges in being on male-dominated Boards

- ❖ be strong and reasonable
- ❖ don't resort to aggression, defensive or reduced behaviour.
- ❖ state the obvious in a measured, sensible way; be firm and concentrate on your own strengths
- ❖ ensure you are heard
- ❖ learn financials and information technology – the skills are in great demand and most people don't have them
- ❖ know your own values – don't forget them

## 6. *Be careful!*

- ❖ Check insurance cover provisions
- ❖ Check what your legal responsibilities involve
- ❖ Check the fine print of the contract
- ❖ Check the best and worst scenarios for yourself

Do you still want to be on a Board? Excellent! Go forth and be brilliant....

WebSites
<a href="http://www.companydirectors.com.au">www.companydirectors.com.au</a>
<a href="http://www.osw.dpmc.gov.au/index.html">www.osw.dpmc.gov.au/index.html</a> (Federal)
<a href="http://www.act.gov.au/government/department/cmd/omca/WPU.htm">www.act.gov.au/government/department/cmd/omca/WPU.htm</a> (ACT)
<a href="http://www.wa.gov.au/wpdo/current_site/index.html">www.wa.gov.au/wpdo/current_site/index.html</a> (WA)
<a href="http://www.premiers.nsw.gov.au">www.premiers.nsw.gov.au</a> (NSW)
<a href="http://www.women.vic.gov.au">www.women.vic.gov.au</a> (VIC)
<a href="http://www.qldwoman.qld.gov.au/publications/infosheets/infosheet19.html">www.qldwoman.qld.gov.au/publications/infosheets/infosheet19.html</a> (QLD)

# WOMEN ACHIEVING IN SCIENCE

*compiled  
by Diana  
Temple*

**Professor Patricia Vickers-Rich** is Director of the Monash Science Centre which was recently launched in Melbourne with much acclaim. She is Professor of Palaeontology at Monash University and has many awards, including two Eureka prizes.

**Dr Philippa Uwins**, a geologist at the University of Queensland, has been studying amazing very-microorganisms she calls Nanobes. She discovered these filamentous structures in geologically ancient sandstone obtained from several kilometres beneath the Australian seabed. These structures are controversial because, being between 50 and 150 nm in size, they are smaller than the calculated minimum size (200 nm) required to house the enzymatic and genetic material of life. However, Philippa Uwins has published, with colleagues Richard Webb and Anthony Taylor, evidence that nanobe colonies, containing the elements Carbon, Oxygen and Nitrogen grow spontaneously and give positive results when tested for the presence of DNA. This continuing research may open new doors to the nature and origin of life. Paul Davies speculates that nanobes could be “a missing link on the road to life”, or “relic organisms from another genesis”. Heady stuff!

*Source: Today's Life Science Nov/Dec 2001.*

**Dr Catherine Stampfl** has been awarded a prestigious Federation Fellowship to focus on surface science modelling at the School of Physics, University of Sydney. Federation Fellowships are the richest publicly-funded research fellowships ever offered in Australia, planned to reverse the brain drain. Catherine Stampfl, an Australian, has an international reputation in theoretical physics and surface science. Applications of her work include catalytic converters in car exhausts. She has worked at the Fritz Haber Institute in Berlin, and returns to Australia from a position at Northwestern University, USA.

*Source: UniNews, (University of Sydney) 2 Aug 2002.*

**Dr Manjula Sharma** is a lecturer in physical optics at the University of Sydney. Commenting on publication of a survey,

“Women Physicists speak: the 2001 International Study of Women in Physics”, she pointed out that although the survey showed a low proportion of women, less than 8%, in research and academic positions in physics worldwide, 3 of 22 tenured positions in physics are held by women (14 %) at Sydney University. Dr Sharma says that women physicists from other countries attending the Conference were surprised to hear about Australia's initiatives in affirmative action, anti-discrimination and anti-harassment. It appears from statistics that this physics school is impressively ahead in its encouragement of women in physics.

*Source: UniNews (University of Sydney), Aug 2 2002.*

**Dr Kristen Nowak** was last year's Young West Australian of the Year in science and technology. She has won a 4-year CJ Martin Fellowship, through the National Health and Medical Research Council, to work at Oxford University with international expert, Professor Kay Davies on inherited muscle disease such as muscular dystrophy and genetic forms of therapy. Working in the same area is Professor Miranda Grounds, of the University of Western Australia, who has won new grants worth more than \$1m for her pioneering work in muscle regeneration. She used stem cells, long before they became so well known, in her cell-based gene therapy strategy. She is collaborating with Associate Professor Nadia Rosenthal of Massachusetts General Hospital, Boston.

*Source: Uniview (University of WA) June 2002.*

**Vanessa Chewings** works at CSIRO's Centre for Arid Zone Research in Alice Springs. With colleague Gary Bastin, she has been using satellite data to identify land damage by grazing. This helps government and the pastoralists who lease fragile arid-zone land in which vegetation is particularly at risk near watering points for grazing stock. They use information from the dish which is part of the Australian Centre for Remote Sensing, next door to the CSIRO Centre, to map specific areas at risk of damage.

*Source: Sydney Morning Herald, Aug 7 2002.*

# 2002 SCIENCE PRIZES

*Compiled  
by Diana  
Temple*

The glittering dinner for the annual award of the Science Prizes held on 20 August, 2002 in the Great Hall of Parliament House was attended by a number of WISENET representatives: Anna Robinson (National Convenor), Rosemary Sutton (immediate past National Convenor), Sarah Miller (Treasurer), Julie Evans (Journal Editor) and members, Haley Jones, Janet Salisbury, Miriam Baltuck and Juliann Crossley.

Women scientists featured prominently as prizewinners.

The main award, the Prime Minister's Prize for Science (\$300,000) went to elder statesman of science, **Professor Frank Fenner**, Life Scientist of the Year, famed chiefly for his contributions to the eradication of smallpox from the world in 1980, and for the introduction of myxomatosis to control Australia's rabbit plague.

The McIntosh Prize (\$35,000), in honour of the late Dr Malcolm McIntosh (former Head of CSIRO), is awarded to researchers in physical science aged 35 years or under. This award was won by **Professor Marcela Bilek** of Sydney University. The Science Minister's prize, Life Scientist of the Year, awarded to a researcher 35 years of age or less, was won by **Dr Joel Mackay** of Sydney University. He works on the control of genes, with the potential for controlling cancer. Given the secrecy surrounding the awards, the two younger researchers could not have known beforehand that they share much in common, apart from working in the same university. They are both keen to dispel the myth that science is a lonely career spent locked away in a laboratory. It's a team endeavour, with lots of travel, they say. Their scientific curiosity has taken them both around the world. Born a week apart, Bilek in Prague, Czechoslovakia and Mackay in Auckland, New Zealand, they both credit some of their initial enthusiasm for research to dedicated high school teachers.

Two prizes for Excellence in Science Teaching were introduced in 2002, to emphasise the importance of science education. The Prime Minister's Award for Excellence in Science Teaching in Primary Schools (\$35,000) was won by Mrs Marianne Nicholas from Walkerville Primary School, Adelaide. Marianne Nicholas has taught science in

primary schools for 10 years. She captures children's interest by explaining the science in everyday life.

The Prime Minister's Prize for Excellence in Science Teaching in Secondary Schools (also \$35,000) was won by **Mrs Ruth Dircks** from Dungog High School, NSW. Ruth, a former member of WISENET, is the author of the Dircks Report on science teaching, commissioned by the Australian Academy of Science in the 1990s. She first did consulting work then returned to science teaching after having retired to a farm near Dungog, because of her love of teaching. She is critical of science teaching in Australia because of the lack of resources. Her acceptance speech, described by the Sun-Herald newspaper as "the speech of the night", is reproduced below, slightly edited.

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The Sydney Morning Herald has given permission to reprint an edited version of an article about Marcella Bilek by science journalist Deborah Smith (published in SMH, 21 August 2002). We were delighted when Ruth Dircks kindly agreed to Sarah's request to have her response printed in this WISENET Journal. Both articles make for thoughtful and inspiring reading – our thanks.

**Professor Marcela Bilek, winner of the McIntosh Prize, Physical Scientist of the Year.**

Abalone shells are one of nature's wonders. They are made from two very weak substances - a soft, squishy protein, and a very brittle mineral. Yet they are extraordinarily strong. The trick used by the abalone to build its almost unbreakable home, is to stack extremely thin layers of each substance in an alternating pattern. It's a strategy Marcela Bilek is keen to emulate.

Bilek, 34, the first woman to have been appointed a professor of physics at the University of Sydney, is an expert in designing super tough new materials. To match the mollusc, she uses the latest nanotechnology techniques and equipment to deposit different substances, one atomic layer at a time, creating unique coatings and surfaces. Industry is seeking her help to solve manufacturing prob-



*Professor Frank Fenner*



*Professor Marcela Bilek*

lens. "The potential uses for super-tough metals, glasses and plastics are limited only by our imagination and budget" says Bilek, who has an eye for the business side of science. "This is not a case of having scientific knowledge that is looking for an application."



*Dr Joel Mackay*

Bilek immigrated to Sydney at age four with her parents, who were political refugees from the 1968 Russian invasion of Czechoslovakia. At Heathcote High, in the city's south, she not only had very good maths and science teachers, but also an economics teacher who encouraged her to stretch herself intellectually and "think outside the box". They both enjoy the challenge of endurance sports. "Problems seems less of a problem when you're fit," say Bilek, a long distance cyclist who has toured Eastern Europe by bike, and likes the coastal ride to Wollongong.

Bilek began her PhD at Cambridge, via a circuitous route. Travelling has always been a passion, which is why she quickly ruled out medicine or law professions with qualifications that are not always recognised by other states or countries. The first chance for an overseas trip came during her undergraduate degree, when she topped her year in computer science. IBM offered her 12 month's work in Japan. "I jumped at that. It was a wonderful opportunity to learn Japanese and I learnt so much about the culture and business." After graduating she spent two years working in industry, at the Comalco Research Centre in Melbourne. But Cambridge beckoned. Like Mackay, Bilek won a scholarship to attend the world famous university. "It was one of the best decisions I ever made," she says. "The real attraction is the richness of cultures. There are so many international students and scholars, and there was always an expert in everything you might have a question on." Bilek liked it so much she stayed on at Cambridge in a research position that allowed her to travel and work in Germany and the US, as well. She also completed an MBA part time "to understand how business people think." With universities being pushed to find funding outside the traditional granting bodies, Bilek could see business nous would become increasingly important. Contacts between academics and those in industry were often problematic, she realised, because "they were not talking the same language". She contemplated going into business after the MBA but was lured back to Sydney two years ago by the physics professorship and the warm weather. Bilek, who drives her father's old car, will probably spend some of it (her \$35,000 prize-money) on a new one.



*Marianne Nicholas*

The super tough materials Bilek's team is developing have many applications, including to coat high performance machine tools, reducing the need for environmentally damaging lubricants. In the biomedical industry, implants, such as artificial hearts, require coatings to ensure they survive as long as the patient. Thin film laminates are also being developed for solar power applications. "Industry is coming to us and asking us to develop materials for them," says Bilek, who has filed for three patents so far in her two years back home. She is using sophisticated computer techniques to predict the structure and properties of new materials and alloys before attempting to fabricate them. To lay down the surfaces she starts with material in an ionised gaseous form, or plasma. Then she uses electrical pulses or magnetic fields to deposit them. "We need to control what happens at the growth surface. We can change the way the atoms bond by throwing them down with a lot of energy or putting them down gently." Abalone shells consist of 90 per cent aragonite, or calcium carbonate, a mineral that is easily snapped. Bilek believes the key to the strength of the shells, could be the way the layer system arrests the growth of any cracks. She admits she spends much of her time, even when cycling, thinking about her latest scientific puzzle, in search of inspiration.

The persistent image of a physicist is "some old guy in a lab coat playing with machinery with no-one else in sight," she says. The reality is much more exciting. "It's an international discipline. It's about team work. There's never a dull moment. And there's a lots of travel."

**Response by Marianne Nicholas, winner of the Prime Minister's Prize for Excellence in Science Teaching in Primary schools:** I am very proud, very humbled and very overwhelmed to be one of the recipients of this inaugural and most significant award. An award for science teaching that to my knowledge is without precedence.

Teachers are not dissimilar from politicians and scientists. We too can influence many lives, and potentially mould the future of our society and our country through our work. As science teachers, we can inspire the scientists of the future. Perhaps some of you here tonight may remember being drawn to science because of the skill and passion of one of your teachers. I remember my own high school science teacher who made the subject come alive for me, with lasting effects.

When I began my job as a specialist science teacher in a Junior Primary School in 1989, none of my three sons had yet begun school. For the next 10 years I brought home baby ducks and chickens, lizards and butterflies, electrical, circuits, crystals, mirrors, magnets, marble mazes, rock collections and water rockets and tried my science lessons out on my children.

Interestingly all of them now aspire to careers in science. But none of them are attracted to teaching.

I am very aware that it is only because of my very supportive family and in particular my husband, Steve, that I have been able to pursue my passion for science teaching in the way I have.

However, this award is not so much personal, but a validation of the vital importance of educators and education in our society. Of particular note is that this unprecedented award acknowledges the importance of the teaching of science in Primary and Junior Primary Schools.

Certainly this is a time in a child's life where attitudes towards learning are shaped. And the teaching of science in the early years is so much more important than that, as science investigations develop a child's ability to think, to question, to reason and to seek solutions.

Investigative science activities can help those students who are struggling with literacy and numeracy to be successful, and it can extend those students who are academically gifted to achieve much greater heights.

Thank you for this recognition of the importance of education and in particular, science education, to the community.

While I am overwhelmed at being a recipient, I am even more proud of belonging to a nation that would honour teaching and teachers with such a prestigious accolade.

**Response by Ruth Dircks, winner of the Prime Minister's Prize for Excellence in Science Teaching in Secondary schools:** I don't regard this as my prize. I am just representing all those science teachers out there, who are doing an excellent job, in a variety of challenging circumstances. There are those in selective schools whose eager students, between them, want to know about the forefront of science across all the disciplines so that these teachers are struggling to keep up with the whole range of



Ruth Dircks

advances in science. There are those teachers in places like the western suburbs of Sydney and Melbourne whose students, especially the Year 9 boys, regard the claim that they are bored to be a badge of honour. And there are those teachers in country schools who feel isolated and travel large distances to interact with their peers and who, unlike me, have not had the good luck to be drawn into wider projects.

But in spite of the efforts of a lot of good teachers, and largely because of the excessive demands of the job, secondary science in Australia is not in a good condition. I hope that those of you who acknowledge this don't join in the popular cry that teachers are a hopeless lot. But rather, I hope you will say, at every opportunity, that teachers need help. Some support is being provided but it is patchy and inadequate and often doesn't get to the most needy. And I am pessimistic about it being otherwise, while ever we have eight different ways of designing and implementing the science curriculum.

The Australian Academy of Science has made several attempts to produce excellent teaching materials but, because they have tried to meet the needs of all States and Territories, these resources have finished up being satisfactory to none. Because our small population is divided into eight parts we are missing out on economies of scale but worse still we are, by and large, failing to share good ideas across State and Territory borders.

If secondary science is to improve, we need commitment from politicians and from academics and from the Australian Science Teachers Association. I hope very much that any awareness-raising that results from this award will lead to a more common sense approach to science education so that we can do the right thing for Australian kids, because that, after all, is what it is all about.

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*Photographs used with the permission of the Department of Education, Science and Training ([www.dest.gov.au/scienceprize/](http://www.dest.gov.au/scienceprize/))*

# THE KNOWLEDGE ECONOMY AND YOU



*Mairéad  
Browne*

Sometimes I despair that I'll ever get my head around the terms 'Knowledge Economy', 'Knowledge Society', 'Information Revolution' which are part of everyday discourse but are nonetheless ambiguous and elusive concepts. For all their familiarity they can be intimidating for those of us who feel they would like to be part of 'it' but don't know where to start. It all seems so abstract in its talk of innovation, productivity, globalisation, R&D, science, creativity, ICT, global knowledge networks..... So to bring it down to something more concrete I am going to venture some ideas of how us mere mortals can understand and respond to the changes which underlie the Knowledge Economy.

To begin with, it's important that we come to terms with the basic characteristics of this new economy since it's said that 80% of us will be working in knowledge-based activities by 2020 with the vast majority at the upper end of the skill spectrum. In this context, perhaps the most important fact to comprehend is that nowadays economic activity (activities to do with production and consumption of goods and services) is based very much less on the production of tangibles such as coal and wool than was the case in the past. What's more important now is the production and use of knowledge which comes from the intellectual effort of human beings. Tangibles resources do continue to be important – we will always need resources of this kind although the ways we produce and exploit these is changing dramatically. We need to focus on finding smarter ways to dig things from the ground and get them to the best markets.

But the much more valuable type of economic activity in the knowledge economy is based purely on intangibles. These are described as 'knowledge based' activities and include areas such as education services, financial markets, research and development programmes, cultural activities and so on. Essentially there is a new kind of capitalism - 'Knowledge Capitalism' – which is based on the accumulation of knowledge as opposed to

monetary or physical manifestations of capitalistic activity. In knowledge economies the suppliers of knowledge become more important than, for example, the suppliers of risk capital.

Information and communication technologies (ICT) are essential tools for knowledge economy workers but the mere existence of ICT is no guarantee that knowledge will be developed, or that an economy can be characterized as a knowledge economy. It's the old story – it's not the machines but the use by humans of the machines that is the essential ingredient notwithstanding the fact that the existence of an ICT industry itself is an indicator of an economy focused on knowledge development . It's remarkable how often that fact is lost in the hype about technology, despite the insights gained over the past twenty years into the sheer uselessness of technology which is designed and implemented without adequate understanding or how people work or what will actually assist them in their cognitive efforts.

But to cut to the chase, what does it all mean for our daily lives and work?

People and their intellectual capacity are the fundamental ingredient of a knowledge economy. So the more we can develop that capacity the better off we are as individuals and as a society. This means hard yards of education and training for all of us and it has to be on-going, no resting on the laurels of a bachelor's degree.

People are again being recognized as important assets (hooray!) . The era of downsizing and cutting have given way to a keen understanding that when people leave an organization, voluntarily or otherwise, they walk out the door with much of a company's assets in their heads. This so-called 'implicit knowledge' and the know-how that makes things happen in the organization is a huge loss when it goes away with an individual

Boundaries are blurring. In organizations there is less emphasis on internal structures and more on seeing work as part of organization-wide processes which require knowledge sharing and collaboration.

Departmental loyalties and interests are challenged by the need to look at the big picture of what an organization is aiming to achieve.

Knowledge development happens everywhere and incorporates the practical and applied knowledge that emerges in the workplace. The idea that new knowledge is developed only in universities is long gone. There is now an understanding that there are many different kinds of knowledge including knowledge that develops out of the action occurring in work settings. However, capturing, managing and transferring that knowledge, especially implicit or tacit knowledge, within an organisation is a huge challenge.

Given these fundamentals, how can mere mortals respond to the emergence of this new kind of economy? I conclude by suggesting that those who want to be effective in the knowledge economy need to be able to demonstrate several attributes. Firstly, they need to show they are continuing to learn and adapt to new ways. That might be shown by acquiring formal qualifications but it could also be demonstrated by continuing education, completion of web-based learning or simply by compiling evidence of the fruits of independent reading and thoughtful analysis. Generic intellectual skills such as analysis, evaluation, interpretation are crucial for the knowledge economy.

The second attribute is understanding of the value of 'know-how' and being able to show results of actions taken to apply substantive knowledge gained, for example, in formal course. This could be via reports of work or community projects completed, completion of a research degree which combines theory and application. The basic idea is to show a capacity to make things happen as a result of the acquisition of knowledge. Knowing is not enough; being able to do is crucial.

The third way to become an effective operator in the knowledge economy is to be a good collaborator and team player. Compartmentalisation does not work in a knowledge economy. Multidisciplinary

approaches are needed to solve complex problems so this means working with expertise from outside one's comfort zone. Organisations cannot afford to lock away specialists in cosy corners; they need people who can move with confidence across the organization to share knowledge and know-how to tackle difficult problems. Success in this situation depends on people with teamwork, negotiation and other transferable people skills.

Finally, a way to operate in the knowledge economy is to make a career in the new field of knowledge management. This differs from information management in the extent of emphasis and techniques for facilitating exchange of knowledge, experience, values and insights which are of their nature undocumented. The main idea is to enrich the store of tangible representations of knowledge that occurs in published or at least publicly accessible resources. Many courses are now available to prepare for a spectrum of knowledge manager positions.

In conclusion, the knowledge economy is a complicated story. For those of you interested in reading about the Knowledge Economy there is a plethora of sources in libraries and on the web. Alan Burton-Jones' *Knowledge Capitalism: Business, Work and Learning in the New Economy* (Oxford, 1999) is a great read despite the scary title.

*Professor Mairéad Browne undertook her undergraduate studies at University College, Dublin, Dip Psych.; obtained her M. Lib at the University of New South Wales, and her PhD at Macquarie University. Mairéad is an Emeritus Professor of University of Technology, Sydney and held the positions of Dean of the Faculty of Humanities and Social Sciences and Dean of the University Graduate School at UTS. She was a member of the Knowledge Nation Taskforce chaired by Barry Jones 2000-01, member of the Council of the National Library of Australia, 1992-98 and President of the Australian Library and Information Association, 2000-01. Mairéad was appointed as an auditor for the Australian Universities Quality Agency in 2001.*

# THE SEARCH FOR NEW LIFE FORMS?



*Dr Miriam Baltuck at the controls... in the search for new life forms?*

ACT WISENET member, **Dr Miriam Baltuck**, Science and Technology Adviser, US Embassy, Canberra, and NASA Scientist, delivered the Toyota-ANU Public Lecture entitled Life Beyond Earth! at the Australian National University on Thursday the 14th November. A decade ago the idea of detecting life beyond earth was hard to defend. The mere

concept was greeted with skepticism and there was little hard data to support it. Over the last few years the discovery of planets beyond our solar system, the announcement of fossil life in a meteorite from Mars, and a better understanding of what is necessary to life on earth have led to a different focus: the search for life beyond Earth has become a search for

water. In her talk, Miriam traced the path in scientific thought from complacency about Earth's uniqueness to recent results from Mars which challenge that thinking. She outlined the current suite of international spaceflight projects designed to find life beyond Earth, and discussed Australia's critical role in these undertakings.

(Miriam's contact email: [baltuckm@state.gov](mailto:baltuckm@state.gov))

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